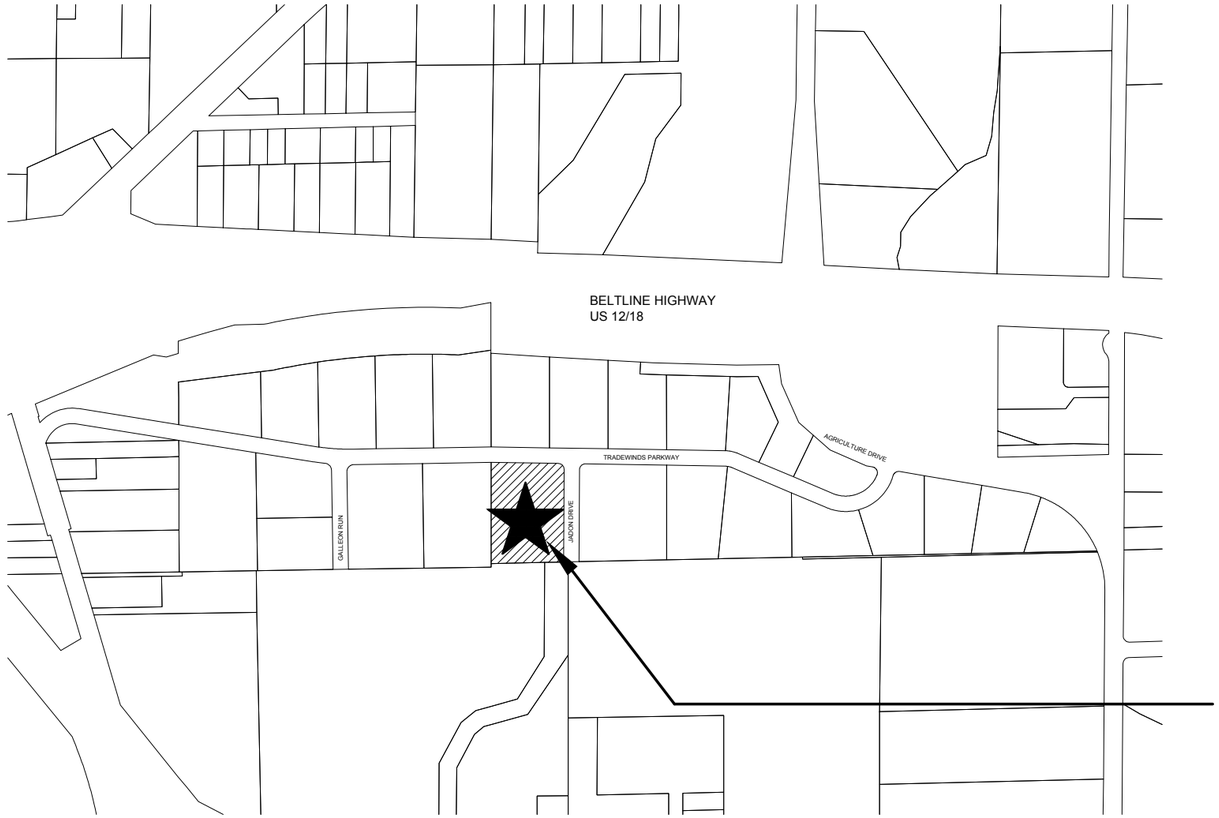
PLOTTED: 1-20-2017 1:30 PM
PLOT SCALE: 1:2

DRAWINGS FOR
UNIT WELL 31
WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

WISCONSIN
RANDY J. SANFORD
33689
ALTOONA, WI
PROFESSIONAL ENGINEER
4/13/17

CONTRACT NO. 7500
PROJECT NO. 53W10434
MUNIS NO. 10434-86-140



Madison Water Utility

PUBLIC IMPROVEMENT PROJECT APROVED MAY 5, 2015 BY THE COMMON COUNCIL OF MADISON, WI

PROJECT LOCATION
4901 TRADEWINDS PARKWAY

SHEET NUMBERING LEGEND

SHEET
P2
- P2 — CONSECUTIVE SEQUENCE DRAWING NUMBER
- DISCIPLINE
  - G GENERAL
  - C CIVIL
  - P PROCESS
  - E ELECTRICAL

SEH
6800 DANA RD, SUITE 200
MADISON, WI 53719-1137
PHONE: 608.826.0199
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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY
DRAWN BY

SHEET TITLE
TITLE SHEET

SHEET
G1

I:\SEH\CF1 PROJECTS\KO.M\MADWU\129083.5-FINAL-DSGN 51-DRAWINGS\...\GENERAL\...\GG1 TITLE SHEET.DWG
SAVED: 11-10-2016 3:16 PM USER: CHAD KATZENBERGER
XREFs: ...\Base\Border Files\Madison AutoCAD 22 .34 Border

PLOTTED: 1-23-2017 9:34 AM
PLOT SCALE: 1:2

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G2 GENERAL DRAWINGS SHEET INDEX

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C2 UNIT WELL 31 WATER UTILITY PLAN
C3 UNIT WELL 31 SANITARY SEWER PLAN
C4 UNIT WELL 31 STORMWATER MANAGEMENT PLAN
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SEH

Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY
DRAWN BY
Short Elliott Hendrickson, Inc. © (SEH)

SHEET TITLE
GENERAL DRAWINGS
SHEET INDEX

SHEET
G2

I:\SEHCF1\PROJECTS\KO\M\MADWU\129083\5-FINAL-DSGN\51-DRAWINGS\...\GENERAL\...\G02 INDEX SHEET.DWG
SAVED: 1-23-2017 9:30 AM USER: CHAD.KATZENBERGER
XREFs: ...\Base Border Files\Madison AutoCAD 22 34 Border

PLOTTED: 1-12-2017 3:04 PM
PLOT SCALE: 1:2

NOTES:

1. THE APPLICANT SHALL REPLACE ALL SIDEWALK AND CURB AND GUTTER WHICH ABUTS THE PROPERTY WHICH IS DAMAGED BY THE CONSTRUCTION OR ANY SIDEWALK AND CURB AND GUTTER WHICH THE CITY ENGINEER DETERMINES NEEDS TO BE REPLACED BECAUSE IT IS NOT AT A DESIRABLE GRADE REGARDLESS OF WHETHER THE CONDITION EXISTED PRIOR TO BEGINNING CONSTRUCTION. (POLICY)
2. ALL WORK IN THE PUBLIC RIGHT-OF-WAY SHALL BE PERFORMED BY A CITY LICENSED CONTRACTOR. (MGO 16.23(9)(C)5) AND MGO 23.01)
3. ALL DAMAGE TO THE PAVEMENT ON TRADEWINDS PARKWAY AND JADON DRIVE, ADJACENT TO THIS DEVELOPMENT SHALL BE RESTORED IN ACCORDANCE WITH THE CITY OF MADISON'S PAVEMENT PATCHING CRITERIA., FOR ADDITIONAL INFORMATION PLEASE SEE THE FOLLOWING LINK: http://www.cityofmadison.com/engineering/patchingCriteria.cfm (Policy)
4. QUANTITES ARE FOR REFERENCE ONLY, NOT FOR BIDDING QUANTITIES.
5. REFER TO CURRENT YEAR OF PART 8 FOR DETAILS: https://www.cityofmadison.com/business/pw/specs.cfm. MOST RECENT VERSIONS AS OF THIS DESIGN ARE INCLUDED IN THIS PLAN SET.

NOTES (CONTINUED):

6. ALL ASPHALT PAVEMENT SHALL CONFORM TO DETAIL C/CD1.
7. ALL SIDEWALKS SHALL CONFORM TO DETAIL D/CD1.
8. ALL GRAVEL SURFACE AREAS SHALL CONFORM TO DETAIL E/CD1.
9. ALL CURB & GUTTER INSTALLATIONS SHALL CONFORM TO DETAIL 3.06/CD10.
10. ALL APRON ENDWALLS SHALL CONFORM TO DETAIL 5.4.1/CD15.
11. RIP RAP SHALL CONFROM TO DETAIL 5.4.4/CD17.
12. GUARDS SHALL BE CONSTRUCTED AT ALL PROPOSED APRON ENDWALLS ACCORDING TO DETAIL 5.6.1/CD23.
13. EXPANSION JOINTS SHALL BE CONSTRUCTED BETWEEN ALL BUILDING CONCRETE AND EXTERIOR CONCRETE AND ASPHALT PAVEMENT INTERFACES.

N

scale 20 0 20 40 feet

33' ROW
33' ROW
TRADEWINDS PKWY
REPAIR CURB & GUTTER AT ENTRANCES AS APPLICABLE
REPLACE CONCRETE SIDEWALK & SAWCUT AS REQ'D
STREET BARRICADES AND SIGNING AS REQ'D SEE DETAIL 6.29/CD32
NEW DRIVEWAY APRON & SIDEWALK 560 SF CONCRETE, 7-INCHES THICK SEE DETAIL 3.09/CD32
REPAIR CURB & GUTTER AT ENTRANCES AS APPLICABLE
REPLACE CONCRETE SIDEWALK & SAWCUT AS REQ'D
AESTHETIC VISUAL SCREEN MOUNTED ATOP CONCRETE REFER TO ARCHITECT PLANS
TURF ESTABLISHMENT AREA
REPLACE CONCRETE SIDEWALK & SAWCUT AS REQ'D
REPAIR CURB & GUTTER AT ENTRANCES AS APPLICABLE
REPAIR CURB & GUTTER AT ENTRANCES AS APPLICABLE
REPLACE CONCRETE SIDEWALK & SAWCUT AS REQ'D
NEW DRIVEWAY APRON & SIDEWALK 530 SF CONCRETE, 7-INCHES THICK SEE DETAIL 3.09/CD32
HYDRANT TOP NUT N: 472250.487' E: 844538.651' Z: 862.073'
PROTECT EXISTING TV PEDESTAL
750 SY ASPHALT DRIVEWAY SEE DETAIL C/CD1.
555 SY ASPHALT DRIVEWAY SEE DETAIL C/CD1.
TRANSFORMER AND BOLLARDS - SEE ELECTRICAL PLANS
127 LF 30" MOUNTABLE CONCRETE CURB & GUTTER TYPE A PER DETAIL 3.06/CD10
CONSTRUCTION DISTURBANCE LIMITS
SEE EROSION CONTROL PLAN.
12" RCP APRON ENDWALL WITH RIP RAP, GEOTEXILE, & TRASH GUARD INV = 856.00 N = 472082.49' E = 844801.55'
75' PUBLIC STORM WATER DRAINAGE EASEMENT
FIELD LOCATED WETLAND 10-15-2014
EXISTING STORM WATER DRAINAGE EASEMENT
TURF ESTABLISHMENT AREA
TURF ESTABLISHMENT AREA
CLEAR STONE SPILLWAY DETAIL 1.05/CD8.
75 LF 12" CLASS V RCP @ 2.5%
ASPHALT PARKING LOT AND DRIVEWAY; SEE DETAIL C/CD1
CONCRETE BETWEEN GENERATOR AND SCREEN OR BUILDING. MATCH THICKNESS DETAILS ON DETAIL 3.09 WITH JOINTS PER DETAIL D/CD1.
GENERATOR PAD, SEE DETAIL SHEET E31
BOLLARDS - SEE ELECTRICAL PLANS
BACKWASH OVERFLOW INLET STRUCTURE SEE DETAIL E/CD3.
EXISTING GROUND RESERVOIR
PROPOSED WET BASIN SEE SHEET C4 & C5 FOR MORE INFORMATION
WATER SERVICE, NO CURB STOP
FUTURE SCRUBBER (BY OTHERS)
REFER TO ELECTRICAL PLANS
PROPOSED WATER TREATMENT PLANT
ADA ACCESSIBILITY SIGN K-1471-HI-12x18 MOUNTED ON WHITE PAINTED GALVANIZED STEEL POST. ADA SIGN K-1505-EG-06x18 IMMEDIATELY BELOW. SIGN BOTTOM IS 5 FEET ABOVE GROUND. SEE DETAIL B/CD2.
WELL HEAD
265 SF 5' WIDE CONCRETE SIDEWALK
PARKING LOT
ADA VAN ACCESSIBILTY AREA 10' X 20'
ADA ACCESSIBLE PARKING STALL SEE WISDOT S.D.D 15C7-13A
ASPHALT PARKING LOT AND DRIVEWAY SEE DETAIL 4.06 AND DETAIL B/DC1
TURF ESTABLISHMENT AREA
283 LF CONCRETE MOUNTABLE CURB & GUTTER TYPE A SEE DETAIL 3.06/CD10.
38 LF BASKET-WEAVE WOODEN FENCE
GATE 2 32-FOOT SLIDING CANTILEVER SEE ELECTRICAL PLANS FOR INSTALLATION
GRAVEL PARKING LOT AND DRIVEWAY SEE DETAIL E/DC1
REFER TO ELECTRICAL PLANS
32-FOOT SLIDING GATE SEE SHEET L1
4' WIDE 7" THICK CONCRETE STRIP UNDER TRAVEL PATH OF CANTILEVER GATE
14 LF FENCE SEE SHEET L1
50'-5" FENCE
62'-3" COATED CHAIN LINK FENCE
4'x 6' x 5" THICK CONCRETE PAD WITH 4' LONG 5" THICK CONCRETE TAPER TO GATE CONCRETE
SEE SECTION 32 31 13 & SECTION 32 31 23
4' WIDE 7" THICK CONCRETE STRIP UNDER TRAVEL PATH OF CANTILEVER GATE
TURF ESTABLISHMENT AREA
REFER TO ELECTRICAL PLANS
GRAVEL PARKING LOT AND DRIVEWAY SEE DETAIL E/DC1
87'-3" COATED CHAIN LINK FENCE SEE SHEET L1
GATE 1 32-FOOT SLIDING CANTILEVER SEE ELECTRICAL PLANS FOR INSTALLATION
PROP. BOUNDARY PER FINAL PLAT (TYP.)
1760 SY GRAVEL STORAGE AREA SEE DETAIL E/CD1
REINFORCE 1:1 SLOPES WITH 4" THICK CONCRETE (1,310 SF) PER DETAIL D/CD3.
159'-11" BASKET-WEAVE WOODEN FENCE
INLET (TYP)
621 SY NO MOW 15-FOOT DRIVEABLE NO MOW GRASS TANK PERIMETER. 2-PERCENT SLOPES AWAY FROM TANK
30' MADISON GAS & ELEC. EASEMENT
CLEAR STONE SPILLWAY DETAIL 1.05/CD8.
9.9948'
16.2743
15' MADISON METROPOLITAN SEWAGE DISTRICT EASEMENT
90' PVT. STORM WATER MGMT. EASEMENT
MAINTAIN ALL DISTURBANCE 10 FEET FROM WETLAND
TURF ESTABLISHMENT AREA
FIELD LOCATED WETLAND 10-15-2014
WET
XC
OX

TOTAL IMPERVIOUS AREA = 53,990 SF
TOTAL DISTURBANCE AREA = 94,845 SF
DISTURBANCE DUE TO SOUTH POND = 15,175 SF
DISTURBANCE DUE TO WATER PLANT AND TANK = 79,670 SF

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1-12-2017 2:59 PM
USER: JOSH BOHNERT

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SEH

Madison Water Utility

UNIT WELL 31
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE DECEMBER 19, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM

SHEET TITLE
UNIT WELL 31
SITE PLAN

SHEET
C1

PLOTTED: 1-12-2017 3:04 PM
PLOT SCALE: 1:2

NOTES & REQUIREMENTS:

1. ALL COORDINATES SHOWN ARE TO CENTER OF WATER STRUCTURE/FEATURE.
2. ALL WATER MAINS AND APPURTENANCES SHALL CONFORM TO SECTION 33 11 00 AND AWWA STANDARDS. ALL WATER MAIN PIPING IS RESTRAINED JOINTS. ALL PIPING SHALL HAVE THRUST BLOCKING PER DETAIL 7.03.
3. ALL WATER MAIN PIPE INSTALLATION SHALL CONFORM TO DETAIL 5.2.1 & 5.2.2.
4. ALL CONCRETE PIPE INSTALLATION SHALL CONFORM TO DETAIL 5.4.6.
5. QUANTITIES ARE FOR REFERENCE ONLY, NOT FOR BIDDING QUANTITIES.
6. REFER TO CURRENT YEAR OF PART 8 FOR DETAILS: https://www.cityofmadison.com/business/pw/specs.cfm. MOST RECENT VERSIONS AS OF THIS DESIGN ARE INCLUDED IN THIS PLAN SET.

NOTES & REQUIREMENTS (CONTINUED):

7. ALL TRENCHES SHALL BE COMPACTED PER DETAIL 5.2.2/CD13.
8. ALL WATER MAIN FITTINGS SHALL HAVE THRUST BLOCKS PER DETAIL 7.13/CD35 AND DETAIL 7.14/CD35.
9. ALL JOINTS AT WATER MAIN FITTINGS & VALVES SHALL BE RESTRAINED PER DETAIL 7.17/CD36.
10. ALL WATER MAINS AND WATER SERVICES SHALL BE CONSTRUCTED WITH A MINIMUM COVER OF 6.0 FEET BELOW FINISHED GRADE. WHERE WATER MAINS CROSS SEWERS, WATER MAIN SHALL BE LOWERED AND INSULATED PER DETAIL F/CD1 AND DETAIL 7.16/CD36.
11. ENCASE ALL WATER MAINS PER DETAIL 7.02/CD33.
12. ALL WATER MAIN SHALL HAVE PIPE BEDDING PER DETAIL 7.01/CD33.
13. ALL VALVE BOXES IN PAVEMENT SHALL BE ADJUSTED PER DETAIL 7.06/CD34.
14. ALL BUTTERFLY VALVES & BOXES SHALL CONFORM TO DETAIL A/CD1.
15. ALL GATE VALVES & BOXES SHALL CONFORM TO DETAIL B/CD1.
16. WHERE WATER MAINS CROSS OVER SEWERS, THE MINIMUM VERTICAL SEPARATION SHALL BE 6 INCHES WALL TO WALL.
17. WHERE WATER MAINS CROSS UNDER SEWER, THE MINIMUM VERTICAL SEPARATION SHALL BE 18 INCHES WALL TO WALL.

N

20 0 20 40
scale 10 feet

33' ROW
33' ROW
WET
XC
SEE EROSION CONTROL PLAN
SEE SITE PLAN.
SEE SITE PLAN
17 LF 12" DIP WATER MAIN
12"X6" 90°REDUCING DIP BEND
8 LF 12" DIP WATER MAIN
34 LF 6" DIP WATER MAIN ONE LOWER WATER MAIN
CONNECT TO EXISTING WATER MAIN
12" DIP 22.5° BEND
15 LF 12" DIP WATER MAIN
PROPOSED WATER TREATMENT PLANT
16" X 6" TEE
16"X12" REDUCER (S)
CONNECT TO PROCESS PIPING
CONNECT TO EXISTING WATER MAIN
6" 22.5° DIP BEND
16" BUTTERFLY VALVE & BOX
20.8'
4.2'
HYDRANT (UTILITY STANDARD RED) WITH COMPLETE ASSEMBLY SEE DETAIL 7.04CD/34. N=472178.73' E=844675.32' 6" GV & BOX 12 LF 6" DIP WM
CONNECT TO PROCESS PIPING
20" DIP - SEE PROCESS DRAWINGS
2.3'
20" 45° BEND SEE DETAIL 7.03 (TYP)
CONNECT TO PROCESS PIPING
72 LF 12" DIP
6-INCH DIP 45° BEND
6-INCH DIP 45° BEND
6-INCH DIP CONNECTION BY MECH. CONTRACTOR
6 LF 6" DIP ONE LOWER WATER MAIN
12" 90° DIP BEND
40 LF 12" WM
CONNECT TO PROCESS PIPING
ONE LOWER WATER MAIN & INSULATE
52.7'
8' MIN.
29 LF 12" DIP
7 LF 12" DIP
12" 45° BEND
42 LF 12" DIP WATER MAIN
INSULATE WATER MAIN
8' MIN.
62 LF 6" DIP LOWER WATER MAIN & INSULATE
INSULATE WATER MAIN
HYDRANT (WHITE) WITH COMPLETE ASSEMBLY SEE DETAIL 7.04CD/34. N=472179.79' E=844613.72' 12" GV & BOX
48 LF 6" DIP INSULATE WATER MAIN
46 LF 20" DIP
12" 45° BEND
20" 45° BEND
3'
12" 45° BEND
39 LF 12" DIP
46 LF 20" DIP
20" 45° BEND
71 LF 20" DIP
5.0'
12'
EXISTING GROUND STORAGE RESERVOIR
REMOVE EXISTING PLUG AND CONNECT VALVE TO EXISTING 12" WATER MAIN ACTUAL LOCATION OF CONNECTION WILL BE PROVIDED DURING CONSTRUCTION
12" BUTTERFLY VALVE & BOX
REMOVE EXISTING PLUG AND CONNECT VALVE TO EXISTING 20" WATER MAIN ACTUAL LOCATION OF CONNECTION WILL BE PROVIDED DURING CONSTRUCTION
12"x8" TEE DIRECTLY CONNECTED TO VALVE
20"x8" TEE
20" BUTTERFLY VALVE & BOX
8-INCH DIP 45° BEND
6 LF 8" DIP
17 LF 8" DIP WATER MAIN CONNECTION ONE 8" TEE ONE 8" 90° BEND TWO 8" GATE VALVE & BOX VALVES TO REMAIN CLOSED LOWER WATER MAIN
88 LF 8" DIP WATER MAIN
8" 45° BEND SEE DETAIL 7.03
46 LF 8" DIP WATER MAIN
HYDRANT (WHITE) WITH COMPLETE ASSEMBLY SEE DETAIL 7.04/CD34. HYDRANT TOP NUT ELEVATION AT OR BELOW 863.00 N=471866.15' E=844682.84' 8" X 6" REDUCER
SEE EROSION CONTROL PLAN.
STORAGE YARD FENCE SEE PAGE L1.

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SEH

Madison Water Utility

UNIT WELL 31
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE DECEMBER 19, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM
Short Elliott Hendrickson, Inc. © (SEH)

SHEET TITLE
UNIT WELL 31
WATER UTILITY PLAN

SHEET
C2

C:\PROJECTS\KOMMADW\0129083\5-FINAL-DSGN\51-CONST-DWGS-CAD\10-CIVIL\MA129083_SITEPLANJDWG
USER: JOSH BOHNERT
1-12-2017 2:59 PM

PLOTTED: 1-12-2017 3:04 PM
PLOT SCALE: 1:2

ADDITIONAL NOTES & REQUIREMENTS:
1. ALL SANITARY SEWER SHALL HAVE PIPE BEDDING PER DETAIL 5.2.1/CD9.
2. ALL TRENCHES SHALL BE COMPACTED PER DETAIL 5.2.2/CD10.
3. SANITARY MAINS AND SANITARY SERVICES SHALL BE INSULATED PER DETAIL F/CD1.
4. ALL PVC PIPE 6" AND LARGER SHALL PASS CITY STANDARD MANDREL IN DETAIL 5.1.1/CD15.

EX 12" RCP STM SWR

EXISTING SANITARY SAS
RIM = 857.80
INV = 846.64

EX 8" PVC SAN SWR

EXISTING SANITARY SAS
RIM = 859.67
INV = 845.34

N

20 0 20 40
scale 10 feet

NOTES & REQUIREMENTS:
1. REFER TO DETAIL SHEET CD3 FOR SANITARY SEWER STRUCTURE TABLES WITH CONSTRUCTION DETAILS.
2. ALL COORDINATES SHOWN ARE TO CENTER OF MANHOLE STRUCTURE.
3. SEE SECTION 33 31 00.
4. QUANTITIES ARE FOR REFERENCE ONLY, NOT FOR BIDDING QUANTITIES.
5. REFER TO CURRENT YEAR OF PART 8 FOR DETAILS: https://www.cityofmadison.com/business/pw/specs.cfm
6. ALL SANITARY SEWER SHALL HAVE PIPE BEDDING PER DETAIL 5.2.1/CD12.
7. ALL TRENCHES SHALL BE COMPACTED PER DETAIL 5.2.2/CD13.
8. SANITARY MAINS AND SANITARY SERVICES SHALL BE INSULATED PER DETAIL F/CD1.
9. ALL PVC PIPE 6" AND LARGER SHALL PASS CITY STANDARD MANDREL IN DETAIL 5.1.1/CD11.
10. PIPE COUPLINGS SHALL CONFORM TO DETAIL 5.3.3/CD14.
11. ALL PVC PIPE CONNECTIONS TO MANHOLES SHALL CONFORM TO DETAIL 5.7.31/CD31.
12. ALL CONNECTIONS WITH MORE THAN 2.00 FEET ELEVATION DIFFERENCE BETWEEN INFLUENT AND EFFLUENT PIPE INVERTS SHALL HAVE A SANITARY DROP ACCORDING TO STANDARD DETAIL 5.7.30.

33' ROW
33' ROW

EX 48" RCP STM SWR

EX 8" PVC SAN SWR

EX 6" PVC SAN SWR
APPROX LOCATION

SS-1

WET
XC

EXISTING GROUND RESERVOIR

PROPOSED WATER
TREATMENT PLANT

40 LF 6" C900 DR14 PVC
SANITARY SERVICE
@ 1.0 % MINIMUM SLOPE

SEE SHEET M1 FOR
DOMESTIC
SEWER LOCATION

26 LF 8" PVC SAN SERVICE
SEE BEDDING DETAIL 5.2.1
(TYP ALL SAN)
CONNECT TO EXISTING
SANITARY SEWER

SS-2
4-FT SANITARY SAS W/ DROP
SEE STRUCTURE
TABLE SHEET CD3
SEE DETAILS 5.7.2, 5.7.15,
5.7.16, 5.7.17, AND 5.7.31
N=472161.903
E=844621.074

21'
17'
21'

SS-2
SS-3

17 LF 4" C900 DR14 PVC
SANITARY SERVICE
@ 1.0 % MINIMUM SLOPE

31 LF 4" C900 DR14 PVC
SANITARY SERVICE

42 LF 6" C900 DR14 PVC
SANITARY SERVICE

CONNECT TWO 4"
SERVICES TO MANHOLE
PER DETAIL 5.7.30/CD30.

SS-3
4-FT SANITARY SAS W/ DROP
SEE STRUCTURE TABLE SHEET CD3
SEE DETAILS 5.7.2, 5.7.15,
5.7.16, 5.7.17, AND 5.7.31
N=472119.579
E=844621.074

EXISTING SANITARY SAS
RIM = 859.28'
INV = 850.97

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FAX: 888.908.8166
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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO.	129083
PROJECT NO.	53W10434
ISSUE DATE	DECEMBER 19, 2016
DESIGNED BY	JJB
DRAWN BY	JJB/SGM

SHEET TITLE
UNIT WELL 31
SANITARY SEWER PLAN

SHEET
C3

PLOTTED: 1-12-2017 3:04 PM
PLOT SCALE: 1:2

NOTES:

1. REFER TO DETAIL SHEET CD3 FOR STORM SEWER STRUCTURE TABLES WITH CONSTRUCTION DETAILS.
2. ALL COORDINATES SHOWN ARE TO CENTER OF INLET OR MANHOLE STRUCTURE, ACTUAL BACK OF CURB, OR END OF PIPE (NOT END OF ENDWALL)
3. ALL STORM SEWER PIPE INSTALLATION SHALL CONFORM TO DETAIL 5.2.1, 5.2.2 & 5.4.6.
4. SEE SECTION 33 41 00.
5. SEE DETAILS 5.7.26 & 5.7.27 FOR STORM SEWER STAKING REQUIREMENTS.
6. SEE DETAILS 5.7.7, 5.7.20, 5.7.21, & 5.7.29 FOR INLET REQUIREMENTS.
7. CONCRETE PIPE JOINTS SHALL CONFORM TO DETAIL 5.4.6/CD16.
10. ALL APRON ENDWALLS SHALL CONFORM TO DETAIL 5.4.1/CD15.
11. RIP RAP SHALL CONFROM TO DETAIL 5.4.4/CD17.
12. GUARDS SHALL BE CONSTRUCTED AT ALL PROPOSED APRON ENDWALLS ACCORDING TO DETAIL 5.6.1/CD23.
13. SEE DETAIL 5.2.1 & 5.2.2 FOR BEDDING AND COMPACTION REQUIREMENTS.
14. QUANTITIES ARE FOR REFERENCE ONLY, NOT FOR BIDDING QUANTITIES.
15. REFER TO CURRENT YEAR OF PART 8 FOR DETAILS:https://www.cityofmadison.com/business/pw/specs.cfm
10. CONTRACTOR SHALL OBTAIN A CONNECTION PERMIT AND EXCAVATION PERMIT PRIOR TO COMMENCING STORM SEWER CONSTRUCTION. MGO 37.05(7). THE PERMIT APPLICATION IS AVAILABLE ONLINE AT http://www.cityofmadison.com/engineering/permits.cfm

33' ROW
33' ROW
SEE EROSION CONTROL PLAN
EXISTING 12" RCP AEW
FIELD VERIFY LOCATION
12" RCP AEW
REFER TO SHEET C5
DETAIL 5.4.1 & 5.4.4
SEE EROSION CONTROL PLAN
CLEAR STONE SPILLWAY
DETAIL 1.05/CD8.
125 LF CONCRETE
CURB & GUTTER
EXISTING 12" RCP
FIELD VERIFY LOCATION
12" CLASS IV RCP
END BACK CURB
BC = 861.26
N=472142.13'
E=844779.69'
R63.82'
PT BACK CURB
BC = 861.70
N=472067.57'
E=844779.69'
END BACK CURB
BC = 861.20
N=472020.98'
E=844759.67'
EXISTING POTABLE WATER TANK
OVERFLOW STRUCTURE
FIELD VERIFY LOCATION
EXISTING GROUND RESERVOIR
PROPOSED WET BASIN
SEE SHEET C4 & C5
FOR MORE INFORMATION
GRADE SWALE TO
DRAIN AWAY FROM
ELECTRICAL GENERATOR.
PROPOSED WATER
TREATMENT PLANT
PLACE ST-2 UNDER
ROOF DRAIN OUTLET.
SEE STRUCTURE TABLE ON SHEET CD3
AND DETAIL C/CD3.
CLAY BASIN LINER
REFER TO SHEET C5
SEE EROSION CONTROL PLAN
18" RCP AEW, GRATE, & RIP RAP
REFER TO SHEET C5
39 LF 12" RCP
CLASS IV @ 0.50%
50 LF 12" RCP
CLASS IV @ 0.50%
TRENCH DRAIN
FULL LENGTH OF ENTRANCE
SEE DETAIL A/CD2.
INV = 859.77
END BACK CURB
BC = 860.75
N=472168.02'
E=844567.85'
8 LF 12" RCP
CLASS IV @ 0.50%
179 LF 18" RCP
CLASS IV @ 0.50%
39 LF 18" RCP
CLASS IV @ 0.51%
123 LF CONCRETE
CURB & GUTTER
105 LF 18" RCP
CLASS IV @ 0.63%
160 LF CONCRETE
CURB & GUTTER
8 LF 12" RCP
CLASS IV @ 0.50%
59 LF 18" RCP
CLASS IV @ 0.48%
21 LF 4" C900 DR 14
PVC @ 9.52%
BACK CURB - DETAIL 3.06
BC = 860.75
N=472045.51'
E=844556.36'
BACK CURB - DETAIL 3.06
BC = 860.00
N=472009.03'
E=844557.74'
END BACK CURB - DETAIL 3.06
ADD TRANSITION
TC = 859.37
N=471885.51'
E=844558.21'
ST-1
ST-2
ST-3
ST-4
ST-5
ST-6
ST-7
ST-8
ST 9

N
20 0 20 40
scale 10 feet

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Madison Water Utility

UNIT WELL 31
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

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		REVISIONS

SEH FILE NO. 129083
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ISSUE DATE DECEMBER 19, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM
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SHEET TITLE
UNIT WELL 31
STORMWATER MANAGEMENT
PLAN

SHEET
C4

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NOTES:
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2. ALL APRON ENDWALLS SHALL CONFORM TO DETAIL 5.4.1/CD15.
3. RIP RAP SHALL CONFROM TO DETAIL 5.4.4/CD17.
4. GUARDS SHALL BE CONSTRUCTED AT ALL PROPOSED APRON ENDWALLS ACCORDING TO DETAIL 5.6.1/CD23.
5. REFER TO CURRENT YEAR OF PART 8 FOR DETAILS: https://www.cityofmadison.com/business/pw/specs.cfm

N

scale 10 5 0 10 20 feet

EXISTING GROUND RESERVOIR

APPROXIMATE CENTERLINE DRAINAGE DITCH

12" RCP APRON ENDWALL WITH RIP RAP, GEOTEXILE, & TRASH GUARD
INV = 854.50
N=471861.053
E=844800.153
DETAIL 5.4.1 & 5.4.4

43 LF 12" CLASS IV @ 1.16%

WET POND INLET STRUCTURE
DETAIL A/CD3.

SEE EROSION CONTROL PLAN

SEE EROSION CONTROL PLAN

ST-8

1 C8

18" RCP APRON ENDWALL WITH RIP RAP, GEOTEXTILE, & TRASH GUARD
INV = 855.46
SEE DETAILS 5.4.1 & 5.4.4
N=471866.140
E=844594.520

C5

FOREBAY
BOT EL = 852.00

BOT EL = 852.00

11,300 SF (ALONG GRADE)
2.0' THICK TYPE A CLAY LINER
TO ELEVATION 858.75
TYPE A" LINER PER APPENDIX D OF DNR TECH STD 1001 LINER
SHALL BE CONSTRUCTED AT THE TIME THE SITE IS
CONSIDERED STABILIZED

EMERGENCY OVERFLOW
ELEV = 858.60
DETAIL 1.05/CD8

C8

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SHEET TITLE
UNIT WELL 31
WET BASIN

SHEET
C5

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N

20 0 20 40
scale 10 feet

33' ROW
33' ROW
JADON DR.
TRADEWINDS WAY
SLOPE SIDEWALK @ 1.5% TOWARD STREET
MATCH EXISTING GRADE
END BACK CURB BC = 861.26' N=472143.40' E=844770.94'
PT BACK CURB BC = 861.70' N=472068.84' E=844771.44'
FINISH GRADE TO PREVENT/MINIMIZE OFFSITE RUNOFF (ENTIRE SITE)
DRAINAGE DITCH AROUND TANK BEGINS @ 0.50 %
BERM TO PREVENT OFFSITE STORM WATER RUNOFF
10-FOOT WIDE EMERGENCY SPILLWAY INVERT ELEV. = 858.56 FEET SEE TYPICAL SECTION 3/C9
AVOID ANY DISTURBANCE TO EXISTING WETLAND
ASPHALT PARKING LOT AND DRIVEWAY; TYPE B ROADWAY; SEE DETAIL 4.06 AND DETAIL B/DC1
GRADE TO MATCH FINISHED FLOOR ELEVATION OF STORAGE BUILDING TO DRIVE-THROUGH DOORS MAXIMUM 7:1 SLOPE UP TO 10 FEET OUTSIDE DOOR
END BACK CURB BC = 861.20' N=472022.62' E=844751.08'
EXISTING GROUND RESERVOIR
64' RAD TO BC N=472067.62' E=844715.38'
CENTERLINE OF DRAINAGE DITCH
PROPOSED WATER TREATMENT PLANT FFE = 862.50 FEET
GRAVEL PARKING LOT AND DRIVEWAY SEE DETAIL C/DC1
15-FOOT NO MOW GRASS 2-PERCENT SLOPES AWAY FROM TANK (SEE TYPICAL SECTION)
CONCRETE SIDEWALK TO DRAIN AT 1.50% SLOPE AWAY FROM BUILDING
WELL HEAD
GRADE TO MATCH FINISHED FLOOR ELEVATION OF STORAGE BUILDING TO DRIVE-THROUGH DOORS MAXIMUM 7:1 SLOPE UP TO 10 FEET OUTSIDE DOOR
FINISHED GRADE ALONG STRUCTURES SHALL BE 6 INCHES BELOW FINISHED FLOOR ELEVATION
CONCRETE SIDEWALK 1.50% CROSS SLOPE DESIRABLE MATCH EXISTING SLOPE AT ENDS
WET POND BOTTOM 852.00 FEET SEE PROFILE DETAIL
MATCH ASPHALT FLUSH WITH SIDEWALK
MATCH EXISTING GRADE
TRENCH DRAIN
DRAINAGE DITCH INV. = 859.50 FEET
ASPHALT PARKING LOT AND DRIVEWAY; TYPE B ROADWAY; SEE DETAIL 4.06 AND DETAIL B/DC1
GRAVEL PARKING LOT AND DRIVEWAY SEE DETAIL C/DC1
BACK CURB - DETAIL 3.06 BC = 860.75' N=472046.79' E=844548.10'
CONCRETE CURB & GUTTER @ 0.50% SLOPE
BACK CURB - DETAIL 3.06 BC = 860.00' N=472008.80' E=844549.54'
GRADE GRAVEL AREA TO DRAIN TO CONCRETE CURB & GUTTER
END BACK CURB - DETAIL 3.06 ADD TRANSITION TC = 859.37' N=471881.90' E=844549.98'
TOTAL CUT = 5,190 CY
TOTAL FILL = 3,770 CY

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SHEET TITLE
UNIT WELL 31
GRADING PLAN

SHEET
C6

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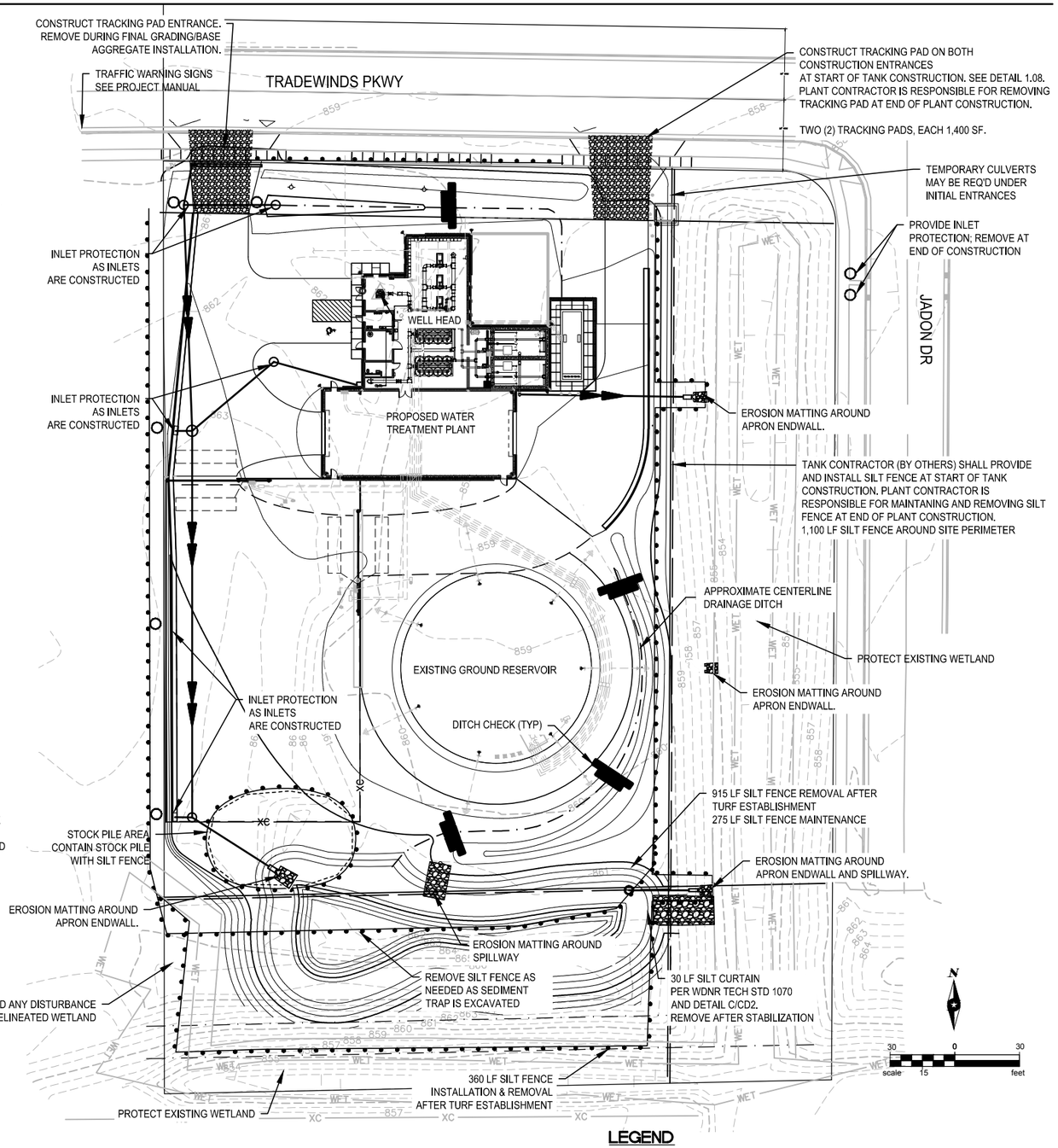
EROSION CONTROL GENERAL NOTES:

1. CONSTRUCT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE "WISCONSIN STORMWATER CONSTRUCTION AND POST-CONSTRUCTION TECHNICAL STANDARDS".
2. DISTURBED AREAS SHALL BE UNIFORMLY GRADED PRIOR TO TURF ESTABLISHMENT.
3. STONE TRACKING PADS SHALL BE THE FULL WIDTH OF THE EGRESS POINT, A MINIMUM OF 50-FEET LONG AND 12-INCH DEPTH (3-6" CLEAR STONE). STONE TRACKING PADS SHALL BE PLACED IN LOCATIONS AS REQUIRED. WDNR TECHNICAL STANDARD 1057 SHALL BE FOLLOWED FOR THE MAINTENANCE OF THE STONE TRACKING PADS.
4. ANY DISTURBED SOIL NOT ANTICIPATED TO BE REMOVED WITHIN 7 DAYS SHALL BE TEMPORARY SEEDED OR OTHERWISE PROTECTED. WORK IS INCIDENTAL TO THE BID ITEM TURF ESTABLISHMENT, AND WILL NOT BE MEASURED FOR PAYMENT.
5. TEMPORARY SEEDING TO CONFORM WITH SECTION 630.2.1.5.1.2 OF THE STATE OF WISCONSIN STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (ANNUAL OATS).
6. ALL WASTE, AND UNUSED BUILDING MATERIALS (INCLUDING GARBAGE, DEBRIS, CLEANING WASTES, WASTEWATER, OR TOXIC MATERIALS) SHALL BE PROPERLY DISPOSED OF AND NOT ALLOWED TO BE CARRIED OFFSITE BY RUNOFF OR WIND.
7. ALL OFFSITE SEDIMENT DEPOSITS OCCURRING AS A RESULT OF CONSTRUCTION WORK OR A STORM EVENT SHALL BE CLEANED UP BY THE END OF EACH DAY. FLUSHING SHALL NOT BE ALLOWED.
8. ANY SOIL EROSION THAT OCCURS AFTER FINAL GRADING AND/OR THE APPLICATION OF STABILIZED MEASURES MUST BE REPAIRED AND THE WORK REDONE.
9. CONTRACTOR SHALL MAINTAIN ALL TEMPORARY EROSION CONTROL INSTALLATIONS UNTIL THE SITE IS STABILIZED WITH 70% VEGETATION AND A NOTICE OF TERMINATION HAS BEEN APPROVED BY THE WDNR.
10. WIND EROSION SHALL BE KEPT TO A MINIMUM DURING CONSTRUCTION. WATERING, MULCH, OR A TACKING AGENT MAY NEED TO BE UTILIZED TO PROTECT NEARBY BUSINESSES/WATER RESOURCES.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL THE EROSION CONTROL MEASURES IN CONFORMANCE WITH THE WDNR CONSERVATION PRACTICE STANDARDS.
12. DISTURBED SOILS SHALL BE STABILIZED IMMEDIATELY AFTER FINAL GRADING IS COMPLETE.
13. ALL EROSION CONTROL DEVICES SUCH AS SILT FENCE AND INLET PROTECTION SHALL BE IN PLACE PRIOR TO ANY LAND DISTURBING ACTIVITIES.
14. UPON COMPLETION OF STORM INLET INSTALLATION, THE CONTRACTOR SHALL INSTALL INLET PROTECTION.
15. FINE SEDIMENT ACCUMULATIONS SHALL BE CLEANED FROM STREETS, PRIVATE DRIVES, AND/OR PARKING AREAS BY SWEEPING A MINIMUM OF ONCE PER WEEK AND BEFORE ALL IMMINENT RAINS.
16. EROSION AND SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED WEEKLY AND WITHIN 24 HOURS OF RAINFALL OF 0.5-INCHES OR MORE. SEE STORMWATER MANAGEMENT PLAN.
17. CONTRACTOR SHALL REMOVE TEMPORARY EROSION CONTROL BMPS UPON PROJECT ACCEPTANCE AND ESTABLISHED TURF.
18. CONTRACTOR SHALL COORDINATE WITH ENGINEER ON TEMPORARY TOPSOIL STOCKPILE LOCATIONS. IF STOCKPILE IS TO REMAIN IN PLACE FOR MORE THAN 4 DAYS, IT SHALL BE ENCIRCLED WITH SILT FENCE. IF STOCKPILE IS TO REMAIN IN PLACE FOR MORE THAN 14 DAYS IT SHALL BE SEEDED WITH A TEMPORARY SEED MIX. CONFORM WITH WISCONSIN SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION SECTION 630.2.1.5.1.2.
19. ALL DISTURBED AREAS SHALL BE RESTORED AS NOTED. AREAS REQUIRING TEMPORARY SEEDING SHALL BE SEEDED USING A TEMPORARY SEED MIX AND DISC ANCHORED.
20. FOR DORMANT SEEDING (NOV. 1 TO MAY 15), SEED WITH SPECIFIED MIX AT A RATE OF 150% OF WHAT IS SPECIFIED (INCIDENTAL). ALL AREAS SEEDED IN LATE FALL/WINTER SHALL BE RE-SEEDED AFTER THE THREAT OF FROST IN THE SPRING PASSES.
    DEADLINES FOR SEEDING ARE:
    SEPTEMBER 15 - COOL GRASS SEEDING;
    OCTOBER 15 - TEMPORARY SEEDING;
    NOVEMBER 15 - DORMANT SEEDING.
21. HYDRO-MULCHING ALL DISTURBED AREAS W/POLYACRYLAMIDE IS REQUIRED FOR WINTER STABILIZATION (PER DOT'S PAL).
22. TOPSOIL SHALL NOT BE USED AS FILL MATERIAL IN THE NON-STRUCTURAL AREAS UNTIL ALL SOURCES OF STRUCTURAL CUT AND TRENCH SPOILS HAVE BEEN EXHAUSTED.
23. RESTORATION SHALL BE 3" TOPSOIL (REASONABLY FREE OF STONES, STICKS, ROOTS, AND OTHER OBJECTIONABLE DEBRIS). ONCE TOPSOIL HAS BEEN SPREAD, THE AREA SHALL BE SEEDED WITH SEED MIXTURE NO. 30 IN SECTION 630 OF THE "STATE SPECIFICATIONS" EXCEPT TEH WHITE CLOVER SHALL BE ELIMINATED AND THE RESPECTIVE PERCENTAGES OF THE OTHE SEED MATERIAL INCREASED IN THE SAME PROPORTION AS THE ORIGINAL MIX.THE CONTRACTOR SHALL APPLY A FERTILIZER (20-0-0) OVER THE SEEDED AREA AT A RATE OF 10 POUNDS PER 1000 SQUARE FEET. THIS AREA SHALL BE MAINTAINED BY THE CONTRACTOR. STRAW MULCH SHALL BE PLACED IN ACCORDANCE WITH METHODS "B" OR "C", AS DESCRIBED IN SECTION 627 OF THE "STATE SPECIFICATIONS", EXCEPT THAT THE MULCH SHALL BE PLACED WITHIN ONE (1) DAY AFTER THE SEEDING HAS BEEN COMPLETED.
24. PROVIDE EROSION MAT WHERE SLOPES EXCEED 1:5.

CONSTRUCTION SEQUENCE

1. INSTALL TEMPORARY TRACKING PADS.
2. INSPECT THE EXISTING SILT FENCE.
3. STRIP AND STOCKPILE TOPSOIL. IMMEDIATELY STABILIZED STOCKPILE WITH TEMPORARY SEED & MULCH.
4. COMPLETE ROUGH GRADING AND EXCAVATION FOR STRUCTURE FOUNDATION CONSTRUCTION. IMMEDIATELY STABILIZED STOCKPILE WITH TEMPORARY SEED & MULCH. EXCAVATE FUTURE WET POND FOR TEMPORARY SEDIMENT TRAP.
5. INSTALL TEMPORARY SEEDING AND HYDRO MULCH WITH TACKIFIER ON ALL DISTURBED AREAS WITHIN 7 DAYS OF THE END OF DISTURBANCE. NOTE THAT POLYACRYLAMIDE MUST BE USED TO STABILIZE DISTURBED AREAS DURING THE NON-GROWING SEASON. APPLY CLASS I TYPE A EROSION MAT PER WDNR TECHNICAL STANDARD 1052.
6. INSTALL DITCH CHECKS IN TEMPORARY OR FINAL DITCHES.
7. COMPLETE PLANT AND STORAGE FACILITY.
8. COMPLETE PAVEMENTS AND GRAVEL SURFACES.
9. COMPLETE LANDSCAPING, PLANTING, AND SEEDING.
10. INSTALL FINAL RESTORATION OF ALL DISTURBED AREAS.
11. ONCE SITE IS ADEQUATELY STABILIZED, TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED. ANY DISTURBANCE CAUSED BY REMOVAL SHALL BE PROPERLY RESTORED.



NOTES:

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LEGEND

- TRACKING PAD (SEE DETAIL 1.07/CD9)
- EROSION MAT CITY STANDARD 100 PERCENT COCONUT TYPE III (SEE DETAIL 1.02/CD5)
- SILT FENCE (SEE DETAIL 1.01/CD4)
- INLET PROTECTION (SEE DETAIL 1.04/CD7)
- DITCH CHECK (SEE DETAIL 1.03/CD6)
- RIPRAP MEDIUM WITH GEOTEXTILE (SEE DETAIL 5.4.4/CD17)

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SHEET TITLE
UNIT WELL 31
EROSION CONTROL PLAN

SHEET
C7

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NOTES:

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20 0 20 40
scale 10 feet

JADON DR.

33' ROW

33' ROW

TRADEWINDS PKWY

WET

CONVEY RUNOFF INTO PROPOSED SWALE AND AROUND PROPOSED BERM (PREVENT RUNOFF FROM ENTERING WETLAND TO EAST)

CENTERLINE DRAINAGE DITCH

CENTERLINE DRAINAGE DITCH

EXISTING GROUND RESERVOIR

PROPOSED WATER TREATMENT PLANT

WELL HEAD

HIGH POINT

CONVEY RUNOFF INTO CURB AND GUTTER

XC

= DRAINAGE ARROW SHOWING FINISHED RUNOFF FLOW DIRECTIONS

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SHEET TITLE
UNIT WELL 31
DRAINAGE PLAN

SHEET
C8

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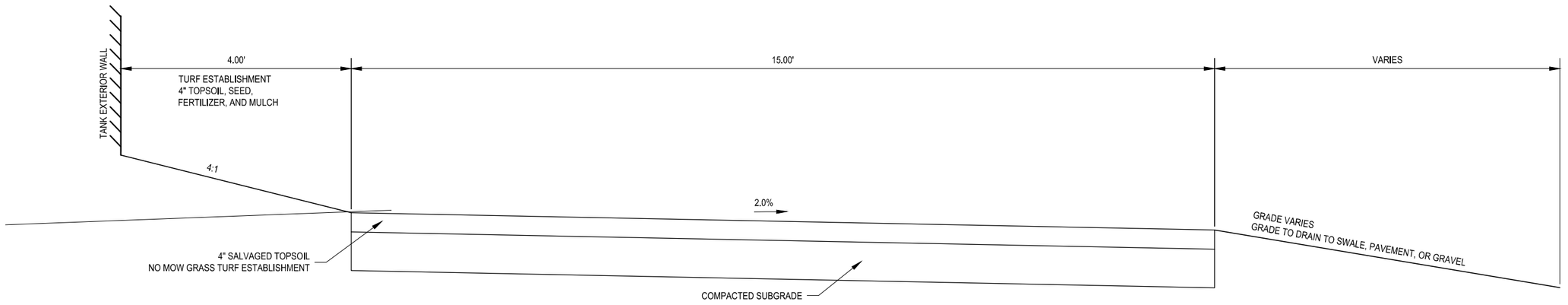
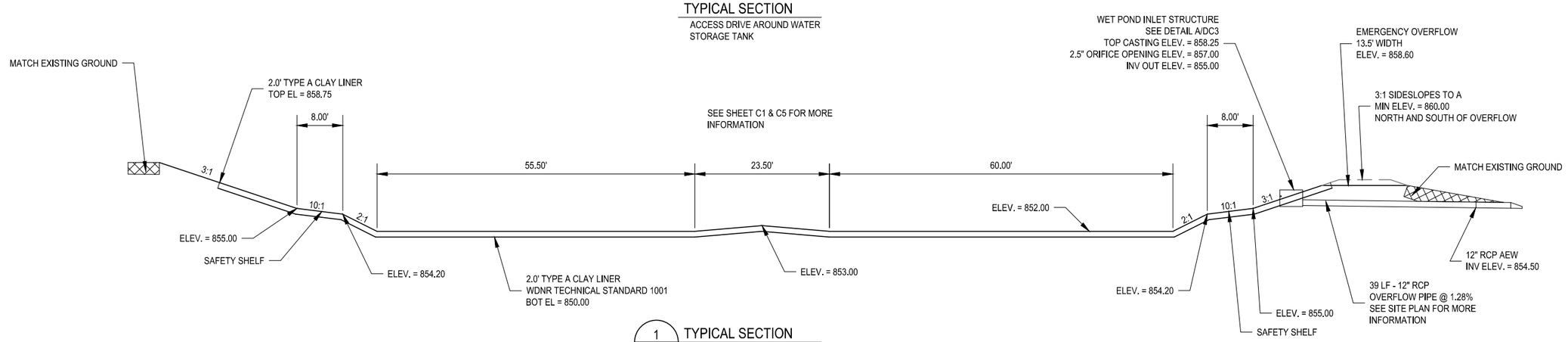
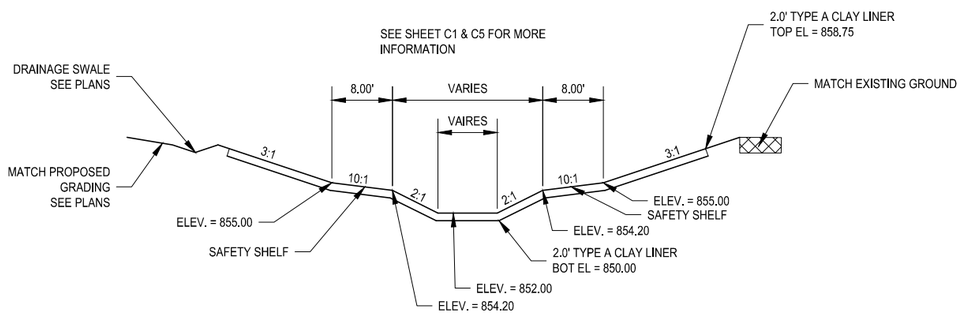


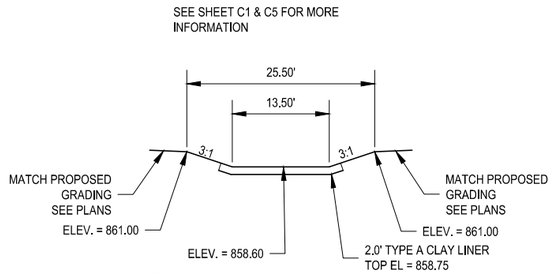
TYPICAL SECTION
ACCESS DRIVE AROUND WATER STORAGE TANK



1/C9 TYPICAL SECTION
THROUGH WET BASIN
(LOOKING NORTH)



2/C9 TYPICAL SECTION
THROUGH WET BASIN
(LOOKING EAST)



3/C9 TYPICAL SECTION
THROUGH WET BASIN EMERGENCY
OVERFLOW (LOOKING EAST)

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Madison Water Utility

UNIT WELL 31
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE DECEMBER 19, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM

SHEET TITLE
UNIT WELL 31
TYPICAL SECTIONS

SHEET
C9

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USER: JOSH BOHNERT

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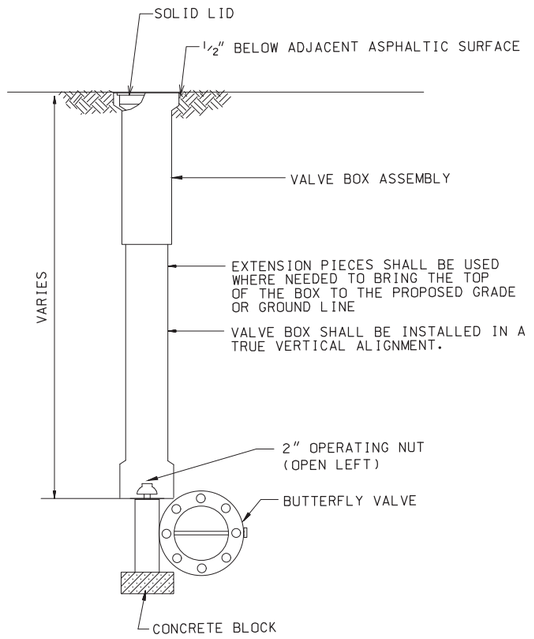
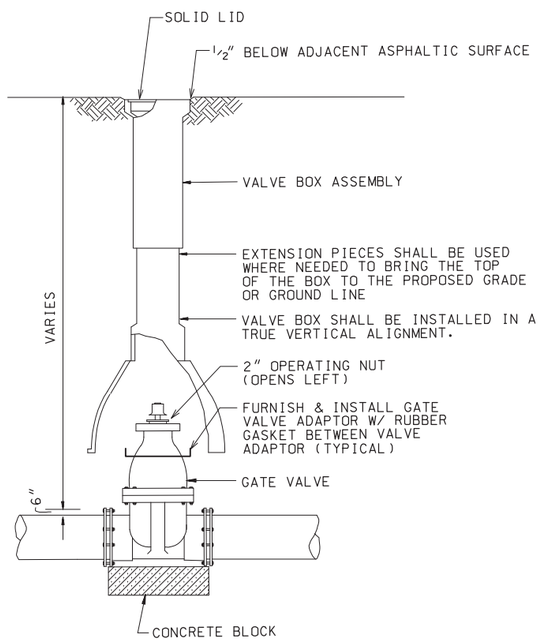
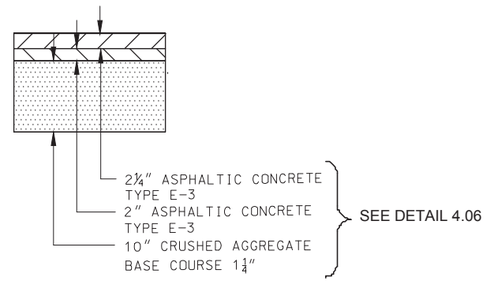


A CD1 BUTTERFLY VALVE & BOX
SCALE: NONE



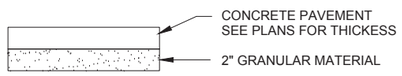
B CD1 GATE VALVE & BOX
SCALE: NONE

CITY OF MADISON STANDARD
DETAILS LOCATED ONLINE:
REFER TO CURRENT YEAR OF PART 8 FOR
DETAILS:https://www.cityofmadison.com/business/pw/specs.cfm



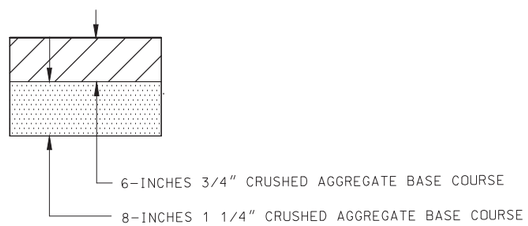
C CD1 ASPHALTIC PARKING LOTS AND DRIVEWAYS
SCALE: NONE

SEE SPECIFICATIONS ON CONCRETE AN BASE MATERIALS.

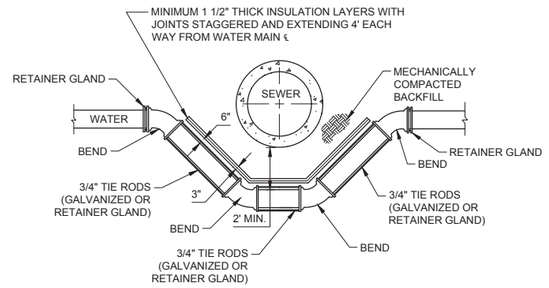


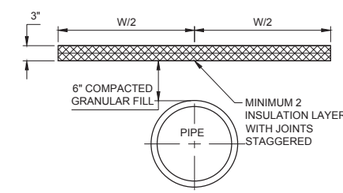
A. JOINT CONSTRUCTION
1. DIVIDE WALK INTO UNIFORM SIZED PANELS AND OUTLINE WITH CONTRACTION OR EXPANSION JOINTS. USE A TYPICAL LENGTH EQUAL TO THE SIDEWALK WIDTH.
2. PROVIDE SQUARE PANELS WITH MAXIMUM 36 SQUARE FEET OF AREA.
3. JOINTS SHALL BE:
   a. VERTICAL AND STRAIGHT.
   b. PARALLEL TO OR AT RIGHT ANGLES TO THE EDGE OF THE WALK.
   c. ALIGNED WITH LIKE JOINTS IN ADJOINING WORK.
   d. 1/8 INCH WIDE FOR CONTRACTION JOINT.
   e. 1/2 INCH WIDE FOR EXPANSION JOINT.
4. ROUND ALL JOINTS AND EDGES WITH A 1/4-INCH RADIUS EDGING TOOL.
5. EXTEND CONTRACTION JOINTS TO AT LEAST 1/3 OF THE THICKNESS OF THE WALK.
6. EXTEND EXPANSION JOINTS TO THE FULL THICKNESS OF THE WALK.
7. PLACE 1/2 INCH PREFORMED JOINT FILLER ADJACENT TO ALL FIXED OBJECTS.

D CD1 CONCRETE SIDEWALK
SCALE: NONE



E CD1 GRAVEL PARKING LOTS & DRIVEWAYS
SCALE: NONE





COVER	WIDTH W
4.0'-4.9'	8'
5.0'-5.4'	6'
5.5'-6.0'	4'
6.0' +	0'

NOTES:
1. INSULATION SHALL BE EXTRUDED POLYSYRENE (XEPS) INSULATION BOARD, "CERTIFOAM SE" OR "STYROFOAM SM" OF EQUIVALENT, EXCEPT AS FOLLOWS: WHERE MN/DOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION" APPLY, INSULATION BOARD SHALL BE "CERTIFOAM 40" OR STYROFOAM HI-35 OR HI-40" OR EQUIVALENT.
2. INSULATION SHALL BE PLACED ON A SMOOTH, LEVEL FOUNDATION WHICH HAS BEEN FIRMLY COMPACTED.
3. SEPARATE LAYERS OF INSULATION USED TO MAKE UP THE 3" THICKNESS SHALL HAVE STAGGERED JOINTS TO ENSURE THE CONTINUITY OF THE INSULATION.
4. LENGTH AND WIDTH OF INSULATION SHOWN ON PLANS IS APPROXIMATE. SEE TABLE 1 FOR ACTUAL WIDTH REQUIRED ONCE THE ACTUAL DEPTH OF WATER MAIN IS KNOWN.

F CD1 WATER MAIN & SEWER INSULATION
SCALE: NONE

6878 ODANA RD, SUITE 200
MADISON, WI 53719-1137
PHONE: 608.820.6199
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WI TF: 800.325.2055
www.sehinc.com

Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM

SHEET TITLE
CIVIL DETAILS

SHEET
CD1

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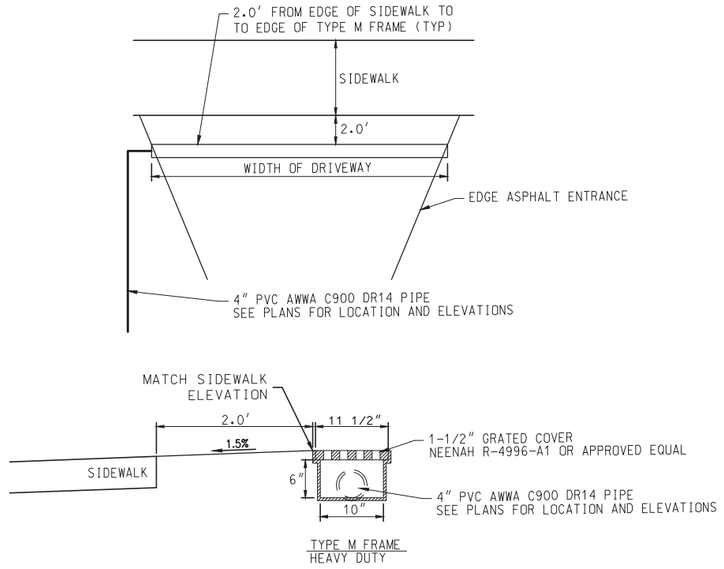


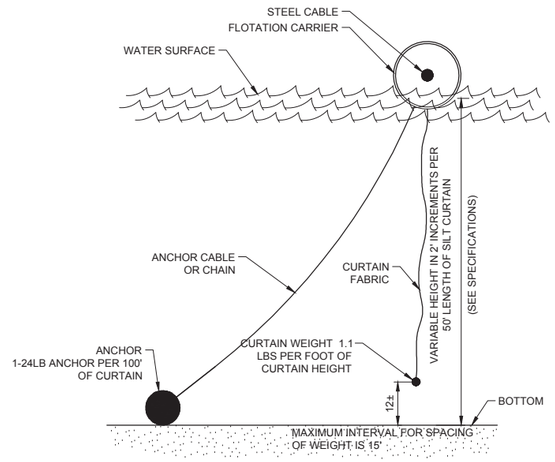
A CD2 TRENCH DRAIN

SCALE: NONE

ADA COMPLIANT SIGN
PER MADISON CITY ORDINANCE.
"RESERVED PARKING. VEHICLES
WITH DIS OR DIS VET PLATES OR
STATE DISABLED CARD THIS SPACE.
VAN ACCESSIBLE."

B CD2 ADA PARKING SIGN

SCALE: NONE



NOTES:
-REFER TO SPECS FOR TYPE OF SILT CURTAIN
(STILL OR MOVING WATER).
-DOUBLE SILT CURTAINS SHOULD BE SPACED 10' APART.
-CURTAIN LENGTH TO MATCH BOTTOM PROFILE AS CLOSELY
AS POSSIBLE.

C CD2 FLOTATION SILT CURTAIN

SCALE: NONE

6818 ODANA RD, SUITE 200
MADISON, WI 53719-1137
PHONE: 608.826.0199
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Madison Water Utility

UNIT WELL 31 WATER
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CIVIL DETAILS

SHEET
CD2

PLOTTED: 11-14-2016 10:03 AM
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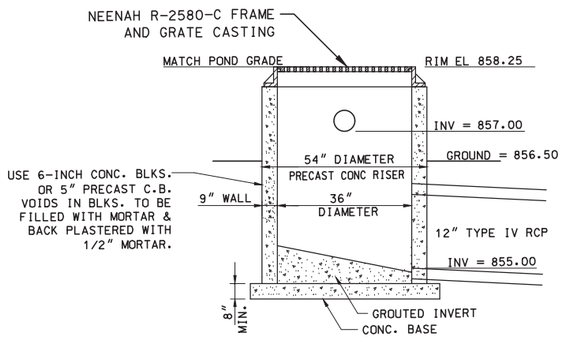
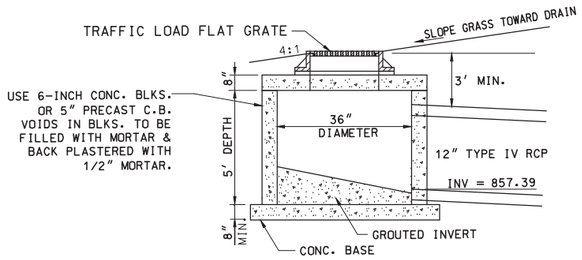
SEE SECTION 33 41 00



6" MECHANICALLY COMPACTED CRUSHED STONE REQUIRED UNDER STRUCTURE

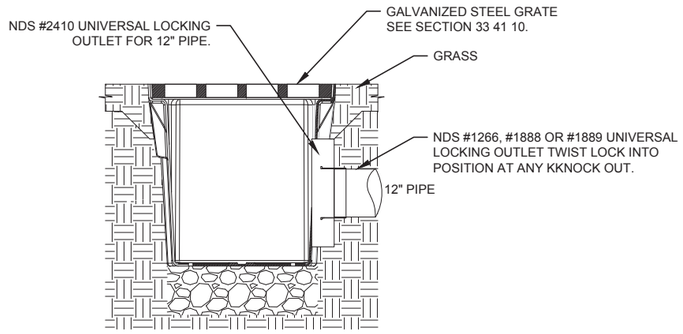
A CD3 WET POND INLET STRUCTURE
SCALE: NONE

SEE SECTION 33 41 00



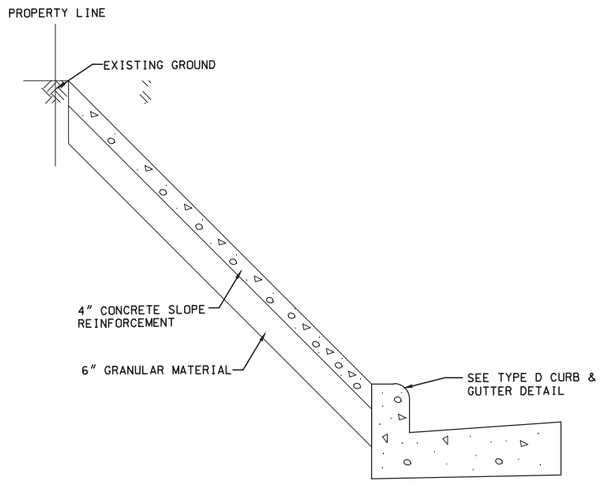
6" MECHANICALLY COMPACTED CRUSHED STONE REQUIRED UNDER STRUCTURE

B CD3 AREA DRAIN STRUCTURE
SCALE: NONE



NOTE:
- NDS ADAPTERS THAT FIT THIS BASIN ARE AS FOLLOWS. # 1242, # 1243, # 1245 # 1266 # 1888 & #1889 USE # 1206 IF PLUGGING AN OUTLET. 2410 NEEDED FOR ALL CONNECTIONS.

C CD3 NDS 24" SQUARE CATCH BASIN
SCALE: NONE

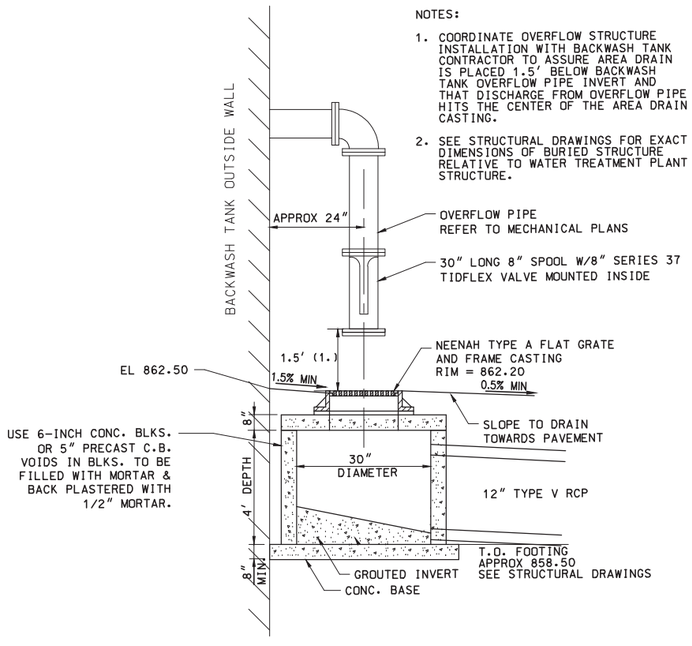


NOTES:

THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE COURSE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED

D CD3 CONCRETE SLOPE REINFORCEMENT
SCALE: NONE

REFERENCE STRUCTURAL DETAIL 8/S10
FOR ADDITIONAL INFORMATION



NOTES:
1. COORDINATE OVERFLOW STRUCTURE INSTALLATION WITH BACKWASH TANK CONTRACTOR TO ASSURE AREA DRAIN IS PLACED 1.5' BELOW BACKWASH TANK OVERFLOW PIPE INVERT AND THAT DISCHARGE FROM OVERFLOW PIPE HITS THE CENTER OF THE AREA DRAIN CASTING.
2. SEE STRUCTURAL DRAWINGS FOR EXACT DIMENSIONS OF BURIED STRUCTURE RELATIVE TO WATER TREATMENT PLANT STRUCTURE.

E CD3 BACKWASH OVERFLOW INLET STRUCTURE
SCALE: NONE

STORM SEWER STRUCTURES

NO.	TYPE	N	E	TC EL	INV EL	DETAILS	CASTINGS
ST-1	AREA DRAIN	472098.80'	844605.57'	861.00	12" RCP (E&SW) = 857.39	B/CD3	R-2557-A W/TYPE G GRATE
ST-2	NDS 24" SQUARE CATCH BASIN	472088.15'	844645.20'	862.00	12" RCP (SW) = 857.59	C/CD3	PROPRIETARY SQUARE GRATE
ST-3	STORM SAS - 60"	472066.77'	844567.64'	863.10	12" RCP (NE) = 857.14 12" RCP (W) = 857.14 18" RCP (N&S) = 856.64	5.7.5, 5.7.6, 5.7.15, 5.7.16A, 5.7.17	"CITY OF MADISON ENGINEERING" STANDARD CASTING. REFERENCE DETAIL 5.7.16A
ST-4	AREA DRAIN	472171.63'	844606.45'	859.60	18" RCP (W) = 857.50	B/CD3	R-2557-A W/TYPE G GRATE
ST-5	STORM SAS - 48"	472171.60'	844563.80'	860.83	4" PVC (N) = 857.97 18" RCP (E&S) = 857.30	5.7.5, 5.7.6, 5.7.15, 5.7.17	R-2557-A W/TYPE G GRATE
ST-6	TYPE H INLET	472067.02'	844559.88'	860.65 BC	12" RCP (E) = 857.49	5.7.7, 5.7.18, 5.7.19, 5.7.21, 5.7.26, 5.7.27, 5.7.29	R-3067, W/, TYPE V GRATE
ST-7	STORM SAS - 48"	471887.57'	844567.68'	859.57	12" RCP (W) = 856.24 18" RCP (N&SE) = 855.74	5.7.5, 5.7.6, 5.7.15, 5.7.16A, 5.7.17	"CITY OF MADISON ENGINEERING" STANDARD CASTING. REFERENCE DETAIL 5.7.16A
ST-8	TYPE H INLET	471885.63'	844560.71'	859.88 BC	12" RCP (E) = 857.58	5.7.7, 5.7.18, 5.7.19, 5.7.21, 5.7.26, 5.7.27, 5.7.29	R-3067, W/, TYPE V GRATE
ST-9	WET POND INLET	471853.79'	844770.34'	858.25	12" RCP (E) = 855.00 2-1/2" ORIFICE = 857.00	5.7.31, A/CD3	SEE DETAIL A/CD3

SANITARY SEWER STRUCTURES

NO.	TYPE	N	E	TC EL	INV EL	DETAILS	REMARKS
SS-1	EX SANITARY SAS	472222.65'	844679.93'	859.04	8" (E&W) = 849.01	N/A	VERIFY LOCATION & ELEVATIONS
SS-2	SANITARY SAS (DROP STRUCTURE)	472160.64'	844629.33'	861.00	6" PVC (SE) = 856.00 6" PVC (S) = 856.00 8" PVC (NE) = 850.05	5.7.2, 5.7.15, 5.7.16A, 5.7.17, 5.7.30, 5.7.31	"CITY OF MADISON ENGINEERING" STANDARD CASTING. REFERENCE DETAIL 5.7.16A
SS-3	SANITARY SAS	472118.31'	844629.33'	862.15	6" PVC (E) = 857.00 4" PVC (S) = 857.17 6" PVC (N) = 856.95	5.7.2, 5.7.15, 5.7.16A, 5.7.17, 5.7.30, 5.7.31	"CITY OF MADISON ENGINEERING" STANDARD CASTING. REFERENCE DETAIL 5.7.16A

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

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SEH FILE NO. 129083
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DESIGNED BY JJB
DRAWN BY JJB/SGM
Short Elliott Hendrickson, Inc. © (SEH)

SHEET TITLE: CIVIL DETAILS

SHEET CD3

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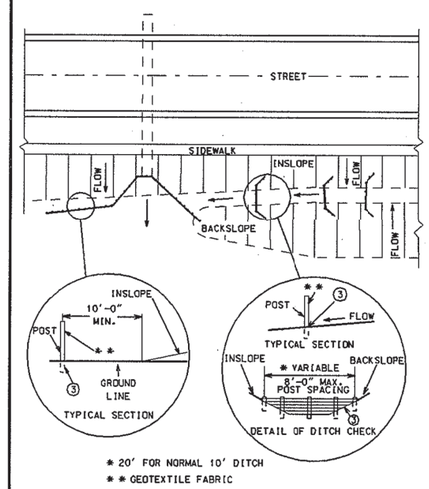
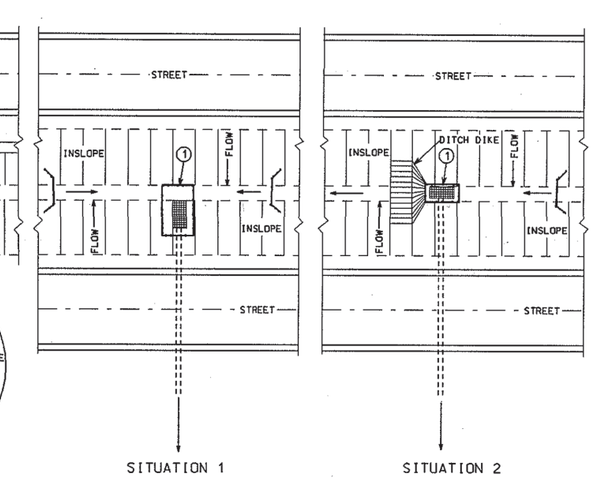


PLAN VIEW

TYPICAL APPLICATIONS OF SILT FENCE



PLAN VIEW

SILT FENCE AT MEDIAN SURFACE DRAINS

GENERAL NOTES

DETAIL OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

(1A) WHEN POSSIBLE THE SILT FENCE SHOULD BE CONSTRUCTED IN AN ARC OR HORSESHOE SHAPE WITH THE ENDS POINTING UPSLOPE TO MAXIMIZE BOTH STRENGTH AND EFFECTIVENESS.

(1) CROSS BRACE WITH 2" X 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS AS DIRECTED BY THE ENGINEER.

(2) MINIMUM 14 GAGE WIRE REQUIRED. FOLD FABRIC 3" OVER THE WIRE AND STAPLE OR PLACE WIRE RINGS ON 12" C-C.

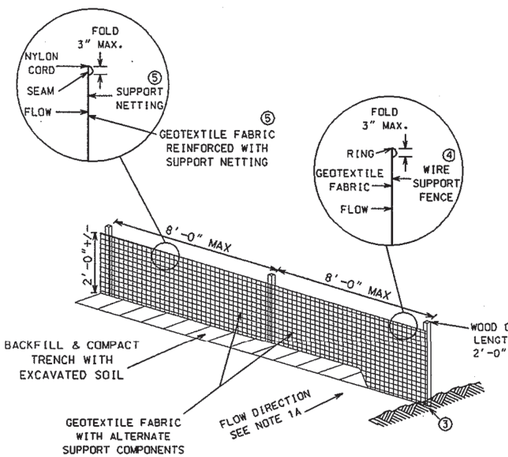
(3) *EXCAVATE A TRENCH A MINIMUM* OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.

(4) WIRE SUPPORT FENCE SHALL BE 14 GAGE MINIMUM WOVEN WIRE WITH A MAXIMUM MESH SPACING OF 6". SECURE TOP OF GEOTEXTILE FABRIC TO TOP OF FENCE WITH STAPLES OR WIRE RINGS AT 12" C-C.

(5) GEOTEXTILE FABRIC SHALL BE REINFORCED WITH AN INDUSTRIAL POLYPROPYLENE NETTING WITH A MAXIMUM MESH SPACING OF $^{3}/_{4}$" OR EQUAL. A HEAVY DUTY NYLON TOP SUPPORT CORD OR EQUIVALENT IS REQUIRED.

(6) STEEL POSTS SHALL BE STUDDED "TEE" OR "U" TYPE WITH A MINIMUM WEIGHT OF 1.28 LBS/LINEAL FOOT (WITHOUT ANCHOR). FIN ANCHORS SUFFICIENT TO RESIST POST MOVEMENT ARE REQUIRED. WOOD POSTS SHALL BE A MINIMUM SIZE OF 4" DIA. OR $1^{1}/_{2}$" X 3 $^{1}/_{8}$" EXCEPT WOOD POSTS FOR GEOTEXTILE FABRIC REINFORCED WITH NETTING SHALL BE A MINIMUM SIZE OF $1^{1}/_{8}$" X $1^{1}/_{8}$" OAK OR HICKORY.

ALTERNATES A & B ARE EQUAL AND EITHER MAY BE USED.

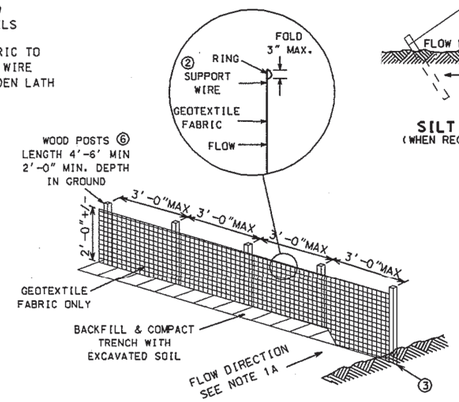


ALTERNATE "A"

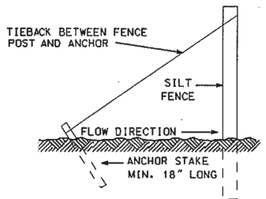
NOTE: ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS

ATTACH THE FABRIC TO THE POSTS WITH WIRE STAPLES OR WOODEN LATH AND NAILS

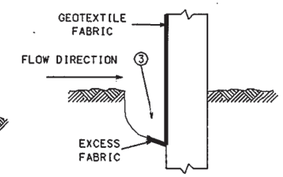
SILT FENCE



ALTERNATE "B"



SILT FENCE TIE BACK
(WHEN REQUIRED BY THE ENGINEER)



TRENCH DETAIL

2004

CITY OF MADISON
ENGINEERING DIVISION

SILT FENCE

STANDARD DETAIL DRAWING 1.01

1.01

6808 ODANA RD, SUITE 200
MADISON, WI 53719-1137
PHONE: 608.600.6199
FAX: 888.868.8186
WI: 800.829.3565
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Madison Water Utility

UNIT WELL 31 WATER
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MADISON, WISCONSIN

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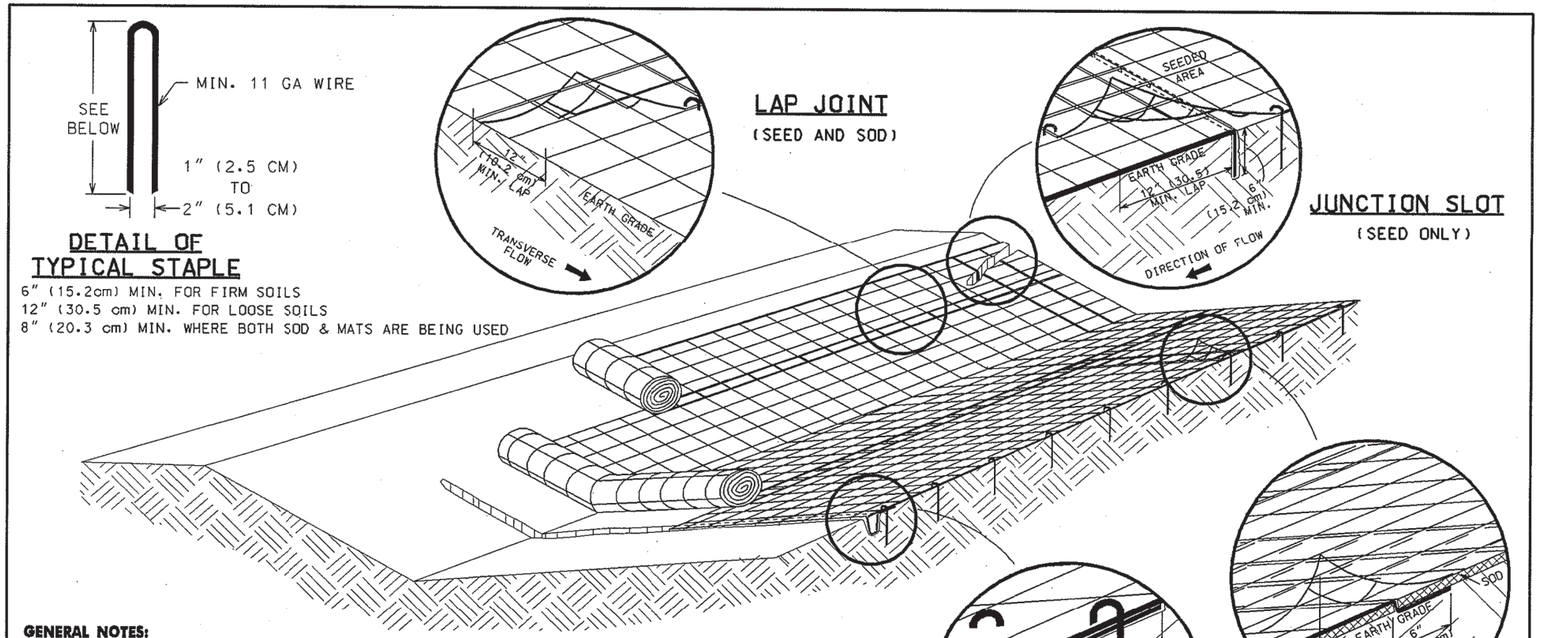
SHEET TITLE
CIVIL DETAILS

SHEET
CD4



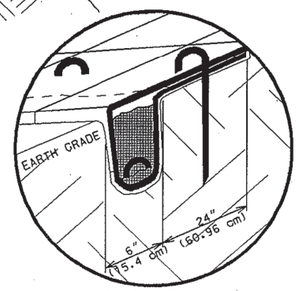
DETAIL OF TYPICAL STAPLE

6" (15.2cm) MIN. FOR FIRM SOILS
12" (30.5 cm) MIN. FOR LOOSE SOILS
8" (20.3 cm) MIN. WHERE BOTH SOD & MATS ARE BEING USED

LAP JOINT
(SEED AND SOD)

JUNCTION SLOT
(SEED ONLY)

JUNCTION SLOT
(SOD ONLY)



ANCHOR SLOT
AT BEGINNING OF EROSION MAT
EXTRA STAPLE AT END ONLY
(SEED AND SOD)

1.02

GENERAL NOTES:

DETAILS OF CONSTRUCTION MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

VARIATIONS IN THE DIMENSIONS OR MATERIALS SHOWN HEREON SHALL BE PERMITTED IF THEY PROVIDE EQUIVALENT PROTECTION AND MATERIAL STRENGTH AND IF PRIOR APPROVAL OF THE ENGINEER IS OBTAINED.

LAP JOINTS SHALL NOT BE PLACED IN THE BOTTOM OF V-SHAPED DITCHES.

JUNCTION SLOTS ON ADJACENT STRIPS OF MATTING SHALL BE STAGGERED A MINIMUM OF 4 FEET (1.219 m) APART.

EROSION MAT SHALL BE MEASURED AND PAID FOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

EROSION MAT OVER SOD:

a. ONLY JUTE FABRIC WILL BE PERMITTED OVER SOD.

b. WOOD STAKES FOR SOD MAY BE OMITTED BY THE ENGINEER IF EXISTING SLOPE AND SOIL CONDITIONS SO WARRANT.

c. THE WIDTH OF EROSION MAT SHALL ALWAYS EXCEED THE SOD WIDTH.

EROSION MAT OVER SEEDING:

JUNCTION OR ANCHOR SLOTS SHALL BE AT MINIMUM INTERVALS OF 100 FEET (30.48 m) ON GRADES UP TO AND INCLUDING 3 PERCENT, AND 50 FEET (15.24 m) ON GRADES EXCEEDING 3 PERCENT.

DRAWING NOT TO SCALE

2004

CITY OF MADISON
ENGINEERING DIVISION

EROSION MAT

STANDARD DETAIL DRAWING 1.02

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UNIT WELL 31 WATER
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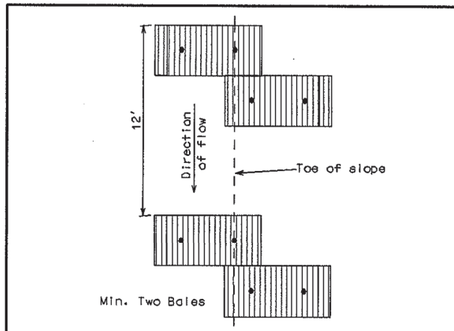
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

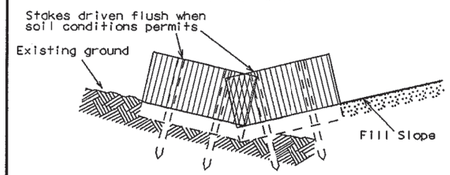
SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM

SHEET TITLE
CIVIL DETAILS

SHEET
CD5

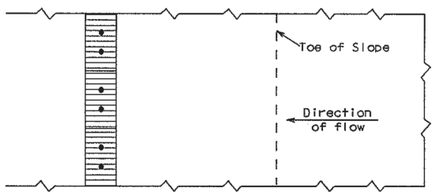


PLAN VIEW

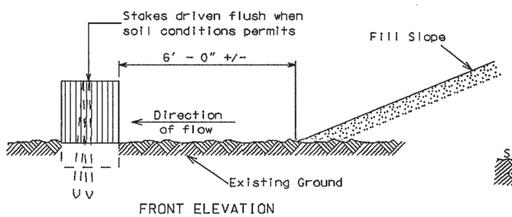


FRONT ELEVATION

EROSION BALES AT TOE OF SLOPE
WHEN EXISTING GROUND SLOPES TOWARD FILL SLOPE

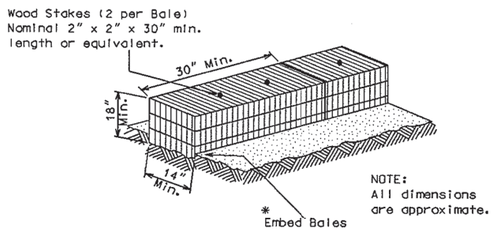


PLAN VIEW

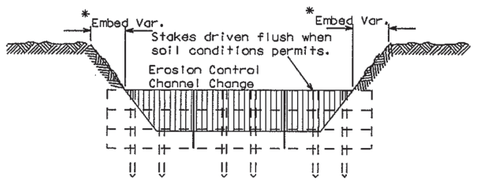


FRONT ELEVATION

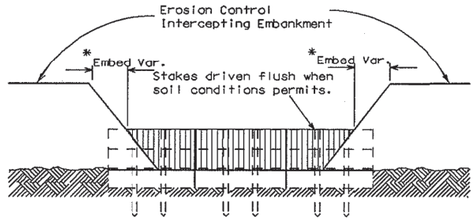
EROSION BALES AT TOE OF SLOPE
WHEN EXISTING GROUND SLOPES AWAY FROM FILL SLOPE



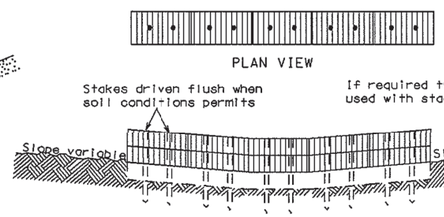
DETAIL OF EROSION BALE INSTALLATION



EROSION CONTROL CHANNEL CHANGE



EROSION CONTROL INTERCEPTING EMBANKMENT



PLAN VIEW

FRONT ELEVATION

EROSION BALES ACROSS DITCH BOTTOM

GENERAL NOTES

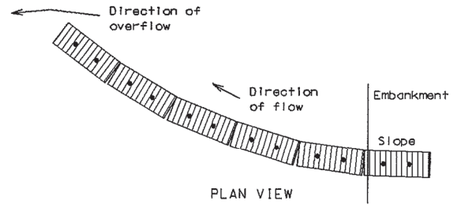
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

BALES SHALL BE PLACED END TO END OR OVERLAPPING AT RIGHT ANGLES TO THE DIRECTION OF FLOW AND FAR ENOUGH UP THE SIDES OF THE DITCH TO PREVENT ERODING AROUND ENDS.

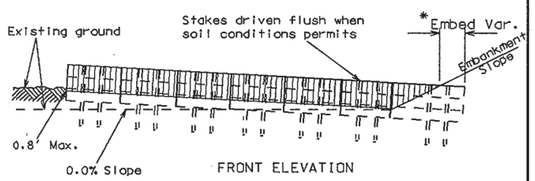
BALES SHALL BE PLACED WITH TWINE OR TIE WIRES PARALLEL TO THE GROUND.

STAKES TO BE BATTERED IN OPPOSITE DIRECTIONS.

* AS DETERMINED BY THE ENGINEER.



PLAN VIEW



FRONT ELEVATION

EROSION BALES AT TOE OF SLOPE

2004

CITY OF MADISON
ENGINEERING DIVISION

TYPICAL INSTALLATIONS OF EROSION BALES

STANDARD DETAIL DRAWING 1.03

1.03

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		REVISIONS

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ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
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SHEET TITLE
CIVIL DETAILS

SHEET
CD6

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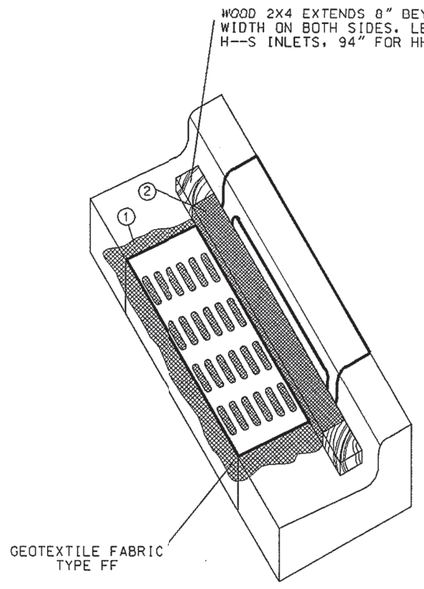

1.04

GENERAL NOTES:

FABRIC SHALL BE REPLACED AT THE ENGINEERS DISCRETION.

THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX.

MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENT'S EROSION CONTROL PRODUCT ACCEPTIBILITY LIST MAY BE SUBSTITUTED.

WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

(1) FABRIC SIZE SHALL BE 8" (MIN) GREATER ON ALL SIDES OF THE INLET COVER TO PROVIDE A HAND HOLD WHEN MAINTENANCE OR REMOVAL IS REQUIRED.

(2) FOR INLET PROTECTION, TYPE C WITH A CURB BOX. AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES.

2004

CITY OF MADISON
ENGINEERING DIVISION

INLET PROTECTION TYPE C

STANDARD DETAIL DRAWING 1.04

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SHEET TITLE
CIVIL DETAILS

SHEET
CD7

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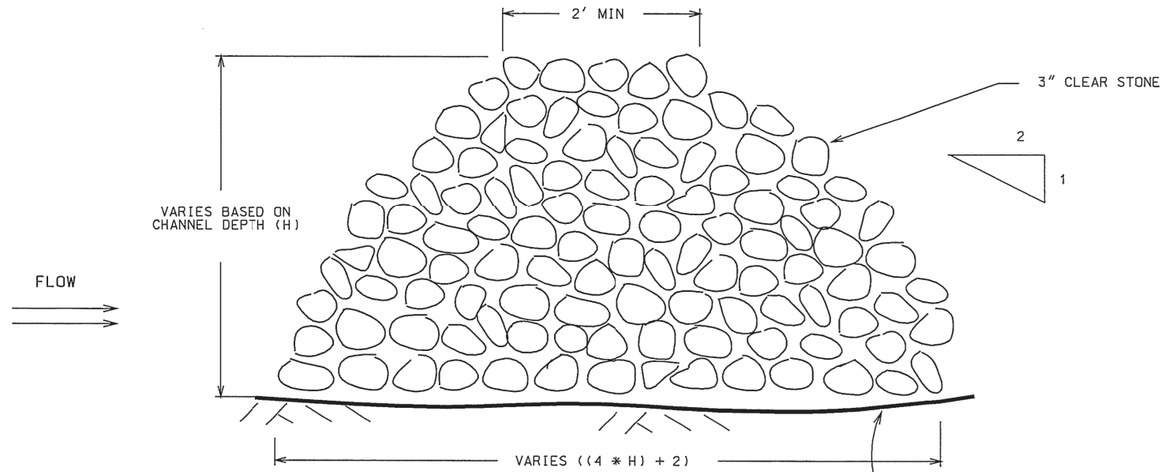
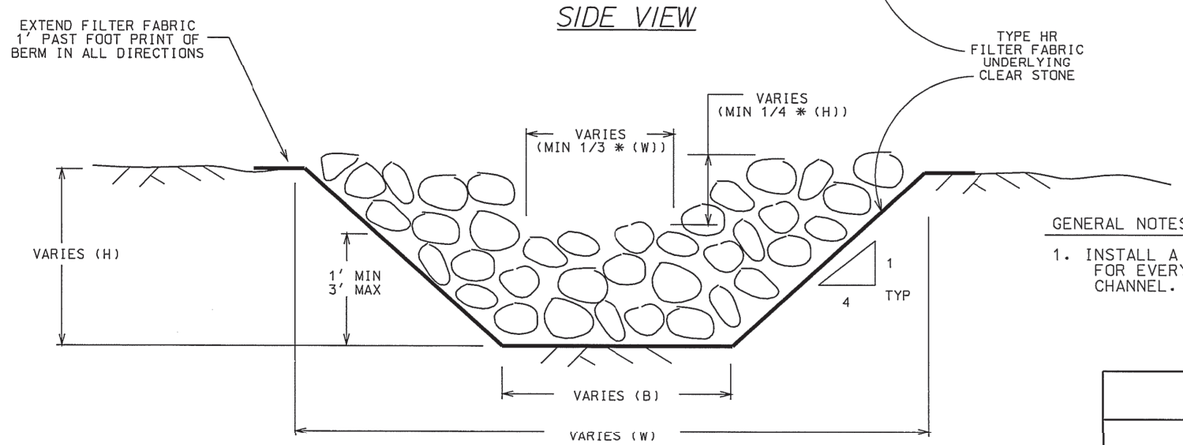
PLOT SCALE: 1:2



SIDE VIEW

1.05



SECTION VIEW

GENERAL NOTES:

1. INSTALL A MINIMUM OF ONE DITCH CHECK FOR EVERY TWO FEET OF DROP IN THE CHANNEL.

2012

CITY OF MADISON
ENGINEERING DIVISION

CLEAR STONE BERM (DITCH CHECK)

STANDARD DETAIL DRAWING 1.05

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SHEET TITLE
CIVIL DETAILS

SHEET
CD8

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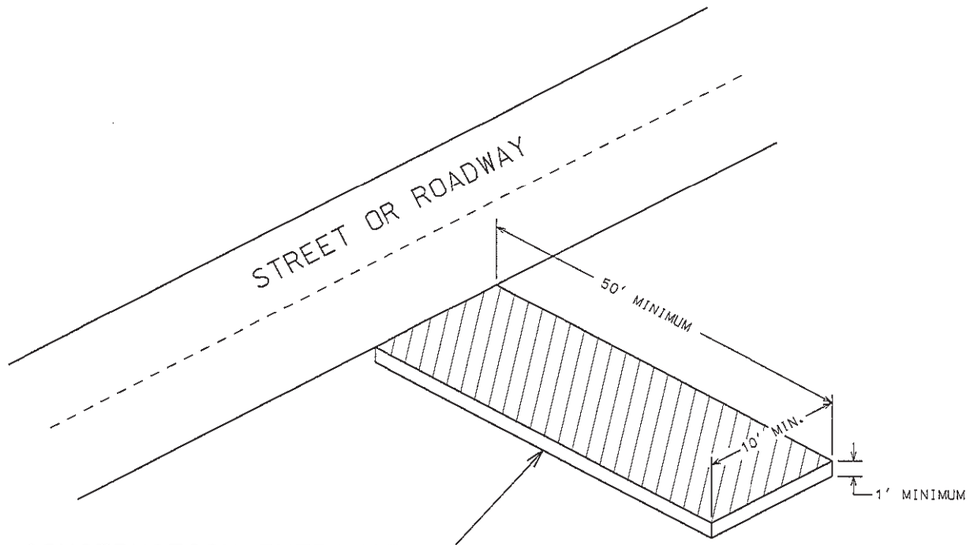
1.07



GENERAL NOTES:

1. CONSTRUCTION ENTRANCE TO BE INSTALLED PRIOR TO ANY TRAFFIC LEAVING THE SITE.
2. THE AGGREATE FOR THE CONSTRUCTION ENTRANCE SHALL BE 3 INCH CLEAR OR WASHED STONE.
3. AGGREGATE SHALL BE PLACED IN A LAYER AT LEAST 12 INCHES THICK.
4. THE CONSTRUCTION ENTRANCE SHALL BE UNDERLAIN WITH A WDOT TYPE HR OR FF GEOTEXTILE FABRIC TO PREVENT MIGRATION OF UNERLYING SOIL INTO THE STONE.
5. SURFACE WATERS MUST BE PREVENTED FROM PASSING THROUGH THE CONSTRUCTION ENTRANCE. FLOWS SHALL BE DIVERTED AWAY FROM THE CONSTRUCTION ENTRANCE OR CONVEYED UNDER AND AROUND THEM BY USE OF A CULVERT, DIVERSION BERM OR OTHER PRACTICES AS APPROVED BY THE CONSTRUCTION ENGINEER.
6. CLEANING BY SCRAPING OR ADDING NEW STONE SHALL BE REQUIRED IF ENTRANCE BECOMES MORE THAN 50% COVERED BY TRACKED MUD.

2012

CITY OF MADISON
ENGINEERING DIVISION

CONSTRUCTION ENTRANCE

STANDARD DETAIL DRAWING 1.07

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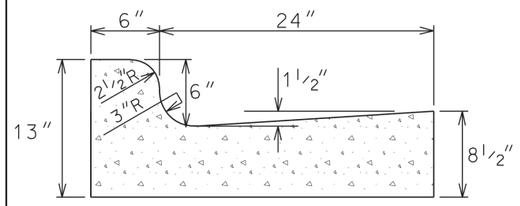
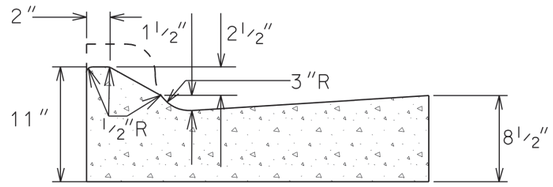
SHEET TITLE
CIVIL DETAILS

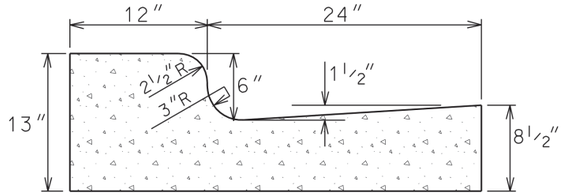
SHEET
CD9



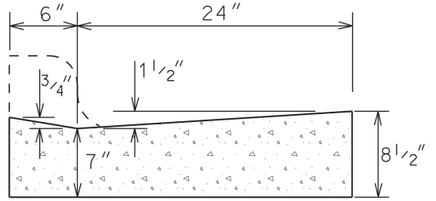
TYPE 'A' CONCRETE
CURB & GUTTER



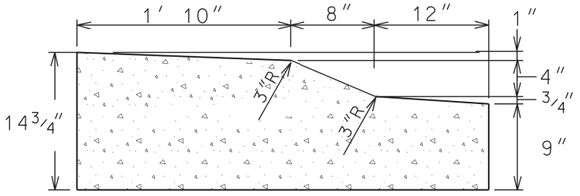
TYPE 'A' MOUNTABLE CONCRETE
CURB & GUTTER
(PAY AS TYPE 'A' CURB AND GUTTER)



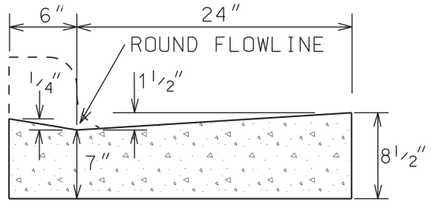
TYPE 'B' CONCRETE
CURB & GUTTER



DRIVEWAY SECTION TYPE 'A'
CONCRETE CURB & GUTTER
(PAY AS TYPE 'A' CURB AND GUTTER)



TRAFFIC CIRCLE MOUNTABLE
CONCRETE CURB & GUTTER



BIKE/PED. RAMP SECTION TYPE 'A'
CONCRETE CURB & GUTTER
(PAY AS TYPE 'A' CURB AND GUTTER)

GENERAL NOTES:

LATERAL CONTRACTION JOINTS SHALL BE PLACED AT INTERVALS OF NOT MORE THAN 15′ NOR LESS THAN 6′ IN LENGTH. THE JOINTS SHALL BE A MINIMUM OF 3″ IN DEPTH

EXPANSION JOINTS SHALL BE PLACED TRANSVERSLY AT RADIUS POINTS ON CURVES OF RADIUS 200′ OR LESS, AND AT ANGLE POINTS, OR AS DIRECTED BY THE ENGINEER. THE EXPANSION JOINT SHALL BE A ONE PIECE ASPHALTIC MATERIAL HAVING THE SAME DIMENSIONS AS CURB & GUTTER AT THAT STATION AND BE 1/2″ THICK.

IN ALL CASES, CONCRETE CURB & GUTTER SHALL BE PLACED ON THOROUGHLY COMPACTED CRUSHED STONE

2016

CITY OF MADISON
ENGINEERING DIVISION

MADISON STANDARD
CONCRETE CURB & GUTTER

STANDARD DETAIL DRAWING 3.06

3.06

PLOTTED: 11-14-2016 10:04 AM
PLOT SCALE: 1:2

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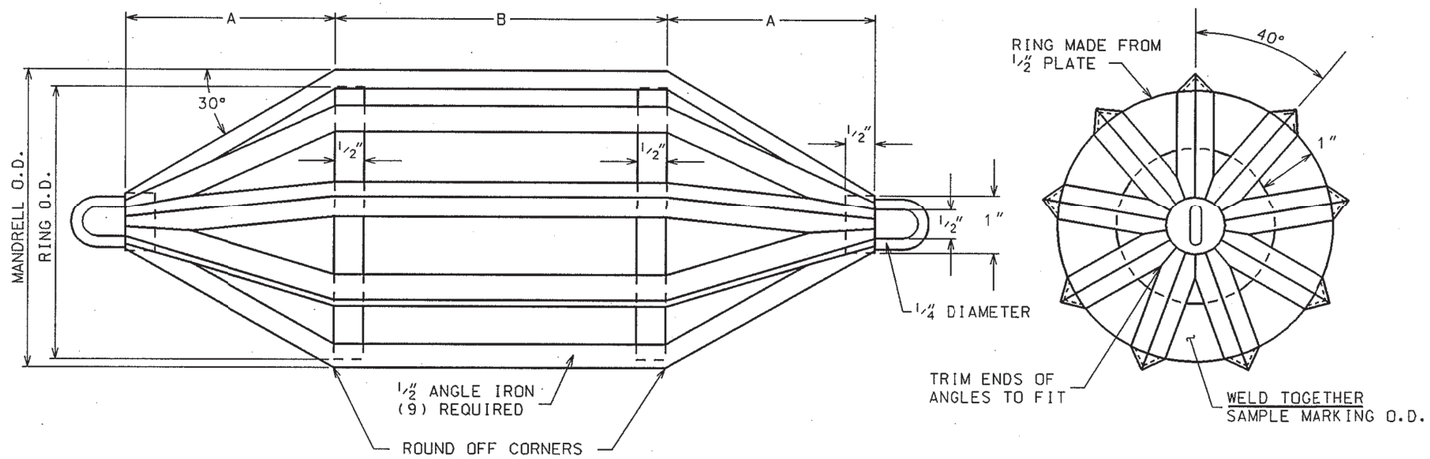
SHEET TITLE
CIVIL DETAILS

SHEET
CD10



SIDE VIEW

END VIEW

5.1.1

NOMINAL PIPE SIZE ID, in	DIMENSIONS A, in	DIMENSIONS B, in	MANDRELL O.D., in	RING O.D., in
6	4.0	4	5.61	4.90
8	5.3	6	7.36	6.65
10	6.7	6	9.21	8.50
12	8.0	8	11.06	10.35
15	10.0	9	13.82	13.11

MANDREL FOR USE IN ALL P.V.C. SEWER PIPE

2004

NOTE:

AFTER CONSTRUCTION IS COMPLETE, TRUE THE O.D. DIMENSION FOR THE FULL LENGTH OF "B" TO +/-0.010" BY TOOL AND LATHE OR GRINDING.

CITY OF MADISON
ENGINEERING DIVISION

MANDREL DETAIL

STANDARD DETAIL DRAWING 5.1.1

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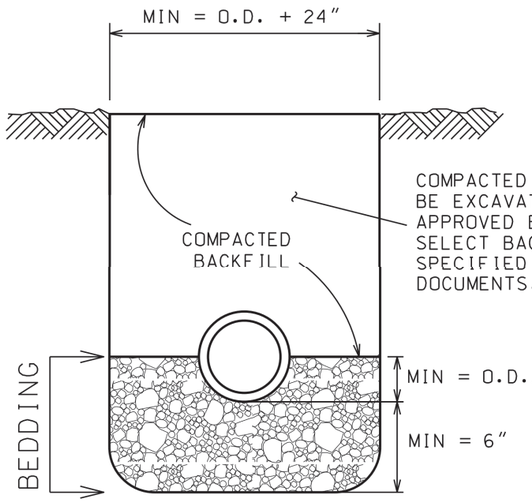
SHEET TITLE
CIVIL DETAILS

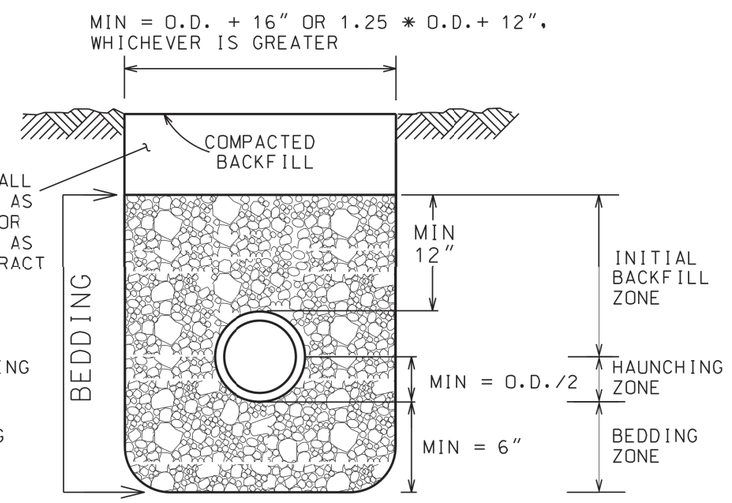
SHEET
CD11

5.2.1



WASHED GRAVEL OR CRUSHED STONE AS SPECIFIED IN SECTION 502.1 (d), BEDDING OF SEWER PIPES

BEDDING FOR REINFORCED CONCRETE SEWER PIPES



WASHED GRAVEL, CRUSHED STONE, SAND OR LIMESTONE SCREENINGS FOR PIPE SIZES 10" IN DIAMETER OR LESS. WASHED GRAVEL OR CRUSHED STONE FOR PIPE SIZES OVER 10" IN DIAMETER. AS SPECIFIED IN SECTION 502.1 (d), BEDDING OF SEWER PIPES

BEDDING FOR SANITARY PIPE

NOTES:

UNLESS OTHERWISE SPECIFIED, ALL SANITARY PIPES, INCLUDING LATERALS AND LEADS, SHALL BE INSTALLED WITH THE TYPE OF BEDDING SHOWN FOR THE TYPE AND SIZE OF PIPE INSTALLED.

THE COSTS OF BEDDING SHALL BE INCLUDED IN THE UNIT PRICES BID FOR THE PIPE.
FOR RCP, BEDDING INCLUDES THE HAUNCHING & BEDDING ZONES.
FOR PLASTIC PIPES, THE BEDDING INCLUDES THE HAUNCHING, BEDDING & INITIAL BACKFILL ZONES.
THE BEDDING SHALL BE INSTALLED & COMPACTED IN 6" MAXIMUM LIFTS.

ALL TRENCHES SHALL BE HAND BACKFILLED TO A POINT 12" ABOVE THE TOP OF THE PIPE. ALL BEDDING SHALL BE MECHANICALLY COMPACTED.

PAYMENT SHALL NOT BE MADE FOR BACKFILL WITH EXCAVATED MATERIAL, IF APPROVED. SELECT FILL, IF REQUIRED, SHALL BE PAID PER CONTRACT.

THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE 3 * O.D., THE MINIMUM TRENCH WIDTH AS SPECIFIED, AND SHALL APPLY FROM THE BOTTOM OF THE TRENCH TO A POINT 12" ABOVE THE TOP OF THE PIPE. WHERE THIS WIDTH IS EXCEEDED, THE CONTRACTOR SHALL FURNISH AND INSTALL A HIGHER TYPE OF BEDDING AT **NO EXTRA COST.** THE TYPE OF BEDDING SHALL BE DETERMINED BY THE ENGINEER.

O.D. EQUALS THE OUTSIDE DIAMETER OF THE PIPE.

DRAWING NOT TO SCALE

2016

CITY OF MADISON
ENGINEERING DIVISION

PIPE BEDDING AND BACKFILL

STANDARD DETAIL DRAWING 5.2.1

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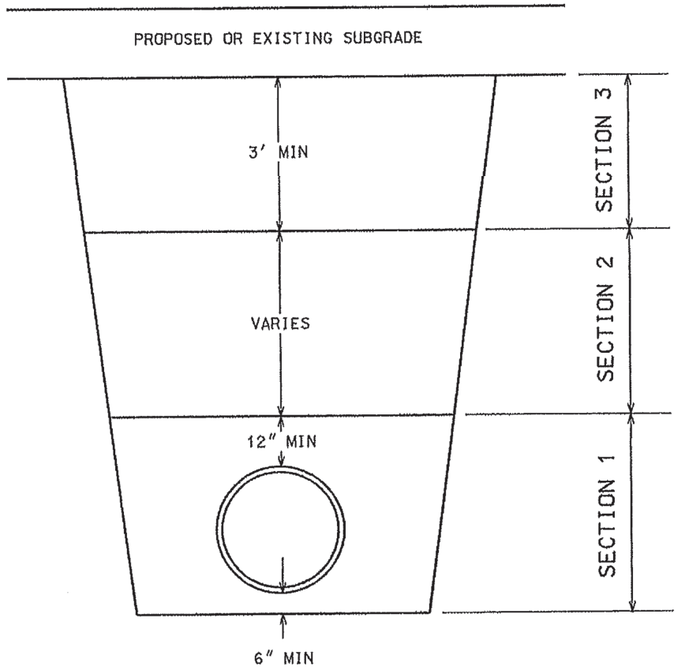
SHEET TITLE
CIVIL DETAILS

SHEET
CD12



TYPICAL TRENCH COMPACTION

ALL BACKFILL MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" BEFORE COMPACTION UNLESS AUTHORIZED BY THE ENGINEER DUE TO THE CHARACTER OF THE MATERIAL AND THE COMPACTING EQUIPMENT. EACH LIFT SHALL BE MECHANICALLY COMPACTED TO THE REQUIRED DENSITY PRIOR TO PLACING SUCCEEDING LIFTS OF BACKFILL MATERIAL.

IN COLD WEATHER, TRENCHES SHALL BE COMPACTED IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN SECTION 502.1 (e), BACKFILLING EXCAVATIONS AND COMPACTION OF BACKFILL, OF THESE SPECIFICATIONS.

SECTION 1:

MECHANICALLY COMPACTED BEDDING AS REQUIRED BY THE SPECIFICATIONS. COMPACTION ACHIEVED WITH SMALLER PLATE COMPACTOR.
FOR ALL PLASTIC PIPE SECTION 1 SHALL BE INSTALLED IN ACCORDANCE WITH S.D.D. 5.2.1A

SECTION 2:

MINIMUM COMPACTION OF 90% MAXIMUM DENSITY. COMPACTION OF BACKFILL WITH BOMAG OR HOE-PAC SHALL NOT BEGIN UNTIL THE DEPTH OF BACKFILL MATERIAL IS TWO FEET ABOVE THE TOP OF PIPE.

SECTION 3:

MINIMUM COMPACTION OF 95% MAXIMUM DENSITY.

2011

CITY OF MADISON
ENGINEERING DIVISION

TYPICAL TRENCH COMPACTION

STANDARD DETAIL DRAWING 5.2.2

6818 ODANA RD, SUITE 200
MADISON, WI 53719-1137
PHONE: 608.620.6199
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WI: 800.242.8511
www.sehinc.com

Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM

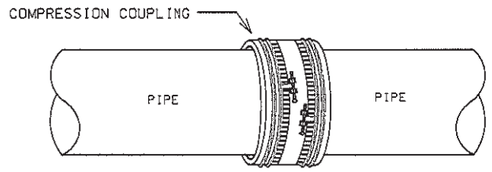
SHEET TITLE
CIVIL DETAILS

SHEET
CD13

PLOTTED: 11-14-2016 10:04 AM
PLOT SCALE: 1:2
C:\PROJECTS\KD\MMADWU\129083\5-FINAL-DSGN\51-CONST-DWGS-CAD\10-CIVIL\CIVILDETAILS_MA130966.DWG
SAVED: 11-9-2016 4:09 PM USER: JOSH BOHNERT

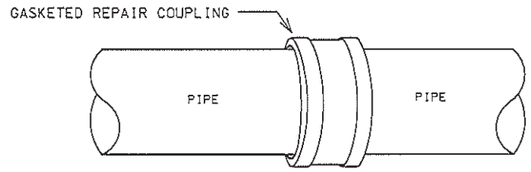
COMPRESSION COUPLING

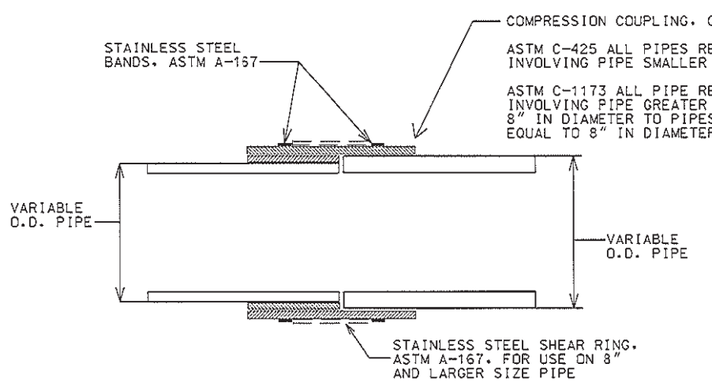
PIPES WITH DIFFERENT MATERIAL TYPES
PIPES WITH DIFFERENT OUTSIDE DIAMETERS

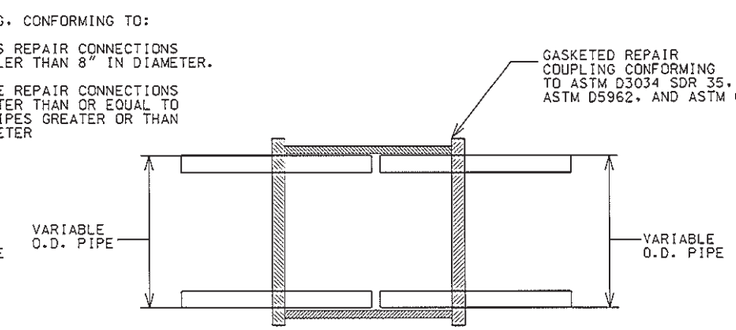


GASKETED REPAIR COUPLING

PVC TO PVC CONNECTION







5.3.3

ALL REPAIRS INVOLVING PIPE CONNECTIONS 8" IN DIAMETER TO 8" IN DIAMETER OR LARGER SHALL UTILIZE THE FERNCO RC STRONGBACK OR EQUIVALENT REPAIR COUPLING. (ASTM C1173).

2012

CITY OF MADISON
ENGINEERING DIVISION

COUPLING DETAILS

STANDARD DETAIL DRAWING 5.3.3

6808 ODANA RD. SUITE 200
MADISON, WI 53719-1137
PHONE: 608.600.6199
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WI: 800.242.8511
www.sehinc.com

Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

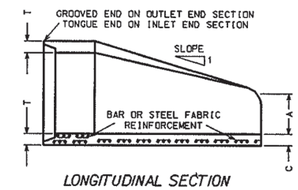
MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM

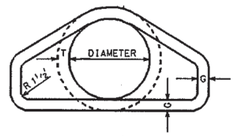
SHEET TITLE
CIVIL DETAILS

SHEET
CD14

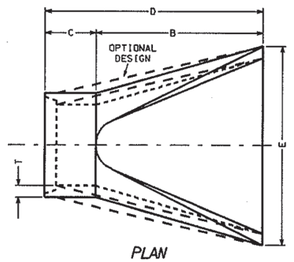
REINFORCED CONCRETE APRON ENDWALLS



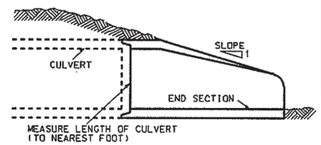
LONGITUDINAL SECTION



END SECTION



PLAN



SIDE ELEVATION

DIA	APPROX. WEIGHT/ SECTION	T	A	B	C	D	E	G	APPROX. SLOPE
12"	530	2"	4"	24"	48 7/8"	72 1/8"	24"	2"	3 TO 1
15"	740	2 1/4"	6"	27"	46"	73"	30"	2 1/4"	3 TO 1
18"	990	2 1/2"	9"	27"	46"	73"	36"	2 1/2"	3 TO 1
21"	1280	2 3/4"	9"	36"	37 1/2"	73 1/2"	42"	2 3/4"	3 TO 1
24"	1520	3"	9 1/2"	43 1/2"	30"	73 1/2"	48"	3"	3 TO 1
27"	1930	3 1/4"	10 1/2"	49 1/2"	24"	73 1/2"	54"	3 1/4"	3 TO 1
30"	2190	3 1/2"	12"	54"	19 3/4"	73 3/4"	60"	3 1/2"	3 TO 1
36"	4100	4"	15"	63"	34 3/4"	97 3/4"	72"	4"	3 TO 1
42"	5380	4 1/2"	21"	63"	35"	98"	78"	4 1/2"	3 TO 1
48"	6550	5"	24"	72"	26"	98"	84"	5"	3 TO 1
54"	8040	5 1/2"	27"	65"	33 1/4"/35"	98 1/4"/100"	90"	5"	2 1/2 TO 1
60"	8730	6"	30"/35"	60"	39"	99"	96"	5"	2 TO 1
66"	10630	6 1/2"	24"/30"	72"/78"	21"/27"	99"	102"	5 1/2"	2 TO 1
72"	12520	7"	24"/36"	78"	21"	99"	108"	6"	2 TO 1
78"	14430	7 1/2"	24"/36"	78"	21"	99"	114"	6 1/2"	2 TO 1
84"	18160	8"	36"	90 1/2"	21"	111 1/2"	120"	6 1/2"	1 1/2 TO 1

NOTE: MINIMUM/MAXIMUM

GENERAL NOTES:

DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

VARIATIONS OF THE DIMENSIONS AND DESIGNS SHOWN BEFORE WILL BE PERMITTED PROVIDING EQUIVILENT CAPACITY AND STRUCTURAL INTEGRITY ARE ATTAINED, AND PRIOR APPROVAL OF THE ENGINEER IS OBTAINED.

CONCRETE CULVERT ENDWALLS MAY NOT BE USED WITH GALVANIZED STEEL OR ALUMINUM CULVERT PIPE OR VICE VERSA.

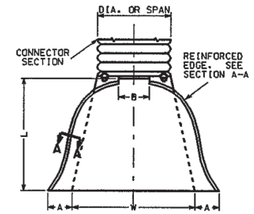
GALVANIZED STEEL OR ALUMINUM ENDWALLS SHALL NORMALLY BE INSTALLED ON CULVERT PIPE OF THE SAME METAL. THE USE OF GALVANIZED STEEL ENDWALLS ON ALUMINUM PIPES IS PERMITED, PROVIDED THE TWO METALS AT THE JOINT INTERRACE ARE KEPT SEPARATED BY A SUITABLE INSULATING MATERIAL APPROXIMATELY 1/16" THICK OR GREATER. SUCH MATERIAL WOULD BE AN ASPHALT IMPREGNATED FABRIC, A SHEET PLASTIC, A RUBBER GASKET OR OTHER NONBIODEGRADABLE MATERIAL OF SUBSTANTIAL STRENGTH.

WHEN TWO OR MORE PIPE ARCHES WITH APRON ENDWALLS ARE TO BE LAID ADJACENT TO EACH OTHER, THEY SHALL BE SEPARATED BY THE FOLLOWING AMOUNT.
PIPES: TOTAL WIDTH OF APRON ENDWALL LESS THE DIAMTER OF PIPE PLUS 6 INCHES.
PIPE ARCHES: TOTAL WIDTH OF APRON ENDWALL LESS THE SPAN DIMENSION OF THE PIPE ARCH PLUS 6 INCHES.

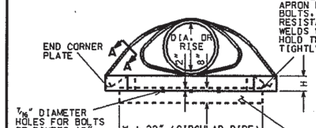
METAL APRON ENDWALLS FOR PIPE ARCHES

PIPE-ARCH DIMENSIONS SPAN	PIPE-ARCH DIMENSIONS RISE	MIN. METAL THICK	DIMENSIONS A +/-1"	B MAX	H +/-1"	L +/-1 1/2"	W +/-2"	APPROX. SLOPE
17"	13"	0.064	7"	9"	6"	19"	31"	2 1/2 TO 1
21"	15"	0.064	7"	10"	6"	23"	26"	2 1/2 TO 1
24"	18"	0.064	8"	12"	6"	28"	42"	2 1/2 TO 1
28"	20"	0.064	9"	14"	6"	32"	48"	2 1/2 TO 1
35"	24"	0.079	10"	16"	6"	39"	60"	2 1/2 TO 1
42"	29"	0.079	12"	18"	8"	46"	75"	2 1/2 TO 1
49"	33"	0.109	13"	21"	9"	53"	85"	2 1/2 TO 1
57"	38"	0.109	18"	26"	12"	63"	90"	2 1/2 TO 1
64"	43"	0.109	18"	30"	12"	70"	102"	2 1/4 TO 1
71"	47"	0.109	18"	33"	12"	77"	114"	2 1/4 TO 1
77"	52"	0.109	18"	35"	12"	77"	126"	2 TO 1
83"	57"	0.109	18"	39"	12"	77"	138"	2 TO 1

NOTE: ALL SPLICES TO BE LAP RIVETED OR BOLTED

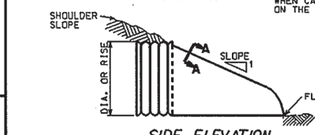


PLAN



END CORNER PLATES MAY BE FASTENED TO APRON PROPER BY BOLTS, RIVETS, OR RESISTANCE SPOT WELDS WHICH WILL HOLD THE SURFACES TIGHTLY TOGETHER

END VIEW



SIDE ELEVATION

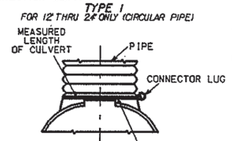
METAL OR ALUMINUM APRON ENDWALLS FOR CIRCULAR PIPES

DIA	MIN. METAL THICKNESS	MIN. ALUM THICKNESS	DIMENSIONS A +/-1"	B MAX	H +/-1"	L +/-1 1/2"	W +/-2"	APPROX. SLOPE
12"	0.064	0.060	6"	6"	6"	21"	24"	2 1/2 TO 1
15"	0.064	0.060	7"	8"	6"	26"	30"	2 1/2 TO 1
18"	0.064	0.060	8"	10"	6"	31"	36"	2 1/2 TO 1
21"	0.064	0.060	9"	12"	6"	36"	42"	2 1/2 TO 1
24"	0.064	0.075	10"	13"	6"	41"	48"	2 1/2 TO 1
30"	0.079	0.075	12"	16"	8"	51"	60"	2 1/2 TO 1
36"	0.079	0.105	14"	19"	9"	60"	72"	2 1/2 TO 1
42"	0.109	0.105	16"	22"	11"	69"	84"	2 1/2 TO 1
48"	0.109	0.105	18"	27"	12"	78"	90"	2 1/4 TO 1
54"	0.109	0.105	18"	30"	12"	84"	102"	2 TO 1
60"	0.109	N/A	18"	33"	12"	87"	114"	1 3/4 TO 1
66"	0.109	N/A	18"	36"	12"	87"	120"	1 1/2 TO 1
72"	0.109	N/A	18"	39"	12"	87"	126"	1 1/3 TO 1
78"	0.109	N/A	18"	42"	12"	87"	132"	1 1/4 TO 1
84"	0.109	N/A	18"	45"	12"	87"	138"	1 1/4 TO 1

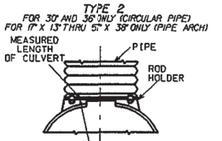
NOTE: ALL SPLICES TO BE LAP RIVETED OR BOLTED

CONNECTION DETAILS

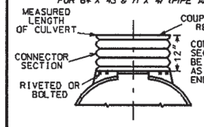
TYPE 1
FOR 12 THRU 24 ONLY (CIRCULAR PIPE)



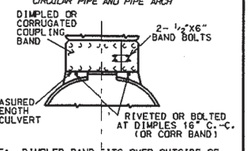
TYPE 2
FOR 30 AND 36 ONLY (CIRCULAR PIPE)
FOR 17" X 13" THRU 51" X 35" ONLY (PIPE ARCH)



TYPE 3
FOR 42 THRU 84 ONLY (CIRCULAR PIPE)
FOR 64" X 43" & 71" X 47" (PIPE ARCH)



TYPE 5
ALTERNATE FOR AL. SIZES CORRUGATED CIRCULAR PIPE AND PIPE ARCH



CONNECTION NOTES:
CIRCULAR PIPE -
FOR CIRCUMFERENTIALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2, 3, OR 5 AS APPLICABLE.

FOR HELICALLY CORRUGATED PIPE USE ENDWALL CONNECTION DETAILS 1, 2, OR 5.

FOR HELICALLY CORRUGATED PIPES WITH TWO CIRCUMFERENTIAL CORRUGATIONS AT EACH END USE ENDWALL CONNECTION DETAILS 1, 2, OR 3.

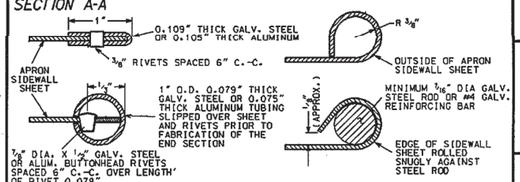
PIPE ARCH -
USE ENDWALL CONNECTION DETAILS 2, 3, OR 5 AS APPLICABLE.

NOTE: DIMPLED BAND FITS OVER OUTSIDE OF ENDWALL AND CORRUGATED BAND FITS INSIDE ENDWALL. DIMPLED BAND MAY BE USED WITH HELICALLY CORRUGATED PIPE

ALTERNATE CONNECTOR STRAP FOR TYPE 1 CONNECTION

2004

SECTION A-A



CITY OF MADISON
ENGINEERING DIVISION

APRON ENDWALLS FOR PIPES AND PIPE ARCHES

STANDARD DETAIL DRAWING 5.4.1

5.4.1

6818 ODANA RD, SUITE 200
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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

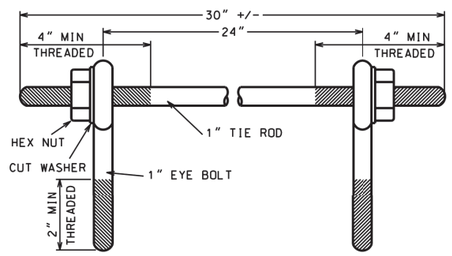
MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM
Short Elliott Hendrickson, Inc. © (SEH)

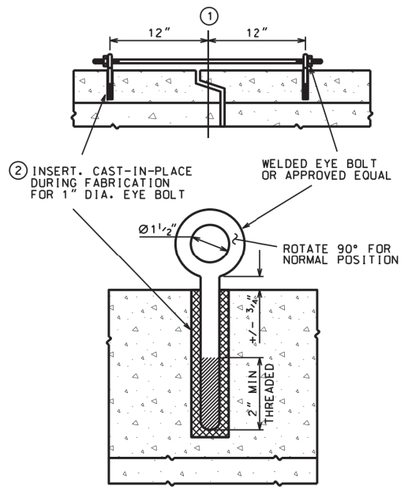
SHEET TITLE
CIVIL DETAILS

SHEET
CD15

ALTERNATE 1
EYE BOLT AND TIE ROD ASSEMBLY
(JOINT TIES FOR 72" DIA AND OVER CONCRETE PIPE)

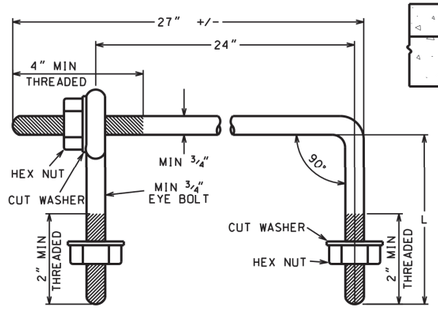


EYE BOLTS AND TIE ROD



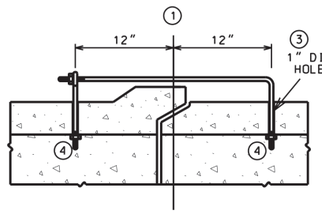
(CAST-IN-PLACE THREADED INSERT)
LONGITUDINAL SECTIONS

ALTERNATE 2
EYE BOLT AND TIE ROD ASSEMBLY
(JOINT TIES FOR 18" TO 66" DIA CONCRETE PIPE)

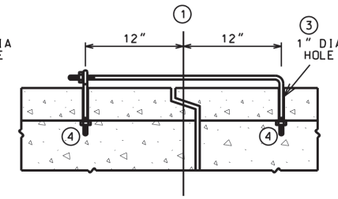


NOTE: TWO EYE BOLTS MAY BE USED WITH A 30" LONG THREADED ROD IN LIEU OF THE 90° BENT TIE ROD

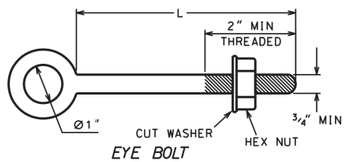
EYE BOLT AND TIE ROD



(MODIFIED BELL PIPE)
LONGITUDINAL SECTION



(TONGUE AND GROOVE PIPE)
LONGITUDINAL SECTION

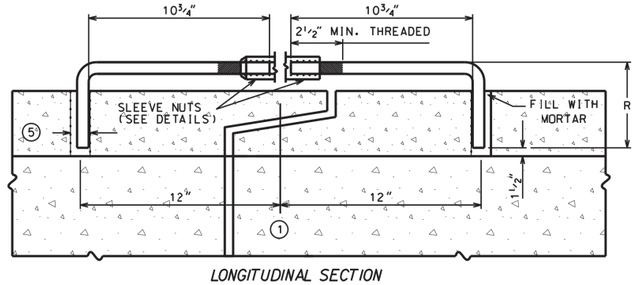


EYE BOLT

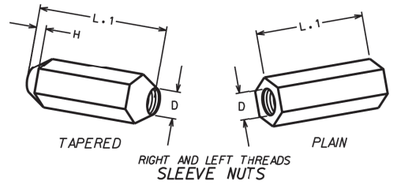
PIPE SIZE	L = LENGTH	
	TOUNGE & GROOVE PIPE	MODIFIED BELL PIPE
18" TO 24"	4 1/2"	6 1/4"
30"	5"	7"
36"	5 1/2"	7"
42"	6"	
48"	6 1/2"	
60"	7 1/2"	
66"	8"	

EYE BOLT DIMENSION TABLE

ALTERNATE 3
ADJUSTABLE TIE ROD
(JOINT TIES FOR 12" TO 108" DIA CONCRETE PIPE)



LONGITUDINAL SECTION



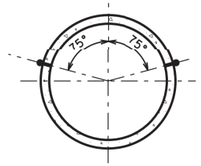
TAPERED *PLAIN*
RIGHT AND LEFT THREADS
SLEEVE NUTS

PIPE DIAMETER	TIE ROD DIAMETER	D	L.1	H	R
12" TO 30"	1/2"	1/2"	5"	1/2"	1 3/4"
66" TO 84"	3/4"	3/4"	5"	1/2"	5"
90" TO 104"	1"	1"	7"	1 7/16"	7 1/2"

ADJUSTABLE TIE ROD TABLE

2014

PLACEMENT OF (2) CAST-IN-PLACE INSERTS OR HOLES DURING FABRICATION FOR PIPE SECTIONS REQUIRING TIE RODS



TRANSVERSE SECTION

GENERAL NOTES:

CONCRETE CULVERT PIPE SHALL BE TIED TOGETHER IN THE MANNER ILLUSTRATED BY THIS DETAIL AND PER STANDARD SPEC. 504.3 (C) AT LOCATION DESIGNATED ON THE PLAN. THE CONTRACTOR MAY USE EITHER ALTERNATE 1, 2, OR 3 FOR DRAINAGE STRUCTURES. ONLY ALTERNATE 1 AND 3 MAY BE USED FOR CATTLE PASSES. UNLESS OTHERWISE STATED IN THE CONTRACT, THE MATERIALS, FABRICATION AND WORK NECESSARY TO THE CULVERT PIPE AS INDICATED ON THE PLANS AND BY THIS DETAIL WILL BE CONSIDERED INCIDENTAL TO CULVERT PIPE, REINFORCED CONCRETE CULVERT PIPE, OR REINFORCED CONCRETE PIPE CATTLE PASS.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR JOINT TIES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

1. ℄ OF TONGUE AND GROOVE OR BELL AND SPIGOT JOINTS
2. THE INSIDE OF THE THREADED INSERTS SHALL BE CLEAN TO ALLOW THE INSERTION OF THREADED EYE BOLTS
3. HOLES SHALL BE CAST-IN-PLACE OR DRILLED, 12" FROM ℄ OF TONGUE AND GROOVE
4. RODS SHALL BE CUT FLUSH W/ BOLT HEAD OR THE TIE SYSTEM ROTATED SO THE NUT IS ON THE OUTSIDE OF THE PIPE
5. ROD DIAMETER = 1 INCH

CITY OF MADISON
ENGINEERING DIVISION

CONCRETE PIPE JOINT TIES

STANDARD DETAIL DRAWING 5.4.6

5.4.6

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

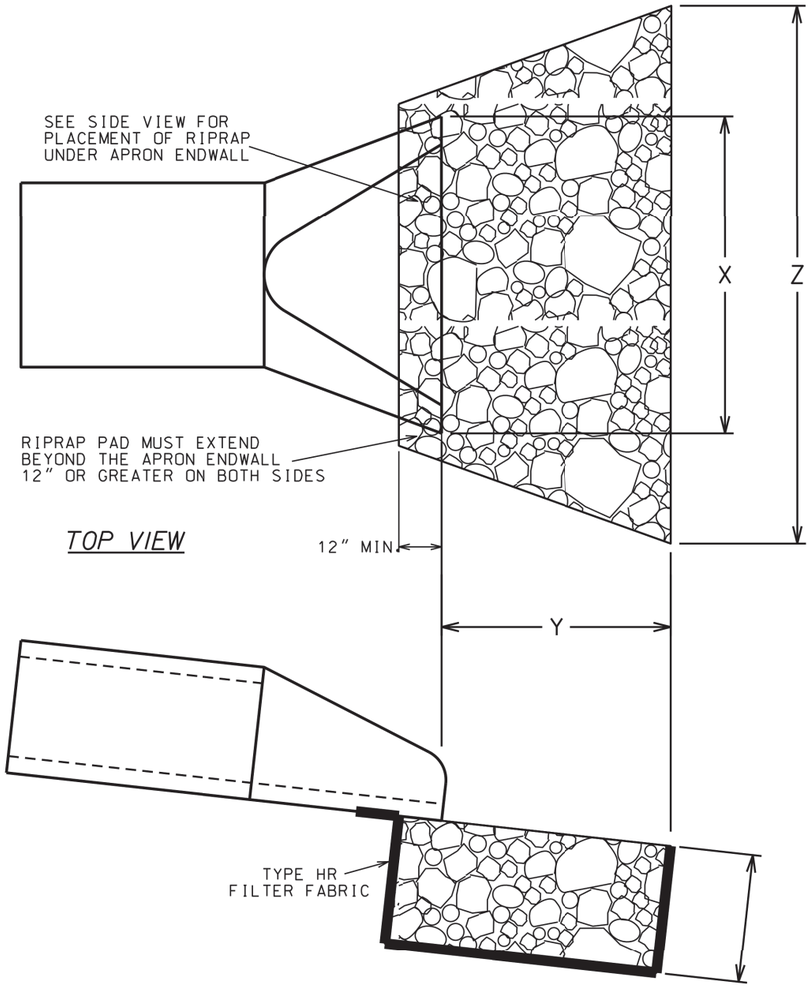
MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM

SHEET TITLE
CIVIL DETAILS

SHEET
CD16

5.4.4



TOP VIEW

SIDE VIEW

DIA (in)	X (in)	Y (in)	Z (in)	APPROX. WEIGHT (tons)
12	24	48	48	1.78
15	30	60	60	2.64
18	36	60	60	2.78
21	42	72	72	3.83
24	48	72	72	4.00
27	54	72	81	4.42
30	60	84	90	5.64
36	72	96	108	7.56
42	78	96	120	8.22
48	84	108	120	9.50
54	90	108	150	11.00
60	96	108	162	11.75
66	102	132	174	15.28
72	108	132	186	16.19

NOTES:

1) CITY OF MADISON STANDARD SPECIFICATIONS SHALL APPLY TO ALL INSTALLATIONS.

2) PIPES 36" AND GREATER SHALL HAVE JOINT TIES PER STANDARD DETAIL DRAWING 5.4.6 & SECTION 504.2 (i).

3) PIPES 36" OR GREATER SHALL HAVE 50% OF THE RIPRAP PAD PLACED WITH A SLURRY GROUT MIX ON AN UNEVEN RIPRAP SURFACE. SLURRY GROUT SHALL BE TYPE B SLURRY PER SECTION 300 OF THE STANDARD SPECIFICATIONS.

4) TWIN APRON INSTALLATIONS SHALL BE GOVERNED BY THE OUTSIDE DIMENSIONS OF A SINGLE PIPE.

RIPRAP PLACEMENT & THICKNESS IN ACCORDANCE WITH ARTICLE 212.3

NOT TO SCALE

2015

CITY OF MADISON
ENGINEERING DIVISION

RIPRAP AT APRON END WALLS

STANDARD DETAIL DRAWING 5.4.4

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MADISON, WISCONSIN

MARK	DATE	DESCRIPTION

REVISIONS

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PROJECT NO. 53W10434
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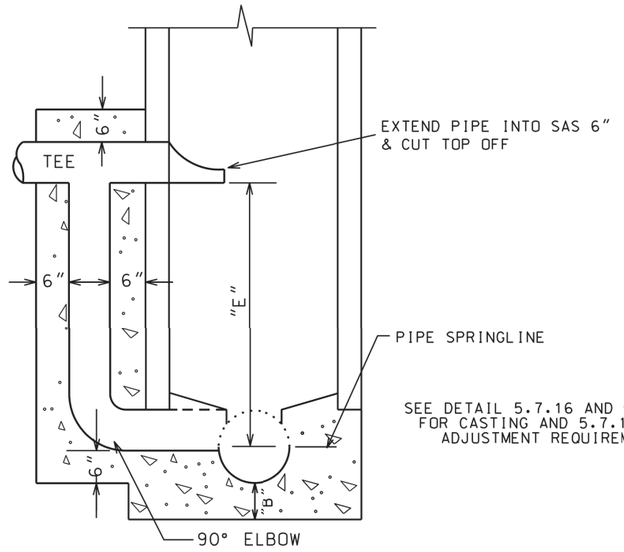
SHEET TITLE
CIVIL DETAILS

SHEET
CD17



DETAIL A

SHOWING DROP INLET CONSTRUCTION FOR SANITARY SEWER MAINS & LATERALS

NOTES:

1) PRECAST S.A.S. SECTIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C-478.

2) THICKNESS OF BASE, "B":
   6" MIN. FOR 4' DIAMETER SAS
   8" MIN. FOR 5' AND 6' DIAMETER SAS

3) FOR CASTING DESIGNATION REFER TO STANDARD DETAIL DRAWING 5.7.16 AND 5.7.16A

4) CENTERED (CONCENTRIC) CONE SHALL BE INSTALLED UNLESS OTHERWISE DIRECTED.

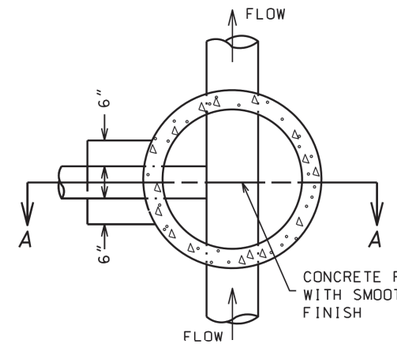
5) DROP INLET SHALL BE BUILT FOR ALL SEWER MAINS AND LATERALS WHEN "E" IS GREATER THAN 24". "E" SHOULD BE MEASURED FROM INVERT OF INCOMING PIPE TO THE SPRINGLINE OF THE OUTGOING SEWER. INSIDE DROP PER STANDARD DETAIL DRAWING 5.7.30 MAY BE INSTALLED FOR 4" AND 6" SERVICE CONNECTIONS WHERE OUTSIDE DROP INLET CONSTRUCTION IS INFEASIBLE. ENGINEER SHALL APPROVE INSIDE DROP INLET PRIOR TO INSTALLATION.

6) FLEXIBLE PIPE TO SAS CONNECTOR REQUIRED PER STANDARD DETAIL DRAWING 5.7.31

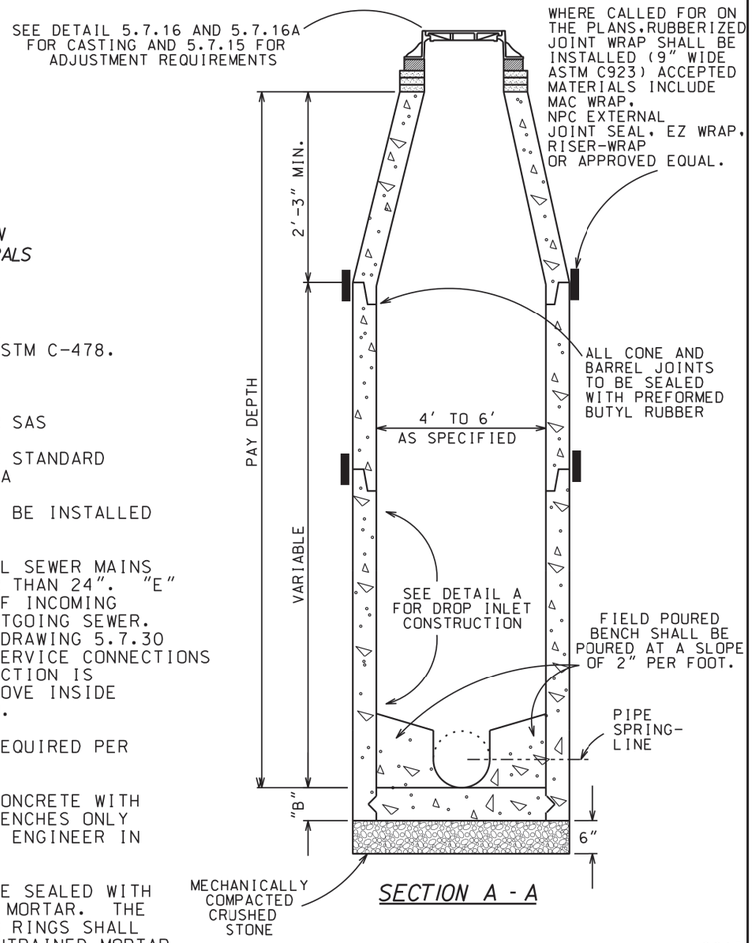
7) ALL BENCHES TO BE FIELD POURED CONCRETE WITH SMOOTH TROWEL FINISH. PRECAST BENCHES ONLY PERMITTED WITH PRIOR APPROVAL OF ENGINEER IN WRITING.

8) ALL JOINTS BETWEEN RINGS SHALL BE SEALED WITH $\frac{3}{8}$" OF AIR-ENTRAINED TYPE M OR S MORTAR. THE OUTSIDE SURFACE OF THE ADJUSTING RINGS SHALL BE SEALED WITH A $\frac{1}{2}$" THICK AIR-ENTRAINED MORTAR TYPE M OR S SEAL. THE METHOD USED FOR SEALING THE OUTSIDE SURFACE SHALL BE COMPATIBLE WITH THAT USED TO SEAL JOINTS BETWEEN THE RINGS.

9) PRECAST SANITARY SEWER ACCESS STRUCTURES FOR STREET RECONSTRUCTION PROJECTS AND FOR STREET EXCAVATION PERMITS REQUIRE PRECAST SHOP DRAWING APPROVAL FROM CITY ENGINEERING. PRIOR TO BEING FABRICATED BY THE MANUFACTURER NO PRECAST SHOP DRAWINGS ARE REQUIRED FOR NEW CONSTRUCTION IN SUBDIVISION DEVELOPMENTS.



TOP VIEW



SECTION A - A

2015

CITY OF MADISON
ENGINEERING DIVISION

SANITARY SEWER PRECAST SAS

STANDARD DETAIL DRAWING 5.7.2

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MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM

SHEET TITLE
CIVIL DETAILS

SHEET
CD18

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PLOT SCALE: 1:2
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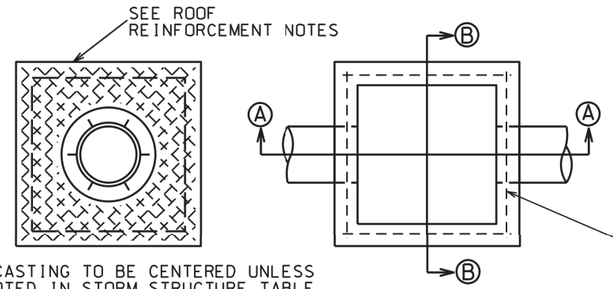
USER: JOSH BOHNERT

SEWER ACCESS STRUCTURES



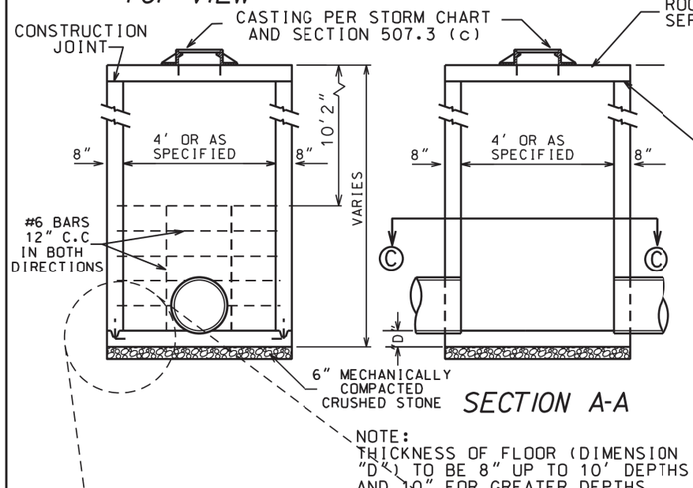
NOTE: CASTING TO BE CENTERED UNLESS NOTED IN STORM STRUCTURE TABLE

SECTION C-C

ROOF REINFORCEMENT NOTES:

1) EPOXY COATED REBARS SHALL BE USED IN ALL CASES
2) #6 BARS PLACED ON 6" CENTERS FOR 3'X3' 3'X4' 4'X4' 4'X5' 5'X5' STRUCTURES
3) #6 BARS PLACED ON 4" CENTERS FOR 6'X5' 6'X6' AND LARGER STRUCTURES
4) 3" CLEAR SHALL BE MAINTAINED IN ALL CASES
5) ROOF THICKNESS SHALL BE 8" MINIMUM UNLESS SPECIFIED OTHERWISE.

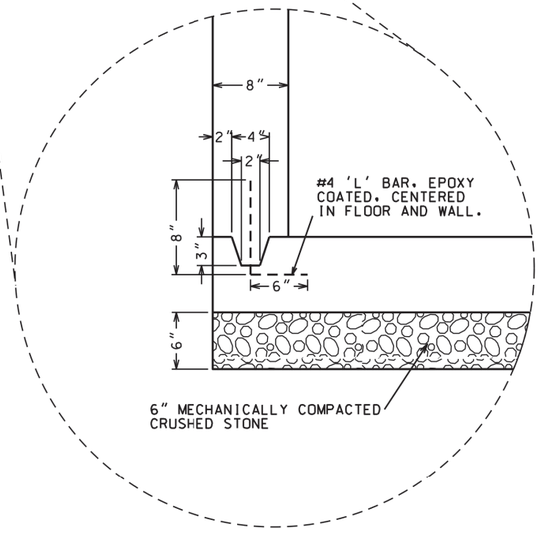
TOP VIEW



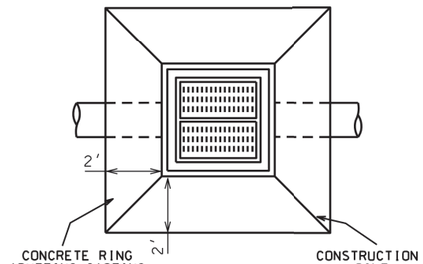
SECTION A-A

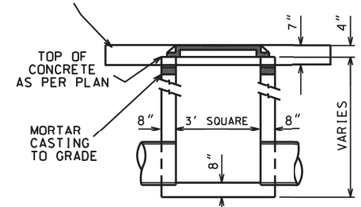
NOTE:
THICKNESS OF FLOOR (DIMENSION "D") TO BE 8" UP TO 10' DEPTHS AND 10" FOR GREATER DEPTHS

SECTION B-B



3'X3' CATCH BASIN





PRECAST REINFORCED CONCRETE STRUCTURES MAY BE USED IF APPROVED ACCORDING TO ARTICLES 106.3 AND 507.3 (b) OF THE STANDARD SPECIFICATIONS

NEENAH FOUNDRY CASTINGS AS LISTED OR EQUAL. ALL CASTING WITH FLANGE AT BASE.
LIGHT DUTY
R-1879-A10G FOR OPEN GRATE
R-1879-A10L FOR SOLID LID
HEAVY DUTY
R-1878-A10G FOR OPEN GRATE
R-1878-A10L FOR SOLID LID

2016

CITY OF MADISON
ENGINEERING DIVISION

STORM SEWER FIELD POURED SAS AND CATCH BASINS

STANDARD DETAIL DRAWING 5.7.3

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MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

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PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
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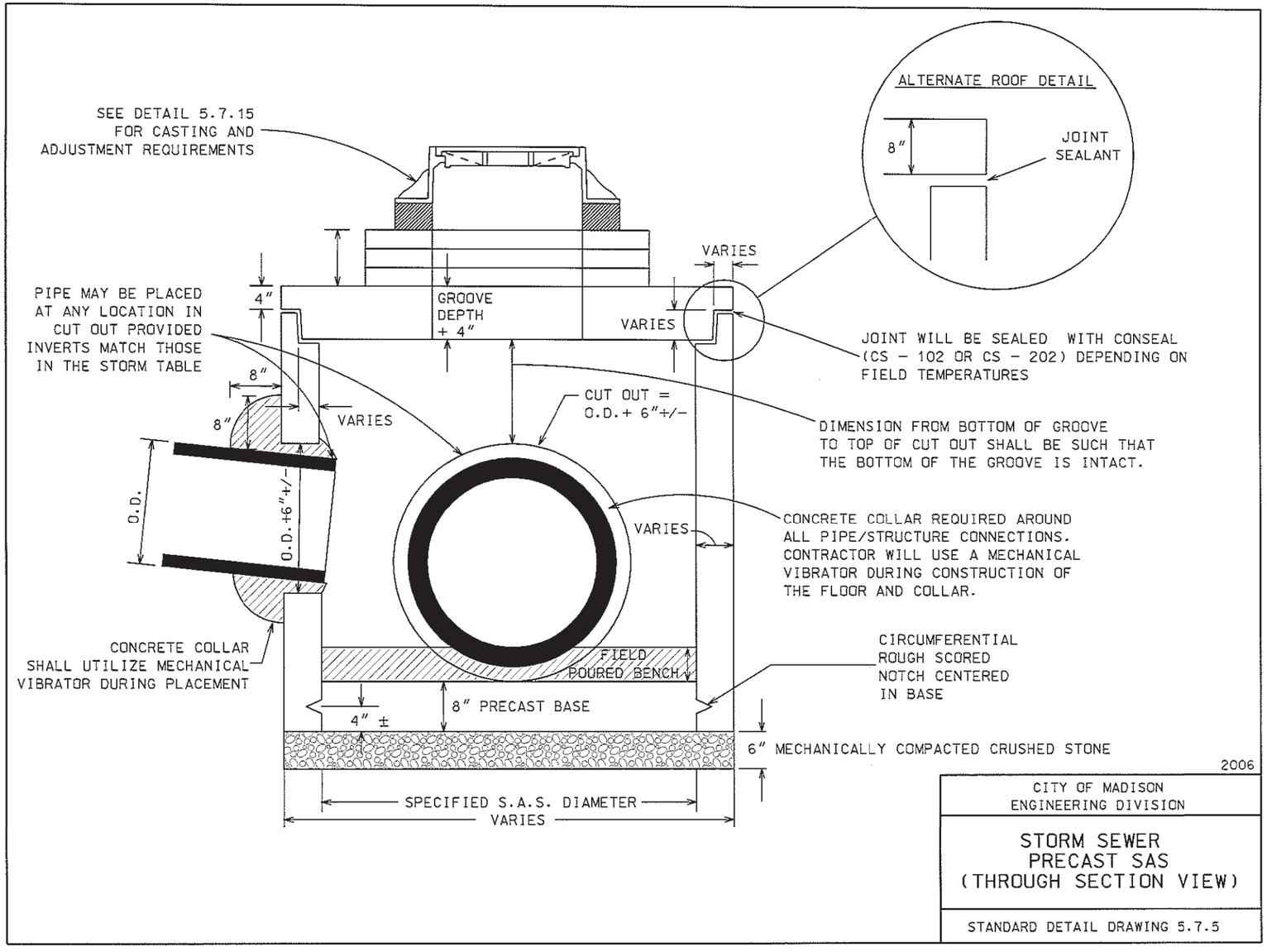
DRAWN BY JJB/SGM

SHEET TITLE
CIVIL DETAILS

SHEET
CD19



5.7.5

2006

CITY OF MADISON
ENGINEERING DIVISION

STORM SEWER PRECAST SAS (THROUGH SECTION VIEW)

STANDARD DETAIL DRAWING 5.7.5

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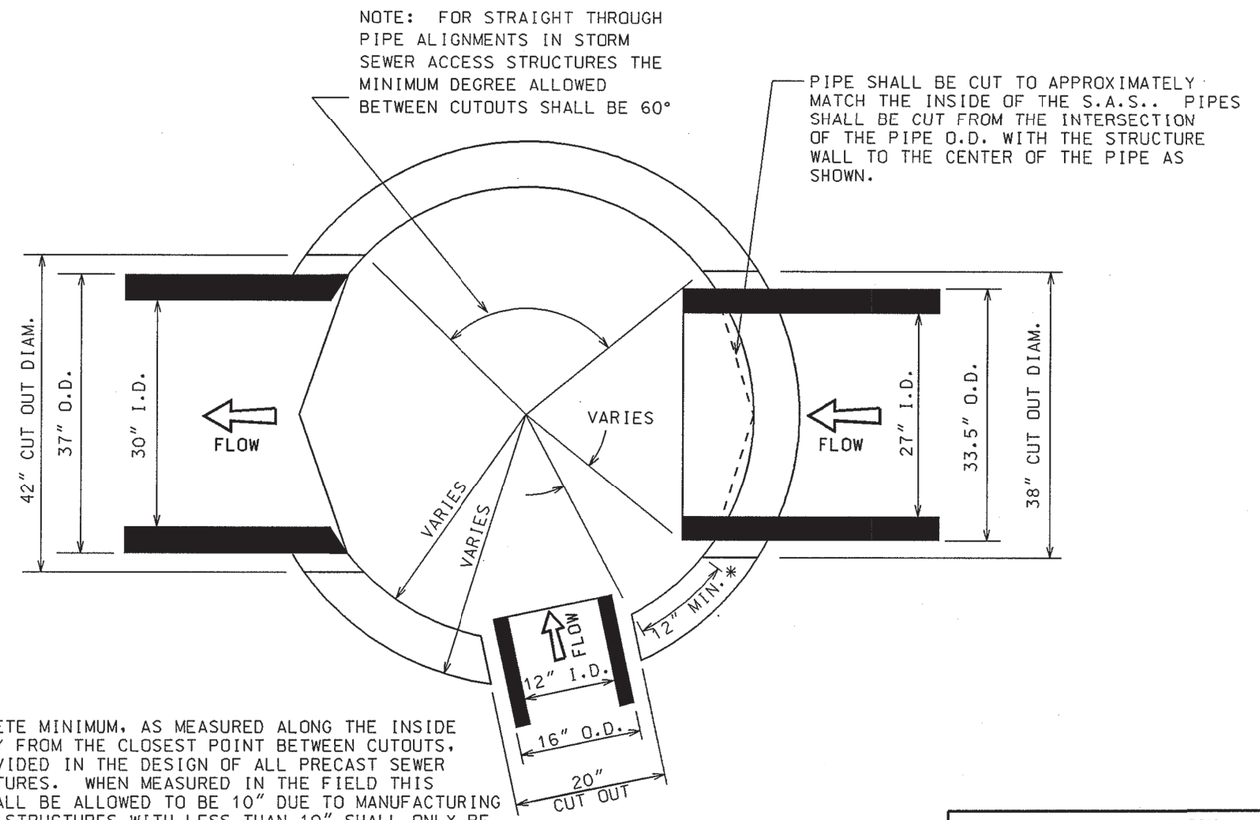
SHEET TITLE
CIVIL DETAILS

SHEET
CD20

NOTE: ALL STORM SEWER ACCESS STRUCTURES (S.A.S.) SHALL BE CONSTRUCTED IN COMPLIANCE WITH ASTM C478



* 12" OF CONCRETE MINIMUM, AS MEASURED ALONG THE INSIDE WALL RADIALLY FROM THE CLOSEST POINT BETWEEN CUTOUTS, SHALL BE PROVIDED IN THE DESIGN OF ALL PRECAST SEWER ACCESS STRUCTURES. WHEN MEASURED IN THE FIELD THIS DIMENSION SHALL BE ALLOWED TO BE 10" DUE TO MANUFACTURING TOLERANCES. STRUCTURES WITH LESS THAN 10" SHALL ONLY BE ALLOWED WITH THE CONSTRUCTION ENGINEER'S APPROVAL.

** NOTE: PIPES SHOWN IN VARIOUS CONSTRUCTION STAGES FOR ILLUSTRATIVE PURPOSES.

2004

CITY OF MADISON
ENGINEERING DIVISION

STORM SEWER PRECAST SAS (TOP VIEW)

STANDARD DETAIL DRAWING 5.7.6

5.7.6

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SHEET TITLE
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SHEET
CD21

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PLOT SCALE: 1:2
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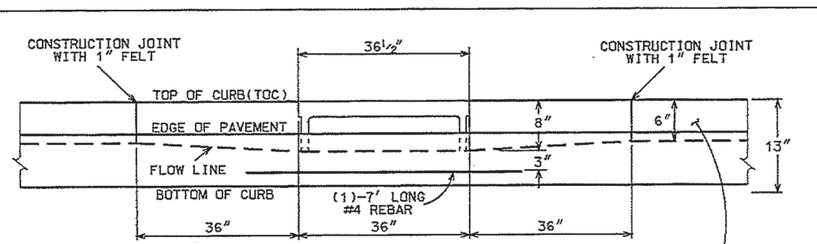
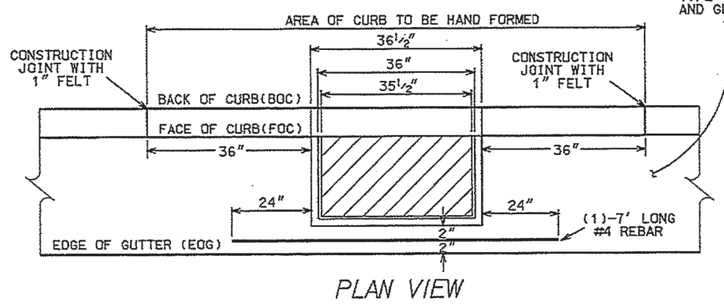
5.7.7

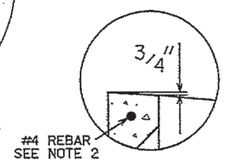


FRONT ELEVATION

NOTE: TYPE "A" CURB AND GUTTER SHOWN

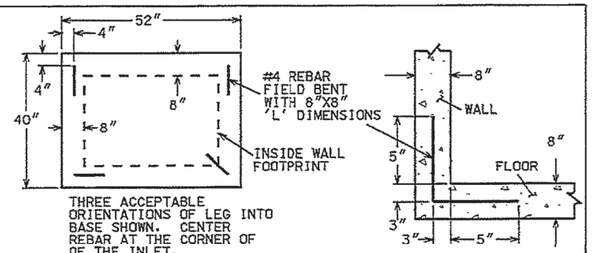


PLAN VIEW



NOTE: ¾" TILT CREATES SPECIFIED FLOW LINE DEPRESSION

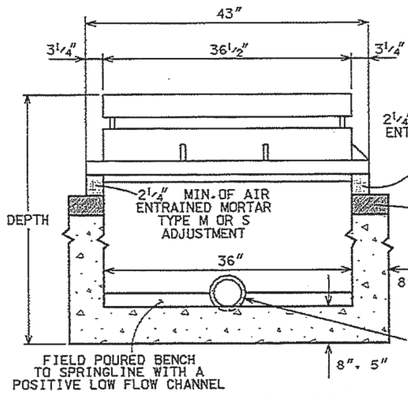
INSET



TOP VIEW OF FLOOR WITH INSIDE WALL FOOTPRINTS

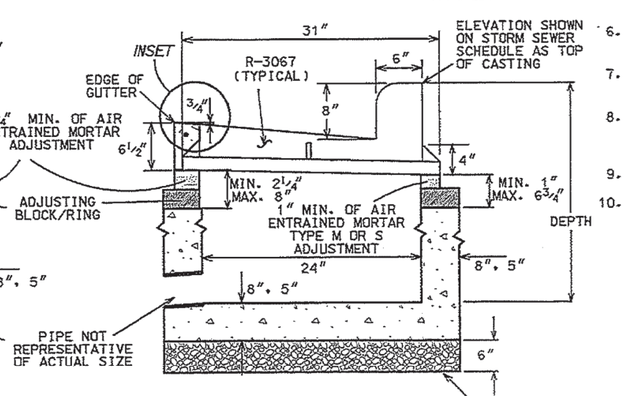
INLET WALL AND FLOOR INTERSECTION

FIELD POURED FLOOR REINFORCEMENT



TYPICAL FRONT SECTION

INLET DEPTH AS PER PLANS



TYPICAL SECTION

INLET DEPTH AS PER PLANS

DRAWING NOT TO SCALE

NOTES:

1. PRECAST REINFORCED CONCRETE STRUCTURES MAY BE USED IF APPROVED ACCORDING TO SECTION 106.3, 507.3 (b) OF THE STANDARD SPECIFICATIONS.
2. INSTALLATION COST OF INLETS SHALL INCLUDE THE COST OF REINFORCING BARS AS FOLLOWS:
   - (1)-#4 BARS 7'-0" LONG IN CONCRETE GUTTER ALONG THE FRONT OF INLET.
   - (4) #4 REBARS FIELD BENT WITH 8"X8" 'L' DIMENSIONS.
3. WHEN AN "S" INLET IS SPECIFIED, THE INSIDE DIMENSIONS OF THE STANDARD "H" INLET SHALL BE ALTERED TO 2'-4" x 1'-6'.
4. PRECAST INLETS REQUIRE 2" OF CONCRETE FROM THE EDGE OF CUTOUT/KNOCKOUT TO THE INSIDE WALLS AND TO THE TOP OF STRUCTURE.
5. FIELD POURED STRUCTURES SHALL HAVE A BENCH POURED INSIDE TO THE SPRINGLINE OF THE PIPES CREATING A POSITIVE LOW FLOW CHANNEL AS SHOWN IN THE TYPICAL FRONT SECTION VIEW.
6. ASSUMING 90 DEGREE PIPE CONNECTIONS, THE MAXIMUM PIPE OUT A 3' SIDE IS 21" AND THE MAXIMUM PIPE OUT A 2' SIDE IS 12".
7. WALL THICKNESS DIMENSIONS OF 8" AND 5" CORRESPOND TO CAST-IN-PLACE AND PRECAST STRUCTURES, RESPECTIVELY.
8. THERE SHALL BE AN 8" FLOWLINE DEPRESSION FROM TOC ALONG THE INLET TAPERED FROM THE TYPICAL 6" FLOWLINE AS SHOWN IN THE FRONT ELEVATION.
9. SEE STANDARD DETAIL DRAWING 5.7.29 FOR INLET CASTING OFFSET CRITERIA FOR H INLETS.
10. FLOOR REINFORCEMENT REQUIRED IN ALL FIELD POURED INLETS

2011

CITY OF MADISON
ENGINEERING DIVISION

TYPE "H" INLET

STANDARD DETAIL DRAWING 5.7.7

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MADISON, WISCONSIN

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SHEET TITLE: CIVIL DETAILS

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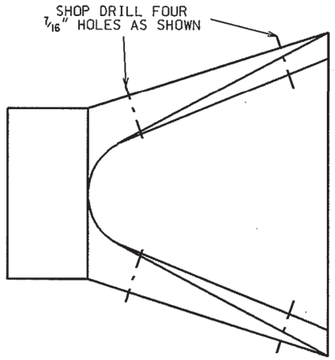
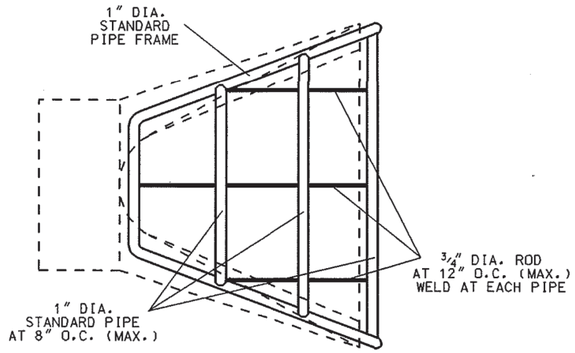
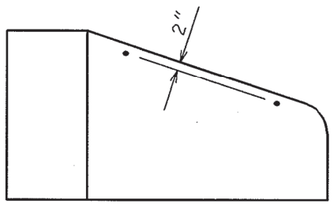
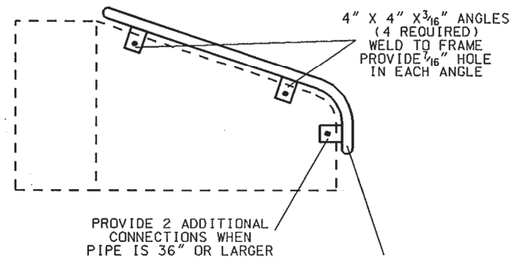
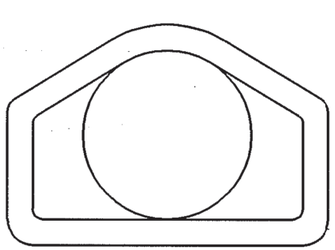
CD22

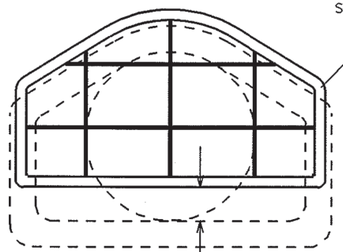












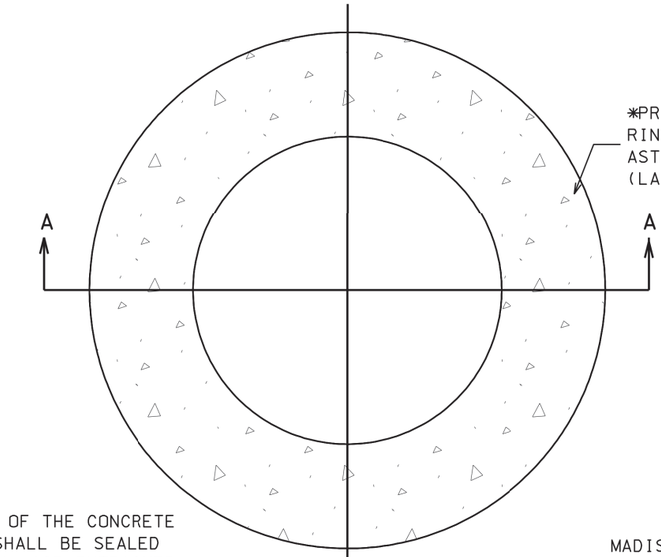
THE CONTRACTOR SHALL BOLT THE PIPE GATE TO THE CONCRETE ENDWALL WITH FOUR 3/8" X 6" MACHINE BOLTS WITH NUTS ON INSIDE WALL.

PAINTING SPECIFICATIONS

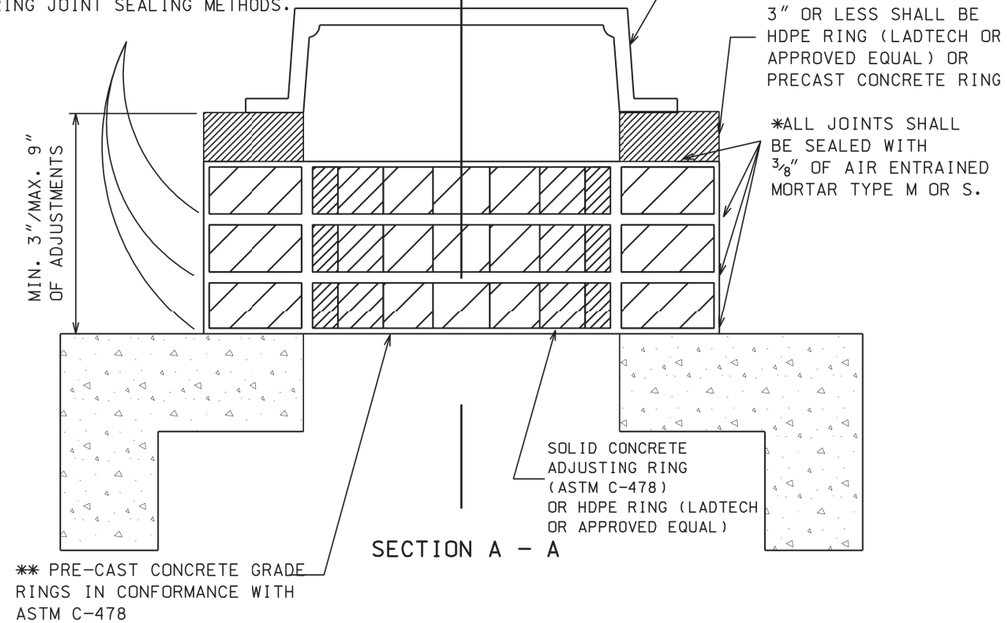
FOR PAINTING REQUIREMENTS, SEE SECTION 506.2 (b) STRUCTURAL STEEL PAINT-EPOXY SYSTEM FOR STORM SEWER GRATES/GATES

2004

CITY OF MADISON ENGINEERING DIVISION
RCP AE GATE
STANDARD DETAIL DRAWING 5.6.1



*THE OUTSIDE OF THE CONCRETE ADJUSTING RINGS SHALL BE SEALED WITH A 1/2" THICK, AIR ENTRAINED MORTAR TYPE M OR S SEAL. THE METHOD USED WILL BE COMPATIBLE WITH THE ADJUSTING RING JOINT SEALING METHODS.



SECTION A - A

2016

**NOTE: HDPE ADJUSTMENT RINGS (LADTECH OR APPROVED EQUAL) MEETING AASHTO HS25 SPECS, ASTM D-1248 INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS WILL BE CONSIDERED AN ACCEPTABLE ALTERNATE TO PRECAST RINGS, CRETEX PRO RING WILL BE CONSIDERED AN ACCEPTED ALTERNATE FOR TOP 3" ADJUSTMENT OVER PRECAST RINGS.
RING JOINT SEALANT SHALL BE ASTM C990 AND AASHTO M-198 (TROWLABLE EZ-STICK #3 OR EQUAL)

CITY OF MADISON ENGINEERING DIVISION
SAS CHIMNEY AND CASTING
STANDARD DETAIL DRAWING 5.7.15

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SEH

Madison Water Utility

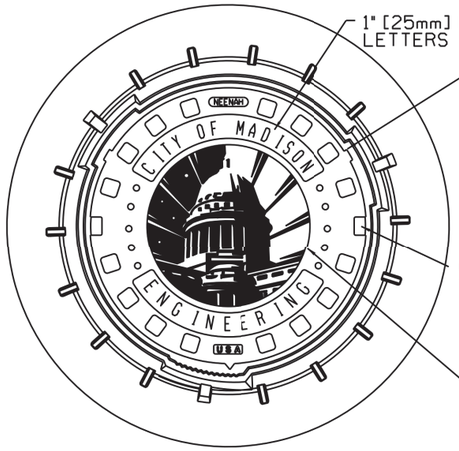
UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

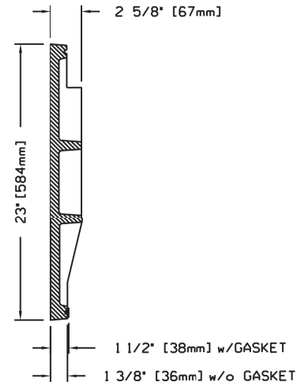
SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM
Short Elliott Hendrickson, Inc. © (SEH)

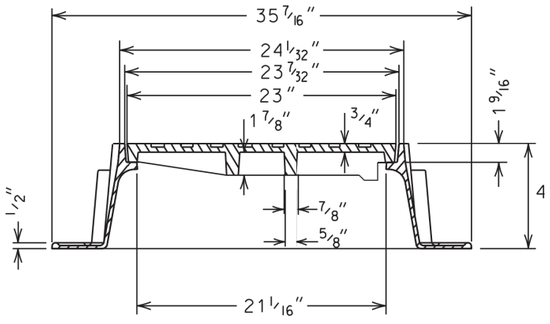
SHEET TITLE
CIVIL DETAILS

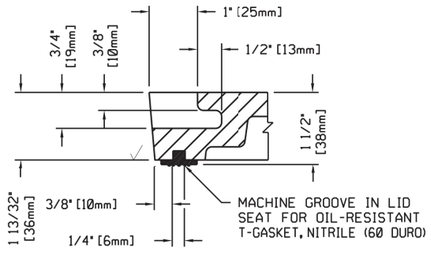
SHEET
CD23



LOGO DETAIL







T-SEAL GASKET / CONCEALED PICK DETAIL

NOTES:

APPROXIMATE TOTAL WEIGHTS:
R-1550 R-1050 FRAME w/ LOGO LID 1550-0054, 9" FRAME AND LID = 240 LBS.
R-1689 FRAME w/ LOGO LID 1550-0054, 4" FRAME AND LID = 279 LBS.

IF LOCKABLE LID IS NECESSARY, R-1916 C, 83/4" FRAME AND LID = 300 LBS
THERE IS NO CITY OF MADISON LOGO LID AVAILABLE FOR THIS FRAME AND CASTING.

THE FOLLOWING NEENAH FOUNDRY CASTINGS (OR EQUAL CASTINGS) SHALL BE ACCEPTABLE:

1. R-1050, 9" NON-ROCKING ACCESS STRUCTURE FRAME.
2. R-1689, 4" NON-ROCKING ACCESS STRUCTURE FRAME (WHEN REQUESTED BY THE CITY CONSTRUCTION ENGINEER).
3. R-1916 C LOGO WITH A LOCKING CASTING AS WELL AS A LOCKING FRAME. THIS CASTING SHALL BE USED IN GREENWAYS AND EASEMENTS (SEE SDD 5.7.16a)

1. FRAME AND COVER SHALL BE MACHINED AND FITTED SO THAT ROCKING AND CHATTERING WILL BE ELIMINATED.
2. ALL LIDS SHALL BE SELF-SEALING EXCEPT FOR STORM SEWER.
3. ALL LIDS SHALL HAVE CITY OF MADISON LOGO AS SHOWN IN DETAIL (R-1050-0054 OR EQUIV.)

LID NOTES: ALL DIMENSIONS SHOWN ARE IN ENGLISH AND [METRIC]
MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 40A

2015

CITY OF MADISON
ENGINEERING DIVISION

SAS FRAME & COVER

STANDARD DETAIL DRAWING 5.7.16

5.7.16

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
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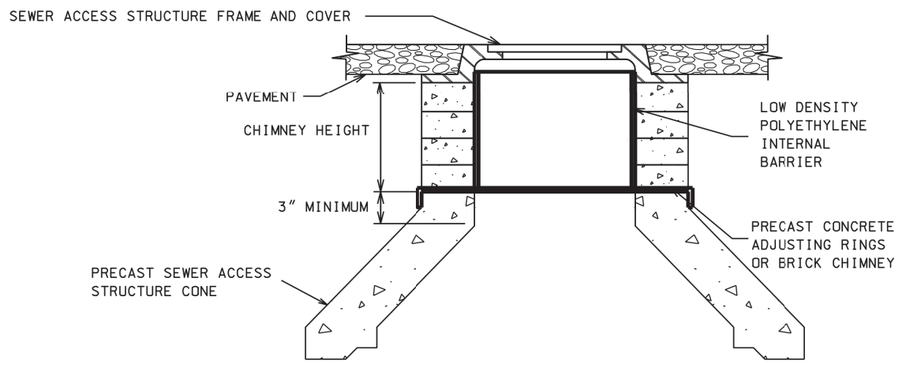
SHEET TITLE
CIVIL DETAILS

SHEET
CD24



LOW DENSITY POLYETHYLENE INTERNAL BARRIER

INTERNAL CHIMNEY SEALS SHALL BE USED ON ALL SANITARY SEWER ACCESS STRUCTURES AT THE FOLLOWING LOCATIONS:

1) WITHIN 100' OF A STREET LOW POINT
2) ALL GREENWAYS
3) WHERE SPECIFIED BY THE ENGINEER

AN INTERNAL CHIMNEY SEAL WHERE NEEDED, SHALL BE INSTALLED TO COVER THE ENTIRE CHIMNEY AREA IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. FRAME SEALS SHALL CONSIST OF THE FOLLOWING INTERNAL SEAL:

LOW DENISTY POLYETHYLENE INTERNAL BARRIER

A LOW DENSITY POLYETHYLENE INTERNAL BARRIER SHALL MAINTAIN THEIR ADHESION ALLOWING REPEATED HORIZONTAL MOVEMENT OF NOT LESS THAN 1 INCH. THE BARRIER SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCH AND CONFORM TO THE REQUIREMENTS OF THE FOLLOWING STANDARDS:
ASTM D 1248, D 1238, D 790, D 648, D 1693, ASTN D-792, UL-94.

2015

CITY OF MADISON
ENGINEERING DIVISION

SAS INTERNAL CHIMNEY SEAL

STANDARD DETAIL DRAWING 5.7.17

5.7.17

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UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM

SHEET TITLE
CIVIL DETAILS

SHEET
CD25

PLOTTED: 11-14-2016 10:04 AM
PLOT SCALE: 1:2
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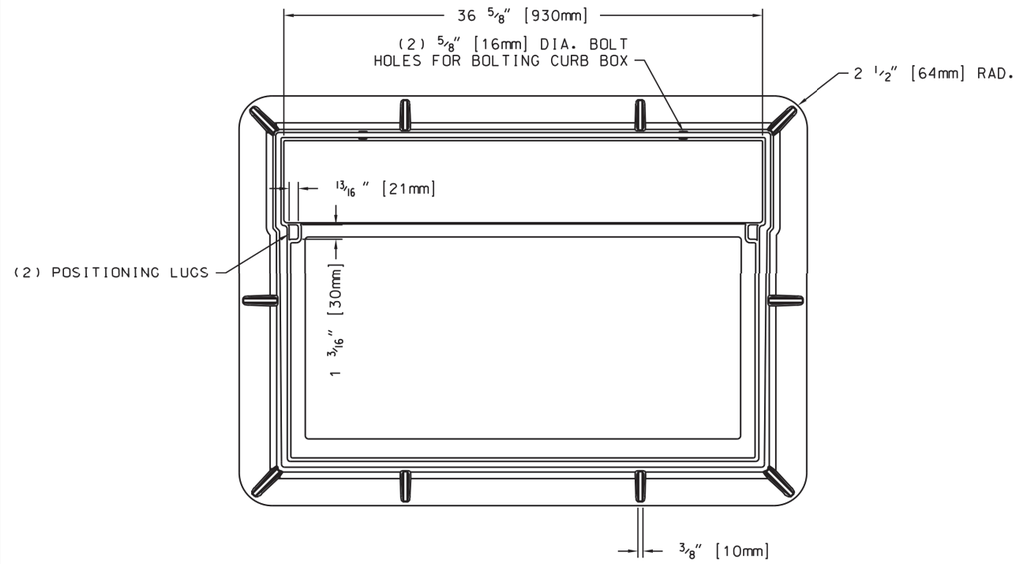
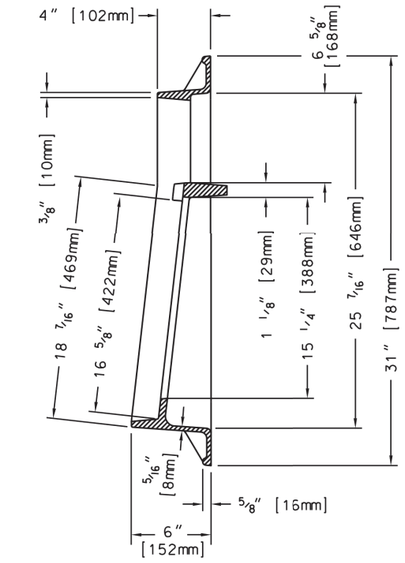
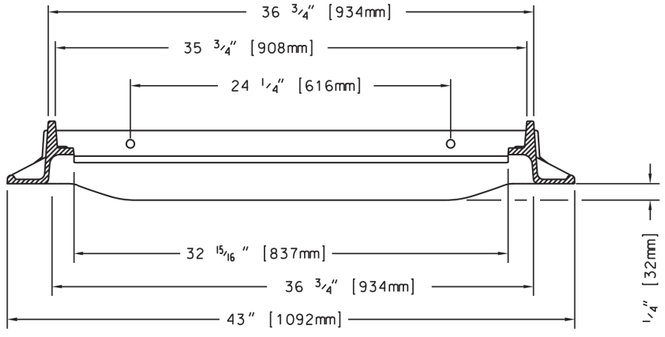
SAVED: 11-9-2016 4:09 PM
USER: JOSH BOHNERT

5.7.18







NOTES: ALL DIMENSIONS ARE SHOWN IN ENGLISH AND [METRIC].
ALL DRAFT ANGLES ARE 5° UNLESS OTHERWISE SHOWN.
MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
FINISH: NOT PAINTED
WEIGHT: APPROX. 155#

NEENAH FOUNDRY CASTINGS

1. R-3067 CURB INLET FRAME WITH DIAGONAL GRATE (TYPE R) SHALL BE USED FOR TYPE "H" INLETS AT ALL LOW POINTS AND WHERE LONGITUDINAL ROAD SLOPE IS LESS THAN 1%. GRATE PER STANDARD DETAIL DRAWING 5.7.20
2. R-3067-V CURB INLET FRAME WITH VANE GRATE (TYPE V) SHALL BE USED FOR "H" INLETS AT ALL LOCATIONS HAVING A LONGITUDINAL ROAD SLOPE EQUAL TO OR GREATER THAN 1%. GRATE PER STANDARD DETAIL DRAWING 5.7.21

NOTE: ALL DIMENSIONS ARE SHOWN IN ENGLISH AND [METRIC].

GENERAL NOTES:

1. DETAILS OF CONSTRUCTION, MATERIALS, AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.
2. DETAIL DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR INLET COVERS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.
3. ROUND FRAMES AND COVERS SHALL HAVE CONTINUOUSLY MACHINED BALL BEARING SURFACES TO PREVENT ROCKING AND RATTLING.
4. ACTUAL WEIGHT OF COVERS MAY VERY WITHIN 5 PERCENT(PLUS OR MINUS) OF THE APPROXIMATE WEIGHT.
5. INLETS SHALL BE DEPRESSED IN THE CURB FLOW LINE. SEE MADISON STANDARD DETAIL DRAWING 5.7.7

2016

CITY OF MADISON
ENGINEERING DIVISION

R-3067 FRAME

STANDARD DETAIL DRAWING 5.7.18

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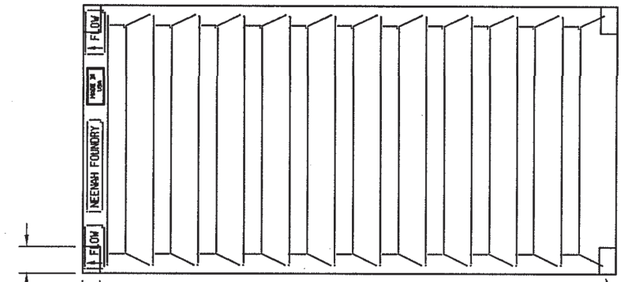
MADISON WATER UTILITY
MADISON, WISCONSIN

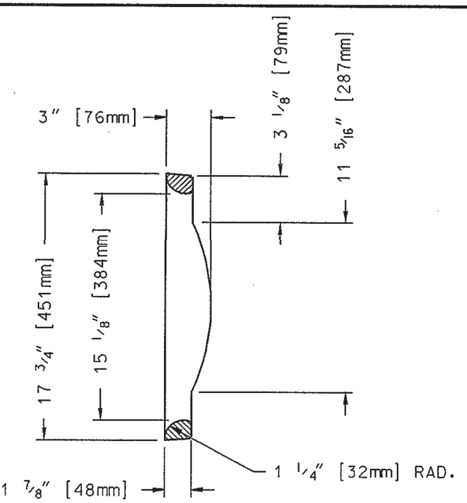
MARK	DATE	DESCRIPTION
		REVISIONS

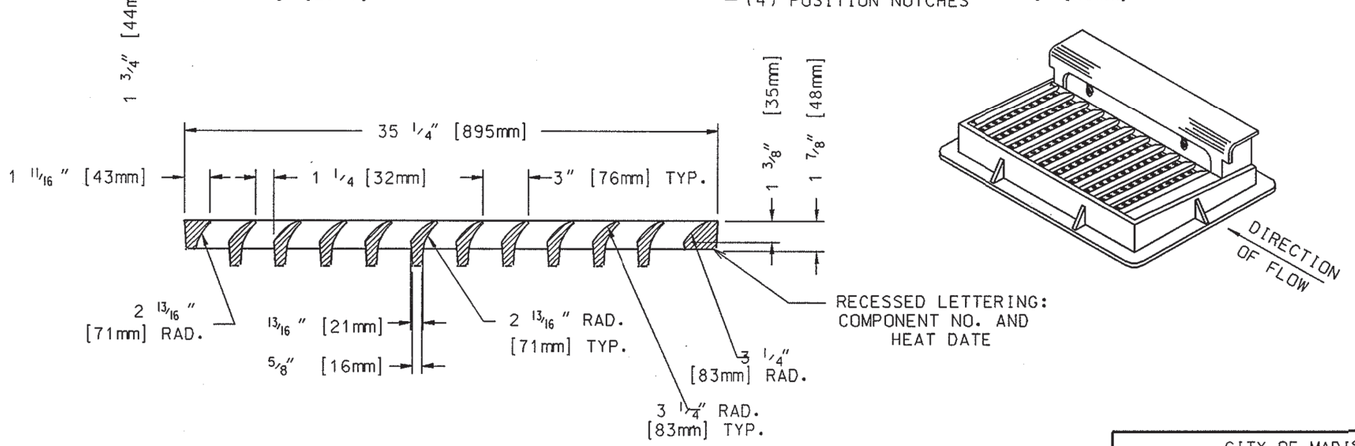
SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM

SHEET TITLE
CIVIL DETAILS

SHEET
CD26







5.7.21

2004

FREE OPEN AREA = 347 SQUARE INCHES
MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
FINISH: NO PAINT
WEIGHT: 132#

NOTE: GRATE IS REVERSIBLE. R-3067-V (LEFT FLOW) IS SHOWN IN DETAILS

CITY OF MADISON
ENGINEERING DIVISION

R-3067
TYPE V GRATE (VANE)

STANDARD DETAIL DRAWING 5.7.21

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MARK	DATE	DESCRIPTION
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ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
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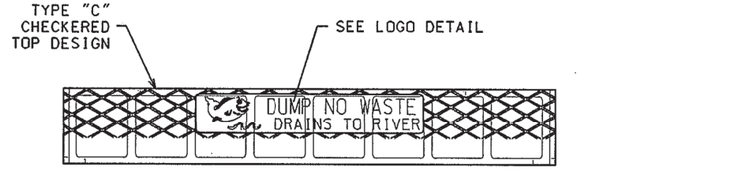
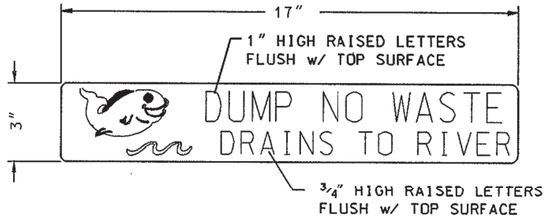
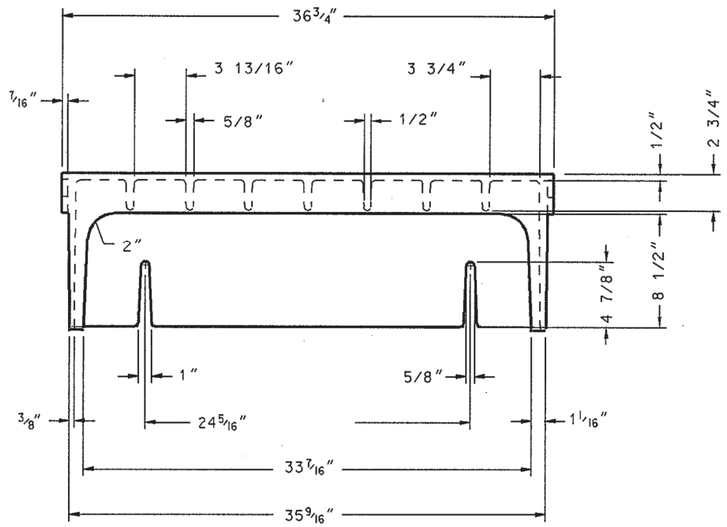
SHEET TITLE
CIVIL DETAILS

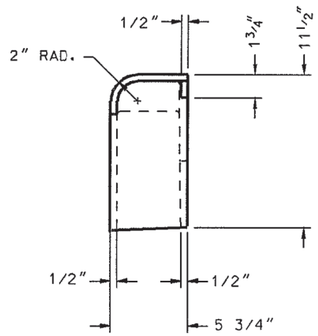
SHEET
CD27





LOGO DETAIL





5.7.23

2004

NEENAH FOUNDARY PRODUCT NUMBER 30677003
MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
FINISH: NO PAINT
WEIGHT: 126#

CITY OF MADISON
ENGINEERING DIVISION

R-3067 ER CURB BOX

STANDARD DETAIL DRAWING 5.7.23

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MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
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PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
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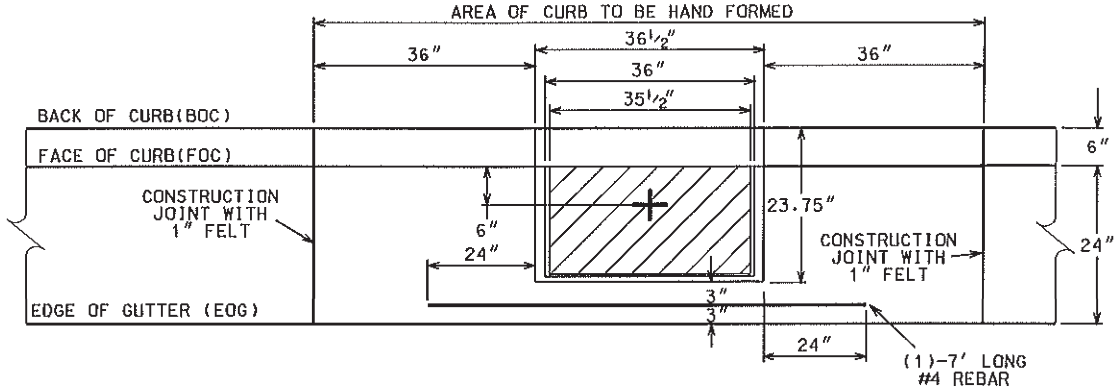
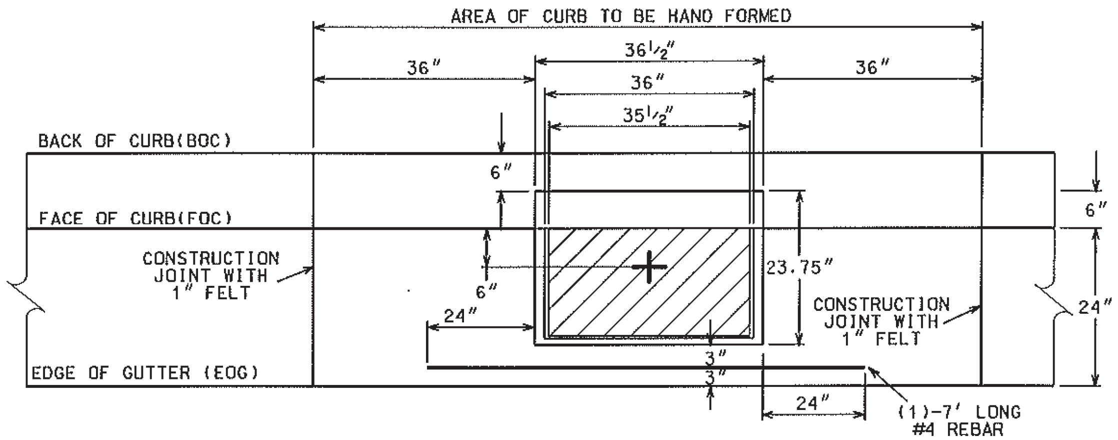
SHEET TITLE
CIVIL DETAILS

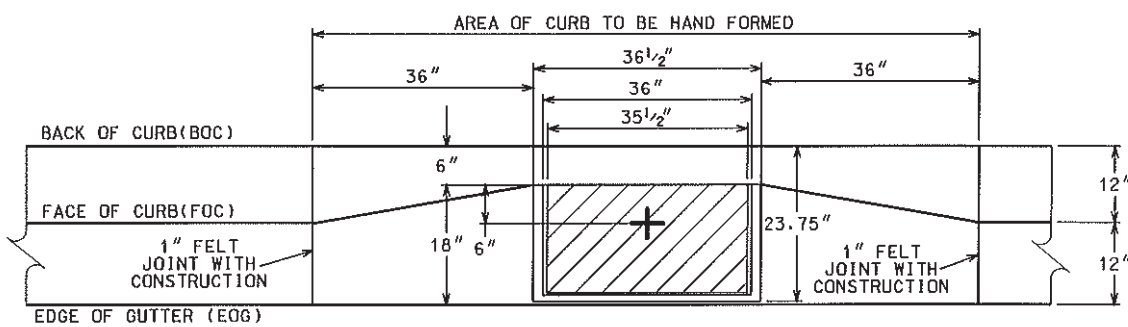
SHEET
CD28



TYPE "A" CURB AND GUTTER
PLAN VIEW

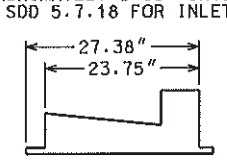


TYPE "B" CURB AND GUTTER
PLAN VIEW



NOTE:
CASTING FLANGE (NOT SHOWN) PROTRUDES APPROXIMATELY 3.63" INTO THE PAVEMENT. SEE SDD 5.7.18 FOR INLET FRAME DETAILS.

TYPE "H" CURB AND GUTTER
PLAN VIEW



INLET CASTING
SIDE VIEW

+ = CENTER OF STRUCTURE (STATION AND OFFSET AS INDICATED ON THE STORM SCHEDULE)

DRAWING NOT TO SCALE

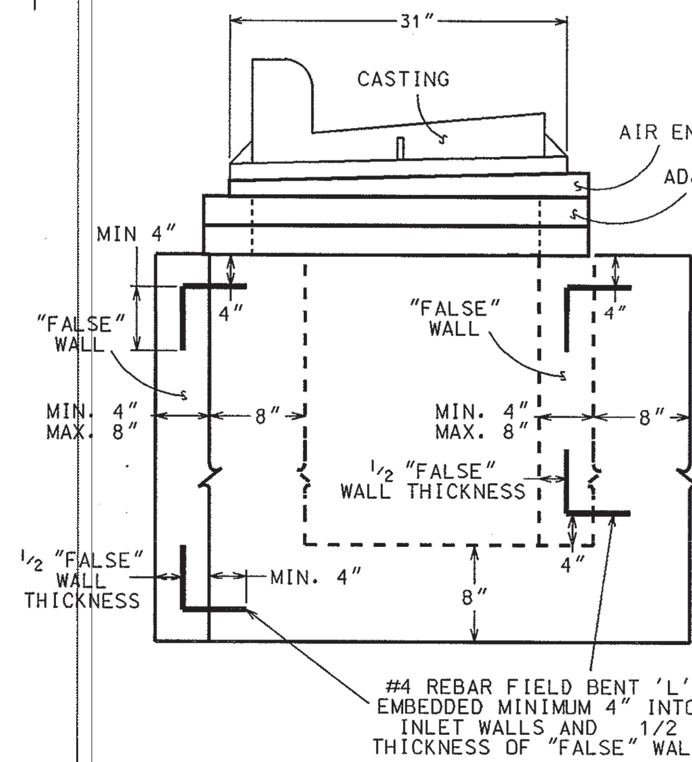
2006

CITY OF MADISON
ENGINEERING DIVISION

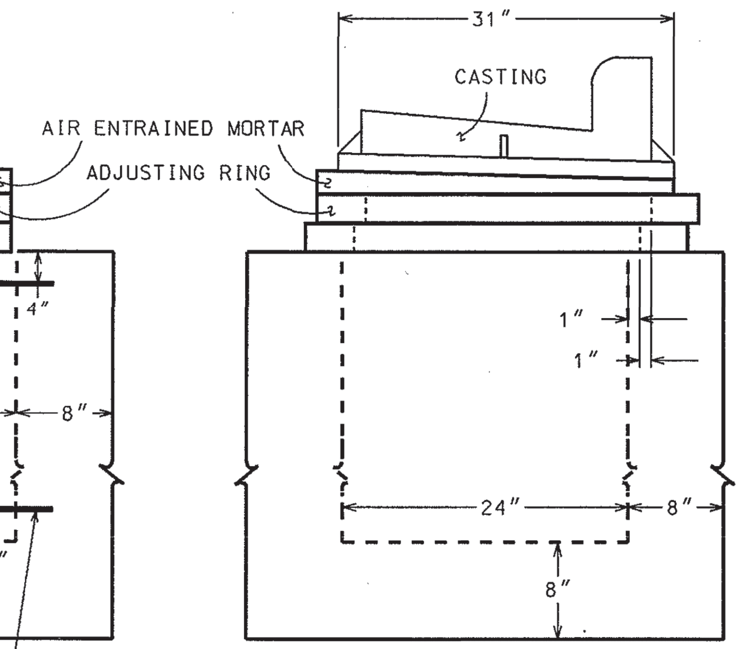
H INLET LOCATIONS IN DIFFERENT CURB TYPES

STANDARD DETAIL DRAWING 5.7.27

5.7.27



OFFSET USING FALSE WALL
INLET SIDE VIEW



OFFSET USING ADJUSTING RINGS
INLET SIDE VIEW

NOTE:

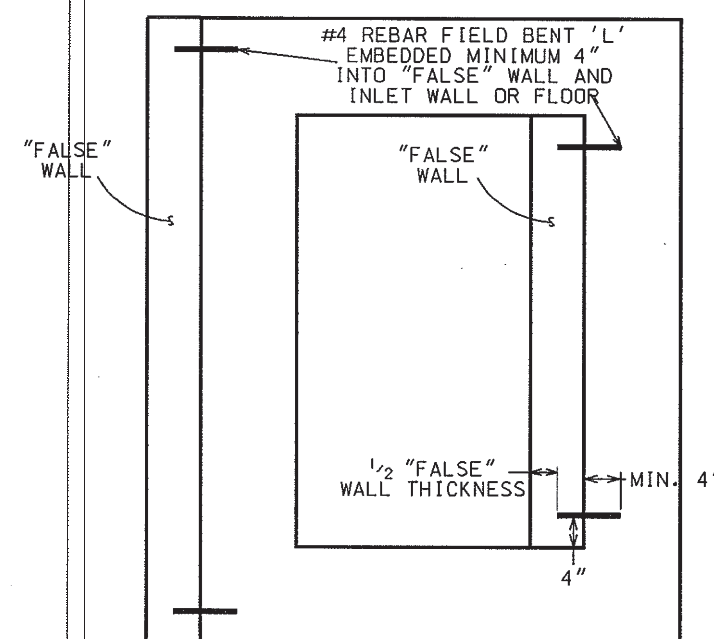
TO INSURE THE INLET CASTING IS ALIGNED CORRECTLY WITH THE CURB AND GUTTER, AN OFFSET OF THE INLET CASTING MAY BE REQUIRED. THE ACCEPTABLE INLET CASTING OFFSETS ARE SHOWN AND THE GUIDELINES ARE AS FOLLOWS:

(1) IF THE ADJUSTMENT REQUIRED IS LESS THAN TWO (2) INCHES, THIS CAN BE OBTAINED BY TWO ONE (1) INCH SHIFTS OF THE ADJUSTING RINGS A MAXIMUM OF ONE (1) INCH EACH AND/OR A ONE (1) INCH SHIFT OF THE CASTING.

(2) IF THE ADJUSTMENT REQUIRED IS GREATER THAN TWO (2) INCHES AND LESS THAN FOUR (4) INCHES, THE INLET CASTING OFFSET SHALL BE OBTAINED BY THE CONSTRUCTION OF ONE FOUR (4) INCH THICK "FALSE" WALL ADJACENT TO THE INLET WALL THAT PROVIDES FULL SUPPORT OF THE CASTING. THE PLACEMENT AND ANCHORING SHALL BE CONSTRUCTED IN THE MANNER SHOWN.

(3) IF THE ADJUSTMENT REQUIRED IS GREATER THAN FOUR (4) INCHES AND LESS THAT EIGHT (8) INCHES, THE INLET CASTING OFFSET SHALL BE OBTAINED BY THE CONSTRUCTION OF TWO FALSE WALLS WITH EQUAL WALL THICKNESSES VARYING FROM FOUR (4) TO EIGHT (8) INCHES DEPENDING ON THE OFFSET REQUIRED. THE PLACEMENT AND ANCHORING SHALL BE CONSTRUCTED IN THE MANNER SHOWN.

(4) IF THE ADJUSTMENT REQUIRED IS GREATER THAN EIGHT (8) INCHES, THE INLET SHALL BE REPOSITIONED OR RECONSTRUCTED TO REDUCE THE OFFSET.



OFFSET USING FALSE WALL
INLET TOP VIEW

THESE SPECIFICATIONS ARE APPLICABLE FOR BOTH POURED-IN-PLACE AND PRECAST INLETS. THE DETAIL SHOWS A POURED-IN-PLACE INLET. A PRECAST INLET WOULD ONLY DIFFER WITH A WALL THICKNESS OF 5".

2004

CITY OF MADISON
ENGINEERING DIVISION

INLET CASTING OFFSET CRITERIA FOR H INLETS

STANDARD DETAIL DRAWING 5.7.29

5.7.29

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

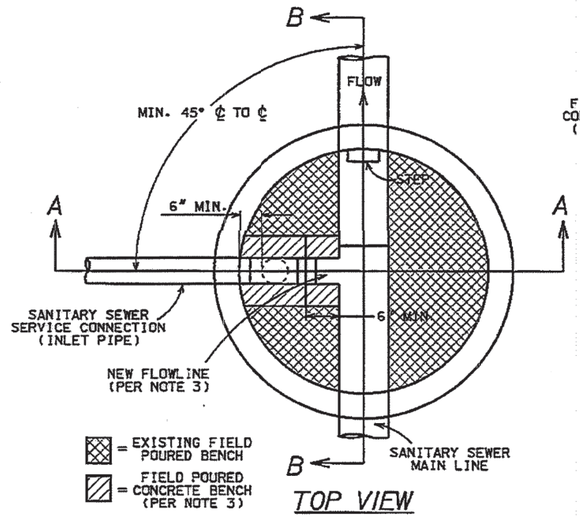
MARK	DATE	DESCRIPTION
REVISIONS		

SEH FILE NO.	129083
PROJECT NO.	53W10434
ISSUE DATE	NOVEMBER 11, 2016
DESIGNED BY	JJB
DRAWN BY	JJB/SGM

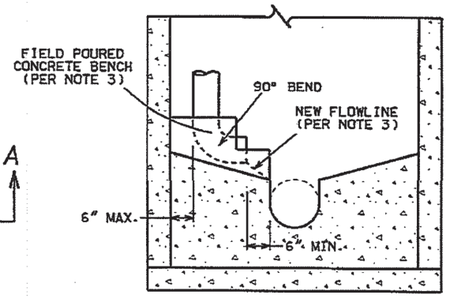
SHEET TITLE
CIVIL DETAILS

SHEET
CD29

5.7.30



TOP VIEW



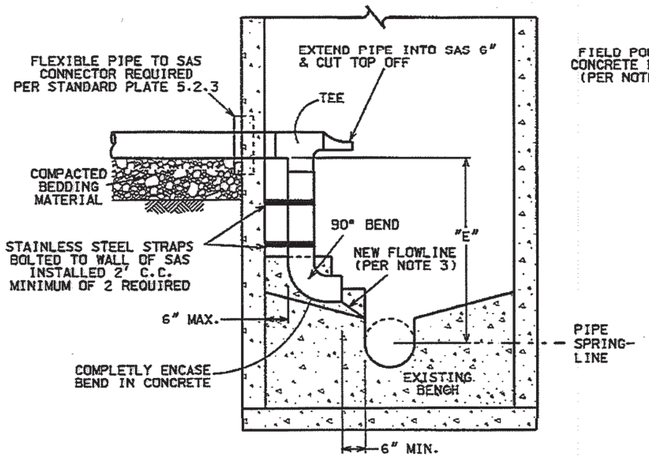
SIDE VIEW
FIELD POURED
CONCRETE BENCH

NOTES:

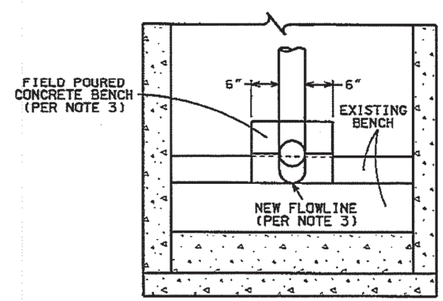
1) INSIDE DROP INLETS SHALL BE USED ONLY WHERE SITE CONDITIONS MAKE AN OUTSIDE DROP CONNECTION INFEASIBLE TO CONSTRUCT. THIS DETERMINATION SHALL BE MADE BY THE ENGINEER IN THE FIELD. THE CONTRACTOR SHALL OBTAIN APPROVAL FOR INSTALLATION OF THE INSIDE DROP INLET FROM THE ENGINEER PRIOR TO CONSTRUCTION.

2) DROP INLET SHALL BE BUILT WHEN "E" IS GREATER THEN 24" AND THE INLET PIPE DIAMETER IS 6" OR LESS. INLET PIPES GREATER THAN 6" SHALL HAVE AN OUTSIDE DROP CONNECTION PER STANDARD DETAIL DRAWING 5.7.2 "E" SHALL BE MEASURED FROM THE INVERT OF THE INCOMING PIPE TO THE SPRINGLINE OF THE OUTGOING SEWER.

3) ENCASE INLET PIPE IN CONCRETE FROM THE EXISTING BENCH TO FIRST JUINT ABOVE THE 90° BEND. FORM NEW SMOOTH FLOWLINE FROM PIPE END TO MAIN CHANNEL. ROUGH BRUSH FINISH ALL OTHER SURFACES OF THE NEW CONCRETE ENCASEMENT.



SECTION A-A



SECTION B-B

DRAWING NOT TO SCALE

2010

CITY OF MADISON
ENGINEERING DIVISION

INSIDE DROP FOR SANITARY LATERAL

STANDARD DETAIL DRAWING 5.7.30

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Madison Water Utility

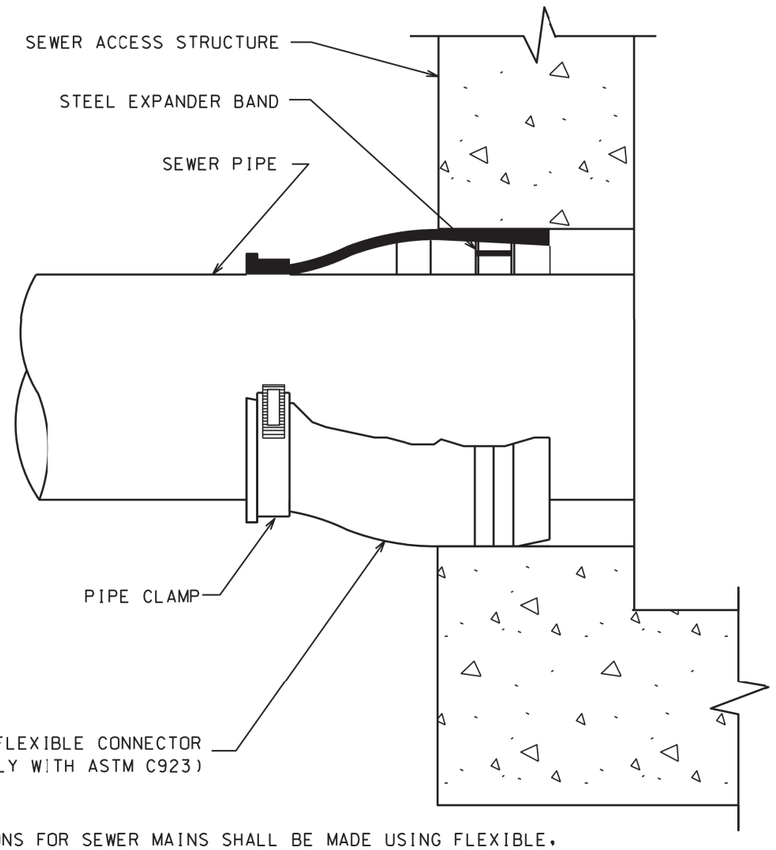
UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM

SHEET TITLE
CIVIL DETAILS

SHEET
CD30



NOTES:

1. S.A.S. CONNECTIONS FOR SEWER MAINS SHALL BE MADE USING FLEXIBLE, WATERTIGHT CONNECTIONS SUCH AS KOR-N-SEAL I OR APPROVED EQUAL, UNLESS DIRECTED OTHERWISE BY ENGINEER.

2. ALL STAINLESS STEEL ELEMENTS OF CONNECTOR SHALL BE TOTALLY NON-MAGNETIC SERIES 304 STAINLESS, EXCLUDING THE WORM SCREW FOR TIGHTENING THE STEEL BAND AROUND THE PIPE WHICH SHALL BE SERIES 305 STAINLESS. THE WORM SCREW FOR TIGHTENING THE STEEL BAND SHALL BE TORQUED BY A BREAK-AWAY TORQUE WRENCH AVAILABLE FOR THE PRECAST S.A.S SUPPLIER AND SET FOR 60 - 70 INCH/LBS.

3. THE CONNECTOR SHALL BE INSTALLED IN THE S.A.S. WALL BY ACTIVATING THE EXPANDING MECHANISM IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE CONNECTOR MANUFACTURER.

4. THE CONNECTOR SHALL BE OF A SIZE SPECIFICALLY DESIGNED FOR THE PIPE MATERIAL AND SIZE BEING UTILIZED ON THE PROJECT.

5. ALL COSTS SHALL BE CONSIDERED INCIDENTAL TO THE S.A.S. AND/OR PIPE. THE ENGINEER RESERVES THE RIGHT TO REQUIRE A "CONCRETE ENCASEMENT" CONNECTION AT NO ADDITIONAL EXPENSE IN THE EVENT OF DESIGN CHANGE.

6. FLEXIBLE, WATERTIGHT CONNECTIONS SHALL ALSO BE USED AS REQUIRED FOR STORM SEWER CONNECTIONS.

2016

CITY OF MADISON
ENGINEERING DIVISION

FLEXIBLE PIPE TO S.A.S. CONNECTOR

STANDARD DETAIL DRAWING 5.7.31

6818 ODANA RD, SUITE 200
MADISON, WI 53719-1137
PHONE: 608.620.6199
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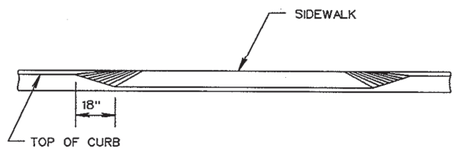
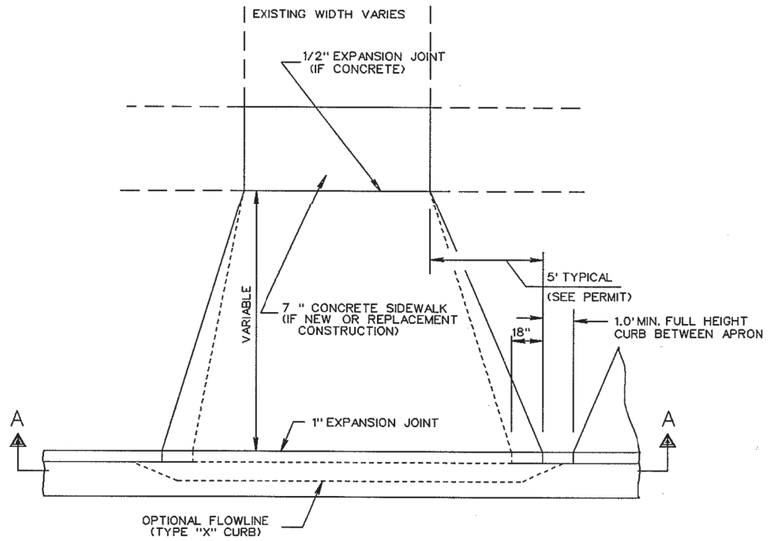
SHEET
CD31

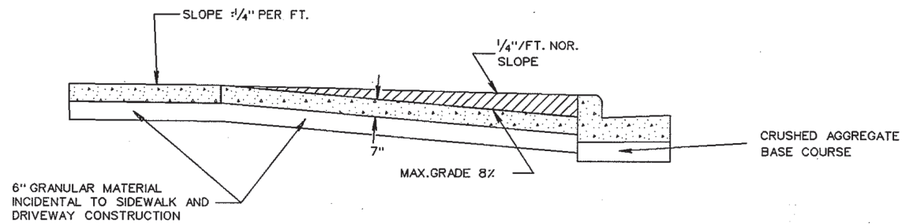
COMMERCIAL DRIVEWAY DETAIL



SECTION A-A



PLAN



PROFILE

2004

CITY OF MADISON
ENGINEERING DIVISION

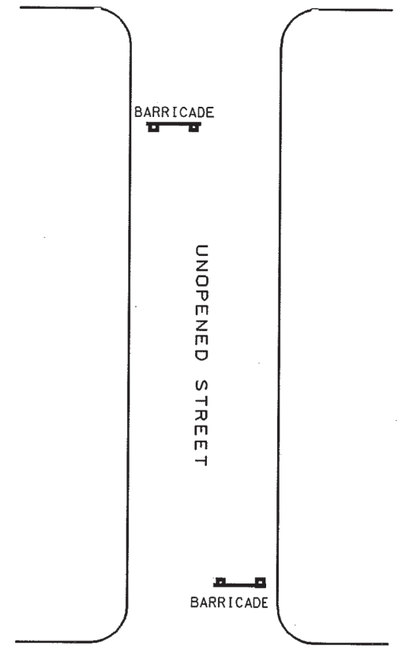
MADISON STANDARD COMMERCIAL DRIVE DETAILS

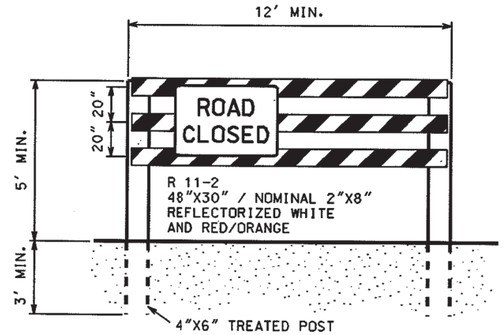
STANDARD DETAIL DRAWING 3.09

A TYPE III BARRICADE WITH SIGN ATTACHED IS REQUIRED FOR THESE CONDITIONS AND SHALL BE INSTALLED ON STREETS WHERE LARGE TRAFFIC VOLUMES EXIST OR A SAFETY HAZARD IS PRESENT. I.E., DROP IN GRADE IN EXCESS OF 12" FROM THE PAVEMENT SURFACE TO THE GROUND OR A PILE OF DEBRIS AT THE END OF THE STREET.

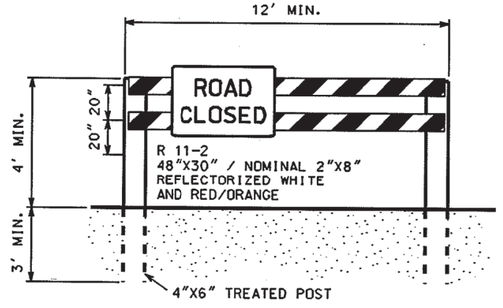
A TYPE III A BARRICADE WITH SIGN ATTACHED IS REQUIRED TO BE INSTALLED BY THE DEVELOPER RESPONSIBLE ON ALL STREETS WHICH HAVE NOT BEEN ACCEPTED BY THE CITY OF MADISON.

A PORTABLE BARRICADE OF THE REQUIRED TYPE MAY BE USED ON STREETS THAT WILL BE OPENED WITHIN 30 DAYS. A PERMANENT BARRICADE WILL BE USED ON ALL OTHER PROPOSED STREETS.





TYPE III BARRICADE



TYPE III A BARRICADE

NOTE:
EACH BARRICADE SHALL HAVE ALTERNATE REFLECTORIZED WHITE AND RED/ORANGE STRIPES 4" TO 6" WIDE AND PLACED AT A 45 DEGREE ANGLE. THE ENTIRE AREA OF WHITE AND RED/ORANGE SHALL BE REFLECTORIZED WITH A SMOOTH, SEALED OUTER SURFACE (3M "SCOTCHLITE" OR BETTER) THAT WILL DISPLAY THE SAME APPROXIMATE SIZE, SHAPE AND COLOR DAY AND NIGHT. FOR FURTHER INFORMATION CALL CITY TRAFFIC ENGINEERING AT 266-4961.

2004

CITY OF MADISON
TRAFFIC ENGINEERING DIVISION

STREET BARRICADE DETAILS

STANDARD DETAIL DRAWING 6.29

6808 ODANA RD, SUITE 200
MADISON, WI 53719-1137
PHONE: 608.600.6199
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WI TOLL FREE: 800.829.3565
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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

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DRAWN BY JJB/SGM
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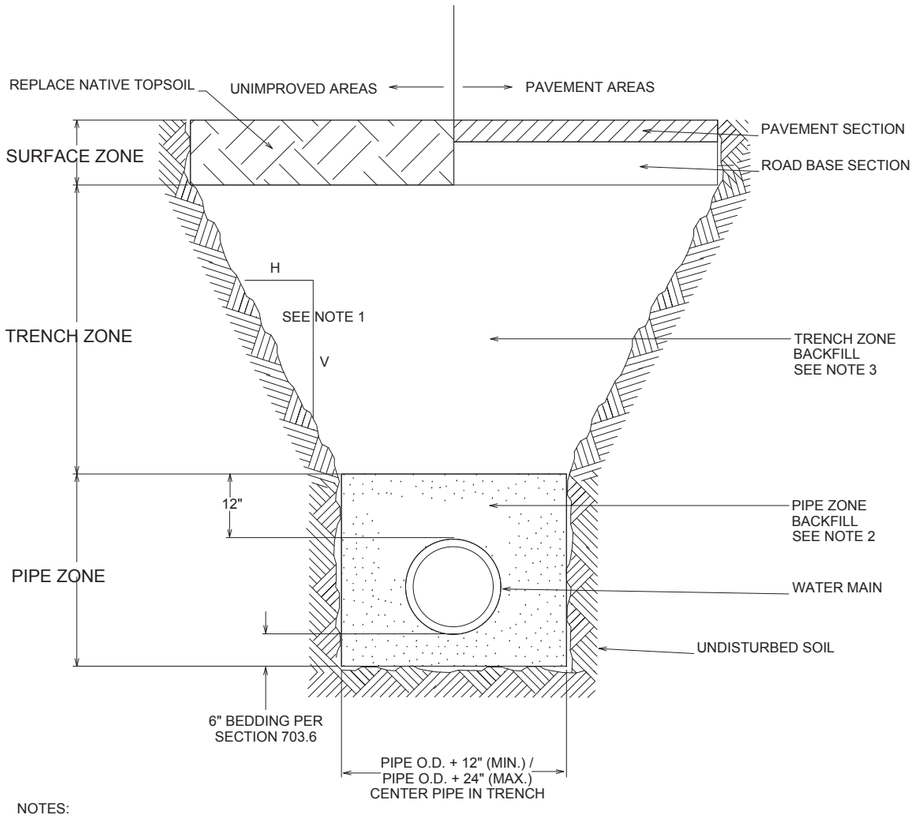
SHEET TITLE: CIVIL DETAILS

SHEET
CD32



NOTES:

1) ALL EXCAVATION SHALL BE IN ACCORDANCE WITH THE WISCONSIN ADMINISTRATIVE CODE FOR "TRENCH EXCAVATION AND TUNNEL CONSTRUCTION" AND ANY ADDITIONAL REQUIREMENTS INCLUDING IN THE CONTRACT DOCUMENTS.

2) BACKFILL OPERATIONS SHALL COMPLY WITH SECTIONS 703.6 AND 202.2(B) OF THE STANDARD SPECIFICATIONS.

3) THE PIPE ZONE BEDDING MATERIAL SHALL CONSIST OF SELECT FILL SAND, LIMESTONE SCREENINGS, CLEAR STONE, OR WASHED GRAVEL.

4) SEE SECTION 703.6.1 FOR BACKFILL/COMPACTION REQUIREMENTS OF BEDDING/COVER MATERIAL IN THE PIPE ZONE.

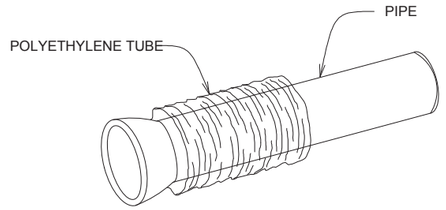
5) TRENCH ZONE COMPACTION REQUIREMENTS:
-- ALL COMPACTION OPERATIONS SHALL COMPLY WITH SECTION 703.6.3
-- DENSITY REQUIREMENTS:
1. FROM 2-FEET OVER THE PIPE TO WITHIN 3-FEET OF THE SUBGRADE: A MINIMUM OF 90% OF MAXIMUM DENSITY.
2. WITHIN 3-FEET OF THE BOTTOM OF SUBGRADE: A MINIMUM OF 95% OF MAXIMUM DENSITY.

CITY OF MADISON WATER UTILITY	NOT TO SCALE	TYPICAL WATER PIPE TRENCH

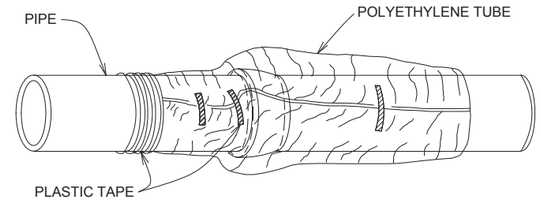
City of Madison Standard Specifications for Public Works Construction

FIELD INSTALLATION-POLYETHYLENE WRAP

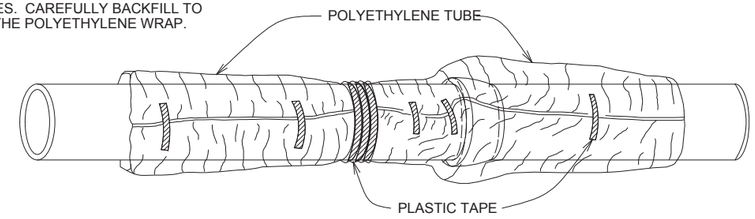
STEP-1
CLEAN SURFACE OF PIPE. CUT POLYETHYLENE TWO FEET LONGER THAN THE PIPE (8 MIL MIN.). PLACE TUBE OF POLYETHYLENE MATERIAL AROUND PIPE PRIOR TO LOWERING PIPE INTO TRENCH. DIG BELL HOLES AT JOINTS, LOWER PIPE.



STEP-2
LIFT ENOUGH TO PULL THE TUBE OVER THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH THREE CIRCUMFERENTIAL TURNS OF TWO-INCH WIDE PLASTIC TAPE TO HOLD PLASTIC TUBE AROUND SPIGOT END.

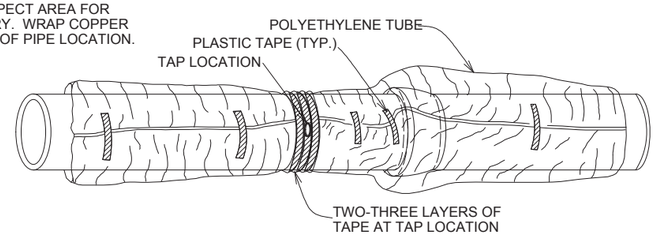


STEP-3
ADJACENT TUBE OVERLAPS FIRST TUBE AND IS SECURED WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE WILL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED INTO AN OVERLAP ON TOP OF THE PIPE AND HELD IN PLACE BY MEANS OF PIECES OF THE PLASTIC TAPE AT APPROX. THREE FOOT INTERVALS. REPAIR ANY TEARS WITH TAPE OR SECURED POLYWRAP PATCHES. CAREFULLY BACKFILL TO AVOID DAMAGING THE POLYETHYLENE WRAP.



TAPPING POLYETHYLENE WRAP

STEP-1
WRAP TWO OR THREE LAYERS OF TAPE COMPLETELY AROUND PIPE WHERE TAPPING MACHINE WILL BE PLACED. MOUNT TAPPING MACHINE ON TAPED AREA AND TAP DIRECTLY THROUGH THE TAPE AND POLYETHYLENE WRAP. INSTALL CORPORATION STOP. INSPECT AREA FOR DAMAGE AND REPAIR IF NECESSARY. WRAP COPPER SERVICE LINE WITHIN THREE FEET OF PIPE LOCATION.



CITY OF MADISON WATER UTILITY	NOT TO SCALE	FIELD INSTALLATION POLYETHYLENE WRAP / TAPPING POLYETHYLENE WRAP

City of Madison Standard Specifications for Public Works Construction

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www.sehinc.com

Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

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		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY JJB
DRAWN BY JJB/SGM

SHEET TITLE: CIVIL DETAILS

SHEET CD33

PLOTTED: 11-14-2016 10:04 AM
PLOT SCALE: 1:2
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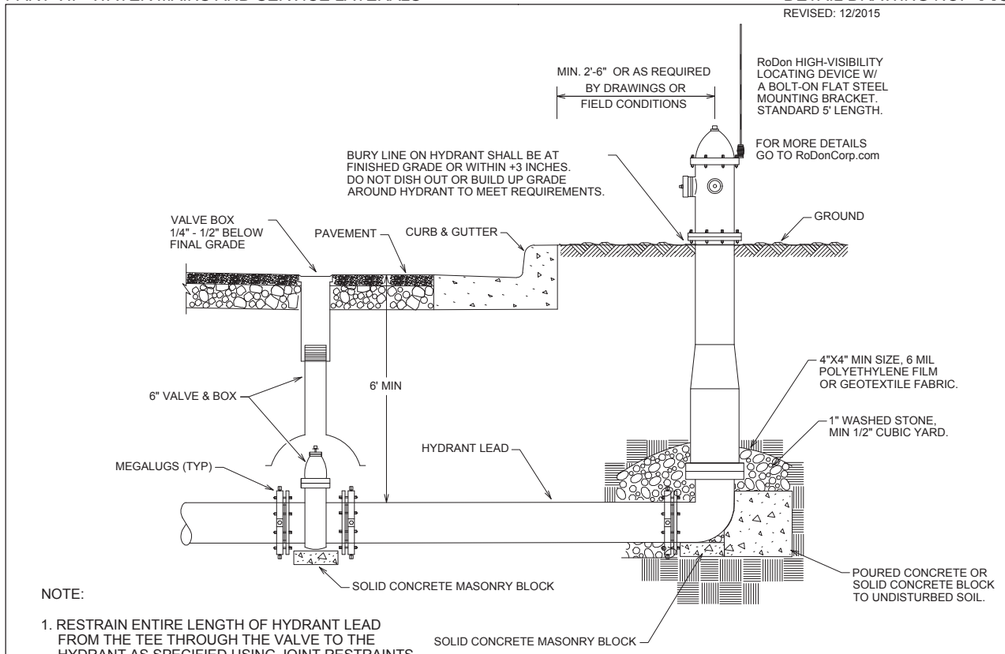
SAVED: 11-9-2016 4:09 PM USER: JOSH BOHNERT

PART VII - WATER MAINS AND SERVICE LATERALS

DETAIL DRAWING NO. **7.04**

REVISED: 12/2015



NOTE:

1. RESTRAIN ENTIRE LENGTH OF HYDRANT LEAD FROM THE TEE THROUGH THE VALVE TO THE HYDRANT AS SPECIFIED USING JOINT RESTRAINTS PER SECTION 703.10

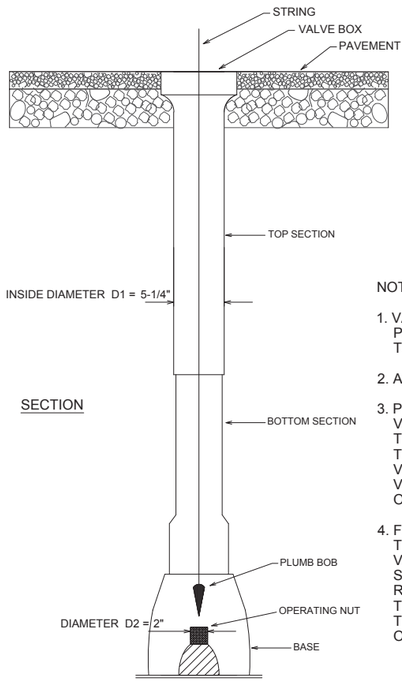
CITY OF MADISON WATER UTILITY	NOT TO SCALE	TYPICAL HYDRANT INSTALLATION

City of Madison Standard Specifications for Public Works Construction

PART VII - WATER MAINS AND SERVICE LATERALS

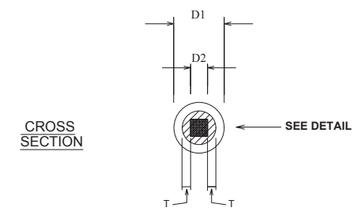
DETAIL DRAWING NO. **7.06**

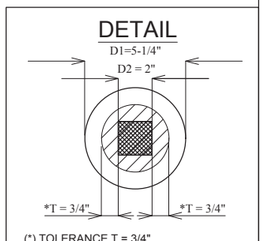
REVISED: 12/2015



NOTES:

1. VALVE BOX SHALL BE LOCATED PLUMB AND CENTERED WITH RESPECT TO THE VALVE OPERATING NUT.
2. ALLOWABLE TOLERANCE SHALL BE 3/4"
3. PLUMBNESS AND ALIGNMENT SHALL BE VERIFIED WITH A PLUMB BOB, LOCATING THE VALVE NUT WITHIN THE ALLOWABLE TOLERANCE, AND CONFIRMING THAT THE VALVE IS OPERATIONAL WITHOUT THE VALVE KEY TOUCHING THE INSIDE EDGE OF THE VALVE BOX.
4. FOR STREETS WITH SLOPE GREATER THAN 3% THAT DOES NOT ALLOW EASY PLUMBNESS VERIFICATION, THE VALVE BOX STRAIGHTNESS SHALL BE VISUALLY ASSESSED VERIFYING ITS RELATIVE CENTERED POSITION, CONFIRMING THAT THE VALVE IS OPERATIONAL WITHOUT THE VALVE KEY TOUCHING THE INSIDE EDGE OF THE VALVE BOX AND RESTRICTING ITS USE.





CITY OF MADISON WATER UTILITY	NOT TO SCALE	WATER VALVE BOX ALIGNMENT

City of Madison Standard Specifications for Public Works Construction

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

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SHEET TITLE
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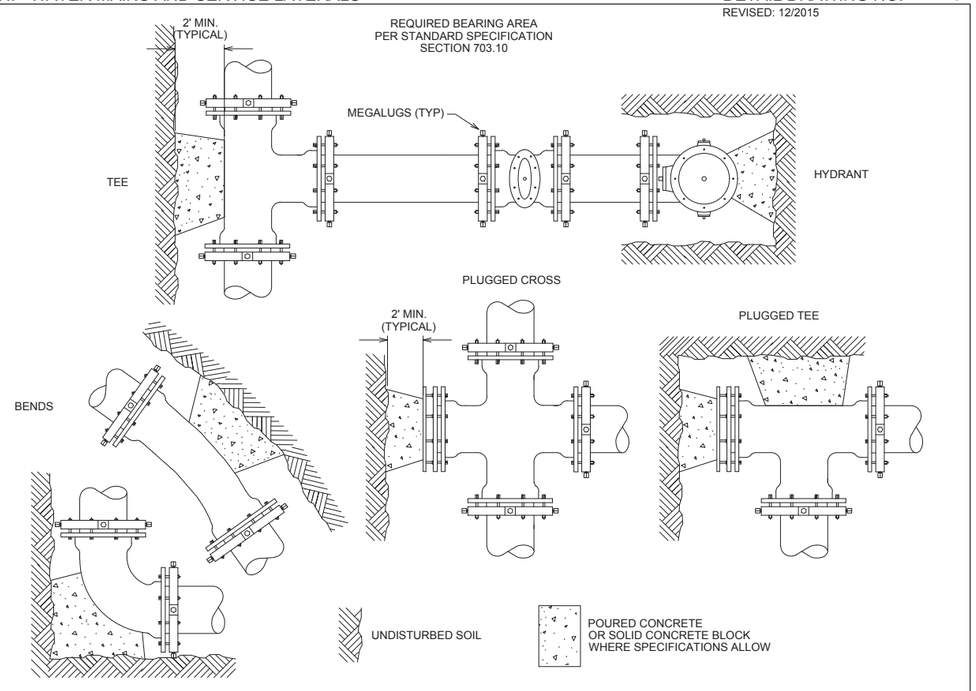
CD34

DETAIL DRAWING NO. **7.13**

REVISED: 12/2015



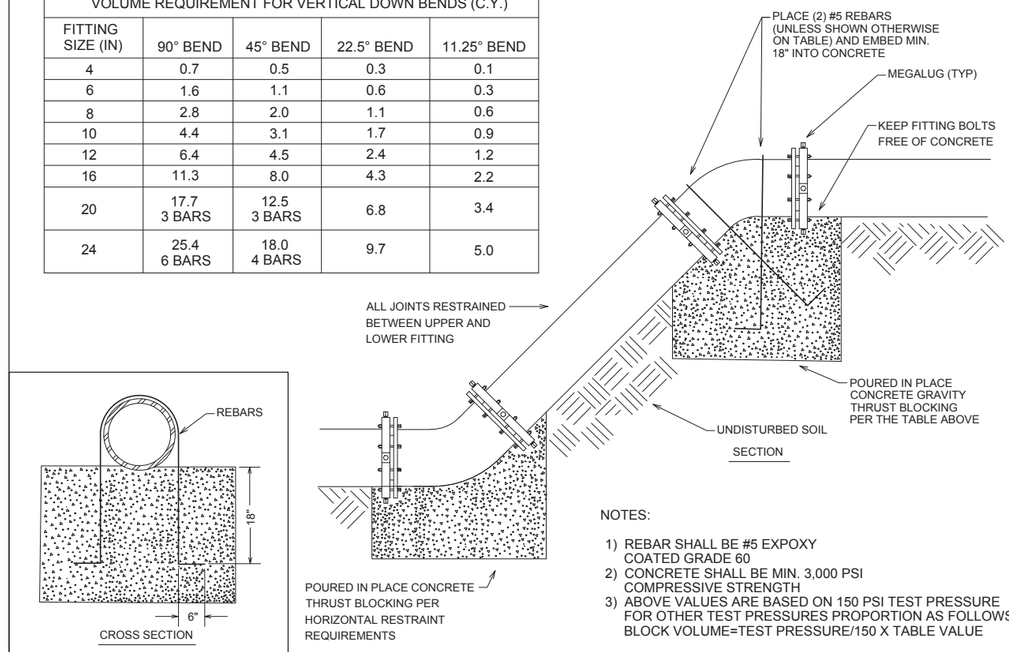
CITY OF MADISON WATER UTILITY	NOT TO SCALE	STANDARD CONCRETE BLOCK THRUST RESTRAINT

City of Madison Standard Specifications for Public Works Construction

DETAIL DRAWING NO. **7.14**

REVISED: 12/2015

VOLUME REQUIREMENT FOR VERTICAL DOWN BENDS (C.Y.)				
FITTING SIZE (IN)	90° BEND	45° BEND	22.5° BEND	11.25° BEND
4	0.7	0.5	0.3	0.1
6	1.6	1.1	0.6	0.3
8	2.8	2.0	1.1	0.6
10	4.4	3.1	1.7	0.9
12	6.4	4.5	2.4	1.2
16	11.3	8.0	4.3	2.2
20	17.7 3 BARS	12.5 3 BARS	6.8	3.4
24	25.4 6 BARS	18.0 4 BARS	9.7	5.0



NOTES:

1) REBAR SHALL BE #5 EXPOXY COATED GRADE 60
2) CONCRETE SHALL BE MIN. 3,000 PSI COMPRESSIVE STRENGTH
3) ABOVE VALUES ARE BASED ON 150 PSI TEST PRESSURE FOR OTHER TEST PRESSURES PROPORTION AS FOLLOWS: BLOCK VOLUME=TEST PRESSURE/150 X TABLE VALUE

CITY OF MADISON WATER UTILITY	NOT TO SCALE	GRAVITY BLOCK THRUST RESTRAINT FOR VERTICAL BENDS

City of Madison Standard Specifications for Public Works Construction

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SHEET TITLE
CIVIL DETAILS

SHEET
CD35

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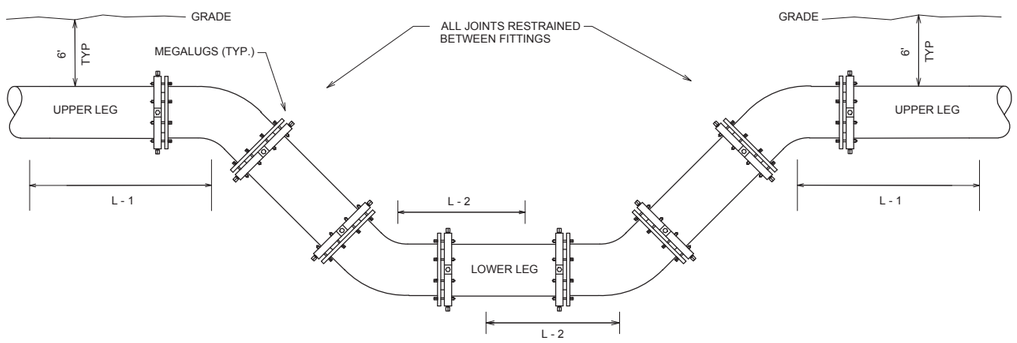
DETAIL DRAWING NO. **7.16**

REVISED: 12/2015



L - 1: RESTRAINED JOINT LENGTH
UPPER LEG OF VERTICAL BEND

L - 2: RESTRAINED JOINT LENGTH
LOWER LEG OF VERTICAL BEND

REFER TO DETAIL F/CD1
FOR INSULATION REQUIREMENTS

	90° BEND		45° BEND		22.5° BEND		11.25° BEND	
FITTING SIZE (IN)	L - 1 (FT)	L - 2 (FT)	L - 1 (FT)	L - 2 (FT)	L - 1 (FT)	L - 2 (FT)	L - 1 (FT)	L - 2 (FT)
4	34	30	16	3	8	2	4	1
6	47	43	21	4	11	2	6	1
8	60	56	27	5	13	3	7	2
10	72	68	31	6	16	3	8	2
12	84	80	37	7	18	4	9	2
16	108	104	46	10	23	5	12	3
20	132	128	56	12	28	6	14	3
24	154	150	66	13	32	7	16	4

NOTES:
SOURCE: Adapted from the EBAA Iron Restraint Length Calculator, Version 6.3
Materials = Poly Wrapped Ductile Iron Pipe
Soil Type = GM (Silty Gravels, Gravel-Sand-Silt Mixtures)
Test Pressure = 150 PSI

Safety Factor = 1.5
Trench Type = 4
High Side Depth = 6'
Low Side Depth = 8'

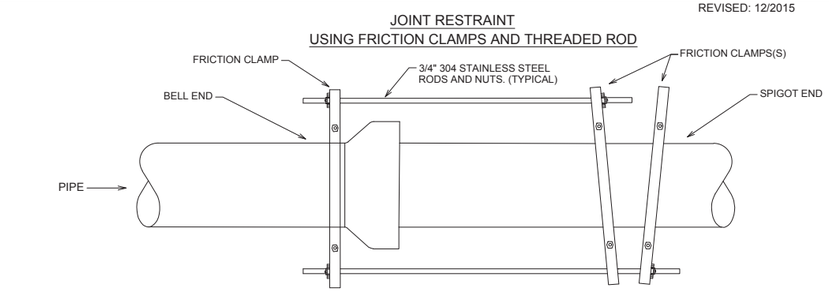
CITY OF MADISON WATER UTILITY	NOT TO SCALE	JOINT RESTRAINT LENGTHS FOR VERTICAL BENDS

City of Madison Standard Specifications for Public Works Construction

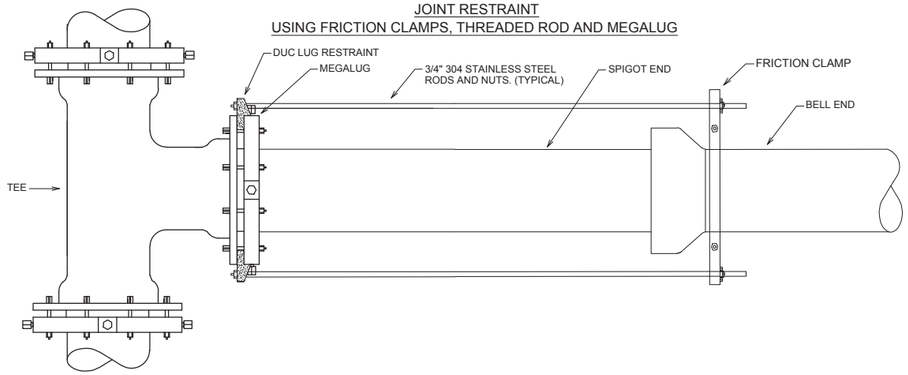
DETAIL DRAWING NO. **7.17**

REVISED: 12/2015

JOINT RESTRAINT
USING FRICTION CLAMPS AND THREADED ROD



JOINT RESTRAINT
USING FRICTION CLAMPS, THREADED ROD AND MEGALUG



CITY OF MADISON WATER UTILITY	NOT TO SCALE	THREADED ROD - JOINT RESTRAINT

City of Madison Standard Specifications for Public Works Construction

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SHEET TITLE
CIVIL DETAILS

SHEET
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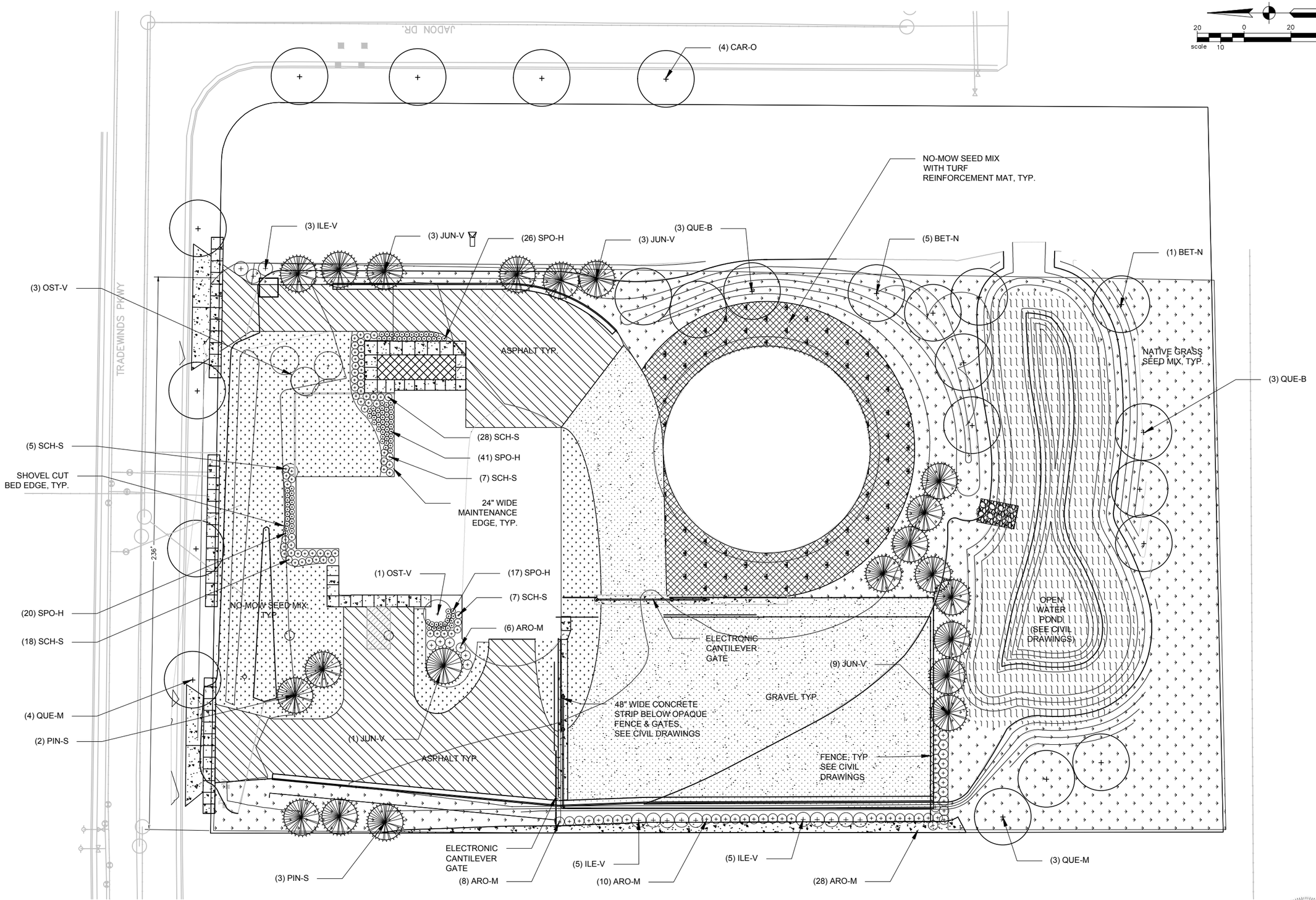

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USER: JON RUBLE

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DRAWN BY JRR
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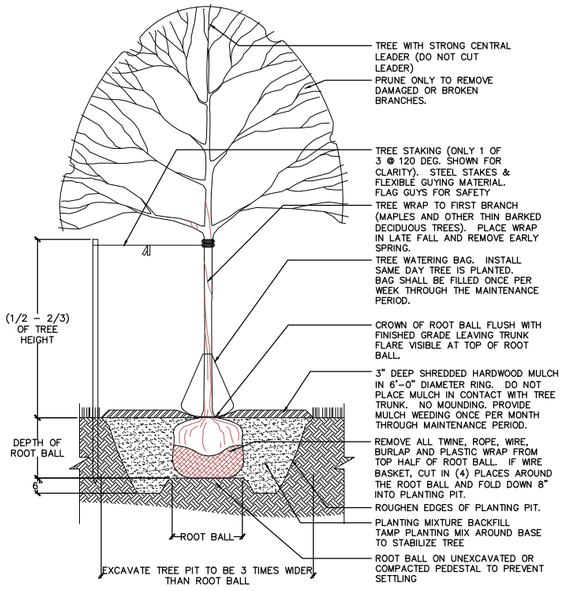
SHEET TITLE
LANDSCAPE PLAN

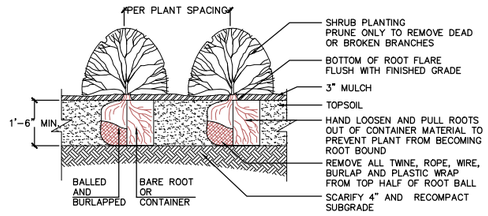
SHEET
L1

WISCONSIN
JON RUBLE
LA-685-14
VALPARAISO
IN
LANDSCAPE ARCHITECT

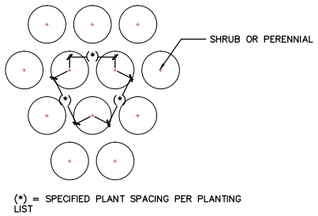
PLOTTED: 11-14-2016 2:10 PM
PLOT SCALE: 1:2



1 TREE PLANTING DETAIL
NOT TO SCALE



2 SHRUB PLANTING DETAIL
NOT TO SCALE



(*) = SPECIFIED PLANT SPACING PER PLANTING LIST

3 PLANT SPACING DETAIL
NOT TO SCALE

Lineal feet of frontage: 236
Total Developed Area (sq. ft.): 92,484

ORDIANCE 28.142 LANDSCAPE & SCREENING REQUIREMENTS

Plant Type	***Points***	***Minimum Size at Installation***
Overstory Deciduous Tree	35	2.5 inch caliper
Ornamental Tree	15	1.5 inch caliper
Evergreen Tree	15	3 feet tall
Shrub, deciduous	2	18" or 3 gallon container size
Shrub, evergreen	3	18" or 3 gallon container size
Ornamental Grasses	2	18" or 3 gallon container size
Ornamental/decorative fencing or wall	4 per 10 ln.ft.	n/a

Landscape Calculations & Distrubution	***Plant Req.***	***Req. Points***	
Required Landscape Units:	154	**771**	
Development Frontage Landscape	***Plant Req.***	***Points***	
Overstory Deciduous Trees:	8	275	
Ornamental Trees:	0	0	(2 may be used in the place of 1 Overstory Decidous Tree)
Evergreen Trees:	0	0	(2 may be used in the place of 1 Overstory Decidous Tree)
Shrub, deciduous	39	0	
Shrub, evergreen	0	0	
Ornamental Grasses	0	0	
Frontage Fencing (in lineal feet)	236	0	
		TOTAL POINTS:	***275***

Development Landscape	***Plants***	***Points***
Overstory Deciduous Trees:	23	805
Ornamental Trees:	3	45
Evergreen Trees:	21	315
Shrub, deciduous	62	124
Shrub, evergreen	0	0
Ornamental Grasses	169	338
TOTAL POINTS:		***1627***

4 ORDINANCE REQUIREMENTS

Madison Wellhead 31

Plant List

Quantity	Code	Botanical Name	Common Name	Size	Spacing
SHADE TREES					
6	BET-N	*Betula nigra*	River Birch	2.5" cal.	24'
4	CAR-O	*Carya ovata*	Shagbark Hickory	2.5" cal.	24'
6	QUE-B	*Quercus bicolor*	Swamp White Oak	2.5" cal.	24'
7	QUE-M	*Quercus macrocarpa*	Bur Oak	2.5" cal.	24'
23					
ORNAMENTAL TREES					
4	OST-V	*Ostrya virginiana*	Ironwood (Eastern Hop Hornbeam)	8' B&B	12'
4					
EVERGREEN TREES					
16	JUN-V	*Juniperus virginiana 'Burkii'*	Burkii Eastern Red Cedar	8' B&B	
5	PIN-S	*Pinus strobus*	Eastern White Pine	8' B&B	
21					
SHRUBS					
52	ARO-M	*Aronia melanocarpa 'Morton'*	Iroquois Beauty Chokeberry	#5	4'
10	ILE-V	*Ilex verticillata*	Winterberry	#5	6'
62					
ORNAMENTAL GRASSES					
65	SCH-S	*Schizachyrium scoparium 'Carousel'*	Carousel Little Bluestem	#3	30"
104	SPO-H	*Sporobolus heterolepis*	Prairie Dropseed	#3	24"
169					

5 PLANT SCHEDULE

PLANTING NOTES:

1. EXISTING SHRUBS FOUND ON SITE SHALL BE REMOVED. QUESTIONS REGARDING EXISTING PLANT MATERIAL SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT PRIOR TO REMOVAL.
2. THE LAYOUT OF ALL PLANTING BEDS AND INDIVIDUAL TREES SHALL BE STAKED BY THE CONTRACTOR IN ADVANCE OF INSTALLATION. FLAGGING, STAKES, OR PAINT MAY BE USED TO DELINEATE LOCATIONS AS SCALED FROM THE PLANS. THE LANDSCAPE ARCHITECT WILL REVIEW THESE LOCATIONS WITH THE CONTRACTOR AND MAKE MINOR ADJUSTMENTS AS NECESSARY. BED LAYOUT SHALL ALSO INCLUDE PERENNIAL GROUPINGS BY SPECIES.
3. THE CONTRACTOR IS RESPONSIBLE FOR INDEPENDENTLY DETERMINING THE PLANT MATERIAL QUANTITIES REQUIRED BY THE LANDSCAPE PLANS . REPORT ANY DISCREPANCIES TO THE LANDSCAPE ARCHITECT.
4. SALVAGE TOPSOIL FROM THE EARTHWORK AREAS AS APPROPRIATE AND/OR AS DIRECTED BY LANDSCAPE ARCHITECT AND STOCKPILE FOR REUSE IN LOCATION APPROVED BY OWNER
5. CONTRACTOR SHALL ENSURE THAT SOIL CONDITIONS AND COMPACTION ARE ADEQUATE TO ALLOW FOR PROPER DRAINAGE AROUND THE CONSTRUCTION SITE. UNDESIRABLE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT PRIOR TO BEGINNING OF WORK. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE PROPER SURFACE AND SUBSURFACE DRAINAGE IN ALL AREAS
6. ALL SEED & SOD AREAS SHALL RECEIVE A MINIMUM OF 6" DEPTH OF TOPSOIL
7. ALL PLANTING BEDS SHALL RECEIVE 18" DEPTH OF PREPARED SOIL .
8. PAINT OR STAKE LIMITS OF SEEDING FOR REVIEW BY LANDSCAPE ARCHITECT & OWNER PRIOR TO SEEDING.
9. NEW SEEDED AREAS TO BE TREATED WITH HERBICIDE TO KILL ALL EXISTING GROUNDCOVER. THERE SHALL BE A MINIMUM OF TWO (2) APPLICATIONS SEPARATED BY 10 DAYS. IF ALL EXISTING GROUNDCOVER VEGETATION IS NOT KILLED WITHIN 10 DAYS OF 2ND APPLICATION, A 3RD APPLICATION IS REQUIRED.
10. ALL DISTURBED AREAS OUTSIDE THE LIMITS OF WORK SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE OWNER.
11. ALL PLANTING BEDS SHALL HAVE A SHOVEL CUT EDGE, UNLESS OTHERWISE SPECIFIED.
12. ALL PLANTING BEDS AND PLANTED TREES SHALL BE MULCHED WITH 3" DEEP SHREDDED HARDWOOD MULCH PER PLANTING DETAILS. MULCH SHALL BE CONSIDERED INCIDENTAL TO PLANT MATERIALS
13. NO PLANT MATERIAL SUBSTITUTIONS WILL BE ACCEPTED UNLESS APPROVAL BY THE LANDSCAPE ARCHITECT. ALL PLANT MATERIAL AND SEED SHALL BE PROVIDED FROM A NURSERY (WITHIN 200 MILES) WITH A SIMILAR PLANT HARDINESS ZONE AS PROJECT LOCATION.
14. CONTRACTOR IS RESPONSIBLE FOR ON-GOING MAINTENANCE OF ALL NEWLY INSTALLED MATERIALS UNTIL TIME OF OWNER ACCEPTANCE. ANY ACTS OF VANDALISM OR DAMAGE WHICH MAY OCCUR PRIOR TO OWNER ACCEPTANCE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR
15. PROVIDE 1 YEAR WARRANTY ON ALL PLANT MATERIAL
16. LAWN SEED SHALL BE ESTABLISHED BY THE CONTRACTOR TO A DENSE, GREEN CONSISTENT LAWN VOID OF ANY BARE OR PATCHY AREAS LARGER THAN 3"X3"
17. SEED PRIOR TO OCT. 15. IF SEEDED AFTER OCT. 15, MAINTAIN AND ESTABLISH LAWN UNTIL SPRING REVIEW

WISCONSIN
JON RUBLE
LA-685-14
VALPARAISO
IN
LANDSCAPE ARCHITECT

6808 ODANA RD. SUITE 200
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PHONE: 608.620.6199
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www.sehinc.com

Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE: NOVEMBER 11, 2016
DESIGNED BY JRR
DRAWN BY JRR
Short Elliott Hendrickson, Inc. © (SEH)

SHEET TITLE
LANDSCAPE DETAILS

SHEET
L2

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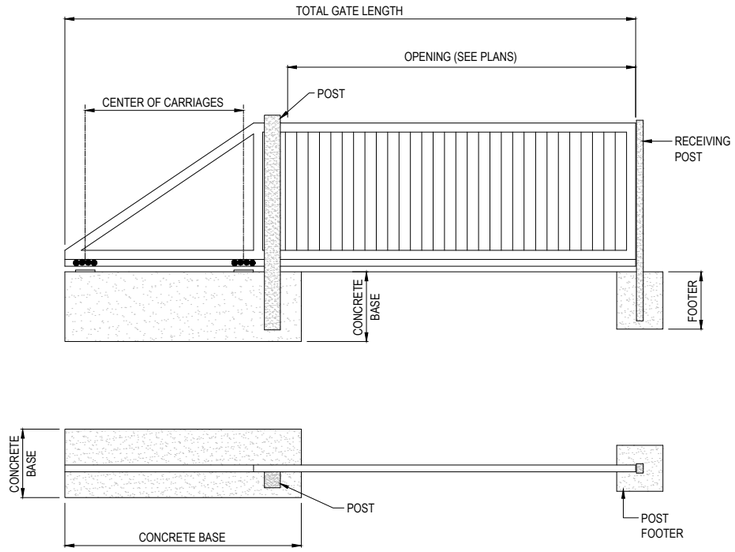
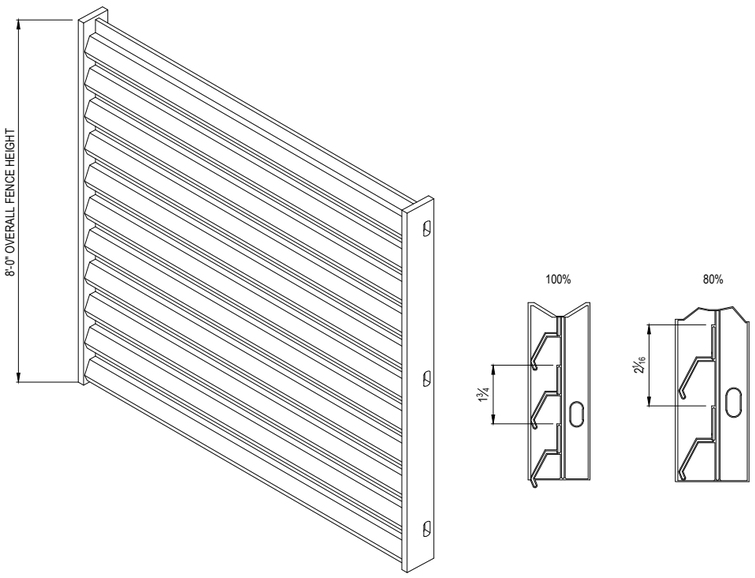


NOTES:
1. BASIS OF DESIGN FOR THE CANTILEVER GATE IS "ECLIPSE 80 MONORAIL GATE", AS PROVIDED BY AMETCO MANUFACTURING CORPORATION.
2. POST SPACING, FOUNDATION SIZING AND INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. ALL DIMENSIONS ARE CONSIDERED TRUE AND REFLECT MANUFACTURER'S SPECIFICATIONS.

1 CATILEVER GATE DETAIL
NOT TO SCALE



NOTES:
1. BASIS OF DESIGN FOR THE OPAQUE FENCE PANELS IS "ECLIPSE 80", AS PROVIDED BY AMETCO MANUFACTURING CORPORATION.
2. POST SPACING, FOUNDATION SIZING AND INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. ALL DIMENSIONS ARE CONSIDERED TRUE AND REFLECT MANUFACTURER'S SPECIFICATIONS.

2 OPAQUE FENCE DETAIL
NOT TO SCALE

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FAX: 888.908.8166
WI TOLL FREE: 800.472.2005
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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION

REVISIONS

SEH FILE NO. 129083
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SHEET TITLE
FENCING & GATE DETAILS

SHEET
L3

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REFERENCE STANDARDS

ACI	AMERICAN CONCRETE INSTITUTE
ADA	AMERICANS WITH DISABILITIES ACT
AGA	AMERICAN GAS ASSOCIATION
AIA	AMERICAN INSTITUTE OF ARCHITECTS
AWS	AMERICAN WELDING SOCIETY
AWI	ARCHITECTURAL WOODWORKING INSTITUTE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING REFRIGERATING, AND AIR CONDITIONING ENGINEERS
ASPE	AMERICAN SOCIETY OF PLUMBING ENGINEERS
ASSE	AMERICAN SOCIETY OF SANITARY ENGINEERS
AWWA	AMERICAN WATER WORKS ASSOCIATION
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS
CS	COMMERCIAL STANDARD
CSI	CONSTRUCTION SPECIFICATION INSTITUTE
CISPI	CAST IRON SOIL PIPE INSTITUTE
DNR	STATE OF WISCONSIN, DEPARTMENT OF NATURAL RESOURCES
DOT	STATE OF WISCONSIN, DEPARTMENT OF TRANSPORTATION
DOC	STATE OF WISCONSIN, DEPARTMENT OF COMMERCE
FS	FEDERAL SPECIFICATIONS
IGCC	INSULATING GLASS CERTIFICATION COUNCIL
MSS	MANUFACTURERS STANDARDIZATION SOCIETY
NBS	NATIONAL BUREAU OF STANDARDS
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NFPA	NATIONAL FOREST PRODUCTS ASSOCIATION
NPA	NATIONAL PARTICLEBOARD ASSOCIATION
NSF	NATIONAL SANITATION FOUNDATION
NSPI	NATIONAL SWIMMING POOL INSTITUTE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PCI	PRECAST/PRESTRESSED CONCRETE INSTITUTE
PDI	PLUMBING AND DRAINAGE INSTITUTE
SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
SIGMA	SEALED INSULATING GLASS MANUFACTURERS ASSOCIATION
SSHSC	STANDARD SPECIFICATION FOR HIGHWAY AND STRUCTURE CONSTRUCTION, WISCONSIN DOT, DIVISION OF HIGHWAYS
UL	UNDERWRITERS LABORATORIES
WCF	WATER CONDITIONING FOUNDATION

TRADE STANDARDS

A/E	ARCHITECT AND/OR ENGINEER
EC	ELECTRICAL CONTRACTOR
ELC	ELEVATOR CONTRACTOR
FPC	FIRE PROTECTION CONTRACTOR
FSC	FOOD SERVICE CONTRACTOR
GC	PRIME CONTRACTOR OR DESIGNATED CONTRACTOR OF HIS CHOICE
HC	HEATING CONTRACTOR
PC	PLUMBING CONTRACTOR
TCC	TEMPERATURE CONTROL CONTRACTOR

GENERAL STANDARDS

AFF	ABOVE FINISHED FLOOR
ALUM	ALUMINUM
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BLKHD	BULKHEAD
C/C	CENTER TO CENTER
C&G	CURB AND GUTTER
CJ	CONTROL JOINT
CL	CENTER LINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CONST JT	CONSTRUCTION JOINT
COL	COLUMN
CONC	CONCRETE
DIM	DIMENSION
DWG	DRAWING
EA	EACH
EFS	EXTERIOR FINISH SYSTEM
EL	ELEVATION
ELEC	ELECTRIC/ELECTRICAL
EMER	EMERGENCY
EQ	EQUAL
EQUIP	EQUIPMENT
EXST	EXISTING
EXP	EXPANSION
EXP BT	EXPANSION BOLT
EXP JT	EXPANSION JOINT
EXT	EXTERIOR
EXST GR	EXISTING GRADE
FE	FIRE EXTINGUISHER
FD	FLOOR DRAIN
FGL	FIBERGLASS
FT	FOOT/FEET
FTG	FOOTING
GL	GLASS
GL BLK	GLASS BLOCK
GLZ	GLAZING
GLZ CMU	GLAZED CONCRETE MASONRY UNIT
GR	GRADE/GRADING
GSB	GYPSUM SHEATHING BOARD
GWB	GYPSUM WALLBOARD
GYP	GYPSUM
GYP BD	GYPSUM BOARD
GYP PLAS	GYPSUM PLASTER
HDR	HEADER
HDWD	HARDWOOD
HDW	HARDWARE
HM	HOLLOW METAL
HMD	HOLLOW METAL DOOR
HMF	HOLLOW METAL FRAME
HT	HEIGHT
HTG	HEATING
HVAC	HEATING, VENTILATING, & AIR CONDITIONING

GENERAL STANDARDS

IN	INCHES
JAN CLO	JANITOR CLOSET
JST	JOIST
JT	JOINT
K	KIP
KD	KNOCKED DOWN
KIP FT	ONE THOUSAND FOOT POUNDS
KIT	KITCHEN
KLF	KIPS PER LINEAR FOOT
KO	KNOCKOUT
KOP	KNOCKOUT PANEL
KPL	KICK PLATE
KSF	KIPS PER SQUARE FOOT
KSI	KIPS PER SQUARE INCH
LAB	LABORATORY
LAM	LAMINATE/LAMINATED
LAU	LAUNDRY
LAV	LAVATORY
LBR	LUMBER
LBS	POUNDS
LD BRG	LOAD BEARING
LF	LINEAR FEET (FOOT)
LG	LENGTH, LONG
LH	LEFT HAND
LHR	LEFT HAND REVERSE
LIB	LIBRARY
LIN	LINEAR
LKR	LOCKER
LKR RM	LOCKER ROOM
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LNTL	LINTEL
LPT	LOW POINT
LR	LIVING ROOM
LT	LIGHT
LTG	LIGHTING
LT WT	LIGHTWEIGHT
LVR	LOUVER
LWC	LIGHTWEIGHT CONCRETE
MAINT	MAINTENANCE
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MBR	MASTER BEDROOM
MBW	MASONRY BEARING WALL
MCM	METAL COMPOSITE MATERIAL
MDO	MEDIUM DENSITY OVERLAY
MECH	MECHANICAL
MEMB	MEMBRANE
MEZZ	MEZZANINE
MFR	MANUFACTURER
MH	MANHOLE
MHGT	MOUNTING HEIGHT
MIN	MINIMUM
MIRR	MIRROR
MISC	MISCELLANEOUS
MJ	MOVEMENT JOINT
MKBD	MARKER BOARD
ML	METAL LATH
MLDG	MOLDING (MOULDING)
MLWK	MILLWORK
MO	MASONRY OPENING
MS	MACHINE SCREW
MTD	MOUNTED
MTG	MOUNTING
MTL	METAL
MTP	METAL TOILET PARTITION
MULL	MULLION
MWP	MEMBRANE WATERPROOFING
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NRC	NOISE REDUCTION COEFFICIENT
NTS	NOT TO SCALE
OFCI	OWNER FURNISHED-CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED-OWNER INSTALLED
O/O	OUT TO OUT
OF	OUTSIDE FACE
OA	OUTSIDE AIR
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFF	OFFICE
OPH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
OVHD	OVERHEAD
OZ	OUNCE
PAR	PARALLEL
PB	PUSHBUTTON
PBD	PARTICLEBOARD
PCF	POUNDS PER CUBIC FOOT
PCP	PORTLAND CEMENT PLASTER
PERIM	PERIMETER
PERP	PERPENDICULAR
PERF	PERFORATED
PG	PIPE GUARD
PI	POINT OF INTERSECTION
PIV	POST INDICATOR VALVE
PKWY	PARKWAY
PL	PLATE
PL	PROPERTY LINE
PL GL	PLATE GLASS
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLBG	PLUMBING
PLF	POUNDS PER LINEAR FOOT
PLYWD	PLYWOOD
PMFS	PRE-MOLDED FILLER STRIP
PNL	PANEL
POL	POLISHED
PP	POWER POLE
PR	PAIR
PREFAB	PREFABRICATED
PREFIN	PREFINISHED
PRKG	PARKING
PROJ	PROJECT
PROP	PROPERTY
PS CONC	PRESTRESSED CONCRETE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PNT	PAINT/POINT/POST TENSIONED/
PTD	PAPER TOWEL DISPENSER
PTN	PARTITION
QT	QUARRY TILE
QTB	QUARRY TILE BASE
QTF	QUARRY TILE FLOOR
QTY	QUANTITY

GENERAL STANDARDS

RB	RESILIENT BASE
RC	REINFORCED CONCRETE
RCVR	RECEIVER
RECPT	RECEPTACLE
RD	ROOF DRAIN
RD	ROAD
REBAR	REINFORCING STEEL BARS
REC	RECESSED
RECT	RECTANGULAR
REF	REFERENCE
REFR	REFRIGERATOR
REINF	REINFORCING/REINFORCEMENT
REM	REMOVABLE
REQD	REQUIRED
RESIL	RESILIENT
RET	RETURN
REV	REVISE/REVISION
RFG	ROOFING
RF	RESILIENT FLOORING
RH	RIGHT HAND
RHR	RIGHT HAND REVERSE
RLG	RAILING
RM	ROOM
RND	ROUND
RO	ROUGH OPENING
ROW	RIGHT OF WAY
RR	RAILROAD
RV	ROOF VENT
S	SOUTH
SA	SUPPLY AIR
SAFB	SOUND ATTENUATION FIRE BLANKET
SAN	SANITARY
SB	SPLASH BLOCK
SC	SOLID CORE
SCHED	SCHEDULE/SCHEDULED
SCJ	SLAB CONTROL JOINT
SCMU	SOLID CONCRETE MASONRY UNIT
SCT	STRUCTURAL CLAY TILE
SD	SOAP DISPENSER
SECT	SECTION
SFTWD	SOFTWOOD
SHR	SHOWER
SHT	SHEET
SHTHG	SHEATHING
SIM	SIMILAR
SJ	SCORED JOINT
SM	SHEET METAL
SND	SANITARY NAPKIN DISPENSER
SNR	SANITARY NAPKIN RECEPTOR
SPEC	SPECIFICATION
SPKLR	SPRINKLER
SPKR	SPEAKER
SQ	SQUARE
SQ FT	SQUARE FOOT (FEET)
SQ IN	SQUARE INCH
SQ YD	SQUARE YARD
SS	SERVICE SINK
SST	STAINLESS STEEL
ST	STREET
STAG	STAGGERED
STC	SOUND TRANSMISSION CLASSIFICATION
STD	STANDARD
STIF	STIFFENER
STIR	STIRRUP
STL	STEEL
STL JST	STEEL JOIST
STL LNTL	STEEL LINTEL
STL PL	STEEL PLATE
STOR	STORAGE
STRUCT	STRUCTURAL/STRUCTURE
SUSP	SUSPEND/SUSPENDED
SUSP CLG	SUSPENDED CEILING
SW	SIDEWALK
SW	SWITCH
SYMM	SYMMETRICAL
T	TREAD
T&B	TOP AND BOTTOM
TB	TOWEL BAR
TD	TOWEL DISPENSER
TD	TRENCH DRAIN
TDR	TOWEL DISPENSER/RECEPTACLE
TEL	TELEPHONE
TEMP	TEMPERATURE
TER	TERRAZZO
TFF	TOP OF FINISH FLOOR
T&G	TONGUE AND GROOVE
THRES	THRESHOLD
TMPD GL	TEMPERED GLASS
TOB	TOP OF BEAM
TOC	TOP OF CONCRETE
TOC	TOP OF CURB
TOF	TOP OF FOOTING
TOJ	TOP OF JOIST
TOPO	TOPOGRAPHY
TOS	TOP OF SLAB
TOS	TOP OF STEEL
TOW	TOP OF WALL
TP	TELEPHONE POLE
TPH	TOILET PAPER HOLDER
TRTD	TREATED
TV	TELEVISION
TYP	TYPICAL
UC	UNDERCUT
UF	UNDER FLOOR
UGND	UNDERGROUND
UH	UNIT HEATER
UNEX	UNEXCAVATED
UNFIN	UNFINISHED
UON	UNLESS OTHERWISE NOTED
UR	URINAL
UTIL	UTILITY
UV	UNIT VENTILATOR
VB	VINYL BASE
VIF	VERIFY IN FIELD
VR	VAPOR RETARDER
VNR	VENEER
VENT	VENTILATING
VERT	VERTICAL
W	WEST
W/O	WITHOUT
WBL	WOOD BLOCKING
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
WGL	WIRED GLASS
WH	WALL HYDRANT
WP	WEATHERPROOF

MATERIAL LEGEND

SECTION

- EARTH
- GRANULAR FILL
- GROUT, MORTAR AND PLASTER
- CONCRETE MASONRY UNITS
- BRICK
- STONE
- METAL
- WOOD (ROUGH)
- PLYWOOD
- INSULATION (LOOSE OR BATT)
- INSULATION (RIGID)

ELEVATION

- BRICK
- CONCRETE, PLASTER AND ACOUSTICAL CEILING TILE
- STONE

SYMBOLS LEGEND

SPECIFIC NOTES

- (XX) NEW NOTE
- (XX) DEMOLITION NOTE
- (X) WINDOW/IGU TYPE
- (XXXX) FINISH NOTE
- (XXX'-XX") CEILING HEIGHT NOTE

ROOM NAME AND NUMBER

ROOM NAME
RM. #

'OPENING' REFERENCE NUMBER

100A

PARTITION TYPE REFERENCE

XX / XX — NOTE: PARTITION TYPES DESIGNATED 'S' ARE TO EXTEND TO STRUCTURE ABOVE. EXAMPLE: XX/S

BUILDING SECTION REFERENCE

XX / XXXX — DETAIL NUMBER; XX / XXXX — DRAWING NUMBER

WALL SECTION REFERENCE

XX / XXXX — DETAIL NUMBER; DRAWING NUMBER

EXTERIOR ELEVATION REFERENCE

XX — DETAIL NUMBER; XXXX — DRAWING NUMBER

INTERIOR ELEVATION REFERENCE

XX — DETAIL NUMBER; XXXX — DRAWING NUMBER

INTERIOR ELEVATION REFERENCE (MULTIPLE VIEW)

XX / XXXX / XX — DETAIL NUMBER; XX — DRAWING NUMBER

DETAIL SECTION REFERENCE

XX / XXXX — DETAIL NUMBER; DRAWING NUMBER

DETAIL REFERENCE

XX / XXXX — DETAIL NUMBER; DRAWING NUMBER

EXIT ARROW SYMBOL

XX" — EXIT WIDTH; XXX — NUMBER OF OCCUPANTS

DIMENSIONS

3/4" — SLASH INDICATES DIMENSION TO FACE OR CENTERLINE OF OBJECT

SPOT ELEVATIONS ON PLANS

000'-00"

FLOOR ELEVATION REFERENCE

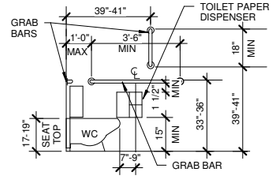
LOCATION
000'-0"

MOUNTING HEIGHTS

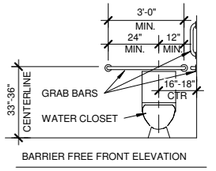
GENERAL NOTES:

1. SEE FLOOR PLANS/ENLARGED FLOOR PLANS FOR TOILET DESIGNATIONS AND LOCATIONS.
2. MOUNTING HEIGHT DRAWINGS BELOW ARE NOT TO SCALE.
3. SEE PLUMBING DRAWINGS/SPECS FOR TYPES OF PLUMBING FIXTURES.

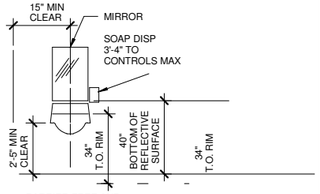
MOUNTING HEIGHTS



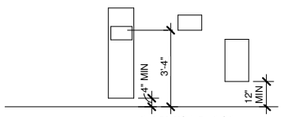
BARRIER FREE SIDE ELEVATION



BARRIER FREE FRONT ELEVATION



BARRIER FREE AND STD. LAV. AND MIRROR



PAPER TOWEL DISP. & WASTE RECEPTACLE

GENERAL NOTES

1. SEE FLOOR PLAN FOR PARTITION TYPE
2. SEE STRUCTURAL DRAWINGS FOR INTERIOR CMU LOAD BEARING WALLS.
3. SEE DA8 FOR PARTITION TYPES INDICATED ON THE DRAWINGS.
4. ALL CMU PARTITIONS ARE RUNNING BOND UNLESS OTHERWISE INDICATED.
5. REFER TO ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES, FOR ADDITIONAL NOTES, SYMBOLS AND ABBREVIATIONS.
6. IN MASONRY CONSTRUCTION, LOCATE DOOR FRAMES ON THE SIDE OF THE WALL TOWARD THE ROOM INTO WHICH THE DOOR SWINGS UNLESS OTHERWISE INDICATED.
7. PROVIDE BULLNOSE CMU AT OUTSIDE VERTICAL CORNERS UNLESS OTHERWISE INDICATED.
8. SEE DRAWINGS GA2 FOR REFERENCE FLOOR PLAN INDICATING FIRE RATED PARTITIONS AND SPACES. ALL MECHANICAL, ELECTRICAL AND PLUMBING PENETRATIONS THROUGH FIRE RATED CONSTRUCTION SHALL BE SLEEVED AND FIRE-SAFED, HAVE FIRE DAMPERS EQUIVALENT TO THE HOURLY FIRE RATING OF THE PENETRATED CONSTRUCTION.
9. ALL PITCHED FLOOR AREAS SHOWN WITH PITCH LINES SHALL SLOPE AT 1/4"/FT. UNLESS OTHERWISE INDICATED. PROVIDE A SLAB DEPRESSION AT ALL FLOOR DRAINS WHERE PITCH LINES ARE NOT SHOWN ON PLANS.
10. UNLESS OTHERWISE INDICATED, DASHED PLAN ELEMENTS INDICATE ITEMS TO BE PROVIDED BY THE OWNER AND ARE SHOWN FOR COORDINATION PURPOSES ONLY.
11. WHERE SPECIFIC DIMENSIONS, DETAILS OR DESIGN INTENT CANNOT BE DETERMINED FROM THE DOCUMENTS, CONSULT A/E BEFORE PROCEEDING WITH THE WORK.
12. FINISH FLOOR ELEVATIONS ARE TO THE TOP OF CONCRETE UNLESS OTHERWISE INDICATED.
13. WHERE DOORS OCCUR IN PARTITIONS WITHOUT DIMENSIONS, SEE THE DOOR FRAME DETAILS TO DETERMINE THE EXACT LOCATION OF THE DOOR.
14. REFER TO 1/4" SCALE ENLARGED FLOOR PLANS FOR DIMENSIONS OF TOILET ROOMS AND OTHER PLAN ELEMENTS
15. GENERAL CONTRACTOR SHALL PROVIDE STIFFENERS, BRACING, BACKING PLATES, AND SUPPORTING BRACKETS REQUIRED FOR THE PROPER INSTALLATION OF ALL CASEWORK, TOILET ROOM ACCESSORIES, TOILET PARTITIONS, AND OTHER SIMILAR.
16. ALL RECESSED CABINETS, PANELS, BOXES, ETC. LOCATED IN FIRE RATED PARTITIONS SHALL BE INSTALLED IN A MANNER WHICH MAINTAINS THE FIRE RATING OF THE PARTITION.
17. GENERAL CONTRACTOR SHALL COORDINATE ALL EQUIPMENT BASE AND HOUSEKEEPING PADS WITH CONTRACTOR WHOSE EQUIPMENT WILL BE INSTALLED ON THE PAD OR BASE. INSTALL PADS BENEATH THE FULL PROJECTED AREA OF EQUIPMENT PLUS 6" ON ALL SIDES.
18. ALL CONCRETE HOUSEKEEPING PADS SHALL BE 4" HIGH MINIMUM WITH ONE LAYER OF 6x6/W4.0xW4.0 WWF UNLESS OTHERWISE INDICATED.
19. GENERAL CONTRACTOR SHALL COORDINATE ALL PLUMBING, MECHANICAL AND ELECTRICAL FLOOR, ROOF AND WALL SLEEVES AND SHAFTS WITH THE DRAWINGS OF ALL OTHER TRADES.
20. REFER TO PLUMBING, MECHANICAL AND ELECTRICAL CONTRACTORS DRAWINGS AND MANUFACTURERS TEMPLATE DRAWINGS FOR ALL EQUIPMENT SUPPORTS, BOLT SETTING TEMPLATES, ISOLATIONS, SPRING ISOLATORS, ETC.

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Madison Water Utility

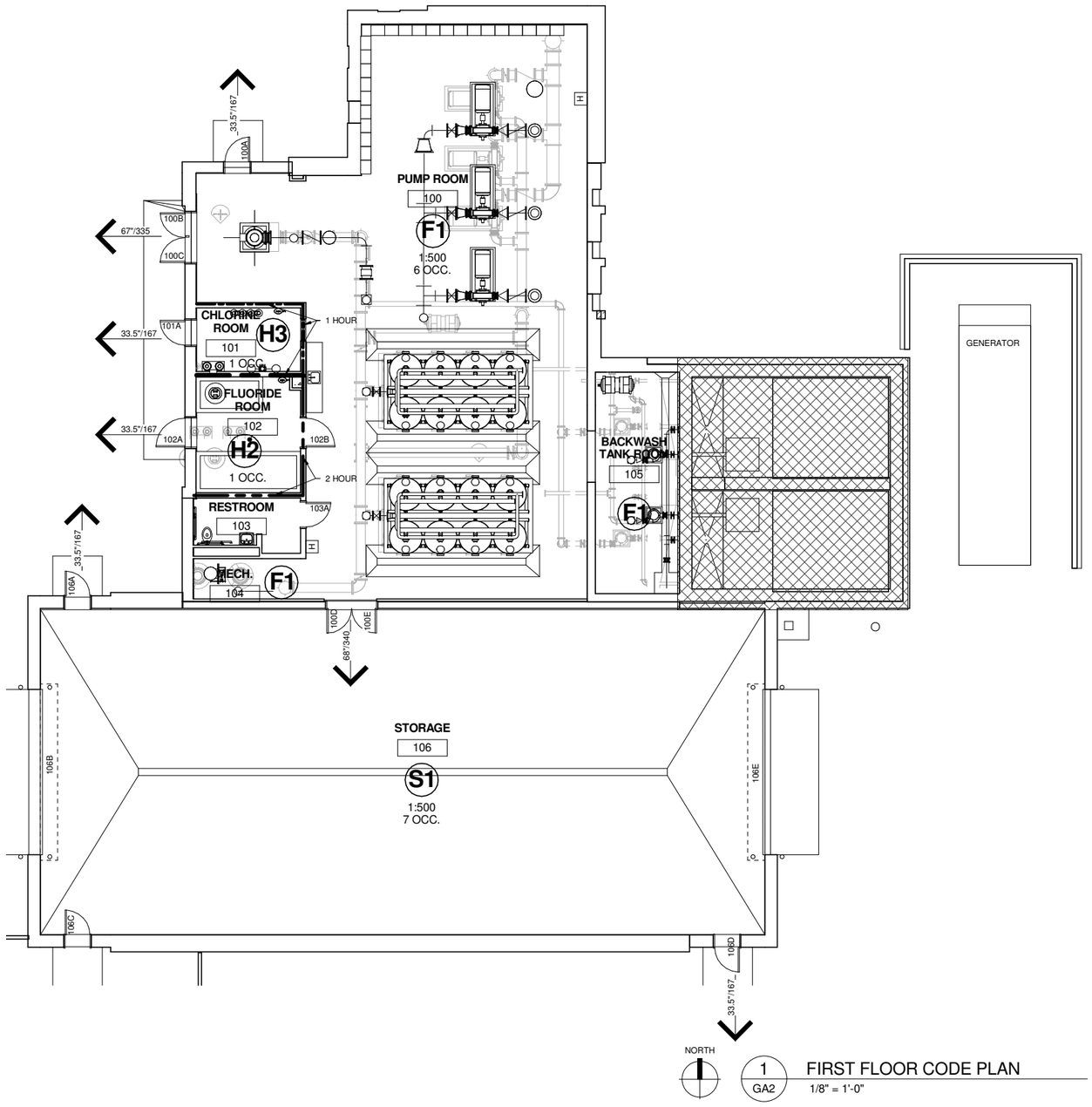
UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WI

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE January 13, 2017
DESIGNED BY
DRAWN BY Short Elliott Hendrickson, Inc. (SEH)

SHEET TITLE
ABBREVIATIONS, SYMBOLS AND NOTES

SHEET
GA1



1 GA2 FIRST FLOOR CODE PLAN

1/8" = 1'-0"

CODE INFORMATION

UNIT WELL 31 WATER TREATMENT PLANT **Potter Lawson Project No.** 2014.23.00

Madison, WI

General Code Information

ITEM	INFORMATION	REMARKS
Design code:	2009 IBC	
Occupancy Type:	Separated Use	
	F-1 Factory Industrial (water treatment)	
	H-2 Hazardous (Fluoride Room)	
	H-3 Hazardous (Chlorine Room)	
Occupancy Seperations	**Fire Rating** Table 508.4	
F-1:H-2	2 hour	
F-1:H-3	1 hour	
H-2:H-3	1 hour	
Construction type:	5B	
Fully Sprinkled?	Yes, per WCBC 903.3.1.1	

Hasardous Materials

Chemical	Chemical Classification	Max Control Area Qun.	Actual Quantity *
Chlorine Gass	Oxidizing Gas, Toxic	300 LB	600 LB
23% Hydroflurosilicic Acid	Toxic, Corrosive	1000 LB	165 gal.
Ascetic Acid (Future)			600 gal.

Notes:
A. Actual quantity is for combined storage and closed systems use.
B. Control area quantity per 307.1(1) Footnote i.

General Building Information

ITEM	ALLOWABLE	ACTUAL
Building height & no. of stories:		
Stories	2	1
Building Height	60'	35'
Area per floor level		
F-1	8,500 SF	2,850 SF
H-2	3,000 SF	93 SF
H-3	5,000 SF	160 SF
S-1	9,000 SF	3,434 SF
		Building Total Area: 8,214 SF

Means of Egress

ITEM	REQUIRED	PROVIDED / REMARKS
Number of Exits	1 Each Area	1 Each Area
Travel Distances	**EXIT ACCESS / COMMON PATH**	
F-1	250 FT / 75 FT	OK/OK
H-2	100 FT / 25 FT	OK/OK
H-3	150 FT / 25 FT	OK/OK
S-1	250 FT / 75 FT	OK/OK
Allowable number of Control Areas		4
Acutal Control Areas		3
Control Area Room Numbers		101,102, Remainder of Building

Fire Resistances, Suppression and Alarm

ITEM	REQUIRED	PROVIDED
Fire Resistance Rating for all Building Components:	0	Per Table 601
Fire Suppression	Fully Sprinkled	Fully Sprinkled

Sanitary Fixtures

Fixtures required per IBC Chapter 3, COMM 62 and table 2902.1
Based on "Total Estimated Calculated Occupants," = 15 occ.

Compliance Check	Water Closets	Lavatories	Drinking Fountain	Service Sink
	Male / Female	Male / Femaile		
Number of fixtures **Required**	1	1	0	1
Number of fixtures **Provided**	1	1	0	1

CODE LEGEND
NOTE: FIRE BARRIERS AND SMOKE BARRIERS SHALL BE PERMANENTLY IDENTIFIED WITH STENCILING IN ACCESSIBLE AND CONCEALED LOCATIONS AT INTERVALS NOT EXCEEDING 30' ALONG THE BARRIER

OCCUPANCY CLASSIFICATION F1

OCCUPANT CAPACITY OF EXIT

EXIT WIDTH 60"/300

1 HOUR RATED WALL

2 HOUR RATED WALL

UNOCCUPIED SPACE

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WI

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REVISIONS		

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SHEET TITLE CODE PLAN

SHEET GA2

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GENERAL NOTES
1. BUILDING AND SITE ARE ALL TO BE LAID OUT AND LOCATED RELATIVE TO THE CENTER LINE OF THE EXISTING WELL CASING.

2. REFER TO OTHER DRAWINGS FOR LAYOUT OF PROCESS EQUIPMENT AND THEIR HOUSEKEEPING PADS, FLOOR AND TRENCH DRAINS, AND FLOOR SLOPES TO DRAINS.

3. CONTRACTOR SHALL PROVIDE CAUTION SIGNS AS DETAILED ON DRAWINGS FOR ENTRANCES TO RESERVOIR AND BACKWASH TANKS

FLOOR PLAN KEYNOTES:
1. 42" HORIZONTAL GRAB BAR
2. 18" VERTICAL GRAB BAR
3. 36" HORIZONTAL GRAB BAR
4. SURFACE MOUNTED, MULTI-ROLL TOILET PAPER DISPENSER
5. SURFACE MOUNTED SANITARY NAPKIN DISPENSER
6. 20"x30" FRAMELESS PLATE GLASS MIRROR
7. PAPER TOWEL DISPENSER AND WASTE RECEPTACLE
8. SOAP DISPENSER
9. FDC
10. CARD ACCESS READER
11. EMERGENCY EYE WASHING STATION - REFER TO PLUMBING DRAWINGS
12. CONTAINMENT CURB
13. COAT THE INSIDE OF THE CONTAINMENT WELL (FLOOR, SIDE WALLS AND TOPS OF PARTIAL HEIGHT WALLS) WITH CHEMICAL-RESISTANT COATING
14. MEZZANINE ACCESS LADDER - COORDINATE LOCATION WITH STRUCTURAL AND MEP - SEE 3/A3 FOR DETAILS
15. CHEMICAL TANKS - PROVIDE CHAIN RAILING TO ENSURE SECUREMENT OF TANKS
16. LINE OF CONC. BULK HEAD ABOVE
17. UTILITY SHELF / MOP HOLDER
18. 6' DIAMETER PIPE BOLLARD
19. STOOP

PUMP ROOM 100
CHLORINE ROOM 101
FLUORIDE ROOM 102
RESTROOM 103
MECH. 104
BACKWASH TANK ROOM 105
AREA RESERVED FOR FUTURE SCRUBBER BUILDING ADDITION
GENERATOR
CANOPY ABOVE
LINE OF METAL PANEL ABOVE
WELL HEAD
TRENCH DRAIN - SEE PLUMBING
ENCLOSE GENERATOR VIF
MATCH LINE - SEE A2 FOR CONTINUATION
AT BRICK
AT METAL PANEL

PARTIAL FIRST FLOOR PLAN - PUMP STATION
1/4" = 1'-0"

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UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WI

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SEH FILE NO. 129083
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SHEET TITLE: FLOOR PLAN

SHEET: A1

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FLOOR PLAN KEYNOTES:

1. 42" HORIZONTAL GRAB BAR
2. 18" VERTICAL GRAB BAR
3. 36" HORIZONTAL GRAB BAR
4. SURFACE MOUNTED, MULTI-ROLL TOILET PAPER DISPENSER
5. SURFACE MOUNTED SANITARY NAPKIN DISPENSER
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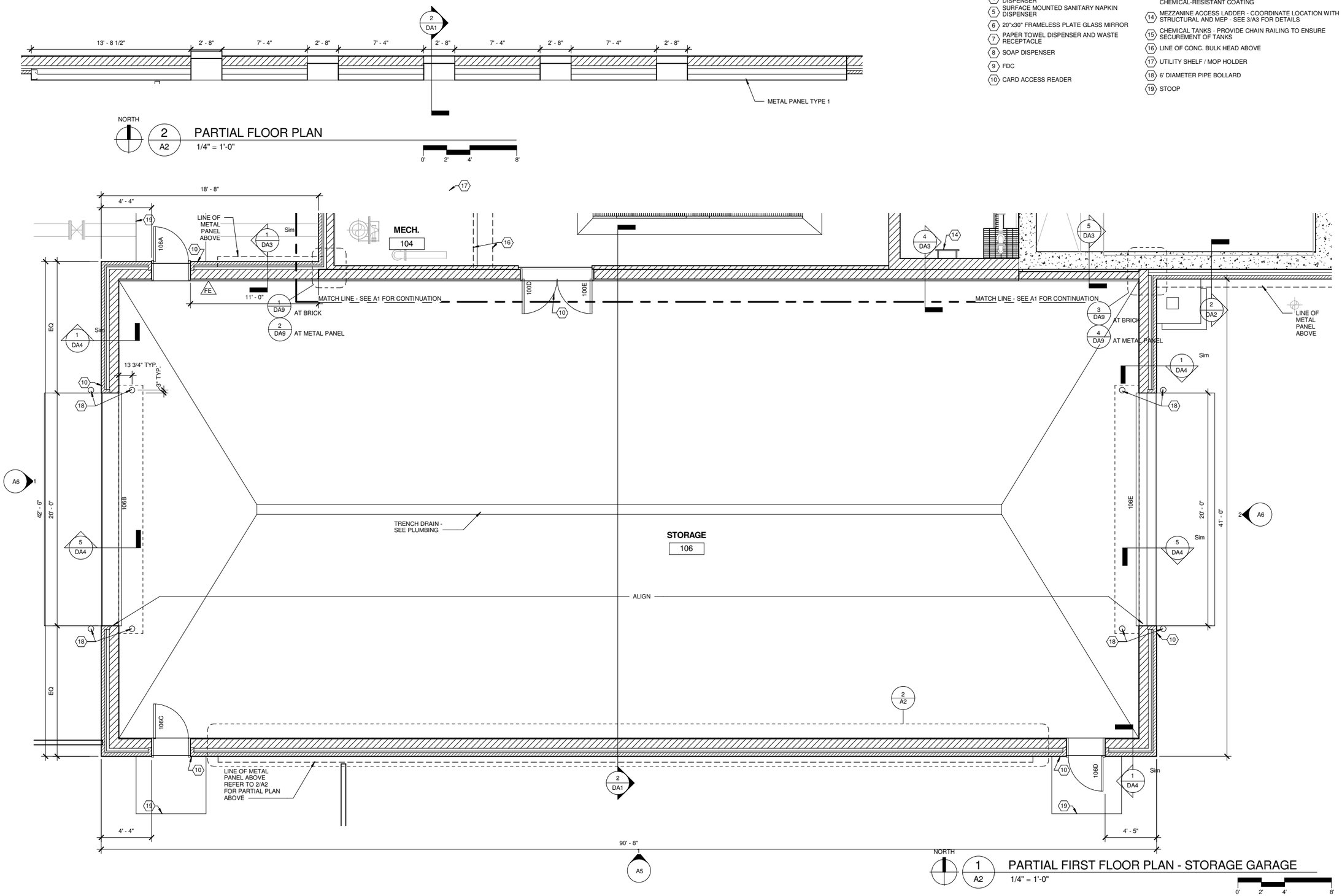
19. STOOP



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SHEET TITLE: FLOOR PLAN

SHEET: A2

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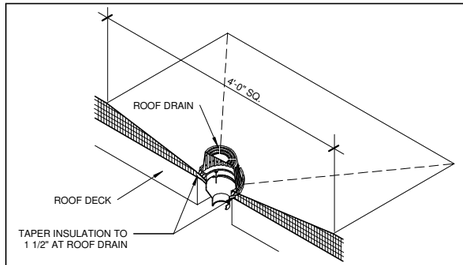
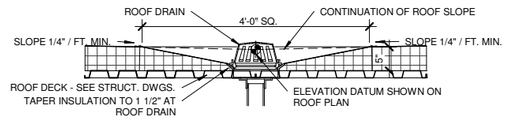
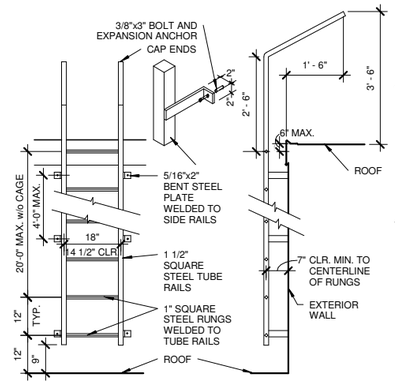




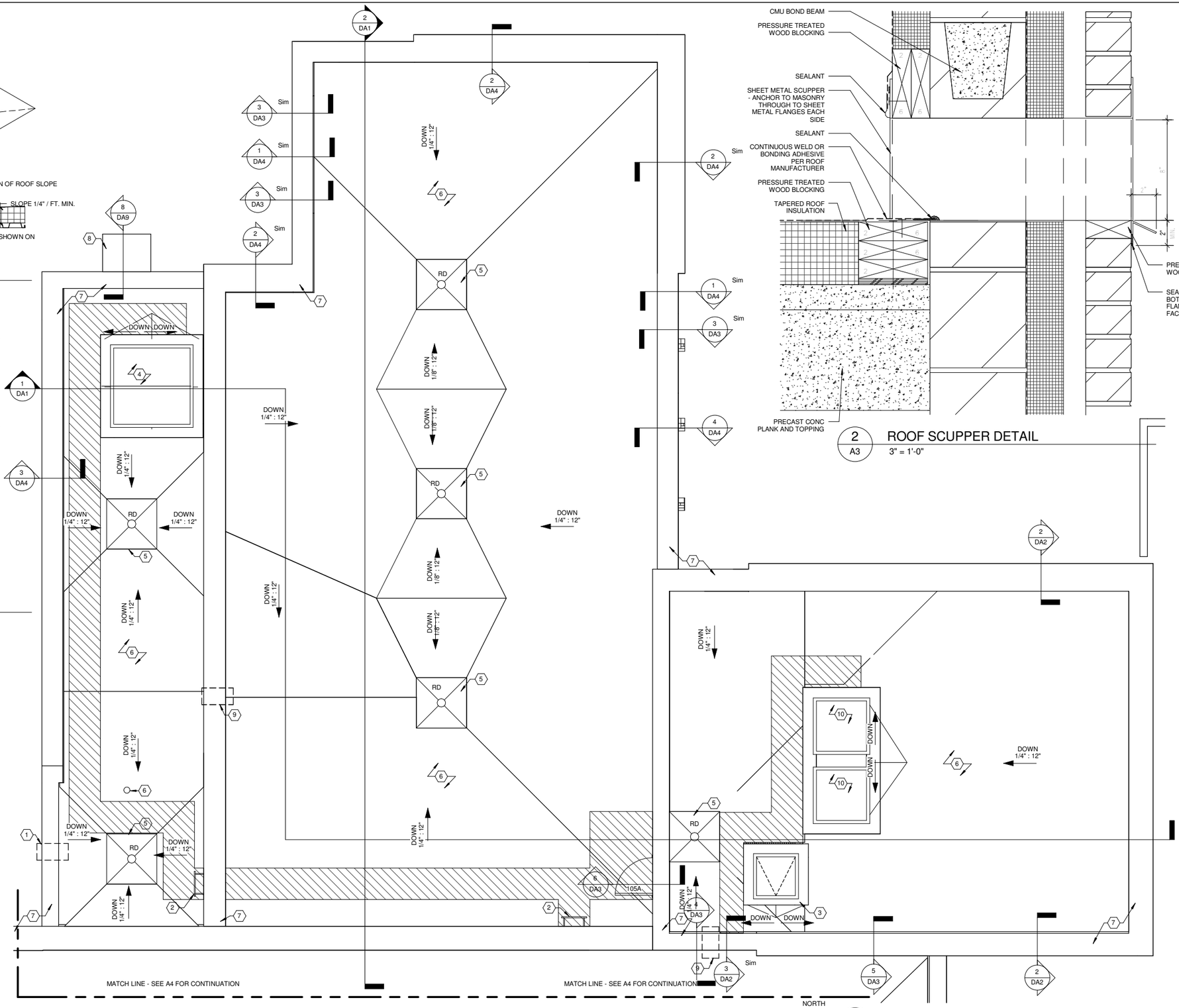
4 A3 ROOF DRAIN DTAIL

3/4" = 1'-0"



3 A3 EXTERIOR ROOF LADDER

1/2" = 1'-0"



ROOF PLAN LEGEND:

30" WIDE INTERLOCKING ROOF PAVERS

ROOF PLAN KEYNOTES:

1. THROUGH WALL ROOF SCUPPER - SEE 2/A3
2. ACCESS LADDER - SEE 3/A3
3. 36"x36" CLR MANUFACTURED ROOF ACCESS HATCH - SEE SECTION 077233
4. 72"x72" CLR ROOF ACCESS HATCH - SEE 7/DA9
5. ROOF DRAIN SUMP - SEE 4/A3
6. MEMBRANE ROOFING SYSTEM ON TAPERED INSULATION
7. METAL ROOF EDGE - TYP
8. CANOPY BELOW
9. COPING SCUPPER - SEE 2/A4
10. 48"x48" CLR ROOF ACCESS HATCH - SEE 7/DA9

NORTH

1 A3 PARTIAL ROOF PLAN - PUMP ROOM

1/4" = 1'-0"

0' 2' 4' 8'

2 A3 ROOF SCUPPER DETAIL

3" = 1'-0"

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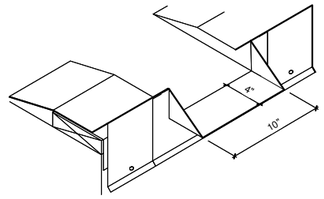
SHEET TITLE
ROOF PLAN

SHEET
A3



2 A4 ROOF EDGE COPING SCUPPER DETAIL

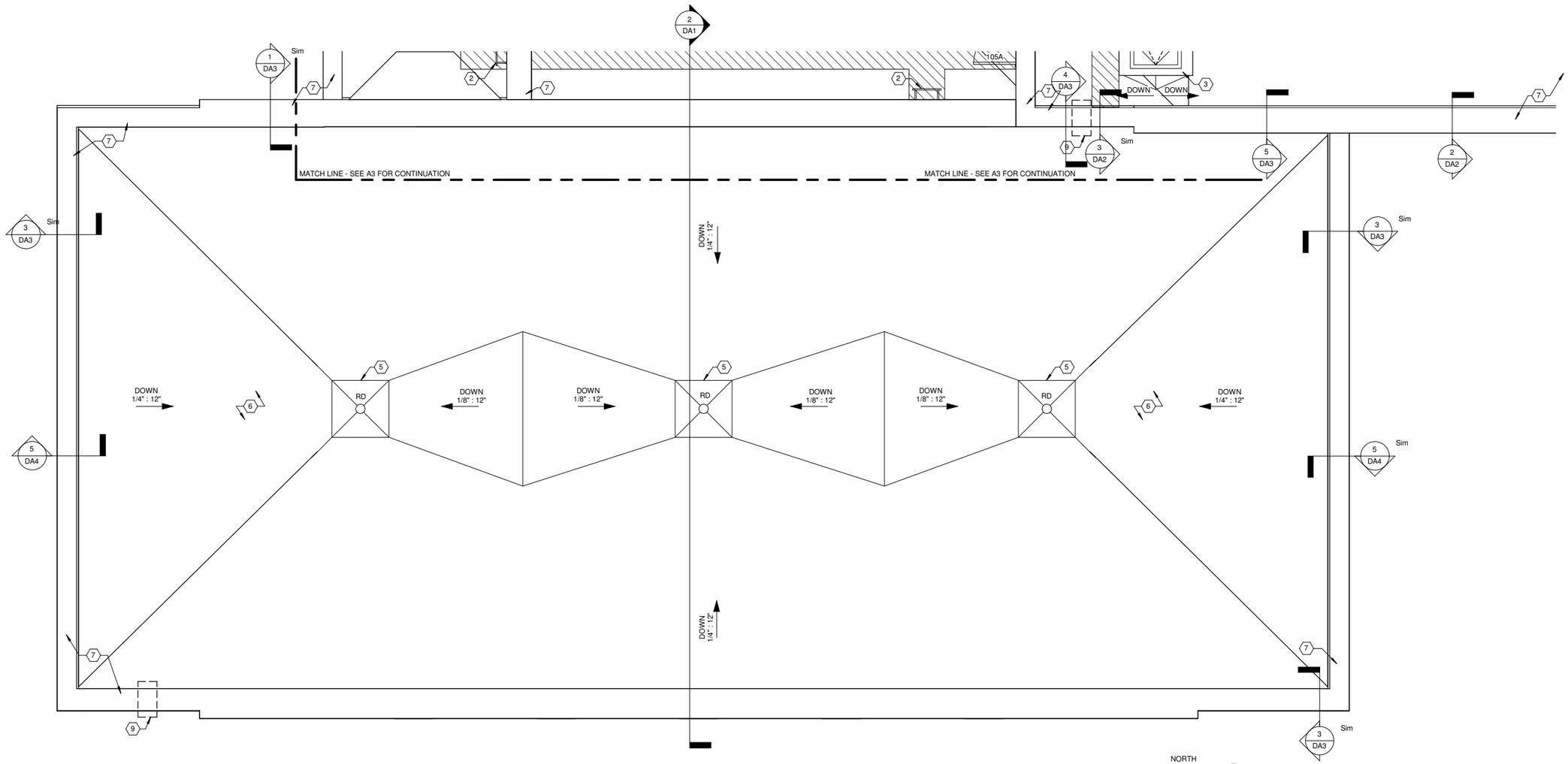
1 1/2" = 1'-0"

ROOF PLAN LEGEND:

30" WIDE INTERLOCKING ROOF PAVERS

ROOF PLAN KEYNOTES:

1. THROUGH WALL ROOF SCUPPER - SEE 2/A3
2. ACCESS LADDER - SEE 3/A3
3. 36"x36" CLR MANUFACTURED ROOF ACCESS HATCH - SEE SECTION 077233
4. 72"x72" CLR ROOF ACCESS HATCH - SEE 7/DA9
5. ROOF DRAIN SUMP - SEE 4/A3
6. MEMBRANE ROOFING SYSTEM ON TAPERED INSULATION
7. METAL ROOF EDGE - TYP
8. CANOPY BELOW
9. COPING SCUPPER - SEE 2/A4
10. 48"x48" CLR ROOF ACCESS HATCH - SEE 7/DA9



1 A4 PARTIAL ROOF PLAN - STORAGE

1/4" = 1'-0"

0' 2' 4' 8'

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SHEET TITLE ROOF PLAN

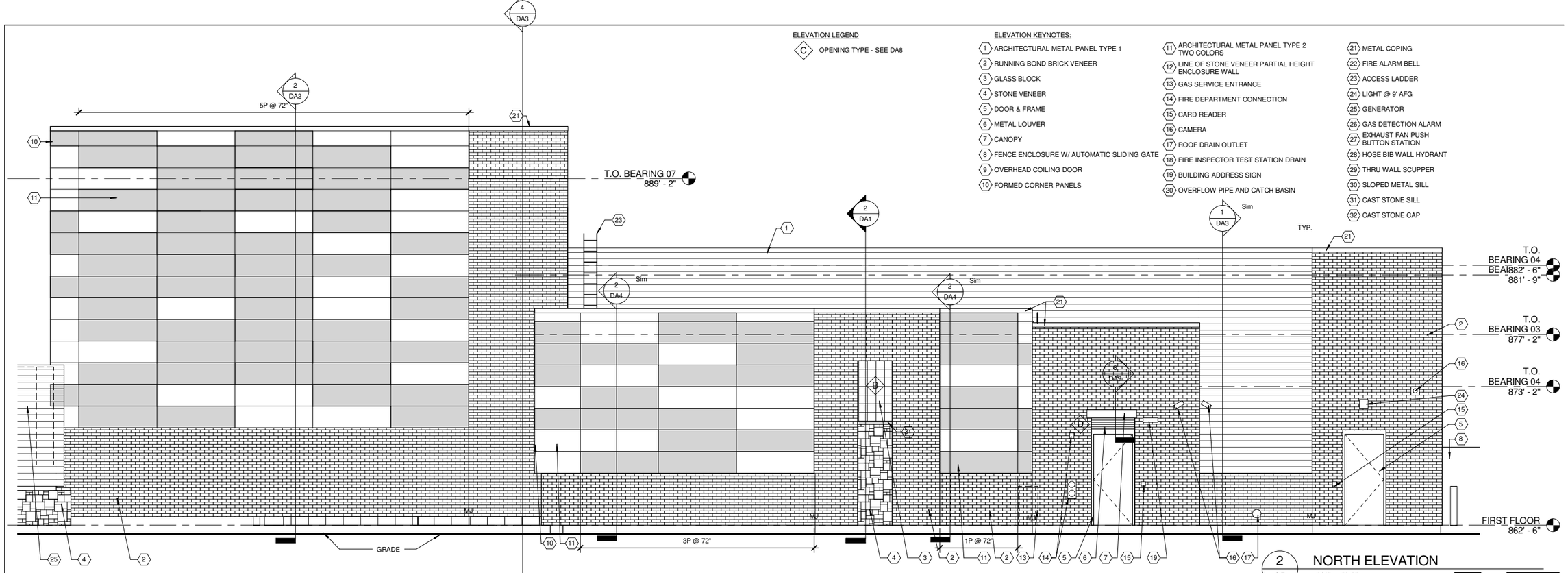
SHEET A4

ELEVATION LEGEND

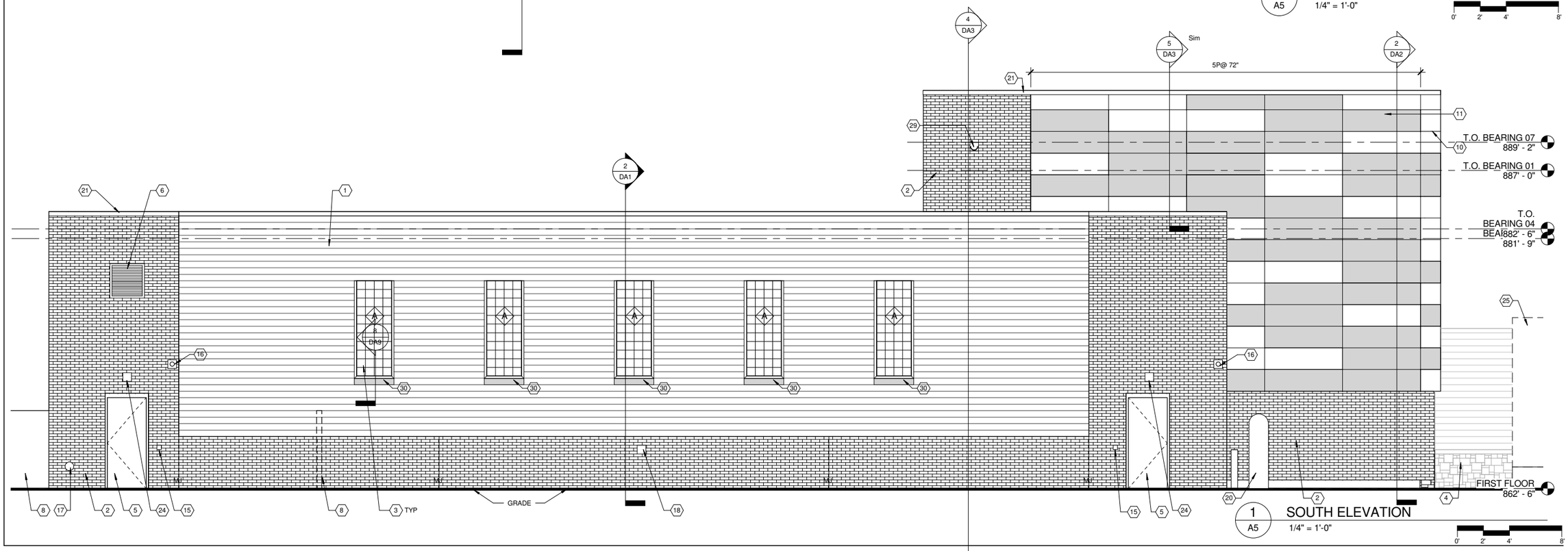
C OPENING TYPE - SEE DA8

ELEVATION KEYNOTES:

1 ARCHITECTURAL METAL PANEL TYPE 1
2 RUNNING BOND BRICK VENEER
3 GLASS BLOCK
4 STONE VENEER
5 DOOR & FRAME
6 METAL LOUVER
7 CANOPY
8 FENCE ENCLOSURE W/ AUTOMATIC SLIDING GATE
9 OVERHEAD COILING DOOR
10 FORMED CORNER PANELS
11 ARCHITECTURAL METAL PANEL TYPE 2 TWO COLORS
12 LINE OF STONE VENEER PARTIAL HEIGHT ENCLOSURE WALL
13 GAS SERVICE ENTRANCE
14 FIRE DEPARTMENT CONNECTION
15 CARD READER
16 CAMERA
17 ROOF DRAIN OUTLET
18 FIRE INSPECTOR TEST STATION DRAIN
19 BUILDING ADDRESS SIGN
20 OVERFLOW PIPE AND CATCH BASIN
21 METAL COPING
22 FIRE ALARM BELL
23 ACCESS LADDER
24 LIGHT @ 9' AFG
25 GENERATOR
26 GAS DETECTION ALARM
27 EXHAUST FAN PUSH BUTTON STATION
28 HOSE BIB WALL HYDRANT
29 THRU WALL SCUPPER
30 SLOPED METAL SILL
31 CAST STONE SILL
32 CAST STONE CAP



2 A5 NORTH ELEVATION
1/4" = 1'-0"



1 A5 SOUTH ELEVATION
1/4" = 1'-0"

0' 2' 4' 8'

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SHEET TITLE
BUILDING ELEVATIONS

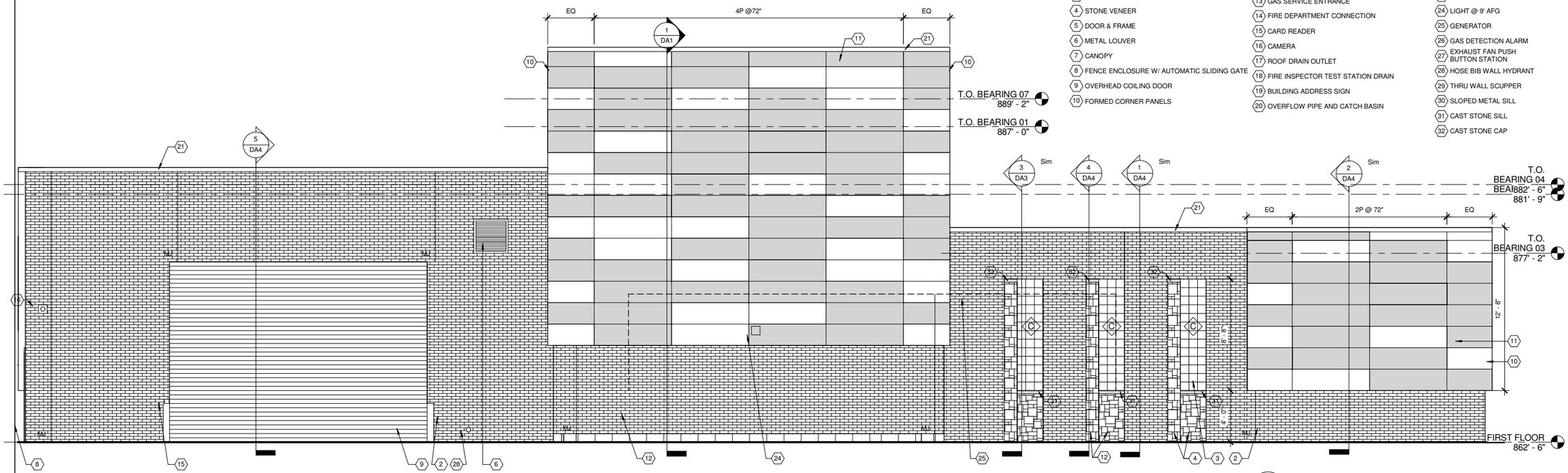
SHEET
A5

ELEVATION LEGEND

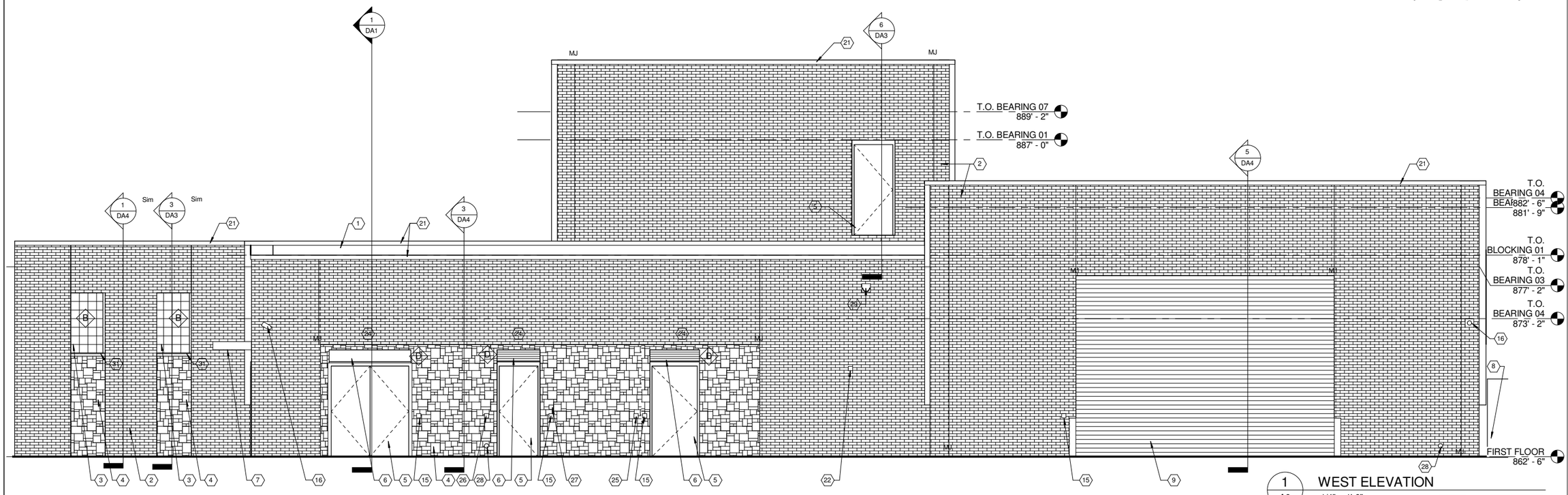
C OPENING TYPE - SEE DA8

ELEVATION KEYNOTES:

1 ARCHITECTURAL METAL PANEL TYPE 1
2 RUNNING BOND BRICK VENEER
3 GLASS BLOCK
4 STONE VENEER
5 DOOR & FRAME
6 METAL LOUVER
7 CANOPY
8 FENCE ENCLOSURE W/ AUTOMATIC SLIDING GATE
9 OVERHEAD COILING DOOR
10 FORMED CORNER PANELS
11 ARCHITECTURAL METAL PANEL TYPE 2 TWO COLORS
12 LINE OF STONE VENEER PARTIAL HEIGHT ENCLOSURE WALL
13 GAS SERVICE ENTRANCE
14 FIRE DEPARTMENT CONNECTION
15 CARD READER
16 CAMERA
17 ROOF DRAIN OUTLET
18 FIRE INSPECTOR TEST STATION DRAIN
19 BUILDING ADDRESS SIGN
20 OVERFLOW PIPE AND CATCH BASIN
21 METAL COPING
22 FIRE ALARM BELL
23 ACCESS LADDER
24 LIGHT @ 9' AFG
25 GENERATOR
26 GAS DETECTION ALARM
27 EXHAUST FAN PUSH BUTTON STATION
28 HOSE BIB WALL HYDRANT
29 THRU WALL SCUPPER
30 SLOPED METAL SILL
31 CAST STONE SILL
32 CAST STONE CAP



2 EAST ELEVATION (A6)
1/4" = 1'-0"
0' 2' 4' 8'



1 WEST ELEVATION (A6)
1/4" = 1'-0"
0' 2' 4' 8'

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WI

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE January 13, 2017
DESIGNED BY
DRAWN BY Short Elliott Hendrickson, Inc.
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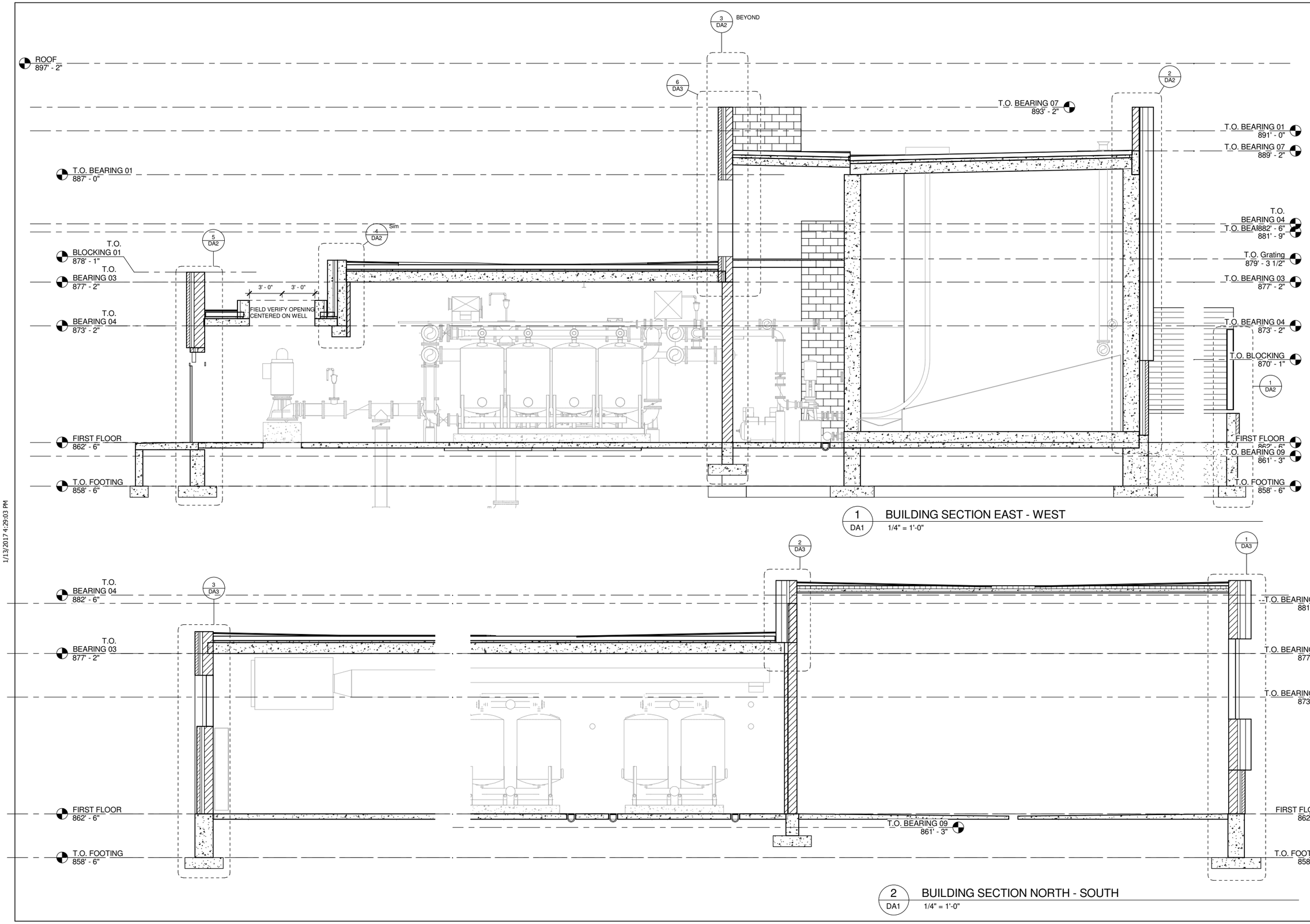
SHEET TITLE
BUILDING ELEVATIONS

SHEET
A6



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FAX: 888.908.8166
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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WI

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE January 13, 2017
DESIGNED BY
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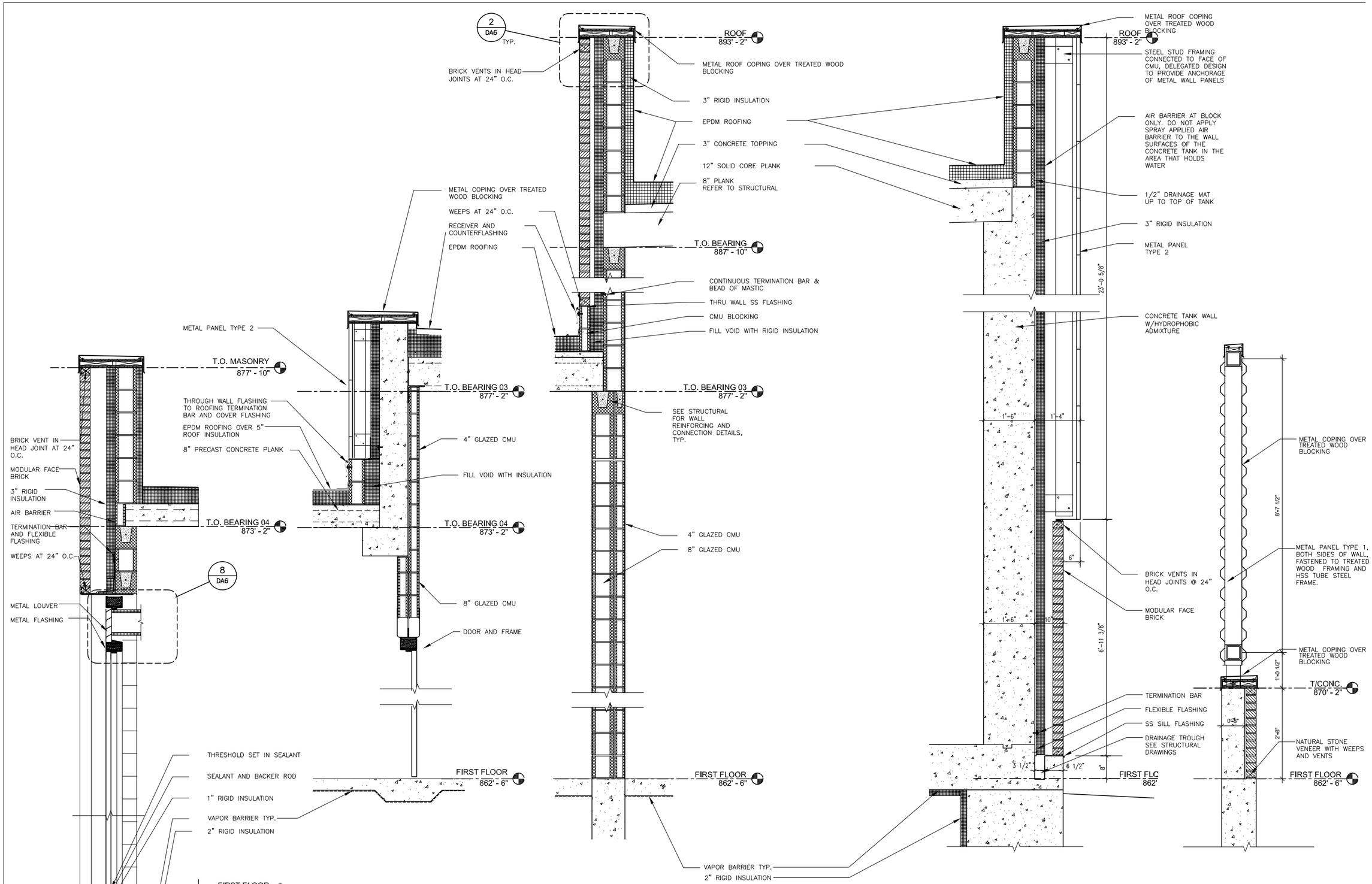
SHEET TITLE
BUILDING SECTIONS

SHEET
DA1



5 DA2 WALL SECTION 3/4" = 1'-0"

4 DA2 WALL SECTION 3/4" = 1'-0"

3 DA2 WALL SECTION 3/4" = 1'-0"

2 DA2 WALL SECTION 3/4" = 1'-0"

1 DA2 WALL SECTION 3/4" = 1'-0"

6808 ODANA RD, SUITE 200
MADISON, WI 53719-1137
PHONE: 608.620.6199
FAX: 888.908.8166
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UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
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SEH FILE NO. 129083
PROJECT NO. 53W10434
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SHEET TITLE
WALL SECTIONS

SHEET
DA2

6/1/2015 10:19:35 AM

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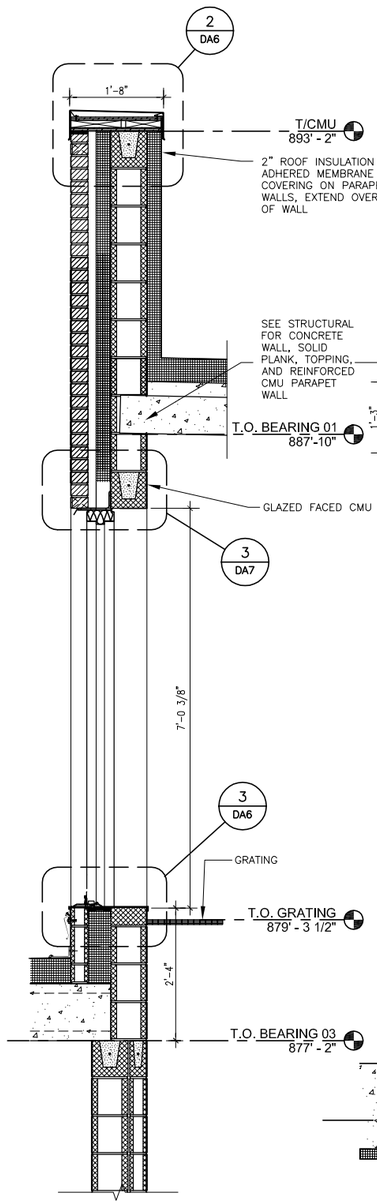
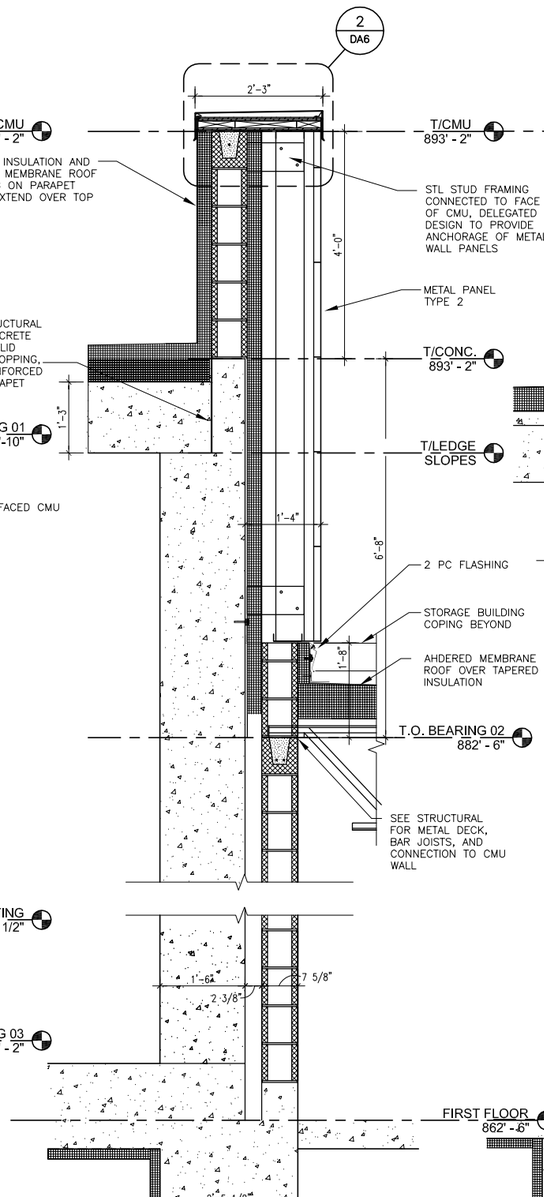
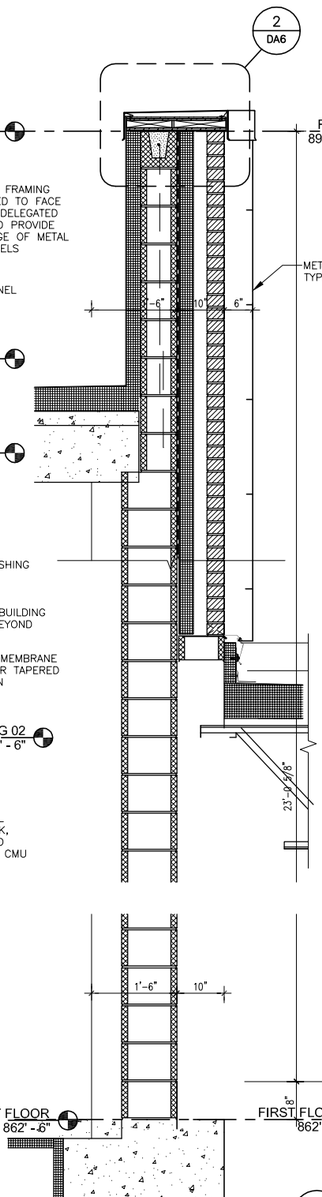
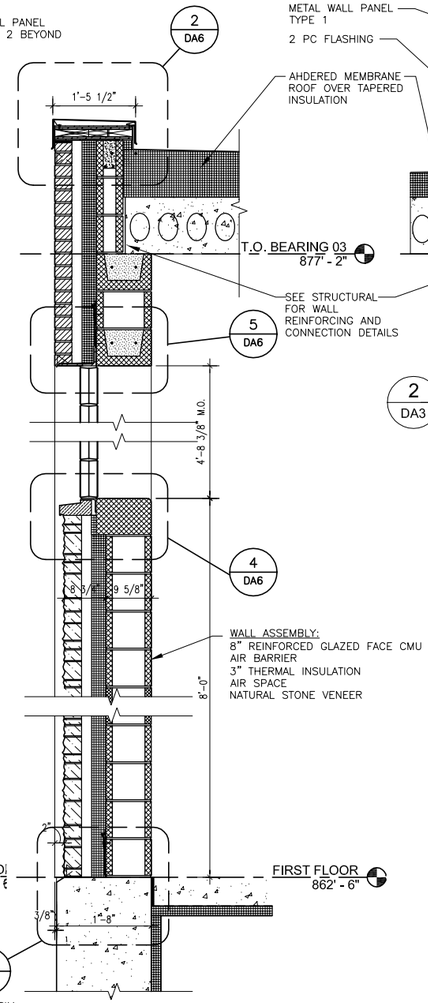
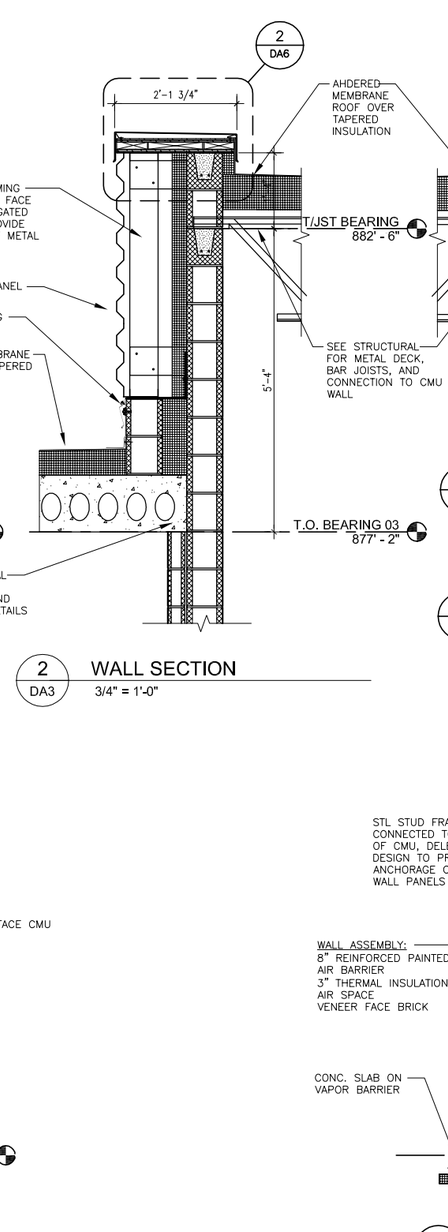


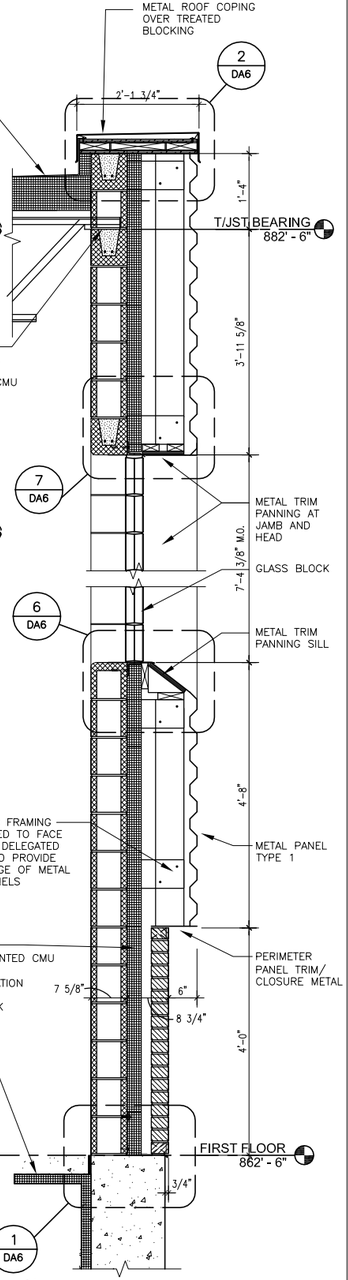








2 DA3 WALL SECTION
3/4" = 1'-0"



6 DA3 WALL SECTION 3/4" = 1'-0"

5 DA3 WALL SECTION 3/4" = 1'-0"

4 DA3 WALL SECTION 3/4" = 1'-0"

3 DA3 WALL SECTION 3/4" = 1'-0"

1 DA3 WALL SECTION 3/4" = 1'-0"

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MAY 21 2015

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

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SHEET TITLE
WALL SECTIONS

SHEET
DA3

6/1/2015 10:21:11 AM

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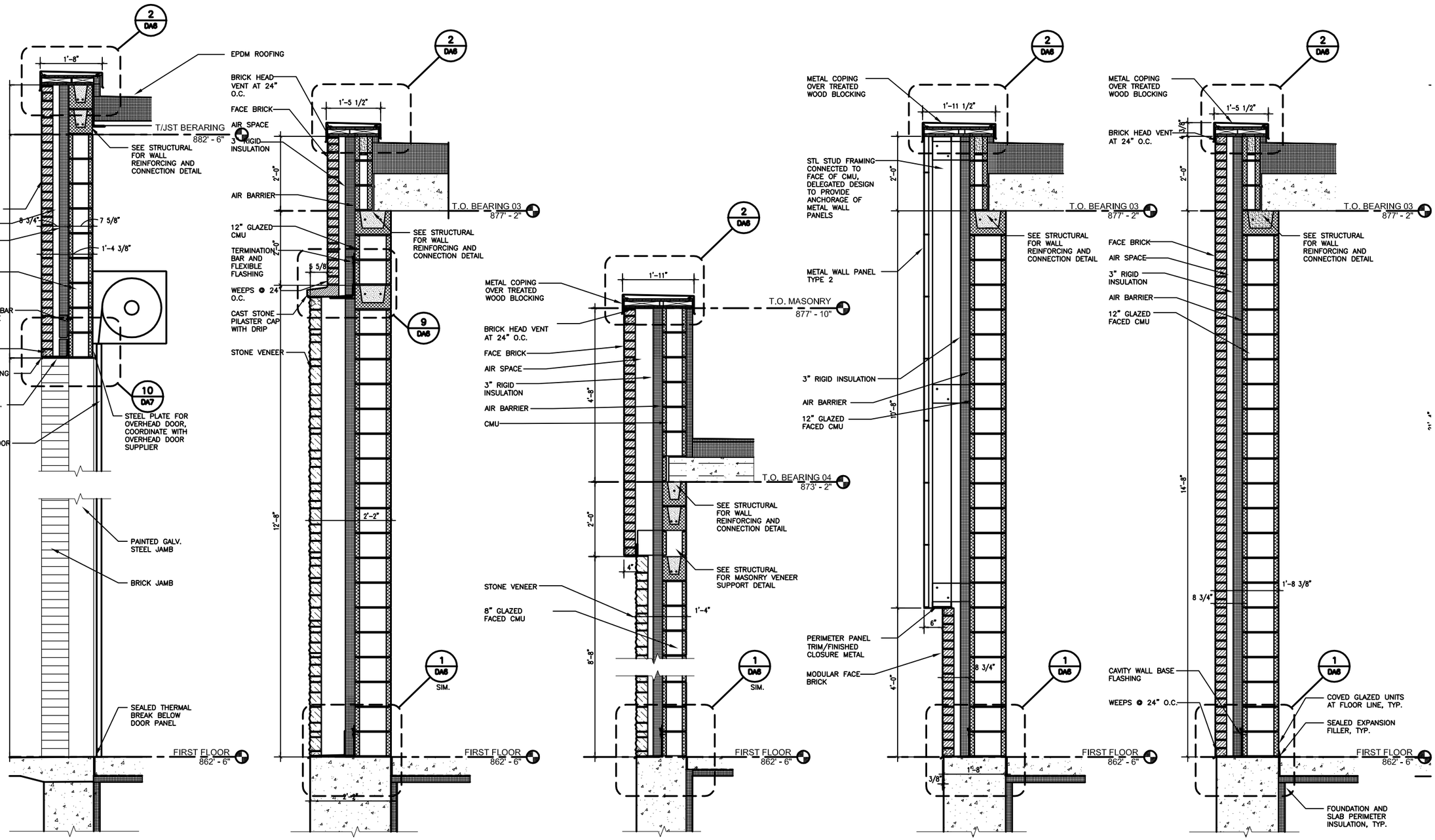

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UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

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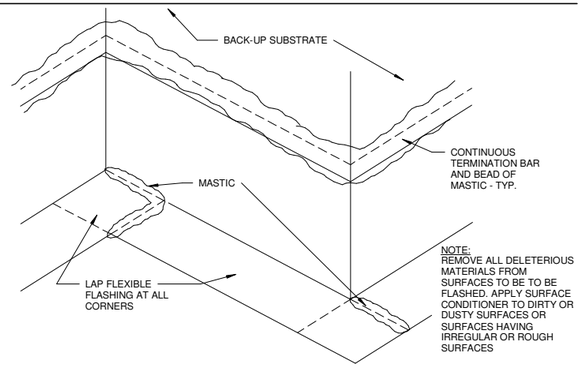
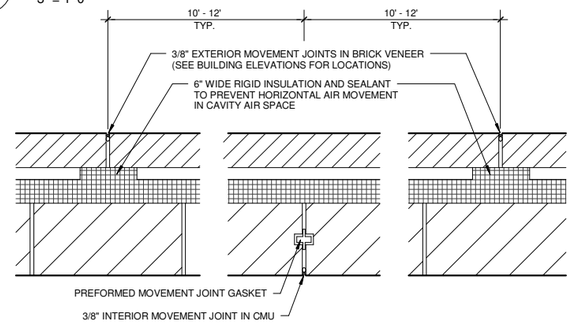
SHEET TITLE
WALL SECTIONS

SHEET
DA4



4 DA5 FLEXIBLE FLASHING DETAIL AT CORNER

3" = 1'-0"

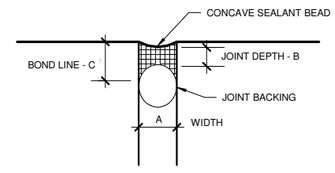


3 DA5 EXTERIOR WALL MOVEMENT JOINT

1 1/2" = 1'-0"

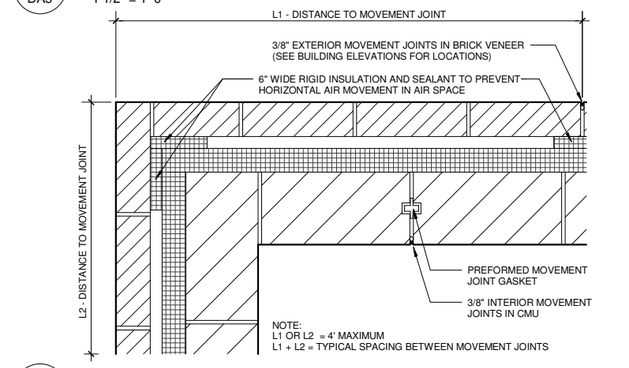
JOINT - WIDTH - TO - DEPTH RECOMMENDATIONS

A. WIDTH	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"
B. DEPTH	1/4"	1/4"	1/4"	3/8"	3/8"	3/8"	3/8"
C. MININUM BOND LINE	1/4"	3/8"	1/2"	1/2"	1/2"	1/2"	1/2"



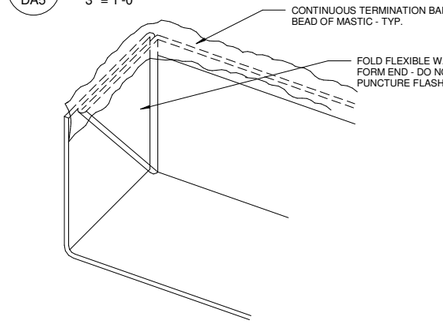
6 DA5 JOINT DESIGN WITH JOINT BACKING

3" = 1'-0"



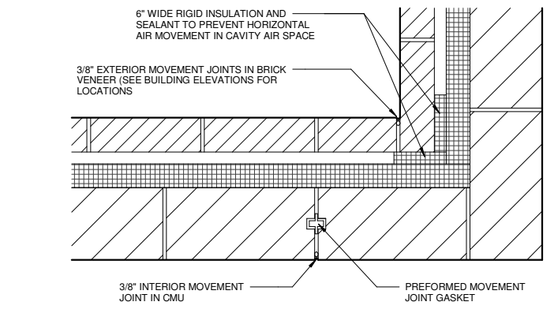
2 DA5 EXTERIOR WALL MOVEMENT JOINT 2

1 1/2" = 1'-0"



5 DA5 FLEXIBLE FLASHING DETAIL AT END DAMN

3" = 1'-0"



1 DA5 EXTERIOR WALL MOVEMENT JOINT 3

1 1/2" = 1'-0"

6608 ODANA RD, SUITE 200
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MADISON WATER UTILITY
MADISON, WI

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SHEET TITLE
TYPICAL BUILDING ENVELOPE DETAILS

SHEET
DA5

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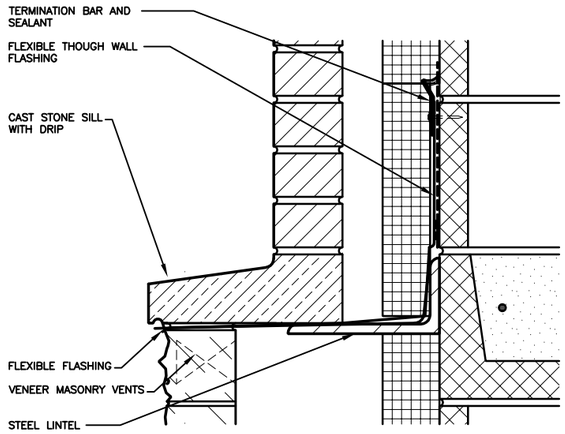
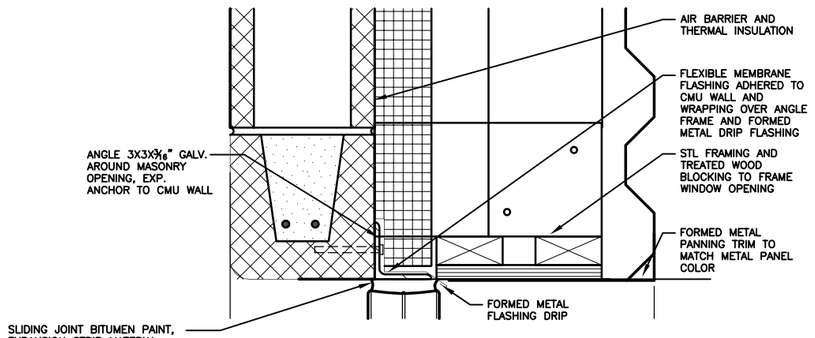
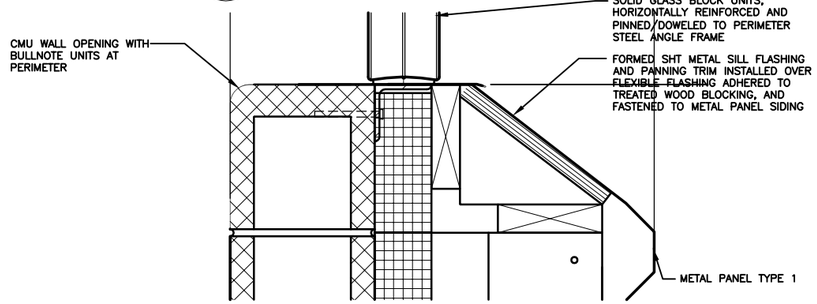


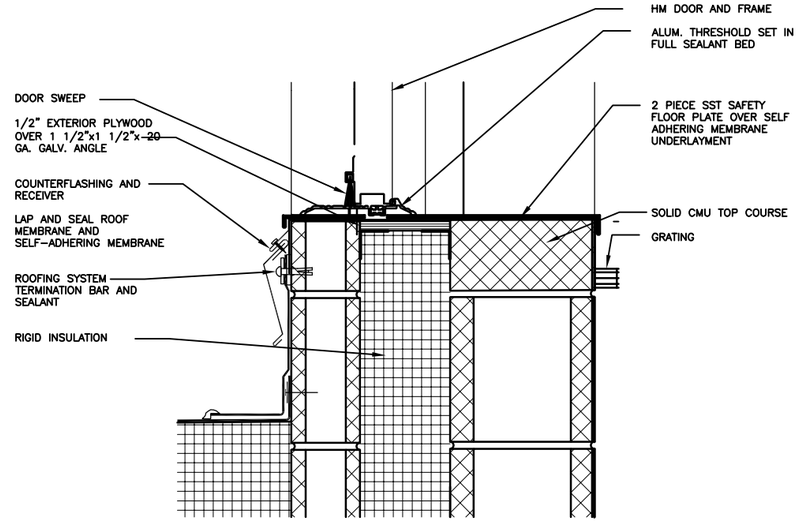
9 DA6 CAST STONE CAP
3" = 1'-0"



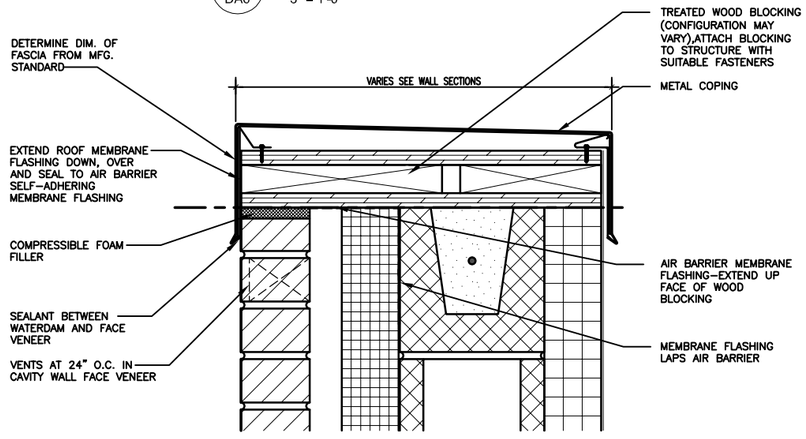
7 DA6 WINDOW HEAD DETAIL
3" = 1'-0"



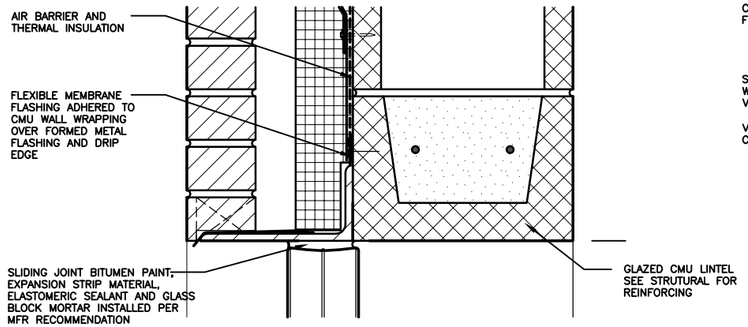
6 DA6 WINDOW SILL DETAIL
3" = 1'-0"



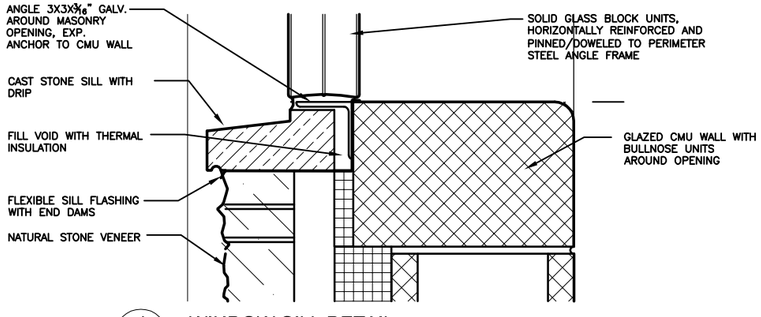
3 DA6 ROOF ACCESS DOOR SILL DETAIL
3" = 1'-0"



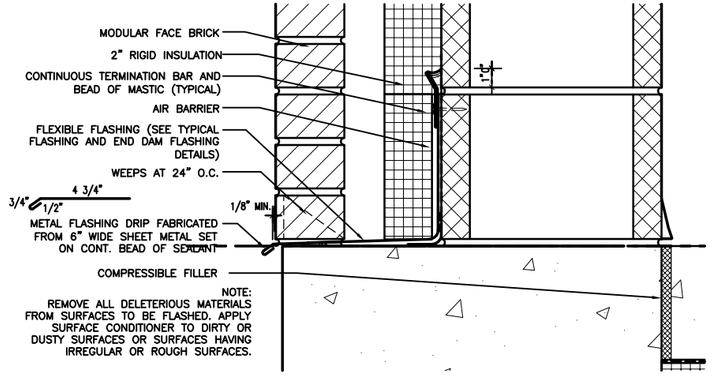
2 DA6 TYP. ROOF EDGE DETAIL
3" = 1'-0"



5 DA6 WINDOW HEAD DETAIL
3" = 1'-0"



4 DA6 WINDOW SILL DETAIL
3" = 1'-0"



1 DA6 TYP. BASE OF WALL FLASHING DETAIL
3" = 1'-0"

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6500 Cowin Rd, Suite 300
Madison, WI 53718-1337
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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

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SHEET TITLE DETAILS

SHEET DA6

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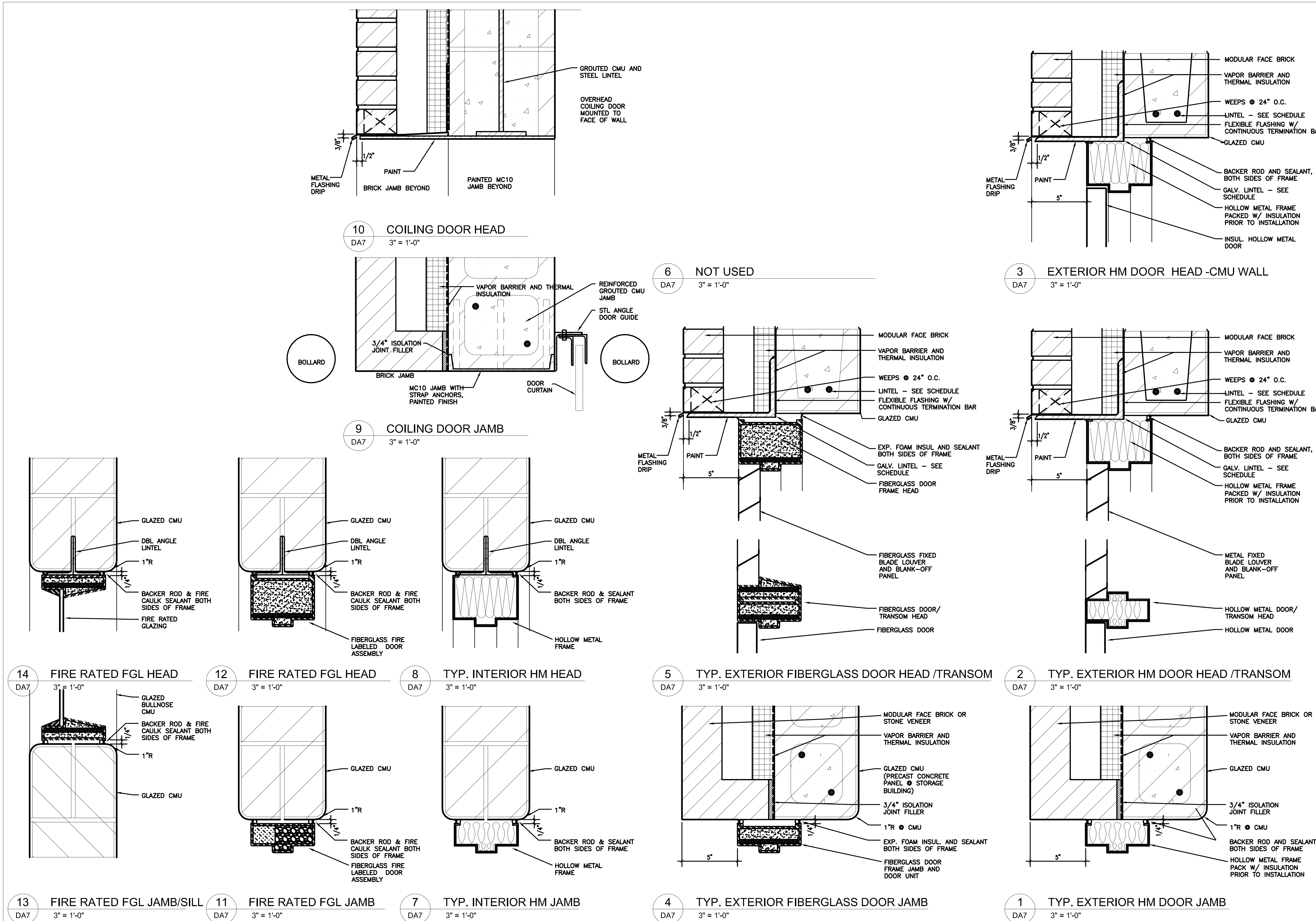

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MADISON WATER UTILITY
MADISON, WISCONSIN

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SHEET TITLE
DETAILS

SHEET
DA7

DOOR, FRAME & HARDWARE SCHEDULE

UNIT WELL 31 WATER TREATMENT PLANT
Town of Madison, WI

Abbreviations: Matl: Material; EL: Elevation; HG: Hardware Group; F: Function

Opening	Door Information				Glass	Label	Frame Information & Details					Hardware		
Number	Width	Height	Matl	EL	Type	Min.	Matl	EL	Head	Jamb	Sill	HG	F	Notes
100A	3'-0"	7'-0"	HM	1			HM	A	2/DA7	1/DA7		2.0		
100B	3'-0"	7'-0"	HM	1			HM	B	1/DA7	2/DA7		1.0		
100C	3'-0"	7'-0"	HM	1					8/DA6	1/DA7				
100D	3'-0"	7'-0"	HM	1		1HR	HM	B	16/DA7	15/DA7		5.0		
100E	3'-0"	7'-0"	HM	1		1HR			16/DA7	15/DA7				
101A	3'-0"	7'-0"	FGL	1			FGL	A	5/DA7	4/DA7		4.0		
102A	3'-6"	7'-0"	FGL	1			FGL	A	5/DA7	4/DA7		3.0		
102B	3'-6"	7'-0"	FGL	3		2HR	FGL	A	12/DA7	11/DA7		6.0		
103A	3'-0"	7'-0"	HM	1			HM	A	8/DA7	7/DA7		7.0		
105A	3'-0"	7'-0"	HM	1			HM	A	3/DA7	1/DA7	3/DA6			
106A	3'-0"	7'-0"	HM	1			HM	A	6/DA7	SIM 6/DA7		2.0		
106B	20'-0"	14'-0"	STL	2					10/DA7	9/DA7				
106C	3'-0"	7'-0"	HM	1			HM	A	6/DA7	SIM 6/DA7		2.0		
106D	3'-0"	7'-0"	HM	1			HM	A	6/DA7	SIM 6/DA7		2.0		
106E	20'-0"	14'-0"	STL	2					10/DA7	9/DA7				

ROOM FINISH SCHEDULE

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UNIT WELL 31 WATER TREATMENT PLANT
MADISON, WI

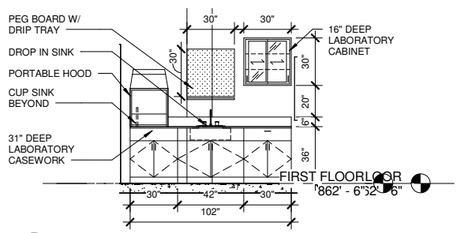
ROOM NO.	ROOM NAME	FLOOR		BASE		NORTH WALL		EAST WALL		SOUTH WALL		WEST WALL		CEILING		REMARKS
		Matl.	Fin.	Matl.	Fin.	Matl.	Fin.	Matl.	Fin.	Matl.	Fin.	Matl.	Fin.	Matl.	Fin.	
100	PUMP ROOM	F1		B1		W1		W1		W1		W1		C1		
101	CLORINE ROOM	F1		B1		W1		W1		W1		W1		C1		
102	FLOURIDE ROOM	F1		B1		W1		W1		W1		W1		C1		
103	RESTROOM	F1		B1		W1		W1		W1		W1		C1		
104	MECH.	F1		B1		W1				W1		W1		C1		
105	BACKWASH TANK ROOM	F1		B1		W1		W2		W1		W1		C1		
106	STORAGE	F1		B1		W2		W2		W2		W2		C1		

ROOM FINISH SYMBOLS LEGEND

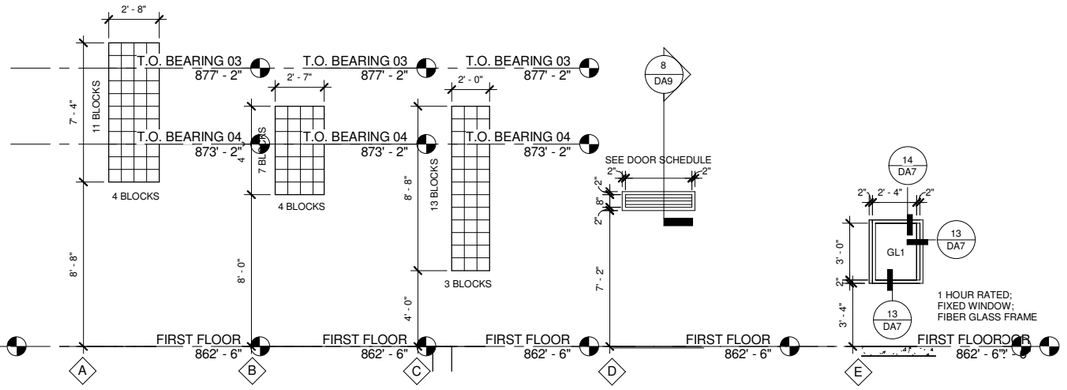
Floor		Base		Wall		Ceiling	
Code	Description	Code	Description	Code	Description	Code	Description
F1	RESINOUS FLOORING	B1	RESINOUS BASE (8")	W1	GLAZED CONCRETE BLOCK	C1	PAINT PRECAST CONCRETE PLANKE
				W2	PAINTED CONCRETE		

General Notes

1. CONCRETE BASES UNDER TREATMENT VESSELS TO BE PAINTED.



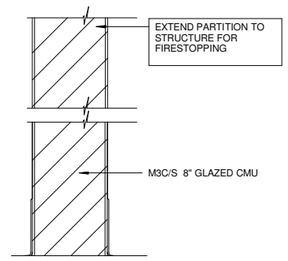
12 DA8 CABINET ELEVATION
1/4" = 1'-0"



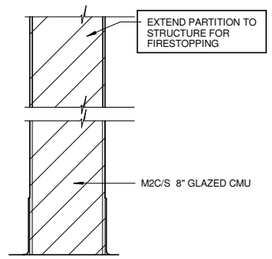
8 DA8 GLASS BLOCK ELEVATIONS
1/4" = 1'-0"

7 DA8 LOUVER ELEVATION
1/4" = 1'-0"

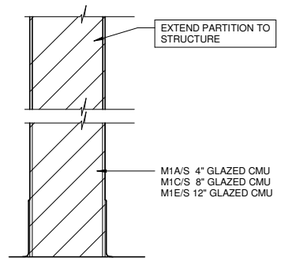
6 DA8 WINDOW ELEVATION
1/4" = 1'-0"



11 DA8 PARTITION TYPE M3/S - 2 HOUR
1 1/2" = 1'-0"

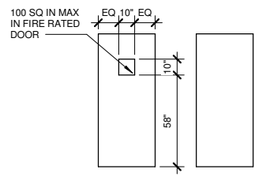


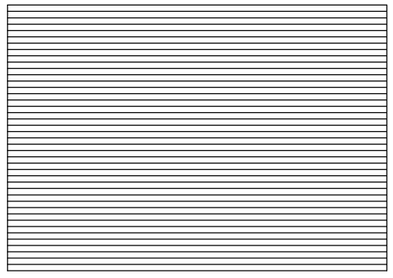
10 DA8 PARTITION TYPE M2/S - 1 HOUR
1 1/2" = 1'-0"



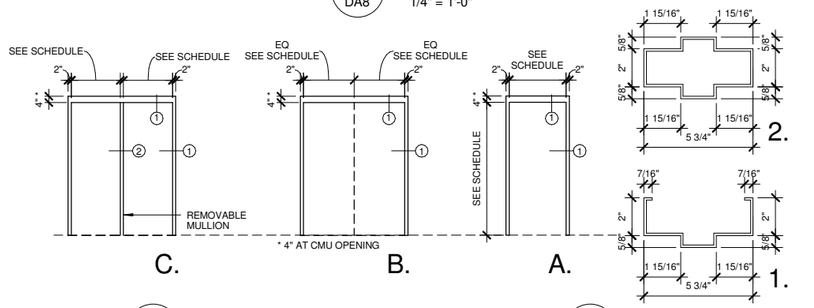
9 DA8 PARTITION TYPE M1/S
1 1/2" = 1'-0"

PARTITION TYPES





5 DA8 DOOR ELEVATIONS
1/4" = 1'-0"



4 DA8 DOOR FRAME ELEVATIONS
1/4" = 1'-0"

3 DA8 DOOR FRAME DETAIL
3" = 1'-0"

6808 ODANA RD, SUITE 200
MADISON, WI 53719-1137
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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WI

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53WT0434
ISSUE DATE January 13, 2017
DESIGNED BY
DRAWN BY Short Elliott Hendrickson, Inc.
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SHEET TITLE
OPENING, PROFILES AND PARTITIONT YPES

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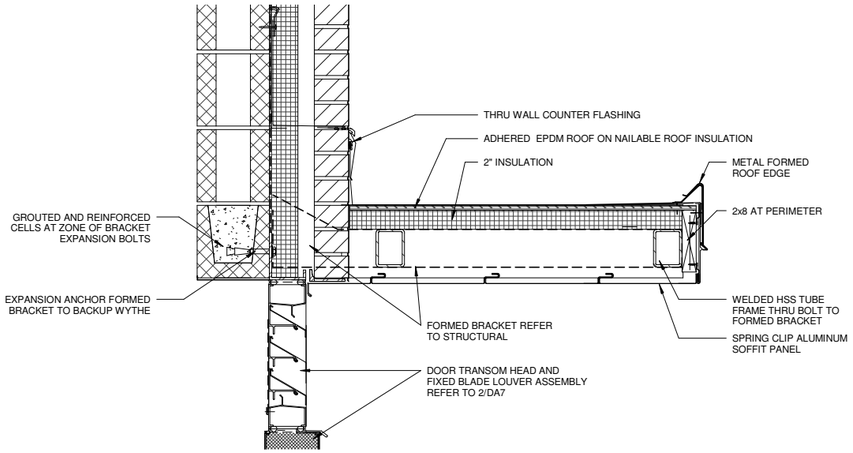
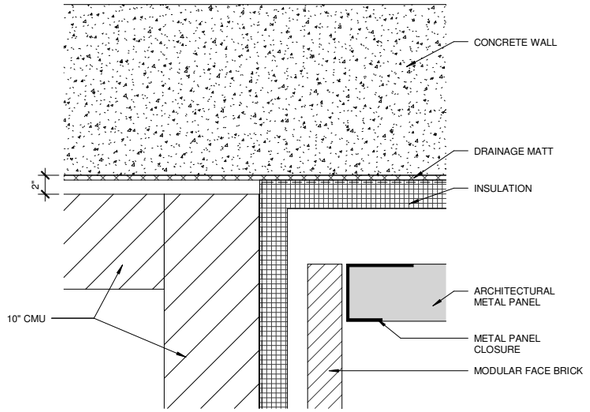


8 DA9 — DETAIL AT CANOPY
1 1/2" = 1'-0"



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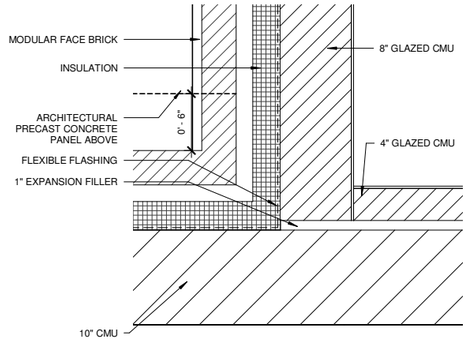

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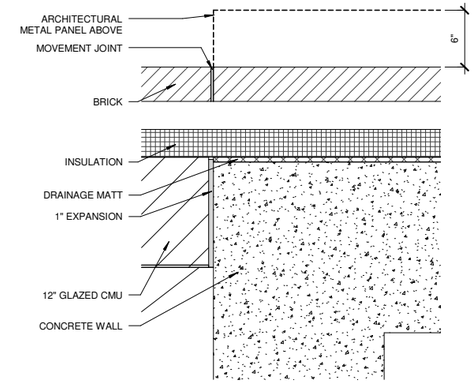

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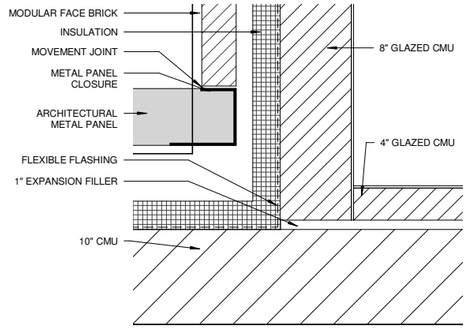

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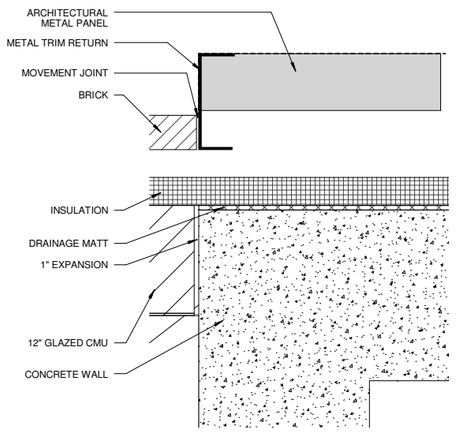

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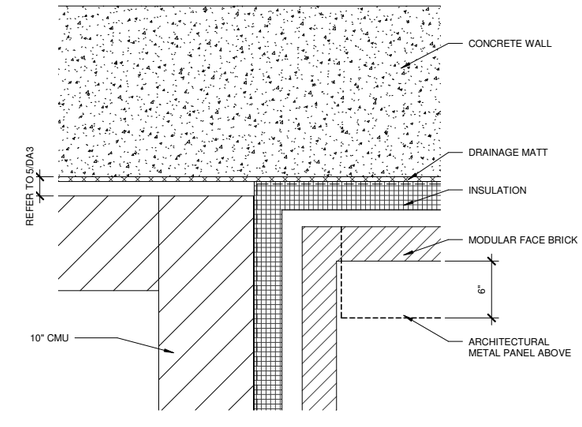

3 DA9 — DETAIL AT BRICK
1 1/2" = 1'-0"

7 DA9 — ROOF HATCH DETAIL
3" = 1'-0"

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GENERAL STRUCTURAL NOTES

THESE NOTES DO NOT REPLACE THE SPECIFICATIONS BUT ARE TO BE READ IN CONJUNCTION WITH THEM. ANY DISCREPANCIES OR CONFLICTS BETWEEN THE TWO SHALL BE BROUGHT TO THE ATTENTION OF THE SER FOR RESOLUTION.

THESE DRAWINGS ARE FOR MADISON WATER UTILITY UNIT WELL 31 AND STORAGE FACILITY AND NO OTHER USE IS AUTHORIZED. CONTACT SER, BEN WOLF OF SEH AT 507-316-6648.

GOVERNING BUILDING CODE:

1. 2011 WISCONSIN ENROLLED COMMERCIAL BUILDING CODE.
2. 2009 INTERNATIONAL BUILDING CODE AS ADOPTED AND AMENDED BY THE STATE BUILDING CODE
3. ACI - 350 ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES
4. ACI - 318
5. AISC - 360, 303

DESIGN LOADS

1. LIVE LOAD:
   FLOOR SLABS 150 PSF U.N.O.
2. SNOW LOADS:
   GROUND SNOW LOAD 30 PSF — SNOW EXPOSURE FACTOR 1.0
   ROOF SNOW LOAD 25 PSF + DRIFTING & UNBALANCED PER IBC — THERMAL FACTOR 1.00
   IMPORTANCE FACTOR 1.20 (BASED ON OCC CAT III) — RAIN LOADS N/A
3. WIND LOADS: (ASCE 7-05)
   WIND SPEED (3 SEC GUST) 90.00 MPH
   WIND IMPORTANCE FACTOR 1.15 (BASED ON OCC CAT III)
   WIND EXPOSURE C
   INTERNAL PRESS COEF +/-0.55
4. SEISMIC LOADS:
   SITE CLASS D — Fv 2.4
   Ss 0.11 G — Ie 1.0
   S1 0.08 G — RISK CATEGORY III
   Fa 1.6 — SEISMIC DESIGN CATEGORY B
5. SOIL CRITERIA:
   ALLOWABLE SOIL BEARING PRESSURE 1,500 PSF
   Q100 WATER ELEVATION ---
   PERCHED GROUNDWATER ELEVATION ---
   DEWATER AS REQUIRED TO KEEP EXCAVATIONS DRY
   FROST DEPTH 48 INCHES
   ANTICIPATED MAX DIFFERENTIAL SETTLEMENT 1/2 INCH
   ANTICIPATED MAX TOTAL SETTLEMENT 1 INCH
   CLAY BACKFILL — SAND BACKFILL
   WET UNIT WEIGHT 120 PCF — WET UNIT WEIGHT 115 PCF
   FRICTION ANGLE 25 DEGREES — FRICTION ANGLE 35 DEGREES
   AT-REST PRESSURE 70 PCF — AT-REST PRESSURE 50 PCF
   PASSIVE PRESSURE 300 PCF
   SLIDING COEFFICIENT 0.35
   SUBGRADE MODULUS 150 PCI
6. PRECAST PLANK LOADING, WHERE NOT NOTED ON DRAWINGS:
   APPLIED DEAD LOAD 2" CONCRETE TOPPING 25 PSF
   3" CONCRETE TOPPING 38 PSF
   LIGHTING, PIPING, HVAC 20 PSF
   LIVE LOAD 100 PSF PLUS LIFTING LOADS AS SHOWN ON DRAWINGS

DESIGN / CONSTRUCTION CRITERIA

1. THE CONTRACTOR SHALL VERIFY DIMENSIONS AND CONDITIONS BEFORE CONSTRUCTION AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES, INCONSISTENCIES, OR DIFFICULTIES AFFECTING THE WORK BEFORE PROCEEDING.
2. ALL. MATERIAL, WORKMANSHIP, AND DETAILS SHALL BE IN ACCORDANCE WITH TYPICAL COMPETENT CONSTRUCTION PRACTICES, CURRENT MANUFACTURERS RECOMMENDATIONS, AND ALL APPLICABLE CODES AND GOVERNMENT REGULATIONS. SPECIAL STRUCTURAL INSPECTION IS REQUIRED AS SCHEDULED AND PER IBC CHAPTER 17. CONTRACTOR SHALL COORDINATE WITH OWNER'S TESTING AGENCY.
3. THE CONTRACTOR SHALL COORDINATE ALL DISCIPLINES, VERIFYING SIZE AND LOCATION OF ALL OPENINGS, WHETHER SHOWN ON STRUCTURAL DRAWINGS OR NOT, AS CALLED FOR ON ARCHITECTURAL, MECHANICAL, OR ELECTRICAL DRAWINGS. ALL CONFLICTS, INCONSISTENCIES, OR OTHER DIFFICULTIES AFFECTING STRUCTURAL WORK SHALL BE CALLED TO THE ARCHITECT AND ENGINEER'S ATTENTION FOR DIRECTION BEFORE PROCEEDING.
4. THE CONTRACTOR SHALL SUPPLY ALL NECESSARY TEMPORARY BRACING, SHORING, GUYING, OR OTHER MEANS TO AVOID EXCESSIVE STRESSES AND TO HOLD STRUCTURAL ELEMENTS IN PLACE DURING CONSTRUCTION.
5. JOB SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR & THEIR SUBCONTRACTORS.
6. THE ENGINEER IS NOT RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES OR PRACTICES. WHERE DRAWINGS AND DETAILS IMPLY THIS, THEY ARE PROVIDED TO SHOW FINAL CONSTRUCTION. IF CONTRACTOR DESIRES TO USE DIFFERENT MEANS AND METHODS THAN IMPLIED BY THESE DRAWINGS, SUBMIT SIMILAR DETAILS FOR REVIEW.
7. STANDARD OR TYPICAL STRUCTURAL DETAILS ARE INTENDED TO ILLUSTRATE DESIGN CONCEPTS AND TO SPECIFY MATERIAL AND REQUIRED PHYSICAL DIMENSIONS MATCHING OR SIMILAR TO THE REFERENCED LOCATIONS IN THE DRAWINGS SET.
8. THERE IS NO PROVISION FOR FUTURE VERTICAL EXPANSION IN THE DESIGN.

FOUNDATIONS

1. CAUTION: EXISTING UNDERGROUND UTILITIES MAY EXIST ANYWHERE ON THE SITE. NOTIFY DIGGER'S HOTLINE (800) 242-8511 PRIOR TO DISTURBING ANY GRADE OR EXCAVATION.
2. STRUCTURAL FOUNDATIONS CONSIST OF WALL AND SPREAD FOOTINGS ESTABLISHED ON MATERIAL CAPABLE OF SAFELY SUPPORTING 1.5 KSF AS RECOMMENDED BY CONSTRUCTION - GEOTECHNINCAL CONSULTANTS, INC. TESTING IN REPORT C15099 DATED 5/8/2015. THE STRUCTURAL ENGINEER IS NOT RESPONSIBLE FOR THE ACCURACY OR CONTENT OF THE SUBSURFACE SOIL CONDITIONS DESCRIBED IN THE SPECIFICATIONS, TEST BORINGS, OR GEOTECHNICAL REPORT. THE OWNER SHALL EMPLOY A CERTIFIED GEOTECHNICAL ENGINEER DURING CONSTRUCTION TO TEST, INSPECT AND VERIFY ALL ASSUMED SOIL CONDITIONS.
3. FOUNDATION WALLS SHALL BE ADEQUATELY BRACED DURING BACKFILLING AND COMPACTION TO PREVENT MOVEMENT OR STRUCTURAL DAMAGE. BRACING SHALL REMAIN IN PLACE UNTIL PERMANENT BRACING IS IN PLACE AND UNTIL CONCRETE ACHIEVES SUFFICIENT STRENGTH TO RESIST IMPOSED LOADS.
4. WHEN PLACING COMPACTED FILL ADJACENT TO FOUNDATION WALLS AND PIERS, PLACE BACKFILL AT EQUAL RATES ON BOTH SIDES TO PREVENT OVERTURNING OR STRUCTURAL DAMAGE.
5. CONTRACTOR SHALL PROVIDE FOR DEWATERING AT EXCAVATIONS FROM EITHER SURFACE WATER OR SEEPAGE.
6. MOISTURE CONTENT IN SOILS BENEATH BUILDING LOCATIONS SHOULD NOT BE ALLOWED TO CHANGE AFTER FOOTING EXCAVATIONS AND AFTER GRADING FOR SLABS ON GRADE ARE COMPLETED. IF SUBGRADE MATERIALS BECOME DESICCATED OR SOFTENED BY WATER OR OTHER CONDITIONS, REMOVE AND REPLACE WITH ENGINEERED FILL AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER. DO NOT PLACE CONCRETE ON FROZEN GROUND, NOR ALLOW GROUND BENEATH FOUNDATIONS TO FREEZE. ALL FOUNDATION WORK SHALL BE PLACED ON SUBSTRATE APPROVED AND TESTED BY GEOTECHNICAL ENGINEER OF RECORD.
7. DO NOT PLACE BACKFILL ON FROZEN SUBGRADE. DO NOT PLACE FROZEN BACKFILL.
8. SLABS ON GRADE SHALL BE CONSTRUCTED ON A SUBGRADE OF ENGINEERED FILL COMPACTED TO AT LEAST 96 PERCENT OF ITS MAXIMUM DRY DENSITY (STANDARD PROCTOR) AND 6 INCHES OF AGGREGATE BASE BELOW THE SLAB. TANK SLAB SUBGRADE SHALL CONSIST OF AT LEAST 2 FOOT OF CLEAN SAND OR DRAINAGE AGGREGATE OVER NATIVE STIFF CLAYEY SOILS.
9. GRADING: WHERE NOT SPECIFICALLY SHOWN ON THE PLANS, IT IS INTENDED THAT ALL EXCAVATED AND BACKFILLED AREAS SHALL BE GRADED TO SLOPE AWAY FROM BUILDINGS AND OTHER STRUCTURES.

CONCRETE

1. CONCRETE AND ITS PLACEMENT SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE FOLLOWING:
   ACI 350 ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES
   ACI 318 BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE
   ACI 301 SPECIFICATIONS FOR STRUCTURAL CONCRETE
   ACI MCP MANUAL OF CONCRETE PRACTICE
2. AN INDEPENDENT TESTING AGENCY SHALL CAST 4 TEST CYLINDERS FOR EACH 75 CUBIC YARDS OF EACH CONCRETE MIX PLACED OR FOR EACH DAY'S OPERATION, WHICH EVER IS THE LESSER AMOUNT. THE TESTING AGENCY SHALL CAST, CURE, AND TEST THE SPECIMENS IN ACCORDANCE WITH ASTM C31 AND ASTM C39. AIR AND SLUMP SHALL BE TESTED FOR EACH TRUCKLOAD AT THE FINAL LOCATION (TEST AFTER PUMP, NOT AT TRUCK).
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF FORM WORK TO COMPLY WITH THE DIMENSIONS INDICATED ON THE PLANS, MAINTAINING PROPER ALIGNMENT DURING CONCRETE POURING OPERATIONS. SPECIAL CARE SHALL BE TAKEN WITH FORMWORK FOR SELF-CONSOLIDATING CONCRETE.
4. ALL CONCRETE EXCEPT EXTERIOR FLAT WORK AND BACKWASH TANK SHALL DEVELOP MINIMUM ULTIMATE COMPRESSIVE DESIGN STRENGTH OF 4000 PSI IN 28 DAYS. CONCRETE USED IN WALLS AND FOOTINGS SHALL HAVE A MAXIMUM W/C (WATER/ CEMENT + POZZOLAN) RATIO OF 0.45, AND A MAXIMUM OF 4 INCHES OF SLUMP BEFORE ADDITION OF ADMIXTURES. CONCRETE USED IN SLAB ON GRADE STRUCTURAL SLABS SHALL HAVE A MAXIMUM W/C RATIO OF 0.45, AND A MAXIMUM OF 4 INCHES OF SLUMP BEFORE ADDITION OF ADMIXTURES. CONCRETE USED IN BACKWASH TANK WALLS AND FLOOR SLAB SHALL DEVELOP ULTIMATE COMPRESSIVE STRENGTH OF 5000 PSI IN 28 DAYS. AND SHALL HAVE A MAXIMUM W/C RATIO OF 0.43.
5. CONCRETE FOR EXTERIOR FLATWORK AND STOOP SLABS SHALL HAVE A MINIMUM DESIGN COMPRESSIVE STRENGTH OF 4500 PSI IN 28 DAYS, A MAXIMUM W/C RATIO OF .45, WITH 6% +/- 1% AIR ENTRAINMENT, AND A MAXIMUM OF 4 INCHES OF SLUMP BEFORE ADDITION OF WATER REDUCING ADMIXTURE.
6. THE PRECEEDING MINIMUM MIX REQUIREMENTS MAY HAVE WATER-REDUCING ADMIXTURES CONFORMING TO ASTM C494 ADDED TO THE MIX AT MANUFACTURER'S DOSAGE RATES FOR IMPROVED WORKABILITY. NO CHLORIDE CONTAINING ADMIXTURES WILL BE ALLOWED. DO NOT ADD WATER TO CONCRETE AT THE JOBSITE WITHOUT WRITTEN APPROVAL OF THE S.E.R.
7. CONCRETE USED IN TANK SLABS AND WALLS SHALL HAVE XYPEX ADMIXTURE ADDED TO THE MIX AT MANUFACTURER'S DOSAGE RATES (MAXIMUM 2 PERCENT OF CEMENT CONTENT IN POTABLE WATER TANKS). CONCRETE USED IN ANAEROBIC TANKS AND AREAS SUBJECT TO DE-ICING SALTS SHALL HAVE CORTEC MCI ADDED TO THE MIX AT MANUFACTURER'S DOSAGE RATES.
8. ALL CONCRETE IS NORMAL WEIGHT UNLESS SPECIFICALLY NOTED OTHERWISE. CEMENT SHALL BE PORTLAND CEMENT TYPE 1 CONFORMING TO ASTM C150. UP TO 25% CEMENT CAN BE REPLACED WITH CLASS "C" FLYASH. AND UP TO 40% WITH GGBFS (50% COMBINED MAX.). AGGREGATE FOR NORMAL WEIGHT CONCRETE SHALL CONFORM TO ASTM C33. WATER IS TO BE POTABLE.
9. PROTECT CONCRETE IN ACCORDANCE WITH ACI 305 AND ACI 306 FOR HOT WEATHER CONCRETING AND COLD WEATHER CONCRETING RESPECTIVELY. WHEN HEAT IS REQUIRED, CONCRETE SHALL NOT BE EXPOSED TO COMBUSTION PRODUCTS (USE DUCTED HEATER OR GROUND THAW). KEEP PROTECTION IN PLACE MINIMUM 24 HOURS AFTER CESSATION OF HEATING TO PROVIDE GRADUAL COOL-DOWN. CONCRETE BEING PLACED SHALL BE PROTECTED FROM RAIN. IF RAIN FALLS ON CONCRETE BEFORE IT HAS SET, OR WITHIN 3 HOURS OF PLACEMENT IN ANY EVENT, CONTRACTOR SHALL BEAR COST OF TESTING TO PROVE CONCRETE IS UNAFFECTED, AND SHALL REMOVE AND REPLACE AFFECTED CONCRETE TO THE SATISFACTION OF THE ENGINEER.
10. CEMENTITIOUS GROUT SHALL BE NON-SHRINK AND NON-METALLIC GROUT. PLACE ACCORDING TO MANUFACTURER'S RECOMMENDATIONS AND TRIM NEATLY WHERE VISIBLE.
11. COORDINATE WITH OTHER TRADES FOR SLEEVES, CONDUIT, ELECTRICAL GROUNDING WIRES, INSERTS, UNDERGROUND UTILITIES, AND OTHER ITEMS TO BE EMBEDDED INTO CONCRETE AND VERIFY THAT THEY ARE PROPERLY INSTALLED AND SUPPORTED BEFORE CASTING CONCRETE. DIAMETER OF CONDUIT AND PIPE RUNNING WITHIN SLAB OR WALL SHALL NOT EXCEED 1/6 THE SLAB OR WALL THICKNESS AND SHALL BE PLACED IN THE CENTER OF THE MEMBER. PLACEMENT OF SUCH ITEMS SHALL BE COORDINATED WITH REINFORCING PLACEMENT WHERE THEY WOULD OTHERWISE DISPLACE EACH OTHER. FOR INSTANCE, IN AREAS WITH A SINGLE MAT OF REINFORCING, EAST-WEST CONDUIT SHOULD BE PLACED WITH EAST-WEST REINFORCING, THEN NORTH-SOUTH CONDUIT IS PLACED WITH NORTH-SOUTH REINFORCING.
12. NO UNCOATED ALUMINUM ITEMS SHALL BE EMBEDDED IN ANY CONCRETE. ALL ALUMINUM SURFACES IN DIRECT CONTACT WITH CONCRETE SHALL RECEIVE ONE 8-12 MIL DRY FILM THICKNESS BITUMASTIC.
13. UNLESS SHOWN ON DRAWINGS, CONCRETE SHALL BE PLACED WITHOUT CONSTRUCTION JOINTS EXCEPT WHERE SPECIFICALLY SHOWN ON SHOP DRAWINGS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING ADDITIONAL OR ALTERNATE CONSTRUCTION JOINT LOCATIONS TO THE ENGINEER FOR APPROVAL.
14. BEVEL ALL EXPOSED CORNERS OF CONCRETE 3/4"X3/4".
15. VERIFY SIZE AND LOCATION OF ALL EQUIPMENT BASES / HOUSEKEEPING PADS
16. CONCRETE FLOORS: ALL CAST-IN-PLACE CONCRETE FLOORS SHALL BE PROVIDED WITH A MIN. 1/8" PER FT SLOPE TO FLOOR DRAINS UNLESS NOTED OTHERWISE. ALL INTERIOR SLABS ON GRADE SHALL BE PLACED OVER 15 MIL VAPOR BARRIER WITH JOINTS WELDED OR LAPPED AND SEALED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. ALL DAMAGE AND PENETRATIONS SHALL BE SEALED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. IF CONCRETE CONTAINS MORE THAN 2 PERCENT ENTRAINED AIR, DELAY START OF FINISHING TO PRECLUDE WEAKENED AIR-RICH PLANE JUST BELOW SURFACE.
17. WATERSTOPS SHALL BE PVC, CENTER BULB, RIBBED, UNLESS SPECIFICALLY NOTED OTHERWISE.

PRECAST CONCRETE

1. PRE-ENGINEERED PRECAST UNITS SHALL BE IN COMPLIANCE AND DESIGNED IN ACCORDANCE WITH THE FOLLOWING AGENCIES REQUIREMENTS AND RECOMMENDATIONS:
   ACI 318- LATEST EDITION "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE,
   PCI MNL 120- LATEST EDITION "PCI DESIGN HANDBOOK- PRECAST AND PRESTRESSED CONCRETE"
   PCI MNL 123- LATEST EDITON "DESIGN AND TYPICAL DETAILS OF CONNECTIONS PRECAST AND PRESTRESSED CONCRETE"
2. PRIOR TO INSTALLATION, THE PRECAST CONCRETE MANUFACTURER SHALL SUBMIT STRUCTURAL CALCULATIONS AND PLANS TO THE ARCHITECT/ENGINEER FOR REVIEW. THE STRUCTURAL CALCULATIONS SHALL. CONTAIN AN ORIGINAL PROFESSIONAL ENGINEER'S SEAL AND SIGNATURE BY THE DESIGN ENGINEER REGISTERED IN THE STATE WHERE THE PROJECT IS LOCATED.
3. PRECAST CONCRETE UNITS SHALL BE DESIGNED FOR ALL POTENTIAL LOADING CONDITIONS INCLUDING INITIAL HANDLING AND ERECTION STRESSES, ALL SUPERIMPOSED DEAD AND LIVE LOADS SHOWN ON THE CONTRACT DRAWINGS, AND ALL CONCENTRATED LOADS FROM MECHANICAL EQUIPMENT AND LIFTING POINTS. GENERAL CONTRACTOR SHALL VERIFY MECHANICAL LOADS WITH THE MECHANICAL CONTRACTOR AND PROVIDE TO PRECAST DESIGNER AND S.E.R. BEFORE DESIGN.
4. THE PRECAST CONCRETE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL PRECAST CONNECTION HARDWARE INCLUDING HANGERS, EMBED PLATES, ANCHORS, CLIP ANGLES, ETC. THAT ARE CAST INTO THE PRECAST UNITS.
5. ALL ROOF OPENING DIMENSIONS AND LOCATIONS SHOWN ON THE PLANS SHALL BE VERIFIED BY THE CONTRACTOR AND ROOF MANUFACTURER.
6. WHERE TOPPING IS CALLED FOR, PLANK SHALL RECEIVE A TRANSVERSE BROOM FINISH AT PLANT AND SHALL HAVE KEYS GROUTED MINIMUM 4 DAYS BEFORE TOPPING IS PLACED. IMMEDIATELY BEFORE PLACING TOPPING, PRESSURE-WASH SURFACE OF PLANK AND BLOC CLEAN WITH OIL-FREE COMPRESSED AIR, THEN RUB WITH CEMENT SLURRY AS A BONDING AGENT, WORKING JUST AHEAD OF CONCRETE PLACEMENT. SURFACE TO BE FREE OF STANDING WATER BUT SLURRY MUST BE WET WHEN TOPPING IS PLACED. WET CURE TOPPING (BURLAP/POLY) FOR A MINIMUM OF 7 DAYS.

REINFORCING STEEL

1. ALL REINFORCING STEEL SHALL BE DETAILED, FABRICATED, AND INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND CODES: ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCING" ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" MSP2 "CRSI MANUAL OF STANDARD PRACTICE" AWS D1.4 "STRUCTURAL WELDING CODE- REINFORCING STEEL" WRI "WELDED WIRE FABRIC MANUAL OF STANDARD PRACTICE"
2. ALL CONCRETE IS REINFORCED CONCRETE UNLESS SPECIFICALLY CALLED OUT AS UNREINFORCED. REINFORCE ALL CONCRETE NOT OTHERWISE SHOWN WITH SAME STEEL AS IN SIMILAR SECTIONS OR AREAS. ANY DETAILS NOT SHOWN SHALL BE DETAILED PER ACI 315 AND MEET REQUIREMENTS OF ACI 318, CURRENT EDITIONS.
3. ALL REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615 OR A706 GRADE 60 STEEL. REINFORCING TO BE WELDED SHALL ONLY BE WELDED TO STRUCTURAL STEEL, NOT OTHER REINFORCING, UNLESS SPECIFICALLY NOTED ON THE DRAWINGS. WELDED PLAIN WIRE FABRIC SHALL BE SUPPLIED IN SHEETS, NOT ROLLS, AND CONFORM TO THE REQUIREMENTS OF ASTM A185.
4. CLEAR MINIMUM COVERAGE OF CONCRETE OVER REINFORCING STEEL SHALL BE AS FOLLOWS UNLESS SPECIFICALLY NOTED OTHERWISE:
   CONCRETE PLACED AGAINST EARTH 3"
   ALL OTHER CONCRETE 2"
5. ALL FOOTING DOWELS SHALL BE ACCURATELY POSITIONED AND WIRED IN PLACE BEFORE CASTING FOOTING CONCRETE. WHERE NOT NOTED, PROVIDE AND INSTALL DOWELS OF SAME SIZE AND SPACING AS VERTICAL REINFORCEMENT IN ALL COLUMNS AND WALLS. POSITION ALL ANCHOR BOLTS WITH TEMPLATES.
6. BAR LAP LENGTHS IN CONCRETE AND 90 DEGREE END HOOKS SHALL BE IN ACCORDANCE WITH THE TABLE BELOW UNLESS NOTED OTHERWISE. THIS TABLE LISTS CLASS 'B' LAPS. INCREASE LAP LENGTH BY 50% FOR EPOXY COATED REINFORCING STEEL WITH C-C BAR SPACING < 6Db AND COVER TO CENTER OF BAR <3Db, OTHERWISE INCREASE BY 20%. FOR MASONRY REINFORCING, USE "WALL TOP BAR" VALUES.

REINF.	WALL, COLUMN OR SLAB		BEAMS		90 DEGREE
BAR SIZE	BAR LAP	* TOP BAR	BAR LAP	* TOP BAR	END HOOK
#3	19 IN	24 IN	28 IN	36 IN	6 IN
#4	25 IN	32 IN	37 IN	48 IN	8 IN
#5	31 IN	40 IN	46 IN	60 IN	10 IN
#6	37 IN	48 IN	56 IN	72 IN	12 IN
#7	54 IN	70 IN	81 IN	105 IN	14 IN
#8	62 IN	80 IN	93 IN	120 IN	16 IN
#9	70 IN	90 IN	104 IN	135 IN	18 IN

* DENOTES TOP BAR SPLICES: HORIZONTAL REINFORCEMENT PLACED SUCH THAT MORE THAN 12-INCHES OF CONCRETE IS CAST IN THE MEMBER BELOW THE SPLICE.

7. BARS MARKED CONTINUOUS, CORNER BARS, AND ALL VERTICAL STEEL SHALL BE LAPPED IN ACCORDANCE WITH TABLE ABOVE AT SPLICES AND EMBEDMENTS, UNLESS SHOWN OTHERWISE. SPLICE TOP BARS NEAR MIDSPAN AND SPLICE BOTTOM BARS OVER SUPPORTS, UNLESS NOTED OTHERWISE.
8. BAR SUPPORT ACCESSORIES SHALL BE AS SPECIFIED IN LATEST EDITION OF THE ACI DETAILING HANDBOOK AND THE CONCRETE REINFORCING STEEL INSTITUTE DESIGN HANDBOOK. MAXIMUM ACCESSORY SPACING SHALL BE 4'-0" ON CENTER, AND ALL ACCESSORIES ON EXPOSED SURFACES SHALL HAVE PLASTIC COATED ENDS.
9. ALL SLABS AND STAIRS NOT SHOWN OTHERWISE SHALL BE 6" THICK WITH #4 BARS AT 12" ON CENTER EACH WAY. ALL EXTERIOR STOOPS NOT OTHERWISE DETAILED MAY BE CONSTRUCTED IN ANY STANDARD MANNER, SOLID OR HOLLOW, BUT MUST BE REINFORCED WITH EPOXY COATED #4 BARS AT 12" ON CENTER EACH WAY MINIMUM. PORCHES AND STOOPS SHALL BE DOWELED TO ADJACENT WALLS OR GRADE BEAMS WITH #4 BARS AT 12" ON CENTER, HOOKED OR EMBEDDED 40 DIAMETERS INTO BOTH MEMBERS. SLOPE STOOPS 1/8" PER FOOT FOR DRAINAGE UNLESS NOTED OTHERWISE.

CONCRETE BLOCK MASONRY

1. REINFORCED CONCRETE MASONRY MATERIALS AND CONSTRUCTION SHALL COMPLY WITH THE FOLLOWING CODES AND SPECIFICATIONS: ACI 530.1- LATEST EDITION, TMS 602- "SPECIFICATIONS FOR MASONRY STRUCTURES"- LATEST EDITION, ACI 530/ASCE 5/ TMS 402- "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES"- LATEST EDITION.
2. CONCRETE BLOCK USED IN EXTERIOR WALLS OR LOAD BEARING WALLS SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS:
   MASONRY ASSEMBLY Fm'= 1,500 PSI
   CONCRETE MASONRY UNITS: ASTM C90-11a 1,900 PSI
   MORTAR, ASTM C-270-10 TYPE M BELOW GRADE
   TYPE S ABOVE GRADE
   GROUT, ASTM C-476-10 f's= 3000 PSI
3. THE CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY BRACING FOR ALL MASONRY WALLS DURING CONSTRUCTION.
4. CONCRETE BLOCK SHALL BE LAID IN RUNNING BOND PATTERN TYPICAL UNLESS NOTED OTHERWISE. NO VERTICAL (HEAD) JOINT SHALL BE CONTINUOUS FOR MORE THAN ONE BLOCK HEIGHT. LAY HOLLOW CONCRETE MASONRY UNITS WITH FULL MORTAR COVERAGE ON HORIZONTAL AND VERTICAL FACE SHELLS. BED WEBS IN MORTAR IN STARTING COURSE ON FOOTINGS AND FOUNDATION WALLS AND IN ALL COURSES OF PIERS, COLUMNS, AND PILASTERS, AND WHERE ADJACENT TO CELLS OR CAVITIES WHICH ARE TO BE REINFORCED OR TO BE FILLED WITH CONCRETE OR GROUT.
5. ALL JOINTS SHALL BE CONCAVE TOOLED JOINTS ABOVE AND BELOW GRADE.
6. MASONRY WALLS SHALL BE REINFORCED WITH HOT DIPPED GALVANIZED TRUSS HORIZONTAL REINFORCING (PER ASTM A153) WITH 9 GAGE SIDE AND CROSS RODS. REINFORCING SHALL BE CONTINUOUS IN HORIZONTAL JOINTS EVERY OTHER BLOCK COURSE (16" O.C.) IN WALLS EVERY COURSE (8" O.C.) IN PARAPETS, WITH PREFABRICATED CORNER AND TEE SECTIONS.
7. UNLESS NOTED OTHERWISE, CONCRETE BLOCK SHALL BE REINFORCED AS FOLLOWS IN 6", 8", 10", AND 12" WALLS:
   - VERTICAL REINFORCING SHALL BE A MINIMUM OF 1 - #5 BAR IN 6" AND 8" WALLS AND 2 - #4 BARS IN 10" AND 12" WALLS AT 4'-0" ON CENTER, AT EACH CORNER, AT EACH DOOR AND WINDOW JAMB, EACH SIDE OF CONTROL JOINTS AND IN THE END VOID OF EACH LENGTH OF WALL. LAP SPLICES FOR MASONRY VERTICAL REINFORCING SHALL BE ACCORDING TO THE TABLE ABOVE, FOR "WALL TOP BAR."
   - STACK BOND CMU SHALL HAVE CONTINOUS HORIZONTAL BOND BEAMS AT 48"0.C. REINFORCED WITH 2#4 CONTINUOUS.
   - CONTINUOUS HORIZONTAL BARS SHALL BE INCLUDED PER SECTION OR DETAIL IN BOND BEAM OR OPTIONAL RUNNING BOND BEAM WHERE NOTED. WHERE NOT DETAILED, USE 2-#5 CONTINUOUS. WHERE BOND BEAMS ARE CONTINUOUS AT CORNERS OF WALLS, SUPPLY CORNER BARS MATCHING SIZE OF HORIZONTAL BARS. ALL BOND BEAM REINFORCING SHALL HAVE STANDARD LAPS OR HOOKED DEVELOPMENT REINFORCING BARS AT WALL CORNERS AND INTERSECTIONS.
9. GROUTING AND REINFORCING: ALL MASONRY, GROUTING, AND REINFORCING WORK SHALL BE PERFORMED BY MASON CRAFTWORKERS WHO HAVE SUCCESSFULLY COMPLETED THE INTERNATIONAL MASONRY INSTITUTE (1-800-IMI -0988) TRAINING COURSE FOR GROUTING AND REINFORCED MASONRY CONSTRUCTION, OR EQUAL
10. MASONRY BLOCK CELLS WITH VERTICAL REINFORCING AND BOND BEAMS WITH HORIZONTAL REINFORCING SHALL BE GROUTED SOLID WITH A CEMENT GROUT MIX, Fg' = 3000 PSI. MORTAR IS NOT ACCEPTABLE. PROVIDE A CLEANOUT HOLE AT THE BASE OF ALL GROUTED CELLS. ACCOUNT FOR FLY ASH IN GROUT DURING WINTER CONSTRUCTION BY PROTECTING AND HEATING AS REQUIRED TO ASSURE SET AND STRENGTH GAIN.
11. NON-LOAD BEARING CONCRETE BLOCK WALLS SHALL BE ISOLATED FROM ADJACENT STRUCTURAL ELEMENTS WITH VERTICAL 1/2 INCH CONTROL JOINTS AND AT THE TOP OF THE WALL WITH MINIMUM 1/2 INCH AIR SPACE OR COMPRESSIBLE MATERIAL AND SUPPORT PER DETAILS ON THE DRAWINGS.
12. UNLESS OTHERWISE COVERED ON ARCHITECTURAL PLANS OR SPECIFICATIONS, VERTICAL CONTROL JOINTS IN MASONRY CONSTRUCTION SHALL BE 3/8" WIDE, FULL HEIGHT OF WALL. JOINTS SHALL BE SPACED AT A MAXIMUM OF 16' -0" ON CENTER AND COORDINATED WITH THE ARCHITECT/ENGINEER. INSTALL CONTROL JOINTS IN LOCATIONS AS REQUIRED AND AS DIRECTED BY ENGINEER/ARCHITECT.
13. ALL HORIZONTAL JOINT REINFORCING SHALL BE DISCONTINUOUS AT CONTROL JOINTS IN MASONRY. ALL BOND BEAM HORIZONTAL REINFORCING SHALL BE CONTINUOUS THROUGH CONTROL JOINTS.
14. LINTELS OVER ALL OPENINGS IN WALLS NOT OTHERWISE NOTED SHALL BE ONE 6" X 3-1/2" X 5/16" ANGLE FOR EACH 4" OF MASONRY (2 ANGLES FOR 12" CMU). ALL EXTERIOR LINTELS TO BE HOT-DIP GALVANIZED.
15. PROVIDE ADDITIONAL VERTICAL REINFORCEMENT AT ENDS OF WALLS, CORNERS, AND OPENINGS. REINFORCING SIZE TO MATCH WALL REINFORCING. WALLS SHALL BE ANCHORED AT BOTTOM BY DOWELS MATCHING WALL VERTICAL REINFORCING (UNLESS NOTED OTHERWISE) FROM FLOOR SLAB BOTTOM. WALLS SHOULD BE ANCHORED AT TOP BY BRACING ANGLES PER DETAILS ON DRAWINGS.
16. BOTTOM COURSE OF BOND BEAM LINTELS SHALL BE STANDARD "HORSE COLLAR" TYPE (U-SHAPED) BLOCK. COURSES ABOVE SHALL BE FLOW-THROUGH BOND BEAM BLOCK IN ORDER TO MAINTAIN COURSING. CONTINUITY BOND BEAMS MAY BE FLOW-THROUGH BLOCK.
17. ALL EXPOSED CONCRETE MASONRY SURFACES WITHIN ROOMS 100 THROUGH 105 SHALL BE GLAZED CMU WITH COVED STARTER COURSE AT FLOOR LEVEL AND BULLNOSE CORNERS.
18. MASON SHALL DETERMINE AND PROVIDE SPECIAL BLOCK SHAPES AS NEEDED AT JAMBS, SILLS, AND HEADS OF OPENINGS AND ENDS OF WALLS TO MAINTAIN BOND PATTERN CONSISTENT WITH REMAINDER OF WALL.

POST INSTALLED ANCHOR RODS AND DOWELS

1. UNLESS NOTED OTHERWISE, ANCHORS AND REINFORCING DOWELS INSTALLED IN CONCRETE OR CONCRETE MASONRY SHALL BE AS NOTED BELOW. ANCHORS NOT SHOWN OR NOTED ON THE DRAWINGS, THOSE REQUIRED BY THE CONTRACTOR SOLELY FOR HIS MEANS AND METHODS, OR THOSE REQUIRED BY MECHANICAL/ELECTRICAL AND CARRYING LESS THAN 100 POUNDS, DO NOT REQUIRE SPECIAL INSPECTION.
2. APPROVED MANUFACTURERS ARE: HILTI, ITW/REDHEAD, SIMPSON, AND POWERS/RAWL. SUBMIT PRODUCT DATA AND CURRENT ICC ES REPORT OR IAPMO REPORT SHOWING PRODUCT IS COMPLIANT WITH PROJECT CODE REQUIREMENTS FOR REVIEW. CONTRACTOR SHALL ARRANGE FOR MANUFACTURER'S REP TO TRAIN ALL INSTALLERS ON THE COMPLETE INSTALLATION PROCESS. A LETTER OF PROCEDURE STATING METHOD OF DRILLING, THE PRODUCT FOR USE, THE COMPLETE INSTALLATION PROCEDURE, MANUFACTURER TRAINING DATE AND A LIST OF THE PERSONNEL TRAINED ON ANCHOR INSTALLATION SHALL BE SUBMITTED TO THE ENGINEER.
3. PERMANENT ANCHORS EXPOSED TO EARTH, WEATHER, OR CORROSIVE ENVIRONMENTS, INCLUDING ALL ANCHORS IN WWTP AND WATER TREATMENT PLANT WORK, SHALL BE STAINLESS STEEL TYPE 304 OR 316; ANCHORS IN CONTACT WITH SEWAGE OR CHLORIDE DE-ICER RUNOFF SHALL BE TYPE 316. OTHERWISE, ANCHORS SHALL BE ZINC PLATED, MINIMUM ASTM A36 MATERIAL UNLESS ASTM A193 GRADE B7 IS NOTED IN THE DRAWINGS, AND SHALL BE ACCORDING TO ASTM F1554. REINFORCING DOWELS SHALL BE OF THE SAME MATERIAL AND COATING (IF ANY) AS THE CONTINUING REINFORCING.
4. WHERE EXPANSION ANCHORS ARE CALLED FOR, CONTRACTOR MAY SUBSTITUTE SCREW TYPE ANCHORS WITH SELF-TAPPING THREADS OR ADHESIVE ANCHORS OF THE SAME SIZE AND EMBEDMENT, SUBJECT TO REVIEW OF CAPACITY BY THE ENGINEER FOR THE PRODUCT SUBSTITUTED. WHERE ADHESIVE ANCHORS ARE CALLED FOR, OTHER TYPES SHALL NOT BE SUBSTITUTED.
5. ADHESIVE SHALL HAVE A CURRENT ICC ES REPORT. USE HIGH VISCOSITY ADHESIVE AND PLACEMENT DEVICES IN CONSULTATION WITH THE MANUFACTURER FOR OVERHEAD WORK. OVERHEAD INSTALLATION SHALL BE SUBJECT TO CONTINUOUS SPECIAL INSPECTION DURING INSTALLATION. USE LOW TEMPERATURE FORMULATIONS FOR COLD WEATHER WORK. DO NOT APPLY SIGNIFICANT LOAD TO ANCHORS IN COLD WEATHER UNTIL THEIR CAPACITY HAS BEEN ASSURED.
6. ANCHORS INSTALLED IN CONCRETE MASONRY AND PRECAST HOLLOWCORE CONCRETE SHALL BE INSTALLED IN CORES GROUTED SOLID. MINIMUM GROUT STRENGTH Fg' = 3000 PSI. MINIMUM 6 INCHES OF GROUT EACH WAY ALONG HORIZONTAL CORES FROM ANCHOR. VERTICAL CORES SHALL BE GROUTED FULL HEIGHT. ANCHORS INSTALLED IN MASONRY SHALL NOT BE INSTALLED WITHIN 1 1/2 INCHES OF ANY HEAD JOINT UNLESS BLOCK ARE SQUARE END AND MORTARED ACROSS FULL WIDTH OF HEAD JOINT, OR FILLED BOND BEAM.
7. HOLES SHALL BE DRILLED, CLEANED, AND MAINTAINED UNTIL INSTALLATION IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS USING STANDARD ROTARY-IMPACT BITS AND OIL-FREE COMPRESSED AIR; DIAMOND CORE BITS SHALL NOT BE USED UNLESS SPECIFICALLY APPROVED BY THE MANUFACTURER. LOCATE AND AVOID REINFORCING BARS AND PT TENDONS. MAINTAIN SPACING (MINIMUM 8 INCHES) AND EDGE/CORNER DISTANCES (MINIMUM 4 INCHES) AS RECOMMENDED BY MANUFACTURER UNLESS SPECIFICALLY NOTED OTHERWISE IN THE DRAWINGS.
8. UNLESS NOTED OTHERWISE, ANCHORS SHALL BE INSTALLED TO THE FOLLOWING EMBEDMENTS:

	DIAMETER	CIP CONCRETE	GROUTED CMU
EXPANSION/SCREW:	1/2 INCH	3 1/2 INCHES	4 1/2 INCHES
	5/8 INCH	4 INCHES	5 INCHES
	3/4 INCH	5 INCHES	6 INCHES
ADHESIVE:	1/2 INCH	4 1/2 INCHES	5 1/2 INCHES
	5/8 INCH	5 INCHES	6 INCHES
	3/4 INCH	6 INCHES	7 INCHES (6" IN 8" CMU)

9. EXCEPT AS NOTED, ALL ANCHORS SHALL HAVE INTERMITTENT SPECIAL STRUCTURAL INSPECTION BY ONE OF THE FOLLOWING. LOAD TESTS SHALL BE TO 150 PERCENT OF SERVICE CAPACITY OR 50 PERCENT OF ULTIMATE STRENGTH, WITH NO APPRECIABLE SLIP OR PERMANENT DEFORMATION. ANCHORS WHICH FAIL THIS TEST SHALL BE REPLACED AT NO COST TO THE PROJECT. TWO FAILURES IN A GIVEN INSTALLATION SHALL RESULT IN MANDATORY LOAD TESTING AT DOUBLE THE RATE NOTED BELOW.

   EXPANSION AND SCREW ANCHORS:
   - WITNESS INSTALLATION WITH TORQUE WRENCH ACCORDING TO MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS OF ICC REPORT
   - TEST WITH TORQUE WRENCH AFTER INSTALLATION (INCLUDING LOAD TEST OF 5 PERCENT OF INSTALLED ANCHORS)
   - LOAD TEST OF 10 PERCENT OF INSTALLED ANCHORS BY SUPPLIER OR THIRD PARTY INSPECTOR

   ALL ADHESIVE ANCHOR RODS AND DOWELS SHALL HAVE SPECIAL STRUCTURAL INSPECTION (INTERMITTENT EXCEPT AS NOTED FOR OVERHEAD INSTALLATION) BY ONE OF THE FOLLOWING:
   - WITNESS INSTALLATION ACCORDING TO MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS OF ICC REPORT
   - LOAD TEST OF 10 PERCENT OF INSTALLED ANCHORS BY SUPPLIER OR THIRD PARTY INSPECTOR

STRUCTURAL METALS

1. ALL STRUCTURAL STEEL WIDEFLANGE BEAMS AND COLUMNS SHALL BE ASTM A992, GRADE 50 STEEL AND ALL MISCELLANEOUS STEEL SHALL BE ASTM A992 OR A36 STEEL (MIN. Fy = 36 KSI). RECTANGULAR STEEL TUBES (HSS) SHALL BE ASTM A500, GRADE B STEEL (Fy = 46 KSI). PIPE SHALL BE ASTM A53 (Fy = 35 KSI) OR A500 GRADE B (42 KSI). OTHER SHAPES SHALL BE ASTM A36 (36 KSI). SPLICING OR MODIFICATION OF MEMBERS IN THE FIELD IS PROHIBITED WITHOUT PRIOR WRITTEN APPROVAL OF THE S.E.R.
2. FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE AISC MANUAL OF STEEL CONSTRUCTION, EXCEPT AS FOLLOWS:
   - TO PARAGRAPH 3.1, ADD 'THE PROJECT ARCHITECTURAL DRAWINGS ARE A PART OF THE STRUCTURAL STEEL DESIGN DRAWINGS BY REFERENCE AND MUST BE USED CONCURRENTLY WITH THE STRUCTURAL STEEL DESIGN DRAWINGS FOR ANY INFORMATION NOT SHOWN ON THE STRUCTURAL STEEL DESIGN DRAWINGS."
   - DELETE PARAGRAPH 3.2 AND INSERT THE FOLLOWING: "ARCHITECTURAL, PROCESS, ELECTRICAL AND MECHANICAL PLANS SHALL BE USED AS A SUPPLEMENT TO THE STRUCTURAL STEEL DESIGN DRAWINGS TO DEFINE DETAIL CONFIGURATIONS AND CONSTRUCTION INFORMATION."
   - PARAGRAPH 3.3 MODIFY THE LAST SENTENCE TO READ, "IN CASE OF DISCREPANCIES BETWEEN THE STRUCTURAL STEEL PLANS AND PLANS OF OTHER DISCIPLINES, SUCH DISCREPANCIES SHALL BE CALLED TO THE ARCHITECT / ENGINEER'S ATTENTION FOR RESOLUTION."
3. ALL ALUMINUM SHAPES SHALL BE ASTM B209, B308, ALLOY 6061-T6; EXCEPT HANDRAIL MAY BE 6063-T6.
4. ALL STEEL SHALL RECEIVE A PRIMER COAT UNLESS GALVANIZED, REFER TO SPECIFICATION MANUAL.
5. UNLESS GALVANIZED, ALL STEEL SHALL RECEIVE A THREE COAT PAINT SYSTEM: ZINC-RICH PRIMER, EPOXY, POLYURETHANE.
6. ALL WELDING SHALL BE PERFORMED BY A CERTIFIED WELDER USING E70 ELECTRODES IN ACCORDANCE WITH THE REQUIREMENTS OF THE AWS D1.1 AND D1.2 "STRUCTURAL WELDING CODE" AND VISUALLY INSPECTED. FULL-PEN WELDS SHALL ALSO BE INSPECTED BY NDT METHODS SUCH AS ULTRASONIC, MAG PARTICLE, OR DYE PEN.
7. ALL FIELD WELDED CONNECTIONS SHALL BE CHIPPED, GROUND WHERE REQUIRED, WIRE BRUSH CLEANED AND PAINTED TO MATCH THE PAINT SYSTEM.
8. ALL BOLTS NOT OTHERWISE SPECIFIED SHALL BE 3/4" DIAMETER HIGH STRENGTH (ASTM A325-N). ALL BOLTS SHALL BE FULLY PRETENSIONED. ANY NON-TWISTOFF BOLTS SHALL HAVE 10 PERCENT CHECKED WITH A TORQUE WRENCH BY THE SPECIAL INSPECTOR. ALL BEAM CONNECTIONS SHALL BE DESIGNED PER THE AISC MANUAL OF STEEL CONSTRUCTION "FRAMED BEAM CONNECTIONS" FOR THE INDICATED REACTIONS OR AT LEAST 0.60 x BEAM TOTAL SHEAR CAPACITY SHOWN IN THE ALLOWABLE UNIFORM LOAD TABLES, WHICHEVER IS GREATER. ALL CONNECTIONS MUST BE TWO BOLT MINIMUM. ALL COPES SHALL BE MADE WITH A 1 INCH MINIMUM RADIUS.
9. ALL ANCHOR RODS SHALL BE 3/4" DIAMETER *STAINLESS STEEL TYPE 304* UNLESS NOTED OTHERWISE. WHERE HEADED RODS ARE NOTED OR SPECIFIED, BENT RODS SHALL NOT BE FURNISHED.
10. METAL/FRP STAIRWAYS, PLATFORMS AND GRATES SHALL BE PROVIDED/ CONSTRUCTED WITH ADEQUATE DESIGN CHARACTERISTICS (100 PSF LIVE LOAD CAPACITY U.N.O.) AND STRUCTURAL CONFIGURATIONS IN ACCORDANCE WITH THE FABRICATOR'S SHOP DRAWINGS AS APPROVED BY THE ENGINEER. ALL STAIRWAYS, PLATFORMS AND GRATES SHALL SATISFY ALL REQUIREMENTS OF THE PROJECT SPECIFICATIONS. ALL STAIR RUNS LONGER THAN 10 FEET SHALL HAVE DIAGONAL BRACING FASTENED TO THE BOTTOM FLANGES OF THE STRINGERS U.N.O.
11. DAMAGED GALVANIZING SHALL BE REPAIRED BY APPLICATION OF COLD GALVANIZING COMPOUND SUCH AS ZRC (MINIMUM 3 COATS). PAINT FINISH PER ARCHITECTURAL.

OPEN WEB STEEL JOISTS AND JOIST GIRDERS

1. PRE-ENGINEERED OPEN WEB STEEL JOISTS AND JOIST GIRDERS SHALL BE IN COMPLIANCE WITH AND DESIGNED IN ACCORDANCE WITH THE FOLLOWING AGENCIES REQUIREMENTS AND RECOMMENDATIONS:
   - AISC, AMERICAN INSTITUE OF STEEL CONSTRUCTION SPECIFICATION FOR DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS- LATEST EDITION
   - SJI, STEEL JOIST INSTITUTE TECHNICAL DIGESTS AND DESIGN STANDARDS- LATEST EDITIONS
   - AISI, AMERICAN IRON AND STEEL INSTITUTE SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS- LATEST EDITION
2. STEEL JOISTS AND JOIST GIRDERS SHALL BE SHOP PRIMED / *RECEIVE AN EPOXY PAINT SYSTEM*, SEE SPECIFICATION MANUAL.
3. STEEL JOIST AND JOIST GIRDER MANUFACTURER SHALL SUPPLY ALL MISCELLANEOUS ACCESSORIES SUCH AS ANCHORS AND BRIDGING TO COMPLETE THE STEEL JOIST INSTALLATION.
4. ALL SUSPENDED CONCENTRATED LOADS SHALL BE APPLIED TO PANEL POINTS WHERE POSSIBLE. IF SUSPENDED CONCENTRATED LOADS ARE APPLIED BETWEEN PANEL POINTS, ADDITIONAL MEMBERS SHALL BE ADDED TO STRUT THE LOADS BACK TO PANEL POINT LOCATIONS.
5. STEEL JOISTS AND JOIST GIRDER MANUFACTURER SHALL PROVIDE SHOP DRAWINGS FOR THE ARCHITECTS/ENGINEERS REVIEW INCLUDING, STEEL JOISTS AND JOIST GIRDER MEMBER SIZES, SPACING, AND ALL CONNECTIONS.
6. STEEL JOISTS AND JOIST GIRDERS SHALL BE DESIGNED FOR A NET UPLIFT WIND FORCE OF 10 PSF, UNLESS NOTED OTHERWISE. ALL JOISTS SHALL HAVE X BRACING INSTALLED AT THE FIRST BOTTOM PANEL POINT, EACH END.
7. THE HANDLING AND ERECTION OF STEEL JOISTS AND JOIST GIRDERS SHALL BE IN ACCORDANCE WITH THE SJI TECHNICAL DIGEST #9 "HANDLING AND ERECTION OF STEEL JOISTS AND JOIST GIRDERS".
8. ALL K-SERIES JOISTS BEARING ON MASONRY WALLS SHALL HAVE 6"x6"x3/8" BEARING PLATES WITH TWO (2) ½" DIAMETER x 6" STUDS SET IN BOND BEAMS. BEARING PLATES SHALL BE LOCATED ½" FROM THE FACE OF THE WALL ON THE BEARING SIDE; REMOVE FACE SHELL AS NECESSARY. JOISTS SHALL BEAR 4" MINIMUM ON BEARING PLATES AND BE WELDED TO BEARING PLATES WITH 2" OF 3/16" FILLET WELD EACH SIDE (MINIMUM).
9. ALL STEEL JOISTS SHALL HAVE HORIZONTAL BAR OR ANGLE BRIDGING PER STEEL JOIST INSTITUTE SPECIFICATIONS. PROVIDE RIGID X-BRIDGING IN ADDITION TO AND MATCHING HORIZONTAL BRIDGING WHERE JOISTS ARE DISCONTINUOUS UNLESS HORIZONTAL BRIDGING IS ANCHORED TO WALL TOP AND BOTTOM. JOIST SWEEP ALLOWANCE SHALL COMPLY WITH AISC STANDARD PRACTICE.
10. ALL STEEL JOISTS SHALL HAVE A MIDSPAN CAMBER APPROXIMATELY EQUAL TO THAT RECOMMENDED BY THE STEEL JOIST INSTITUTE SPECIFICATIONS.
11. SUPPORT MECHANICAL EQUIPMENT WITH 4"X4"x5/16" ANGLES LAID BETWEEN JOISTS FRAMED TO 4"x4x"5/16" ANGLES (LENGTH EQUALS MECHANICAL UNIT DIMENSION PLUS DISTANCE EACH END TO NEXT PANEL POINT) LAID PARALLEL TO AND WELDED TO TOP AND/OR BOTTOM CHORD OF JOISTS TO DISTRIBUTE LOAD TO JOIST PANEL POINTS. PENETRATIONS THROUGH STEEL DECK SHALL BE REINFORCED ACCORDING TO METAL DECK NOTES.

METAL DECK

1. METAL DECK SHALL SPAN A MINIMUM OF TWO CONTINUOUS SPANS. DECK DESIGN IS BASED ON PRODUCTS OF VULCRAFT CORPORATION, AND ANY SUBSTITUTIONS SHALL MEET THAT STANDARD. WHERE NOT EXPLICITLY NOTED, ROOF DECK IS WIDE RIB.
2. OPENINGS THROUGH DECK WHICH CUT ONE FLUTE NEED NOT BE REINFORCED. OPENINGS WHICH CUT TWO FLUTES SHALL BE REINFORCED WITH A HOT ROLLED ANGLE THE SIZE OF THE DECK DEPTH, MINIMUM 1/8 INCH THICK, EXTENDING 12 INCHES PAST THE OPENING, ON EACH SIDE OF THE OPENING. OPENINGS WHICH CUT MORE THAN TWO FLUTES SHALL BE FRAMED TO SURROUNDING SUPPORTS WITH FRAMES AS DETAILED IN THE DRAWINGS.
3. MANUFACTURER SHALL BE A MEMBER OF THE STEEL DECK INSTITUTE (SDI). DETAIL, MANUFACTURE, AND INSTALL DECK AND ACCESSORIES IN ACCORDANCE WITH SDI AND OSHA.
4. WELDING AND WELDER QUALIFICATIONS SHALL BE IN ACCORDANCE WITH AWS D1.3.
5. DECK SHALL BE FASTENED TO UNDERLYING FRAMING WITH 5/8 INCH DIAMETER PUDDLE WELDS AT SPACING AS INDICATED ON THE DRAWINGS, UNLESS HEADED STUDS ARE TO BE APPLIED. CONTRACTOR MAY SUBMIT SHOT PINS (PAF) FOR APPROVAL AS A SUBSTITUTE FOR PUDDLE WELDS. SIDELAP EDGES SHALL BE JOINED WITH MINIMUM OF ONE #10 SCREW IN EACH DECK SPAN, UNLESS MORE SCREWS ARE INDICATED IN THE DRAWINGS.
6. WHERE SPRAY-ON FIREPROOFING IS REQUIRED, THE GENERAL CONTRACTOR SHALL VERIFY THAT THE DECK FINISH IS COMPATIBLE WITH FIREPROOFING. COORDINATE WITH ARCHITECT.
7. ALL ROOF OPENING DIMENSIONS AND LOCATIONS SHOWN ON THE PLANS SHALL BE VERIFIED BY THE CONTRACTOR AND ROOF MANUFACTURER.

HOISTS, TROLLEYS

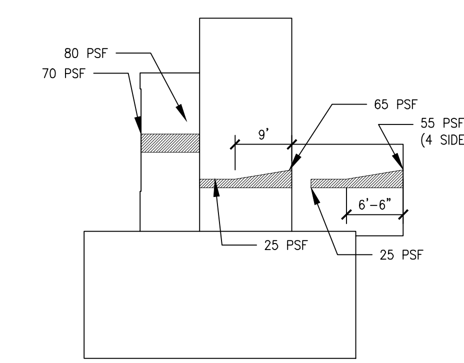
1. HOISTS AND TROLLEYS SHALL BE HAND ACTUATED, LOW OVERHEAD WITH HALF TON CAPACITY, LOCATED AS SHOWN ON THE DRAWINGS. MONORAIL DESIGN AND SUPPORT LOCATIONS SHALL BE BY HOIST DESIGNER; COORDINATE REACTIONS WITH PRESTRESS MANUFACTURER.
2. APPROVED MANUFACTURERS ARE HARRINGTON, COFFING, ROBBINS & MYERS, AND COLUMBUS MCKINNON.

SHOP DRAWING REVIEW

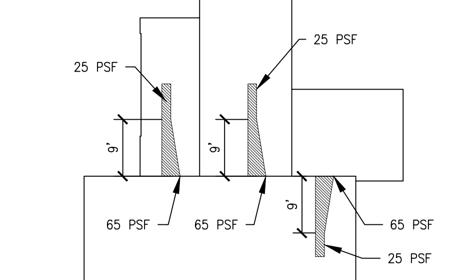
1. SHORT ELLIOTT HENDRICKSON INC. (SEH) WILL REVIEW THE GENERAL CONTRACTOR'S (GC) SHOP DRAWINGS AND RELATED SUBMITTALS (AS INDICATED BELOW) WITH RESPECT TO THE ABILITY OF THE DETAILED WORK, WHEN COMPLETE, TO BE A PROPERLY FUNCTIONING INTEGRAL ELEMENT OF THE OVERALL STRUCTURAL SYSTEM DESIGNED BY SEH. IN GENERAL, SUBMITTALS WILL NOT BE REVIEWED FOR CORRECT QUANTITIES OR CONSTRUCTION CONSIDERATIONS.
2. PRIOR TO SUBMITTAL OF A SHOP DRAWING OR ANY RELATED MATERIAL TO SEH, THE GC SHALL:
   - REVIEW EACH SUBMISSION FOR CONFORMANCE WITH THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND OPERATIONS OF CONSTRUCTION AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THERETO, ALL OF WHICH ARE THE SOLE RESPONSIBILITY OF THE GC.
   - REVIEW AND APPROVE EACH SUBMISSION.
   - STAMP EACH SUBMISSION AS APPROVED.
3. SEH SHALL ASSUME THAT NO SUBMISSION COMPRISES A VARIATION FROM THE CONTRACT DOCUMENTS UNLESS THE GC ADVISES SEH WITH WRITTEN DOCUMENTATION. SHOP DRAWINGS AND RELATED MATERIAL (IF ANY) REQUIRED ARE INDICATED BELOW. SHOULD SEH REQUIRE MORE THAN TEN (10) WORKING DAYS TO PERFORM THE REVIEW, SEH SHALL SO NOTIFY THE GC. SUBMITTALS SHALL INCLUDE:
   - CONCRETE MIX DESIGNS AND MATERIAL CERTIFICATES INCLUDING ADMIXTURES AND COMPOUNDS APPLIED TO THE CONCRETE AFTER PLACEMENT.
   - AGGREGATE TESTS AND CONCRETE TEST HISTORY FOR EACH MIX DESIGN, WITH THE SUBMISSION OF CONCRETE MIX DESIGNS.
   - REINFORCING STEEL SHOP DRAWINGS INCLUDING ERECTION DRAWINGS AND BENDING DETAILS. BAR LIST WILL NOT BE REVIEWED FOR CORRECT QUANTITIES.
   - ELEVATIONS OF ALL REINFORCED CONCRETE MASONRY WALLS AND ALL CONCRETE WALLS WITH FOOTING STEPS OR OTHER ELEVATION CHANGES, AT A SCALE NO SMALLER THAN 1/8" = 1'-0" SHOWING ALL REQUIRED REINFORCING.
   - GROUT MIX DESIGNS (FOR CMU).
   - STRUCTURAL STEEL AND ALUMINUM SHOP DRAWINGS INCLUDING ERECTION DRAWINGS AND PIECE DETAILS. INCLUDE JOIST, DECKING AND CONNECTOR SUBMITTALS. INCLUDE MISCELLANEOUS FRAMING SPECIFIED ON DRAWINGS. JOIST SHOP DRAWINGS FOR JOISTS CARRYING NON-UNIFORM LOADS SHALL INCLUDE SEALED DESIGN CALCULATIONS SEALED BY AN ENGINEER REGISTERED IN THE STATE OF THE PROJECT.
   - PRECAST SHOP DRAWINGS INCLUDING REINFORCING, BEARING DETAILS.
   - PRECAST DESIGN CALCULATIONS SIGNED AND SEALED BY AN ENGINEER REGISTERED IN STATE OF PROJECT.
   - SEH SHALL REVIEW SHOP DRAWINGS AND RELATED MATERIALS WITH COMMENTS PROVIDED THAT EACH SUBMISSION HAS MET THE ABOVE REQUIREMENTS. SEH SHALL RETURN WITHOUT COMMENT UNREQUIRED MATERIAL OR SUBMISSIONS WITHOUT GC APPROVAL STAMP.

REQUIRED INSPECTIONS

DESCRIPTION	TESTING YES	TESTING NO	INSPECTING YES	INSPECTING NO	NA
1 METAL CONSTRUCTION					
WELDING		•	•		
DETAILS: BRACING, LOCATIONS, ETC.		•	•		
BOLTING		•	•		
2 CONCRETE CONSTRUCTION					
CONCRETE	•		•		
PRECAST / PRESTRESSED CONCRETE					•
REINFORCEMENT: SIZE AND SPACING		•	•		
BOLTS INSTALLED IN CONCRETE		•	•		
3 MASONRY CONSTRUCTION					
REINFORCEMENT: SIZE AND SPACING		•	•		
PRISMS		•		•	
DETAILS: GROUTING, LINTELS, ETC.		•	•		
4 WOOD CONSTRUCTION					•
5 GRADING, EXCAVATION AND FILLING	•		•		



1 / GS1 SNOW LOAD DIAGRAM 1
NOT TO SCALE



2 / GS1 SNOW LOAD DIAGRAM 2
NOT TO SCALE

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Madison Water Utility

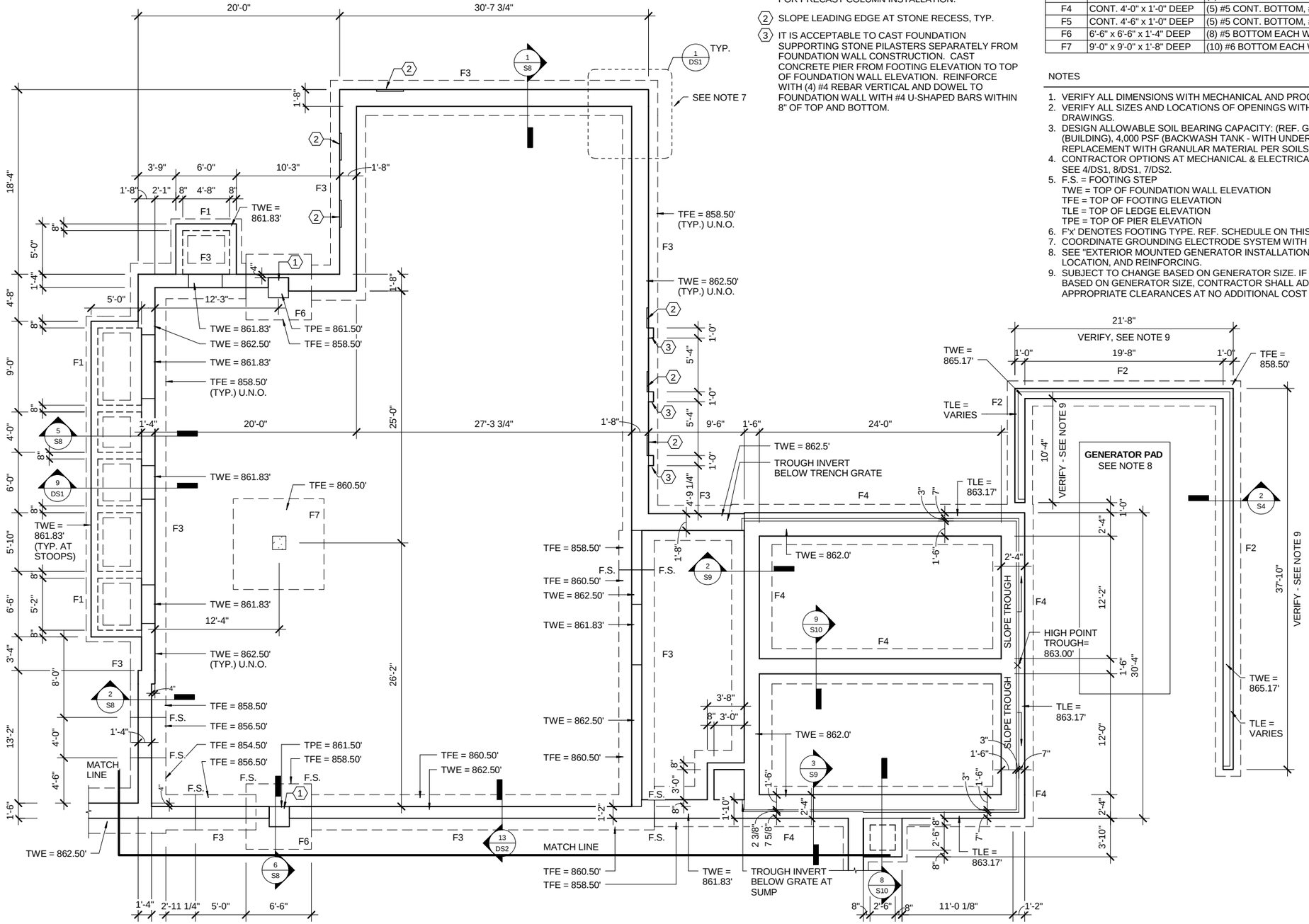
UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK | DATE | DESCRIPTION
REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY BAW
DRAWN BY KMM

SHEET TITLE
STRUCTURAL PLAN
GENERAL STRUCTURAL NOTES

SHEET
GS1



KEYNOTES

1. 2'-0" x 2'-0" CIP CONC. PIER REINFORCED W/ (8) #7 REBAR VERTICALLY & #3 TIES @ 12" O.C. HORIZONTALLY AND (3) #3 TIES @ 2" O.C. AT TOP. BLOCK OUT 1'-0" BELOW TOP OF SLAB ELEVATION FOR PRECAST COLUMN INSTALLATION.
2. SLOPE LEADING EDGE AT STONE RECESS, TYP.
3. IT IS ACCEPTABLE TO CAST FOUNDATION SUPPORTING STONE PILASTERS SEPARATELY FROM FOUNDATION WALL CONSTRUCTION. CAST CONCRETE PIER FROM FOOTING ELEVATION TO TOP OF FOUNDATION WALL ELEVATION. REINFORCE WITH (4) #4 REBAR VERTICAL AND DOWEL TO FOUNDATION WALL WITH #4 U-SHAPED BARS WITHIN 8" OF TOP AND BOTTOM.

FOOTING SCHEDULE

MARK	SIZE	REINFORCING
F1	CONT. 1'-8" x 1'-0" DEEP	(3) #5 CONT. BOTTOM
F2	CONT. 2'-6" x 1'-0" DEEP	(3) #5 CONT. BOTTOM
F3	CONT. 3'-6" x 1'-0" DEEP	(4) #5 CONT. BOTTOM
F4	CONT. 4'-0" x 1'-0" DEEP	(5) #5 CONT. BOTTOM, #5 TRANSV. AT 12" O.C.
F5	CONT. 4'-6" x 1'-0" DEEP	(5) #5 CONT. BOTTOM, #5 TRANSV. AT 12" O.C.
F6	6'-6" x 6'-6" x 1'-4" DEEP	(8) #5 BOTTOM EACH WAY
F7	9'-0" x 9'-0" x 1'-8" DEEP	(10) #6 BOTTOM EACH WAY

NOTES

1. VERIFY ALL DIMENSIONS WITH MECHANICAL AND PROCESS DRAWINGS.
2. VERIFY ALL SIZES AND LOCATIONS OF OPENINGS WITH EQUIPMENTS SUPPLIER DRAWINGS.
3. DESIGN ALLOWABLE SOIL BEARING CAPACITY: (REF. GEOTECH REPORT) 1,500 PSF (BUILDING), 4,000 PSF (BACKWASH TANK - WITH UNDERCUT OF MEDIUM STIFF CLAY AND REPLACEMENT WITH GRANULAR MATERIAL PER SOILS REPORT.)
4. CONTRACTOR OPTIONS AT MECHANICAL & ELECTRICAL LINES THROUGH FOUNDATION - SEE 4/DS1, 8/DS1, 7/DS2.
5. F.S. = FOOTING STEP
   TWE = TOP OF FOUNDATION WALL ELEVATION
   TFE = TOP OF FOOTING ELEVATION
   TLE = TOP OF LEDGE ELEVATION
   TPE = TOP OF PIER ELEVATION
6. F'x' DENOTES FOOTING TYPE. REF. SCHEDULE ON THIS SHEET AND DETAILS.
7. COORDINATE GROUNDING ELECTRODE SYSTEM WITH ELECTRICAL PLANS.
8. SEE "EXTERIOR MOUNTED GENERATOR INSTALLATION DETAIL" ON E31 FOR SIZE, LOCATION, AND REINFORCING.
9. SUBJECT TO CHANGE BASED ON GENERATOR SIZE. IF LARGER ENCLOSURE IS REQUIRED BASED ON GENERATOR SIZE, CONTRACTOR SHALL ADJUST DIMENSTIONS TO PROVIDE APPROPRIATE CLEARANCES AT NO ADDITIONAL COST TO OWNER.

NORTH

1 S1 FOUNDATION PLAN

0 4' 8' 12'

1/13/2017 5:27:35 PM

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WI

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO.	129083
PROJECT NO.	53W10434
ISSUE DATE	JANUARY 13, 2017
DESIGNED BY	BAW
DRAWN BY	NJK
Short Elliott Hendrickson, Inc.	(SEH)

SHEET TITLE
FOUNDATION PLAN

SHEET
S1

KEYNOTES:

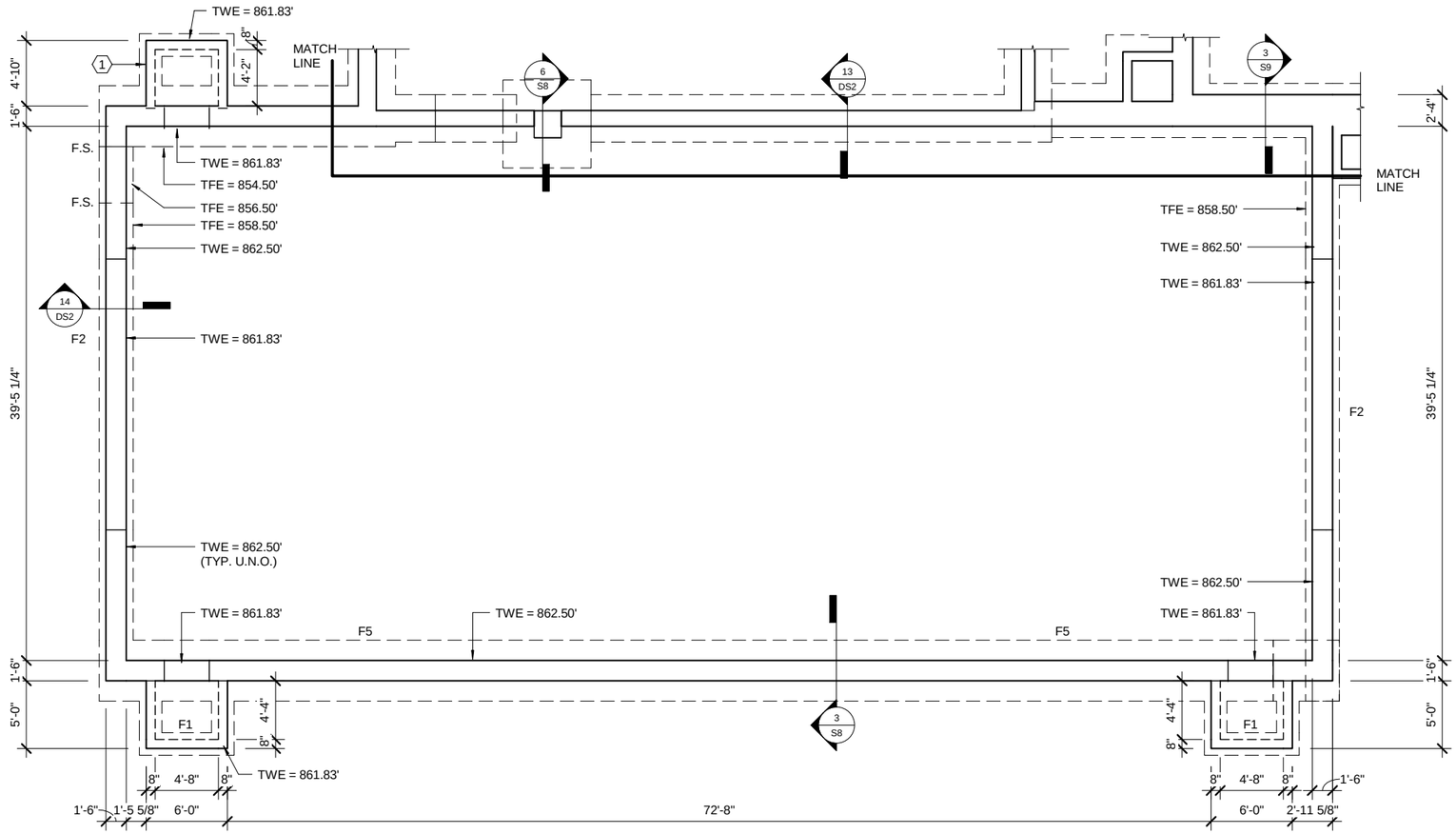
1. BLOCK OUT CONCRETE STOOP SIDEWALL FOR UTILITY PIPING.

NOTES:

1. VERIFY ALL DIMENSIONS WITH MECHANICAL AND PROCESS DRAWINGS.
2. VERIFY ALL SIZES AND LOCATIONS OF OPENINGS WITH EQUIPMENTS SUPPLIER DRAWINGS.
3. DESIGN ALLOWABLE SOIL BEARING CAPACITY: (REF. GEOTECH REPORT) 1,500 PSF (BUILDING), 4,000 PSF (BACKWASH TANK - WITH UNDERCUT OF MEDIUM STIFF CLAY AND REPLACEMENT WITH GRANULAR MATERIAL PER SOILS REPORT.)
4. CONTRACTOR OPTIONS AT MECHANICAL & ELECTRICAL LINES THROUGH FOUNDATION - SEE 4/DS1, 8/DS1, 7/DS2.
5. "Fx" DENOTES FOOTING TYPE. REF. SCHEDULE ON THIS SHEET AND DETAILS.
6. F.S. = FOOTING STEP
   TFE = TOP OF FOOTING ELEVATION
   TLE = TOP OF LEDGE ELEVATION
   TWE = TOP OF WALL ELEVATION
   C.J. = CONTROL JOINT

FOOTING SCHEDULE

MARK	SIZE	REINFORCING
F1	CONT. 1'-8" x 1'-0" DEEP	(3) #5 CONT. BOTTOM
F2	CONT. 2'-6" x 1'-0" DEEP	(3) #5 CONT. BOTTOM
F3	CONT. 3'-6" x 1'-0" DEEP	(4) #5 CONT. BOTTOM
F4	CONT. 4'-0" x 1'-0" DEEP	(5) #5 CONT. BOTTOM, #5 TRANSV. AT 12" O.C.
F5	CONT. 4'-6" x 1'-0" DEEP	(5) #5 CONT. BOTTOM, #5 TRANSV. AT 12" O.C.
F6	6'-6" x 6'-6" x 1'-4" DEEP	(8) #5 BOTTOM EACH WAY
F7	9'-0" x 9'-0" x 1'-8" DEEP	(10) #6 BOTTOM EACH WAY



NORTH

1 S2 FOUNDATION PLAN

0 4' 8' 12'

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WI

REVISIONS

MARK	DATE	DESCRIPTION

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY BAW
DRAWN BY NJK
Short Elliott Hendrickson, Inc. (SEH)

SHEET TITLE
FOUNDATION PLAN

SHEET
S2

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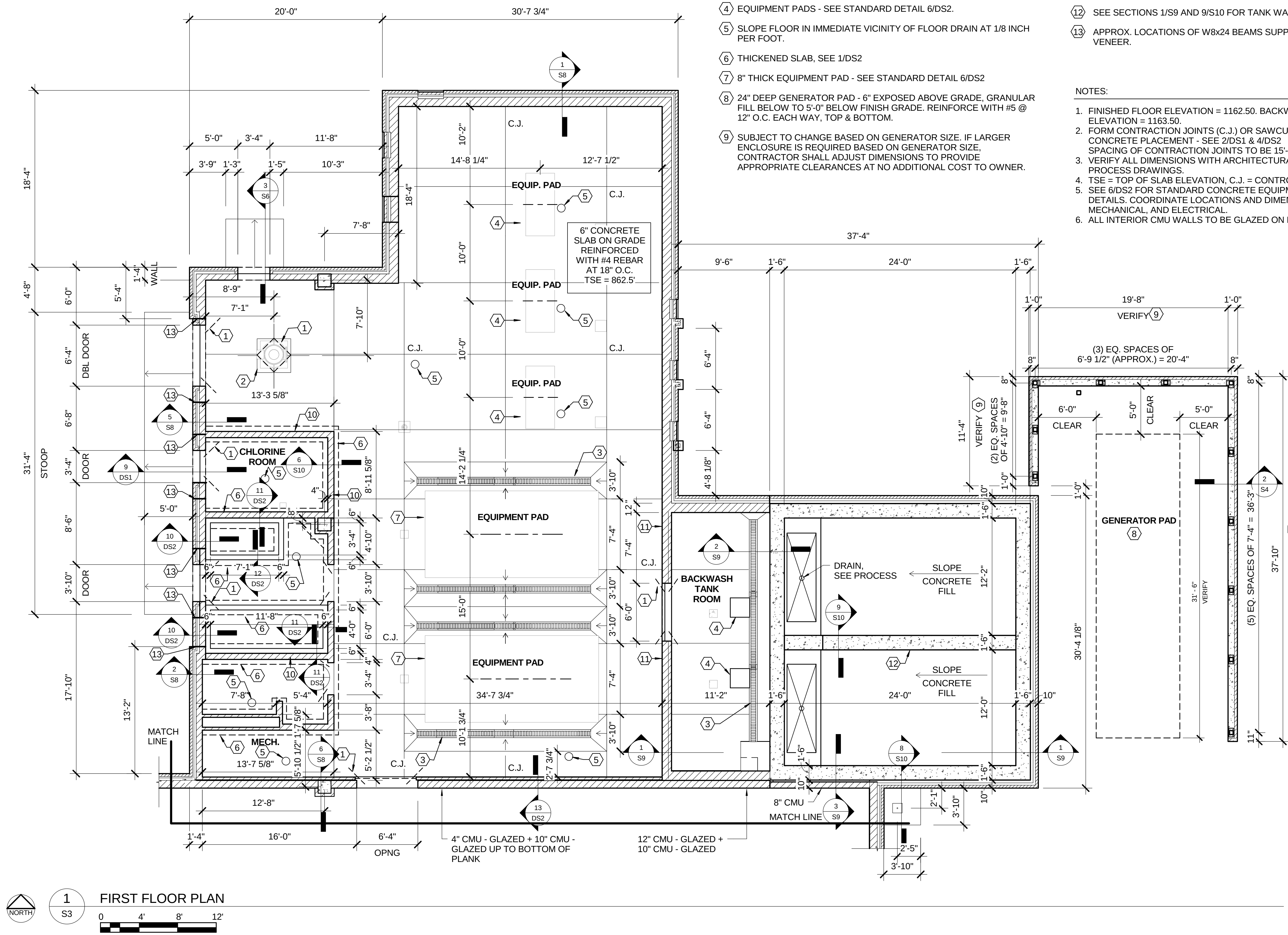

1
S3
FIRST FLOOR PLAN
0 4' 8' 12'

KEYNOTES:

1. #5 REBAR x 30" LONG CENTERED IN SLAB AT ALL RE-ENTRANT CORNERS
2. CONCRETE WELL HEAD - SEE PROCESS PLANS. THICKEN SLAB TO 8" THICK SURROUNDING WELL CASING.
3. TRENCH DRAIN. SEE PROCESS PLANS FOR SPECIFICATIONS.
4. EQUIPMENT PADS - SEE STANDARD DETAIL 6/DS2.
5. SLOPE FLOOR IN IMMEDIATE VICINITY OF FLOOR DRAIN AT 1/8 INCH PER FOOT.
6. THICKENED SLAB, SEE 1/DS2
7. 8" THICK EQUIPMENT PAD - SEE STANDARD DETAIL 6/DS2
8. 24" DEEP GENERATOR PAD - 6" EXPOSED ABOVE GRADE, GRANULAR FILL BELOW TO 5'-0" BELOW FINISH GRADE. REINFORCE WITH #5 @ 12" O.C. EACH WAY, TOP & BOTTOM.
9. SUBJECT TO CHANGE BASED ON GENERATOR SIZE. IF LARGER ENCLOSURE IS REQUIRED BASED ON GENERATOR SIZE, CONTRACTOR SHALL ADJUST DIMENSIONS TO PROVIDE APPROPRIATE CLEARANCES AT NO ADDITIONAL COST TO OWNER.
10. 8" INTERIOR PARTITION WALLS CONSTRUCTED OF 2 WYTHES 4" CMU - GLAZED. SECURE WYTHES TOGETHER WITH STAINLESS STEEL LADDER REINFORCEMENT AT 16" O.C. VERTICALLY.
11. 12" INTERIOR BEARING WALL WITH TWO SIDES EXPOSED, CONSTRUCTED OF 1 WYTHE 8" CMU - GLAZED, AND 1 WYTHE 4" CMU - GLAZED. SECURE WYTHES TOGETHER WITH STAINLESS STEEL LADDER REINFORCEMENT AT 16" O.C. VERTICALLY.
12. SEE SECTIONS 1/S9 AND 9/S10 FOR TANK WALL REINFORCING.
13. APPROX. LOCATIONS OF W8x24 BEAMS SUPPORTING EXTENDED VENEER.

NOTES:

1. FINISHED FLOOR ELEVATION = 1162.50. BACKWASH TANK SLAB ELEVATION = 1163.50.
2. FORM CONTRACTION JOINTS (C.J.) OR SAWCUT WITHIN 18 HOURS OF CONCRETE PLACEMENT - SEE 2/DS1 & 4/DS2 MAXIMUM SPACING OF CONTRACTION JOINTS TO BE 15'-0".
3. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL, MECHANICAL, AND PROCESS DRAWINGS.
4. TSE = TOP OF SLAB ELEVATION, C.J. = CONTROL JOINT
5. SEE 6/DS2 FOR STANDARD CONCRETE EQUIPMENT PAD & PEDESTAL DETAILS. COORDINATE LOCATIONS AND DIMENSIONS WITH PROCESS, MECHANICAL, AND ELECTRICAL.
6. ALL INTERIOR CMU WALLS TO BE GLAZED ON EACH SIDE OF WALL.

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WI

MARK	DATE	DESCRIPTION

REVISIONS

SEH FILE NO.	129083
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ISSUE DATE	JANUARY 13, 2017
DESIGNED BY	BAW
DRAWN BY	NJK

SHEET TITLE
FIRST FLOOR PLAN

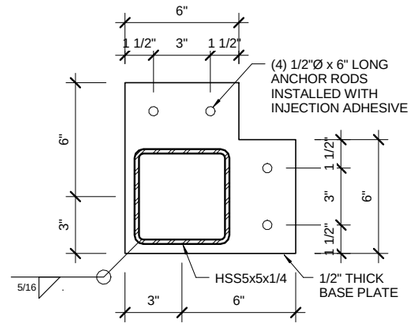
SHEET
S3

KEYNOTES:

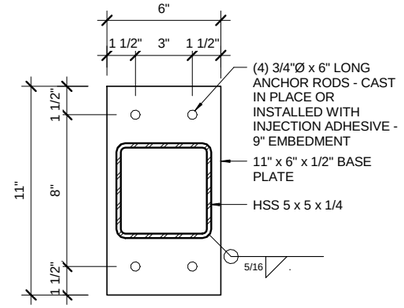
1. SLOPE TO FLOOR DRAIN AT 1/8" PER FOOT
2. SLOPE TO FLOOR DRAIN - MATCH PERIMETER ELEVATION AT DOOR AND DRAIN ELEVATION BASED ON PRIMARY SLOPE.
3. TRENCH DRAIN, SEE PROCESS PLANS FOR SPECIFICATIONS.
4. #5 REBAR x 30" LONG CENTERED IN SLAB AT ALL RE-ENTRANT CORNERS.
5. 10" CMU WALLS REINFORCED WITH (2) #5 REBAR VERT. AT 48" o.c.
6. 8" CMU WALLS REINFORCED WITH (1) #5 REBAR VERT. AT 32" o.c. ADJACENT TO BACKWASH TANK ONLY.

NOTES:

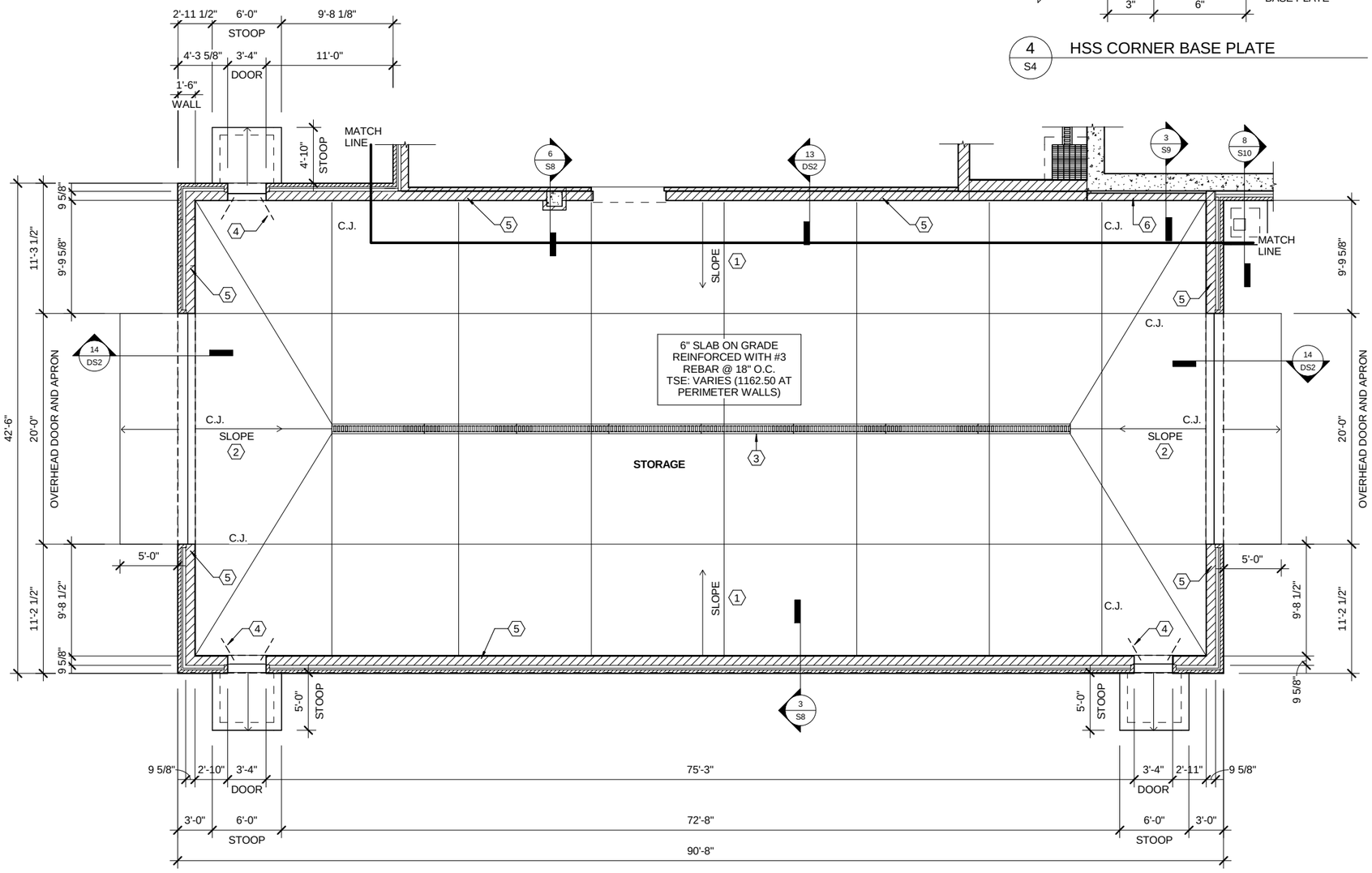
1. FINISHED FLOOR ELEVATION = 1162.50 AT PERIMETER.
2. FORM CONTRACTION JOINTS (C.J.) OR SAWCUT WITHIN 18 HOURS OF CONCRETE PLACEMENT - SEE 2/DS1 & 4/DS2. MAXIMUM SPACING OF CONTRACTION JOINTS TO BE 15'-0".
3. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL, MECHANICAL, AND PROCESS DRAWINGS.
4. TSE = TOP OF SLAB ELEVATION
5. C.J. = CONTROL JOINT



4 S4 HSS CORNER BASE PLATE



3 S4 HSS FRAMING BASEPLATE



NORTH 1 S4 FIRST FLOOR PLAN

0 4' 8' 12'

2 S4 TRASH ENCLOSURE WALL

1/13/2017 5:27:37 PM

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WI

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY BAW
DRAWN BY NJK
Short Elliott Hendrickson, Inc. (SEH)

SHEET TITLE
FIRST FLOOR PLAN

SHEET
S4

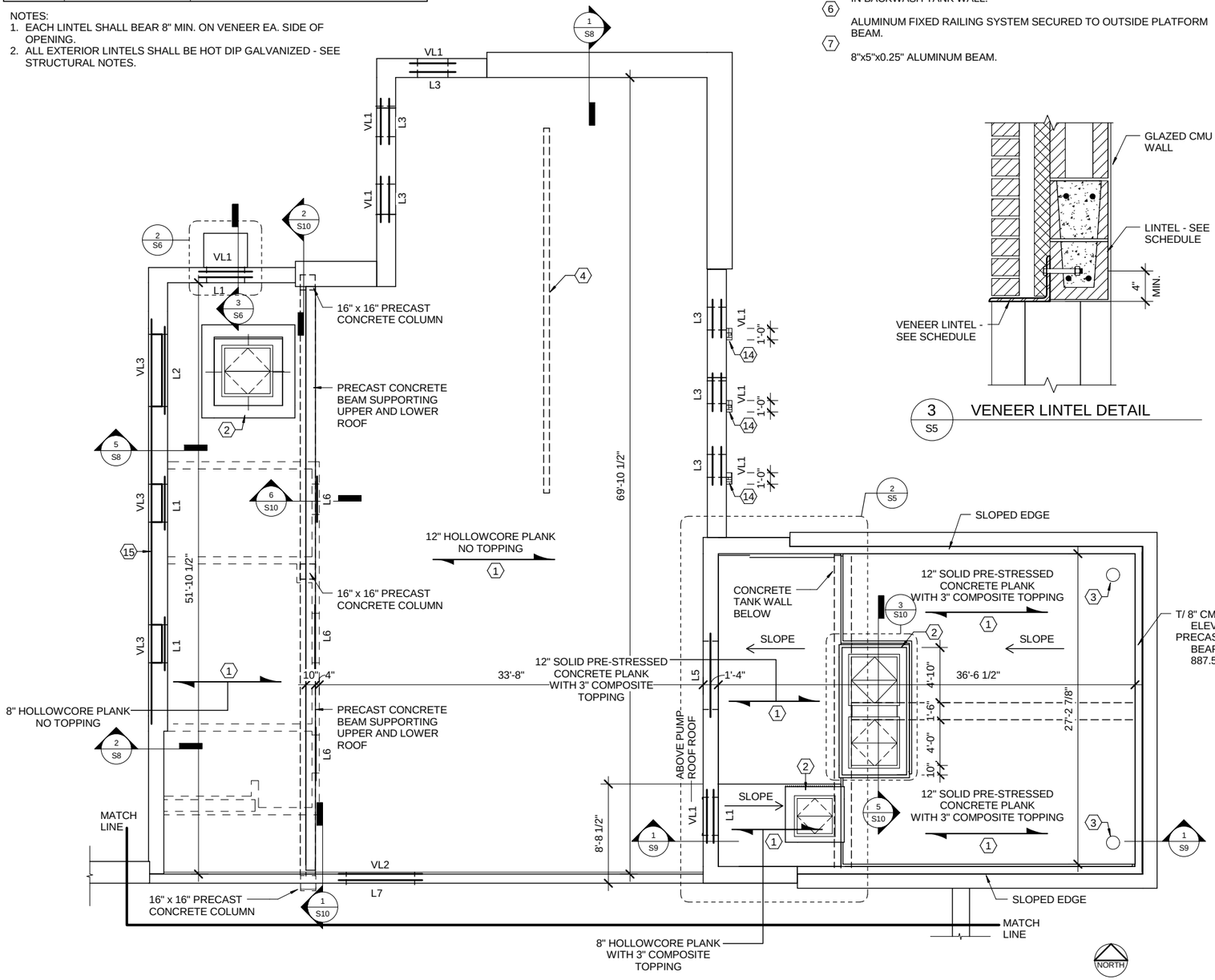
VENEER LINTEL SCHEDULE		
MARK	SIZE OR DESIGNATION	NOTES
VL1	L 8 x 6 x 7/16 (LLH)	HOLES IN VERT LEG AT 8" O.C. FOR 5/8" ADHESIVE ANCHORS TO CMU BOND BEAM - SEE DETAIL 3/S5
VL2	L 6 x 3-1/2 x 3/8	STAINLESS STEEL, ANCHOR TO BOND BEAM AT 16" o.c. SIM. TO DETAIL 3/S5
VL3	SEE DETAIL 5/S8	EXTEND 1/2" PLATE CLOSURE FROM BACK OF L8x4 TO CMU ABOVE DOOR / LOUVER FRAME - GRIND & FINISH WELD BEFORE GALVANIZING FOR SMOOTH CONSISTENT APPEARANCE.

NOTES:
1. EACH LINTEL SHALL BEAR 8" MIN. ON VENEER EA. SIDE OF OPENING.
2. ALL EXTERIOR LINTELS SHALL BE HOT DIP GALVANIZED - SEE STRUCTURAL NOTES.

NOTES:
1. L'x' DENOTES LINTEL. SEE SHEET S6 FOR LINTEL SCHEDULE

KEYNOTES:

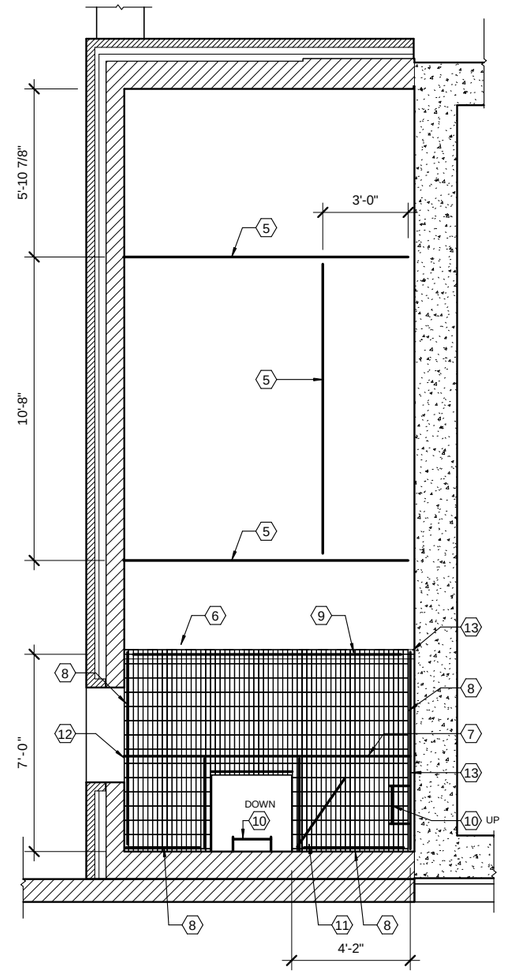
1. ARROW DENOTES SPAN OF PLANK. SECURE PLANK TO BEARING WALLS WITH DOWELS OR WELD PLATES ACCORDING TO DETAILS. PROVIDE 6x6 W2.9x2.9 WWF REINFORCING IN H/C TOPPING WHERE NOTED. (TYP.)
2. RAISED CONCRETE CURB AT ROOF HATCH - SEE DETAILS.
3. CAST IN PLACE CONCRETE AROUND VENT SLEEVES - SEE DETAILS.
4. PAINTED STEEL MONORAIL FOR 3 TON CHAIN HOIST - W8x18 - SECURED TO WELD PLATES IN HOLLOWCORE PLANK AT 4'-0" ON CENTER - SEE DETAILS.
5. PAINTED STEEL MONORAIL AND AND TRANSFER BEAMS FOR 0.5 TON CHAIN HOIST - W8x18 - BEAR 6" IN CMU WALL ON 7"x5"x1/2" BEARING PLATE - SECURE TO 10"x10"x3/4" EMBED PLATE WITH (4) 3/4"Ø ANCHORS x 8" LONG IN BACKWASH TANK WALL.
6. ALUMINUM FIXED RAILING SYSTEM SECURED TO OUTSIDE PLATFORM BEAM.
7. 8"x5"x0.25" ALUMINUM BEAM.
8. 8"x3" ALUMINUM CHANNEL SECURED TO MASONRY OR CONCRETE WITH ADHESIVE ANCHORS AT 24" ON CENTER.
9. 12"x4" ALUMINUM CHANNEL WITH 2"x2"x1/4" ANGLE TO SUPPORT GRATING. FLANGES POSITIONED TO OUTSIDE.
10. ALUMINUM FIXED WALL MOUNT LADDER. SEE DETAILS.
11. ALUMINUM FIXED RAILING SYSTEM SURROUNDING LADDER FROM MAIN LEVEL. PROVIDE SWING GATE WITH SPRING LOADED CLOSER.
12. ALUMINUM BEAMS TO BEAR 6" IN CMU WALL ON 7"x5"x1/2" STAINLESS STEEL EMBED PLATE WITH TWO 1/2" DIA. x 6" LONG HEADED STUDS AND THREADED RODS FOR BEAM ATTACHMENT - COAT END OF BEAM WITH WATERPROOFING PRIOR TO INFILLING CMU AROUND BEAM.
13. ALUMINUM BEAMS TO BE SUPPORTED FROM DOUBLE L4x4x3/8 x 5-1/2" LONG STAINLESS STEEL ANGLES SECURED TO CONCRETE WITH (4) 3/4"Ø S.S. ADHESIVE ANCHORS (BOLTED THROUGH 8" CHANNEL WHERE APPLICABLE).
14. L8 x 6 x 7/16 (LLH) x 10" LONG - SECURE TO SOLID GROUTED MASONRY WITH (2) 5/8" Ø ADHESIVE ANCHORS SPACED 8" APART. SUPPORTS PRECAST CAP AND BRICK ABOVE AT 12" STONE VENEER "PIER" ELEMENTS. SEE ARCHITECTURAL DETAIL 4/DA4.
15. L8 x 4 SUPPORT FOR EXTENDED VENEER - SEE DETAIL 5/S8



1 S5 PARTIAL ROOF PLAN - PUMP ROOM

0 4' 8' 12'

3 S5 VENEER LINTEL DETAIL



2 S5 PARTIAL PLAN - PIPE GALLERY PLATFORM AND HOST BEAM

0 2' 4' 6'

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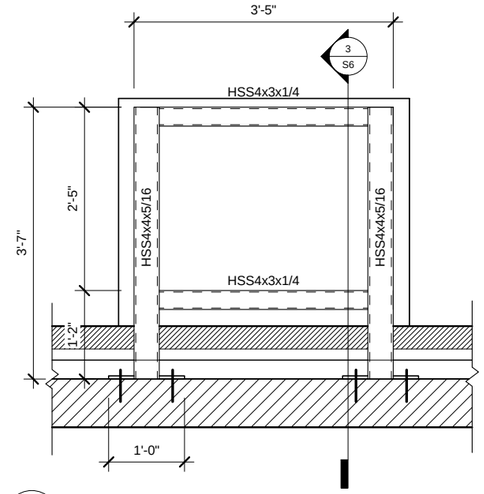
UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WI

MARK	DATE	DESCRIPTION
		REVISIONS

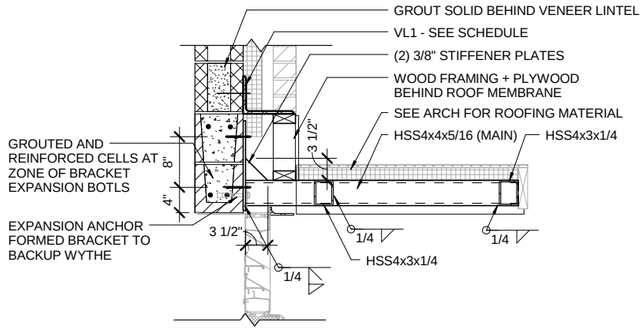
SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY BAW
DRAWN BY NJK
Short Elliott Hendrickson, Inc. (SEH)

SHEET TITLE
ROOF PLAN

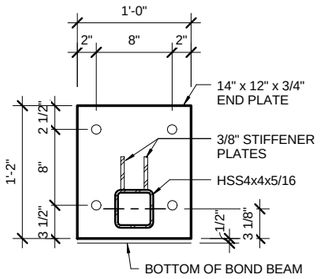
SHEET
S5



2 S6 ROOF CANOPY PLAN



3 S6 SECTION THRU CANOPY



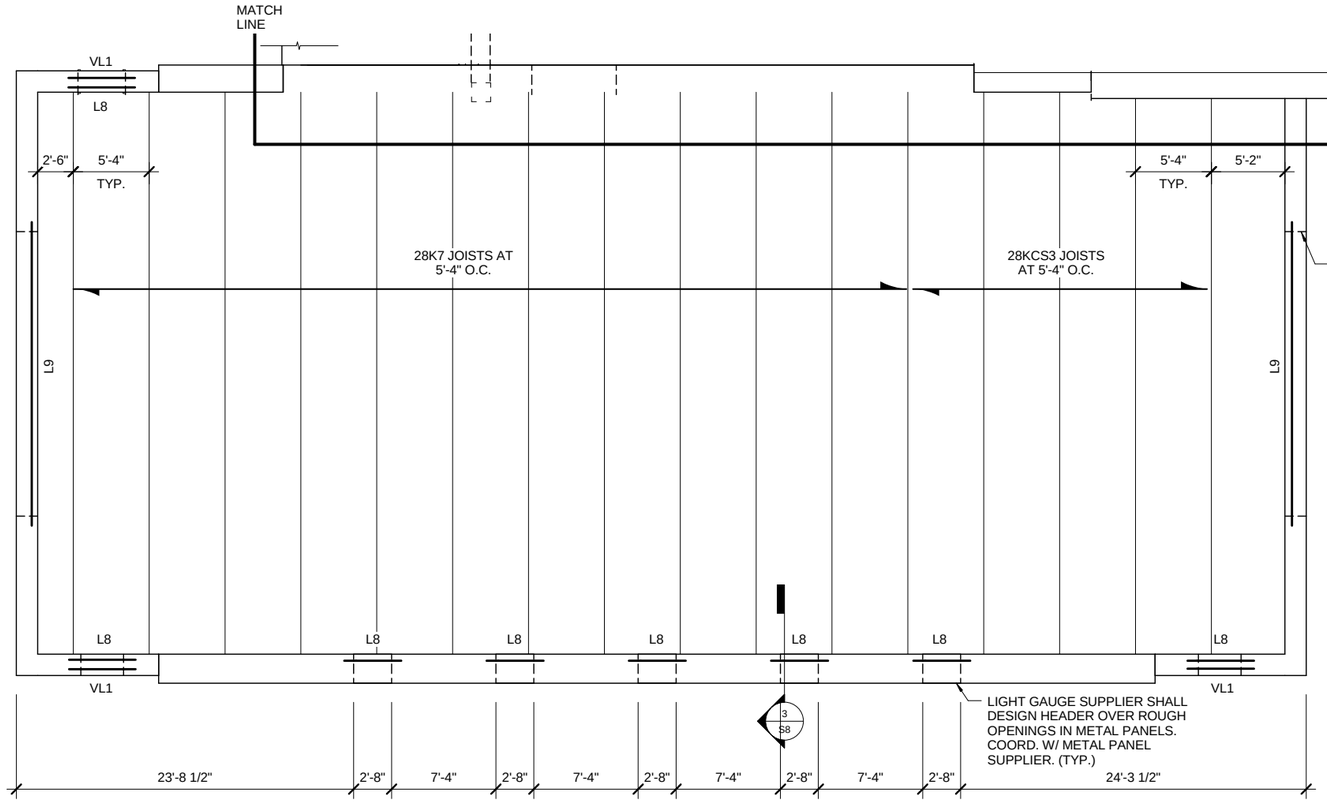
4 S6 CANOPY CONNECTION PLATE DETAIL

NOTES

1. VL'x' DENOTES VENEER LINTEL. SEE SHEET S5 FOR VENEER LINTEL SCHEDULE
2. ROOF DECK:
   1 1/2" DEEP x 20ga. (0.0358") TYPE B METAL ROOF DECK MINIMUM PROPERTIES:
   I = 0.201
   Sp = 0.234
   Sn = 0.247
   CONNECTORS: 5/8" PUDDLE WELDS ON A 36/4 PATTERN TO SUPPORTS - 12" o.c. SIDELAP FASTENERS: (1) #10 TEK SCREWS PER SPAN.
   INSTALL DECK OVER A MINIMUM OF 3 SPANS CONTINUOUS.

LINTEL SCHEDULE		
MARK	SIZE OR DESIGNATION	NOTES
L1	8" W x 16" DEEP CMU LINTEL W/ (2) #5 REBAR, TOP & BOTTOM	
L2	8" W x 24" DEEP CMU LINTEL W/ (2) #5 REBAR, TOP & BOTTOM	
L3	12" W x 16" DEEP CMU LINTEL W/ (2) #5 REBAR, BOTTOM	
L4	12" W x 24" DEEP CMU LINTEL W/ (2) #5 REBAR, TOP & BOTTOM	
L5	W8x18 W/ 5/16" x 10" BOT. PLATE. 6" x 6" x 3/8" BRG. PLATE EA. END	STAINLESS STEEL NOTE 5
L6	(2) L 3 x 3 x 1/4 ANGLE LINTEL	STAINLESS STEEL NOTE 5
L7	10" W x 32" DEEP CMU LINTEL W/ (2) #5 REBAR, TOP & BOTTOM	
L8	10" W x 24" DEEP CMU LINTEL W/ (2) #5 REBAR, TOP & BOTTOM	
L9	W16x36 W/ 3/8" x 18" BOT. PLATE. 8" x 6" x 3/8" BRG. PLATE EA. END	NOTE 6

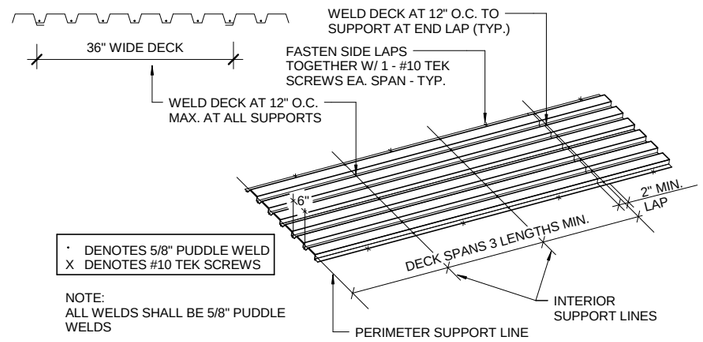
NOTES:
1. EACH MASONRY LINTEL SHALL BEAR 8" MIN. ON CMU WALL. - CONTINUE HORIZ. REINF. TO END OF BEARING.
2. GROUT AND REINFORCE 2 VERTICAL CORES EACH SIDE OF ALL MASONRY AND STEEL LINTELS U.N.O.
3. BOTTOM REBAR TO BE MAINTAINED 2" MIN. CLEAR FROM BOTTOM OF BOND BEAM LINTEL OR GREATER IF REQ'D FOR FIRE RESISTIVE CONSTRUCTION.
4. SHORE CMU LINTELS FOR ENTIRE LENGTH UNTIL BOND BEAMS ARE IN PLACE AND GROUT IS CURED. ALL BOND BEAM LINTELS SHALL BE CONSTRUCTED OF 8" HIGH BLOCK IN RUNNING BOND. USE POUR-THRU BOND BEAM BLOCK FOR UPPER COURSE(S) IF LINTEL HEIGHT EXCEEDING 8" IS INDICATED.
5. VERIFY LINTEL WIDTH WITH SELECTED BLOCK BULLNOSE RADIUS.
6. POSITION EDGE OF BEAM 1" FROM OUTSIDE FACE OF 10" CMU



NORTH

1 S6 PARTIAL ROOF PLAN - PUMP ROOM

0 4' 8' 12'



5 S6 TYPICAL DECK WELDING DETAIL

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
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MADISON, WI

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY BAW
DRAWN BY NJK
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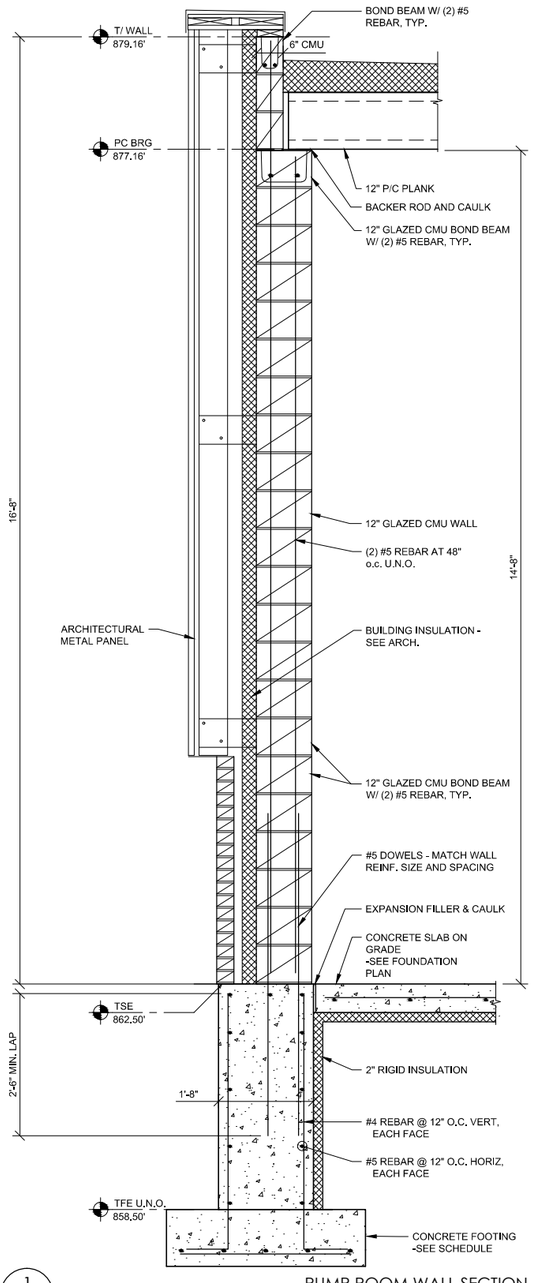
SHEET TITLE: ROOF PLAN

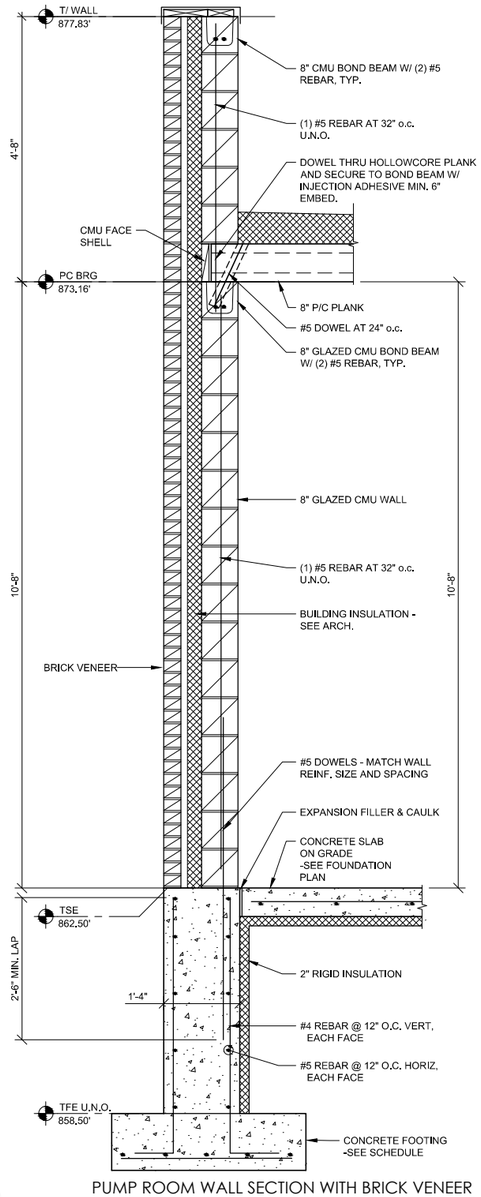
SHEET S6

1/13/2017 5:27:38 PM



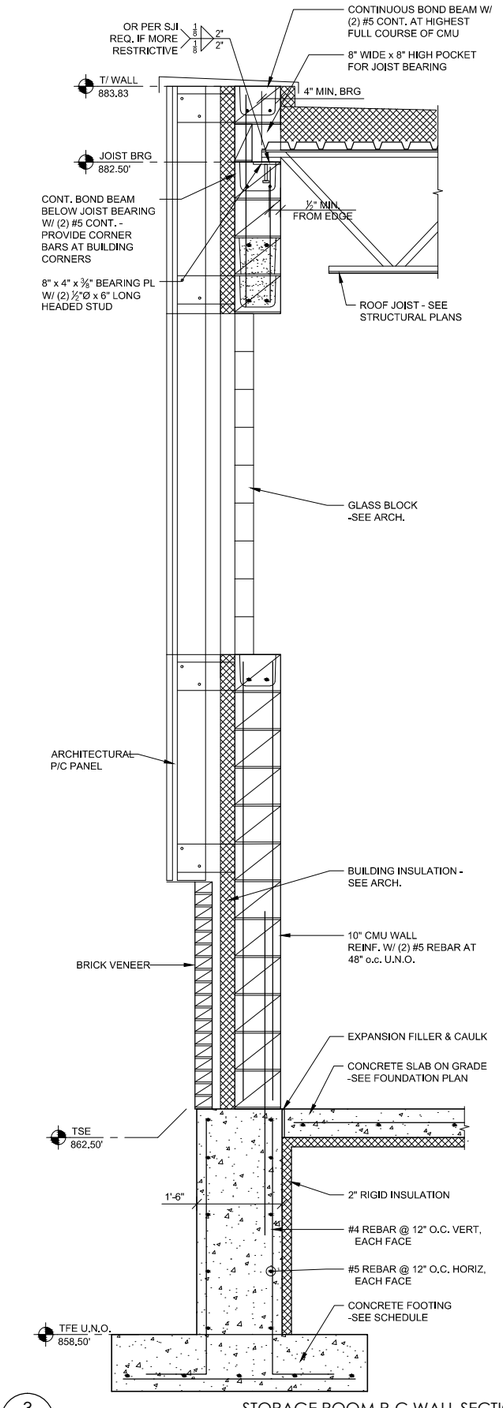
1 S8 PUMP ROOM WALL SECTION

ORIGINAL SCALE: 3/4" = 1'-0"



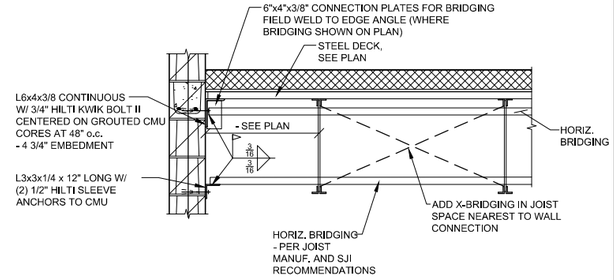
2 S8 PUMP ROOM WALL SECTION WITH BRICK VENEER

ORIGINAL SCALE: 3/4" = 1'-0"



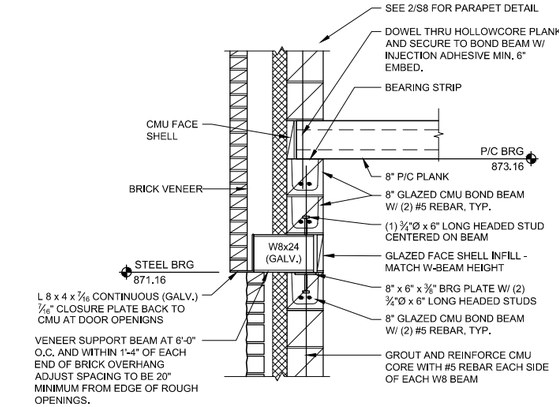
3 S8 STORAGE ROOM P-C WALL SECTION

ORIGINAL SCALE: 3/4" = 1'-0"



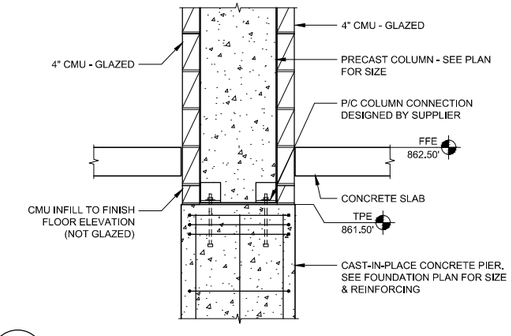
4 S8 CONNECTION DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"



5 S8 BRICK LEDGE DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"



6 S8 SECTION THRU PRECAST COLUMN

ORIGINAL SCALE: 3/4" = 1'-0"

SHEET S7 NOT USED

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
CITY PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY BAW
DRAWN BY KMM
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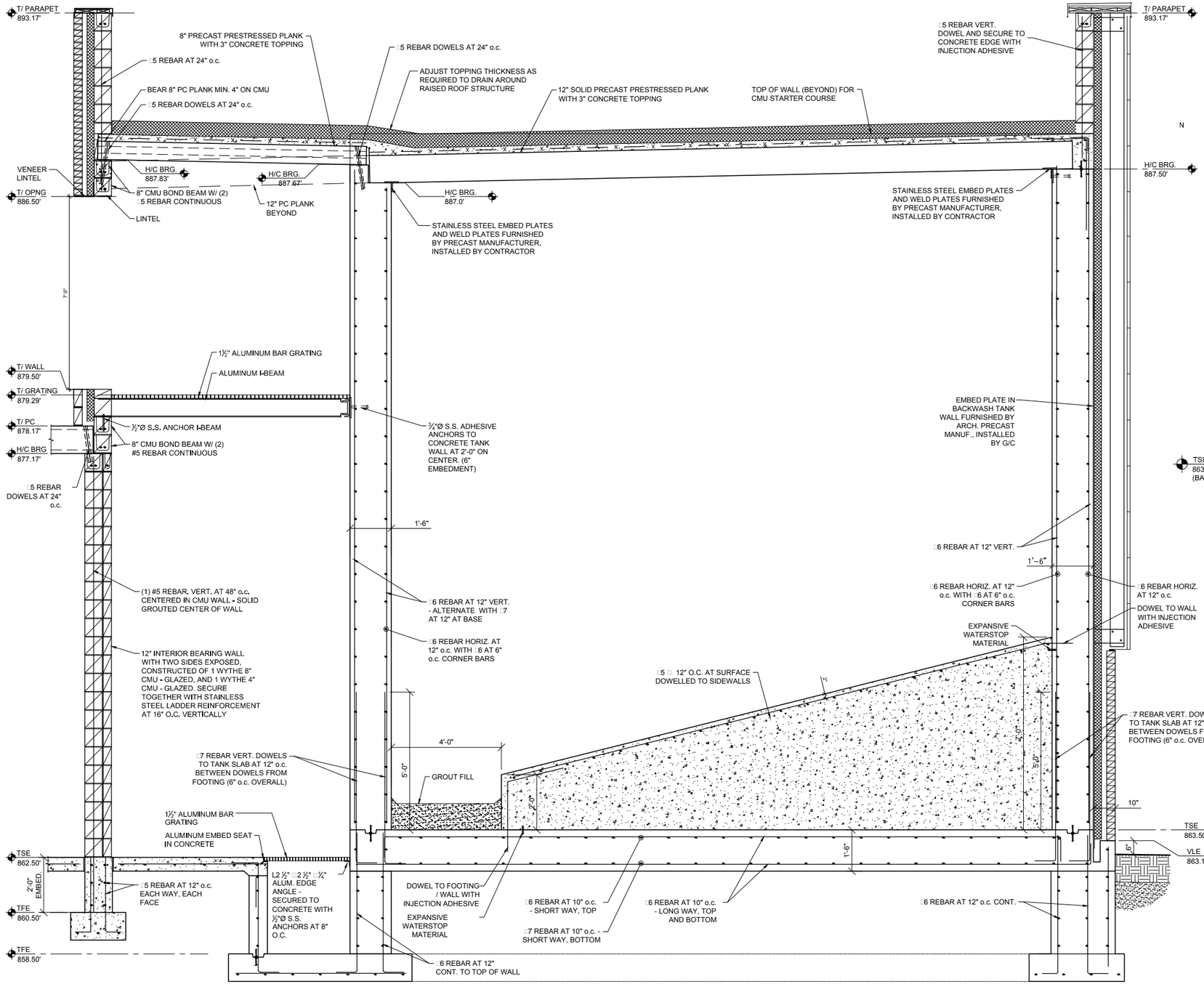
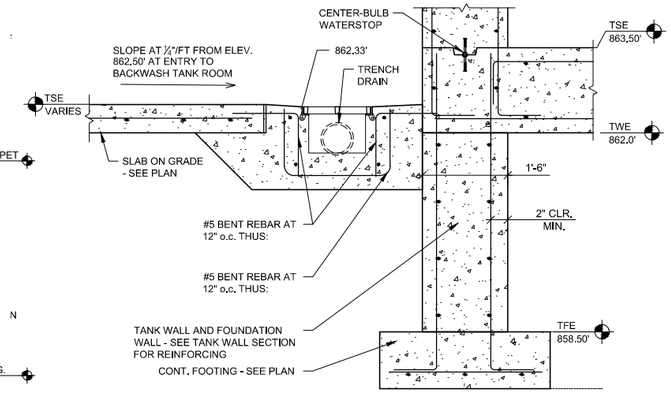
SHEET TITLE
STRUCTURAL PLAN
STRUCTURAL WALL SECTIONS

SHEET
S8



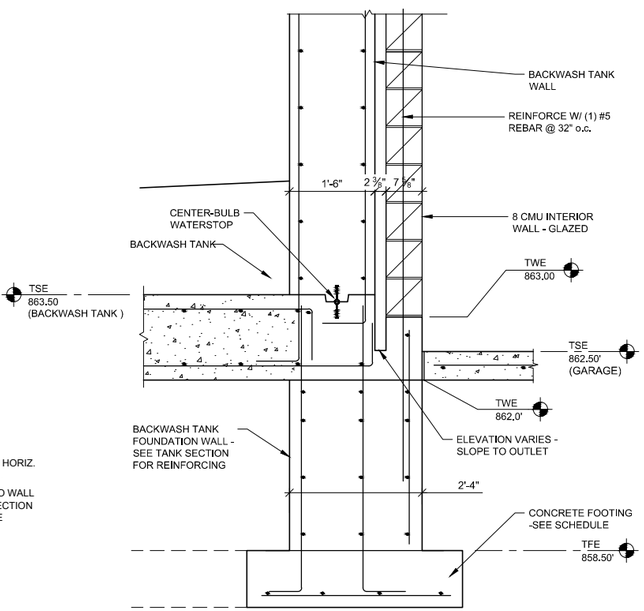
1 S9 TANK SECTION

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



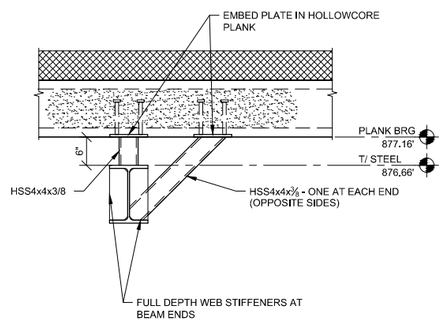
2 S9 TRENCH DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"



3 S9 BACKWASH TANK WALL AT STORAGE ROOM

ORIGINAL SCALE: 3/4" = 1'-0"



4 S9 MONORAIL CRANE ATTACHMENT

ORIGINAL SCALE: 3/4" = 1'-0"

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
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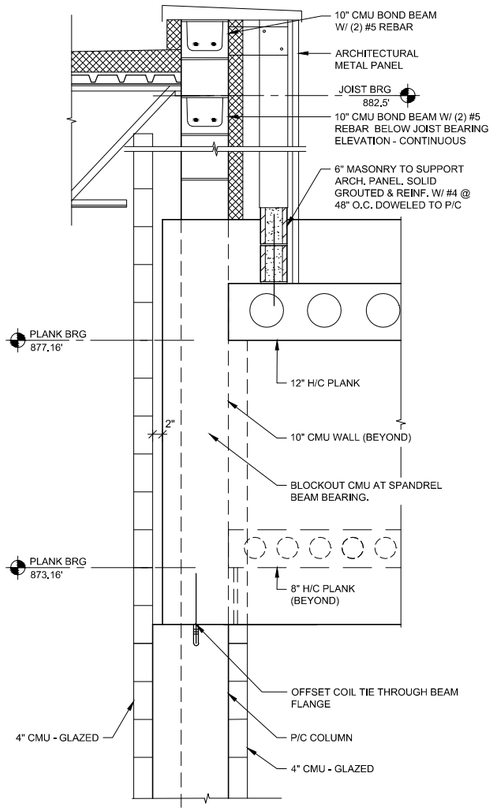
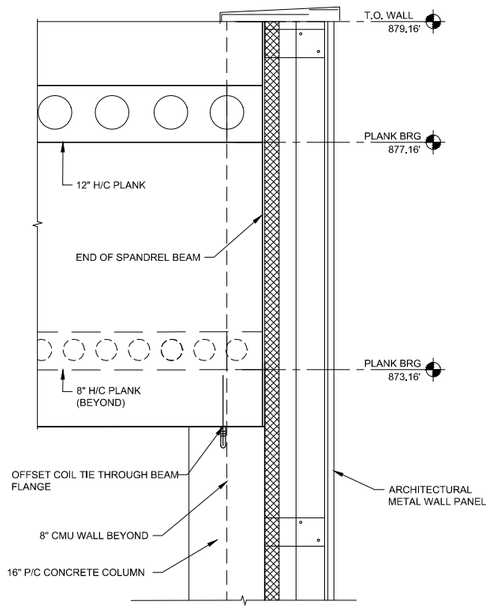
SHEET TITLE
STRUCTURAL PLAN
STRUCTURAL WALL SECTIONS

SHEET
S9



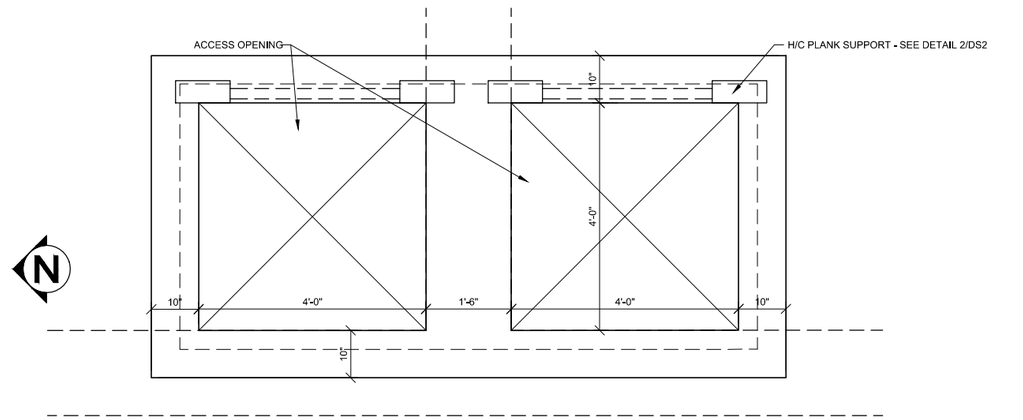
1 S10 PUMP ROOM P-C BEAM BEARING AT CONCR. WALL

ORIGINAL SCALE: 3/4" = 1'-0"



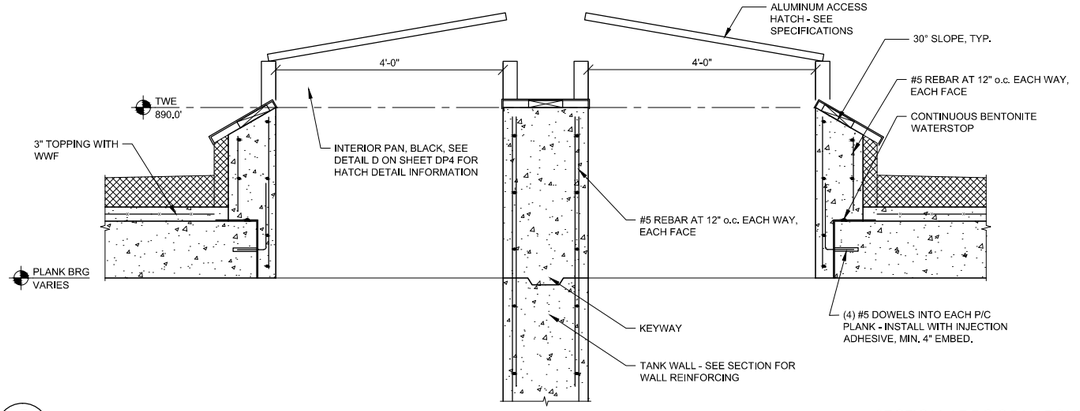
2 S10 PUMP ROOM P-C BEAM BEARING AT EXTERIOR WALL

ORIGINAL SCALE: 3/4" = 1'-0"



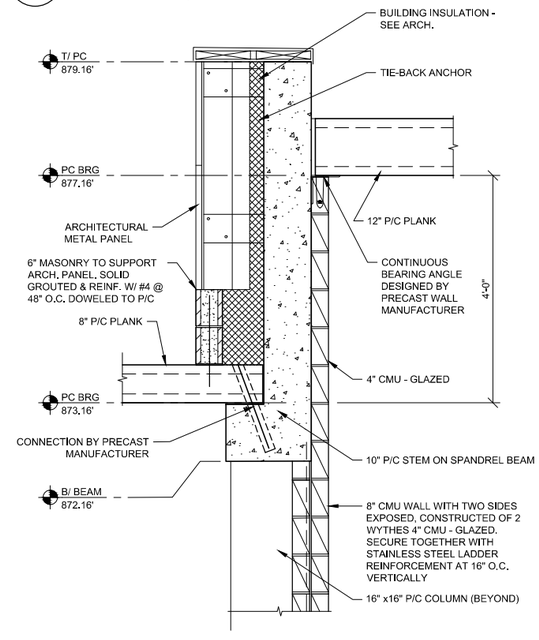
3 S10 ROOF HATCH PLAN

ORIGINAL SCALE: 3/4" = 1'-0"



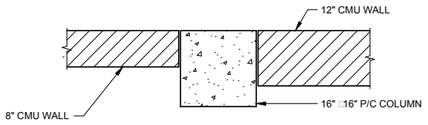
5 S10 SECTION AT ROOF HATCHES

ORIGINAL SCALE: 3/4" = 1'-0"



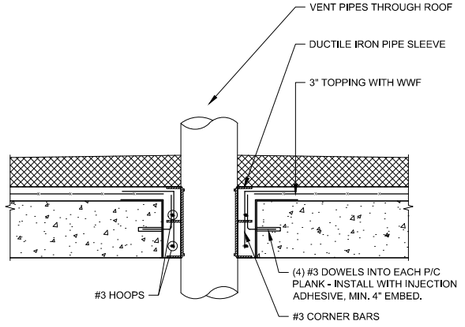
6 S10 PUMP ROOM P-C BEAM SECTION

ORIGINAL SCALE: 3/4" = 1'-0"



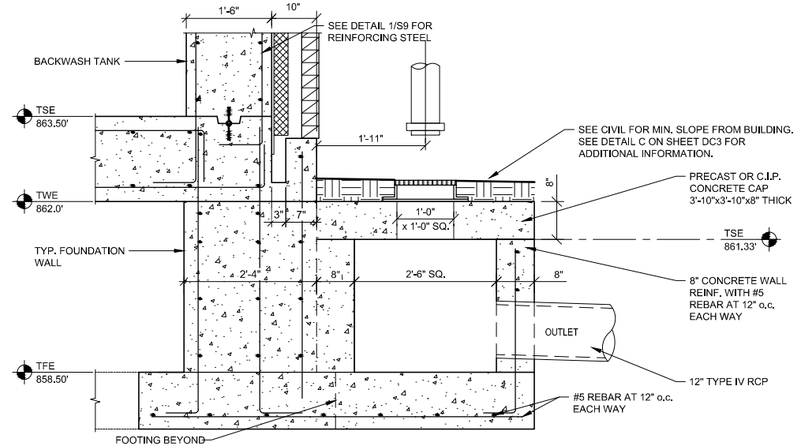
4 S10 PRECAST COLUMN IN CMU WALL DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"



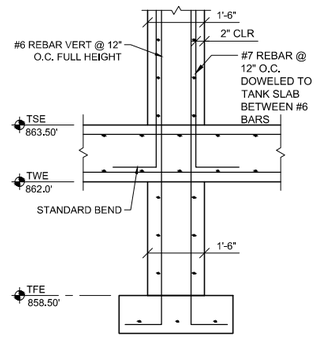
7 S10 PIPE ENCASEMENT DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"



8 S10 BACKWASH OVERFLOW INLET STRUCTURE

ORIGINAL SCALE: 3/4" = 1'-0"



9 S10 BACKWASH TANK WALL DETAIL

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

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
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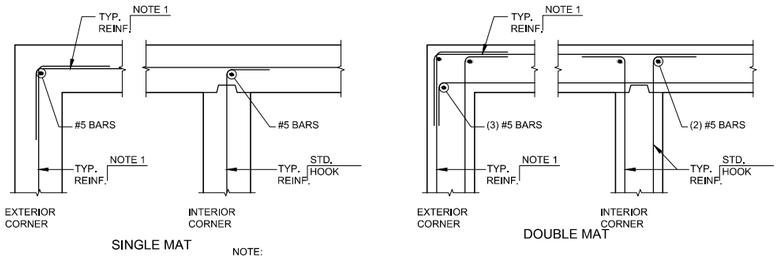
SHEET TITLE
STRUCTURAL PLAN
STRUCTURAL DETAILS

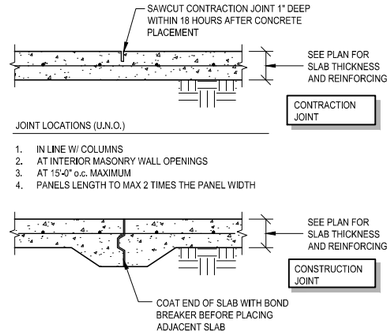
SHEET
S10



NOTE:
1. 90° HOOK SHALL BE OF SUFFICIENT LENGTH TO PROVIDE THE HORIZONTAL BAR LAP LENGTH SHOWN IN THE SPLICE LAP TABLE BELOW.
2. TYPICAL FOR ALL CORNERS UNLESS OTHERWISE SHOWN ON THE PLANS.

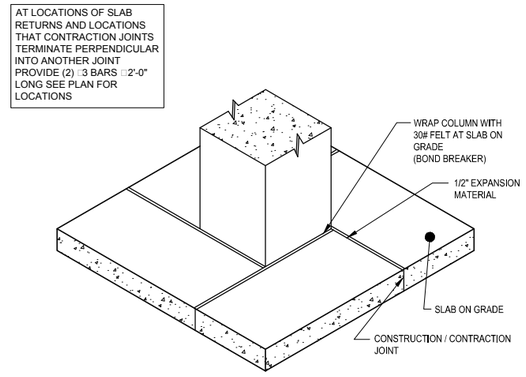
1 DS1 CONCRETE FOUNDATION WALL CORNER DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"



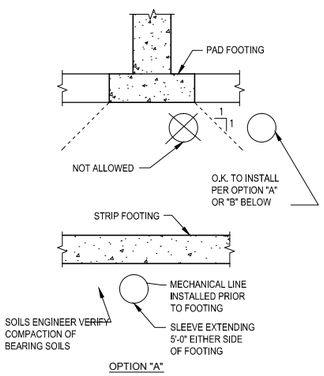
2 DS1 CONSTRUCTION AND CONTRACTION JOINT DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"

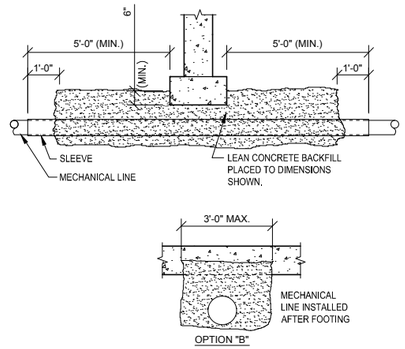


3 DS1 PRECAST ISOLATION JOINT DETAIL AT COLUMN

ORIGINAL SCALE: 3/4" = 1'-0"

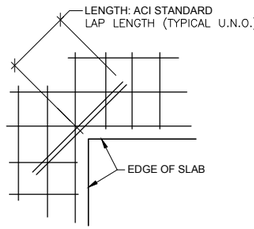


NOTE: DO NOT RUN LINES BENEATH OR WITHIN A 1:1 SLOPE FROM THE EDGE OF PAD FOOTINGS



4 DS1 CONTRACTOR OPTIONS

ORIGINAL SCALE: 3/4" = 1'-0"



WALL/SLAB REINF BARS *	ADDITIONAL CORNER BARS
WWF	2-#4
#4	2-#4
#5	2-#5
#6	2-#6
#7	3-#5
#8	3-#6

* USE LARGEST DIAMETER BAR IN EITHER DIRECTION FOR DETERMINING CORNER BARS.

NOTES:

- PROVIDE 2" CLEAR COVER OVER ALL BARS AT OPENINGS.
- ADDITIONAL CORNER BARS:

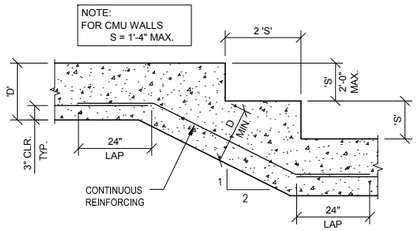
WHEN SLAB HAS BOTTOM REINFORCEMENT LAYER ONLY, PLACE DIAGONAL BARS AT MID-SPAN.

WHEN SLAB HAS TOP REINFORCEMENT LAYER ONLY, PLACE DIAGONAL BARS WITH TOP REINFORCEMENT.

WHEN SLAB HAS TOP & BOTTOM REINFORCEMENT LAYERS, PLACE DIAGONAL BARS WITH TOP & BOTTOM REINFORCEMENT.

5 DS1 SLAB REETNRANT CORNER DETAIL

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

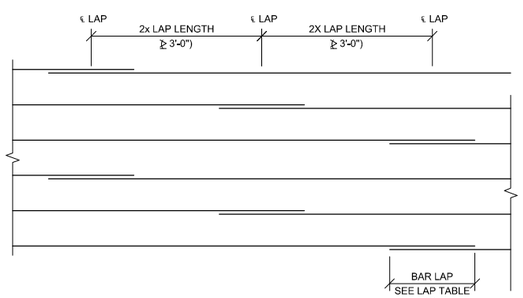


6 DS1 STEPPED FOOTING DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"

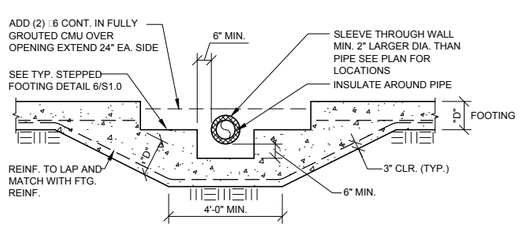
BAR SIZE	MINIMUM BAR LAP LENGTH	
	TOP BARS	OTHER BARS
#3	1'-6"	1'-4"
#4	2'-0"	1'-7"
#5	2'-6"	1'-11"
#6	3'-0"	2'-4"
#7	3'-6"	2'-9"
#8	4'-0"	3'-1"

NOTES:
1. LAPS SHOWN ARE BASED ON f'c = 4000 PSI NORMAL WEIGHT CONCRETE, LAP CLASS B AND NON-EPOXY COATED REINFORCEMENT WITH COVER ≥ 2d AND BAR SPACING ≥ 6d o.c. (CATEGORY 6) FOR ALL OTHER CONDITIONS, PROVIDE BAR LAP LENGTH AS REQUIRED BY ACI 318.
2. TOP BARS REFERRED TO IN THE TABLE ABOVE ARE HORIZONTAL BARS WITH ≥ 12" OF CONCRETE CAST BELOW THE BAR. HORIZONTAL BARS IN WALLS SHALL REQUIRE LAPS AS INDICATED FOR TOP BARS.
3. ALL BAR LAPS SHALL BE CONTACT SPLICES UNLESS OTHERWISE NOTED.
4. USE LAP LENGTH FOR THE SMALLER BAR WHEN LAPPING DIFFERENT SIZE BARS.
5. ALL REINFORCING BAR LAP LENGTHS SHALL BE AS SHOWN IN THE TABLE ABOVE UNLESS OTHERWISE NOTED.



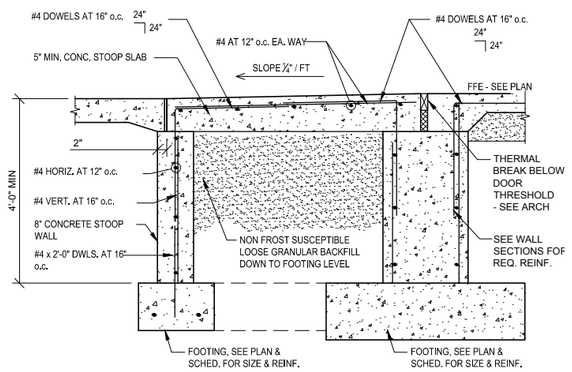
7 DS1 HORIZONTAL STAGGERED BAR LAP DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"



8 DS1 TYPICAL UTILITY OPENING THROUGH WALL DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"



9 DS1 TYPICAL CONCRETE STOOP DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
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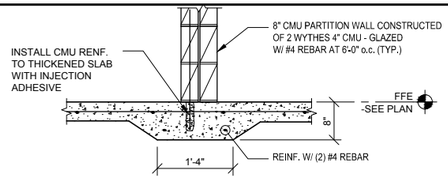
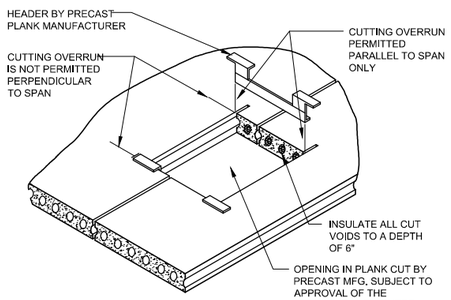
SHEET TITLE
STRUCTURAL PLAN
TYPICAL STRUCTURAL DETAILS

SHEET
DS1



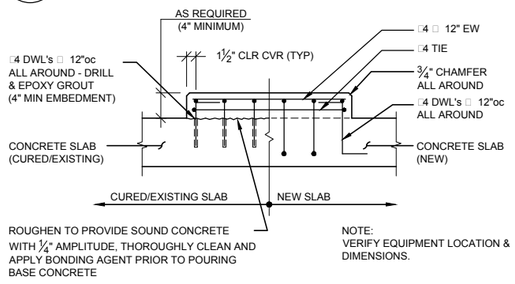
1 DS2 — INTERIOR CMU PARTITION WALL THICKENED SLAB

ORIGINAL SCALE: 3/4" = 1'-0"



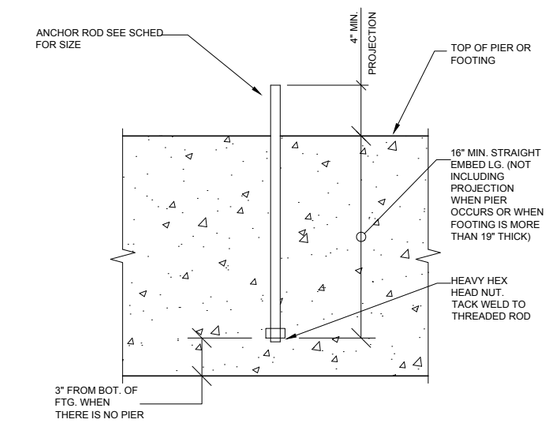
2 DS2 — TYPICAL PRECAST PLANK OPENING DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"



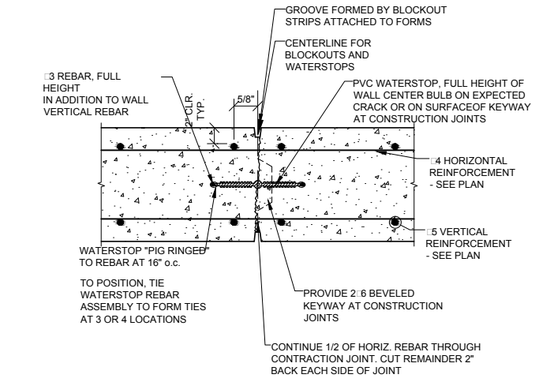
6 DS2 — CONCRETE EQUIPMENT PAD DETAIL

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



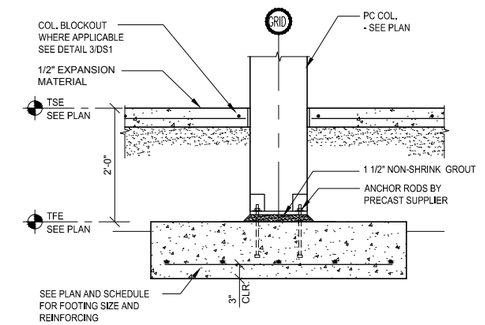
3 DS2 — TYPICAL ANCHOR ROD DETAIL

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



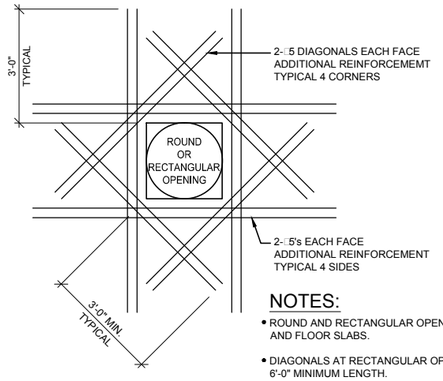
4 DS2 — VERTICAL CONTRACTION AND CONSTRUCTION JOINT DETAIL

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



5 DS2 — PRECAST COLUMN FOOTING DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"

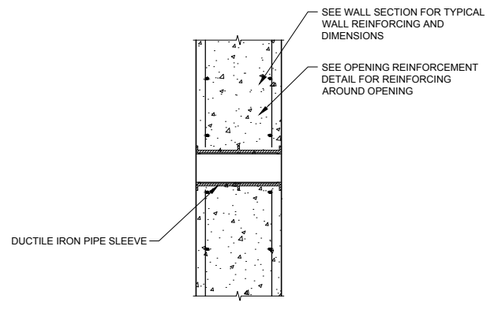


NOTES:

- ROUND AND RECTANGULAR OPENINGS, WALL AND FLOOR SLABS.
- DIAGONALS AT RECTANGULAR OPENINGS SHALL BE 6'-0" MINIMUM LENGTH.

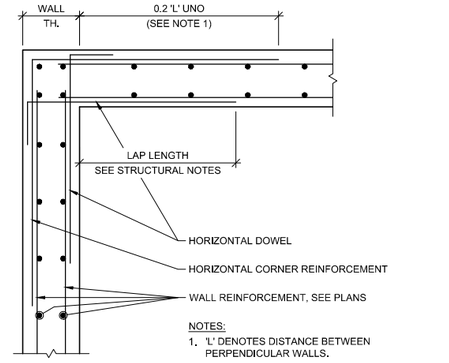
7 DS2 — OPENING REINFORCEMENT DETAIL

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



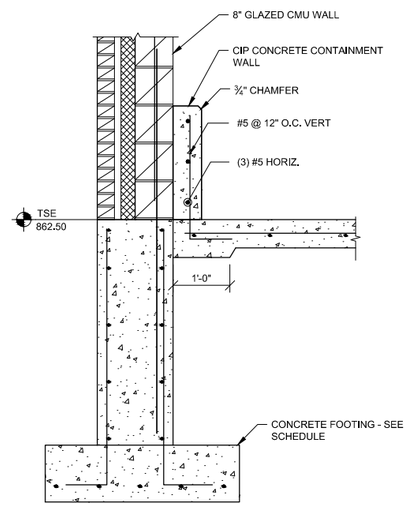
8 DS2 — TYPICAL PIPE SLEEVE THROUGH CONCRETE WALL

ORIGINAL SCALE: 3/4" = 1'-0"



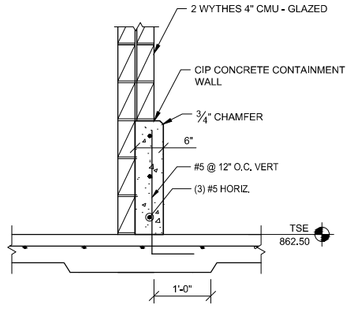
9 DS2 — CONCRETE TANK WALL CORNER DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"



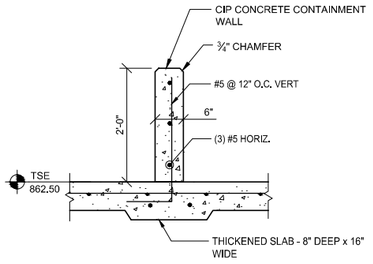
10 DS2 — CONTAINMENT WALL DETAIL AT PERIMETER WALL

ORIGINAL SCALE: 3/4" = 1'-0"



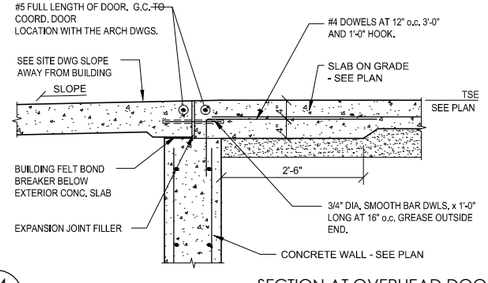
11 DS2 — CONTAINMENT WALL DETAIL AT INTERIOR WALL

ORIGINAL SCALE: 3/4" = 1'-0"



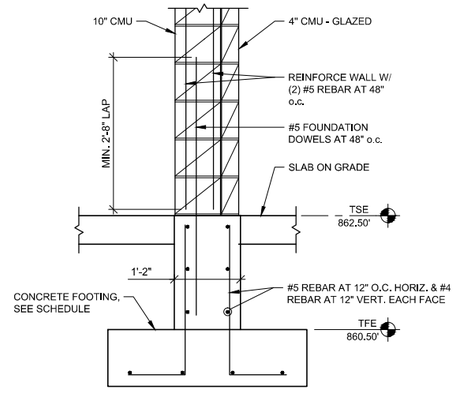
12 DS2 — CONTAINMENT WALL DETAIL

ORIGINAL SCALE: 3/4" = 1'-0"



14 DS2 — SECTION AT OVERHEAD DOOR

ORIGINAL SCALE: 3/4" = 1'-0"



13 DS2 — INTERIOR MASONRY BEARING WALL SECTION

ORIGINAL SCALE: 3/4" = 1'-0"

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY BAW
DRAWN BY KMM
Short Elliott Hendrickson, Inc. © (SEH)

SHEET TITLE
STRUCTURAL PLAN
TYPICAL STRUCTURAL DETAILS

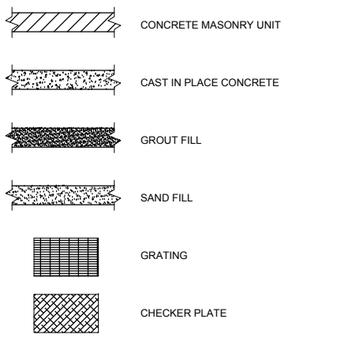
SHEET
DS2

PLOTTED: 11-13-2016 12:48 PM
PLOT SCALE: 1:2

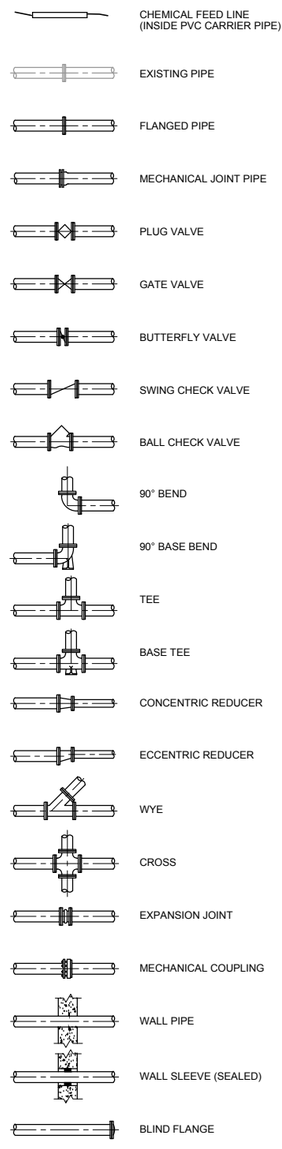
PROCESS GENERAL ABBREVIATION LIST

AB	ANCHOR BOLT
AF	ADAPTER FLANGE
ALT	ALTERNATE
ALUM	ALUMINUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATELY
ARCH	ARCHITECT
ASSY	ASSEMBLY
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AUX	AUXILIARY
AVG	AVERAGE
AWWA	AMERICAN WATERWORKS ASSOCIATION
AZ	AZIMUTH
&	AND
@	AT
BC	BOLT CIRCLE
BIT	BITUMINOUS
BLDG	BUILDING
BF	BLIND FLANGE
BLK	BLOCK
BOT	BOTTOM
BFV	BUTTERFLY VALVE
BFV & B	BUTTERFLY VALVE AND BOX
°C	DEGREES CELSIUS
C	CHECK
CFM	CUBIC FEET PER MINUTE
CHEM	CHEMICAL
CHL	CHLORINE
CI	CAST IRON
CIP	CAST IRON PIPE
CJ	CONSTRUCTION JOINT
CKD	CHECKERED
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEAN-OUT
CONC	CONCRETE
CONT	CONTINUOUS
C.T.	CERAMIC TILE
CTE	CONNECT TO EXISTING
CTRL JT	CONTROL JOINT
CU	CUBIC
CV	CHECK VALVE
DP	DEEP
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DWG	DRAWING
E	EAST
EA	EACH
ECC	ECCENTRIC
EL	ELEVATION
ELEC	ELECTRICAL
EQUIP	EQUIPMENT
EMBED	EMBEDDED
EW	EACH WAY
EX	EXISTING
°F	DEGREES FAHRENHEIT
FD	FLOOR DRAIN
FDN	FOUNDATION
FFE	FINISHED FLOOR ELEVATION
FL	FLOOR
FLG	FLANGE
FM	FORCEMAIN
FPS	FEET PER SECOND
FRP	FIBERGLASS REINFORCED
FT	FEET/FOOT
FTG	FITTING/FOOTING
FUT	FUTURE
G	GATE
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GND	GROUND
GP	GUARD POST
GPD	GALLONS PER DAY
GPM	GALLONS PER MINUTE
GRV	GROOVE
GV & B	GATE VALVE & BOX
HD	HEAVY DUTY
HM	HOLLOW METAL
HP	HORSEPOWER
HPT	HIGH POINT
HR	HOUR
HSP	HIGH SERVICE PUMP
HTR	HEATER
HWL	HIGH WATER LEVEL
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HYD	HYDRANT
ID	INSIDE DIAMETER
IN	INCHES
INV	INVERT
I/P	CURRENT/PRESSURE
IPS	IRON PIPE SIZE
JT	JOINT
KV	KNIFE VALVE
LG	LONG
LF	LINEAL FEET/FOOT
LL	LIQUID LEVEL
LT	LEFT
MAG	MAGNETIC
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MFG	MANUFACTURING
MFR	MANUFACTURER
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
N	NORTH
N/A	NOT APPLICABLE
NOM	NOMINAL
NEG	NEGATIVE
NC	NORMAL CLOSED
NIC	NOT IN CONTRACT
NO	NORMAL OPEN
No.	NUMBER
NPS	NATIONAL PIPE SIZE
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
NW	NORTHWEST
NWL	NORMAL WATER LEVEL
O/C, OC	ON CENTER
OD	OUTSIDE DIAMETER
OPNG	OPENING
OS&Y	OUTSIDE SCREW AND YOKE
PE	PLAIN END
PED	PEDESTRIAN
P&ID	PIPING AND INSTRUMENTATION DIAGRAM
PL	PLATE
PNT	PAINT
POS	POSITIVE
PP	POWER POLE
PPC	PRESTRESSED PRECAST CONCRETE
PRV	PRESSURE RELIEF VALVE
PSI	POUNDS PER SQUARE INCH
PT	POINT
PV	PLUG VALVE
PV & B	PLUG VALVE & BOX
PVC	POLYVINYL CHLORINE
QTY	QUANTITY
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
RECT	RECTANGULAR
RED	REDUCER
REINF	REINFORCE (D)
REQ	REQUIRE (D)
REV	REVISION
RP	RECLAIM PUMP
RPM	REVOLUTIONS PER MINUTE
RR	RAILROAD
SAN	SANITARY
SE	SOUTHEAST
SEC	SECTION
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
SCH	SCHEDULE
SIM	SIMILAR
SLV	SLEEVE
SP	SLUDGE PUMP
SPEC	SPECIFICATION
SS	STAINLESS STEEL
STD	STANDARD
STRUCT	STRUCTURAL
SQ	SQUARE
SYM	SYMMETRICAL
TEMP	TEMPORARY
TH	THICK
THD	THREAD
THRU	THROUGH
TOC	TOP OF CONCRETE
TRTD	TREATED
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
VAC	VACUUM
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOC	VOLATILE ORGANIC CHEMICAL
W	WIDE/WEST
W/	WITH
W/O	WITHOUT
WL	WATER LEVEL
WM	WATER MAIN
WS	WATER SURFACE
WT	WEIGHT
WTP	WATER TREATMENT PLANT
WWTP	WASTEWATER TREATMENT PLANT
X	FENCE
YD	YARD

PROCESS CONSTRUCTION LEGEND



PROCESS PIPING LEGEND



PROCESS GENERAL NOTES

1. INFORMATION REGARDING THE EXISTING CONDITIONS WAS OBTAINED FROM SURVEY DATA AND PRELIMINARY FIELD INVESTIGATIONS. ALL EXISTING AND PROPOSED CONDITIONS SHALL BE FIELD VERIFIED BY CONTRACTOR PRIOR TO ANY CONSTRUCTION.
2. THE DRAWINGS ARE ESSENTIALLY TO SCALE UNLESS NOTED OTHERWISE. DRAWINGS SHALL NOT TAKE PRECEDENCE OVER FIELD MEASUREMENTS.
3. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES. THE CONTRACTOR SHALL CONSULT ALL DRAWINGS AND VARIOUS CONSTRUCTION TRADES TO ACQUAINT SELF WITH THE PROJECT. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES NOTED BEFORE AND DURING CONSTRUCTION. THE ENGINEER RESERVES THE RIGHT TO MAKE REASONABLE MODIFICATIONS IN LAYOUT TO AVOID CONFLICT WITH THE WORK OF OTHER TRADES AND FOR THE PROPER EXECUTION OF THE WORK AT NO ADDITIONAL COST TO THE OWNER.
4. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY ADDITIONAL COSTS WHICH MAY RESULT FROM UNAUTHORIZED DEVIATIONS FROM THE CONTRACT DOCUMENTS.
5. CONTRACTOR SHALL PROTECT ALL EXISTING AND INSTALLED PIPING, EQUIPMENT, AND STRUCTURES DURING CONSTRUCTION NOT NOTED TO BE REMOVED. ALL DAMAGED ITEMS SHALL BE REPAIRED OR REPLACED WITH NO ADDITIONAL COST TO THE OWNER.
6. ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND ORDINANCES SHALL BE ADHERED TO THROUGHOUT THE CONSTRUCTION PROJECT.
7. STANDARD DETAILS ARE INTENDED TO SHOW GENERAL DESIGN CONCEPTS. REFER TO THE SPECIFIC STRUCTURE DRAWINGS FOR DIMENSIONS AND SIZES.
8. WHERE NOT SPECIFICALLY SHOWN ON THE DRAWINGS, IT IS INTENDED THAT ALL AREAS BE GRADED TO SLOPE AWAY FROM BUILDINGS AND STRUCTURES (EXCEPT DRAINAGE RECEIVING STRUCTURES) UNLESS OTHERWISE NOTED ON THE DRAWINGS OR SPECIFICATIONS.
9. SIZE OF FITTINGS AND VALVES SHALL CORRESPOND TO THE SIZE OF ADJACENT PIPING. JOINTS AND FITTING MATERIAL SHALL BE AS SHOWN FOR ADJACENT PIPING.
10. PROVIDE PROPER PLUGS, CAPS, AND RESTRAINTS WHEN ANY PIPING IS TERMINATED.
11. PIPE HANGERS AND SUPPORTS SHALL BE LOCATED IN THE FIELD AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. SEE SPECIFICATIONS FOR THE MAXIMUM SPACING. ALL LINES SHALL BE ADEQUATELY ANCHORED AND SUPPORTED TO PREVENT EXCESS MOVEMENT DURING TESTING AND OPERATION.
12. ALL SUBMERGED ANCHOR BOLTS, NUTS, FASTENERS, ETC., SHALL BE 304 STAINLESS STEEL UNLESS OTHERWISE NOTED.
13. ALUMINUM SURFACES IN CONTACT WITH CONCRETE SHALL RECEIVE TWO COATS OF BITUMASTIC OR ZINC CHROMATE.
14. METAL STAIRWAYS, PLATFORMS, AND GRATING SHALL HAVE ADEQUATE STRUCTURAL CHARACTERISTICS AND DESIGN CHARACTERISTICS TO SUPPORT A MINIMUM OF 100 POUNDS PER SQUARE FOOT. METAL FABRICATIONS SHALL MEET ALL OSHA STANDARDS AND THE REQUIREMENTS SET FORTH IN THE SPECIFICATIONS.
15. ALL WOOD NAILERS AND OTHER LUMBER WHICH IS INSTALLED IN CONTACT WITH METAL, CONCRETE, OR MASONRY SHALL BE TREATED (UNLESS OTHERWISE NOTED) AS OUTLINED IN THE SPECIFICATIONS.
16. ALL PIPING BENEATH FLOOR SLAB SHALL HAVE RESTRAINED JOINTS.
17. ALL PROCESS PIPING SHALL BE DUCTILE IRON UNLESS SPECIFIED OTHERWISE.
18. USE OF UNI-FLANGES SHALL ONLY BE ALLOWED WITH PRIOR APPROVAL OF ENGINEER.
19. THE PROCESS DRAWINGS INDICATE REQUIRED PIPE SIZES, ELEVATIONS, AND THE EXTENT AND GENERAL ARRANGEMENT FOR PROCESS PIPING AND EQUIPMENT. PRIOR TO THE FABRICATION OR INSTALLATION OF ANY PIPING OR EQUIPMENT THE CONTRACTOR SHALL CONSULT ALL DRAWINGS AND CONSTRUCTION TRADES TO ACQUAINT SELF WITH THE MATERIALS, FINISHES, AND LOCATIONS OF CEILINGS, STRUCTURAL MEMBERS, PIPES, DUCTS, LIGHTING FIXTURES, CONDUITS, ETC. WHICH MAY AFFECT THE INSTALLATION. COORDINATE THE WORK WITH OTHER TRADES AND MAKE REASONABLE MODIFICATIONS IN LAYOUT TO AVOID CONFLICT WITH THE WORK OF OTHER TRADES.
20. ALTHOUGH NOT SPECIFICALLY SHOWN, THE CONTRACTOR SHALL PROVIDE 1/2" POLY TUBING AIR INSTRUMENTATION PIPING BETWEEN THE AIR COMPRESSOR, THE VALVE ACTUATOR SOLENOID PANEL, ALL PNEUMATIC VALVES, AND REMOTE AIR CONNECT POINTS TO COMPLETE A FUNCTIONAL VALVE CONTROL SYSTEM.

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY
DRAWN BY Short Elliott Hendrickson, Inc. @ (SEH)

SHEET TITLE
NOTES PROCESS ABBREVIATIONS, LEGENDS, AND GENERAL

SHEET
GP1

P: \KO\M\MADWU\129083.5-FINAL-DSGN\51-DRAWINGS\::PROCESS::\GP1 SYMBOLS NOTES AND ABBREVITAIONS.DWG
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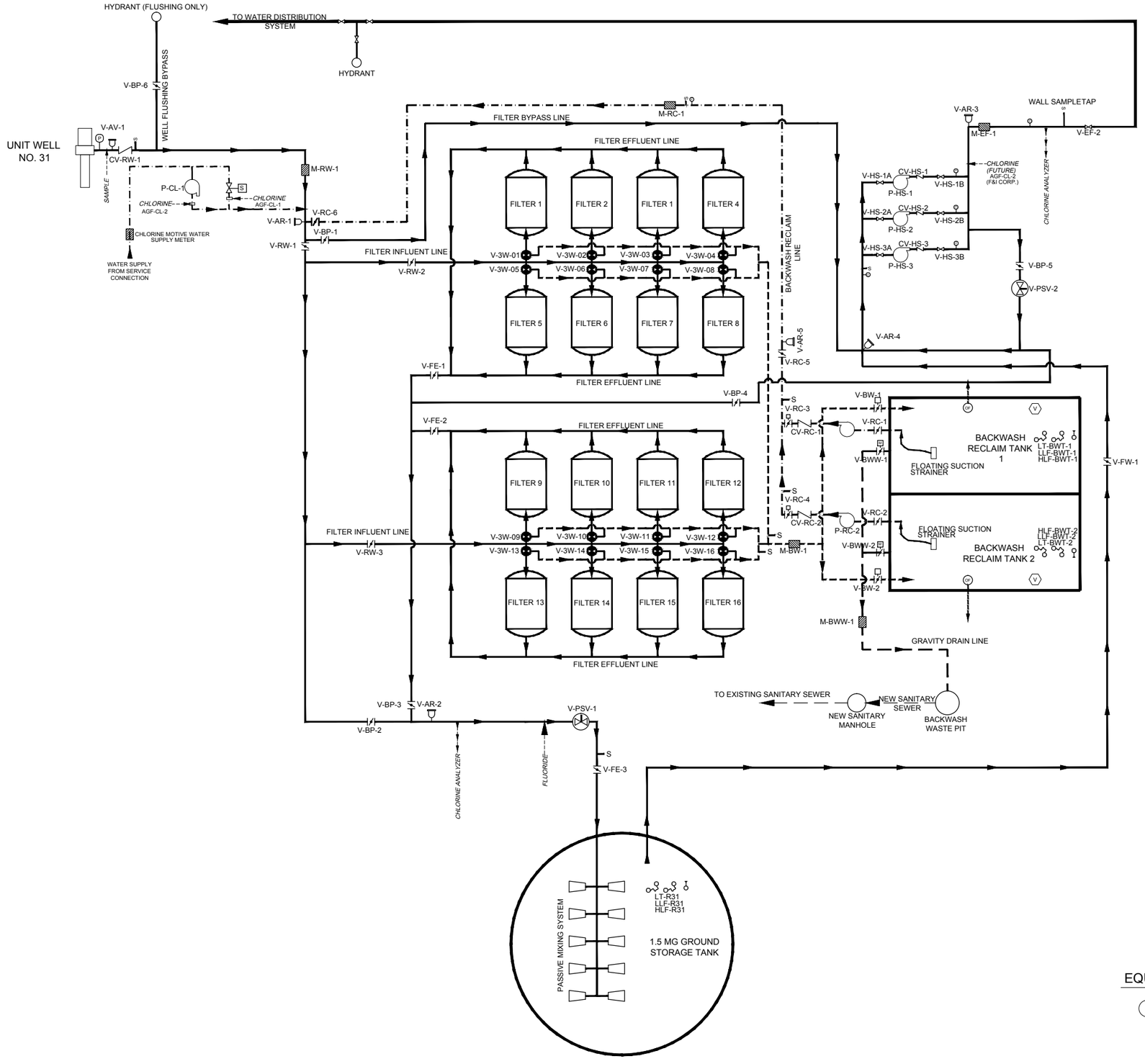
XREFs: ...\Base\Border Files\Madison AutoCAD 22 34 Border



MADISON UNIT WELL 31 WATER TREATMENT PLANT

PROCESS SCHEMATIC LEGEND

PIPING AND VALVES

- PROCESS WATER
- STRUCTURE
- WATER LINE
- BACKWASH WASTE LINE
- BACKWASH RECLAIM LINE
- OVERFLOW LINE
- SLUDGE/SANITARY SEWER LINE
- CHEMICAL FEED POINT
- SAMPLE TAP LOCATION
- BUTTERFLY VALVE
- PNEUMATIC VALVE OPERATOR
- MODULATING PNEUMATIC VALVE
- PLUG VALVE
- 3-WAY VALVE
- PRESSURE SUSTAINING VALVE
- GATE VALVE
- CHECK VALVE
- MAG FLOWMETER
- AIR RELEASE VALVE
- ORIFICE PLATE
- SAMPLE TAP
- FLOAT SWITCH
- LEVEL TRANSDUCER
- PRESSURE GAUGE
- OVERFLOW
- SOLENOID VALVE
- TANK VENT

EQUIPMENT

- PUMP

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Madison Water Utility

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MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
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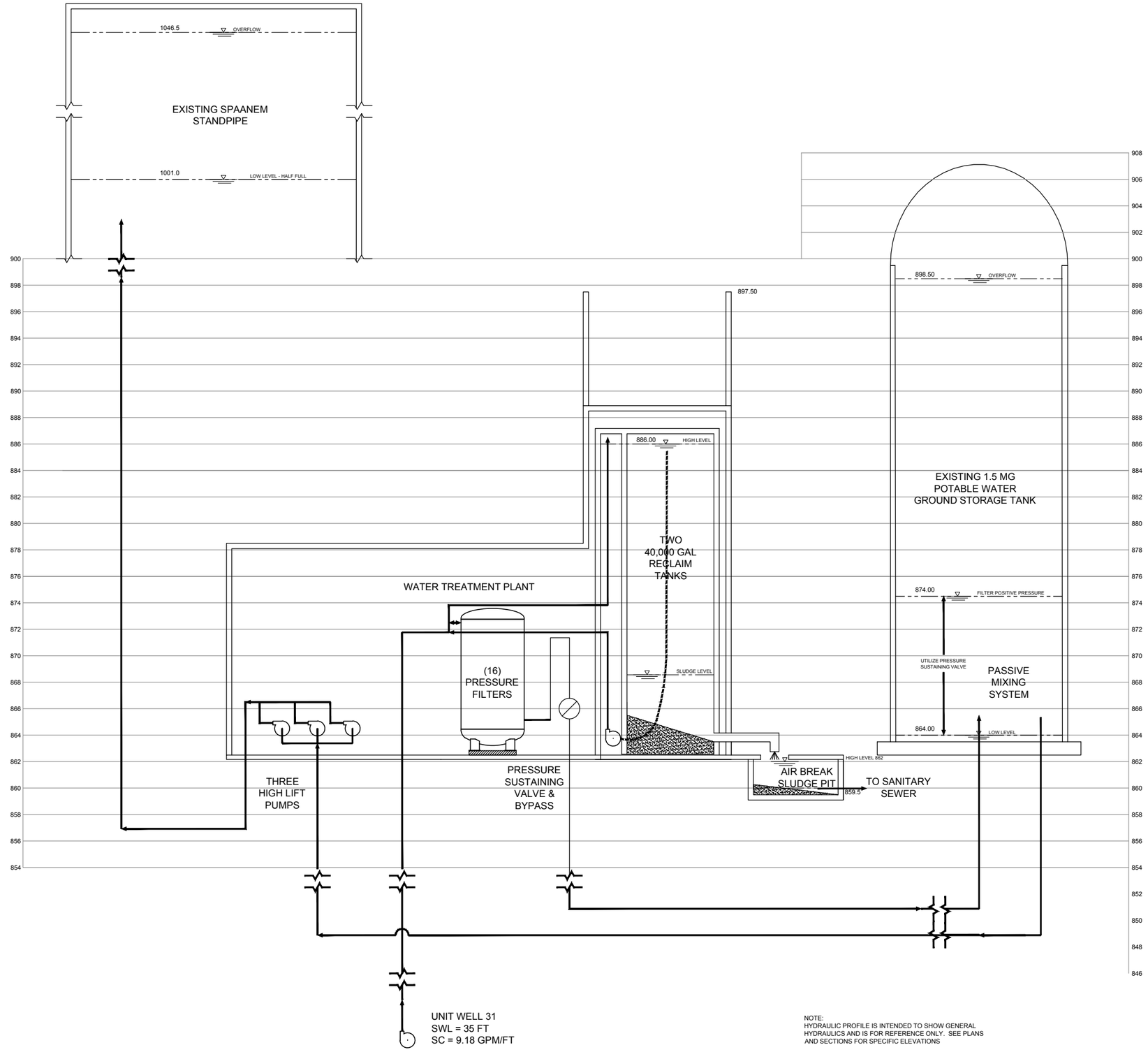
SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY
DRAWN BY Short Elliott Hendrickson, Inc. @ (SEH)

SHEET TITLE
WATER TREATMENT PLANT
PROCESS SCHEMATIC

SHEET
GP2



NOTE:
HYDRAULIC PROFILE IS INTENDED TO SHOW GENERAL HYDRAULICS AND IS FOR REFERENCE ONLY. SEE PLANS AND SECTIONS FOR SPECIFIC ELEVATIONS

TREATMENT PROCESS BASIS OF DESIGN

DESIGN FLOWS

TREATMENT FLOW RATE (CAPACITY)	2200 GPM
DESIGN MAXIMUM DAY PRODUCTION (2030)*	2.7 MGD
*WELL NO.9 OUT OF SERVICE	

WATER SUPPLY

UNIT WELL 31	2200 GPM 3.17 MGD

FILTRATION

NUMBER OF UNITS	16
MEDIA SURFACE AREA PER UNIT	12.57 SQ FT
LOADING RATE □ DESIGN FLOW	12 GPM/SQ FT
OPERATION MODE (FORWARD)	CONSTANT RATE INFLUENT FLOW SPLIT CONSTANT LEVEL
BACKWASH RATE	30 GPM/SQ FT
MEDIA	42" PYROLUSITE

BACKWASH RECLAIM WATER

NUMBER OF TANKS	2
STORAGE TANK VOLUME	40,000 GALLONS
RECYCLE PUMP FLOW	VARIABLE 4% - 6% OF FILTER RATE

CHEMICAL FEED SYSTEMS

FLUORIDE

BULK LIQUID STORAGE	165 GALLONS
ESTIMATED FEED RANGE	0.5 TO 1.2 m□/l

CHLORINE

BULK CYLINDER STORAGE	600 pounds
ESTIMATED FEED RANGE	0.5 TO 3.8 ppm

1

THIS DESIGN IS BASED ON A PILOT PLANT STUDY CONDUCTED BY SEH IN JUNE OF 2013 USING WATER FROM MADISON UNIT WELL 7 WHICH HAS SIMILAR WATER QUALITY TO THAT OF UNIT WELL 31. RAW AND FINISHED WATER QUALITY IN UNIT WELL 7 IS SUMMARIZED AS FOLLOWS:

Raw Water				
	Min	Ma□	A□era□e	EPA Std
Iron (m□/l)	0.37	0.44	0.41	0.3
Man□anese (m□/l)	0.025	0.069	0.044	0.05
Arsenic (u□/l)			0.294	10
Finished Water				
	Min	Ma□	A□era□e	
Iron (m□/l)	0.053	0.062	0.058	
Man□anese (m□/l)	0.004	0.008	0.005	

BASED ON INFLUENT WATER QUALITY FROM THE PRODUCTION WELLS BEING SIMILAR TO THE ABOVE, ALL PROCESS EQUIPMENT AND OPERATIONAL INSTRUCTIONS SHALL BE PROVIDED TO PRODUCE SIMILAR RESULTS (EFFLUENT MEETING EPA PRIMARY AND SECONDARY STANDARDS FOR IRON, MANGANESE AND ARSENIC).

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SEH

Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY
DRAWN BY Shon Elliott Hendrickson, Inc. @ (SEH)

SHEET TITLE
PROCESS DRAWINGS
HYDRAULIC PROFILE
AND BASIS OF DESIGN

SHEET
GP3

P:\KO\M\MADWU\129083-5-FINAL-DSGN\51-DRAWINGS\PROCESS\GP3 HYDRAULIC PROFILE.DWG
11-9-2016 2:47 PM
USER LUKE PEDERSON

PLOTTED: 1-16-2017 12:01 PM
PLOT SCALE: 1:2

AUTOMATED BACKWASH PROCESS VALVES

VALVE	LOCATION	SIZE	TYPE	OPERATOR	PURPOSE	OPERATING PRESSURE	FAIL POSITION	NOTES
V-BW-1	BACKWASH FROM FILTER	6-INCH	BUTTERFLY	OPEN/CLOSE	BACKWASH TANK SELECTION	60PSI	OPEN	SELECTS WICH BW TANK BACKWASH FLOW WILL BE SENT TO (TANK 1)
V-BW-2	BACKWASH FROM FILTER	6-INCH	BUTTERFLY	OPEN/CLOSE	BACKWASH TANK SELECTION	60PSI	OPEN	SELECTS WICH BW TANK BACKWASH FLOW WILL BE SENT TO (TANK 2)
V-BWW-1	BACKWASH SLUDGE	4-INCH	PLUG	MODULATING	THROTTLE/LIMIT BACKWASH SLUDGE FLOW	15PSI	CLOSED	CONTROLS & LIMITS AMOUNT OF GRAVITY SLUDGE FLOW FROM BACKWASH TANK 0 TO 150GPM
V-BWW-2	BACKWASH SLUDGE	4-INCH	PLUG	MODULATING	THROTTLE/LIMIT BACKWASH SLUDGE FLOW	15PSI	CLOSED	CONTROLS & LIMITS AMOUNT OF GRAVITY SLUDGE FLOW FROM BACKWASH TANK 0 TO 150GPM
V-RC-3	BACKWASH RECLAIM	6-INCH	BUTTERFLY	OPEN/CLOSE	LINE OPERATION/FLOW ISOLATION	60PSI	CLOSED	OPEN/CLOSE W/ RC PUMP OPERATION-PREVENT FORWARD GRAVITY FLOW THROUGH PUMPS IN RARE INSTANTACE THAT BW TANK 2 HEAD COULD OVERCOME FILTERS
V-RC-4	BACKWASH RECLAIM	6-INCH	BUTTERFLY	OPEN/CLOSE	LINE OPERATION/FLOW ISOLATION	60PSI	CLOSED	OPEN/CLOSE W/ RC PUMP OPERATION-PREVENT FORWARD GRAVITY FLOW THROUGH PUMPS IN RARE INSTANTACE THAT BW TANK 2 HEAD COULD OVERCOME FILTERS

AUTOMATED SYSTEM PROCESS VALVES

VALVE	LOCATION	SIZE	TYPE	OPERATOR	PURPOSE	OPERATING PRESSURE	FAIL POSITION	NOTES
V-PSV-1	FILTER EFFLUENT	12-INCH	GLOBE	SOLENOID	FILTER BACKWASH PRESSURE CONTROL	90PSI	OPEN	ACTIVATES TO PROVIDE 30-40 PSI OF BACK PRESSURE ON EFFLUENT SIDE OF FILTERS TO ALLOW FOR BACKWASH FLOW, INTERNAL CHECK VALVE
V-PSV-2	HIGH SERVICE PUMP ROOM	6-INCH	GLOBE	SOLENOID	GRAVITY WATER FLOW CONTROL	90PSI	CLOSED	OPEN/CLOSE AND LIMITS AMOUNT OF FLOW FROM WATERH DISTRIBUTION SYSTEM TO FILL GROUND STORAGE RESERVOIR

AUTOMATED FILTER PROCESS VALVES

VALVE	LOCATION	SIZE	TYPE	OPERATOR	PURPOSE	OPERATING PRESSURE	FAIL POSITION	NOTES
V-3W-01	FILTER 1	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-02	FILTER 2	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-03	FILTER 3	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-04	FILTER 4	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-05	FILTER 5	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-06	FILTER 6	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-07	FILTER 7	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-08	FILTER 8	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-09	FILTER 9	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-10	FILTER 10	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-11	FILTER 11	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-12	FILTER 12	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-13	FILTER 13	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-14	FILTER 14	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-15	FILTER 15	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG
V-3W-16	FILTER 16	6-INCH	3 WAY	3 POSITION	OPEN/CLOSED/BACKWASH SELECTION	60PSI	FILTER MODE	PROVIDED BY FILTER MFG

MANUALY OPERATED VALVES

VALVE	LOCATION	SIZE	TYPE	OPERATOR	NOTES
CV-RW-1	UNIT WELL 31 WELLHEAD	12-INCH	SWING CHECK	COUNTER WEIGHT	FLANGED
V-AV-1	UNIT WELL 31 WELLHEAD	3-INCH	AIR RELEASE/VACUUM	PRESSURE	NPT
V-HS-1A	HIGH LIFT PUMP 1 SUCTION	12-INCH	GATE	HANDWHEEL	FLANGED
V-HS-1B	HIGH LIFT PUMP 1 DISCHARGE	12-INCH	BUTTERFLY	HANDWHEEL	FLANGED
V-HS-2A	HIGH LIFT PUMP 2 SUCTION	12-INCH	GATE	HANDWHEEL	FLANGED
V-HS-2B	HIGH LIFT PUMP 2 DISCHARGE	12-INCH	BUTTERFLY	HANDWHEEL	FLANGED
V-HS-3A	HIGH LIFT PUMP 3 SUCTION	12-INCH	GATE	HANDWHEEL	FLANGED
V-HS-3B	HIGH LIFT PUMP 3 DISCHARGE	12-INCH	BUTTERFLY	HANDWHEEL	FLANGED
V-RW-1	WELL 31 ISOLATION	12-INCH	BUTTERFLY	CHAINWHEEL	FLANGED
V-RW-2	FILTER SKID 1 INFLUENT ISOLATION	8-INCH	BUTTERFLY	CHAINWHEEL	FLANGED
V-RW-3	FILTER SKID 2 INFLUENT ISOLATION	8-INCH	BUTTERFLY	CHAINWHEEL	FLANGED
V-BP-1	FILTER BYPASS	12-INCH	BUTTERFLY	CHAINWHEEL	FLANGED, NORMALLY CLOSED
V-BP-2	FILTER BYPASS	12-INCH	BUTTERFLY	CHAINWHEEL	FLANGED, NORMALLY CLOSED
V-BP-3	FILTER BYPASS	12-INCH	BUTTERFLY	CHAINWHEEL	FLANGED, NORMALLY OPEN
V-BP-4	RESERVOIR BYPASS LINE	12-INCH	BUTTERFLY	CHAINWHEEL	FLANGED, NORMALLY CLOSED
V-BP-5	ISOLATION OF V-PSV-2	8-INCH	BUTTERFLY	CHAINWHEEL	FLANGED
V-BP-6	WELL FLUSHING LINE ISOLATION	12-INCH	BUTTERFLY	HANDWHEEL	FLANGED, NORMALLY CLOSED
V-AR-1	START OF PLANT HIGH PIPING	2-INCH	AIR RELEASE	PRESSURE	NPT, LOCATED AT RECYCLE WATER INLET TO RW
V-AR-2	END OF PLANT HIGH PIPING	2-INCH	AIR RELEASE	PRESSURE	NPT
V-AR-3	HIGH LIFT PUMP DISCHARGE	2-INCH	AIR RELEASE	PRESSURE	NPT
V-AR-4	HIGH LIFT PUMP SUCTION	2-INCH	AIR RELEASE	PRESSURE	NPT
V-FE-1	FILTER SKID 1 EFFLUENT	8-INCH	BUTTERFLY	HANDWHEEL	FLANGED
V-FE-2	FILTER SKID 2 EFFLUENT	8-INCH	BUTTERFLY	HANDWHEEL	FLANGED
V-FE-3	PLANT EFFLUENT	12-INCH	BUTTERFLY	HANDWHEEL	FLANGED, NORMALLY OPEN
V-RC-1	RECLAIM PUMP 1 SUCTION	4-INCH	BUTTERFLY	HANDWHEEL	FLANGED
V-RC-2	RECLAIM PUMP 2 SUCTION	4-INCH	BUTTERFLY	HANDWHEEL	FLANGED
V-RC-5	RECLAIM ISOLATION, PRE-METER	6-INCH	BUTTERFLY	CHAINWHEEL	FLANGED
V-RC-6	BW RECLAIM INTO RAW WATER LINE ISO	6-INCH	BUTTERFLY	CHAINWHEEL	FLANGED
V-EF-1	HIGH LIFT PUMP DISCHARGE	16-INCH	BUTTERFLY	HANDWHEEL	FLANGED
V-OF-1	BACKWASH RECLAIM OVERFLOW	8-INCH	RUBBER CHECK	NONE	TIDEFLEX SERIES 37
CV-RC-1	RECLAIM PUMP 1 DISCHARGE	6-INCH	SWING CHECK	COUNTER WEIGHT	FLANGED
CV-RC-2	RECLAIM PUMP 2 DISCHARGE	6-INCH	SWING CHECK	COUNTER WEIGHT	FLANGED
CV-HS-1	HIGH SERVICE PUMP 1 DISCHARGE	12-INCH	SWING CHECK	COUNTER WEIGHT	FLANGED
CV-HS-2	HIGH SERVICE PUMP 2 DISCHARGE	12-INCH	SWING CHECK	COUNTER WEIGHT	FLANGED
CV-HS-3	HIGH SERVICE PUMP 3 DISCHARGE	12-INCH	SWING CHECK	COUNTER WEIGHT	FLANGED

NOTES:

1. VALVE SCHEDULE DOES NOT LIST ALL VALVES SHOWN ON DRAWINGS OR REQUIRED FOR SYSTEM OPERATION.
2. ALL PNEUMATIC OPERATED VALVES SHALL ALSO BE PROVIDED WITH A MANUAL OPERATED OVER-RIDE.
3. VALVES WITH A CENTERLINE OVER 6'-6" ABOVE THE FLOOR SHALL BE PROVIDED WITH A CHAINWHEEL OPERATOR AND CHAIN.
4. ALL PROCESS VALVES SHALL MEET THE REQUIREMENTS OF SPECIFICATION SECTION (40 23 04).
5. THIS VALVE SCHEDULE IS PROVIDED FOR THE CONTRACTORS CONVENIENCE AND THE ENGINEER DOES NOT WARRANT THE ACCURACY OF VALVE SIZES, LOCATIONS, CONNECTIONS OR OTHER REQUIREMENTS. CONTRACTOR SHALL VERIFY ALL VALVE SIZES AND REQUIREMENTS WITH THE DRAWINGS AND SPECIFICATIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
6. VALVE ACTUATORS SHALL BE ROTATED AS REQUIRED TO AVOID CONFLICTS

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

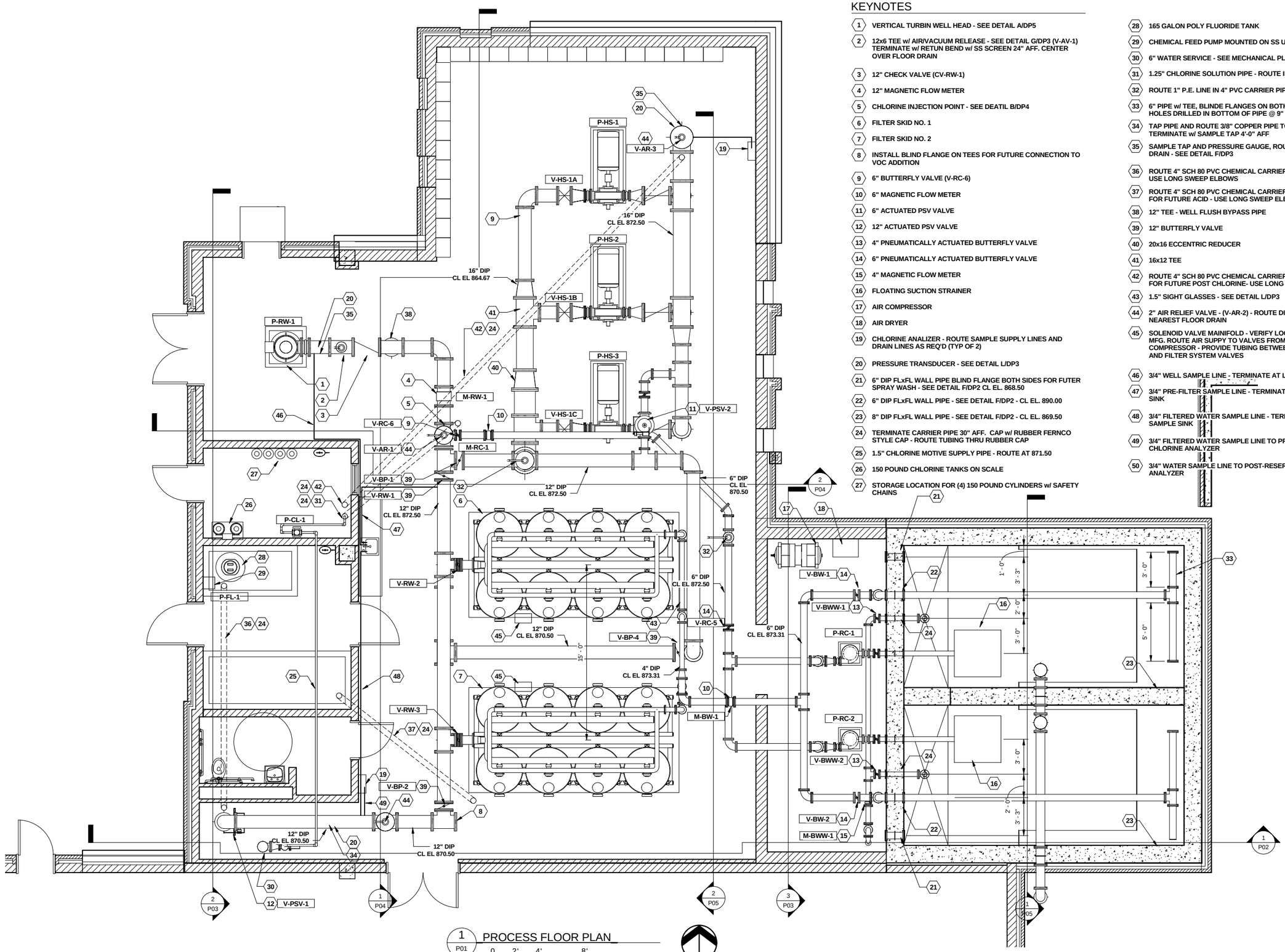
MARK	DATE	DESCRIPTION

REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY
DRAWN BY Short Elliott Hendrickson, Inc. @ (SEH)

SHEET TITLE
WTP PROCESS
VALVE SCHEDULE

SHEET
GP4



KEYNOTES

1. VERTICAL TURBIN WELL HEAD - SEE DETAIL A/DP5
2. 12x6 TEE w/ AIR/VACUUM RELEASE - SEE DETAIL G/DP3 (V-AV-1) TERMINATE w/ RETUN BEND w/ SS SCREEN 24" AFF. CENTER OVER FLOOR DRAIN
3. 12" CHECK VALVE (CV-RW-1)
4. 12" MAGNETIC FLOW METER
5. CHLORINE INJECTION POINT - SEE DEATIL B/DP4
6. FILTER SKID NO. 1
7. FILTER SKID NO. 2
8. INSTALL BLIND FLANGE ON TEES FOR FUTURE CONNECTION TO VOC ADDITION
9. 6" BUTTERFLY VALVE (V-RC-6)
10. 6" MAGNETIC FLOW METER
11. 6" ACTUATED PSV VALVE
12. 12" ACTUATED PSV VALVE
13. 4" PNEUMATICALLY ACTUATED BUTTERFLY VALVE
14. 6" PNEUMATICALLY ACTUATED BUTTERFLY VALVE
15. 4" MAGNETIC FLOW METER
16. FLOATING SUCTION STRAINER
17. AIR COMPRESSOR
18. AIR DRYER
19. CHLORINE ANALIZER - ROUTE SAMPLE SUPPLY LINES AND DRAIN LINES AS REQ'D (TYP OF 2)
20. PRESSURE TRANSDUCER - SEE DETAIL L/DP3
21. 6" DIP FLxFL WALL PIPE BLIND FLANGE BOTH SIDES FOR FUTER SPRAY WASH - SEE DETAIL F/DP2 CL EL. 868.50
22. 6" DIP FLxFL WALL PIPE - SEE DETAIL F/DP2 - CL EL. 890.00
23. 8" DIP FLxFL WALL PIPE - SEE DETAIL F/DP2 - CL EL. 869.50
24. TERMINATE CARRIER PIPE 30" AFF. CAP w/ RUBBER FERNCO STYLE CAP - ROUTE TUBING THRU RUBBER CAP
25. 1.5" CHLORINE MOTIVE SUPPLY PIPE - ROUTE AT 871.50
26. 150 POUND CHLORINE TANKS ON SCALE
27. STORAGE LOCATION FOR (4) 150 POUND CYLINDERS w/ SAFETY CHAINS
28. 165 GALON POLY FLUORIDE TANK
29. CHEMICAL FEED PUMP MOUNTED ON SS UNISTRUT RACK
30. 6" WATER SERVICE - SEE MECHANICAL PLANS
31. 1.25" CHLORINE SOLUTION PIPE - ROUTE IN CARRIER PIPE
32. ROUTE 1" P.E. LINE IN 4" PVC CARRIER PIPE
33. 6" PIPE w/ TEE, BLINDE FLANGES ON BOTH ENDS & 1" DIA HOLES DRILLED IN BOTTOM OF PIPE @ 9" OC
34. TAP PIPE AND ROUTE 3/8" COPPER PIPE TO WALL AND TERMINATE w/ SAMPLE TAP 4'-0" AFF
35. SAMPLE TAP AND PRESSURE GAUGE, ROUTE TO NEAREST DRAIN - SEE DETAIL F/DP3
36. ROUTE 4" SCH 80 PVC CHEMICAL CARRIER PIPE UNDER SLAB - USE LONG SWEEP ELBOWS
37. ROUTE 4" SCH 80 PVC CHEMICAL CARRIER PIPE UNDER SLAB FOR FUTURE ACID - USE LONG SWEEP ELBOWS
38. 12" TEE - WELL FLUSH BYPASS PIPE
39. 12" BUTTERFLY VALVE
40. 20x16 ECCENTRIC REDUCER
41. 16x12 TEE
42. ROUTE 4" SCH 80 PVC CHEMICAL CARRIER PIPE UNDER SLAB FOR FUTURE POST CHLORINE- USE LONG SWEEP ELBOWS
43. 1.5" SIGHT GLASSES - SEE DETAIL L/DP3
44. 2" AIR RELIEF VALVE - (V-AR-2) - ROUTE DISCHARGE TO NEAREST FLOOR DRAIN
45. SOLENOID VALVE MAINIFOLD - VERIFY LOCATION w/ FILTER MFG. ROUTE AIR SUPPY TO VALVES FROM AIR DRYER AND COMPRESSOR - PROVIDE TUBING BETWEEN VALVE MANIFOLD AND FILTER SYSTEM VALVES
46. 3/4" WELL SAMPLE LINE - TERMINATE AT LAB SAMPLE SINK
47. 3/4" PRE-FILTER SAMPLE LINE - TERMINATE AT LAB SAMPLE SINK
48. 3/4" FILTERED WATER SAMPLE LINE - TERMINATE AT LAB SAMPLE SINK
49. 3/4" FILTERED WATER SAMPLE LINE TO PRE-RESERVOIR CHLORINE ANALYZER
50. 3/4" WATER SAMPLE LINE TO POST-RESERVOIR CHLORINE ANALYZER

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

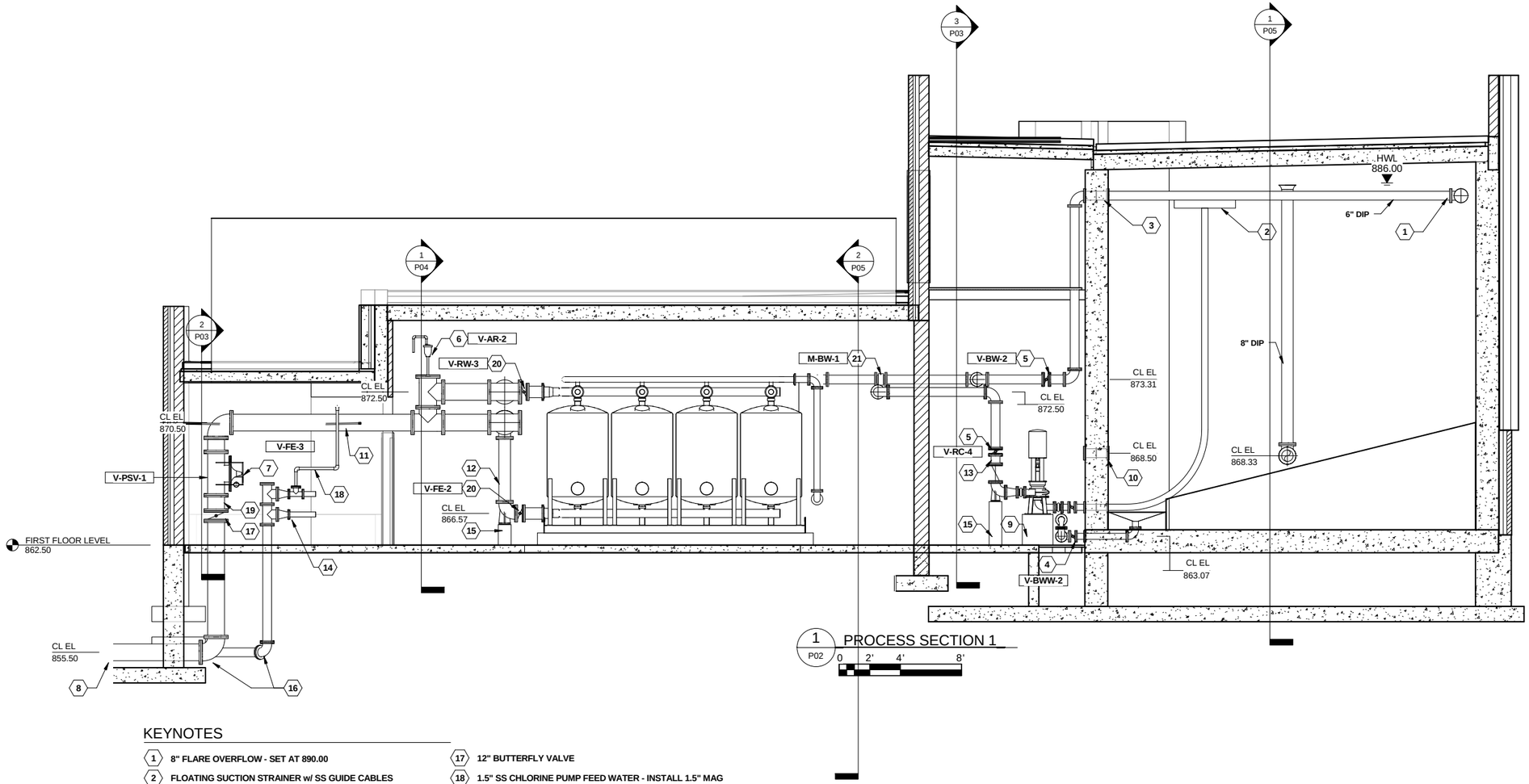
MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY RS
DRAWN BY LP
Short Elliott Hendrickson, Inc. (SEH)

SHEET TITLE
PROCESS
FIRST FLOOR PLAN

SHEET
P01

1/13/2017 4:20:39 PM



1 P02 PROCESS SECTION 1

0 2' 4' 8'

KEYNOTES

1. 8" FLARE OVERFLOW - SET AT 890.00
2. FLOATING SUCTION STRAINER w/ SS GUIDE CABLES
3. 6" FLxFL WALL PIPE - SEE DETAIL F/DP2
4. 4" PNEUMATICALLY ACTUATED BUTTERFLY VALVE (TYP. OF 2)
5. 6" PNEUMATICALLY ACTUATED BUTTERFLY VALVE
6. AIR RELEASE VALVE
7. 12" PRESSURE SUSTAINING VALVE (PSV)
8. 12" DIP TO GROUND STORAGE TANK - SEE SITE PLAN FOR CONTINUATION
9. PUMP BASE - SEE DETAIL A/DP4
10. 6" FLxFL WALL PIPE - BLIND FLANGE ON EACH SIDE
11. TAP PIPE AND ROUTE 3/8" COPPER PIPE TO WALL AND TERMINATE w/ SAMPLE TAP 4'-0" AFF
12. SAMPLE TAP - TYPICAL FOR BOTH FILTER SKIDS - ROUTE TAP AND SUPPLY LINE TO NEAREST DRAIN
13. SAMPLE TAP ROUTED w/ 3/8" COPPER PIPE TO 4'-0" AFF AND DRAIN HUB
14. WATER SUPPLY ASSEMBLY - SEE MECHANICAL
15. CONCRETE PEDISTAL FOR BASE BEND - SEE DETAIL B/DP1
16. JOINT RESTRAINT - SEE DETAIL A/DP2
17. 12" BUTTERFLY VALVE
18. 1.5" SS CHLORINE PUMP FEED WATER - INSTALL 1.5" MAG METER
19. FLUORIDE INJECTION POINT
20. 8" BUTTERFLY VALVE
21. 6" MAGNETIC FLOW METER
22. XXX

1/13/2017 4:20:52 PM

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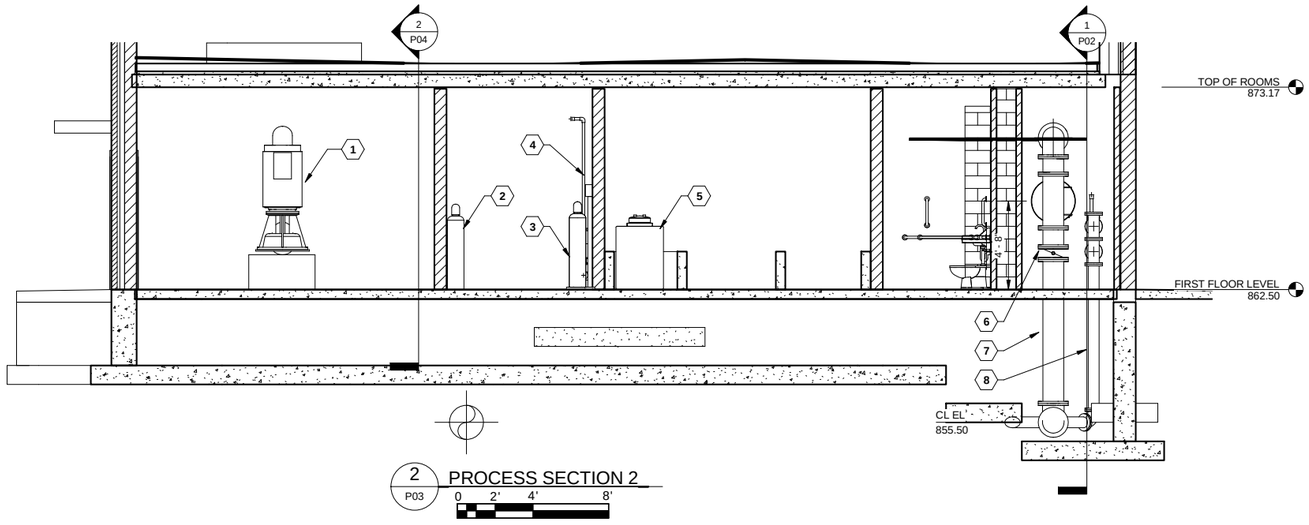
SHEET TITLE
PROCESS SECTIONS

SHEET
P02

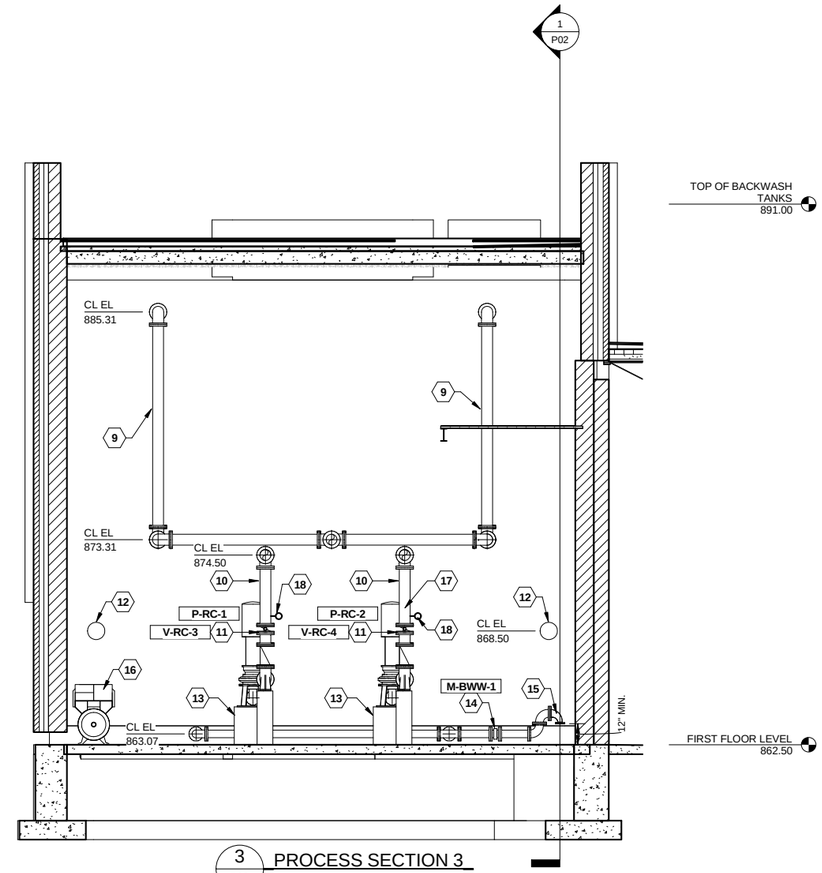


2 P03 PROCESS SECTION 2

0 2' 4' 8'

KEYNOTES

1. VERTICAL TURBIN WELL HEAD - SEE DETAIL B/DP5
2. STORAGE LOCATION FOR (4) 150 POUND CYLINDERS w/ SAFETY CHAINS
3. 150 POUND CHLORINE TANKS ON SCALE
4. 1.25" CHLORINE MOTIVE WATER PIPE - ROUTE THRU CARRIER PIPE BELOW GRADE
5. 165 GALON POLY FLUORIDE TANK
6. 12" PRESSURE SUSTAINING VALVE (V-PSV-1)
7. 12" FILTERED WATER TO GROUND STORAGE TANK
8. 6" DIP WATER SERVICE
9. 6" BACKWASH WASTE PIPE
10. 6" BACKWASH RECYCLE PIPE
11. 4" PNEUMATICALLY ACTUATED BUTTERFLY VALVE
12. 6" DIP FLxFL WALL PIPE BLIND FLANGE BOTH SIDES- SEE DETAIL F/DP3
13. PUMP BASE - SEE DETAIL A/DP4
14. 4" MAGNETIC FLOW METER
15. 4x2 REDUCING ELBOW
16. AIR COMPRESSOR - SEE MECHANICAL
17. SAMPLE TAP ROUTED w/ 3/8" COPPER PIPE TO 4'-0" AFF (TYP OF BOTH RECLAIM PUMPS)
18. PRESSURE GAUGE (TYP OF 2) - SEE DETAIL J/DP3
19. ACCESS PLATFORM - SEE STRUCTURAL



3 P03 PROCESS SECTION 3

0 2' 4' 8'

1/13/2017 4:21:11 PM

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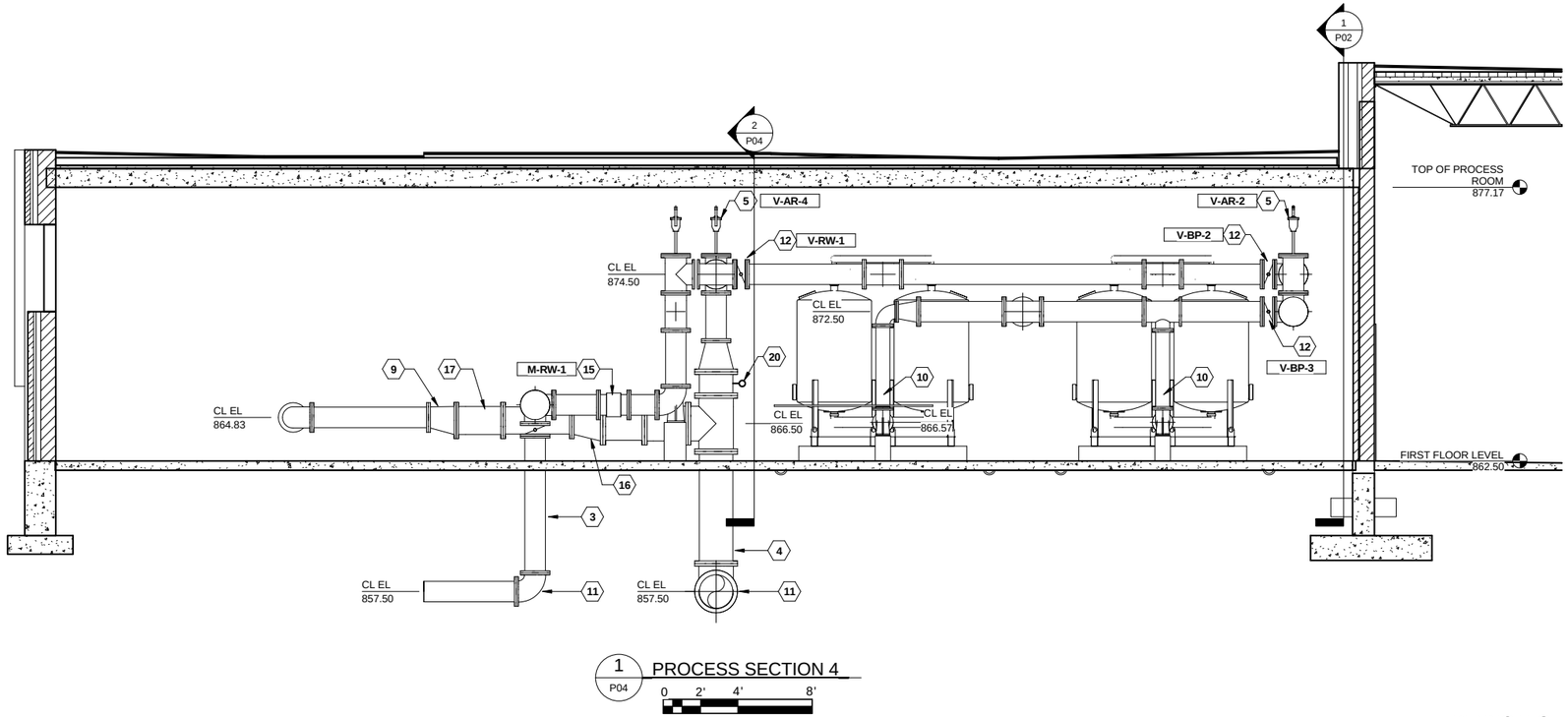
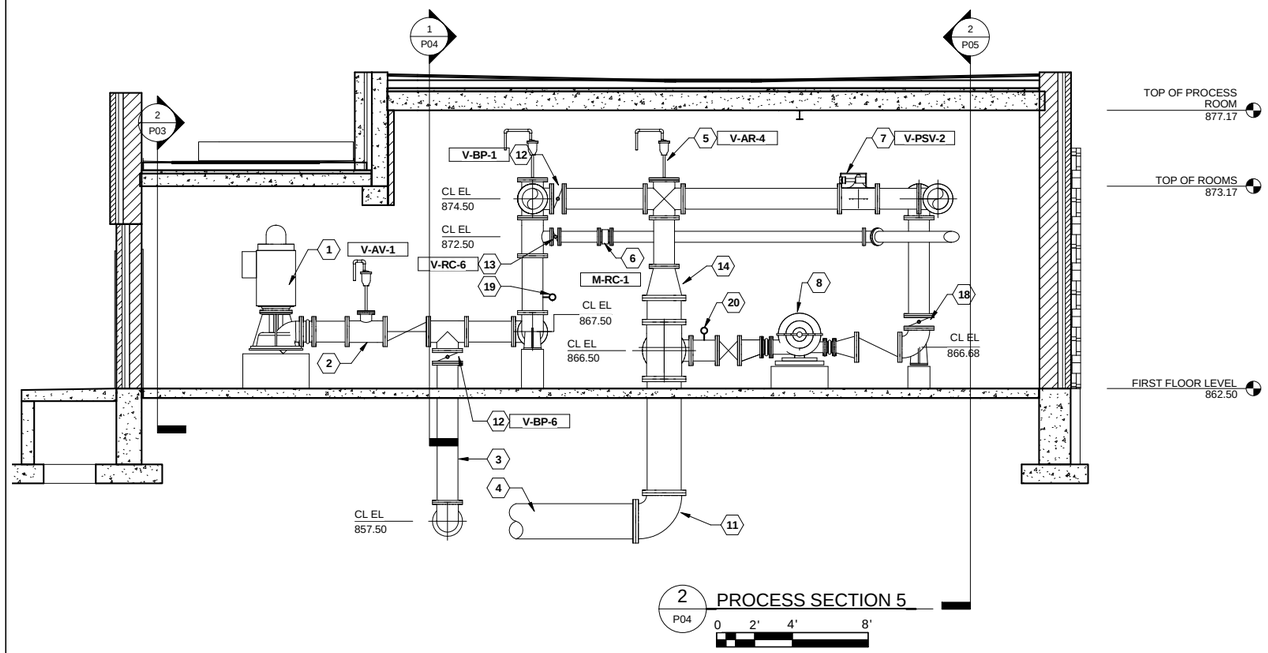
SHEET TITLE
PROCESS SECTIONS

SHEET
P03



1 P04 PROCESS SECTION 4

0 2' 4' 8'



2 P04 PROCESS SECTION 5

0 2' 4' 8'

KEYNOTES

1. VERTICAL TURBIN WELL HEAD - SEE DETAIL B/DP5
2. 12x6 TEE WITH AIR VACUUM VALVE
3. 12" WELL FLUSHING BYPASS -SEE SITE PLAN FOR CONTINUATION
4. 20" FINISHED WATER FROM GROUND STORAGE TANK - SEE SITE PLAN FOR CONTINUATION
5. AIR RELEASE VALVE
6. 6" MAGNETIC FLOW METER
7. 8" ACTUATED PSV VALVE
8. HIGH LIFT PUMPS - COORDINATE CL EL WITH ECCENTRIC REDUCING ELEVATIONS (TYP OF 3)
9. 16x12 ECCENTRIC REDUCER
10. SAMPLE TAP - ROUTE TO NEAREST DRAIN
11. JOINT RESTRAINT - SEE DETAIL A/DP2
12. 12" BUTTERFLY VALVE
13. 6" BUTTERFLY VALVE
14. 20x12 CONCETRIC REDUCER
15. 12" MAGNETIC FLOW METER
16. 20x16 ECCENTRIC REDUCER
17. 16x12 TEE
18. 12" BFV - HIGH SERVICE PUMP DISCHARGE (TYP. OF 3)
19. CHLORINE INJECTION TAP
20. PRESSURE GAUGE (TYP OF ALL PUMP SUCTION PIPES) - SEE DETAIL J/DP3
21. PRESSURE GAUGE - SEE DETAIL J/DP3

1/13/2017 4:21:18 PM

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MADISON WATER UTILITY
MADISON, WISCONSIN

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		REVISIONS

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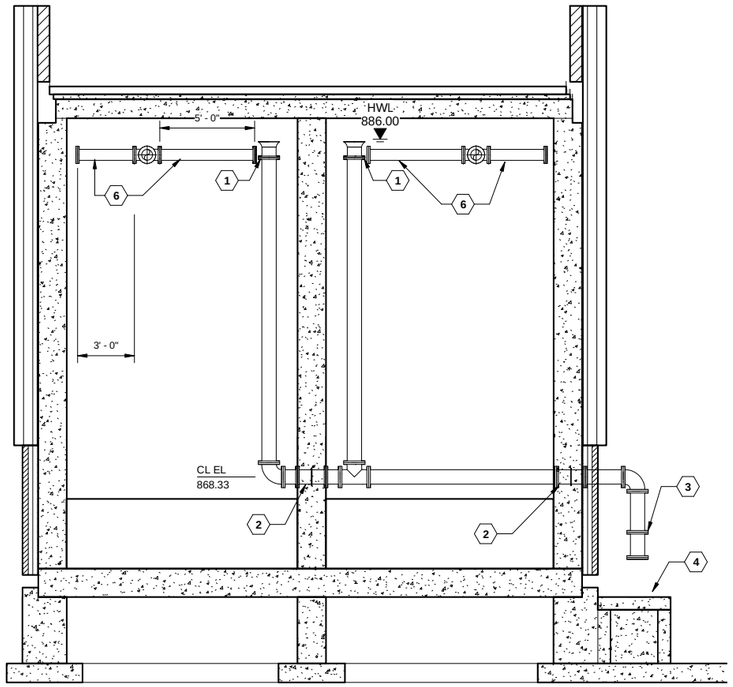
SHEET TITLE
PROCESS SECTIONS

SHEET
P04

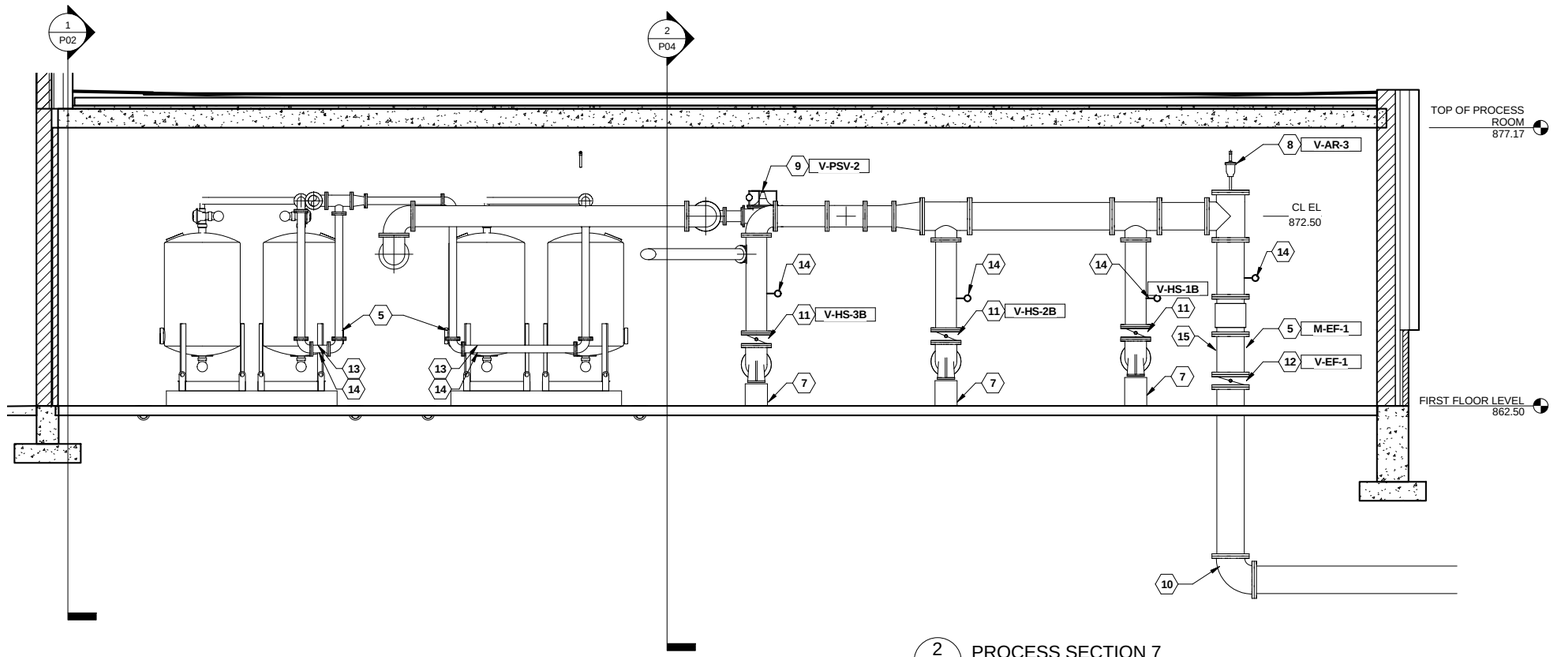


1 P05 PROCESS SECTION 6

0 2' 4' 8'

KEYNOTES

1. 8" FLARE OVERFLOW - SET AT 886.00
2. 8" FLxFL WALL PIPE - SEE DETAIL F/DP2
3. OVERFLOW DISCHARGE CHECK VALVE ASSEMBLY - SEE DETAIL D/DP3
4. OVERFLOW DISCHARGE CATCH BASIN - SEE CIVIL
5. SAMPLE TAP - SEE DETAIL F/DP3 - ROUTE TO NEAREST DRAIN
6. 6" PIPE w/ TEE, BLINDE FLANGES ON BOTH ENDS & 1" DIA HOLES DRILLED IN BOTTOM OF PIPE @ 9" OC
7. BASE BEND SUPPORT - SEE DETAIL B/DP1
8. AIR RELEASE VALVE - ROUTE VENT TO NEARBY DRAIN
9. 6" ACTUATED PSV VALVE
10. JOINT RESTRAINT - SEE DETAIL A/DP2
11. 12" BUTTERFLY VALVE
12. 16" BUTTERFLY VALVE
13. 1.5" SIGHT GLASSES, TOP OF HORIZONTAL SLUDGE PIPE - SEE DETAIL L/DP3
14. TAP BOTTOM OF HORIZONTAL SLUDGE PIPE, INSTALL 3/4" BALL VALVE AND HOSE CONNECTION
15. TAP FOR FUTURE CHLORINE INJECTION
16. PRESSURE GAUGE (TYP) - SEE DETAIL J/DP3
17. PRESSURE TRANSDUCER - SEE ELECTRICAL



2 P05 PROCESS SECTION 7

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SHEET TITLE
PROCESS SECTIONS

SHEET
P05

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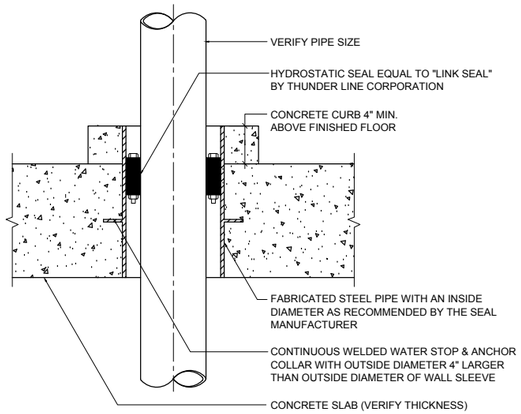
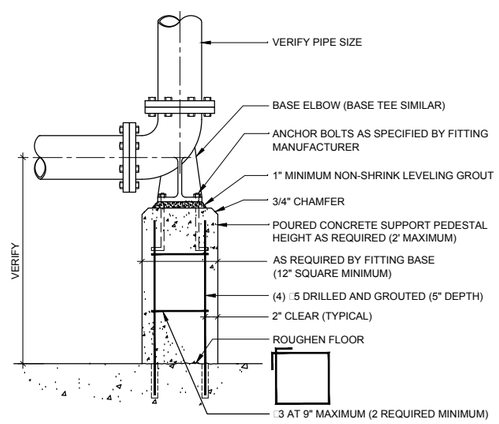


A DP1 — SEALED FLOOR SLEEVE DETAIL — PPIPE008
SCALE: NONE



B DP1 — BASE BEND SUPPORT DETAIL — PSUPP005
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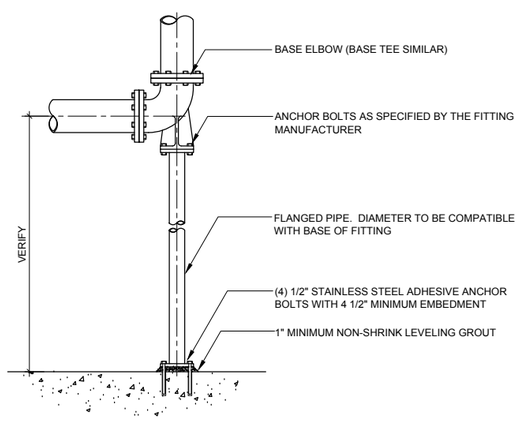
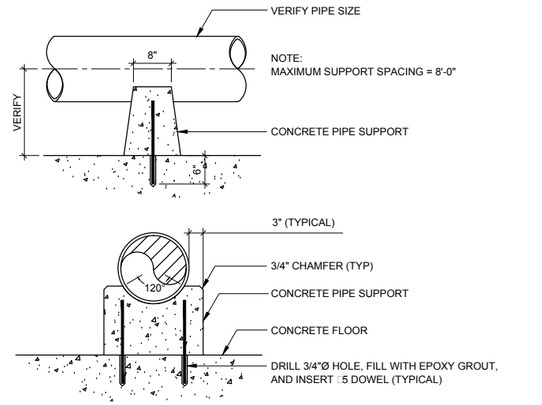
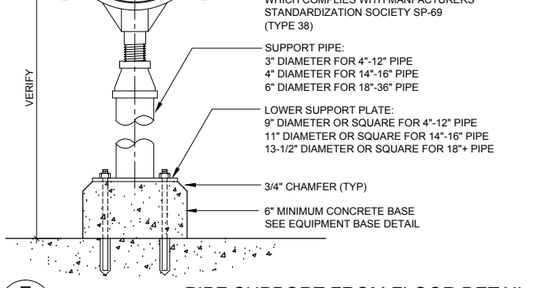


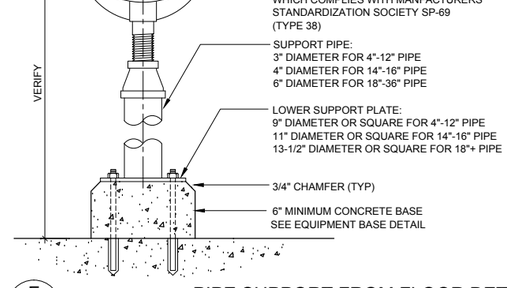
C DP1 — BASE BEND SUPPORT DETAIL — PSUPP004
SCALE: NONE



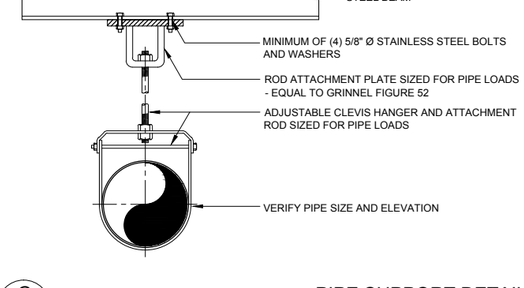
D DP1 — CONCRETE PIPE SUPPORT DETAIL — PSUPP003
SCALE: NONE



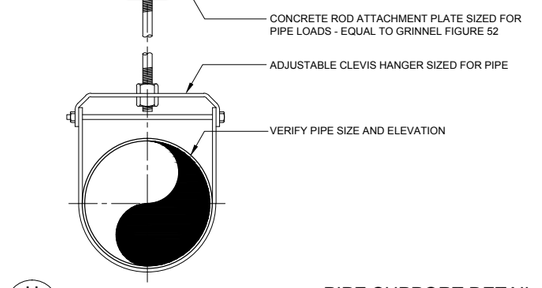
E DP1 — PIPE SUPPORT FROM FLOOR DETAIL — PSUPP014
SCALE: NONE



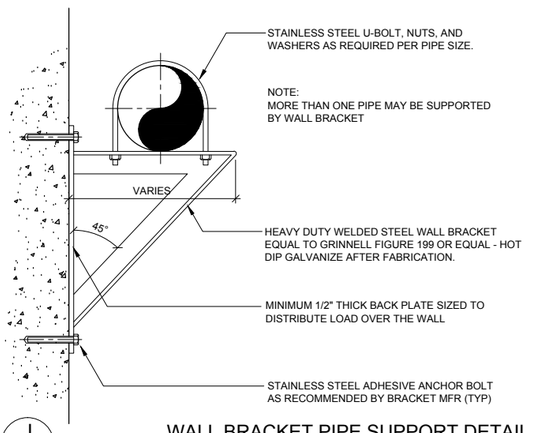
F DP1 — PIPE SUPPORT FROM FLOOR DETAIL — PSUPP002
SCALE: NONE



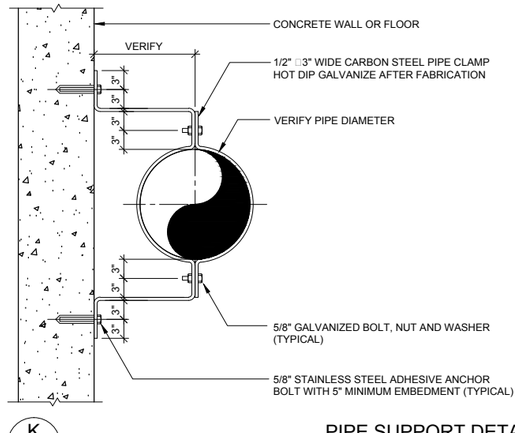
G DP1 — PIPE SUPPORT DETAIL — PSUPP012
SCALE: NONE



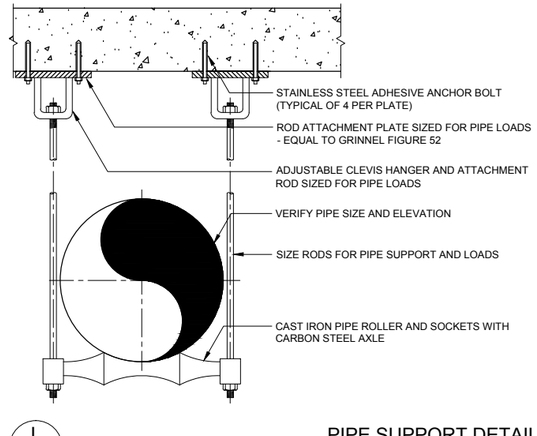
H DP1 — PIPE SUPPORT DETAIL — PSUPP006
SCALE: NONE



J DP1 — WALL BRACKET PIPE SUPPORT DETAIL — PSUPP001
SCALE: NONE



K DP1 — PIPE SUPPORT DETAIL — PSUPP013
SCALE: NONE



L DP1 — PIPE SUPPORT DETAIL — PSUPP017
SCALE: NONE

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SHEET TITLE
PROCESS DRAWINGS
STANDARD DETAILS

SHEET
DP1

P: \KO\MADWU\129083.5-FINAL-DSGN\51-DRAWINGS\...PROCESS DP1.DWG
SAVED: 9-9-2016 12:16 P.M. USER: LUKE PEDERSON
XREFs: ...Base Border Files Madison AutoCAD 22 34 Border.dwg

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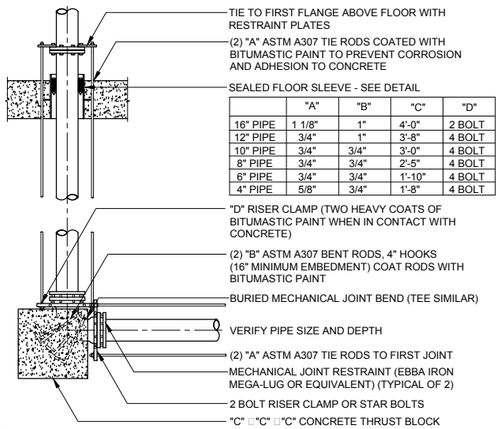
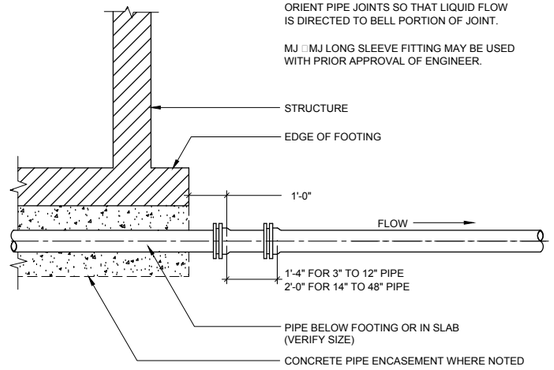
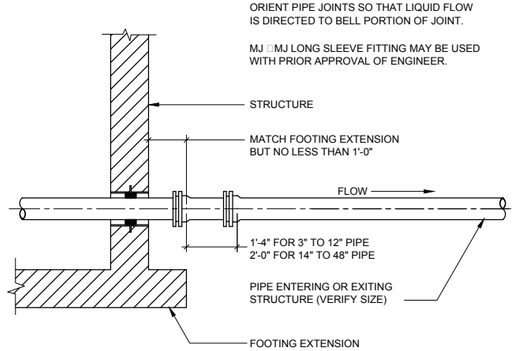


	"A"	"B"	"C"	"D"
16" PIPE	1 1/8"	1"	4'-0"	2 BOLT
12" PIPE	3/4"	1"	3'-8"	4 BOLT
10" PIPE	3/4"	3/4"	3'-0"	4 BOLT
8" PIPE	3/4"	3/4"	2'-5"	4 BOLT
6" PIPE	3/4"	3/4"	1'-10"	4 BOLT
4" PIPE	5/8"	3/4"	1'-8"	4 BOLT

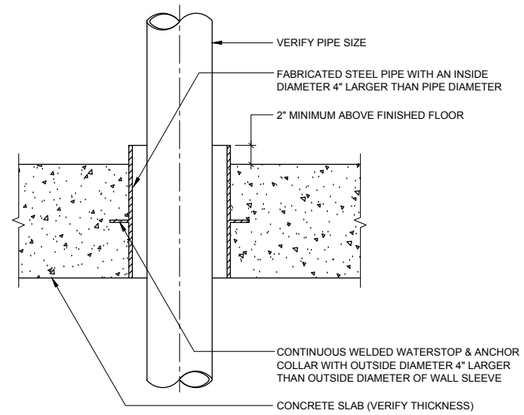
A DP2 — JOINT RESTRAINT DETAIL — PPIPE001
SCALE: NONE



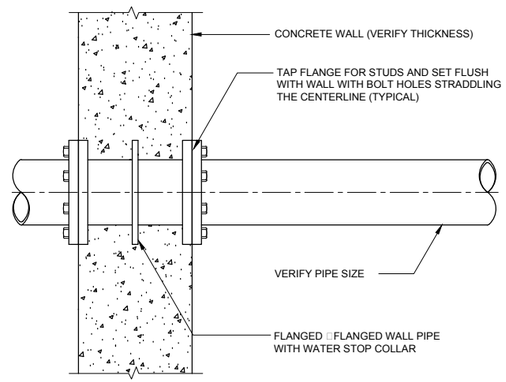
B DP2 — PIPE CONNECTION DETAIL — PPIPE002
SCALE: NONE



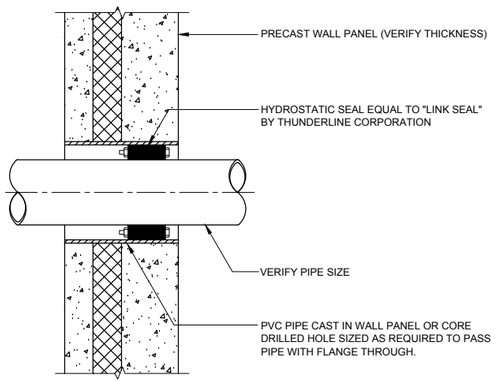
C DP2 — PIPE CONNECTION DETAIL — PPIPE003
SCALE: NONE



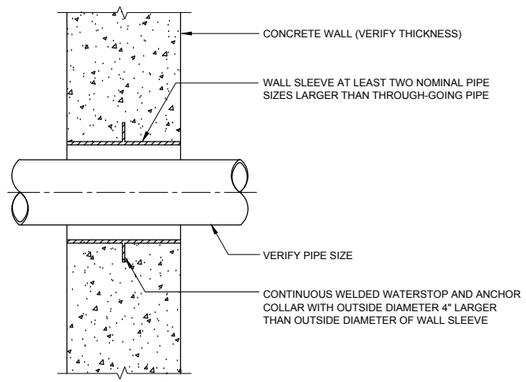
D DP2 — UNSEALED FLOOR SLEEVE DETAIL — PPIPE009
SCALE: NONE



F DP2 — FL □FL WALL PIPE DETAIL — PPIPE016
SCALE: NONE



G DP2 — SEALED PRECAST WALL SLEEVE DETAIL — PPIPE017
SCALE: NONE



H DP2 — UNSEALED WALL SLEEVE DETAIL — PPIPE007
SCALE: NONE

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY
DRAWN BY Short Elliott Hendrickson, Inc. © (SEH)

SHEET TITLE
PROCESS DRAWINGS
STANDARD DETAILS

SHEET
DP2

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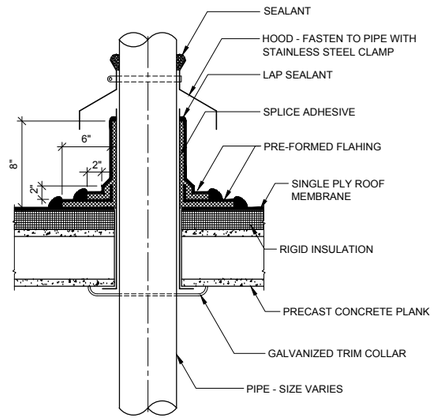
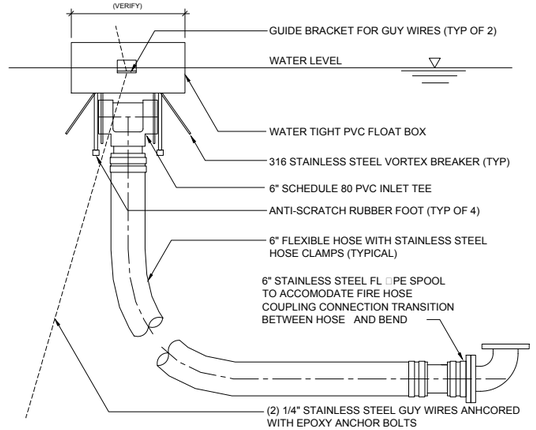
SAVED 9-9-2016 1:04 PM
XREFs ... Base Border Files Madison AutoCAD 22.34 Brand USER: LUKE.PEDERSON



A DP3 — PIPE THRU ROOF DETAIL

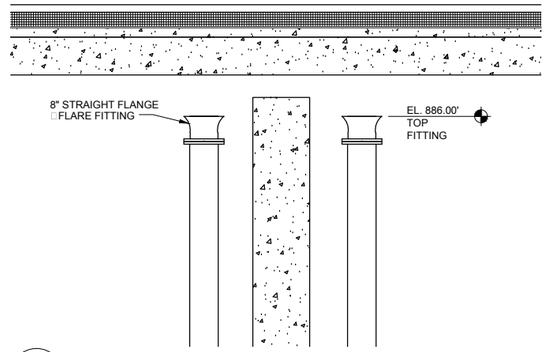
SCALE: NONE



B DP3 — FLOATING SUCTION INTAKE STRAINER DETAIL

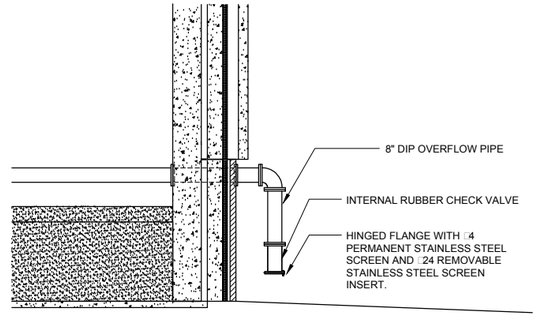
SCALE: NONE

PEQIP008



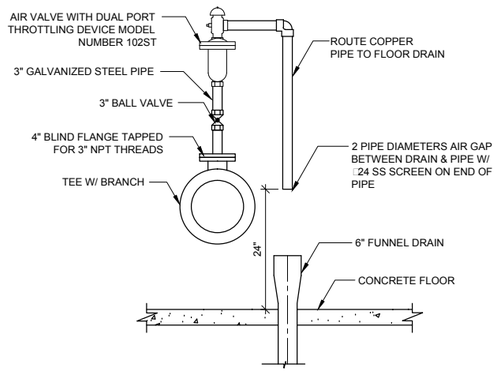
C DP3 — BACKWASH TANK OVERFLOW INLET

SCALE: NONE



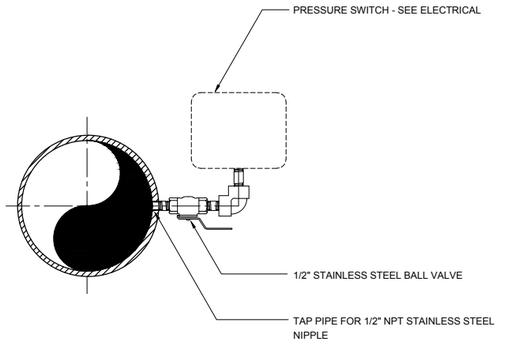
D DP3 — BACKWASH TANK OVERFLOW OUTLET

SCALE: NONE



E DP3 — AIR VALVE & FUNNEL DRAIN DETAIL

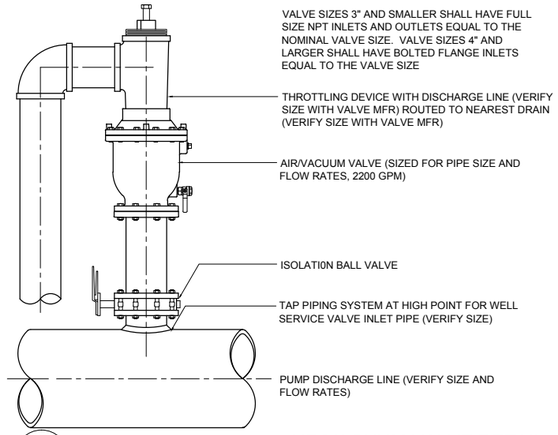
SCALE: NONE



F DP3 — PRESSURE SWITCH DETAIL

SCALE: NONE

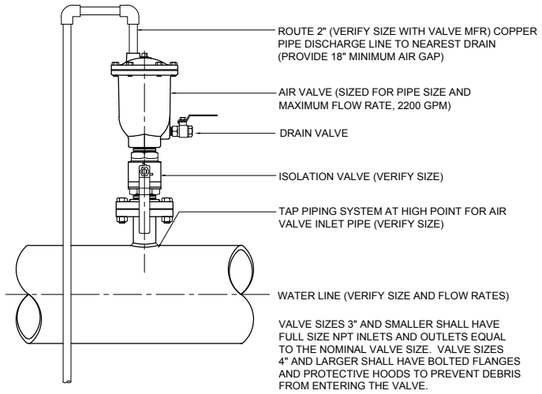
PPIPE020



G DP3 — AIR/VACUUM VALVE DETAIL

SCALE: NONE

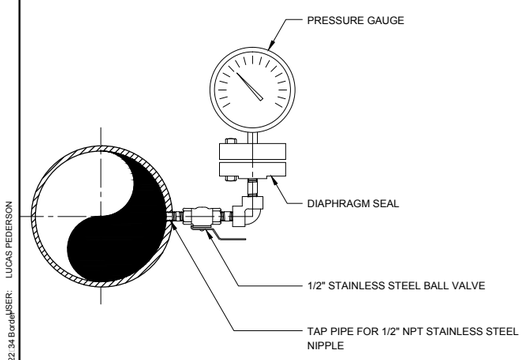
PVALV009



H DP3 — AIR VALVE DETAIL

SCALE: NONE

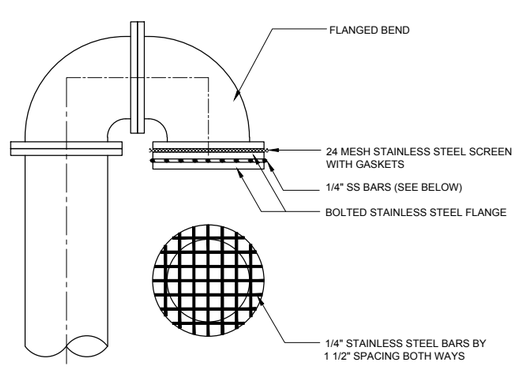
PVALV001



J DP3 — PRESSURE GAUGE DETAIL

SCALE: NONE

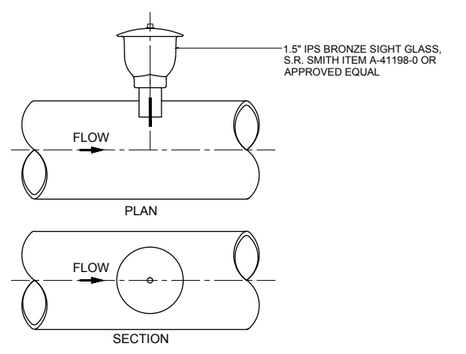
PPIPE018



K DP3 — VENT SCREEN/BAR DETAIL

SCALE: NONE

WPXXX



L DP3 — SIGHT GLASS DETAIL

SCALE: NONE

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY
DRAWN BY
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SHEET TITLE
PROCESS DRAWINGS
STANDARD DETAILS

SHEET
DP3

PLOTTED: 1-16-2017 2:00 PM
PLOT SCALE: 1:2

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USER: LUCAS PEDERSON

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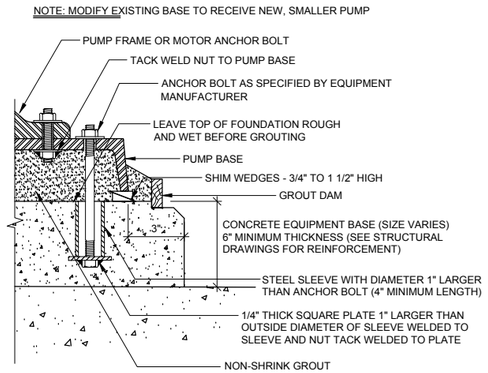

A DP4 — PUMP BASE DETAIL
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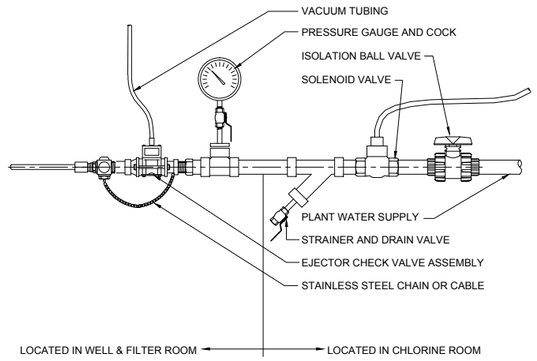
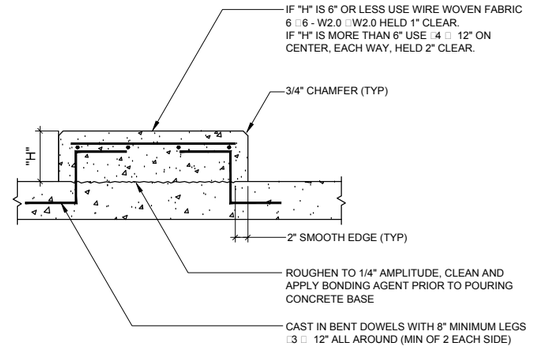
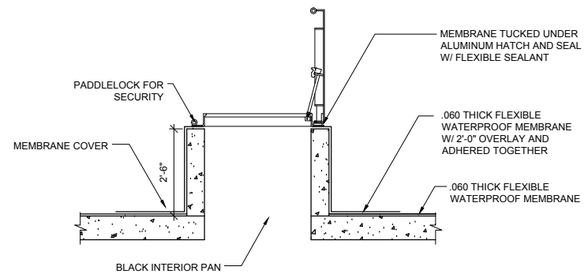


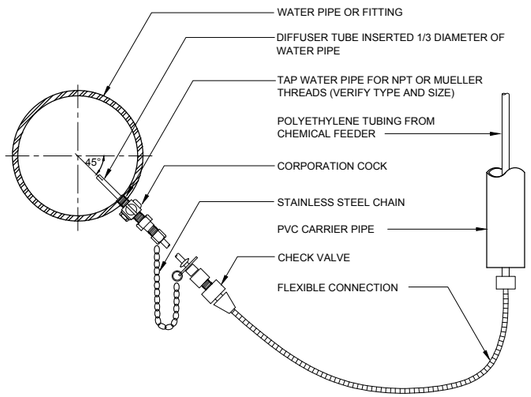
B DP4 — CHLORINE INJECTOR DETAIL
SCALE: NONE
PCHEM001



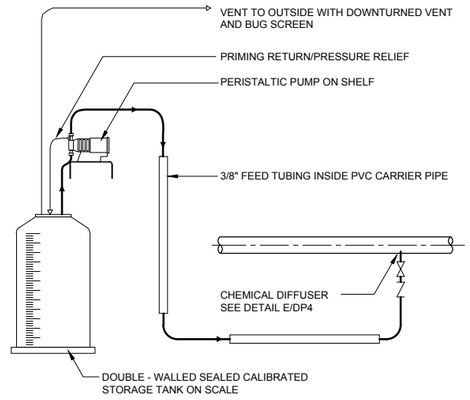
C DP4 — EQUIPMENT PAD REINFORCING DETAIL
SCALE: NONE
SEQIP001



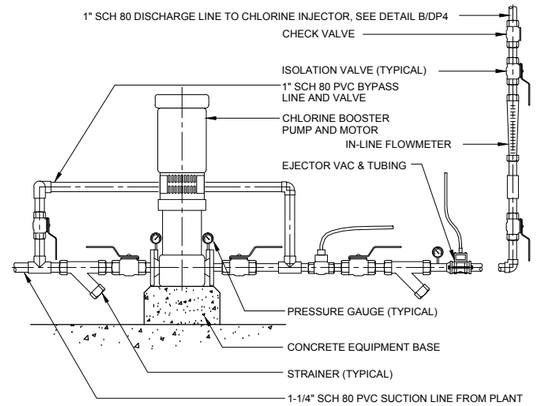
D DP4 — (BACKWASH TANK) EXTERIOR HATCH DETAIL
SCALE: NONE
PVALV001



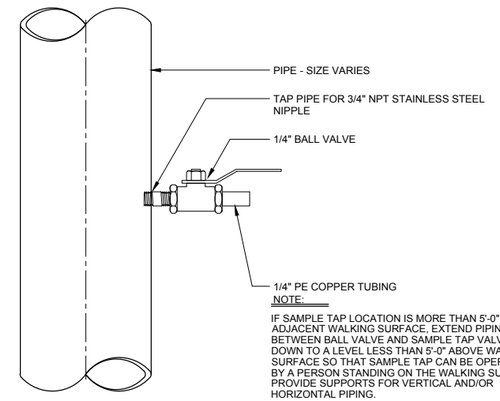
E DP4 — CHEMICAL DIFFUSER DETAIL
SCALE: NONE
PCHEM002



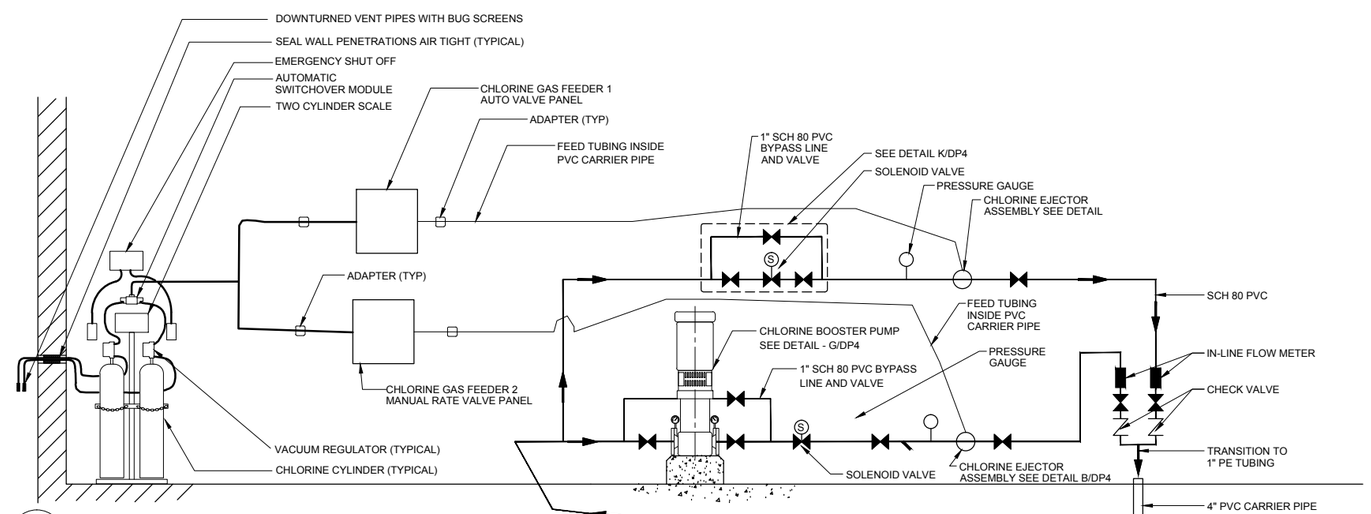
F DP4 — FLUORIDE FEED DETAIL
SCALE: NONE
PCHEM007



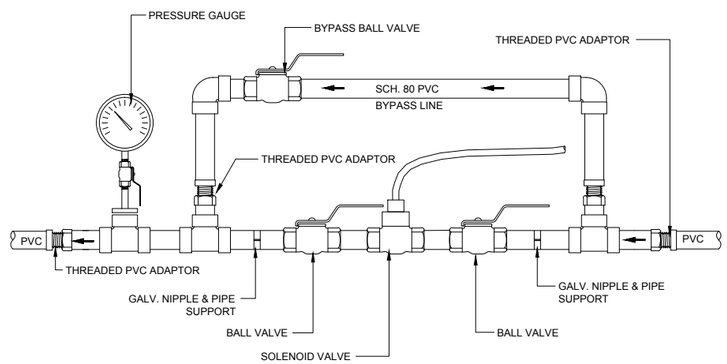
G DP4 — CHLORINE BOOSTER PUMP DETAIL
SCALE: NONE
PCHEM009



H DP4 — SAMPLE TAP DETAIL
SCALE: NONE
PPIPE030



J DP4 — CHLORINE GAS FEED SYSTEM DETAIL
SCALE: NONE
PCHEM003



*NOTE: ALL PIPING TO BE SCH 80 PVC

K DP4 — WATER CONTROL SOLENOID DETAIL
NOT TO SCALE

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY
DRAWN BY

SHEET TITLE
PROCESS DRAWINGS
STANDARD DETAILS

SHEET
DP4

P:\KO.M.MAD\VU.129083.5-FINAL-DSGN.51-DRAWINGS\...\PROCESS DP4.DWG
SAVED: 11-9-2016 3:08 PM
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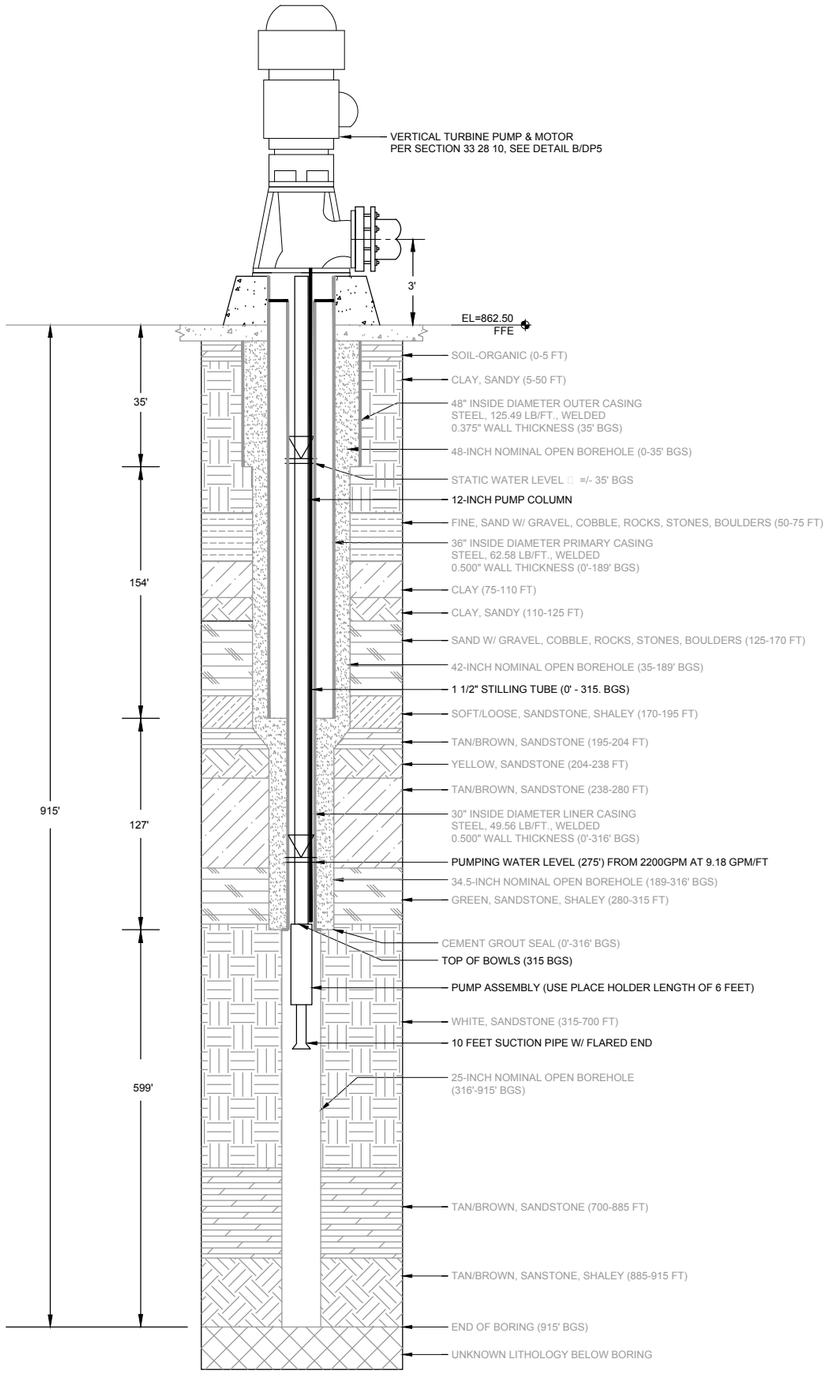
USER: LUKE PEDERSON

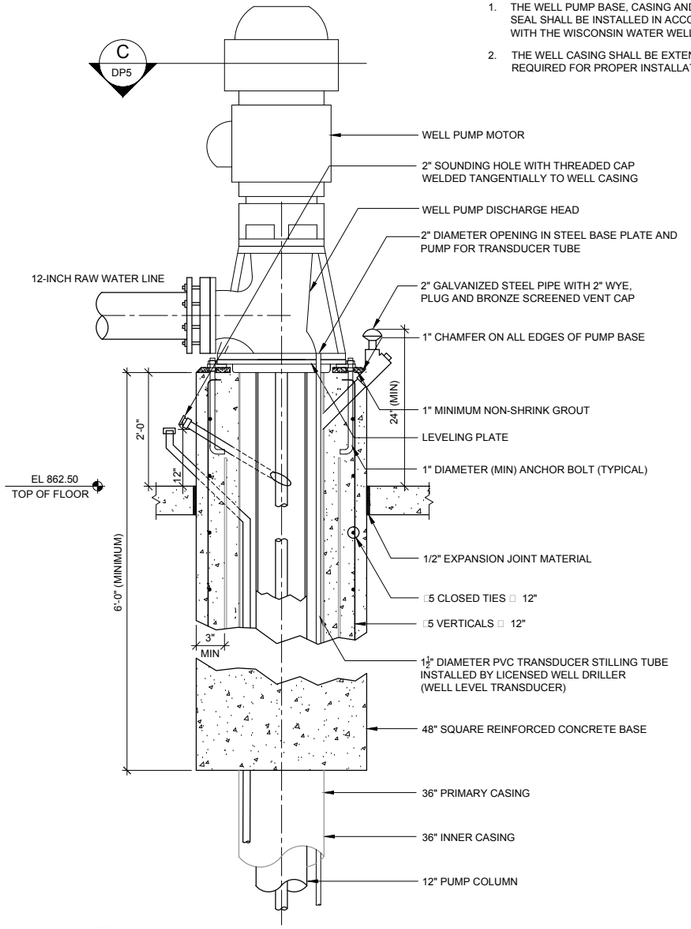
PLOTTED: 11-13-2016 1:23 PM
PLOT SCALE: 1:2



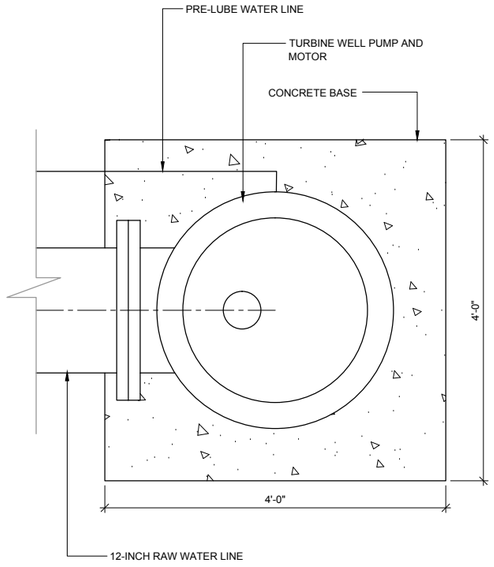
A DP5 PROPOSED UNIT WELL 31
N.T.S.

NOTES:

1. THE WELL PUMP BASE, CASING AND WELL SEAL SHALL BE INSTALLED IN ACCORDANCE WITH THE WISCONSIN WATER WELL CODE.
2. THE WELL CASING SHALL BE EXTENDED AS REQUIRED FOR PROPER INSTALLATION.

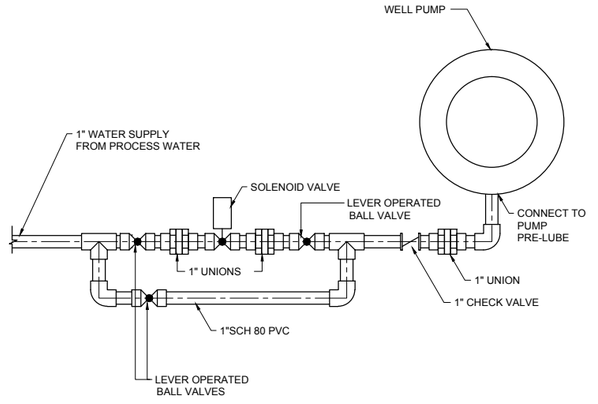


B DP5 VERTICAL TURBINE PUMP BASE DETAIL
SCALE: NONE



C DP5 SECTION
SCALE: NONE

NOTE:
BGS = BELOW GROUND SURFACE
N.T.S. = NOT TO SCALE



D DP5 PUMP PRE-LUBE LINE DETAIL
SCALE: NONE

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE NOVEMBER 11, 2016
DESIGNED BY
DRAWN BY

SHEET TITLE
WELL NO. 31 PROFILE
& ASSEMBLY DETAILS

SHEET
DP5

P: KO:M:MADWU:129083:5-FINAL-DSGN:51-DRAWINGS\: PROCESS:DP5.DWG
SAVED: 9-9-2016 1:18 PM USER: LUKE PEDERSON
XREFs: ... Base Border Files Madison AutoCAD 22 34 Border

MECHANICAL ABBREVIATIONS

ABV.	ABOVE
AC	AIR CONDITIONING
ACU-	AIR CONDITIONING UNIT
A.D.	AREA DRAIN
A.F.C.	ABOVE FINISHED CEILING
A.F.F.	ABOVE FINISHED FLOOR
A.L.	ACOUSTICAL LINING
AHU-	AIR HANDLING UNIT
AMU	AIR MEASURING UNIT
A.P.	ACCESS PANEL
APPROX.	APPROXIMATE
AR	ACID RESISTANT
ARCH.	ARCHITECT/ARCHITECTURAL
AS-	AIR SEPARATOR
BD	BLOWDOWN
B.F.F.	BELOW FINISHED FLOOR
BFV	BUTTERFLY VALVE
BFW	BOILER FEED WATER
BG	BELOW GRADE
BHP	BRAKE HORSEPOWER
BLW.	BELOW
B.O.D.	BOTTOM OF DUCT ELEVATION A.F.F.
B.O.P.	BOTTOM OF PIPE ELEVATION A.F.F.
BOT.	BOTTOM
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
CA	COMPRESSED AIR
CC-	COOLING COIL
CD	CEILING DIFFUSER
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
C.I.	CAST IRON
CG	CEILING GRILLE
CFH	CUBIC FEET PER HOUR
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
C.L.	CENTER LINE
CLG.	CEILING OR COOLING
CMPR.	COMPRESSOR
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
C.O.	CLEAN OUT
CONC.	CONCRETE
COND	CONDENSATE
CONN.	CONNECTION
CONST.	CONSTRUCTION
CONT.	CONTINUATION
CONTR.	CONTRACTOR
CONV-	CONVECTOR
CP	CONDENSATE PUMP
CU-	CONDENSING UNIT
CUH-	CABINET UNIT HEATER
CW	COLD WATER (DOMESTIC)
D.	DRAIN
D & T	DRIP & TRAP
DEMO.	DEMOLITION
DF	DRINKING FOUNTAIN
DFS	DRY FIRE SPRINKLER
DG	DOOR GRILLE
DIA.	DIAMETER
D.I.	DEIONIZED
DMPR.	DAMPER
DN.	DOWN
E.	EAST
EA.	EACH
EAT	ENTERING AIR TEMPERATURE
EF-	EXHAUST FAN
ELEC.	ELECTRIC
ELEV.	ELEVATION
ENCL.	ENCLOSURE
ER	EXHAUST REGISTER
ESP	EXTERNAL STATIC PRESSURE
ET-	EXPANSION TANK
EWC	ELECTRIC WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EXH.	EXHAUST
EXP.	EXPANSION
EXIST.	EXISTING
F & T	FLOAT & THERMOSTATIC
F-	PLUMBING FIXTURE
F.A.	FREE AREA
FCO	FLOOR CLEANOUT
F.D.	FLOOR DRAIN
FD/FS	FLOOR DRAIN WITH FUNNEL STRAINER
FD	FIRE DAMPER
FDV	FIRE DEPARTMENT VALVE
F.F.E.	FINISHED FLOOR ELEVATION
FL.	FLOOR
FMS	FLOW MEASURING STATION
FPM	FEET PER MINUTE
FR	FLOOR REGISTER
F.S.	FIRE SPRINKLER
FSK	FLOOR SINK
FT.	FOOT OR FEET
FTR-	FIN TUBE RADIATION
FUT.	FUTURE
G	GAS PIPING
GA.	GAUGE/GAGE
GEN'L.	GENERAL
GF-	GAS FURNACE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRD.	GRADE/GROUND
GR	GLYCOL RETURN
GS	GLYCOL SUPPLY
GV-	GRAVITY VENT
H.	HIGH
HB	HOSE BIBB
HC	HEATING COIL
HDG	HEAVY DUTY GRILLE
HG	REFRIGERANT HOT GAS
HORIZ.	HORIZONTAL
HPR	HIGH PRESSURE CONDENSATE RETURN
HPS	HIGH PRESSURE STEAM
HTR.	HEATER
H-STAT	HUMIDISTAT
HW	HOT WATER (DOMESTIC)
HWC	HOT WATER CIRCULATED
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX-	HEAT EXCHANGER OR CONVERTOR
I.D.	INSIDE DIMENSION
I.B.S.	IN BEAM SPACE
I.J.S.	IN JOIST SPACE
INV. ELEV.	INVERT ELEVATION
I.T.S.	IN TRUSS/TEE SPACE
IW	INDIRECT WASTE
L	REFRIGERANT LIQUID
LAT	LEAVING AIR TEMPERATURE
LAV.	LAVATORY
L.D.	LINEAR DIFFUSER
L.F.	LINEAL FEET
LG.	LONG OR LENGTH
LP	LIQUID PROPANE
LPR	LOW PRESSURE CONDENSATE RETURN
LPS	LOW PRESSURE STEAM
LSD	LINEAR SLOT DIFFUSER
L.T.	LAUNDRY TUB
MAU-	MAKE-UP AIR UNIT
MAX.	MAXIMUM
MBH	1000 BTU PER HOUR
MFG.	MANUFACTURER
M.H.	MANHOLE
MIN.	MINIMUM
MOT.	MOTORIZED
MS	MOP SINK
N.	NORTH
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NO.	NUMBER
N.T.S.	NOT TO SCALE
O.A.	OUTSIDE AIR
O.D.	OUTSIDE DIMENSION
OFRD	OVERFLOW ROOF DRAIN
OFRWL	OVERFLOW RAINWATER LEADER
OPNG.	OPENING
O.S. & Y.	OUTSIDE SCREW & YOKE
P-	PUMP
ΔP	PRESSURE DIFFERENCE
PCD	PERFORATED CEILING DIFFUSER
PC	PUMPED CONDENSATE
PCW	PROCESSED COLD WATER
PHW	PROCESSED HOT WATER
P.H.	PENTHOUSE
PRV	POWER ROOF VENTILATOR
PRV	PRESSURE REGULATING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	PSI GAUGE
PVC	POLYVINYL CHLORIDE
PW	PUMPED WASTE
RA	RETURN AIR
RAD	RETURN AIR DUCT
RAD.	RADIATOR
RCP	REFLECTED CEILING PLAN
RCP	REINFORCED CONCRETE PIPE
RCVR.	RECEIVER
RCD	ROUND CEILING DIFFUSER
R.D.	ROOF DRAIN
RE-	RETURN EXHAUST FAN
RECIRC.	RECIRCULATING
REQ'D.	REQUIRED
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RHW	RECIRCULATING HOT WATER
RG	RETURN GRILLE
RPM	REVOLUTIONS PER MINUTE
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RPZ	REDUCED PRESSURE ZONE BACKFLOW PREVENTER
RTU-	ROOFTOP UNIT
RWL	RAINWATER LEADER
S	REFRIGERANT SUCTION
S.	SOUTH
SA	SUPPLY AIR
SAD	SUPPLY AIR DUCT
SAN.	SANITARY
SD	SLOT DIFFUSER
SF-	SUPPLY FAN
SR	SUPPLY REGISTER
SP	STATIC PRESSURE
SPEC.	SPECIFICATION
SQ.	SQUARE
S.S.	STAINLESS STEEL
STD.	STANDARD
STM.	STEAM
STS	STORM SEWER
SYS.	SYSTEM
Δt	TEMPERATURE DIFFERENCE
TEMP.	TEMPERATURE
TF-	TRANSFER FAN
THRU	THROUGH
T.O.	TAKE-OFF
T.O.D.	TOP OF DUCT ELEVATION A.F.F.
T.O.P.	TOP OF PIPE ELEVATION A.F.F.
T & P	TEMPERATURE AND PRESSURE
T-STAT	THERMOSTAT
TSP	TOTAL STATIC PRESSURE
TW	TEMPERED WATER
TYP.	TYPICAL
U.F.	UNDERFLOOR
UH-	UNIT HEATER
UR	URINAL
V.	VENT
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VCP	VITRIFIED CLAY TILE PIPE
VERT.	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
V.S.	VENT STACK
V.T.R.	VENT THRU ROOF
W	WATER SERVICE
W.	WEST
WC	WATER CLOSET
W.C.O.	WALL CLEANOUT
WG	WALL GRILLE
W.H.	WALL HYDRANT
WH-	WATER HEATER
WL-	WALL LOUVER
W.S.	WASTE STACK
WT.	WEIGHT
W/	WITH
W/O	WITHOUT
W-W ENC.	WALL TO WALL ENCLOSURE
WW	WELL WATER

GENERAL SYMBOLS

- (3) NUMBERED NOTE
- 103 ROOM NUMBER
- 1 REVISION (NO. 1)
- ∅ DIAMETER OR ROUND
- @ AT
- < ANGLE

FIRE SPRINKLER HEAD SYMBOLS

- UPRIGHT OR PENDENT HEAD
- SEMI-RECESSED PENDENT
- RECESSED OR CONCEALED HEAD
- FREEZEPROOF SIDEWALL HEAD
- SIDEWALL HEAD
- PRE-ACTION PENDENT

CONTROL SYMBOLS

- (T) THERMOSTAT OR TEMPERATURE SENSOR
- (H) HUMIDISTAT OR HUMIDITY SENSOR
- (S) TEMPERATURE SENSOR
- (CO) CARBON MONOXIDE SENSOR
- TIMER SWITCH
- (SP) STATIC PRESSURE SENSOR

PIPING SYMBOLS

- W — DOMESTIC WATER SERVICE
- F — FIRE PROTECTION WATER SERVICE
- FS — FIRE SPRINKLER
- SAN — SANITARY SEWER
- STS — STORM SEWER
- WW — WELL WATER
- UNDERFLOOR SOIL & WASTE
- AR — UNDERFLOOR ACID RESISTANT WASTE
- ABOVE FLOOR WASTE
- AR — ABOVE FLOOR ACID RESISTANT WASTE
- CD — CONDENSATE DRAIN
- D — DRAIN
- IW — INDIRECT WASTE (OPEN WASTE)
- PD — PUMPED DRAIN
- PW — PUMPED WASTE
- V — ABOVE FLOOR VENT
- AR — ABOVE FLOOR ACID RESISTANT VENT
- IV — ISLAND VENT
- UV — UNDERFLOOR VENT
- AR — UNDERFLOOR ACID RESISTANT VENT
- UNDERFLOOR RAINWATER LINE
- ABOVE FLOOR RAINWATER LINE
- UNDERFLOOR OVERFLOW RAINWATER LINE
- ABOVE FLOOR OVERFLOW RAINWATER LINE
- COLD WATER
- HOT WATER
- RECIRCULATING HOT WATER
- NP — NON-POTABLE WATER
- TW — TEMPERED WATER
- S — SOFTENED COLD WATER
- HARD — HARD COLD WATER
- DI — DEIONIZED WATER
- 140 — 140° HOT WATER
- 180 — 180° HOT WATER
- G — GAS
- IG — INTERRUPTABLE GAS
- FG — FIRM GAS
- CA — COMPRESSED AIR
- L — REFRIGERANT LIQUID
- S — REFRIGERANT SUCTION
- HG — REFRIGERANT HOT GAS
- HWS — HEATING WATER SUPPLY
- HWR — HEATING WATER RETURN
- HRR — HEATING WATER REVERSE RETURN
- HGS — HEATING GLYCOL SUPPLY
- HGR — HEATING GLYCOL RETURN
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- PC — PUMPED CONDENSATE
- STM — STEAM
- LPR — LOW PRESSURE CONDENSATE RETURN
- HPS — HIGH PRESSURE STEAM
- HPR — HIGH PRESSURE CONDENSATE RETURN
- CS — CORE WATER RETURN
- CR — CORE WATER SUPPLY
- CWS — CONDENSER WATER SUPPLY
- CWR — CONDENSER WATER RETURN
- CGS — COOLING GLYCOL SUPPLY
- CGR — COOLING GLYCOL RETURN
- FOS — FUEL OIL SUPPLY
- FOR — FUEL OIL RETURN
- A — MEDICAL COMPRESSED AIR
- N — NITROGEN
- O — OXYGEN
- N_2O — NITROUS OXIDE
- CO_2 — CARBON DIOXIDE
- TGE — TRACE GAS EVACUATION
- VAC — VACUUM

VALVES, FITTINGS & APPURTENANCES

- UNION
- SHUT-OFF VALVE
- GATE VALVE
- OUTSIDE STEM & YOKE VALVE
- CHECK VALVE
- BALANCING VALVE
- STOP & WASTE VALVE
- SOLENOID VALVE
- 2-WAY CONTROL VALVE
- 3-WAY CONTROL VALVE
- THERMOSTATIC MIXING VALVE
- GLOBE VALVE
- PRESSURE REGULATING VALVE
- WATER REGULATING VALVE
- GAS PRESSURE REGULATOR
- BALL VALVE
- BUTTERFLY VALVE
- TEMPERATURE & PRESSURE RELIEF VALVE
- BACKFLOW PREVENTER
- REDUCED PRESSURE BACKFLOW PREVENTER
- PIPE ANCHOR
- PIPE GUIDE
- STEAM TRAP
- FLOW MEASURING STATION
- STRAINER
- FLEXIBLE PIPE CONNECTOR
- SHOCK ABSORBER
- PRESSURE GAUGE
- THERMOMETER
- AIR VENT
- FLOW ALARM
- FLOOR SINK
- AREA DRAIN
- ROOF DRAIN
- FLOOR DRAIN
- C.O. — CEILING/WALL CLEANOUT
- C.O. — FLOOR CLEANOUT
- SHOWER HEAD
- CAPPED PIPE
- DIRECTION OF FLOW
- TOP TAKE-OFF
- RISER
- BOTTOM TAKE-OFF
- PIPE DROP
- PIPE RISE

DIFFUSER DESIGNATION CODE

24 06 — 24 INDICATES NECK SIZE DIAMETER IN INCHES; 06 INDICATES SQUARE DIFFUSER SIZE IN INCHES

DUCTWORK SYMBOLS

- FIRE DAMPER
- COMBINATION SMOKE/FIRE DAMPER
- SUPPLY DUCT UP
- RETURN OR EXHAUST DUCT UP
- SUPPLY DUCT DOWN
- RETURN OR EXHAUST DUCT DOWN
- MOTORIZED DAMPER
- BACKDRAFT DAMPER
- OPPOSED BLADE
- PARALLEL BLADE
- SUPPLY AIR DIFFUSER
- RETURN OR EXHAUST AIR GRILLE
- 10"∅ — ROUND DUCT
- 10/12 — RECTANGULAR DUCT (FIRST FIG. IS SIDE SHOWN)
- MANUAL BALANCING DAMPER
- FLEXIBLE DUCT CONNECTION
- AP — ACCESS PANEL (SIZE AS REQUIRED)
- SQUARE TURN DUCT ELBOW WITH TURNING VANES
- RADIUSED DUCT ELBOW WITH RADIUS = 1.5 X WIDTH OF SIDE SHOWN
- CONICAL BRANCH TAKE-OFF CONNECTION
- 45° ENTRY BRANCH TAKE-OFF CONNECTION WITH FILLER PIECES AT CORNERS
- RIGID SHEET METAL BRANCH DUCT WITH FLEXIBLE AIR DUCT EXTENSION TO DIFFUSER
- TRANSITION (20° MAXIMUM ANGLE)
- ACOUSTICALLY LINED DUCT

NOTE: NOT ALL OF THESE ITEMS MAY BE USED ON THESE DRAWINGS

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION

REVISIONS

FILE NO.	129083
CITY PROJECT NO.	53W10434
ISSUE DATE	JAN. 13, 2017
DESIGNED BY	TAW
DRAWN BY	SRS

SHEET TITLE
MECHANICAL SYMBOLS AND ABBREVIATIONS

SHEET
GM1

AIR HANDLING UNITS - MODULAR

UNIT NO.	LOCATION	SERVICE	MODEL NO. *	CFM	ESP "W.G.	COOLING											FAN	MOTOR				CABINET STYLE	FILTER TYPE	CONTROL		SECTIONS	EST. WEIGHT LB.	REMARKS
						TOTAL MBH	SENSIBLE MBH	EWT °F.	LWT °F.	EAT DB °F.	EAT WB °F.	LAT DB °F.	LAT WB °F.	GPM	PRESSURE DROP FT.	ROWS	FINS PER IN.	TYPE	HP	RPM	ELECTRICAL CHARACTERISTICS	FLA			CHANGEOVER	THERMOSTAT			
AHU-1	STORAGE	PUMP ROOM	XT1-57x66	8400	1.0	214.9	185.7	55	62.4	80.0	67.0	60.0	59.1	57.3	9.6	5	12	AF	7-1/2	1750	460/60/3	9.25	HORIZONTAL	30% T.A.	T-STAT	REMOTE PROG.	FILTER / COIL / FAN	2400	PROVIDE BASE RAIL

* BASED ON: JOHNSON CONTROLS

MAKEUP AIR UNITS

UNIT NO.	LOCATION	SERVICE	MODEL NO. *	TYPE	FAN SECTION				MOTOR				HEATING SECTION						FILTER TYPE	ACCESSORIES	EST. WEIGHT LB.	REMARKS
					CAPACITY CFM	E.S.P. "W.G.	DRIVE	FAN DISCH.	TYPE	H.P.	R.P.M.	ELECTRICAL CHARACTERISTICS	GAS	INLET PRESS. PSI	INPUT MBH	OUTPUT MBH	ENT. AIR,°F.	LVG. AIR,°F.				
MAU-1	STORAGE BLDG	STORAGE BLDG	TA-112-NG-HRH	DIRECT	2800	0.75	BELT	HORIZ	ODP	1-1/2	1750	460/60/3	NAT	2	250	250	-10	72.7	30% T.A.	FILTER SECTION, PROGRAMMABLE TIME CLOCK, INLET DAMPER	700	

* BASED ON: TITAN AIR

EXHAUST FANS

FAN NO.	LOCATION	SERVICE	MODEL NO. *		FAN TYPE	CAPACITY CFM	S.P. "W.G.	TIP SPEED FPM	EST. FAN RPM	SONES	DRIVE	MOTOR				ACCESSORIES	REMARKS	INTER-LOCK WITH
												TYPE	H.P.	R.P.M.	ELECTRICAL CHARACTERISTICS			
EF-1	CHLORINE ROOM	CHLORINE ROOM	SQ-065-VG-6	a	IN-LINE	100	0.25	3102	1458	3.5	DIRECT	ECM	1/6	1458	115/60/1	VIBRATION ISOLATORS, MOTOR GUARD, HERESITE COATED	MOUNT VERTICAL, CONTINOUS OPERATION	SF-1. MD-5
EF-2	CHLORINE ROOM	CHLORINE ROOM	SQ-100-VG-4	a	IN-LINE	1000	0.25	3974	1357	7.9	DIRECT	ECM	1/4	1357	115/60/1	VIBRATION ISOLATORS MOTOR GUARD, HERESITE COATED	MOUNT VERTICAL	MD-1, LIGHTS
EF-3	FLUORIDE ROOM	FLUORIDE ROOM	PLA15SS4P	b	BLOWER	250	0.25	-	-	-	DIRECT	ODP	1/3	1725	115/60/1	WALL BRACKET, UNIT MOUNTED SPEED CONTROLLER	CORROSION RESISTANT CONSTRUCTION	CONTINUOUS
EF-4	STORAGE	STORAGE	SQ-160-VG-7	a	IN-LINE	2800	0.25	4649	1060	10.9	DIRECT	ECM	3/4	1060	115/60/1	VIBRATION ISOLATORS, MOTOR GUARD		MAU-1, MD-3
EF-5	TOILET	TOILET	SP-A190	a	CEILING	140	0.25	1839	1277	1.5	DIRECT	ODP	180W	1277	115/60/1	VIBRATION ISOLATORS, UNIT MOUNTED SPEED CONTROLLER, ROOF CURB, ROOF CAP		LIGHTS
EF-6	FUME HOOD	FUME HOOD	FG4	c	IN-LINE	70	0.25	2700	-	-	DIRECT	ODP	19W	2700	115/60/1	VIBRATION ISOLATORS, UNIT MOUNTED SPEED CONTROLLER		MANUAL SWITCH

* BASED ON: a - GREENHECK b - PLASTECH c - FANTECH

GAS-FIRED UNIT HEATERS

UNIT NO.	LOCATION	SERVICE	MODEL NO. *	UNIT TYPE	FAN TYPE	CFM	AIR ENT. °F.	GAS				MOTOR			CONTROLS	REMARKS
								INLET PRESSURE PSI	INPUT MBH	OUTPUT MBH	POWER VENTER	H.P.	RPM	ELECTRICAL CHARACTERISTICS		
UH-1	PUMP ROOM	PUMP ROOM	UDAS 60	HORIZ	PROPELLER	769	60	2	60.0	49.8	YES	3/100	1550	115/60/1	REMOTE T-STAT	MOUNT BOTTOM @ 8 FT. A.F.F., ROOF TERMINATION KIT
UH-2	PUMP ROOM	PUMP ROOM	UDAS 60	HORIZ	PROPELLER	769	60	2	60.0	49.8	YES	3/100	1550	115/60/1	REMOTE T-STAT	MOUNT BOTTOM @ 8 FT. A.F.F., ROOF TERMINATION KIT
UH-3	BACKWASH TANK RM	BACKWASH TANK RM	UDAS 30	HORIZ	PROPELLER	456	60	2	30.0	24.6	YES	2/100	1550	115/60/1	REMOTE T-STAT	MOUNT BOTTOM @ 8 FT. A.F.F., ROOF TERMINATION KIT
UH-4	STORAGE	STORAGE	UDAS 75	HORIZ	PROPELLER	972	60	2	75.0	63.0	YES	6/100	1550	115/60/1	REMOTE T-STAT	MOUNT BOTTOM @ 8 FT. A.F.F., ROOF TERMINATION KIT
UH-5	STORAGE	STORAGE	UDAS 75	HORIZ	PROPELLER	972	60	2	75.0	63.0	YES	6/100	1550	115/60/1	REMOTE T-STAT	MOUNT BOTTOM @ 8 FT. A.F.F., ROOF TERMINATION KIT
UH-6	PUMP ROOM	PUMP ROOM	UDAS 60	HORIZ	PROPELLER	769	60	2	60.0	49.8	YES	3/100	1550	115/60/1	REMOTE T-STAT	MOUNT BOTTOM @ 8 FT. A.F.F., ROOF TERMINATION KIT

* BASED ON: REZNOR

SUPPLY FANS

FAN NO.	LOCATION	SERVICE	MODEL NO. *	FAN TYPE	CAPACITY CFM	S.P. "W.G.	TIP SPEED FPM	EST. FAN RPM	SONES	DRIVE	MOTOR				ACCESSORIES	REMARKS	INTER-LOCK WITH
											TYPE	H.P.	R.P.M.	ELECTRICAL CHARACTERISTICS			
SF-1	PUMP ROOM	CHEMICAL ROOMS	SQ-090-VG-6	IN-LINE	300	0.375	4031	1416	6.3	DIRECT	ECM	1/6	1416	115/60/1	VIBRATION ISOLATORS, FILTER SECTION, MOTOR GUARD		MD-6

* BASED ON: GREENHECK

WALL LOUVER

LOUVER NO.	LOCATION	TYPE	SERVING	MODEL NO. *		WIDTH INCHES	HEIGHT INCHES	DEPTH INCHES	FRAME TYPE	BLADE TYPE	SQ. FT. FREE AREA	REMARKS
WL-1	CHLORINE ROOM	INTAKE	CHLORINE ROOM	-	b	36	8	-	CHANNEL	DRAINABLE	1.26	
WL-2	STORAGE	EXHAUST	STORAGE	ELF6375D	a	32	32	6	CHANNEL	DRAINABLE	3.92	
WL-3	STORAGE	INTAKE	MAU-1	ELF6375D	a	32	32	6	CHANNEL	DRAINABLE	3.92	

* BASED ON: a - RUSKIN b - WITH DOOR SYSTEM BY G.C.

MOTORIZED DAMPERS

DAMPER NO.	LOCATION	SERVING	DESIGN CFM	SIZE		PARALLEL OR OPPOSED BLADE TYPE	ACTUATOR TYPE	CONTROL		REMARKS	INTERLOCK WITH
				WIDTH INCHES	HEIGHT INCHES			ACTION	POS.		
MD-1	CHLORINE ROOM	WL-1	1000	36	8	OPPOSED	120V	2-POS	N.C.	NEMA 4	EF-2
MD-2	CHLORINE ROOM	EF-2	1000	14	14	OPPOSED	120V	2-POS	N.C.	NEMA 4	EF-2
MD-3	STORAGE	WL-2	2800	32	32	OPPOSED	120V	2-POS	N.C.		EF-4
MD-4	STORAGE	WL-3	2800	32	32	OPPOSED	120V	2-POS	N.C.		MAU-1
MD-5	CHLORINE ROOM	EF-1	100	9	9	OPPOSED	120V	2-POS	N.C.	NEMA 4	EF-1
MD-6	PUMP ROOM	SF-1	300	12	12	OPPOSED	120V	2-POS	N.C.		SF-1
MD-7	PUMP ROOM	SF-1	300	12	12	OPPOSED	120V	2-POS	N.C.		SF-1

GRAVITY VENTS

UNIT NO.	LOCATION	SERVING	MODEL NO. *	TYPE	CFM	S.P. "W.G.	THROAT SIZE		ROOF OPENING SIZE **		CURB HEIGHT INCHES	OVERALL HEIGHT INCHES	ACCESSORIES	REMARKS
							WIDTH INCHES	LENGTH INCHES	WIDTH INCHES	LENGTH INCHES				
GV-1	ROOF	CHEMICAL ROOMS	FGI-1212	INTAKE	300	0.02	12	12	14-1/2	14-1/2	8	22	ROOF CURB, EXTENDED BASE W/ SIDE ACCESS	
GV-2	ROOF	CHLORINE ROOM	FGI-1414	EXHAUST	1000	0.11	14	14	16-1/2	16-1/2	8	22	ROOF CURB, EXTENDED BASE W/ SIDE ACCESS	
GV-3	ROOF	CHLORINE ROOM	FGI-1212	EXHAUST	100	0.02	12	12	14-1/2	14-1/2	8	22	ROOF CURB, EXTENDED BASE W/ SIDE ACCESS	

* BASED ON: GREENHECK

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SEH

Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

FILE NO. 120083
CITY PROJECT NO. 53W10434
ISSUE DATE JAN. 13, 2017
DESIGNED BY TAW
DRAWN BY SRS
Short Elliott Hendrickson, Inc. © (SEH)

SHEET TITLE
MECHANICAL
EQUIPMENT
SCHEDULES

SHEET
GM2

Wentz Associates, Inc.
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TANKLESS GAS-FIRED WATER HEATERS

WATER HEATER NO.	LOCATION	SERVICE	MODEL NO. *	MOUNTING	RESERVE TANK GAL.	GAS-FIRED			CAPACITY GPM	TEMP. RISE °F.	WORKING PRESSURE P.S.I.	ELECTRICAL CHARACTERISTICS	AMPS	VENTING	REMARKS
						TYPE	INLET GAS PRESS.	INPUT MBH							
WH-1	PUMP ROOM	DOMESTIC HW	GX200P	WALL	0.5	NAT	2 PSI	199.9	8.4	45	150	120/60/1	4.2	DIRECT VENT W/ 3" CPVC	MANIFOLD SYSTEM, WALL MOUNTING FRAME, BUILT-IN CIRC. PUMP, SIDE/ROOF VENT TERMINATORS, CONDENSATE NEUTRALIZER KIT
WH-2	PUMP ROOM	DOMESTIC HW	GX200P	WALL	0.5	NAT	2 PSI	199.9	8.4	45	150	120/60/1	4.2	DIRECT VENT W/ 3" CPVC	MANIFOLD SYSTEM, WALL MOUNTING FRAME, BUILT-IN CIRC. PUMP, SIDE/ROOF VENT TERMINATORS, CONDENSATE NEUTRALIZER KIT

* BASED ON: HUBBELL

RADIANT GAS HEATING SYSTEM

UNIT NO.	LOCATION	SERVICE	MODEL NO. *	GAS	INLET PRESS.	MBH INPUT	TUBE DIA. SIZE INCHES	TUBE LENGTH FEET	ELECTRICAL CHARACTERISTICS	REMARKS
RH-1	STORAGE	STORAGE	CTH2-125	NAT	2 PSI	125	4	40	115/60/1	W/ SIDE REFLECTOR, THERMOSTAT, COMBUSTION AIR & VENT ROOF TERMINALS
RH-2	STORAGE	STORAGE	CTH2-125	NAT	2 PSI	125	4	40	115/60/1	W/ SIDE REFLECTOR, THERMOSTAT, COMBUSTION AIR & VENT ROOF TERMINALS

* BASED ON: ROBERTS GORDON

ELECTRIC DUCT HEATERS

UNIT NO.	LOCATION	MODEL NO. *	DUCT SIZE		DESIGN CFM	TEMP. RISE °F.	ELECTRIC HEAT		ELECTRICAL CHARACTERISTICS		CONTROLS	REMARKS
			WIDTH INCHES	HEIGHT INCHES			MBH	KW	POWER	CONTROL		
EDH-1	PUMP ROOM	SC	12	12	300	73	22.2	6.5	208/60/3	120	SCR	

* BASED ON: THERMOLEC

PUMPS

PUMP NO.	LOCATION	SERVICE	MODEL NO. *	TYPE	FLUID	DESIGN GPM	DESIGN HEAD FT.	SUCT. SIZE IN.	DISCH. SIZE IN.	MOTOR				REMARKS
										TYPE	WATT	R.P.M.	ELECTRICAL CHARACTERISTICS	
P-1	PUMP ROOM	HW RECIRC	NBF-33	CIRC	WATER	6	5	3/4	3/4	ODP	125	2950	115/60/1	BRONZE

* BASED ON: BELL & GOSSETT

DEHUMIDIFIERS

UNIT NO.	LOCATION	SERVICE	MODEL NO. *	PROCESS AIR				ELECTRICAL CHARACTERISTICS	AMPS	REMARKS
				CFM	MOISTURE REMOVAL LB./DAY	INLET AIR °F. DB	INLET AIR REL HUM %			
D-1	PUMP ROOM	PUMP ROOM	HI-E DRY 195	540	107	70	50	115/60/1	12.0	
D-2	PUMP ROOM	PUMP ROOM	HI-E DRY 195	540	107	70	50	115/60/1	12.0	
D-3	PUMP ROOM	PUMP ROOM	HI-E DRY 195	540	107	70	50	115/60/1	12.0	

* BASED ON: THERMA-STOR

ELECTRIC HEATERS

UNIT NO.	LOCATION	TYPE	KW	ELECTRICAL CHARACTERISTICS	REMARKS
EH-1	CHLORINE ROOM	UNIT HEATER	5.0	460/60/3	MODEL QWD CORROSION RESISTANT
EH-2	FLUORIDE ROOM	UNIT HEATER	5.0	460/60/3	MODEL QWD CORROSION RESISTANT
EH-3	TOILET	WALL HEATER	1.5	208/60/1	RECESS MOUNTED

* BASED ON: Q MARK

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SEH

Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK | DATE | DESCRIPTION
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FILE NO. 129083
CITY PROJECT NO. 53W10434
ISSUE DATE JAN. 13, 2017
DESIGNED BY TAW
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SHEET TITLE
MECHANICAL
EQUIPMENT
SCHEDULES

SHEET
GM3

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(952) 831-1180 info@wentzassoc.com

PLOTTED: 1-20-2017 11:25 AM
PLOT SCALE: 1:0.9586

SEQUENCE OF OPERATIONS

WELL BUILDING:

A. PUMP ROOM HEATING:

Gas unit heaters GUH-1, 2, 3 and 6:

Gas unit heater is furnished with a remote wall mounted thermostat which will cycle heater as required.

The thermostat will be furnished and installed by the Mechanical contractor. The Electrical contractor will furnish and install power wiring, and will provide conduits for thermostat and control wiring.

B. TOILET ROOM VENTILATION:

Exhaust fan EF-5:

Ceiling exhaust fan EF-5 shall be interlocked to energize whenever the lights are turned on.

All power wiring will be provided by Electrical Contractor.

C. CHLORINE ROOM CONTINUOUS VENTILATION SYSTEM:

Exhaust fan EF-1 and motorized dampers MD-5 at exhaust gravity roof hood:

Exhaust fan EF-1 shall normally run continuously and normally closed motorized damper MD-5 shall open whenever fan is energized by wall mounted switch.

The damper actuators, switch and interlocks will be furnished and installed by the Mechanical contractor. The Electrical contractor will furnish and install power wiring, and will provide conduits for interlock and control wiring. The Mechanical contractor will furnish and install the interlock and control wiring in the supplied conduits.

D. CHLORINE ROOM "OCCUPIED" VENTILATION SYSTEM:

Exhaust fan EF-2 and motorized dampers MD-2 at exhaust fan and MD-1 at wall intake louver WL-1:

Exhaust fan EF-2 shall be energized and normally closed motorized dampers MD-2 shall open when space lights are switched on.

Motorized damper MD-1 at wall louver WL-1 shall be interlocked with exhaust fan EF-2 and shall fully open whenever exhaust fan is energized.

The damper actuators and the interlocks will be furnished and installed by the Mechanical contractor. The Electrical contractor will furnish and install power wiring, and will provide conduits for interlock and control wiring. The Mechanical contractor will furnish and install the interlock and control wiring in the supplied conduits.

E. FLOURIDE ROOM VENTILATION SYSTEM:

Exhaust fan EF-3:

Exhaust fan EF-3 shall normally run continuously whenever fan is energized wall mounted switch.

The damper actuators and switch will be furnished and installed by the Mechanical contractor. The Electrical contractor will furnish and install power wiring, and will provide conduits for interlock and control wiring. The Mechanical contractor will furnish and install the interlock and control wiring in the supplied conduits.

F. CHEMICAL ROOM VENTILATION SYSTEM:

Supply Fan SF-1 and motorized intake dampers, MD-6 & MD-7:

Supply fan shall be energized and operate when manually switched on.

Motorized dampers, MD-6 & MD-7 shall be interlocked with supply fan and shall fully open whenever supply fan is energized.

Damper actuators, manual switch and control wiring will be furnished and installed by the Mechanical contractor. The Electrical contractor will furnish and install power wiring, and will provide conduits for interlock and control wiring. The Mechanical contractor will furnish and install the interlock and control wiring in the supplied conduits.

G. ELECTRIC DUCT HEATER:

Electric duct heater, EDH-1:

The electric duct heater, EDH-1 shall be energized from an air flow switch. A discharge air controller shall maintain a supply air temperature of 65 degrees (adjustable).

The temperature sensors to be furnished and installed by the Mechanical contractor. The Electrical contractor will furnish and install power wiring, and will provide conduits for interlock and control wiring. The Mechanical contractor will furnish and install the interlock and control wiring in the supplied conduits.

H. PUMP ROOM VENTILATION COOLING SYSTEM

Air handling unit AHU-1:

This is a single zone cooling only air handling unit. Furnish a modulating 2-way control valve and actuator.

The air handling unit shall be provided with a ON-OFF-AUTO wall switch and a space temperature sensor. Ventilation system control shall be as follows:

System in AUTO mode:

1. The air handling unit shall automatically start when room temperature rises above set point and the cooling control valve shall modulate fully open. When the temperature sensor is satisfied the control valve shall fully close and the unit shall be de-energized.

System in OFF mode:

2. The air handling unit shall be de-energized and the cooling control valve shall be fully closed.

System in ON mode:

3. The air handling unit shall run continuously and the cooling control valve shall modulate open or closed as required to maintain space temperature set point.

Alarms:

1. Generate an alarm when the supply fan status is off when it should be on.
2. Generate an alarm when the discharge air temperature goes 5 degree F. above or below the setpoint for more than a 10 minute duration (all variable operator adjustable.
3. Generate an alarm when the system shuts-down on smoke sensing.

Interface the alarms with the building control system installed under Division 26.

Smoke Detector: Upon smoke sensing, the supply fan shall be automatically shut down by return air smoke detector furnished, installed and wired by the Mechanical contractor.

The temperature sensors, controllers, cooling water control valves and actuators will be furnished and installed by the Mechanical contractor. The Electrical contractor will furnish and install power wiring, and will provide conduits for thermostat, control valve, interlock and control wiring. The Mechanical contractor will furnish and install the thermostat, control valve, interlocks and control wiring in the supplied conduits.

STORAGE BUILDING:

I. STORAGE ROOM SUPPLEMENTAL HEATING:

Gas unit heaters GUH-4 and 5:

Gas unit heaters are furnished with a remote wall mounted thermostats which will cycle heater as required.

The thermostat will be furnished and installed by the Mechanical contractor. The Electrical contractor will furnish and install power wiring, and will provide conduits for thermostat and control wiring.

J. STORAGE ROOM RADIANT HEATING SYSTEMS:

Radiant Heating Systems RH-1 and RH-2:

Gas radiant heaters are furnished with a remote wall mounted thermostats which will cycle heater as required.

The thermostat will be furnished and installed by the Mechanical contractor. The Electrical contractor will furnish and install power wiring, and will provide conduits for thermostat and control wiring.

K. STORAGE GARAGE VENTILATION SYSTEM:

Exhaust fan EF-4 and make-up air unit MAU-1:

Exhaust fan EF-4 and make-up air unit MAU-1 are single speed systems. Make-up air unit MAU-1 shall be provided with intake air dampers, MD-4 and exhaust fan shall be provided with exhaust air dampers, MD-3.

A control panel located where indicated on the Drawings shall allow for make-up air unit operation. The panel shall have an ON-OFF-AUTO fan switch. An air temperature sensor shall automatically switch the unit between Winter and Summer mode whenever the outside air temperature is below/above 50 degrees (adjustable). A low limit stat located in the discharge of MAU-1 shall shut down system whenever discharge temperature drops below 35 degrees (adjustable). Make-up air unit MAU-1 system control shall be as follows:

Fan switch in the "ON" position:

1. The make-up air unit shall operate and run continuously at 100% outside air unless shut-down by a safety feature. The outside air damper shall fully open.

The fan switch in the AUTO position:

2. The make up air unit shall automatically start when the CO and NO2 levels within the space rise above the preset maximum allowable level as sensed by sensors, the make-up air unit OA dampers shall open to allow for 100 percent outside air. The unit shall continue to operate until the CO and/or NO2 levels fall below the maximum allowable levels.

When the levels of CO and NO2 fall below the preset maximum levels, the make-up air unit and exhaust fan shall turn off and the motorized outside air dampers shall close.

3. The make-up air unit shall be automatically start when receiving a run signal from the unit mounted time clock and operate at 100 percent outside air and will run continuously until switched to a different position.

System in "WINTER" mode:

4. Whenever the outside ambient temperature is below 50 degrees (adjustable) the unit will automatically be switched into the Winter heating mode. A temperature selector mounted on the make-up air unit control panel shall modulate the burner in make-up air unit MAU-1 as required to maintain the discharge air temperature set point, adjustable from 40 to 80 degrees)

System in "SUMMER" mode:

5. Whenever the outside ambient temperature is above 50 degrees (adjustable) the unit will automatically be switched into the Summer mode. The systems shall operate as indicated above except the burners will be off and no heating by the make-up air unit will be provided.

Exhaust fan EF-4 shall be interlocked to operate whenever the make-up air unit is operating. Motorized damper MD-3 shall be interlocked with exhaust fan EF-4 and shall fully open whenever exhaust fan is energized.

Motorized damper MD-4 shall be interlocked with make-up air unit MAU-1 and shall fully open whenever make-up air unit is energized.

The make-up air unit shall be provided with programmable time clock and relays as required to interlock the unit with the Gas Detection System components and the exhaust fan. The make-up air unit panel shall be provided with the fan switches and status indicator lights for burner, blower and dirty filter as well as remote discharge temperature selector.

The Gas Detection sensors and control panel shall be furnished and installed by the Mechanical contractor.

The make-up air unit control panel shall be furnished with the make-up air unit and installed by the Mechanical contractor.

All interlocks, relays, damper actuators and control wiring to be furnished and installed by the Mechanical Contractor. Coordinate control wiring termination point with Electrical contractor. The Electrical contractor will furnish and install power wiring, and will provide conduits for interlocks and control wiring.

PROVIDE ALL THERMOSTATS WITH A ENGRAVED PERMANENT PLASTIC LABEL MOUNTED ON THE WALL AT THE THERMOSTAT AND LABELED "HEATING OR COOLING", TEMPERATURE SET POINT (If Required) AND EQUIPMENT SERVED.

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

REVISIONS

MARK	DATE	DESCRIPTION

FILE NO.	129083
CITY PROJECT NO.	53W10434
ISSUE DATE	JAN. 13, 2017
DESIGNED BY	TAW
DRAWN BY	SRS

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SHEET TITLE
MECHANICAL EQUIPMENT
SEQUENCE OF
OPERATIONS

SHEET
GM4

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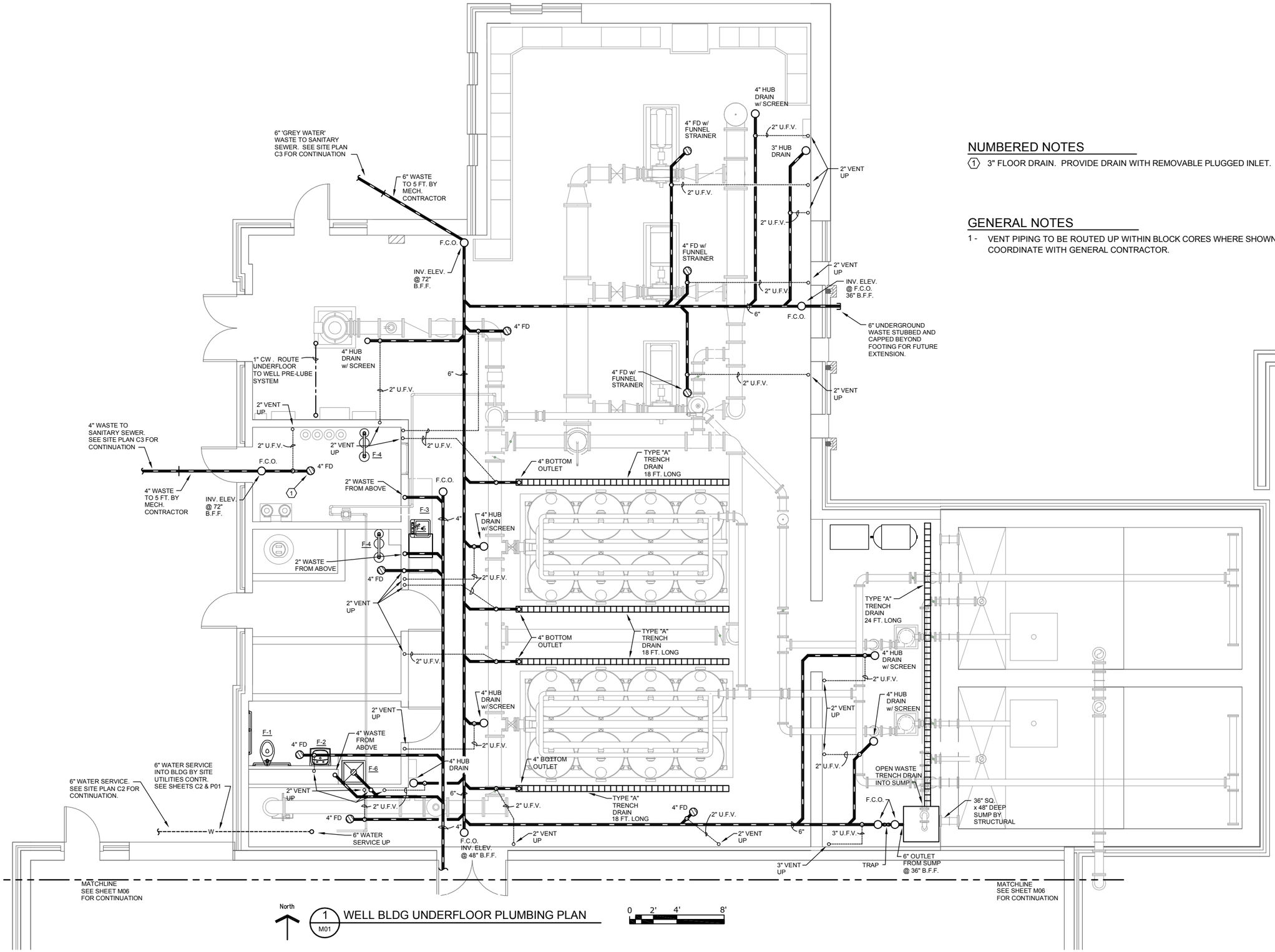

NUMBERED NOTES

1. 3" FLOOR DRAIN. PROVIDE DRAIN WITH REMOVABLE PLUGGED INLET.

GENERAL NOTES

1 - VENT PIPING TO BE ROUTED UP WITHIN BLOCK CORES WHERE SHOWN. COORDINATE WITH GENERAL CONTRACTOR.

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
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MARK	DATE	DESCRIPTION

REVISIONS

FILE NO.	123083
CITY PROJECT NO.	53W10434
ISSUE DATE	JAN. 13, 2017
DESIGNED BY	TAW
DRAWN BY	SRS

Short Elliott Hendrickson Inc. @ (SEH)

SHEET TITLE
WELL BLDG UNDERFLOOR PLUMBING PLAN

SHEET
M01

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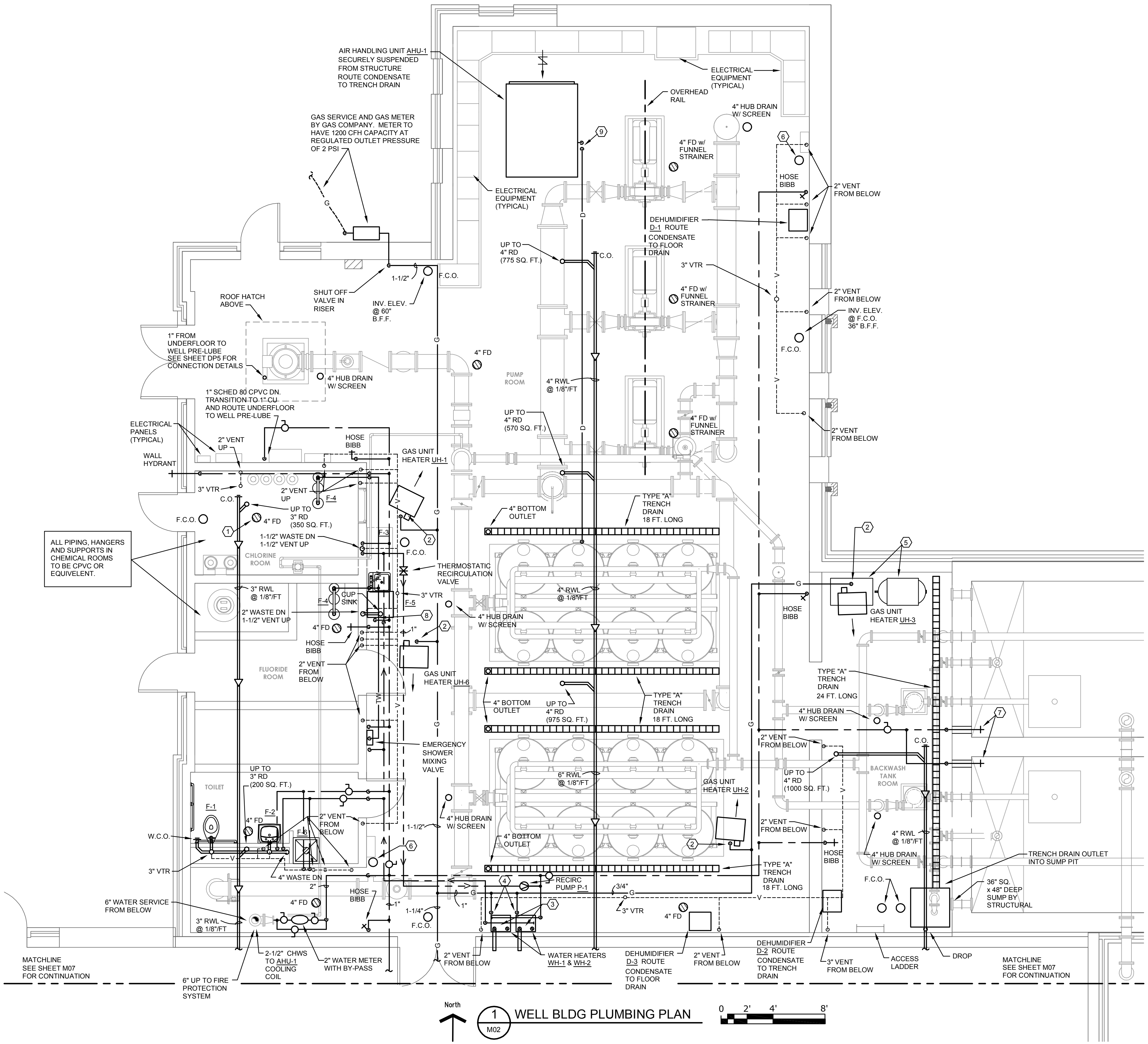

1 / M02 WELL BLDG PLUMBING PLAN

GENERAL NOTES

1 - MAINTAIN MINIMUM OF 42" CLEARANCE IN FRONT OF AND DIRECTLY OVER ALL ELECTRICAL PANELS, FLOOR TO CEILING.

2 - MOUNT HOSE BIBBS AT 36" A.F.F. UNLESS NOTED OTHERWISE.

3 - SEAL ALL PIPING PENETRATIONS OF WALLS/FLOORS/CEILINGS.

4 - ALL VALVES TO BRANCH WATER PIPING TO BE MOUNTED IN ACCESSIBLE LOCATIONS

5 - PROVIDE PERMANENT, ENGRAVED LABELS AT ALL NON-POTABLE WATER (NP) OUTLETS AS "NON-POTABLE WATER - NOT FOR CONSUMPTION"

6 - PIPING SHOWN AWAY FROM WALLS FOR CLARITY ONLY. SECURELY RACK PIPING ON WALLS WHERE POSSIBLE.

7 - PROVIDE SHUT-OFF VALVES ON ALL BRANCH PIPING FROM MAINS.

8 - PIPING INSTALLATION TO BE COORDINATED WITH OTHER SERVICES RACKED ON WALLS.

9 - HANG ALL PIPING AS HIGH AS POSSIBLE UNLESS NOTED OTHERWISE.

10 - NOTE THAT ALL INTERIOR WALLS ARE A GLAZED FINISH. CONTRACTOR TO COORDINATE ALL ANCHOR SYSTEMS WITH GENERAL CONTRACTOR.

NUMBERED NOTES

1. 3" FLOOR DRAIN. PROVIDE DRAIN WITH REMOVABLE PLUGGED INLET.
2. MAKE 3/4" GAS CONNECTION TO UNIT HEATER WITH DRIP LEG, PRESSURE REGULATOR, SHUT-OFF VALVE, AND UNION.
3. 3"Ø COMBUSTION AIR INTAKE FROM 36" ABOVE STORAGE BLDG ROOF AND 3" VENT UP THRU ROOF TO/FROM WATER HEATER. TYPICAL OF EACH.
4. MAKE 3/4" GAS CONNECTION TO WATER HEATER WITH DRIP LEG, PRESSURE REGULATOR, SHUT-OFF VALVE, AND UNION.
5. ROUTE CONDENSATE DRAIN FROM AIR COMPRESSORS TO TRENCH DRAIN. SEE 8/DM2 FOR ADDITIONAL INFORMATION.
6. 4" HUB DRAIN FOR CHLORINE ANALYZER.
7. 1" CW UP AND THRU UNDERSIDE OF TANK CEILING. TERMINATE WITH VALVE W/ CAM LOCK ACCESSIBLE FROM HATCH. SEAL WALL PENETRATION. COORDINATE OUTLET WITH OWNER'S REQUIREMENTS
8. 1/2" CW & HW DOWN TO LAB FUME HOOD F-7 FAUCET. VERIFY EXACT SIZE AND LOCATION.
9. TRAPPED 3/4" CONDENSATE DRAIN FROM AHU-1. ROUTE TO FILTER AND DOWN TO TRENCH DRAIN.

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
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MADISON, WISCONSIN

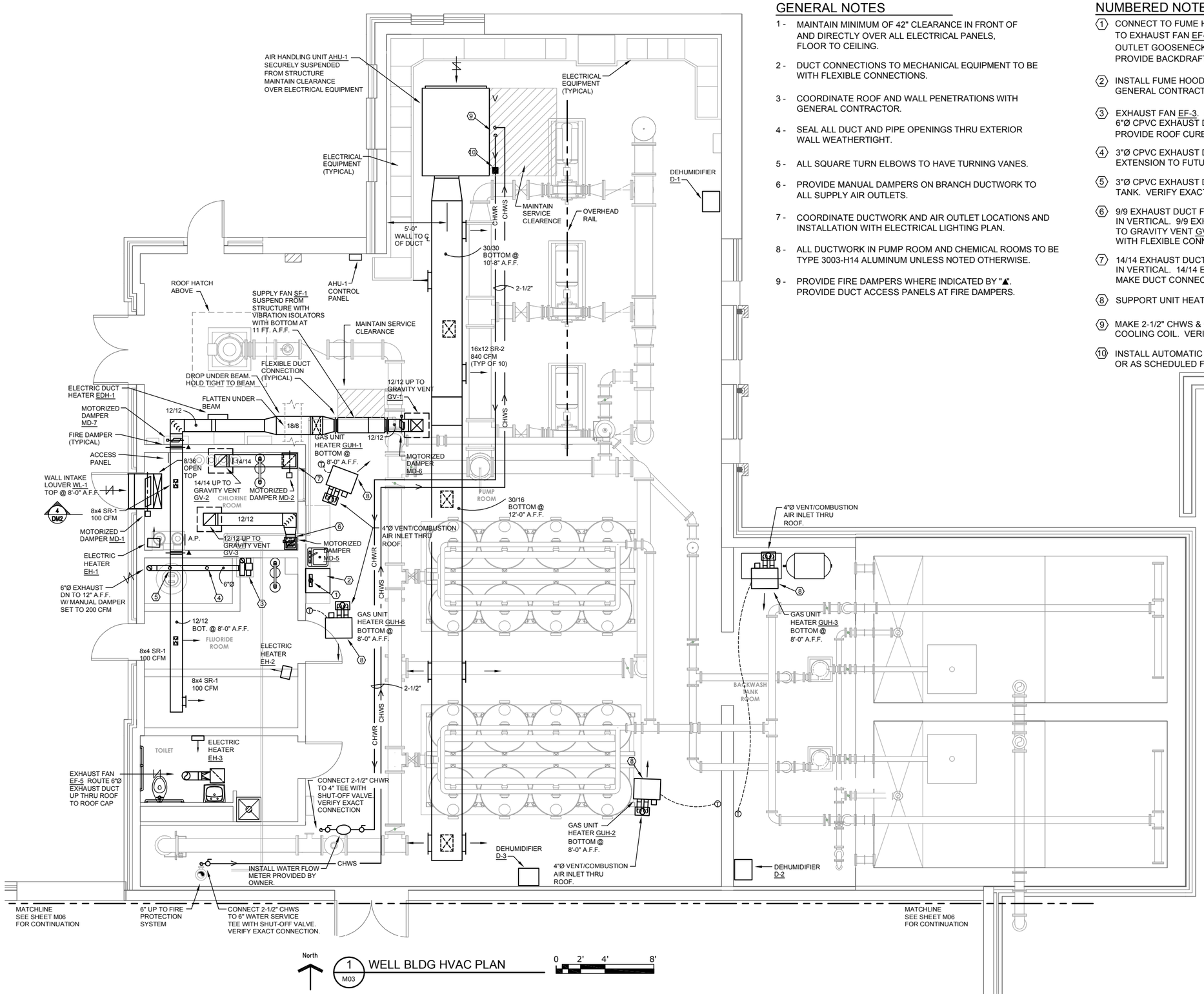
MARK	DATE	DESCRIPTION

REVISIONS

FILE NO.	129083
CITY PROJECT NO.	53W10434
ISSUE DATE	JAN. 13, 2017
DESIGNED BY	TAW
DRAWN BY	SRS

SHEET TITLE
WELL BLDG PLUMBING PLAN

SHEET
M02



GENERAL NOTES

1 - MAINTAIN MINIMUM OF 42" CLEARANCE IN FRONT OF AND DIRECTLY OVER ALL ELECTRICAL PANELS, FLOOR TO CEILING.

2 - DUCT CONNECTIONS TO MECHANICAL EQUIPMENT TO BE WITH FLEXIBLE CONNECTIONS.

3 - COORDINATE ROOF AND WALL PENETRATIONS WITH GENERAL CONTRACTOR.

4 - SEAL ALL DUCT AND PIPE OPENINGS THRU EXTERIOR WALL WEATHERTIGHT.

5 - ALL SQUARE TURN ELBOWS TO HAVE TURNING VANES.

6 - PROVIDE MANUAL DAMPERS ON BRANCH DUCTWORK TO ALL SUPPLY AIR OUTLETS.

7 - COORDINATE DUCTWORK AND AIR OUTLET LOCATIONS AND INSTALLATION WITH ELECTRICAL LIGHTING PLAN.

8 - ALL DUCTWORK IN PUMP ROOM AND CHEMICAL ROOMS TO BE TYPE 3003-H14 ALUMINUM UNLESS NOTED OTHERWISE.

9 - PROVIDE FIRE DAMPERS WHERE INDICATED BY "▲". PROVIDE DUCT ACCESS PANELS AT FIRE DAMPERS.

NUMBERED NOTES

(1) CONNECT TO FUME HOOD WITH 4"Ø ALUMINUM EXHAUST DUCT AND ROUTE UP TO EXHAUST FAN EF-6 THEN THRU ROOF AND TERMINATE WITH SCREENED OUTLET GOOSENECK. PROVIDE ROOF CURB. OFFSET AS REQUIRED. PROVIDE BACKDRAFT DAMPER IN DUCT DOWNSTREAM OF EXHAUST FAN.

(2) INSTALL FUME HOOD. SECURE TO WALL/COUNTER. COORDINATE WITH GENERAL CONTRACTOR.

(3) EXHAUST FAN EF-3. SECURELY MOUNT ON SHELF ON WALL. ROUTE 6"Ø CPVC EXHAUST DUCT UP THRU ROOF TO SCREENED OUTLET GOOSENECK. PROVIDE ROOF CURB.

(4) 3"Ø CPVC EXHAUST DUCT AND MANUAL DAMPER CAPPED FOR FUTURE EXTENSION TO FUTURE TANK.

(5) 3"Ø CPVC EXHAUST DUCT WITH MANUAL DAMPER. MAKE CONNECTION TO TANK. VERIFY EXACT TIE-IN SIZE AND LOCATION. BALANCE TO 50 CFM

(6) 9/9 EXHAUST DUCT FROM 6" A.F.F. TO EXHAUST FAN EF-1 MOUNTED IN VERTICAL. 9/9 EXHAUST OUTLET. TRANSITION TO 12/12 AND UP TO GRAVITY VENT GV-3. MAKE DUCT CONNECTIONS TO EXHAUST FAN WITH FLEXIBLE CONNECTIONS.

(7) 14/14 EXHAUST DUCT FROM 6" A.F.F. TO EXHAUST FAN EF-2 MOUNTED IN VERTICAL. 14/14 EXHAUST OUTLET UP TO GRAVITY VENT GV-2. MAKE DUCT CONNECTIONS TO EXHAUST FAN WITH FLEXIBLE CONNECTIONS.

(8) SUPPORT UNIT HEATER FROM WALL SUPPORT BRACKET/ANGLES.

(9) MAKE 2-1/2" CHWS & CHWR CONNECTION TO AIR HANDLING UNIT AHU-1 COOLING COIL. VERIFY EXACT TIE-IN SIZE AND LOCATION.

(10) INSTALL AUTOMATIC FLOW CONTROL VALVE. FLOW AS INDICATED OR AS SCHEDULED FOR EQUIPMENT SERVED.

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SEH

Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
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MADISON, WISCONSIN

MARK	DATE	DESCRIPTION

REVISIONS

FILE NO.	129083
CITY PROJECT NO.	53W10434
ISSUE DATE	JAN. 13, 2017
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DRAWN BY	SRS

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SHEET TITLE
WELL BLDG HVAC PLAN

SHEET
M03

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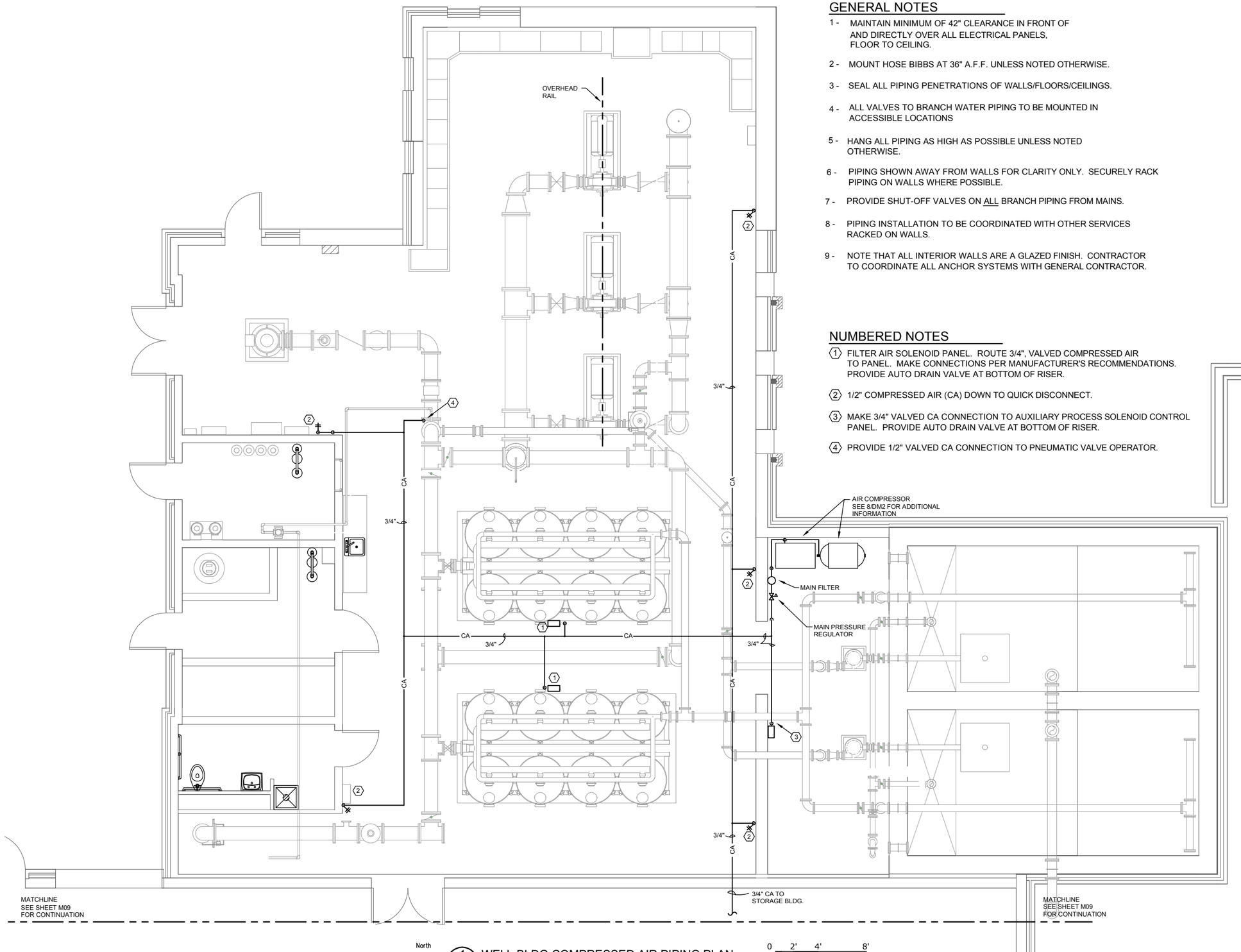

GENERAL NOTES

1 - MAINTAIN MINIMUM OF 42" CLEARANCE IN FRONT OF AND DIRECTLY OVER ALL ELECTRICAL PANELS, FLOOR TO CEILING.

2 - MOUNT HOSE BIBBS AT 36" A.F.F. UNLESS NOTED OTHERWISE.

3 - SEAL ALL PIPING PENETRATIONS OF WALLS/FLOORS/CEILINGS.

4 - ALL VALVES TO BRANCH WATER PIPING TO BE MOUNTED IN ACCESSIBLE LOCATIONS

5 - HANG ALL PIPING AS HIGH AS POSSIBLE UNLESS NOTED OTHERWISE.

6 - PIPING SHOWN AWAY FROM WALLS FOR CLARITY ONLY. SECURELY RACK PIPING ON WALLS WHERE POSSIBLE.

7 - PROVIDE SHUT-OFF VALVES ON ALL BRANCH PIPING FROM MAINS.

8 - PIPING INSTALLATION TO BE COORDINATED WITH OTHER SERVICES RACKED ON WALLS.

9 - NOTE THAT ALL INTERIOR WALLS ARE A GLAZED FINISH. CONTRACTOR TO COORDINATE ALL ANCHOR SYSTEMS WITH GENERAL CONTRACTOR.

NUMBERED NOTES

(1) FILTER AIR SOLENOID PANEL. ROUTE 3/4", VALVED COMPRESSED AIR TO PANEL. MAKE CONNECTIONS PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE AUTO DRAIN VALVE AT BOTTOM OF RISER.

(2) 1/2" COMPRESSED AIR (CA) DOWN TO QUICK DISCONNECT.

(3) MAKE 3/4" VALVED CA CONNECTION TO AUXILIARY PROCESS SOLENOID CONTROL PANEL. PROVIDE AUTO DRAIN VALVE AT BOTTOM OF RISER.

(4) PROVIDE 1/2" VALVED CA CONNECTION TO PNEUMATIC VALVE OPERATOR.

North

1 / M04 WELL BLDG COMPRESSED AIR PIPING PLAN

0 2' 4' 8'

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Madison Water Utility

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REVISIONS

MARK	DATE	DESCRIPTION

FILE NO.	129063
CITY PROJECT NO.	53W10434
ISSUE DATE	JAN. 13, 2017
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SHEET TITLE
WELL BLDG
COMPRESSED AIR
PIPING PLAN

SHEET
M04

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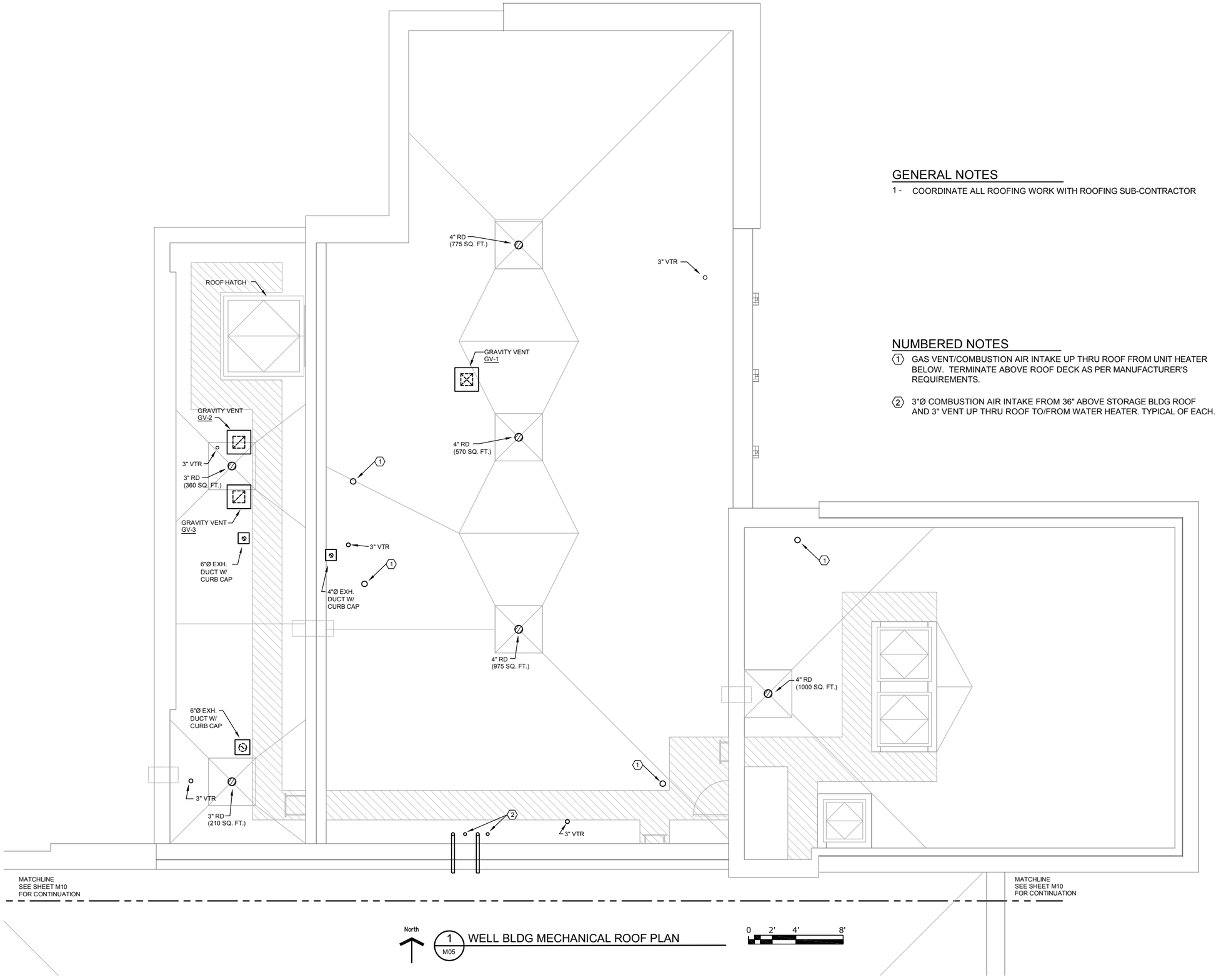

GENERAL NOTES

1 - COORDINATE ALL ROOFING WORK WITH ROOFING SUB-CONTRACTOR

NUMBERED NOTES

1. GAS VENT/COMBUSTION AIR INTAKE UP THRU ROOF FROM UNIT HEATER BELOW. TERMINATE ABOVE ROOF DECK AS PER MANUFACTURER'S REQUIREMENTS.

2. 3"Ø COMBUSTION AIR INTAKE FROM 36" ABOVE STORAGE BLDG ROOF AND 3" VENT UP THRU ROOF TO/FROM WATER HEATER. TYPICAL OF EACH.

North

1 / M05 WELL BLDG MECHANICAL ROOF PLAN

0 2' 4' 8'

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SHEET TITLE
WELL BLDG
MECHANICAL
ROOF PLAN

SHEET
M05

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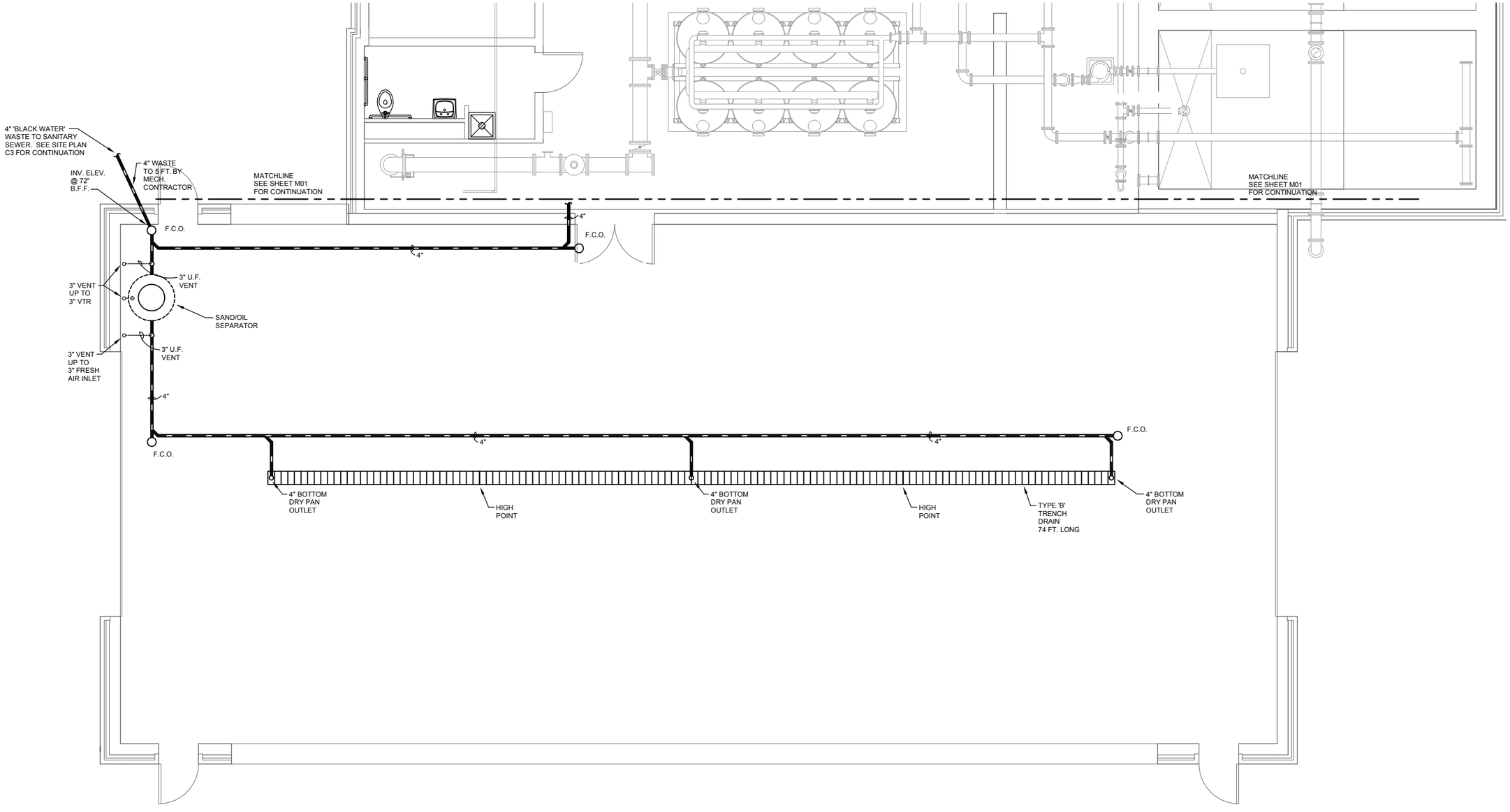

North

1 / M06 STORAGE BLDG UNDERFLOOR PLUMBING PLAN

0 2' 4' 8'

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
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REVISIONS

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SHEET TITLE
STORAGE BLDG UNDERFLOOR PLUMBING PLAN

SHEET
M06

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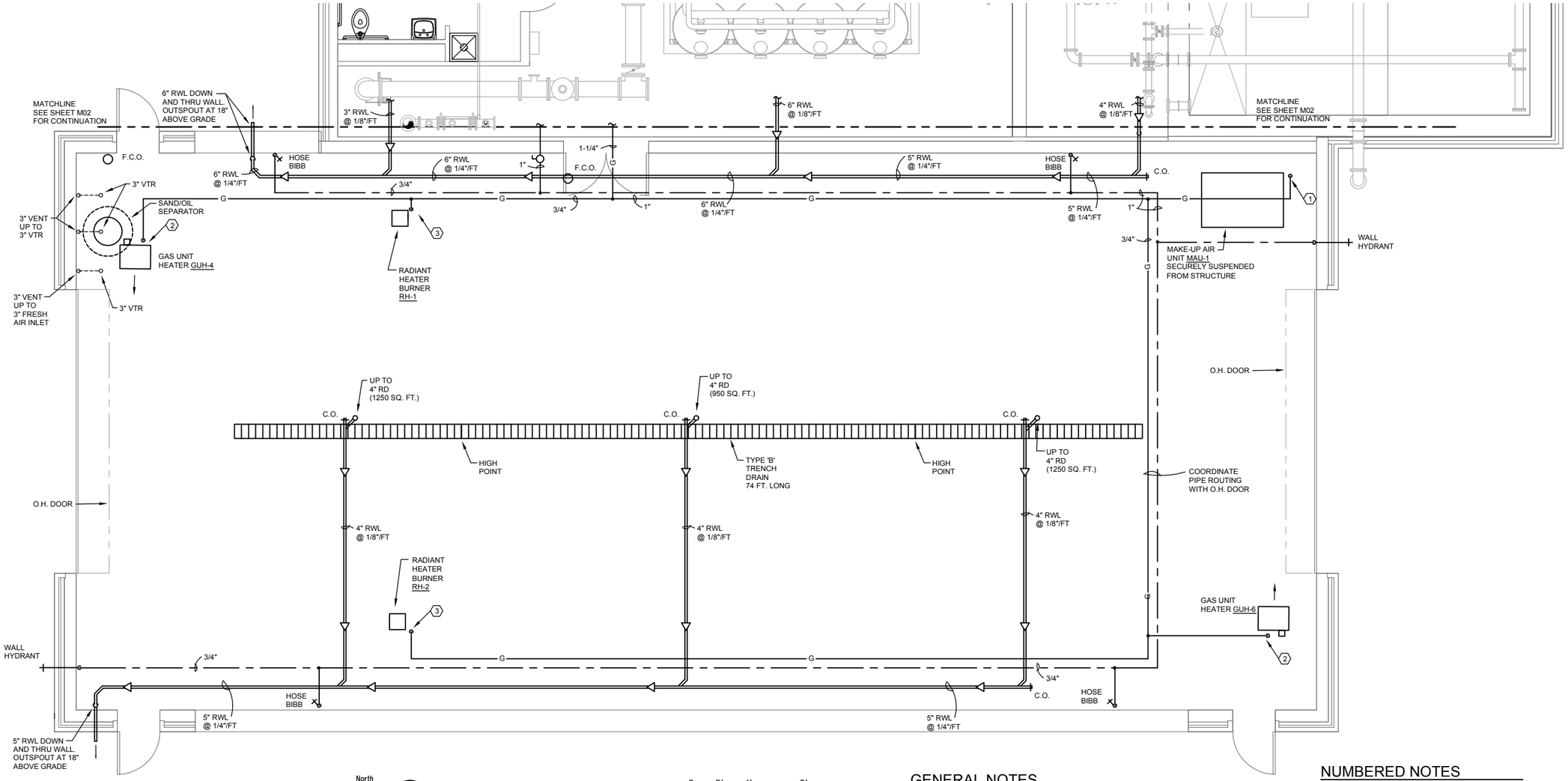

North

1 M07 STORAGE BLDG PLUMBING PLAN

0 2' 4' 8'

GENERAL NOTES

1 - MAINTAIN MINIMUM OF 42" CLEARANCE IN FRONT OF AND DIRECTLY OVER ALL ELECTRICAL PANELS, FLOOR TO CEILING.

2 - MOUNT HOSE BIBBS AT 36" A.F.F. UNLESS NOTED OTHERWISE.

3 - SEAL ALL PIPING PENETRATIONS OF WALLS/FLOORS/CEILINGS.

4 - ALL VALVES TO BRANCH WATER PIPING TO BE MOUNTED IN ACCESSIBLE LOCATIONS

5 - PROVIDE PERMANENT, ENGRAVED LABELS AT ALL NON-POTABLE WATER (NP) OUTLETS AS "NON-POTABLE WATER - NOT FOR CONSUMPTION"

6 - PIPING SHOWN AWAY FROM WALLS FOR CLARITY ONLY. SECURELY RACK PIPING ON WALLS WHERE POSSIBLE.

7 - PROVIDE SHUT-OFF VALVES ON ALL BRANCH PIPING FROM MAINS.

8 - PIPING INSTALLATION TO BE COORDINATED WITH OTHER SERVICES RACKED ON WALLS.

9 - HANG ALL PIPING AS HIGH AS POSSIBLE UNLESS NOTED OTHERWISE.

NUMBERED NOTES

1 MAKE 3/4" GAS CONNECTION TO MAKE-UP AIR UNIT WITH DRIP LEG, SHUT-OFF VALVE, AND UNION.

2 MAKE 3/4" GAS CONNECTION TO UNIT HEATER WITH DRIP LEG, SHUT-OFF VALVE, AND UNION.

3 MAKE 3/4" GAS CONNECTION TO RADIANT HEATER BURNER WITH DRIP LEG, SHUT-OFF VALVE, AND UNION.

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

REVISIONS

MARK	DATE	DESCRIPTION

FILE NO.	129083
CITY PROJECT NO.	53W10434
ISSUE DATE	JAN. 13, 2017
DESIGNED BY	TAW
DRAWN BY	SRS

SHEET TITLE
STORAGE BLDG
PLUMBING
PLAN

SHEET
M07

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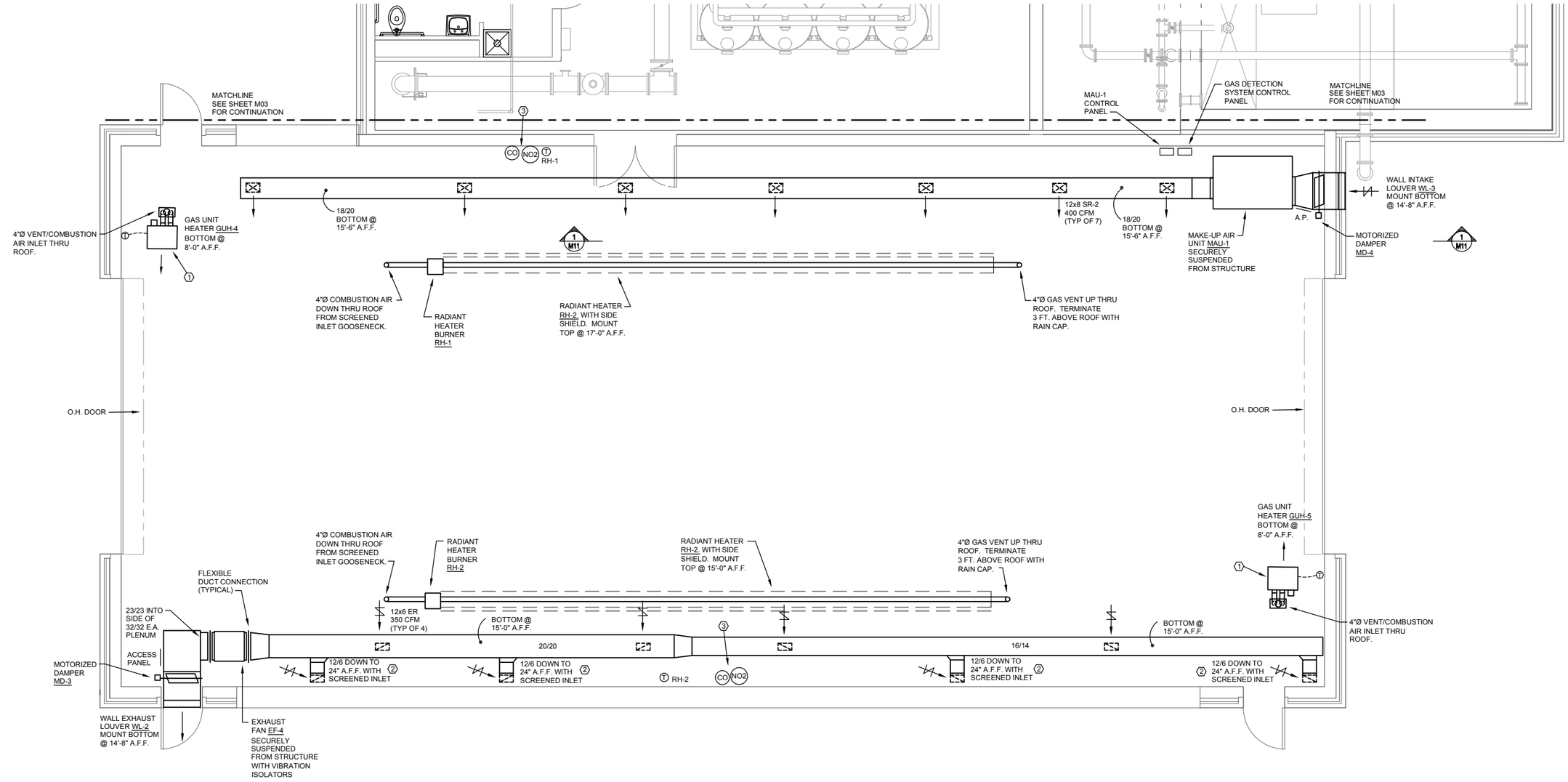

North

1 / M08 STORAGE BLDG HVAC PLAN

0 2' 4' 8'

GENERAL NOTES

1 - MAINTAIN MINIMUM OF 42" CLEARANCE IN FRONT OF AND DIRECTLY OVER ALL ELECTRICAL PANELS, FLOOR TO CEILING.

2 - DUCT CONNECTIONS TO MECHANICAL EQUIPMENT TO BE WITH FLEXIBLE CONNECTIONS.

3 - COORDINATE ROOF AND WALL PENETRATIONS WITH GENERAL CONTRACTOR.

4 - SEAL ALL DUCT AND PIPE OPENINGS THRU EXTERIOR WALL WEATHERTIGHT.

5 - ALL SQUARE TURN ELBOWS TO HAVE TURNING VANES.

6 - PROVIDE MANUAL DAMPERS ON BRANCH DUCTWORK TO ALL SUPPLY AIR OUTLETS.

7 - COORDINATE DUCTWORK AND AIR OUTLET LOCATIONS AND INSTALLATION WITH ELECTRICAL LIGHTING PLAN.

NUMBERED NOTES

(1) SUPPORT UNIT HEATER FROM WALL SUPPORT BRACKET/ANGLES.

(2) PROVIDE MANUAL BALANCING DAMPER IN DUCT DROP AND BALANCE TO 350 CFM.

(3) GAS DETECTORS. MOUNT ON WALL PER MANUFACTURER'S RECOMMENDATIONS.

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SHEET TITLE
STORAGE BLDG
HVAC
PLAN

SHEET
M08

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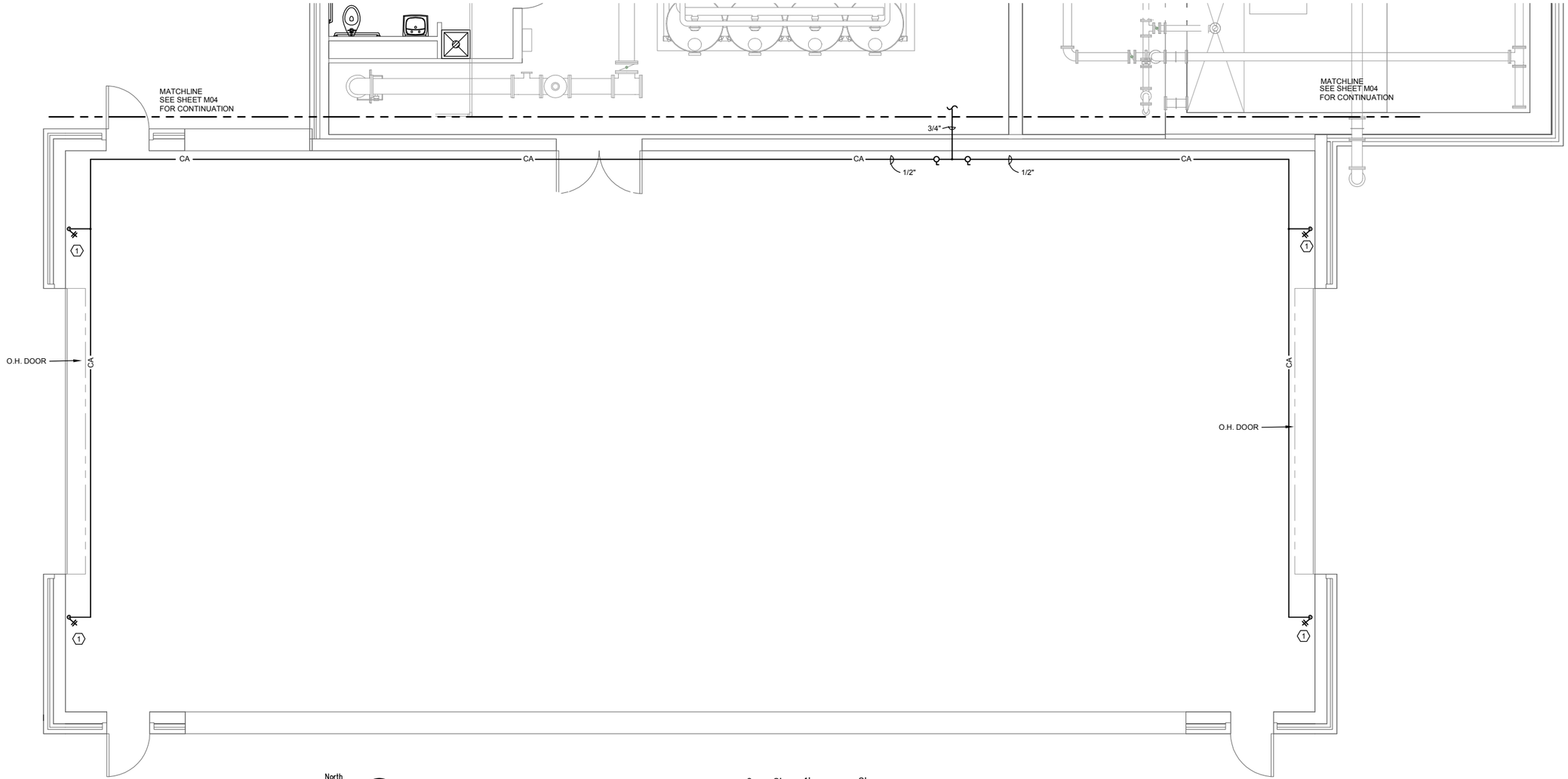

North

1 / M09 STORAGE BLDG COMPRESSED AIR PIPING PLAN

0 2' 4' 8'

GENERAL NOTES

1 - MAINTAIN MINIMUM OF 42" CLEARANCE IN FRONT OF AND DIRECTLY OVER ALL ELECTRICAL PANELS, FLOOR TO CEILING.

2 - MOUNT HOSE BIBBS AT 36" A.F.F. UNLESS NOTED OTHERWISE.

3 - SEAL ALL PIPING PENETRATIONS OF WALLS/FLOORS/CEILINGS.

4 - ALL VALVES TO BRANCH WATER PIPING TO BE MOUNTED IN ACCESSIBLE LOCATIONS

5 - HANG ALL PIPING AS HIGH AS POSSIBLE UNLESS NOTED OTHERWISE.

6 - PIPING SHOWN AWAY FROM WALLS FOR CLARITY ONLY. SECURELY RACK PIPING ON WALLS WHERE POSSIBLE.

7 - PROVIDE SHUT-OFF VALVES ON ALL BRANCH PIPING FROM MAINS.

8 - PIPING INSTALLATION TO BE COORDINATED WITH OTHER SERVICES RACKED ON WALLS.

9 - NOTE THAT ALL INTERIOR WALLS ARE A GLAZED FINISH. CONTRACTOR TO COORDINATE ALL ANCHOR SYSTEMS WITH GENERAL CONTRACTOR.

NUMBERED NOTES

(1) 1/2" COMPRESSED AIR (CA) DOWN TO QUICK DISCONNECT.

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CITY PROJECT NO.	53W10434
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SHEET TITLE
STORAGE BLDG
COMPRESSED AIR
PIPING PLAN

SHEET
M09

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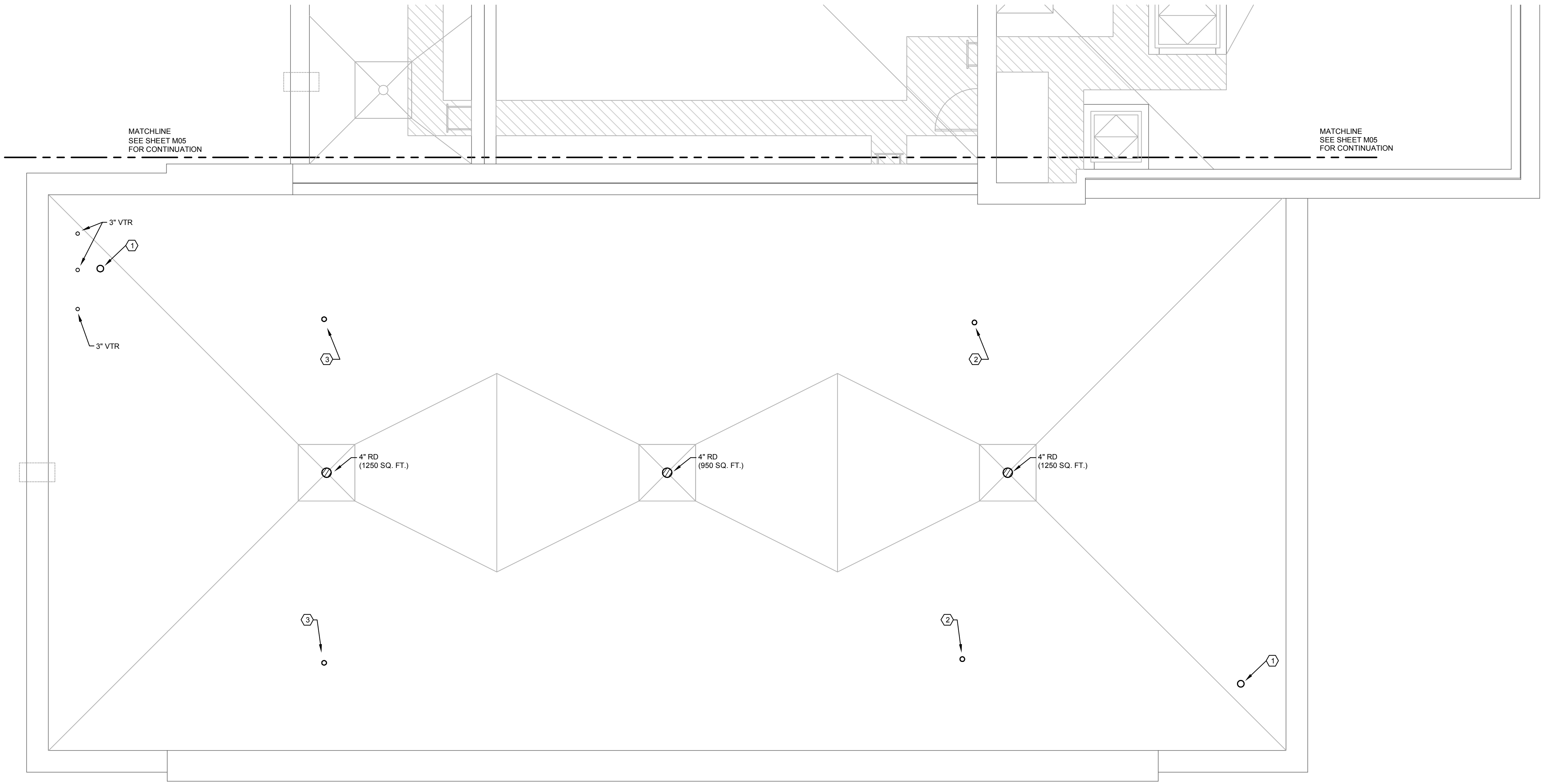

1 STORAGE BLDG MECHANICAL ROOF PLAN
M10

GENERAL NOTES

1 - COORDINATE ALL ROOFING WORK WITH ROOFING SUB-CONTRACTOR

NUMBERED NOTES

1. GAS VENT/COMBUSTION AIR INTAKE UP THRU ROOF FROM UNIT HEATER BELOW. TERMINATE ABOVE ROOF DECK AS PER MANUFACTURER'S REQUIREMENTS.
2. 4"Ø GAS VENT UP THRU ROOF FROM RADIANT HEATER BELOW. TERMINATE ABOVE ROOF DECK AS PER MANUFACTURER'S REQUIREMENTS.
3. 4"Ø COMBUSTION AIR DOWN THRU ROOF TO RADIANT HEATER BELOW FROM SCREENED INLET GOOSENECK. INLET AT MINIMUM 36" ABOVE ROOF DECK.

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SHEET TITLE
STORAGE BLDG MECHANICAL ROOF PLAN

SHEET
M10

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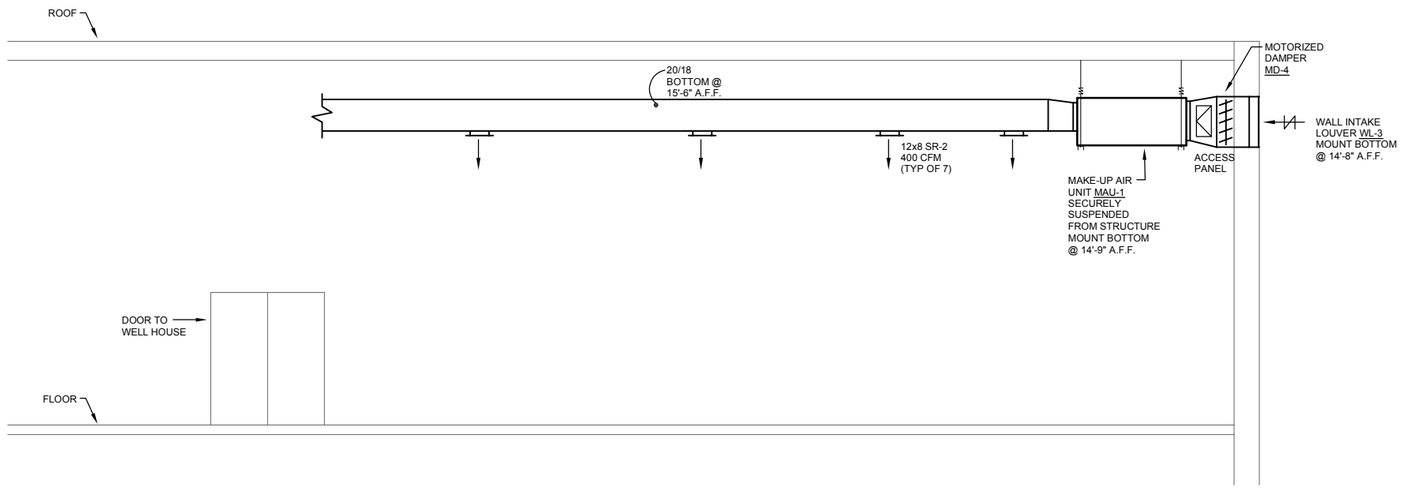

North

1 / M11 STORAGE BLDG MECHANICAL SECTION

0 2' 4' 8'

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SHEET TITLE
STORAGE BLDG
MECHANICAL
SECTION

SHEET
M11

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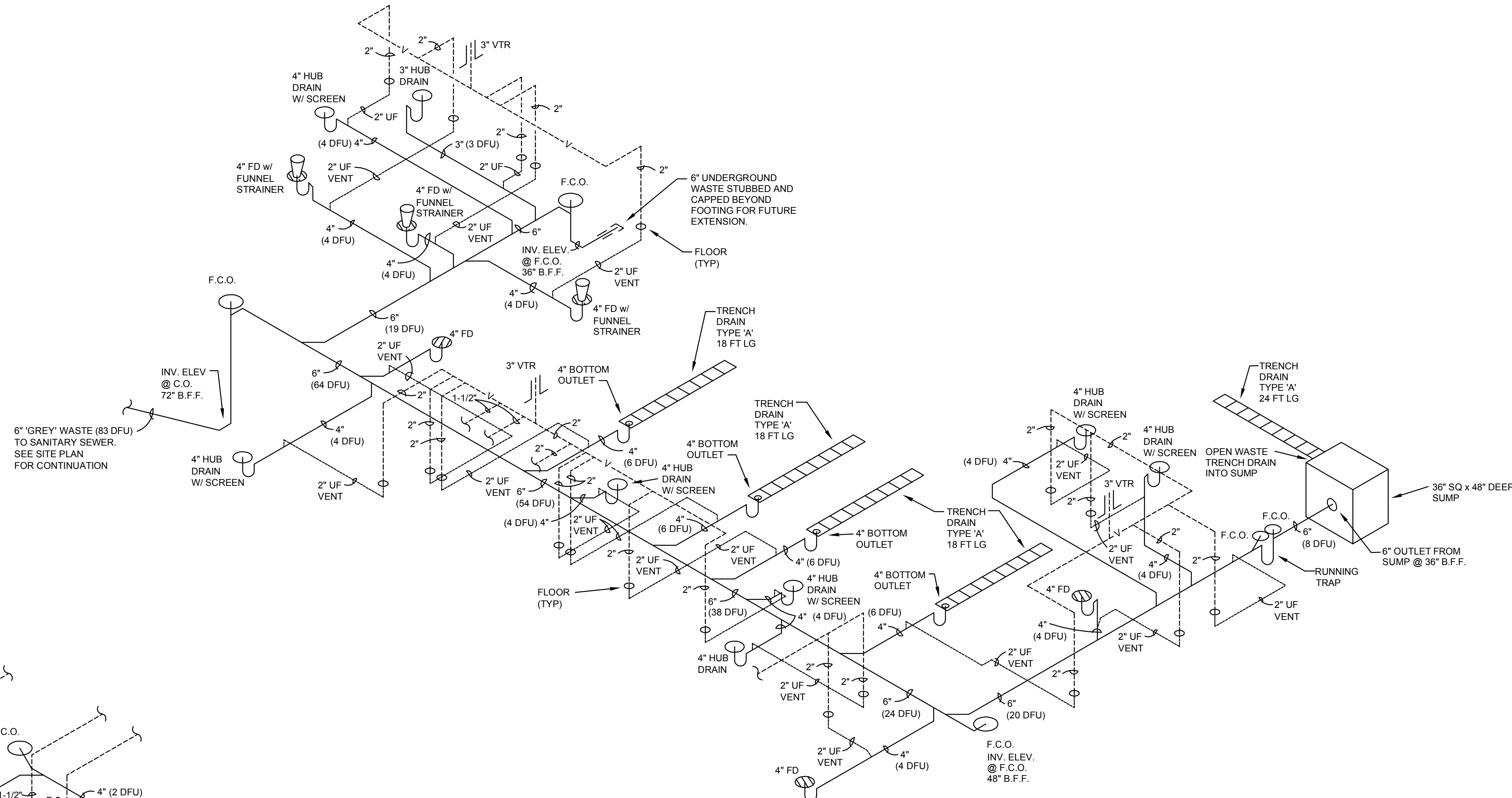
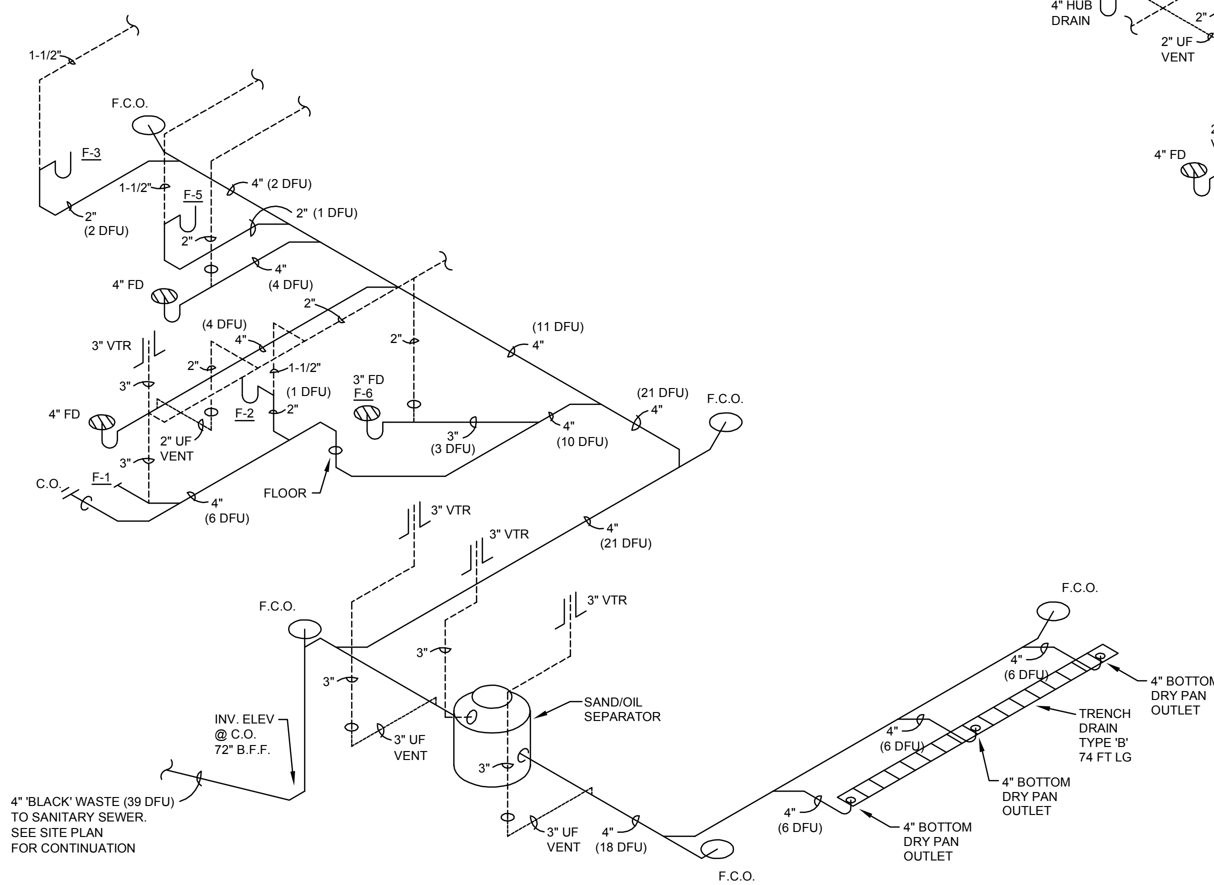


2 'GREY' WASTE & VENT PIPING DIAGRAM
M12



1 'BLACK' WASTE & VENT PIPING DIAGRAM
M12

PLUMBING FIXTURE PIPING

FIXTURE		PIPE SIZE (INCHES)					TOTAL D.F.U.	WSFU			REMARKS
NO.	TYPE	W.	V.	C.W.	H.W.	T.W.		TOTAL	H.W.	C.W.	
F-1	WATER CLOSET	4	3	1-1/2	-	-	6.0	6.5	-	6.5	ADA COMPLIANT
F-2	LAVATORY	1-1/2	1-1/2	1/2	1/2	-	1.0	1.0	0.5	0.5	ADA COMPLIANT
F-3	SINK	1-1/2	1-1/2	1/2	1/2	-	2.0	3.0	2.0	2.0	
F-4	EMERGENCY SHOWER/EYEWASH	-	-	-	-	1-1/4		6.0	2.0	4.0	
F-5	FUME HOOD/CUP SINK	1-1/2	1-1/2	1/2	1/2	-	1.0	1.0	0.5	0.5	
F-6	MOP SINK	3	2	3/4	3/4	-	3.0	4.0	3.0	4.0	

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REVISIONS
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DRAWN BY	SRS

SHEET TITLE
PLUMBING PIPING DIAGRAMS

SHEET
M12

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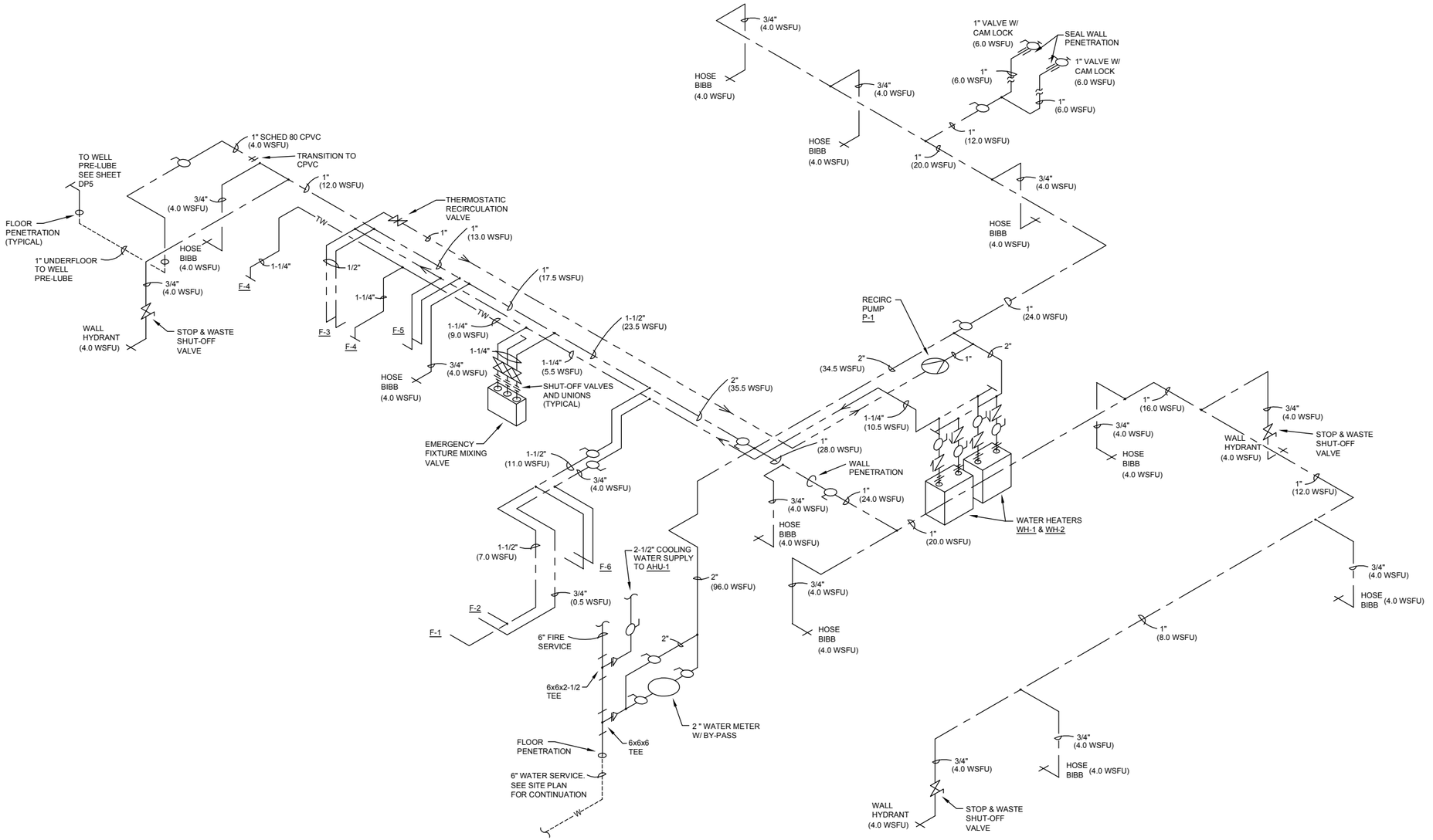

PLUMBING FIXTURE PIPING

FIXTURE		PIPE SIZE (INCHES)					TOTAL D.F.U.	WSFU			REMARKS
NO.	TYPE	W.	V.	C.W.	H.W.	T.W.		TOTAL	H.W.	C.W.	
F-1	WATER CLOSET	4	3	1-1/2	-	-	6.0	6.5	-	6.5	ADA COMPLIANT
F-2	LAVATORY	1-1/2	1-1/2	1/2	1/2	-	1.0	1.0	0.5	0.5	ADA COMPLIANT
F-3	SINK	1-1/2	1-1/2	1/2	1/2	-	2.0	3.0	2.0	2.0	
F-4	EMERGENCY SHOWER/EYEWASH	-	-	-	-	1-1/4		6.0	2.0	4.0	
F-5	FUME HOOD	1-1/2	1-1/2	1/2	1/2	-	1.0	1.0	0.5	0.5	
F-6	MOP SINK	3	2	3/4	3/4	-	3.0	4.0	3.0	4.0	

1 M13 WATER SUPPLY PIPING DIAGRAM

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ISSUE DATE JAN. 13, 2017
DESIGNED BY TAW
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SHEET TITLE
PLUMBING PIPING DIAGRAMS

SHEET
M13

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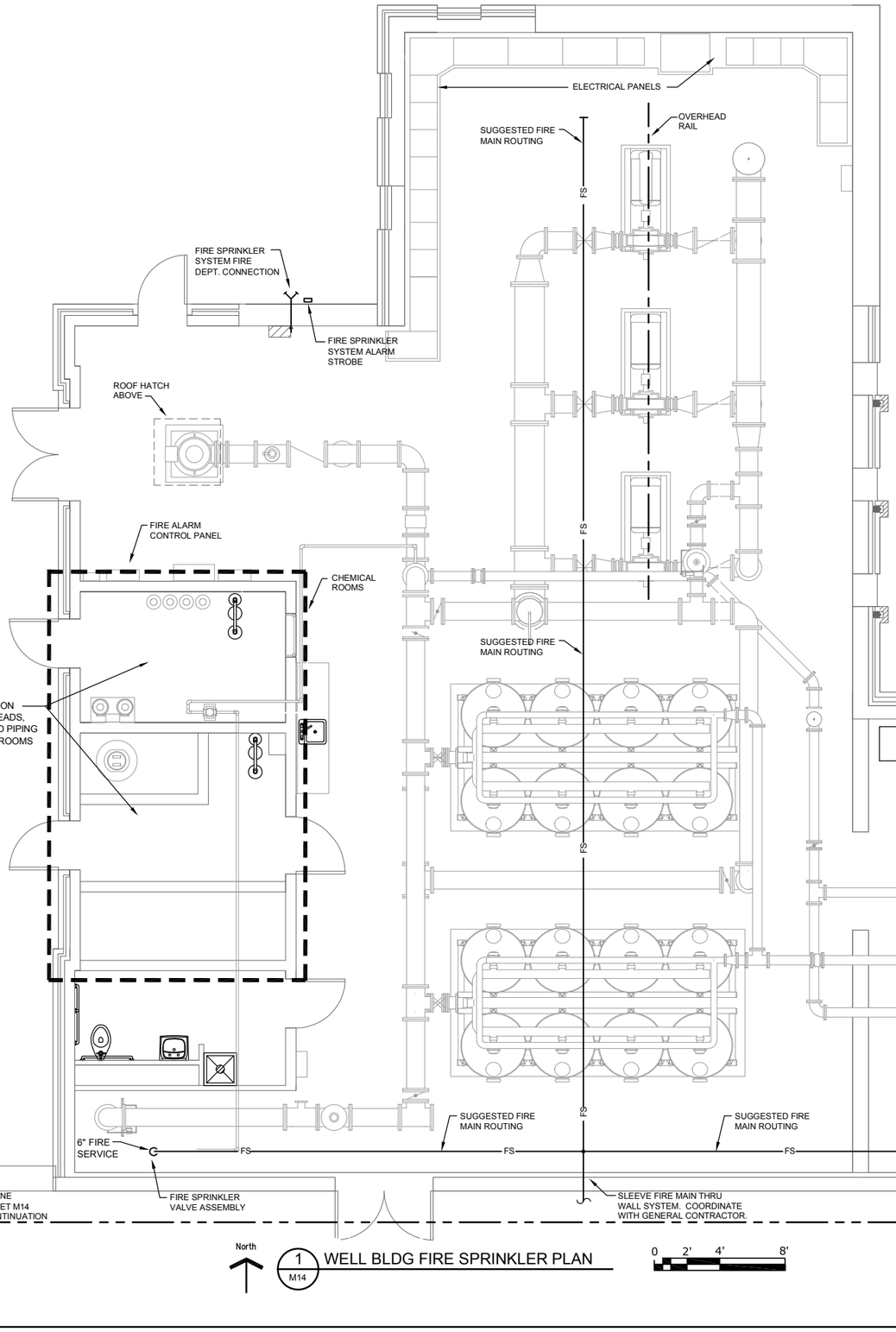


GENERAL NOTES:

1 - PROVIDE SPRINKLER COVERAGE FOR ENTIRE FACILITY.

2 - COORDINATE INSTALLATION OF FIRE SPRINKLER PIPING WITH DUCTWORK, PIPING AND CONDUIT TO BE INSTALLED BY OTHER TRADES.

3 - COORDINATE LOCATIONS OF SPRINKLER HEADS WITH CEILING LIGHT FIXTURES AND GRILLES AS INDICATED ON REFLECTED CEILING PLANS.

4 - SPRINKLER CONTRACTOR SHALL INSTALL FIRE SPRINKLER SYSTEM COMPLETE IN ACCORDANCE WITH THE LOCAL CODE, OWNERS FIRE INSURANCE UNDER-WRITER AND AUTHORITY HAVING JURISDICTION.

5 - PROVIDE AUXILIARY DRAINS WHERE NECESSARY AND WHERE REQUIRED BY CODE.

6 - THE SPRINKLER CONTRACTOR SHALL SUBMIT LAYOUT DRAWINGS OF FIRE SPRINKLER SYSTEM INCLUDING HYDRAULIC CALCULATIONS.

7 - PROVIDE HOOD, SHIELD OR BAFFLE ON SPRINKLER HEADS WHERE WATER DAMAGE MAY RESULT FROM HEADS LOCATED CLOSE TO AND OVER ELECTRICAL PANELS.

8 - PROVIDE FLOW ALARMS AND SUPERVISED ISOLATION VALVES FOR EACH ZONE.

9 - FIRE SPRINKLER CONTRACTOR TO VERIFY LOCATIONS OF DUCTWORK, CEILINGS AND EQUIPMENT THAT REQUIRE HEADS INSTALLED ABOVE AND BENEATH THEM IN ACCORDANCE WITH NFPA 13.

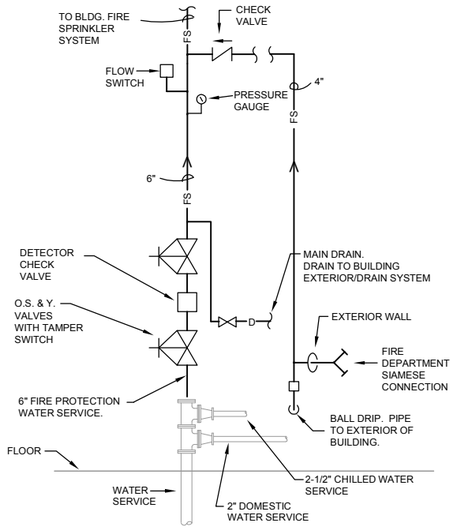
10 - AVOID PIPE CROSSING AT OVERHEAD LIFTING SYSTEMS IN PROCESS ROOMS.

11 - MAINTAIN CLEARANCE OF FIRE SPRINKLER PIPING DIRECTLY OVER AND IN FRONT OF ALL ELECTRICAL PANELS. REFER TO ELECTRICAL PLAN SHEETS FOR COORDINATION.

12 - SEAL ALL PIPING PENETRATIONS THRU WALLS.

13 - FIRE SPRINKLER SYSTEM SERVING CHEMICAL ROOMS TO BE OF CORROSION RESISTANT HEADS, PIPING AND PIPING HANGERS AND SUPPORTS. SEAL ALL PIPE PENETRATIONS THRU WALLS.

14 - NOTE THAT ALL INTERIOR WALLS ARE A GLAZED FINISH. CONTRACTOR TO COORDINATE ALL ANCHOR SYSTEMS WITH GENERAL CONTRACTOR.



FIRE SPRINKLER VALVE ASSEMBLY

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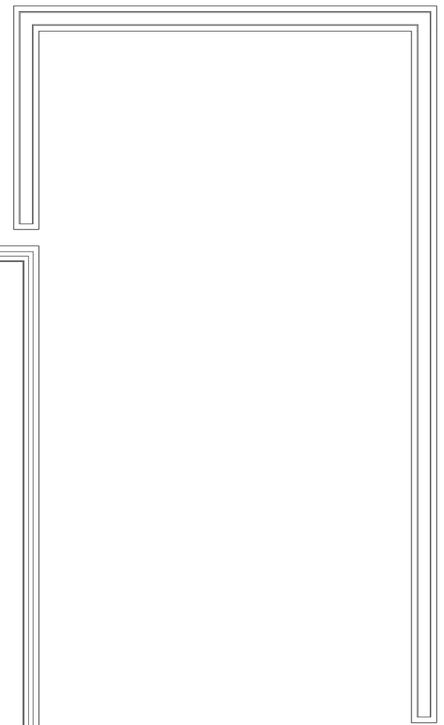

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Madison Water Utility

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MADISON WATER UTILITY
MADISON, WISCONSIN

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FILE NO.	129083
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SHEET TITLE
WELL BLDG FIRE SPRINKLER PLAN

SHEET
M14

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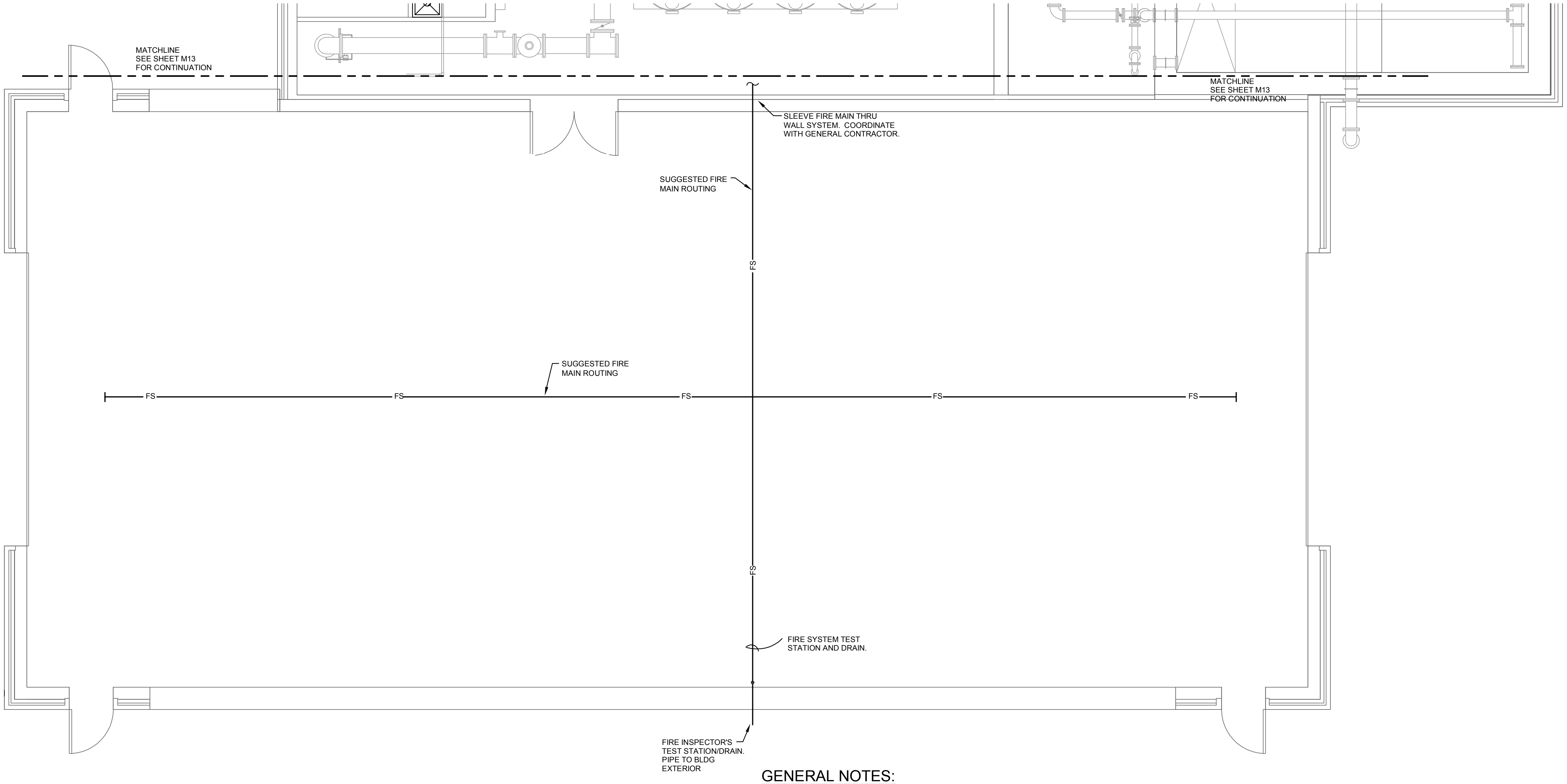

North

1 / M15 STORAGE BLDG FIRE SPRINKLER PLAN

0 2' 4' 8'

GENERAL NOTES:

1 - PROVIDE SPRINKLER COVERAGE FOR ENTIRE FACILITY.

2 - COORDINATE INSTALLATION OF FIRE SPRINKLER PIPING WITH DUCTWORK, PIPING AND CONDUIT TO BE INSTALLED BY OTHER TRADES.

3 - COORDINATE LOCATIONS OF SPRINKLER HEADS WITH CEILING LIGHT FIXTURES AND GRILLES AS INDICATED ON REFLECTED CEILING PLANS.

4 - SPRINKLER CONTRACTOR SHALL INSTALL FIRE SPRINKLER SYSTEM COMPLETE IN ACCORDANCE WITH THE LOCAL CODE, OWNERS FIRE INSURANCE UNDER-WRITER AND AUTHORITY HAVING JURISDICTION.

5 - PROVIDE AUXILIARY DRAINS WHERE NECESSARY AND WHERE REQUIRED BY CODE.

6 - THE SPRINKLER CONTRACTOR SHALL SUBMIT LAYOUT DRAWINGS OF FIRE SPRINKLER SYSTEM INCLUDING HYDRAULIC CALCULATIONS.

7 - PROVIDE HOOD, SHIELD OR BAFFLE ON SPRINKLER HEADS WHERE WATER DAMAGE MAY RESULT FROM HEADS LOCATED CLOSE TO AND OVER ELECTRICAL PANELS.

8 - PROVIDE FLOW ALARMS AND SUPERVISED ISOLATION VALVES FOR EACH ZONE.

9 - FIRE SPRINKLER CONTRACTOR TO VERIFY LOCATIONS OF DUCTWORK, CEILINGS AND EQUIPMENT THAT REQUIRE HEADS INSTALLED ABOVE AND BENEATH THEM IN ACCORDANCE WITH NFPA 13.

10 - AVOID PIPE CROSSING AT OVERHEAD LIFTING SYSTEMS IN PROCESS ROOMS.

11 - MAINTAIN CLEARANCE OF FIRE SPRINKLER PIPING DIRECTLY OVER AND IN FRONT OF ALL ELECTRICAL PANELS. REFER TO ELECTRICAL PLAN SHEETS FOR COORDINATION.

12 - SEAL ALL PIPING PENETRATIONS THRU WALLS.

13 - FIRE SPRINKLER SYSTEM SERVING CHEMICAL ROOMS TO BE OF CORROSION RESISTANT HEADS, PIPING AND PIPING HANGERS AND SUPPORTS.

14 - NOTE THAT ALL INTERIOR WALLS ARE A GLAZED FINISH. CONTRACTOR TO COORDINATE ALL ANCHOR SYSTEMS WITH GENERAL CONTRACTOR.

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REVISIONS

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CITY PROJECT NO.	53W1043
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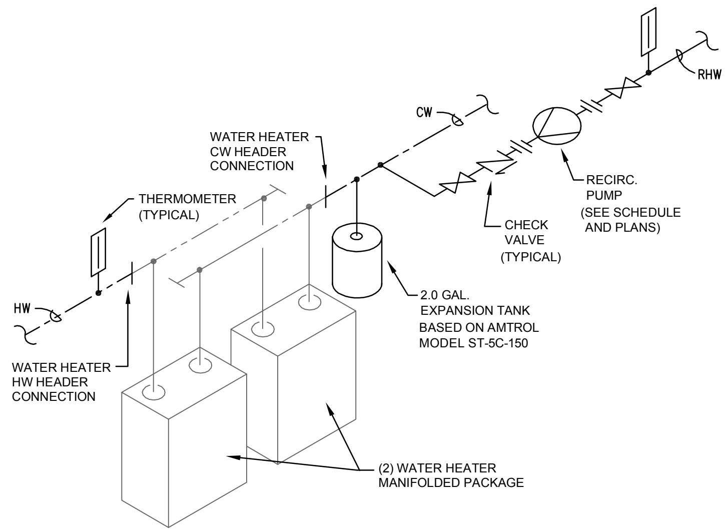
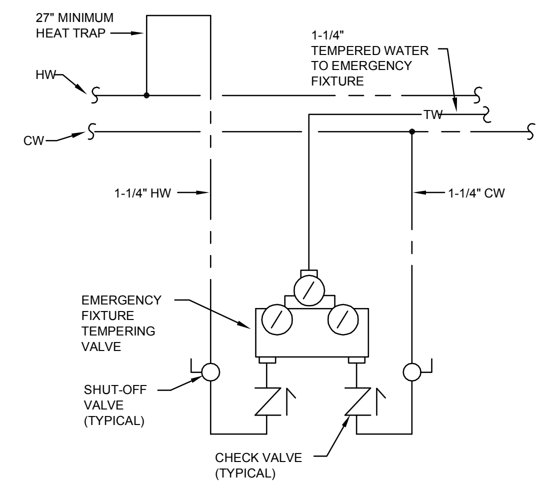
SHEET TITLE
STORAGE BLDG FIRE SPRINKLER PLAN

SHEET
M15



1 DM1 WATER HEATER W/ RECIRC. PIPING
NO SCALE



2 DM1 TEMPERING VALVE PIPING DETAL
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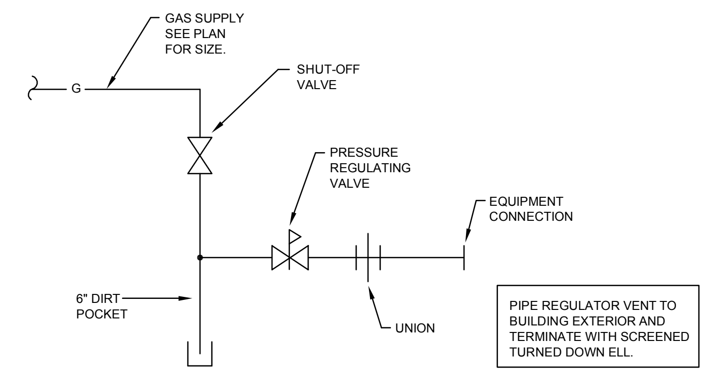

3 DM1 GAS CONNECTION
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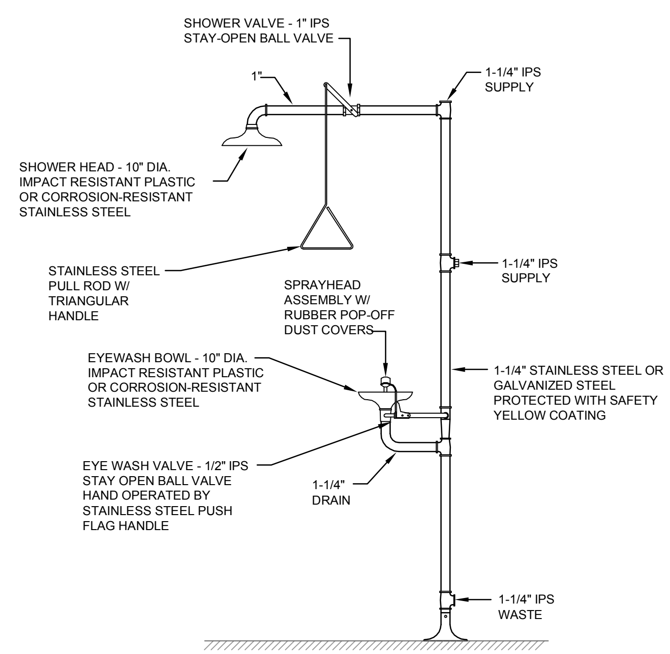

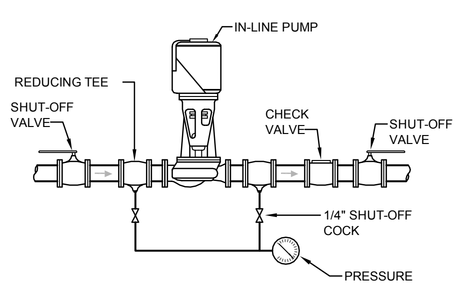

4 DM1 IN-LINE PUMP PIPING DETAIL
NO SCALE

5 DM1 EMERGENCY EYEWASH/SHOWER STATION
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SHEET TITLE
MECHANICAL
DETAILS

SHEET
DM1

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SAVED: 11-10-2016 10:03 AM
USER:
XREFs:

PLOTTED: 1-20-2017 11:25 AM
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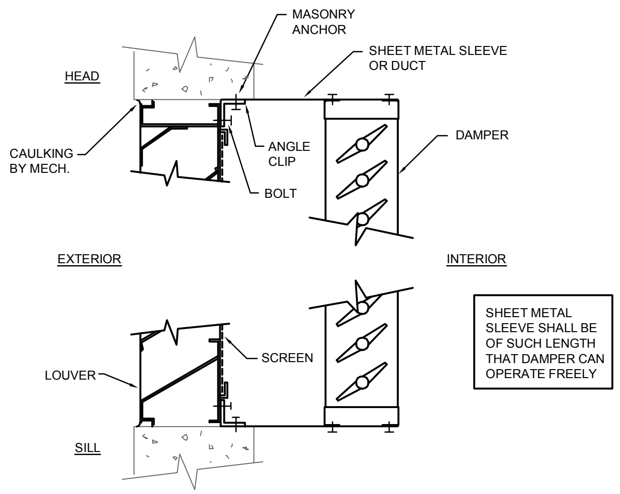
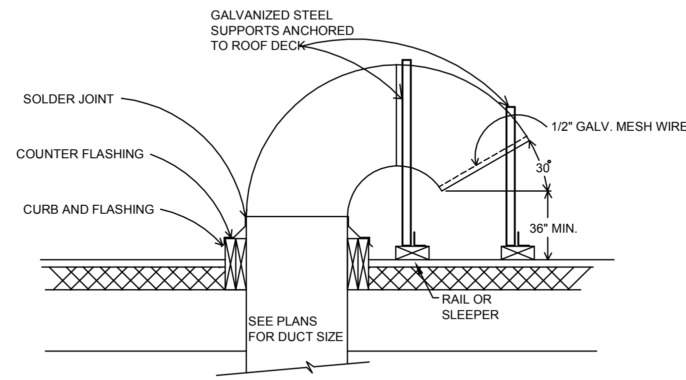
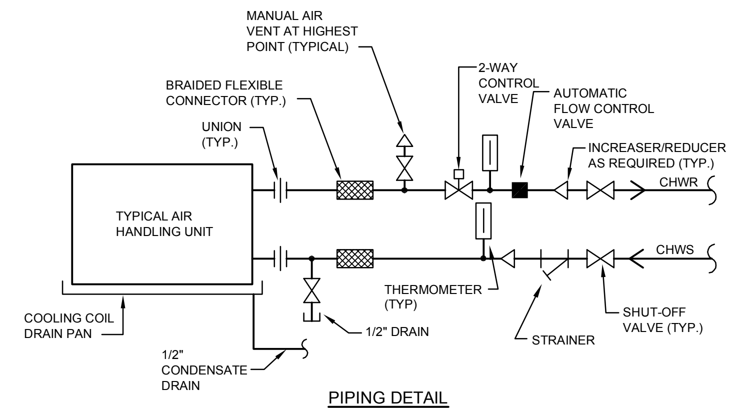


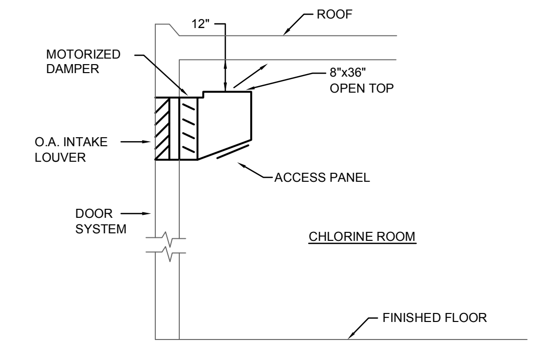
1 DM2 LOUVER INSTALLATION
NO SCALE



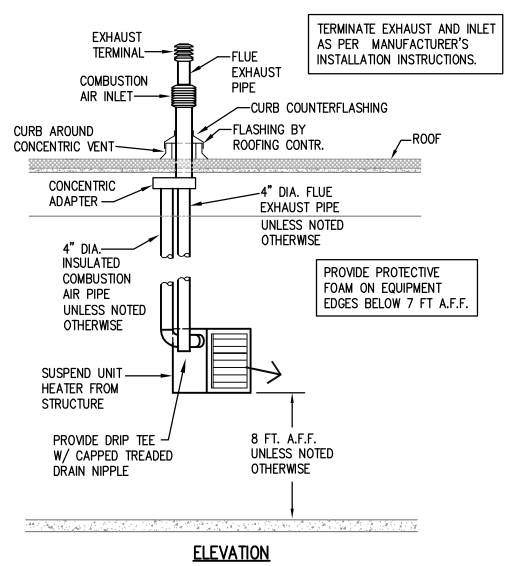
2 DM2 GOOSENECK DETAIL
NO SCALE



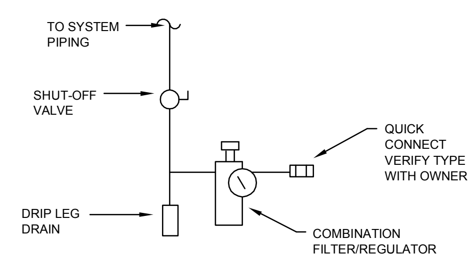
3 DM2 AIR HANDLING UNIT (COOLING) DETAIL
NO SCALE (CHILLED WATER)



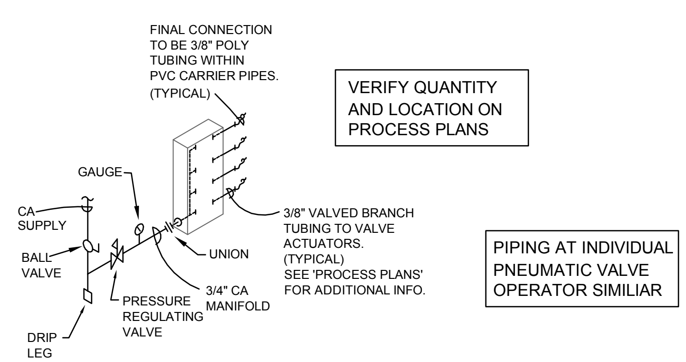
4 DM2 AIR INTAKE
NO SCALE



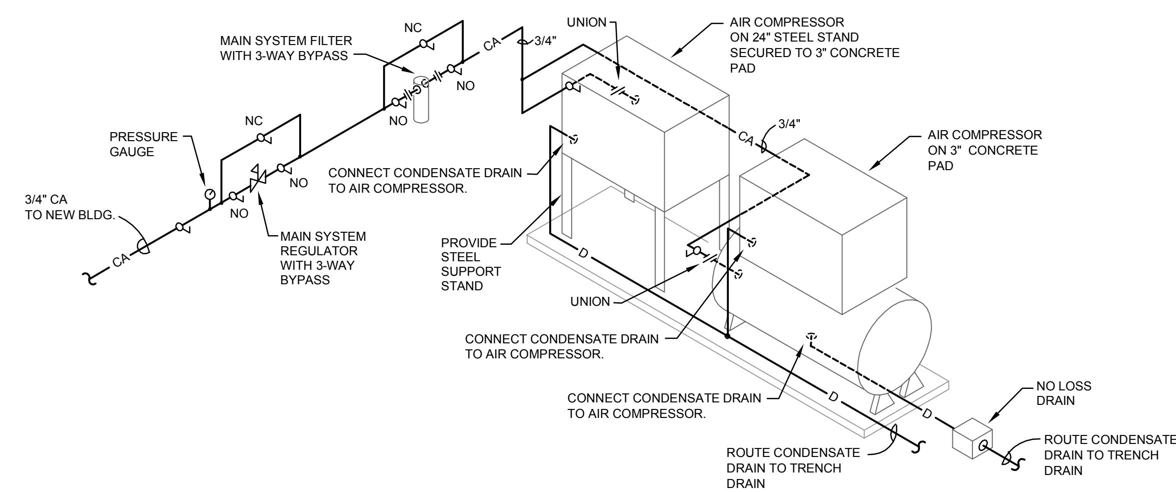
5 DM2 UNIT HEATER VENTING DETAIL
NO SCALE



6 DM2 COMPRESSED AIR QUICK DISCONNECT ASSEMBLY DETAIL
NO SCALE



7 DM2 COMPRESSED AIR PIPING AT PNEUMATIC SOLENOID PANELS
NO SCALE



8 DM2 COMPRESSED AIR SYSTEM PIPING DIAGRAM
NO SCALE

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION

REVISIONS

FILE NO.	129083
CITY PROJECT NO.	53W10434
ISSUE DATE	JAN. 13, 2017
DESIGNED BY	TAW
DRAWN BY	SRS

SHEET TITLE
MECHANICAL DETAILS

SHEET
DM2

X:\PROJECTS\2015 PROJECTS\15-029 MADISON WELL 31\DWG\15-029DM2.DWG
SAVED: 1-20-2017 11:20 AM
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ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
MCC–A	MAJOR ELECTRICAL COMPONENT OR DEVICE – NAME OR IDENTIFYING SYMBOL AS SHOWN.
LA–2	HOME RUN – DESTINATION SHOWN
$X	WALL SWITCH (WHERE X SUBSCRIPT INDICATES) BLANK – SINGLE POLE CRE – CORROSION RESISTANT D – DIMMER EXP – EXPLOSION PROOF K – KEY OPERATED P – PILOT LIGHT WP – WEATHERPROOF 2 – DOUBLE POLE 3 – THREE WAY 4 – FOUR WAY
	CONVENIENCE RECEPTACLE – DUPLEX UNLESS SPECIFIED OTHERWISE MOUNT 48"AFF, UNLESS OTHERWISE NOTED.
	CONTROL STATION, NEMA 12 ENCLOSURE UNLESS INDICATED OTHERWISE. (WP = NEMA 4 ENCLOSURE) SEE CONTROL DIAGRAMS FOR TYPE PUSH BUTTON REQUIRED.
W	MULTI–PARTY WALL MOUNTED COMMUNICATIONS SYSTEM STATION WITH INTEGRAL AMPLIFIER.
400	DRAWOUT VACUUM CONTACTOR, MEDIUM VOLTAGE, CURRENT RATING INDICATED.
400/ST	ADJUSTABLE SOLID STATE OR STATIC TRIP CIRCUIT BREAKER, 3 POLE – CONTINUOUS CURRENT TRIP INDICATED.
FIT–10–1–2 OR 200–MCC–1	TYPICAL EQUIPMENT TAG NAME. SEE I AND C LEGEND OR ELECTRICAL ABBREVIATIONS FOR EXPLANATION.
(X,Y)	TYPICAL CONDUIT AND CONDUCTOR CALL OUT, X – IS CONDUIT, Y – IS CONDUCTOR. IF CODES OR TAG NAMES ARE USED INSTEAD OF ACTUAL SIZES, SEE CKT. AND RACEWAY SCHEDULE.
X	KEYED NOTE, REFER TO LIST OF NOTES ON PLANS.
	LIGHT OUTLET, CEILING MOUNT, INCANDESCENT OR H.I.D., SHADING INDICATES EMERGENCY, R INDICATED RED.
	LIGHT OUTLET, WALL MOUNT, INCANDESCENT OR H.I.D., HEIGHT AS INDICATED.
	POLE MOUNTED HID LIGHT FIXTURE
	WALL MOUNTED FLUORESCENT FIXTURE
	FLUORESCENT FIXTURE – SHADING INDICATES EMERGENCY CIRCUIT
	TRACK LIGHT FIXTURE – LENGTH SCALED OR SPECIFIED, QUANTITY OF FIXTURES AS SHOWN.
	STEP, AISLE OR NIGHT LIGHT
	EMERGENCY LIGHTING BATTERY UNIT
	EXIT LIGHT, CEILING MOUNT, SHADED SIDE INDICATES "EXIT" FACE.
	EXIT LIGHT, WALL MOUNT, HEIGHT AS INDICATED, SHADED SIDE INDICATES "EXIT" FACE.
	EXIT LIGHT WITH DIRECTIONAL ARROW(S) AS INDICATED.
$PX	LOCAL LINE VOLTAGE SWITCH – MOUNTED 48" AFF DLS – DUAL LEVEL SWITCHING (INNER/OUTER LAMPS) PL – PILOT LIGHT 3 – 3 WAY

SYMBOL	DESCRIPTION
OSX	OCCUPANCY SENSOR CD – CEILING DUAL TECHNOLOGY (PIR/ULTRASONIC) CU – CEILING ULTRASONIC DLS – DUAL LEVEL SWITCHING (INNER/OUTER LAMPS) PP – POWER PACK SP – SLAVE PACK W – WALL MOUNTED WP – WEATHER PROOF 2 – TWO INDEPENDENT LTG. LOADS 3 – 3 WAY
LX	LOW VOLTAGE SWITCH STATION DLS – DUAL LEVEL SWITCHING K – KEYED SWITCH OR – OVERRIDE
P	PHOTOCELL
	PUSH BUTTON
C1	CONTACTOR, NUMBERED AS SHOWN
TC1	TIME CLOCK, NUMBERED AS SHOWN
PC	PHOTO CELL
T	THERMOSTAT
	DUPLEX, GROUNDING RECEPTACLE
	DUPLEX, GROUNDING RECEPTACLE, COUNTER HEIGHT OR AS INDICATED.
	SINGLE, GROUNDING RECEPTACLE
GFCI	DUPLEX, GROUND FAULT CIRCUIT INTERRUPTER
WP	DUPLEX, GROUNDING RECEPTACLE, WEATHERPROOF ALUMINUM IN–USE LOCKABLE COVER.
GFCI/WP	DUPLEX, GROUND FAULT CIRCUIT INTERRUPTER WITH ALUMINUM INUSE LOCKABLE COVER.
GFCI/CR	DUPLEX, GROUND FAULT CIRCUIT INTERRUPTER CORROSION RESISTANT (REQUIRES GFI CIRCUIT BREAKER).
EXP	GROUNDING RECEPTACLE (EXPLOSION PROOF)
TP	TELE–POWER POLE

SYMBOL	DESCRIPTION
	CLOCK OUTLET
T	TELEPHONE OUTLET – FLUSH WALL MOUNTED
	TELEPHONE OUTLET – FLOOR MOUNTED
D	DATA OUTLET – FLUSH WALL MOUNTED
	JUNCTION BOX
MW	MOTION SENSOR, FLUSH WALL MOUNTED
	SPECIAL PURPOSE OUTLET OR DEVICE
	BRACKET SYMBOL INDICATES COMMON ENCLOSURE AND PLATE
KL	KEYPAD, BACK LITE, FLUSH WALL MOUNTED.
M	MOTOR – REFER TO SCHEDULE, INTERNAL NUMBER INDICATES HORSE POWER.
$M	MOTOR STARTER SWITCH (MANUAL)
$SC	VARIABLE SPEED CONTROL – FAN
	MAGNETIC MOTOR STARTER
	COMBINATION MOTOR STARTER/DISCONNECT SWITCH
$MOL	MOTOR STARTING SWITCH WITH TERMINAL OVERLOADS
NF	SAFETY/DISCONNECT SWITCH NON–FUSED, NEMA 12
F	SAFETY/DISCONNECT SWITCH–FUSED, NEMA 12
NF/WP	SAFETY/DISCONNECT SWITCH WON FUSED, NEMA 4X STAINLESS STEEL
WP	DISCONNECT SWITCH, FUSED, NEMA 4X STAINLESS STEEL
S	SPEAKER OUTLET
C	COMPUTER CABLE OUTLET
	TERMINAL CABINET, SYSTEM AS NOTED
	ANNUNCIATOR, SYSTEMS NOTED
TX	TRANSFORMER, X REFERS TO NUMBER
	BRANCH CIRCUIT HOMERUN TO PANELBOARD WITH CIRCUIT NO.
	VERTICAL CONDUIT RUNS DOWN, ID DARKENED IS OPEN
	CONDUIT STUB, CAPPED
	WIREMOLD WITH MULTIPLE OUTLETS
	SINGLE POLE SWITCH
FS	SPRINKLER SYSTEM FLOW SWITCH
FSTS	SPRINKLER SYSTEM TAMPER SWITCH
S	DUCT–MOUNTED SMOKE DETECTOR
FASD	FIRE ALARM SMOKE DETECTOR
FAHD	FIRE ALARM HEAT DETECTOR
SZ	DOUBLE CONTACT SMOKE DETECTOR
FAPS	FIRE ALARM MANUAL PULL STATION
FAB	FIRE ALARM SIGNAL – BELL
FAVD	FIRE ALARM SIGNAL – VISUAL INDICATOR
FA CP	FIRE ALARM CONTROL PANEL
	END OF LINE RESISTOR
FAS	SPEAKER FOR FIRE ALARM COMMUNICATION SYSTEM
NF/EXP	DISCONNECT SWITCH, NON–FUSED, NEMA 7
SV	ELECTRICALLY OPERATED SOLENOID VALVE
BV	ELECTRICALLY OPERATED BALL VALVE
SVE	SOLENOID VALVE, EXPLOSION PROOF
D	DIAPHRAGM PUMP
H	WEATHER PROOF HORN
S	WEATHER PROOF STROBE
MS	SECURITY MOTION DETECTOR
CR	CARD READER

(SEE I & C SYMBOLS)

SYMBOL	DESCRIPTION
1	CONTACT – NORMALLY OPEN WITH NEMA SIZE INDICATED AS APPLICABLE.
1	CONTACT – NORMALLY CLOSED WITH NEMA SIZE INDICATED AS APPLICABLE.
	OVERLOAD RELAY HEATER
1	MAGNETIC STARTER WITH NEMA SIZE INDICATED REV INDICATES REVERSING STARTER.
MCP/100	CIRCUIT BREAKER, MAGNETIC TRIP ONLY, FRAME SIZE SHOWN, 3 POLE UNLESS INDICATED OTHERWISE.
1	CIRCUIT BREAKER, THERMAL MAGNETIC TRIP SHOWN, 3 POLE UNLESS INDICATED OTHERWISE. FRAME SIZE AND TRIP RATING SHOWN, IF ADJUSTABLE.
400 400	CIRCUIT BREAKER WITH CURRENT LIMITING FUSES, TRIP AND FUSE RATING INDICATED, 3 POLE UNLESS INDICATED OTHERWISE.
400 225	FUSED SWITCH, SWITCH AND FUSE CURRENT RATING INDICATED, 3 POLE UNLESS INDICATED OTHERWISE.
100	SWITCH – CURRENT RATING INDICATED, 3 POLE UNLESS INDICATED OTHERWISE.
	DRAWOUT AIR CIRCUIT BREAKER, LOW VOLTAGE
	DRAWOUT VACUUM CIRCUIT BREAKER, MEDIUM VOLTAGE
	DRAWOUT FUSED SWITCH, MEDIUM VOLTAGE
	LIGHTNING ARRESTER WITH SURGE CAPACITOR
	FUSE
10	CAPACITOR – KVAR INDICATED
V SW 0–600V	METER WITH SWITCH – SCALE RANGE SHOWN
	GROUND ROD OR PLATE PER PLANS
120V OR 120/240V 15 kVA 1 PH	TRANSFORMER, SECONDARY VOLTAGES, PHASE AND RATING INDICATED AS APPLICABLE.
GFR 25A 0.1	PICK–UP SETTING TIME CURRENT CHARACTERISTIC } GROUND FAULT RELAY WITH C.T.
	PUSH–BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY OPEN.
	PUSH–BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY CLOSED.
	PUSH BUTTON SWITCH, MAINTAINED CONTACTS WITH MECHANICAL INTERLOCK.
	3 POSITION SELECTOR SWITCH MAINTAINED CONTACT
TDR TC OR TDR TC	TIME DELAY RELAY CONTACT (TIME ACTION INDICATED)
	REMOTE DEVICE
O H I A 1 2	SELECTOR SWITCH – MAINTAINED CONTACT – CHART IDENTIFIES OPERATION:

POSITION			
CKT.	HAND	OFF	AUTO
1	X	O	O
2	O	O	X

X – CLOSED CONTACT
O – OPEN CONTACT

SYMBOL	DESCRIPTION
A	INDICATING LIGHT – LETTER INDICATES COLOR A – AMBER B – BLUE C – CLEAR G – GREEN R – RED W – WHITE Y – YELLOW

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
A	AMMETER, AMPERE
AC	ALTERNATING CURRENT
AF	AMPERE FRAME
AFG	ABOVE FINISHED GRADE
AIC	AMPS INTERRUPTING CURRENT
AS	AMMETER SWITCH, AMPERE SENSOR
ASC	ADJUSTABLE SPEED CONTROLLER
ASU	AIR SUPPLY UNIT
AT	AMPERE TRIP
ATC	AUTOMATIC THROWOVER CONTROL
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
B	BELL
BCP	BRANCH CIRCUIT PANEL
BPP	BARE POWER PANEL
BPS	BOLTED PRESSURE SWITCH
C	CONDUIT
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CC	CONTROL CABLE
CKT	CIRCUIT
CL	CURRENT LIMIT
COMB	COMBINATION
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CRT	CATHODE RAY TUBE (TERMINAL)
CRE	CORROSION RESISTANT
CRS	COATED RIGID STEEL CONDUIT
CT	CURRENT TRANSFORMER
CTR	CONTROLLER
CU	COPPER
DC	DIRECT CURRENT
DISC	DISCONNECT
DIV	DIVISION
DPR	DAMPER
DUP	DUPLEX
E	EMPTY
EBB	ELECTRIC BASE BOARD
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
ELR	END OF LINE RESISTOR
EMERG	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
EP	EXPLOSION PROOF
ETM	ELAPSED TIME METER
EXP	EXPOSED
F, FU	FUSE
FA	FIRE ALARM
FBO	FURNISHED BY OTHERS
FC	FOOT CANDLE
FDR	FEEDER
FIXT	FIXTURE
FLA	FULL LOAD AMPS
FLUOR	FLUORESCENT
FR	FRACTIONAL
FUT	FUTURE
GALV	GALVANIZED
GEN	GENERATOR
GENL	GENERAL
GFI	GROUND FAULT INTERRUPTER
GFR	GROUND FAULT RELAY
GND	GROUND
GRS	GALVANIZED RIGID STEEL
H	HORN, HOWLER
HD	HEAVY DUTY
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HOA	HAND–OFF–AUTO
HPS	HIGH PRESSURE SODIUM
HS	HIGH SPEED
HT	HEAT TRACE
HTG	HEATING
HTR	HEATER
HV	HIGH VOLTAGE
HVC	HEATING/VENTILATION/COOLING
HVAC	HEATING/VENTILATION/AIR CONDITIONING
HZ	HERTZ
I	ISOLATE GROUND
I	INSTRUMENTATION AND CONTROL
IC	INTERCOM
IMC	INTERMEDIATE METAL CONDUIT
INCAND	INCANDESCENT
INST	INSTANTANEOUS
INTM	INTERMEDIATE
ISR	INTRINSICALLY SAFE RELAY
IU	IN UNIT
JB	JUNCTION BOX, J BOX
K	KEY INTERLOCK
KCMIL	THOUSAND CIRCULAR MILL
KO	KNOCKOUT
KV	KILOVOLTS
KWH	KILOWATT HOURS

ABBREVIATION	DESCRIPTION
L	LOUVER
LA	LIGHTING ARRESTOR
LC	LIGHTING CONTACTOR
LO	LOCK OUT
LOC	LOCATION
LPS	LOW PRESSURE SODIUM
LRA	LOCKED ROTOR AMPS
LS	LOW SPEED
LTG	LIGHTING
LT FLEX	LIQUID TIGHT FLEX CONDUIT
LV	LOW VOLTAGE
M	METER
MAG	MAGNETIC
MAN	MANUAL
MATV	MASTER ANTENNA TV
MC	MECHANICAL CONTRACTOR
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MDC	MOTORIZED DAMPER CONTROL
MERC	MERCURY VAPOR
MH	MANHOLE
MMP	MECHANICAL MOUNTING PANEL
MO	MOTOR OPERATOR
MS	MOTOR STARTER
MTR	MOTOR
MTS	MANUAL TRANSFER SWITCH
N	NEUTRAL
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NF	NON–FUSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NP	NAMEPLATE
NR	NOT REQUIRED
NU	NEAR UNIT
OA	OVERALL
OL	OVERLOAD RELAY
ONT	OFF–NORMAL–TEST
OU	ON UNIT
P	POLE
PA	PUBLIC ADDRESS
PB	PUSHBUTTON SWITCH
PC	PHOTOCELL
P/E	PNEUMATIC/ELECTRIC
PED	PEDESTAL
PF	POWER FACTOR
PH	PHASE
PL	PILOT LIGHT
PNL	PANEL
PRI	PRIMARY
PS	PRESSURE SWITCH
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE CONDUIT
RC	REMOTE CONTROL
RCPT	RECEPTACLE
REF	REFERENCE
REFL	REFLECTOR
RM	REMOTE MULTIPLEXER
RMS	ROOT MEAN SQUARE
RS	RIGID STEEL CONDUIT
RT	REMOTE TELEMETRY
SC	SPEED CONTROL
SEC	SECONDARY
SF	SUPPLY FAN
SH	SPACE HEATER
SHLD	SHIELD, SHIELDED
SG	SIGNAL
S/N	SOLID NEUTRAL
SP	STANDBY POWER
SPD	SPEED
SPKR	SPEAKER
SPO	SPECIAL PURPOSE OUTLET
ST	STATIC TRIP
STR	STARTER
SV	SOLENOID VALVE
SW	SWITCH
SWBD	SWITCH BOARD
SWGR	SWITCH GEAR
SYS	SYSTEM
T	THERMOSTAT
TB	TERMINAL BOARD
TC	TIME CLOCK
TDR	TIME DELAY RELAY
TEL	TELEPHONE
TERM	TERMINAL(ATE)
TJB	TERMINAL JUNCTION BOX
TR	TRANSFORMER (XFMR)
TS	TIME SWITCH
UCC	UNDER CARPET CONDUCTOR
UG	UNDERGROUND
UH	UNIT HEATER
UVR	UNDER VOLTAGE RELAY
V	VOLTS
VA	VOLT AMPERES
VFD	VARIABLE FREQUENCY DRIVE
W	WATT, WATTMETER
W/O	WITHOUT
WP	WEATHERPROOF

GENERAL NOTES:

1. THE SYMBOLS SHOWN ON THIS SCHEDULE COVER A RANGE OF TYPICAL ELECTRICAL SYMBOLS COMMON TO A VARIED RANGE OF PROJECTS. ONLY THOSE SYMBOLS SPECIFICALLY SHOWN ON THE DRAWINGS ARE APPLICABLE TO THIS SCHEDULE.
2. EQUIPMENT SHALL BE INSTALLED AT THE HEIGHTS INDICATED, UNLESS OTHERWISE SHOWN ON THE ARCHITECTURAL ELEVATIONS, ON THE DRAWINGS OR IN THE SPECIFIC EQUIPMENT SPECIFICATION SECTION.
3. FOR I & C COMPONENTS AND ABBREVIATIONS, SEE I & C LEGEND.
4. FOR GENERAL ABBREVIATIONS, SEE GENERAL LEGEND.

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SEH

Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc. @ (SEH)

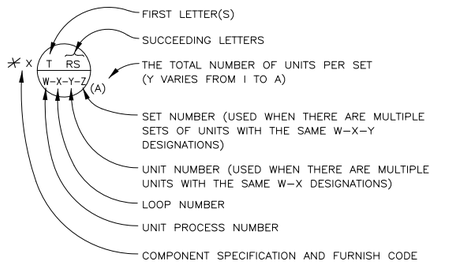
SHEET TITLE
ELECTRICAL SYMBOLS AND ABBREVIATIONS

SHEET
E1

H:\PROJECTS\2284 - Madison Well No.31\2016 Redesign\Powrtek\E1_E2 - Symbols, Instrumentation and Systems Plan.dwg, 1/20/2017 2:27:18 PM

INSTRUMENTATION IDENTIFICATION

EXAMPLE SYMBOLS



NONE = SPECIFIED AND FURNISHED VIA I&C DIVISION 26 09 01

M = SPECIFIED AND FURNISHED IN MECHANICAL/EQUIPMENT DIVISION 11 AND 15

E = SPECIFIED AND FURNISHED IN ELECTRICAL DIVISION 26 09 01

P = SPECIFIED AND FURNISHED WITH ASSOCIATED PACKAGE SYSTEM

O1 = OWNER FURNISHED, OWNER INSTALLED (OFOI)

O2 = OWNER FURNISHED, CONTRACTOR INSTALLED (OFCI)

EXST = EXISTING EQUIPMENT

e.p. FIELD MOUNTED INSTRUMENT EXPLOSION-PROOF

EXST FIELD MOUNTED INSTRUMENT EXISTING

IS FIELD MOUNTED INSTRUMENT INTRINSICALLY SAFE

120V FIELD MOUNTED INSTRUMENT THAT REQUIRES 120VAC AT THE DEVICE

REAR-OF-PANEL MOUNTED INSTRUMENT

FACE OF PANEL MOUNTED INSTRUMENT

MOTOR CONTROL CENTER MOUNTED INSTRUMENT

SPECIAL CASES (@ 2 O'CLOCK POSITION ON SYMBOL)

YL (OO) ON AND OFF EVENT LIGHTS

ZL (OC) OPENED AND CLOSED POSITION LIGHTS

ZS (OC) OPENED AND CLOSED POSITION SWITCHES

HS (OO) ON-OFF HAND SWITCH. MAINTAINED CONTACT SWITCHES (CONTROLLED DEVICE WILL RESTART ON RETURN OF POWER AFTER POWER FAILURE).

HS (SS) STOP-START HAND SWITCH. MOMENTARY CONTACT SWITCHES (CONTROLLED DEVICE WILL NOT RESTART ON RETURN OF POWER AFTER POWER FAILURE).

HS (HOR) HAND-OFF-REMOTE HAND SWITCH. MAINTAINED CONTACT SELECTION

HS (HOA) HAND-OFF-AUTOMATIC HAND SWITCH. MAINTAINED CONTACT SELECTION

YL (OOR) ON-OFF-REMOTE EVENT LIGHTS

YL (OORA) ON-OFF-REMOTE-AUTO EVENT LIGHTS

INSTRUMENT SOCIETY OF AMERICA TABLE

	FIRST LETTER(S)		SUCCEEDING LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS(†)		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE (†)	USER'S CHOICE (†)	USER'S CHOICE (†)
C	USER'S CHOICE (†)			CONTROL	
D	USER'S CHOICE (†)	DIFFERENTIAL	SENSOR (PRIMARY ELEMENT)		
E	VOLTAGE				
F	FLOW RATE	RATIO(FRACTION)		FAULT	
G	USER'S CHOICE (†)		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE (†)	MOMENTARY			MIDDLE
N	USER'S CHOICE (†)		USER'S CHOICE (†)	USER'S CHOICE (†)	USER'S CHOICE (†)
O	USER'S CHOICE (†)		ORIFICE, RESTRICTION		
P	PRESSURE (OR VACUUM)		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE (†)		MULTIFUNCTION (†)	MULTIFUNCTION (†)	MULTIFUNCTION (†)
V	VIBRATION			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED (†)	X AXIS	UNCLASSIFIED (†)	UNCLASSIFIED (†)	UNCLASSIFIED (†)
Y	EVENT, STATE	Y AXIS		RELAY OR COMPUTE (†)	
Z	POSITION, DIMENSION	Z AXIS		DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

(†) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS AND LETTER SYMBOLS.

TRANSDUCERS (@ 2 O'CLOCK POSITION ON SYMBOL)

A	ANALOG	I	CURRENT	I/I	SIGNAL ISOLATOR
D	DIGITAL	P	PNEUMATIC	R/I	RESISTANCE TO CURRENT
E	VOLTAGE	PF	PULSE FREQUENCY		
F	FREQUENCY	PD	PULSE DURATION	CT	CURRENT TRANSFORMER

INSTRUMENT PANEL LOCATION IDENTIFICATION

HS (X) LOCATED IN PANEL IDENTIFIED ON DRAWING, "X" IS USED @ 7 O'CLOCK TO IDENTIFY PANEL LOCATION WHEN DEVICE IS NOT ON THE MCP OR OTHERWISE INDICATED ON DRAWING.

HS (OSC) OPEN-STOP-CLOSE MOMENTARY CONTACT CONTROL SWITCH

FIHK (CM) FLOW INDICATING, COMPUTER/MANUAL CONTROL STATION

FIC (CAM) FLOW INDICATING, COMPUTER/AUTO/MANUAL CONTROL STATION

FIC (SSC) FLOW INDICATING SUPERVISORY SET POINT (BY COMPUTER), AUTO/MANUAL CONTROL STATION

∫ INTEGRAL

Σ SUMMATION

PROGRAMMABLE CONTROLLER INPUT OR OUTPUT

TELEMETRY INPUT OR OUTPUT

EXAMPLE:

FY (I/P) CURRENT TO PNEUMATIC TRANSDUCER (BACK OF PANEL, IN A FLOW LOOP)

LINE LEGEND

PROCESS (CLOSED CONDUIT) DASHED LINE INDICATES ALTERNATE FLOW STREAM

PROCESS (OPEN CHANNEL)

A ANALOG SIGNAL (4 TO 20 mA DC, ETC.)

DISCRETE SIGNAL (ON/OFF ETC.)

PF PULSE FREQUENCY SIGNAL

DH DATA HIGHWAY CABLE

PNEUMATIC SIGNAL

FILLED SYSTEM SIGNAL

HYDRAULIC SYSTEM SIGNAL

BUILDING OR FACILITY BOUNDARY

(4) (6) (3) PARALLEL LINES. (#) PARENTHETICAL NUMBER INDICATES THE NUMBER OF SIGNALS REPRESENTED

CONNECTING LINES

NON-CONNECTING LINES

PD PULSE DURATION SIGNAL

COM MISC. DIGITAL DATA SIGNAL COMMUNICATIONS

MISCELLANEOUS EQUIPMENT AND INSTRUMENTS

DASHED LINE INDICATES COMPONENTS SUPPLIED AS A COMPLETE PACKAGE SYSTEM OR AS NOTED

MISCELLANEOUS EQUIPMENT AND INSTRUMENTS

PHANTOM LINE INDICATES TYPICAL FUNCTIONS FOR SIMILAR PROCESS SYSTEMS AS NOTED

INTERFACE SYMBOLS

S W-A W-A D

= PROCESS INTERFACE

= SIGNAL INTERFACE

W = UNIT PROCESS NO.

A = INTERFACE LETTER

D = DESTINATION SHEET NO.

S = SOURCE SHEET NO.

INTERFACE TO OR FROM PROCESS EXTERNAL TO PROJECT

GENERAL NOTE:

1. THIS IS A STANDARD LEGEND. NOT ALL INFORMATION SHOWN MAY BE USED ON THIS PROJECT.

ABBREVIATIONS & LETTER SYMBOLS

AC	–	ALTERNATING CURRENT
ALKY	–	ALKALINITY
AM	–	AUTO-MANUAL
AVG	–	AVERAGE
BCP	–	BUILDING CONTROL PANEL
CAM	–	COMPUTER-AUTO-MANUAL
Cl_2	–	CHLORINE
CM	–	COMPUTER MANUAL
COD	–	CHEMICAL OXYGEN DEMAND
D	–	DIFFERENCE
DC	–	DIRECT CURRENT
DCP	–	DIGESTER CONTROL PANEL
DO	–	DISSOLVED OXYGEN
e	–	SQUARE ROOT
F(X)	–	CHARACTERIZED
FCl_2	–	FREE CHLORINE RESIDUAL
FOS	–	FAST-OFF-SLOW
FOSA	–	FAST-OFF-SLOW-AUTO
FOSR	–	FAST-OFF-SLOW-REMOTE
FR	–	FORWARD-REVERSE
HDNS	–	HORN, HOWLER
HOA	–	HAND-OFF-AUTO
HOR	–	HAND-OFF-REMOTE
H_2S	–	HYDROGEN SULFIDE
I	–	DIVIDE
LCP-W-X	–	LOCAL CONTROL PANEL (W=UNIT PROCESS NUMBER, X=PANEL NUMBER)
LEL	–	LOWER EXPLOSIVE LIMIT
LOS	–	LOCKOUT STOP
LR	–	LOCAL REMOTE
MA	–	MANUAL-AUTO
MC	–	MODULATE-CLOSE
MCC-X	–	MOTOR CONTROL CENTER NO. X
MCP	–	MAIN CONTROL PANEL (IN CENTRAL CONTROL ROOM)
N	–	SUM
OC	–	OPEN-CLOSE (D)
OCA	–	OPEN-CLOSE-AUTO
OCR	–	OPEN-CLOSE-REMOTE
OO	–	OFF-ON
OOA	–	OFF-ON-AUTO
OOR	–	OFF-ON-REMOTE
OSC	–	OPEN-STOP-CLOSE
PCP	–	PROCESS CONTROL PANEL
PH	–	HYDROGEN ION CONCENTRATION
RM-X	–	REMOTE MULTIPLEXING MODULE NO. X
RTD	–	RESISTANCE TEMPERATURE DETECTOR
SF	–	SLOWER-FASTER
SS	–	START-STOP
SSC	–	SUPERVISORY SET POINT CONTROL
TC	–	THERMOCOUPLE
VIB	–	VIBRATION
X	–	MULTIPLY
Xn	–	RAISE TO THE Nth POWER
1:1	–	REPEAT OR BOOST
>	–	SELECT HIGHEST SIGNAL
<	–	SELECT LOWEST SIGNAL

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SEH

Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	REVISIONS DESCRIPTION

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc. @ (SEH)

SHEET TITLE
INSTRUMENTATION SYMBOLS AND ABBREVIATIONS

SHEET
E2

EXTERIOR LIGHTING FIXTURE SCHEDULE

ABBREVIATIONS

C – CONCRETE
CB – CONCRETE BASE
CH – CHAIN
ES – EXPOSED STRUCTURE

F – FLUSH
G – GYP BOARD
LG – LAYIN GRID

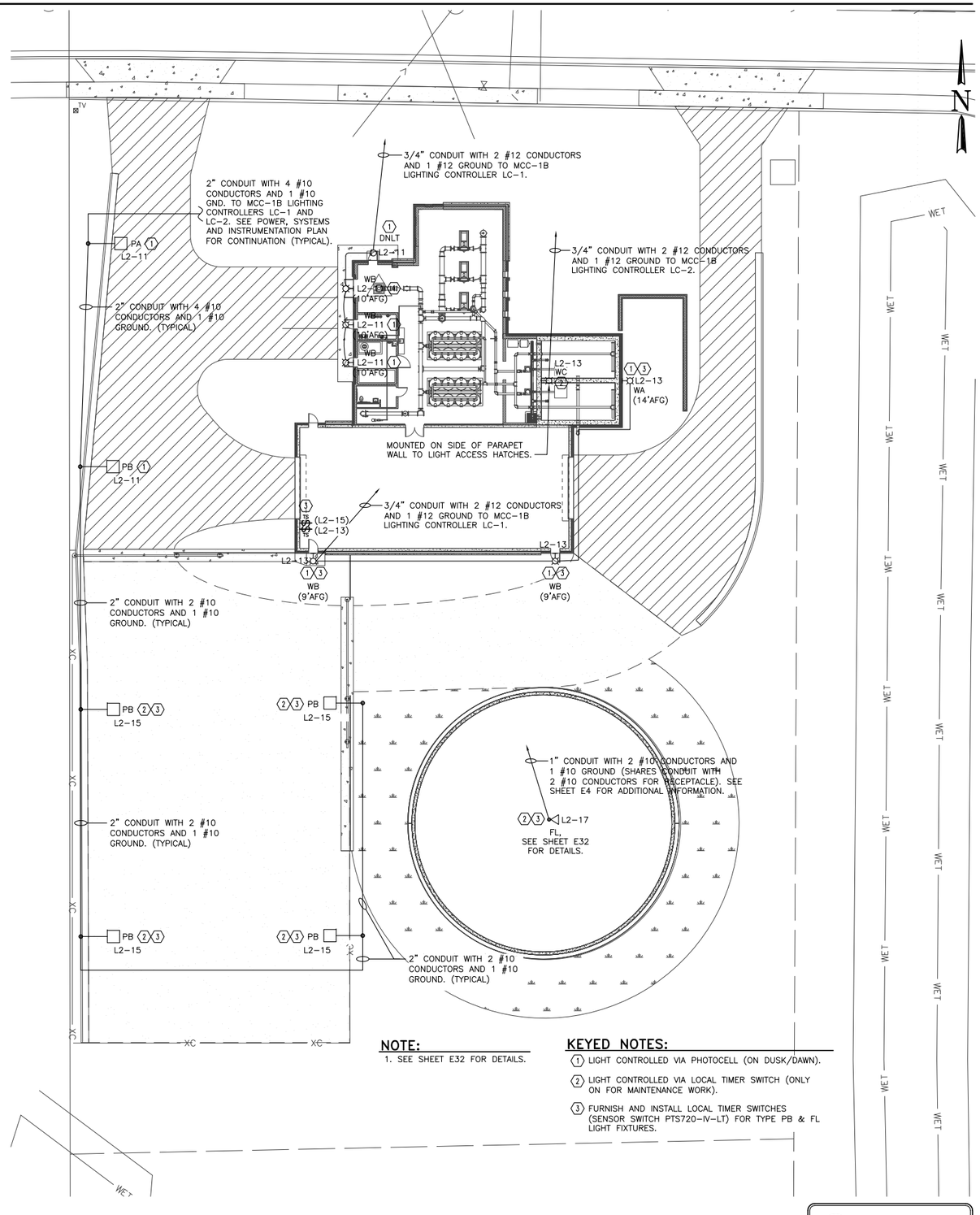
P – PENDANT
R – RECESSED
S – SURFACE

U – UNIVERSAL
V – VARIES
W – WALL

DES.	DESCRIPTION	LIGHT SOURCE	VOLT	DEPTH	MFR.	CAT. NO.	MTG.	MTG. SURF	SEE NOTE
DNLT	SURFACE DOWNLIGHT	LED	120	.07"	HALO	SLD606-8-40-WH-JB/SLD6TRMTBZ	S	V	2,3
FL	FLOOD LIGHT	LED	MVOLT		LITHONIA	DSXF1LED-1-A530/40K-HMF-MVOLT-THK-DDBXD	S	C	2,3
PA	LED LUMINAIRE ON 25-FT POLE, 8-FT ARM	LED	MVOLT		LITHONIA	DSX1LED-30C-530-40K-T3M-MVOLT-MA-HS-DDBXD RTAU-25-8E-BMA-US8-FBC/VD-ADB	POLE	CONC BASE	1,2,3
PB	LED LUMINAIRE ON 25-FT POLE, 8-FT ARM	LED	MVOLT		LITHONIA	DSX1LED-40C-700-40K-T3M-MVOLT-MA-HS-DDBXD RTAU-25-8E-BMA-US8-FBC/VD-ADB	POLE	CONC BASE	1,2,3
WA	WALL LIGHT	LED	MVOLT		LITHONIA	DSXW1LED-20C-350-40K-TFTM-MVOLT-DDBXD	W	C	2,3
WB	WALL LIGHT	LED	MVOLT		LITHONIA	DSXW1LED-10C-350-40K-T3M-MVOLT-DDBXD	W	C	2,3
WC	WALL LIGHT	LED	MVOLT		LITHONIA	TWR1LED-1-40K-MVOLT	W	C	2,3

EXTERIOR LIGHTING FIXTURE SCHEDULE NOTES:

1. PROVIDE ONE (1) LUMINAIRE OF THIS TYPE AS A SPARE TO OWNER. NO POLES INCLUDED.
2. THE SPECIFIED FIXTURE(S) HAS BEEN PROVIDED FOR THE PROPER LIGHTING LEVELS AND FOR ENERGY CODE COMPLIANCE. FOR THE ELECTRICAL CONTRACTOR TO FURNISH A DIFFERENT MANUFACTURER(S) OR FIXTURE(S) CATALOG NUMBER(S), THE ELECTRICAL CONTRACTOR SHALL FIRST SUBMIT LIGHTING AND ENERGY CALCULATIONS WITH DETAILED FIXTURE CUT SHEETS PROVING THE FIXTURE(S) MEET PROJECT REQUIREMENTS USING A VISUAL LIGHTING SOFTWARE PACKAGE OR SIMILAR PROGRAM. THE ENGINEER WILL DETERMINE IF A REVIEW IS APPROPRIATE AND IF SO WILL PROVIDE ONE REVIEW ONLY OF THE ELECTRICAL CONTRACTOR'S SUBMITTAL. IF THE SUBSTITUTED FIXTURE(S) ARE NOT ACCEPTABLE AS DETERMINED BY THE ENGINEER, NO ADDITIONAL REVIEWS WILL BE PROVIDED BY THE ENGINEER AND THE SPECIFIED FIXTURE(S) THAT ARE SHOWN ON THE PLANS SHALL BE SUBMITTED DURING SHOP DRAWING REVIEW. IF THE SUBMITTED FIXTURE(S) SUBSTITUTES MEET PROJECT CONDITIONS THEN CALCULATIONS ARE ALSO REQUIRED FOR ON SITE STATE REVIEW BY THE ELECTRICAL CONTRACTOR, AND AS DETERMINED BY THE ENGINEER.
3. IT IS ALSO THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO VERIFY THE CATALOG NUMBERS SHOWN ON THE PLANS AND UPDATE SAME BEFORE SUBMITTING SHOP DRAWINGS. ANY CATALOG NUMBER REVISIONS OR SUBSEQUENT FIXTURE COST INCREASES SHALL BE MADE AT NO ADDITIONAL COST TO THE CONTRACT WHETHER IT IS BECAUSE OF A DIFFERENT TYPE OR FIXTURE MOUNTING DUE TO PROJECT CONDITIONS, DISCONTINUED CATALOG NUMBERS OR OTHER SUCH ISSUES. IN THE CASE OF DISCONTINUED CATALOG NUMBERS, THE ELECTRICAL CONTRACTOR SHALL BRING IT TO THE ENGINEER'S ATTENTION BEFORE SHOP DRAWINGS ARE SUBMITTED SO THAT A NEW FIXTURE TYPE CAN BE SELECTED BY THE ENGINEER.



NOTE:
1. SEE SHEET E32 FOR DETAILS.

KEYED NOTES:
(1) LIGHT CONTROLLED VIA PHOTOCELL (ON DUSK/DAWN).
(2) LIGHT CONTROLLED VIA LOCAL TIMER SWITCH (ONLY ON FOR MAINTENANCE WORK).
(3) FURNISH AND INSTALL LOCAL TIMER SWITCHES (SENSOR SWITCH PTS720-IV-LT) FOR TYPE PB & FL LIGHT FIXTURES.

PROPOSED SITE LIGHTING PLAN
0' 10' 20' 40'

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

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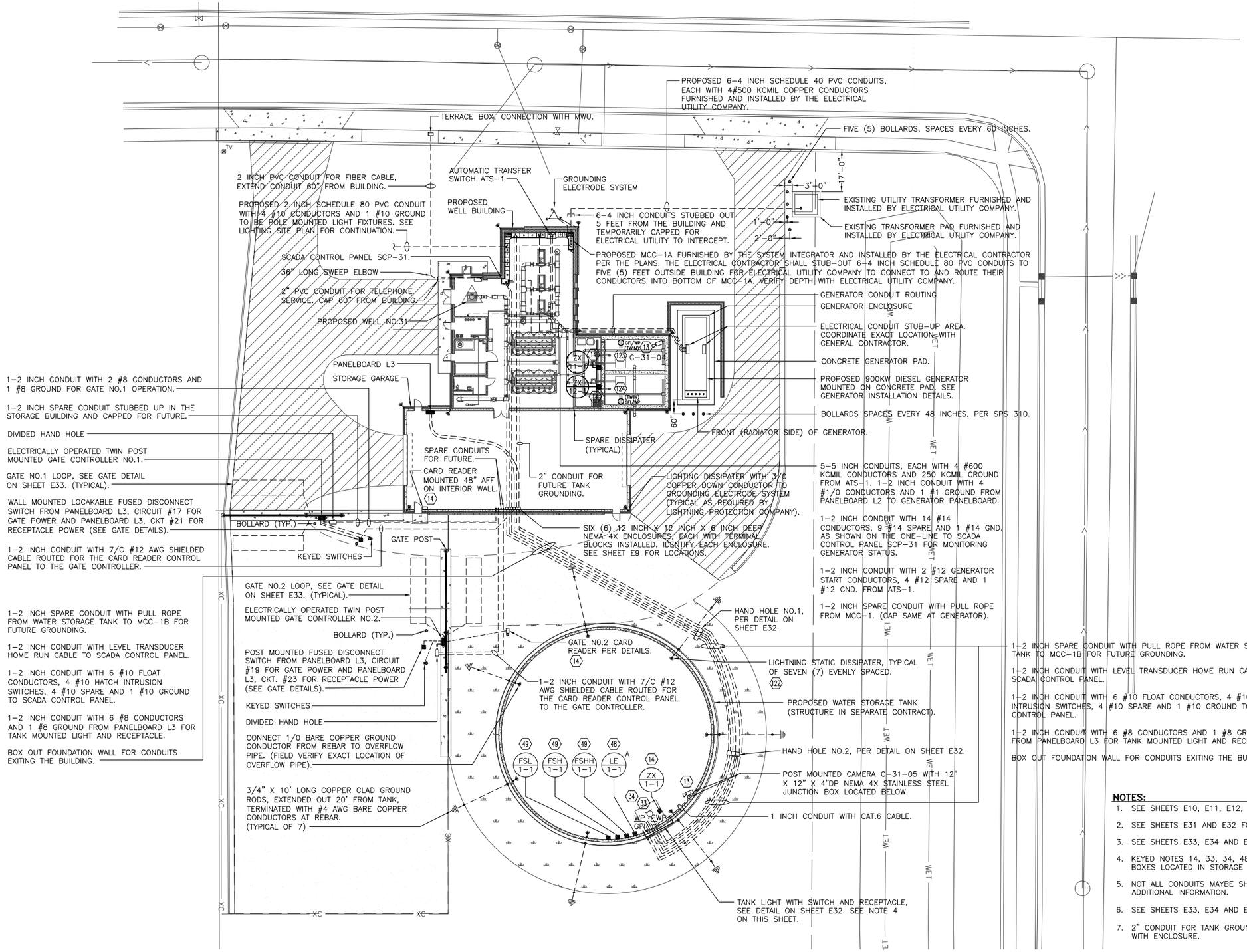
SHEET TITLE
PROPOSED SITE LIGHTING PLAN

SHEET
E3



PROPOSED ELECTRICAL SITE PLAN

0' 10' 20' 40'

NOTES:

1. SEE SHEETS E10, E11, E12, E13 AND E14. FOR KEYED NOTES.
2. SEE SHEETS E31 AND E32 FOR ELECTRICAL DETAILS.
3. SEE SHEETS E33, E34 AND E35 FOR GATE DETAILS.
4. KEYED NOTES 14, 33, 34, 48 AND 50 ARE REFERENCED TO PULL BOXES LOCATED IN STORAGE BUILDING.
5. NOT ALL CONDUITS MAYBE SHOWN, SEE ALL KEYED NOTES FOR ADDITIONAL INFORMATION.
6. SEE SHEETS E33, E34 AND E35 FOR GATE(S) REQUIREMENTS.
7. 2" CONDUIT FOR TANK GROUNDING IS ROUTED THROUGH BUILDING WITH ENCLOSURE.

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

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SHEET TITLE
PROPOSED ELECTRICAL SITE PLAN

SHEET
E4

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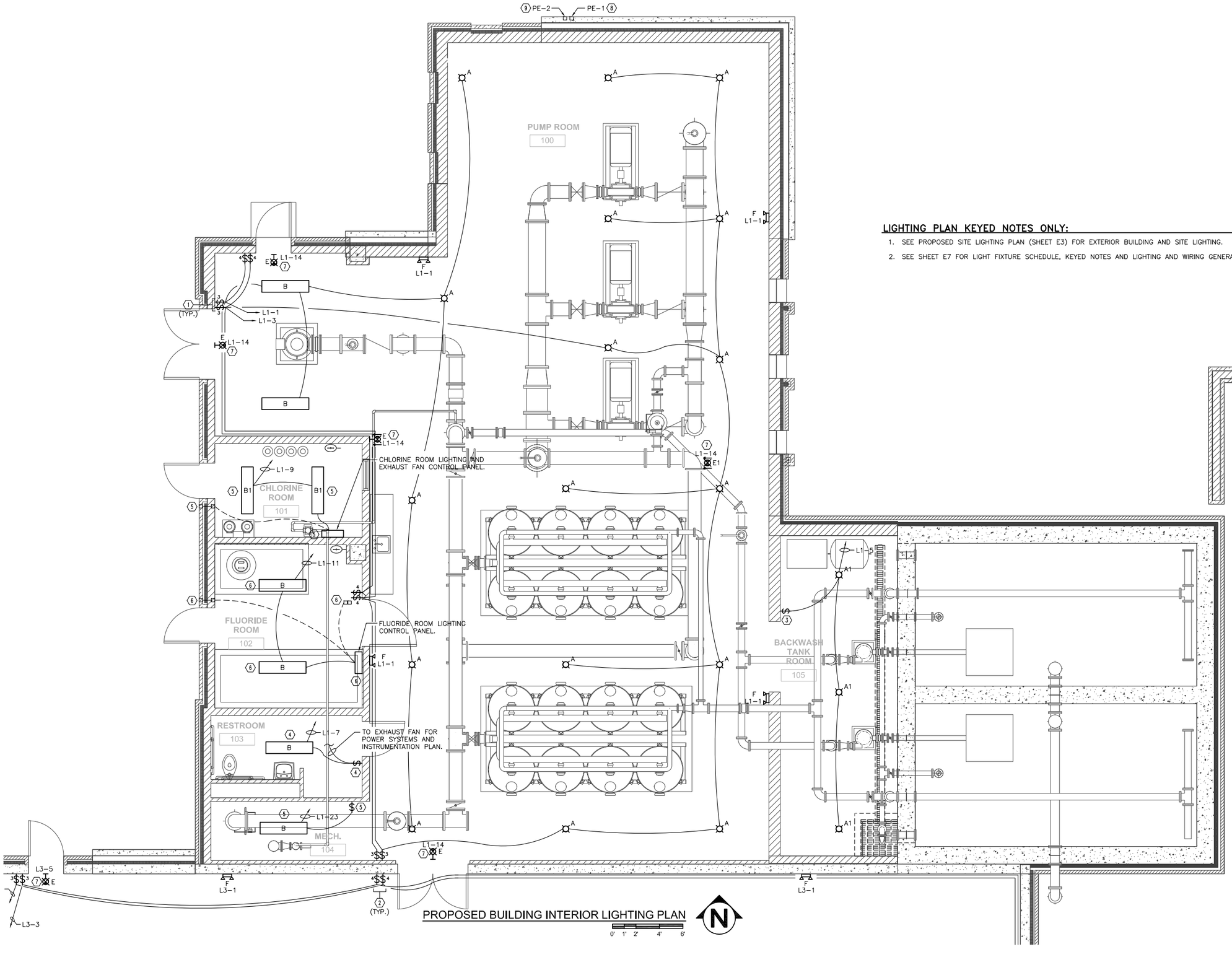

PROPOSED BUILDING INTERIOR LIGHTING PLAN

LIGHTING PLAN KEYED NOTES ONLY:

1. SEE PROPOSED SITE LIGHTING PLAN (SHEET E3) FOR EXTERIOR BUILDING AND SITE LIGHTING.
2. SEE SHEET E7 FOR LIGHT FIXTURE SCHEDULE, KEYED NOTES AND LIGHTING AND WIRING GENERAL NOTES.

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MARK	DATE	DESCRIPTION
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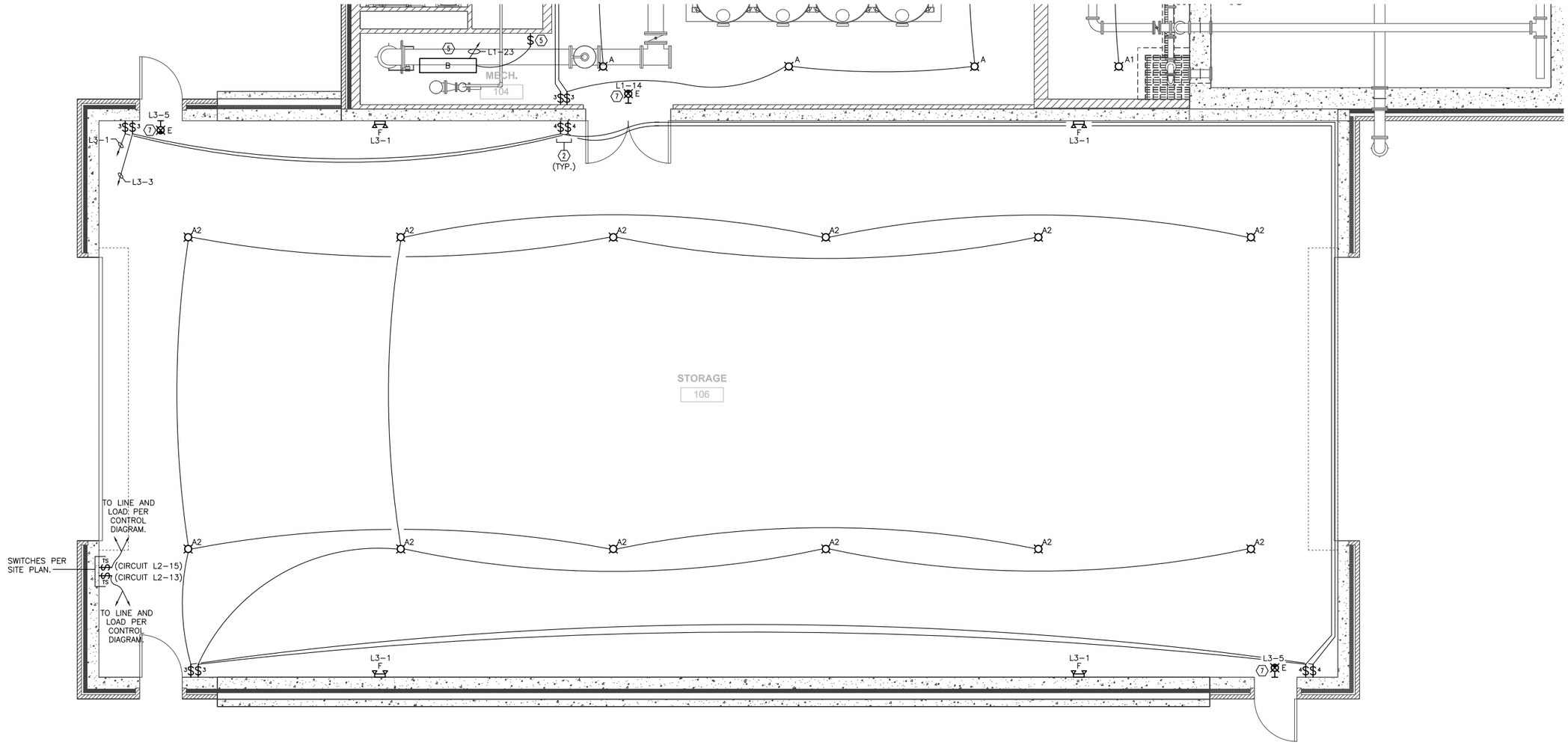
SHEET TITLE
PROPOSED BUILDING INTERIOR LIGHTING PLAN

SHEET
E5



LIGHTING PLAN KEYED NOTES ONLY:

1. SEE PROPOSED SITE LIGHTING PLAN (SHEET E3) FOR EXTERIOR BUILDING AND SITE LIGHTING.
2. SEE SHEET E7 FOR LIGHT FIXTURE SCHEDULE, KEYED NOTES AND LIGHTING AND WIRING GENERAL NOTES.

PROPOSED BUILDING INTERIOR LIGHTING PLAN

0' 1' 2' 4' 6'

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SHEET TITLE
PROPOSED BUILDING INTERIOR LIGHTING PLAN

SHEET
E6

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LIGHTING PLAN KEYED NOTES ONLY:

(1) THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL 3 WAY AND 4 WAY LIGHT SWITCHES AS SHOWN ON THE PLANS FOR THE CEILING MOUNTED LIGHT FIXTURES IN PIPING ROOM. THE LIGHT SWITCHES SHALL BE FLUSH MOUNTED AT 48 INCHES AFF.

THE LIGHT SWITCHES SHALL BE CONNECTED TO THE LIGHTING CIRCUIT SHOWN ON THE PLANS USING 3/4 INCH GALVANIZED RIGID STEEL CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO EACH FIXTURE AND THE APPROPRIATE CONDUCTOR QUANTITY AND COLOR TO THE 3 WAY AND 4 WAY LIGHT SWITCHES SHOWN FROM PANELBOARD L1 AND CONNECT TO THE CIRCUIT SHOWN ON THE PANELBOARD SCHEDULE. PROVIDE A NEUTRAL CONDUCTOR IN EACH SWITCH BOX.

(2) THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL 3 WAY AND 4 WAY LIGHT SWITCHES AS SHOWN ON THE PLANS FOR THE CEILING MOUNTED LIGHT FIXTURES IN STORAGE ROOM. THE LIGHT SWITCHES SHALL BE FLUSH MOUNTED AT 48 INCHES AFF.

THE LIGHT SWITCHES SHALL BE CONNECTED TO THE LIGHTING CIRCUIT SHOWN ON THE PLANS USING 3/4 INCH GALVANIZED RIGID STEEL CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO EACH FIXTURE AND THE APPROPRIATE CONDUCTOR QUANTITY AND COLOR TO THE 3 WAY AND 4 WAY LIGHT SWITCHES SHOWN FROM PANELBOARD L3 AND CONNECT TO THE CIRCUIT SHOWN ON THE PANELBOARD SCHEDULE. PROVIDE A NEUTRAL CONDUCTOR IN EACH SWITCH BOX.

(3) THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A LIGHT SWITCH AS SHOWN ON THE PLANS FOR THE CEILING MOUNTED LIGHT FIXTURES. THE LIGHT SWITCHES SHALL BE MOUNTED INTO FLUSH MOUNTED AT 48 INCHES AFF.

THE LIGHT SWITCHES SHALL BE CONNECTED TO THE LIGHTING CIRCUIT SHOWN ON THE PLANS USING 3/4 INCH GALVANIZED RIGID STEEL CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO EACH FIXTURE AND THE APPROPRIATE CONDUCTOR QUANTITY AND COLOR TO THE LIGHT SWITCH SHOWN. PROVIDE A NEUTRAL CONDUCTOR IN EACH SWITCH BOX.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO EACH FIXTURE AND THE APPROPRIATE CONDUCTOR QUANTITY AND COLOR TO THE 3 WAY LIGHT SWITCHES AS SHOWN FROM PANELBOARD L1 AND CONNECT TO THE CIRCUIT SHOWN ON THE PANELBOARD SCHEDULE.

(4) THE ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL AND WIRE THE CEILING MOUNTED LIGHT FIXTURES TO THE LIGHT SWITCH AS SHOWN ON THE PLANS.

THE LIGHT SWITCH SHALL BE FLUSH MOUNTED AT 48 INCHES AFF.

NOTE THE TOILET ROOM EXHAUST FAN IS ALSO WIRED INTO THE CIRCUIT PER THE RESPECTIVE KEYED NOTE SHOWN ON THE PROPOSED POWER, SYSTEMS AND INSTRUMENTATION PLANS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM THE LIGHT SWITCH TO THE LIGHT AND FROM THE LIGHT SWITCH TO THE PANELBOARD L1 AND CONNECT TO THE CIRCUIT SHOWN ON THE PANELBOARD SCHEDULE.

(5) THE SYSTEM INTEGRATOR SHALL FURNISH THE CHLORINE ROOM LIGHTING AND EXHAUST FAN CONTROL PANEL AND PUSHBUTTON LIGHT SWITCH STATIONS WITH PILOT LIGHTS AND THE ELECTRICAL CONTRACTOR SHALL INSTALL AND WIRE AS SHOWN ON THE PLANS.

THE ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL AND WIRE THE CEILING MOUNTED LIGHT FIXTURES AS SHOWN ON THE PLANS.

THE PUSH BUTTON LIGHT SWITCHES SHALL BE CONNECTED TO THE CONTROL PANEL SHOWN ON THE PLANS USING 3/4 INCH STAINLESS STEEL CONDUIT WITH 5 #14 CONDUCTORS, 4 #14 SPARES AND 1 #14 GROUND FROM THE PUSHBUTTON STATION AND 4 #12 CONDUCTORS AND 1 #12 GROUND FROM THE CONTROL PANEL TO THE PANELBOARD L1 AND 2 #12 CONDUCTORS AND 1 #12 GROUND TO THE ROOM LIGHT FIXTURE USING THE APPROPRIATE CONDUCTOR COLORS FROM THE CONTROL PANEL AS SHOWN. THE CONDUITS SHALL TRANSITION TO GALVANIZED RIGID STEEL OUTSIDE THE CHLORINE ROOM FROM PANELBOARD L1 AND CONNECT TO THE CIRCUIT SHOWN ON THE PANELBOARD SCHEDULE.

SEE THE CHLORINE ROOM LIGHTING AND EXHAUST FAN CONTROL DIAGRAM FOR REQUIREMENTS. NOTE THE DOOR LIMIT SWITCHES, CHLORINE ROOM GAS DETECTOR AND ROOM EXHAUST FAN ARE ALSO INTEGRATED INTO THE CONTROL SYSTEM PER THEIR RESPECTIVE KEYED NOTES SHOWN ON THE PROPOSED POWER, SYSTEMS AND INSTRUMENTATION PLANS.

(6) THE SYSTEM INTEGRATOR SHALL FURNISH THE FLUORIDE ROOM LIGHTING AND EXHAUST FAN CONTROL PANEL AND PUSHBUTTON LIGHT SWITCH STATIONS WITH PILOT LIGHTS AND THE ELECTRICAL CONTRACTOR SHALL INSTALL AND WIRE AS SHOWN ON THE PLANS.

THE ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL AND WIRE THE CEILING MOUNTED LIGHT FIXTURES AS SHOWN ON THE PLANS.

THE PUSH BUTTON LIGHT SWITCHES SHALL BE CONNECTED TO THE CONTROL PANEL SHOWN ON THE PLANS USING 3/4 INCH STAINLESS STEEL CONDUIT WITH 5 #14 CONDUCTORS, 4 #14 SPARES AND 1 #14 GROUND FROM THE PUSHBUTTON STATION AND 4 #12 CONDUCTORS AND 1 #12 GROUND FROM THE CONTROL PANEL TO THE PANELBOARD L1 AND 2 #12 CONDUCTORS AND 1 #12 GROUND TO THE ROOM LIGHT FIXTURE USING THE APPROPRIATE CONDUCTOR COLORS FROM THE CONTROL PANELS SHOWN. THE CONDUITS SHALL TRANSITION TO GALVANIZED RIGID STEEL OUTSIDE THE FLUORIDE ROOM FROM PANELBOARD L1 AND CONNECT TO THE CIRCUIT SHOWN ON THE PANELBOARD SCHEDULE.

SEE THE FLUORIDE ROOM LIGHTING AND EXHAUST FAN CONTROL DIAGRAM FOR REQUIREMENTS. NOTE THE DOOR LIMIT SWITCHES AND ROOM EXHAUST FAN ARE ALSO INTEGRATED INTO THE CONTROL SYSTEM PER THEIR RESPECTIVE KEYED NOTES SHOWN ON THE PROPOSED POWER, SYSTEMS AND INSTRUMENTATION PLANS.

(7) THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE WALL OR CEILING MOUNTED EXIT LIGHT FIXTURES IN THE BUILDING AS SHOWN. THE EMERGENCY LIGHT FIXTURES SHALL BE MOUNTED 90 INCHES ABOVE FINISHED FLOOR.

THE ELECTRICAL CONTRACTOR ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM THE FIXTURE TO THE LIGHTING CIRCUIT LOCATED AS SHOWN ON THE PLANS.

THE ELECTRICAL CONTRACTOR SHALL ADJUST THE AIMING OF EACH LAMP FOR PROPER OPERATION.

(8) THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE PHOTO CONTROL REQUIRED FOR CONTROLLING THE SOFFIT AND OTHER REQUIRED LIGHT FIXTURES SHOWN ON THE SITE LIGHTING PLAN. SEE THE EXTERIOR LIGHTING CONTROL DIAGRAM FOR ADDITIONAL INFORMATION ON THE PHOTO CONTROL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4" CONDUIT WITH 3 #12 CONDUCTORS AND 1 #12 GROUND FROM THE PHOTO CONTROL TO THE EXTERIOR LIGHTING CONTROLLER LOCATED IN MCC-1B.

MOUNT THE PHOTO CELL ON A CAST ALUMINUM PULL BOX WITH A THREADED ALUMINUM COVER WITH GASKET.

(9) THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE PHOTO CONTROL REQUIRED FOR CONTROLLING THE STORAGE AREA AND POLE MOUNTED LIGHT FIXTURES SHOWN ON THE SITE LIGHTING PLAN. SEE THE EXTERIOR LIGHTING CONTROL DIAGRAM FOR ADDITIONAL INFORMATION ON THE PHOTO CONTROL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4" CONDUIT WITH 3 #12 CONDUCTORS AND 1 #12 GROUND FROM THE PHOTO CONTROL TO THE EXTERIOR LIGHTING CONTROLLER LOCATED IN MCC-1B.

MOUNT THE PHOTO CELL ON A CAST ALUMINUM PULL BOX WITH A THREADED ALUMINUM COVER WITH GASKET.

INTERIOR LIGHTING FIXTURE SCHEDULE

ABBREVIATIONS

C – CONCRETE
CB – CONCRETE BASE
CH – CHAIN
ES – EXPOSED STRUCTURE
F – FLUSH
G – GYP BOARD
LG – LAYIN GRID
P – PENDANT
R – RECESSED
S – SURFACE
U – UNIVERSAL
V – VARIES
W – WALL

DES.	DESCRIPTION	LAMP DATA		VOLT	DEPTH	LIGHTING FIXTURE		MTG.	MTG. SURF	SEE NOTE
		NO.	TYPE			MFR.	CAT. NO.			
A	LED HIGH BAY MTD. 12'-0"AFF	–	LED (5000lm)	120	–	HOLOPHANE	PLED2-05L-4K-AS-UN-NA-W-L5	P	ES	1,2
A1	LED HIGH BAY MTD. 23'-0"AFF	–	LED (12000lm)	120	–	HOLOPHANE	PLED2-12L-4K-AS-UN-NA-W-L5	P	ES	1,2
A2	LED HIGH BAY MTD. 15'-0"AFF	–	LED (10000lm)	120	–	HOLOPHANE	PLED2-10L-4K-AS-UN-NA-W-L5	P	ES	1,2
B	4' ENCLOSED AND GASKETED LED UNIT	–	LED (4000lm)	120	–	LITHONIA	FEM-48L-4000L-IMAFL-MD-MVOLT-GZ10-4000K-80CRI	S	ES	1,2
B1	4' ENCLOSED AND GASKETED LED UNIT	–	LED (3000lm)	120	–	LITHONIA	FEM-48L-3000L-IMAFL-MD-MVOLT-GZ10-4000K-80CRI	S	ES	1,2
E	EXIT LIGHT (SINGLE AND DOUBLE FACE)	–	LED	120	–	LITHONIA	LQM-S-W-3-R-120/277-ELN-SD	S	ES	1,2
F	MTD. 10'-0"AFF EGRESS LIGHT	–	LED	120	–	LITHONIA	INQ12100-W-H5012S-SEL	S	ES	1,2,3

LIGHTING FIXTURE SCHEDULE NOTES:

1. THE FIXTURE(S) HAS BEEN PROVIDED FOR THE PROPER LIGHTING LEVELS AND FOR ENERGY CODE COMPLIANCE. FOR THE ELECTRICAL CONTRACTOR TO FURNISH A DIFFERENT MANUFACTURER(S) OR FIXTURE(S) CATALOG NUMBER(S), THE ELECTRICAL CONTRACTOR SHALL FIRST SUBMIT LIGHTING AND ENERGY CALCULATIONS WITH DETAILED FIXTURE CUT SHEETS PROVING THE FIXTURE(S) MEET PROJECT REQUIREMENTS USING A VISUAL LIGHTING SOFTWARE PACKAGE OR SIMILAR PROGRAM. THE ENGINEER WILL DETERMINE IF A REVIEW IS APPROPRIATE AND IF SO WILL PROVIDE ONE REVIEW ONLY OF THE ELECTRICAL CONTRACTOR'S SUBMITTAL, IF THE SUBSTITUTED FIXTURE(S) ARE NOT ACCEPTABLE AS DETERMINED BY THE ENGINEER, NO ADDITIONAL REVIEWS WILL BE PROVIDED BY THE ENGINEER AND THE SPECIFIED FIXTURE(S) THAT ARE SHOWN ON THE PLANS SHALL BE SUBMITTED DURING SHOP DRAWING REVIEW. IF THE SUBMITTED FIXTURE(S) SUBSTITUTES MEET PROJECT CONDITIONS THEN CALCULATIONS ARE ALSO REQUIRED FOR ON SITE STATE REVIEW BY THE ELECTRICAL CONTRACTOR, AND AS DETERMINED BY THE ENGINEER.
2. IT IS ALSO THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO VERIFY THE CATALOG NUMBERS SHOWN ON THE PLANS AND UPDATE SAME BEFORE SUBMITTING SHOP DRAWINGS. ANY CATALOG NUMBER REVISIONS OR SUBSEQUENT FIXTURE COST INCREASES SHALL BE MADE AT NO ADDITIONAL COST TO THE CONTRACT WHETHER IT IS BECAUSE OF A DIFFERENT TYPE OR FIXTURE MOUNTING DUE TO PROJECT CONDITIONS, DISCONTINUED CATALOG NUMBERS OR OTHER SUCH ISSUES. IN THE CASE OF DISCONTINUED CATALOG NUMBERS, THE ELECTRICAL CONTRACTOR SHALL BRING IT TO THE ENGINEER'S ATTENTION BEFORE SHOP DRAWINGS ARE SUBMITTED SO THAT A NEW FIXTURE TYPE CAN BE SELECTED BY THE ENGINEER.
3. AIM HEADS TO ASSIST IN LIGHTING AREA FOR SAFETY.

LIGHTING AND WIRING GENERAL NOTES:

1. ALL POWER CONDUCTORS SHALL BE 600 VOLT RATED, STRANDED COPPER WITH TYPE XHHW OR THWN INSULATION PER THE SPECIFICATIONS.
2. THE MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH FOR UNLESS OTHERWISE NOTED.
3. IN GENERAL, ALL CONDUITS SHALL BE INSTALLED INSIDE PROPOSED WALLS WITH ONLY MINIMAL CONDUITS EXPOSED.
4. ALL CONDUITS LEAVING OR ENTERING THE PANELS, ENCLOSURES AND MOTOR CONTROL CENTERS FROM EXTERIOR OR COLD AREAS SHALL BE DUX SEALED AT BOTH ENDS.
5. ALL HOLES THROUGH MASONRY SHALL BE MADE WITH CORE DRILLS IF NOT SLEEVED THROUGH THE WALLS. IF CONDUITS REQUIRE CORE DRILLING, OTHER METHODS SUCH AS CHISELING OR HAMMERED OUT OPENINGS ARE NOT ACCEPTABLE. THE HOLES SHALL BE MADE NOT LARGER THAN 1/4 LARGER DIAMETER THEN THE CONDUIT. ALL OPENINGS SHALL BE GROUTED WHERE INSTALLED THROUGH CONCRETE AND CAULKED WERE INSTALLED THROUGH SIDING MATERIALS IF SHOWN, DRYWALL OR OTHER FINISHES ABOVE FINISHED GRADE.
6. USE STAINLESS STEEL FASTENERS FOR MOUNTING OF JUNCTION BOXES OR OTHER DEVICES LOCATED ON THE BUILDING EXTERIOR.
7. USE STAINLESS STEEL FASTENERS FOR MOUNTING OF JUNCTION BOXES OR OTHER DEVICES LOCATED ON THE INTERIOR OF THE BUILDING.
8. NOT ALL CONDUITS ARE SHOWN. THE CONDUITS SHOWN ARE INTENDED FOR GENERAL ROUTING ONLY. COORDINATE THE EXACT CONDUITS AND LOCATIONS WITH THE ENGINEER.

   THE ELECTRICAL CONTRACTOR SHALL SUBMIT CONDUIT AND EQUIPMENT LOCATION PLANS DURING SHOP DRAWING REVIEW. THE PLANS SHALL ALSO INDICATE THE RELATIONSHIP OF THE CONDUITS WITH OTHER EQUIPMENT TO BE INSTALLED.
9. THE ELECTRICAL CONTRACTOR SHALL FIELD COORDINATE WITH THE OTHER TRADES FOR LOCATIONS OF SUCH EQUIPMENT AS PROCESS PIPING, MECHANICAL EQUIPMENT, HVAC EQUIPMENT AND DUCTS, FIXTURE LOCATIONS AND SUPPORTS, PULL BOXES, JUNCTION BOXES, MOTOR CONTROL CENTERS AND SIMILAR ELECTRICAL EQUIPMENT, GENERATOR INSTALLATION, DISCONNECT SWITCHES, CONTROL OR MONITORING STATIONS, PROCESS EQUIPMENT, RECEPTACLES AND LIGHT SWITCHES AND SIMILAR DEVICES SHOWN ON THE PLANS PRIOR TO CONSTRUCTION. ANY ELECTRICAL EQUIPMENT RELOCATIONS REQUIRED BY THE ENGINEER DUE TO IMPROPER PLANNING ON THE ELECTRICAL CONTRACTORS PART OR BY THE OTHER TRADES SHALL BE RELOCATED BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.
10. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL HVAC AND PROCESS INSTALLATIONS WITH THE ELECTRICAL INSTALLATIONS WITH THE RESPECTIVE CONTRACTORS PRIOR TO BEGINNING WORK. THIS INCLUDES ALL INTERCONNECT WIRING AND EQUIPMENT NECESSARY TO PROVIDE PROPERLY OPERATING SYSTEMS WETHER IT IS SHOWN ON THE PLANS OR NOT. IT IS THE ELCTRICAL CONTRACTOR'S RESPONSIBILITY TO VERIFY THE PROPER OR INTENDED OPERATION OF EQUIPMENT AND TO WORK-OUT ALL NECESSARY EQUIPMENT, DETAILS, CONDUIT, WIRING AND HARDWARE WITH THE RESPECTIVE CONTRACTORS. THIS INFORMATION SHALL BE PROVIDED TO THE ENGINEER DURING SHOP REVIEW.
11. ALL NEW WORK SHALL CONSIDER FUTURE EXPANSION OF EQUIPMENT WHERE SHOWN ON THE PLANS. PROPER SPACING OF EQUIPMENT, LOCATIONS, AND ROUTING OF CONDUIT(S) SHALL BE PROVIDED. IF THE ENGINEER DETERMINES THAT THE INSTALLATION IS NOT ADEQUATE TO PROVIDE FOR FUTURE EXPANSION, THE ELECTRICAL CONTRACTOR SHALL RELOCATE THE EQUIPMENT AND CONDUIT AT NO ADDITIONAL COST TO THE CONTRACT.
12. THE INSTALLATIONS SHALL PROVIDE FOR EASE OF MAINTENANCE OF ALL EQUIPMENT INSTALLED. IF THE ENGINEER DETERMINES THAT THE INSTALLATION DOES NOT MEET THIS REQUIREMENT, THE ELECTRICAL CONTRACTOR SHALL RELOCATE THE ELECTRICAL EQUIPMENT AND CONDUIT AT NO ADDITIONAL COST TO THE CONTRACT.
13. SEE THE KEYED NOTES FOR OTHER PLAN REQUIREMENTS.

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc., @ (SEH)

SHEET TITLE
PROPOSED LIGHTING PLAN NOTES AND SCHEDULES

SHEET
E7

TERRACE BOX, CONNECTION WITH MWU.

SEE ELECTRICAL SITE PLAN FOR CONTINUATION BY ELECTRICAL UTILITY COMPANY.

2 INCH PVC CONDUIT FOR FIBER CABLE, EXTEND CONDUIT 60" FROM BUILDING.

2 INCH CONDUIT WITH COPPER ETHERNET CABLE.

PROPOSED GAS SERVICE

AHU-1 CONTROL PANEL

CAMERA (120"AFG) C-31-01

36" LONG SWEEP ELBOW

2" PVC CONDUIT FOR TELEPHONE SERVICE, CAP 60" FROM BUILDING.

TELEPHONE GROUND BUS

TO MCC-1A

TO MCC-1B

1" CONDUIT TO PHONE BACKBOARD.

CORNER SECTION | E | D | C | B | A | ATS-1 | D | C | CORNER SECTION

F G H I J K L M

3/4" CONDUIT FOR CONTROL BY HVAC CONTRACTOR.

MOTION SENSOR (96"AFF)

AHU-1

HIGH SERVICE PUMP NO.1

HIGH SERVICE PUMP NO.2

HIGH SERVICE PUMP NO.3

CHECK VALVE

CF-1 CF-2 CF-3 CF-4

M-EF-1

SCP-31

PUMP ROOM 100

WELL PUMP P-RW-1

MOTION SENSOR (96"AFF)

CHECK VALVE

SF-1

M-RW-1

M-RC-1

MD-6

1-4 INCH CONDUIT STUBBED OUT 12 INCHES AND CAPPED FOR FUTURE MCC-2 POWER.

1-2 INCH SPARE CONDUIT STUBBED OUT 12 INCHES AND CAPPED FROM MCC-1B.

1-2 INCH CONDUIT FOR FUTURE ETHERNET CABLE(S) STUBBED OUT 12 INCHES AND CAPPED FROM SCADA CONTROL PANEL.

1-2 INCH CONDUIT FOR FUTURE ANALOG CABLE(S) STUBBED OUT 12 INCHES AND CAPPED FROM SCADA CONTROL PANEL.

1-2 INCH CONDUIT FOR FUTURE DIGITAL CABLE(S) STUBBED OUT 12 INCHES AND CAPPED FROM SCADA CONTROL PANEL. INSTALL A #12 BARE COPPER CONDUCTORS IN EACH CONDUIT FOR TRACING.

VIDEO SURVEILLANCE CONTROL PANEL, WITH ETHERNET PATCH PANEL LOCATED BELOW.

CARD READER CONTROL PANEL. C-31-02

CAMERA (120"AFG)

CHLORINE ROOM 101

EMERGENCY SHUT DOWN SYSTEM CONTROL PANEL.

SOLENOID VALVES SV-14-1 AND SV-14-2

LIGHTING/ EXHAUST FAN CONTROL PANEL

LIGHTING CONTROL PANEL

FILTER NO.1 SOLENOID CONTROL PANEL.

FILTER NO.2 SOLENOID CONTROL PANEL.

2-2" CONDUIT TO THE CARD READER CONTROL PANEL FROM EACH GATE CONTROLLER EACH WITH 6/C #12 SHIELDED CABLE AS SHOWN ON PLANS.

FLUORIDE ROOM 102

MECH. 104

RESTROOM 103

BACKWASH TANK ROOM 105

NORTH BACKWASH TANK

SOUTH BACKWASH TANK

BACKWASH RECLAIM PUMP P-RC-1 P-RC-2

CHECK VALVE V-RC-3 V-RC-4

M-BW-1

V-BWW-1 V-BWW-2

BT-BWW-1

BACKWASH VALVE SOLENOID PANEL VSP.

V-PSV-1 V-PSV-2

PROPOSED WATER MAIN BOND PIPING AND METER.

AIR COMPRESSOR NO.1

AIR COMPRESSOR NO.2

GENERAL REQUIRED ROUTING OF CONDUITS TO GENERATOR. PROVIDE 48 INCH RADIUS BENDS IN 5 INCH CONDUIT SHOWN ON ONE-LINE DIAGRAM AS REQUIRED.

MAU-1* CONTROL PANEL

GAS MONITOR CONTROL PANEL

MAU-1

MD-4

PROPOSED GENERATOR, SEE PROPOSED ELECTRICAL SITE PLAN ON SHEET E4 AND GENERATOR DETAIL ON SHEET E31 FOR ADDITIONAL INFORMATION.

PANELBOARD L4 (FURNISHED WITH GENERATOR)

PANELBOARD L3

PROPOSED POWER, SYSTEMS AND INSTRUMENTATION PLAN

0' 1' 2' 4' 6'

N

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
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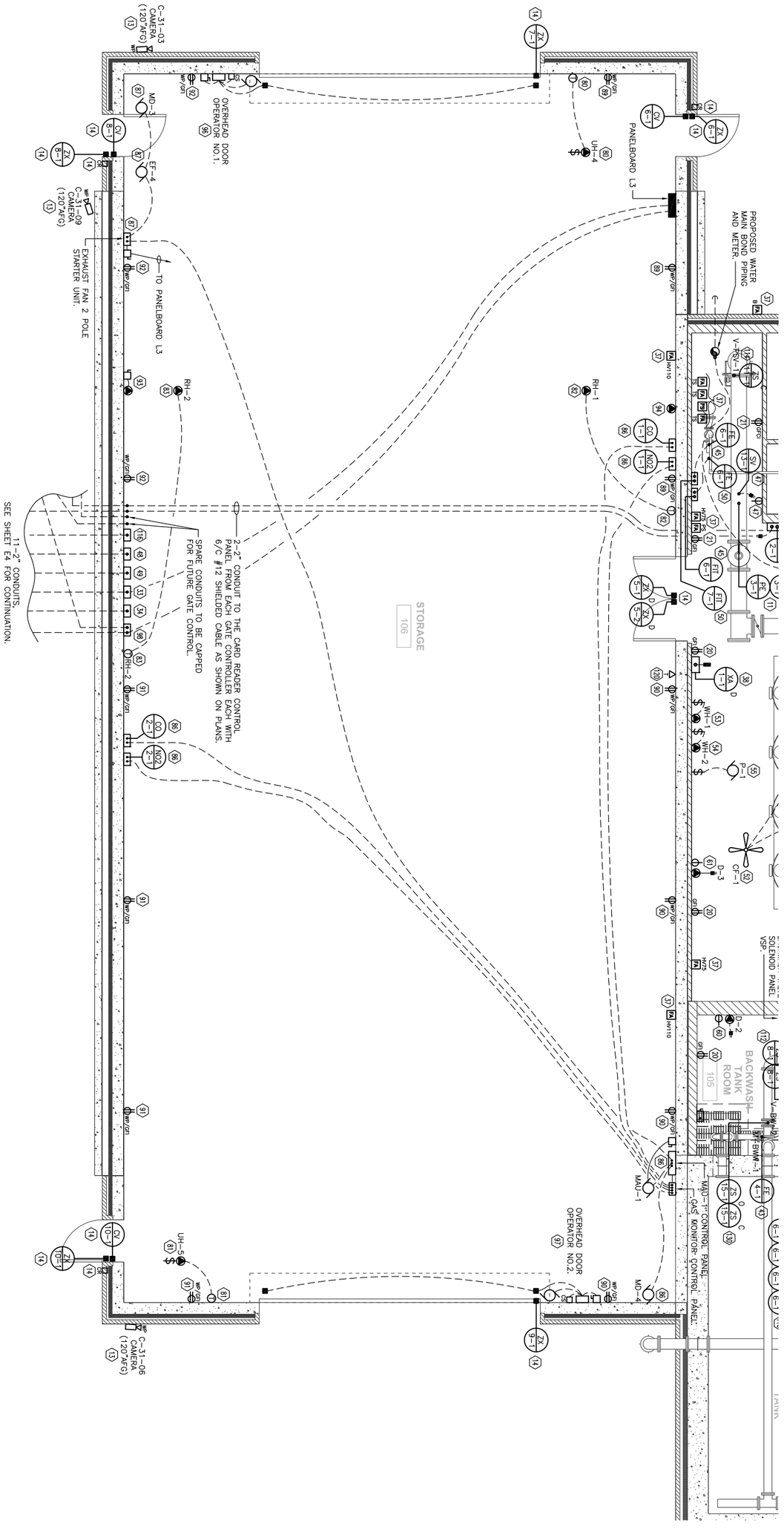
Short Elliott Hendrickson, Inc. @ (SEH)

SHEET TITLE
PROPOSED POWER AND SYSTEMS PLAN

SHEET
E8



PROPOSED POWER, SYSTEMS AND INSTRUMENTATION PLAN

0 1' 2' 4' 8'

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SHEET E9

SHEET TITLE
PROPOSED POWER AND SYSTEMS PLAN

SEH FILE NO.	129083
PROJECT NO.	53W10434
ISSUE DATE	JANUARY 13, 2017
DESIGNED BY	RICHARD J. BOYA
DRAWN BY	BRIAN E. FULLER

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MARK DATE DESCRIPTION
REVISIONS

UNIT WELL 31 WATER TREATMENT PLANT
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MADISON, WISCONSIN

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PROPOSED POWER, SYSTEMS AND INSTRUMENTATION PLAN KEYED NOTES:

(1) PROPOSED METER SOCKET FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE METER SOCKET 48 INCHES ABOVE FINISHED FLOOR USING STAINLESS STEEL SPACERS AND BOLTS. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE FINAL LOCATION WITH THE ENGINEER AND UTILITY COMPANY. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE EXACT MANUFACTURER AND MODEL NUMBER WITH THE UTILITY COMPANY. SEE KEYED NOTE (3) BELOW. WIRE PER ONE-LINE DIAGRAM.

(2) PROPOSED UTILITY METER, FURNISHED AND INSTALLED BY UTILITY COMPANY.

(3) PROPOSED MOTOR CONTROL CENTER MCC-1A FURNISHED BY THE SYSTEM INTEGRATOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL MOTOR CONTROL CENTER MCC-1A AT THE LOCATION SHOWN ON THE PLANS AND ONE-LINE DIAGRAM. THE MCC SHALL BE INSTALLED APPROXIMATELY 1 INCH FROM THE BACK WALL ON THE REQUIRED CONCRETE PAD.

THE CT'S ARE FURNISHED BY THE ELECTRICAL UTILITY COMPANY AND INSTALLED BY THE SYSTEM INTEGRATOR AND CONDUCTORS INSTALLED BY THE ELECTRICAL CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL PROVIDE A 1-1/4 INCH CONDUIT FROM MCC-1A TO THE METER SOCKET. THE ELECTRICAL CONTRACTOR SHALL ROUTE THE CONDUIT AND CONDUCTORS AND GROUNDING SHOWN ON THE ONE LINE DIAGRAM. THE ELECTRICAL UTILITY COMPANY WILL TERMINATE THE CT WIRING AT THE METER SOCKET AND WILL TERMINATE THE CT WIRING AT MCC-1A.

THE ELECTRICAL CONTRACTOR SHALL ROUTE FIVE (5) 5 INCH SCHEDULE 80 PVC CONDUITS FIVE (5) FEET FROM THE BUILDING FOR THE ELECTRICAL UTILITY COMPANY TO CONNECT AND INSTALL THEIR CONDUCTORS TO THE LINE SIDE TERMINATIONS ON THE MAIN SERVICE ENTRANCE RATED CIRCUIT BREAKER. TEMPORARILY CAP SAME, NO GLUE, PRESSURE FIT ONLY.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #14 CONDUCTORS AND 1 #14 GROUND FROM THE SURGE ARRESTOR UNIT TO THE PROPOSED SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH AN ETHERNET CABLE FROM THE OWNER'S METERING TO SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE THE CONDUIT AND WIRING SHOWN ON THE ONE-LINE DIAGRAM FROM MOTOR CONTROL CENTER MCC-1A TO MOTOR CONTROL CENTER-1B AND SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL BOLT THE MCC TO FLOOR AT EACH OF THE FOUR CORNERS ON THE CONCRETE PAD. SEE THE ELEVATION PLAN FOR ADDITIONAL INFORMATION.

(4) PROPOSED GROUNDING ELECTRODE SYSTEM PER THE ONE-LINE DIAGRAM AND DETAILS. INSTALL CLOSEST GROUND PLATE TEN (10) FEET FROM BUILDING, PER THE DETAIL. SEE (8) BELOW FOR ADDITIONAL REQUIREMENTS

(5) PROPOSED SYSTEM BONDING TO PROCESS PIPING PER THE ONE-LINE DIAGRAM.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 2 INCH SCHEDULE 80 PVC CONDUITS WITH BONDING CONDUCTORS AND BOLT TO FLANGE WITH A BOLTED CONNECTION USING A TINNED COPPER LUG SUITABLE FOR THE INSTALLATIONS. SEE ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.

(6) PROPOSED GAS AND WATER PIPING SYSTEMS BONDING TO PROCESS PIPING PER THE ONE-LINE DIAGRAM.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 2 INCH SCHEDULE 80 PVC CONDUITS WITH BONDING CONDUCTORS AND BOLT TO THE REQUIRED PIPING WITH CLAMP TYPE CONNECTIONS SUITABLE FOR THE INSTALLATIONS. SEE ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION

(7) PROPOSED SYSTEM BONDING TO WELL PUMP PER THE ONE-LINE DIAGRAM.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 2 INCH SCHEDULE 80 PVC CONDUITS WITH BONDING CONDUCTORS AND BOLT TO FLANGE WITH A BOLTED CONNECTION USING A TINNED COPPER LUG SUITABLE FOR THE INSTALLATIONS. SEE ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.

(8) PROPOSED SCADA CONTROL PANEL SCP-31 FURNISHED AND PROGRAMMED BY THE SYSTEM INTEGRATOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 2 INCH CONDUIT TO THE FIBER OPTIC ENTRANCE PANEL AND INSTALL THE FIBER OPTIC CABLE TO THE ETHERENT SWITCH LOCATED IN THE CONTROL PANEL.

(9) PROPOSED INLINE PRESSURE SWITCH PE-1-1/PIT-1-1 FURNISHED BY THE SYSTEM INTEGRATOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE ELEMENT/TRANSMITTER ON THE PROCESS PIPING WITH A BRASS GLOBE VALVE SPECIFIED ON THE PROCESS DRAWINGS AND THE SPECIFICATIONS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH (TWO) 2/C #18 AWG TWISTED SHIELDED PAIR CABLE TO SCADA CONTROL PANEL, ONE FOR 24VDC POWER AND ONE FOR THE 4/20MA SIGNAL.

(10) PROPOSED INLINE PRESSURE SWITCH PE-2-1/PIT-2-1 FURNISHED BY THE SYSTEM INTEGRATOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE ELEMENT/TRANSMITTER ON THE PROCESS PIPING WITH A BRASS GLOBE VALVE SPECIFIED IN THE PROCESS DRAWINGS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH (TWO) 2/C #18 AWG TWISTED SHIELDED PAIR CABLE TO SCADA CONTROL PANEL, ONE FOR 24VDC POWER AND ONE FOR THE 4/20MA SIGNAL.

(11) PROPOSED INLINE PRESSURE SWITCH PE-3-1/PIT-3-1 FURNISHED BY THE SYSTEM INTEGRATOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE ELEMENT/TRANSMITTER ON THE PROCESS PIPING WITH A BRASS GLOBE VALVE SPECIFIED IN THE PROCESS DRAWINGS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH (TWO) 2/C #18 AWG TWISTED SHIELDED PAIR CABLE TO SCADA CONTROL PANEL, ONE FOR 24VDC POWER AND ONE FOR THE 4/20MA SIGNAL.

(12) PROPOSED CONCRETE ENCASED GROUNDING ELECTRODE SYSTEM PER THE ONE-LINE DIAGRAM AND DETAIL. COORDINATE INSTALLATION WITH ENGINEER AND GENERAL CONTRACTOR BEFORE POURING CONCRETE FLOOR OR EQUIPMENT PAD. SEE GROUNDING DETAIL. SEE GENERAL CONSTRUCTION NOTE 18.

(13) PROPOSED VIDEO SURVEILLANCE CONTROL PANEL, AND INTERIOR AND EXTERIOR CAMERAS FURNISHED BY THE OWNERS VIDEO SURVEILLANCE COMPANY. SEE ELECTRICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.

THE CAMERAS SHALL BE EQUIPPED WITH ALL MOUNTING HARDWARE FOR THE LOCATIONS SHOWN ON THE PLANS BY THE OWNERS VIDEO SURVEILLANCE COMPANY.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE CAMERAS AND ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT #37 TO THE VIDEO SURVEILLANCE CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A FLUSH MOUNTED JUNCTION BOX AT EACH CAMERA LOCATION AND AS SHOWN ON THE PLANS AND ROUTE A 1 INCH CONDUIT WITH A CAT 6 COPPER CABLE TO THE VIDEO SURVEILLANCE CONTROL PANEL TO EACH CAMERA.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 2 INCH CONDUIT WITH FIBER OPTIC CABLE SHOWN ON THE VIDEO SURVEILLANCE SYSTEM INTERCONNECT DIAGRAM FROM THE FIBER OPTIC ENTRANCE PANEL TO THE PATCH PANEL FOR COPPER CONNECTIONS TO THE VIDEO SURVEILLANCE CONTROL PANEL.

THE FINAL CAMERA LOCATIONS SHALL BE DETERMINED DURING SHOP DRAWING REVIEW.
THE ELECTRICAL CONTRACTOR SHALL INCLUDE AN EXTRA 100 FEET OF 1 INCH CONDUIT AND ETHERNET COPPER CABLE FOR CAMERA LOCATION REVISIONS IN THE BID.

THE CAMERA TERMINATIONS SHALL BE PROVIDED BY OWNERS VIDEO SURVEILLANCE COMPANY.

SEE KEYED NOTE (118) FOR THE REQUIRED ETHERNET PATCH PANEL.

(14) PROPOSED CARD READER CONTROL PANEL(S) WITH MANDOORS AND GATE ACCESS CARD READERS FURNISHED AND TERMINATED BY THE OWNER'S SECURITY CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE CARD READER CONTROL PANEL(S) ON THE WALL INSTALL THE CONDUITS AND CONDUCTORS. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL WORK WITH THE OWNER'S SECURITY CONTRACTOR.

THE DOOR INTRUSION SWITCHES SHALL BE FURNISHED BY THE SYSTEM INTEGRATOR AND INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR. SEE THE DOOR ACCESS AND MONITORING CONTROL DIAGRAM FOR ADDITIONAL INFORMATION.

THE 24 VOLT DC ELECTRIC DOOR STRIKES ARE PROVIDED BY THE DOOR MANUFACTURER AND SHALL BE WIRED BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL 4 INCH SQUARE X 2-1/8 INCH BACK BOXES SHOWN FOR EACH DOOR CARD ACCESS READER NEAR EACH ENTRY DOOR AS SHOWN AND ROUTE A 3/4 INCH CONDUIT WITH A CAT 6 CABLE FROM THE EXISTING CARD READER CONTROL PANEL TO EACH CARD ACCESS READER AS REQUIRED BY THE SECURITY CONTRACTOR.

THE CARD READER TERMINATIONS AT THE CARD READER CONTROL PANEL(S) SHALL BE MADE BY THE OWNER'S SECURITY CONTRACTOR.

THE DOOR STRIKES ARE 24VDC FOR EACH DOOR SHOWN. THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH A 2/C #18AWG SHIELDED CABLE FROM THE CARD READER CONTROL PANEL TO EACH DOOR STRIKE AND TERMINATE AS REQUIRED AT THE DOOR. THE TERMINATIONS AT THE CARD READER CONTROL PANEL SHALL BE MADE BY THE OWNER'S SECURITY CONTRACTOR

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 2 INCH CONDUIT WITH 6 CONDUCTOR #12AWG CONTROL CABLE FROM EACH GATE CONTROLLER AS SHOWN ON THE PLANS TO THE CARD READER CONTROL PANEL(S).

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L1, CKT #39 TO EACH CARD READER CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS, 2 #14 SPARE AND 1 #14 GROUND FROM EACH DOOR INTRUSION SWITCH TO THE SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 2 INCH CONDUIT WITH A 7/C #12 SHIELDED CABLE FROM THE CARD READER CONTROL PANEL TO EACH GATE CONTROLLER FOR CONTROL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 1 INCH AND 2 INCH CONDUITS WITH THE CABLES SHOWN ON THE DOOR ACCESS AND MONITORING CONTROL DIAGRAM FROM THE CARD READER CONTROL PANEL(S) TO THE SCADA CONTROL PANEL.

SEE PROPOSED DOOR ACCESS AND MONITORING CONTROL DIAGRAM FOR ADDITIONAL INFORMATION.

(15) PROPOSED 2000 AMP, 277/480 VOLT, 600 VOLT RATED, 3 PHASE, 4 WIRE, NEMA 1, CLOSED TRANSITION AUTOMATIC TRANSFER SWITCH ATS-1 FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL BOLT THE ATS TO FLOOR AT EACH OF THE FOUR CORNERS ON THE CONCRETE PAD.

THE ELECTRICAL CONTRACTOR SHALL ROUTE THE CONDUITS AND CONDUCTORS SHOWN ON THE ONE-LINE DIAGRAM AND KEYED NOTES.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 4 #14 CONDUCTORS AND 1 #14 GROUND FROM ATS-1 TO SCADA CONTROL PANEL SCP-31 FOR MONITOR AND REMOTE GENERATOR START.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 START CONDUCTORS AND 1 #12 GROUND FROM ATS-1 TO THE GENERATOR FOR GENERATOR START.

(16) PROPOSED MOTOR CONTROL CENTER MCC-1B FURNISHED BY THE SYSTEM INTEGRATOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE MOTOR CONTROL CENTER MCC-1B AT THE LOCATION SHOWN ON THE PLANS.

THE MCC SHALL BE INSTALLED ON THE REQUIRED CONCRETE PAD.

THE ELECTRICAL CONTRACTOR SHALL ROUTE THE POWER CONDUITS FROM MOTOR CONTROL CENTER MCC-1A AND AUTOMATIC TRANSFER SWITCH ATS-1 AS SHOWN ON THE ONE LINE DIAGRAM AND CONTROL DIAGRAMS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH AN ETHERNET CABLE FROM THE MCC TO THE SCADA CONTROL PANEL.

SEE OTHER KEYED NOTES FOR ADDITIONAL INFORMATION.

(17) PROPOSED CONCRETE EQUIPMENT PAD FOR MCC-1A, ATS-1 AND MCC-1B FURNISHED AND INSTALLED BY THE GENERAL CONTRACTOR TO SUPPORT THE MOTOR CONTROL CENTER AND AUTOMATIC TRANSFER SWITCH. THE EQUIPMENT PAD SHALL BE 6 INCHES LONGER AND WIDER THEN THE MCC AND 4 INCHES THICK.

(18) PROPOSED GFI PROTECTED RECEPTACLES LOCATED IN THE PUMP ROOM AND EXTERIOR MOUNTED RECEPTACLE.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE RECEPTACLES 36 INCHES AFF, MEASURED TO TOP OF BOX.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L1, CKT #13 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L1 IS A GFI TYPE.

THE BACK BOXES AND CONDUITS SHALL BE LOCATED IN THE WALL CAVITY. THE EXTERIOR MOUNTED RECEPTACLE SHALL INCLUDE AN ALUMINUM LOCKABLE IN-USE COVER AS LISTED IN THE SPECIFICATIONS.

ALL INTERIOR RECEPTACLES SHALL INCLUDE A STAINLESS STEEL COVER.

(19) PROPOSED GFI PROTECTED RECEPTACLES LOCATED IN THE PUMP ROOM.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE RECEPTACLES 36 INCHES AFF, MEASURED TO TOP OF BOX.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L1, CKT #15 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L1 IS A GFI TYPE.

THE BACK BOXES AND CONDUITS SHALL BE LOCATED IN THE WALL CAVITY. ALL INTERIOR RECEPTACLES SHALL INCLUDE A STAINLESS STEEL COVER.

(20) PROPOSED GFI PROTECTED RECEPTACLES LOCATED IN THE PUMP ROOM.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE RECEPTACLES 36 INCHES AFF, MEASURED TO TOP OF BOX.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L1, CKT #17 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L1 IS A GFI TYPE.

THE BACK BOXES AND CONDUITS SHALL BE LOCATED IN THE WALL CAVITY. ALL INTERIOR RECEPTACLES SHALL INCLUDE A STAINLESS STEEL COVER.

(21) PROPOSED GFI PROTECTED RECEPTACLES LOCATED IN THE PUMP ROOM.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE RECEPTACLES 36 INCHES AFF, MEASURED TO TOP OF BOX.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L1, CKT #19 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L1 IS A GFI TYPE.

THE BACK BOXES AND CONDUITS SHALL BE LOCATED IN THE WALL CAVITY. ALL INTERIOR RECEPTACLES SHALL INCLUDE A STAINLESS STEEL COVER.

(22) PROPOSED GFI PROTECTED RECEPTACLES LOCATED ABOVE THE COUNTER AND ALONG THE WALL OF THE PUMP ROOM.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE RECEPTACLES AT THE COUNTER 48 INCHES AFF AND THE ADJACENT RECEPTACLE 36 INCHES AFF, MEASURED TO TOP OF BOX.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #31 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L2 IS A GFI TYPE.

THE BACK BOXES AND CONDUITS SHALL BE LOCATED IN THE WALL CAVITY. ALL INTERIOR RECEPTACLES SHALL INCLUDE A STAINLESS STEEL COVER.

(23) PROPOSED GFI PROTECTED RECEPTACLES LOCATED IN THE TOILET ROOM.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE RECEPTACLE NEAR THE SINK AT 42 INCHES AFF AND THE OPPOSITE RECEPTACLE AT 24 INCHES AFF, MEASURED TO TOP OF BOX.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #33 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L2 IS A GFI TYPE.

ALL INTERIOR RECEPTACLES SHALL INCLUDE A STAINLESS STEEL COVER.

(24) PROPOSED CORROSION RESISTANT GFI PROTECTED RECEPTACLES LOCATED IN THE CHLORINE ROOM.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE RECEPTACLES 36 INCHES AFF, MEASURED TO TOP OF BOX. PROVIDE GASKETED COVER PLATE FOR EACH RECEPTACLE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #33 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L2 IS A GFI TYPE.

ALL INTERIOR RECEPTACLES SHALL INCLUDE A STAINLESS STEEL COVER.

(25) PROPOSED CORROSION RESISTANT GFI PROTECTED RECEPTACLES LOCATED IN THE FLUORIDE ROOM.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE RECEPTACLES 36 INCHES AFF, MEASURED TO TOP OF BOX. PROVIDE GASKETED COVER PLATE FOR EACH RECEPTACLE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L1, CKT #25 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L1 IS A GFI TYPE.

ALL INTERIOR RECEPTACLES SHALL INCLUDE A STAINLESS STEEL COVER.

(26) PROPOSED HIGH SERVICE PUMP P-HS-1 WITH TEH-2-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS, 4 #14 SPARE CONDUCTORS AND 1 #14 GROUND TO THE VFD AND TERMINATE AT EACH LOCATION FOR THE MOTOR THERMAL DEVICE.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE PULL BOX (ENCLOSURE) SHOWN AND ROUTE THE CONDUITS FROM THE VFD SECTION LOCATED IN MCC-1B TO THE HIGH SERVICE PUMP AS SHOWN ON THE ONE-LINE DIAGRAM AND CONTROL DIAGRAM.

THE ELECTRICAL CONTRACTOR SHALL CONSTRUCT AND INSTALL THE CONDUIT AND PULL BOX SUPPORT STRUCTURE FOR TERMINATING THE POWER AND THERMAL WIRING ON POWER AND TERMINAL BLOCKS INSIDE THE ENCLOSURE PER THE DETAILS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 10 #14 CONDUCTORS, 4 #14 SPARE CONDUCTORS AND 1 #14 GROUND FROM THE VFD TO THE SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO (2) 2 #16 AWG TWISTED SHIELDED PAIR CABLES FROM THE VFD TO THE SCADA CONTROL PANEL.

(27) PROPOSED HIGH SERVICE PUMP P-HS-2 WITH TEH-3-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS, 4 #14 SPARE CONDUCTORS AND 1 #14 GROUND TO THE VFD AND TERMINATE AT EACH LOCATION FOR THE MOTOR THERMAL DEVICE.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE PULL BOX (ENCLOSURE) SHOWN AND ROUTE THE CONDUITS FROM THE VFD SECTION LOCATED IN MCC-1B TO THE HIGH SERVICE PUMP AS SHOWN ON THE ONE-LINE DIAGRAM AND CONTROL DIAGRAM.

THE ELECTRICAL CONTRACTOR SHALL CONSTRUCT AND INSTALL THE CONDUIT AND PULL BOX SUPPORT STRUCTURE FOR TERMINATING THE POWER AND THERMAL WIRING ON POWER AND TERMINAL BLOCKS INSIDE THE ENCLOSURE PER THE DETAILS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 10 #14 CONDUCTORS, 4 #14 SPARE CONDUCTORS AND 1 #14 GROUND FROM THE VFD TO THE SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO (2) 2 #16 AWG TWISTED SHIELDED PAIR CABLES FROM THE VFD TO THE SCADA CONTROL PANEL.

(28) PROPOSED HIGH SERVICE PUMP P-HS-3 WITH TEH-4-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS, 4 #14 SPARE CONDUCTORS AND 1 #14 GROUND TO THE VFD AND TERMINATE AT EACH LOCATION FOR THE MOTOR THERMAL DEVICE.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE PULL BOX (ENCLOSURE) SHOWN AND ROUTE THE CONDUITS FROM THE VFD SECTION LOCATED IN MCC-1B TO THE HIGH SERVICE PUMP AS SHOWN ON THE ONE-LINE DIAGRAM AND CONTROL DIAGRAM.

THE ELECTRICAL CONTRACTOR SHALL CONSTRUCT AND INSTALL THE CONDUIT AND PULL BOX SUPPORT STRUCTURE FOR TERMINATING THE POWER AND THERMAL WIRING ON POWER AND TERMINAL BLOCKS INSIDE THE ENCLOSURE PER THE DETAILS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 10 #14 CONDUCTORS, 4 #14 SPARE CONDUCTORS AND 1 #14 GROUND FROM THE VFD TO THE SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO (2) 2 #16 AWG TWISTED SHIELDED PAIR CABLES FROM THE VFD TO THE SCADA CONTROL PANEL.

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc., @ (SEH)

SHEET TITLE
PROPOSED POWER AND SYSTEMS PLAN KEYED NOTES

SHEET
E10

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PROPOSED POWER, SYSTEMS AND INSTRUMENTATION PLAN KEYED NOTES:

(29) PROPOSED WELL PUMP P-RW-1 WITH THERMAL SENSORS TEH-1-1, PRE-INSTALLED AND FURNISHED AND INSTALLED BY THE OWNER AND PRE-LUBE WATER SOLENOID VALVE SV-1-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL DRILL AN OPENING INTO THE MOTOR TERMINAL BOX FOR MOUNTING THE VIBRATION ANALYZER. THE MOTOR AND VIBRATION ANALYZER YV-1-1 SHALL BE WIRED BY THE ELECTRICAL CONTRACTOR.

THE VIBRATION ANALYZER SHALL BE FURNISHED AND INSTALLED BY AND WIRED BY THE ELECTRICAL CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH A 2/C #18AWG TWISTED SHIELDED CABLE TO THE SCADA CONTROL PANEL AND TERMINATE AT EACH LOCATION. THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GND FROM MCC-1B VFD SECTION FOR POWER TO ANALYZER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS, 2 #14 SPARE CONDUCTORS AND 1 #14 GROUND TO THE VFD AND TERMINATE AT EACH LOCATION FOR THE MOTOR THERMAL SENSOR TEH-1-1. THE ELECTRICAL CONTRACTOR SHALL ROUTE THE WIRING THROUGH THE PULL BOX.

THE ELECTRICAL CONTRACTOR SHALL CONSTRUCT AND INSTALL THE CONDUIT AND PULL BOX SUPPORT STRUCTURE FOR TERMINATING THE POWER AND THERMAL WIRING ON POWER AND TERMINAL BLOCKS INSIDE THE ENCLOSURE PER THE DETAILS. THE VIBRATION ANALYZER WIRING SHALL NOT BE ROUTED INTO THIS ENCLOSURE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM THE VFD TO THE SOLENOID VALVE FOR CONTROL.

THE SYSTEM INTEGRATOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS AND 1 #14 GROUND FROM THE VFD TO THE SCADA CONTROL PANEL FOR FLOW FROM FLOW METER M-RW-1 FOR CHEMICAL CONTROL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 14 #14 CONDUCTORS, 4 #14 SPARE CONDUCTORS AND 1 #14 GROUND FROM THE VFD TO THE SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO (2) 2 #16 AWG TWISTED SHIELDED PAIR CABLES FROM THE VFD TO THE SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE PULL BOX (ENCLOSURE) SHOWN AND ROUTE THE CONDUITS FROM THE VFD SECTION LOCATED IN MCC-1B TO THE HIGH SERVICE PUMP AS SHOWN ON THE ONE-LINE DIAGRAM AND CONTROL DIAGRAM.

SEE KEYED NOTE (30) BELOW FOR THE WELL LEVEL TRANSDUCER.

(30) PROPOSED WELL LEVEL TRANSDUCER LE-2-1 FURNISHED BY THE SYSTEM INTEGRATOR AND INSTALL AND WIRED BY THE ELECTRICAL CONTRACTOR INTO THE WELLS STILLING WELL.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE NEMA 4X JUNCTION BOX FOR ROUTING THE TRANSDUCER CABLE FROM THE STILLING WELL TO THE SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE PROPOSED JUNCTION BOX ON THE CONDUIT SUPPORT STRUCTURE. THE JUNCTION BOX SHALL BE 8 INCHES HIGH X 8 INCHES WIDE X 4 INCH DEEP ENCLOSURE, WITH BACK PANEL AND THE SPECIFIED TERMINAL BLOCKS FOR TERMINATING THE CONDUCTORS.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE NEMA 4X JUNCTION BOX 36 INCHES ABOVE FINISHED FLOOR, MEASURED TO TOP OF THE ENCLOSURE AND ROUTE A 1 INCH CONDUIT WITH A 4/C #18 AWG TWISTED SHIELDED CABLE FROM SCADA CONTROL PANEL TO THE JUNCTION BOX AND TERMINATE EACH ON THE TERMINAL BLOCKS. THE CABLE FROM THE JUNCTION BOX TO SCADA CONTROL PANEL SHALL MEET THE TRANSDUCER MANUFACTURER'S REQUIREMENTS AND SHALL BE TERMINATED AT SCADA CONTROL PANEL BY THE SYSTEM INTEGRATOR.

(31) PROPOSED DOOR LIMITED SWITCH ZX-4-2 LOCATED IN THE FLUORIDE ROOM FURNISHED BY THE SYSTEM INTEGRATOR. SEE THE SPECIFICATIONS FOR THE REQUIRED DOOR SWITCH. NOTE THIS DOOR SWITCH IS FOR CONTROL OF THE LIGHTING AND EXHAUST FAN.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE DOOR INTRUSION SWITCH AT THE LOCATION ON THE PLANS AT THE TOP OF THE DOOR AND ROUTE 2 #14 CONDUCTORS & 1 #14 GROUND TO LIGHTING AND EXHAUST FAN CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #14 CONDUCTORS & 1 #14 GROUND TO LIGHTING CONTROL PANEL FROM THE DOOR SWITCH.

(32) PROPOSED DOOR LIMITED SWITCH ZX-3-2 LOCATED IN THE CHLORINE ROOM FURNISHED BY THE SYSTEM INTEGRATOR. SEE THE SPECIFICATIONS FOR THE REQUIRED DOOR SWITCHES. NOTE THIS DOOR SWITCH IS FOR CONTROL OF THE LIGHTING AND EXHAUST FAN.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE DOOR SWITCH AT THE LOCATION ON THE PLANS AT THE TOP OF THE DOOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #14 CONDUCTORS & 1 #14 GROUND TO THE LIGHTING AND EXHAUST FAN CONTROL PANEL.

(33) PROPOSED 12 INCH SQUARE X 6 INCH DEEP NEMA 12 PULL BOX WITH TERMINAL BLOCKS MOUNTED 36 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE FOR POWER TO THE LIGHT FIXTURE AND RECEPTACLE LOCATED ON THE TOP OF THE WATER STORAGE TANK.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 2 INCH CONDUIT WITH 6 #8 CONDUCTORS FOR LIGHT FIXTURE AND RECEPTACLE AND 1 #8 GROUND PANELBOARD L3, CKT'S 28, 30 AND 32. ROUTE ALL WIRING THROUGH HAND HOLES NO.1 AND NO.2 AS SHOWN ON THE PLANS.

(34) PROPOSED 12 INCH SQUARE X 6 INCH DEEP NEMA 12 PULL BOX WITH SIX TERMINAL BLOCKS MOUNTED 36 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE FOR FUTURE USE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 2 INCH CONDUIT WITH A PULL ROPE FROM HAND HOLES NO.1 TO NO.3 INTO THE BOTTOM OF MCC-1B.

(35) PROPOSED BACKWASH RECLAIM PUMP P-RC-1 WITH TEH-5-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A 60 AMP, 480 VOLT, 3 POLE, NEMA 12 DISCONNECT SWITCH AUX CONTACTS AND ROUTE A 1 INCH CONDUIT WITH 2 #14 THERMAL CONDUCTORS, 2 #14 DISCONNECT SWITCH AUX CONTACTS, 2 #14 SPARE CONDUCTORS AND 1 #14 GROUND TO THE VFD AND TERMINATE AT EACH LOCATION FOR THE MOTOR THERMAL DEVICE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE THE CONDUITS FROM THE VFD SECTION LOCATED IN MCC-1B TO THE BACKWASH RECLAIM PUMP AS SHOWN ON THE ONE-LINE DIAGRAM AND CONTROL DIAGRAM.

THE SYSTEM INTEGRATOR SHALL ROUTE A 1 INCH CONDUIT WITH 10 #14 CONDUCTORS, 4 #14 SPARE CONDUCTORS AND 1 #14 GROUND FROM THE VFD TO THE SCADA CONTROL PANEL.

THE SYSTEM INTEGRATOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO (2) 2 #16 AWG TWISTED SHIELDED PAIR CABLES FROM THE VFD TO THE SCADA CONTROL PANEL.

(36) PROPOSED BACKWASH RECLAIM PUMP P-RC-2 WITH TEH-6-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A 60 AMP, 480 VOLT, 3 POLE, NEMA 12 DISCONNECT SWITCH AUX CONTACTS AND ROUTE A 1 INCH CONDUIT WITH 2 #14 THERMAL CONDUCTORS, 2 #14 DISCONNECT SWITCH AUX CONTACTS, 2 #14 SPARE CONDUCTORS AND 1 #14 GROUND TO THE VFD AND TERMINATE AT EACH LOCATION FOR THE MOTOR THERMAL DEVICE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE THE CONDUITS FROM THE VFD SECTION LOCATED IN MCC-1B TO THE BACKWASH RECLAIM PUMP AS SHOWN ON THE ONE-LINE DIAGRAM AND CONTROL DIAGRAM.

THE SYSTEM INTEGRATOR SHALL ROUTE A 1 INCH CONDUIT WITH 10 #14 CONDUCTORS, 4 #14 SPARE CONDUCTORS AND 1 #14 GROUND FROM THE VFD TO THE SCADA CONTROL PANEL.

THE SYSTEM INTEGRATOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO (2) 2 #16 AWG TWISTED SHIELDED PAIR CABLES FROM THE VFD TO THE SCADA CONTROL PANEL.

(37) PROPOSED FIRE ALARM SYSTEM CONTROL PANEL (FACP) AND REMOTE DEVICES FURNISHED, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR PER THE PLANS AND SPECIFICATIONS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L2, CKT #32 FOR CONTROL POWER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 4 #14 CONDUCTORS, 4 #14 SPARE AND 1 #14 GROUND TO THE SCADA CONTROL PANEL FOR REMOTE MONITORING TROUBLE AND ALARM.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 3/4 INCH GALVANIZED RIGID STEEL CONDUIT TO EACH FIRE ALARM DEVICE (PULL STATION, SMOKE DETECTOR, HORN/STROBES, STROBES, EACH FIRE PROTECTION FLOW AND TAMPER SWITCH AS SHOWN AND ROUTE THE REQUIRED FIRE ALARM MONITORING CABLES TO EACH DEVICE SHOWN ON THE PLANS PER THE MANUFACTURER REQUIREMENTS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM THE FACP CONTROL PANEL TO THE ALARM BELL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH FIRE ALARM MONITORING CABLES FROM THE FACP CONTROL PANEL TO EACH TAMPER AND FLOW SWITCH.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH CAT 6 CABLE FROM THE FACP CONTROL PANEL TO THE TELEPHONE TERMINATION BLOCKS FOR REMOTE MONITORING.

SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION. THE JUNCTION BOXES REQUIRED FOR EACH DEVICE SHALL BE GALVANIZED STEEL. PAINT ALL FIRE ALARM CONDUITS AND JUNCTION BOXES RED.

COORDINATE LOCATIONS WITH FIRE PROTECTION EQUIPMENT.

SEE THE FIRE ALARM SYSTEM INTERCONNECT DIAGRAM FOR ADDITIONAL INFORMATION.

(38) PROPOSED FLOOD ALARM XA-1-1 FURNISHED BY THE SYSTEM INTEGRATOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE FLOOD ALARM (WATERBUG) AT THE LOCATION SHOWN ON THE PLANS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 4 #14 CONDUCTORS & 1 #14 GROUND FROM THE DEVICE TO SCADA CONTROL PANEL. NOTE THE DEVICE IS 24 VOLTS DC AND REQUIRES A POWER SUPPLY FOR PROPER OPERATION. TWO CONDUCTORS ARE REQUIRED FOR POWER AND TWO CONDUCTORS ARE REQUIRED FOR MONITORING.

(39) PROPOSED FLOOD ALARM XA-1-2 FURNISHED BY THE SYSTEM INTEGRATOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE FLOOD ALARM (WATERBUG) AT THE LOCATION SHOWN ON THE PLANS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 4 #14 CONDUCTORS & 1 #14 GROUND FROM THE DEVICE TO SCADA CONTROL PANEL. NOTE THE DEVICE IS 24 VOLTS DC AND REQUIRES A POWER SUPPLY FOR PROPER OPERATION. TWO CONDUCTORS ARE REQUIRED FOR POWER AND TWO CONDUCTORS ARE REQUIRED FOR MONITORING.

(40) PROPOSED FLUORIDE ROOM LOW TEMPERATURE THERMOSTAT TEL-1-1 FURNISHED BY THE SYSTEM INTEGRATOR.

THE THERMOSTAT SHALL BE INSTALLED AND WIRED TO THE SCADA CONTROL PANEL BY ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE THERMOSTAT IN THE FLUORIDE ROOM AT 48 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE.

SEE SPECIFICATIONS FOR THE REQUIRED THERMOSTAT.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #14 & 1 #14 GROUND TO THE SCADA CONTROL PANEL FROM THE THERMOSTAT.

(41) PROPOSED CHLORINE ROOM LOW TEMPERATURE THERMOSTAT TEL-2-1 FURNISHED BY THE SYSTEM INTEGRATOR.

THE THERMOSTAT SHALL BE INSTALLED AND WIRED TO THE SCADA CONTROL PANEL BY ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE THERMOSTAT IN THE CHLORINE ROOM AT 48 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE.

SEE SPECIFICATIONS FOR THE REQUIRED THERMOSTAT.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #14 & 1 #14 GROUND TO THE SCADA CONTROL PANEL FROM THE THERMOSTAT.

(42) PROPOSED FLOW ELEMENT FE-1-1 AND FLOW TRANSMITTER FIT-1-1 (M-RW-1) FURNISHED BY THE OWNER.

THE FLOW ELEMENT SHALL BE INSTALLED BY THE PROCESS CONTRACTOR AND THE FLOW TRANSMITTER FIT-1-1 INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR AT 54 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE TWO (2) 1 INCH CONDUITS FROM THE FLOW ELEMENT TO THE FLOW TRANSMITTER FOR THE SIGNAL AND COIL WIRING. COORDINATE EXACT WIRING WITH MANUFACTURER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #23 TO THE FLOW TRANSMITTER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE TRANSMITTER FIT-1-1 TO THE SCADA CONTROL PANEL WITH SHIELDED 6/C CABLE USING BLACK AND RED FOR THE ANALOG (4/20MA) SIGNAL AND GREEN/YELLOW FOR THE PULSE SIGNAL (TAPE OFF THIRD PAIR) FOR MONITORING INSTANTANEOUS FLOW AND TOTALIZED FLOW.

ALL FLOW METER CABLE LENGTHS SHALL BE FIELD VERIFIED BY THE ENGINEER AND OWNER DURING SHOP DRAWING REVIEW.

(43) PROPOSED FLOW ELEMENT FE-4-1 AND FLOW TRANSMITTER FIT-4-1 (M-BWW-1) FURNISHED BY THE OWNER.

THE FLOW ELEMENT SHALL BE INSTALLED BY THE PROCESS CONTRACTOR AND THE FLOW TRANSMITTER FIT-4-1 INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR AT 54 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE TWO (2) 1 INCH CONDUITS FROM THE FLOW ELEMENT TO THE FLOW TRANSMITTER FOR THE SIGNAL AND COIL WIRING. COORDINATE EXACT WIRING WITH MANUFACTURER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #24 TO THE FLOW TRANSMITTER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE TRANSMITTER FIT-4-1 TO THE SCADA CONTROL PANEL WITH SHIELDED 6/C CABLE USING BLACK AND RED FOR THE ANALOG (4/20MA) SIGNAL AND GREEN/YELLOW FOR THE PULSE SIGNAL (TAPE OFF THIRD PAIR) FOR MONITORING INSTANTANEOUS FLOW AND TOTALIZED FLOW.

ALL FLOW METER CABLE LENGTHS SHALL BE FIELD VERIFIED BY THE ENGINEER AND OWNER DURING SHOP DRAWING REVIEW.

(44) PROPOSED FLOW ELEMENT FE-3-1 (M-BW-1) AND FLOW TRANSMITTER FIT-3-1 FURNISHED BY THE OWNER.

THE FLOW ELEMENT SHALL BE INSTALLED BY THE PROCESS CONTRACTOR AND THE FLOW TRANSMITTER FIT-3-1 INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR AT 54 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE TWO (2) 1 INCH CONDUITS FROM THE FLOW ELEMENT TO THE FLOW TRANSMITTER FOR THE SIGNAL AND COIL WIRING. COORDINATE EXACT WIRING WITH MANUFACTURER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #22 TO THE FLOW TRANSMITTER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE TRANSMITTER FIT-3-1 TO THE SCADA CONTROL PANEL WITH SHIELDED 6/C CABLE USING BLACK AND RED FOR THE ANALOG (4/20MA) SIGNAL AND GREEN/YELLOW FOR THE PULSE SIGNAL (TAPE OFF THIRD PAIR) FOR MONITORING INSTANTANEOUS FLOW AND TOTALIZED FLOW.

ALL FLOW METER CABLE LENGTHS SHALL BE FIELD VERIFIED BY THE ENGINEER AND OWNER DURING SHOP DRAWING REVIEW.

(45) PROPOSED FLOW ELEMENT FE-6-1 AND FLOW TRANSMITTER FIT-6-1 FURNISHED BY THE OWNER.

THE FLOW ELEMENT SHALL BE INSTALLED BY THE PROCESS CONTRACTOR AND THE FLOW TRANSMITTER FIT-3-1 INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR AT 54 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE TWO (2) 1 INCH CONDUITS FROM THE FLOW ELEMENT TO THE FLOW TRANSMITTER FOR THE SIGNAL AND COIL WIRING. COORDINATE EXACT WIRING WITH MANUFACTURER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L-2, CKT #9 TO THE FLOW TRANSMITTER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE TRANSMITTER FIT-3-1 TO THE SCADA CONTROL PANEL WITH TWO (2) 2/C #18 TWISTED SHIELDED CABLES FOR MONITORING INSTANTANEOUS FLOW AND TOTALIZED FLOW.

(46) PROPOSED CORD AND PLUG CONNECTED CHLORINE ANALYZER QIT-1-1 AND A CORD AND PLUG CONNECTED (BY ELECTRICAL CONTRACTOR) SOLENOID VALVE SV-12-1 INSTALLED BY THE PROCESS CONTRACTOR. FIELD VERIFY FINAL LOCATIONS OF EQUIPMENT WITH PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE RECEPTACLE AND ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT #12 FOR THE ANALYZER AND VALVE RECEPTACLES.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 4 #14 CONDUCTORS AND 1 #14 GROUND FROM CHLORINE ANALYZER TO THE SCADA CONTROL PANEL FOR MONITORING CHLORINE ALARMS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH A 4/C #18 AWG TWISTED SHIELDED CABLE FROM THE CHLORINE ANALYZER TO THE SCADA CONTROL PANEL FOR MONITORING CHLORINE LEVELS.

(47) PROPOSED CORD AND PLUG CONNECTED (BY THE ELECTRICAL CONTRACTOR) CHLORINE ANALYZER QIT-2-1 AND SOLENOID VALVE SV-13-1 INSTALLED BY THE PROCESS CONTRACTOR. FIELD VERIFY FINAL LOCATIONS OF EQUIPMENT WITH PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE RECEPTACLE AND ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L2, CKT #34 FOR THE ANALYZER AND VALVE RECEPTACLES.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 4 #14 CONDUCTORS AND 1 #14 GROUND FROM CHLORINE ANALYZER TO THE SCADA CONTROL PANEL FOR MONITORING CHLORINE ALARMS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT FROM THE CHLORINE ANALYZER TO CONTROL PANEL AND ROUTE A 4/C #18 AWG TWISTED SHIELDED CABLE TO THE SCADA CONTROL PANEL FOR MONITORING CHLORINE LEVELS.

(48) PROPOSED 12 INCH SQUARE X 6 INCH DEEP NEMA 12 PULL BOX WITH TERMINAL BLOCKS MOUNTED 36 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE FOR WATER STORAGE TANK PRESSURE TRANSDUCER LE-1-1 IN THE WATER STORAGE TANK.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 2 INCH CONDUIT WITH 2 PAIR #16 AWG TWISTED SHIELDED CABLE FROM THE JUNCTION BOX LOCATED AT THE WATER STORAGE TANK TO THIS JUNCTION BOX AND TERMINATE AS REQUIRED.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT FROM THIS JUNCTION BOX TO THE SCADA CONTROL PANEL AND INSTALL AND TERMINATE THE 2 PAIR #16 AWG TWISTED SHIELDED CABLE AT BOTH LOCATIONS. ROUTE ALL WIRING THROUGH HAND HOLES NO.1 AND NO.2 AS SHOWN ON THE PLANS.

(49) PROPOSED 12 INCH SQUARE X 6 INCH DEEP NEMA 12 PULL BOX WITH TERMINAL BLOCKS MOUNTED 36 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE FOR RESERVOIR FLOATS FSL-1-1, FSH-1-1 AND FLOAT SWITCH FSHH-1-1 AND HATCH INTRUSION SWITCH ZX-1- 1 ON THE WATER STORAGE TANK.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 2 INCH CONDUIT WITH 10 #12 CONDUCTORS FOR HATCH INTRUSION SWITCHES AND FLOATS, 4 #12 SPARE, 1 #12 GROUND FROM THE JUNCTION BOX LOCATED AT THE WATER STORAGE TANK TO THIS JUNCTION BOX AND TERMINATE AS REQUIRED.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT FROM THIS JUNCTION BOX TO THE SCADA CONTROL PANEL AND INSTALL AND TERMINATE THE 10 #12 CONDUCTORS, 4 #12 SPARE, 1 #12 GROUND AT BOTH LOCATIONS. ROUTE ALL WIRING THROUGH HAND HOLES NO.1 AND NO.2 AS SHOWN ON THE PLANS.

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SEH

Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson Inc. @ (SEH)

SHEET TITLE
PROPOSED POWER AND SYSTEMS PLAN KEYED NOTES

SHEET
E11

H:\PROJECTS\2284 - Madison Well No.31\2016 Redesign\Powrtek\E8_E15 - Proposed Plan and Keyed Notes.dwg, 1/20/2017 2:28:49 PM

PROPOSED POWER, SYSTEMS AND INSTRUMENTATION PLAN KEYED NOTES:

(50) PROPOSED FLOW ELEMENT FE-7-1 AND FLOW TRANSMITTER FIT-7-1 FURNISHED BY THE OWNER.

THE FLOW ELEMENT SHALL BE INSTALLED BY THE PROCESS CONTRACTOR AND THE FLOW TRANSMITTER FIT-6-1 INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR AT 54 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE TWO (2) 1 INCH CONDUITS FROM THE FLOW ELEMENT TO THE FLOW TRANSMITTER FOR THE SIGNAL AND COIL WIRING. COORDINATE EXACT WIRING WITH MANUFACTURER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L-2, CKT #17 TO THE FLOW TRANSMITTER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE TRANSMITTER FIT-2-1 TO THE SCADA CONTROL PANEL WITH TWO (2) 2/C #18 TWISTED SHIELDED CABLES FOR MONITORING INSTANTANEOUS FLOW AND TOTALIZED FLOW.

(51) PROPOSED 24 INCH SQUARE 3/4 INCH PAINTED PLYWOOD BACKBOARD FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR FOR THE TELEPHONE AND INTERNET COMPANY(S) TO INSTALL TELPHONE/INTERNET PUNCHBLOCKS. THE ELECTRICAL CONTRACTOR SHALL ROUTE THE 2 INCH CONDUIT UNDERGROUND 5 FEET FROM BUILDING AND EXTEND UP TO 12 INCHES AFF. CAP ABOVE AND BELOW GRADE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH A GREEN INSULATED GROUND FROM THE MCC-1A BUSSING TO THE PUNCHBLOCK AREA, LEAVING 36 INCHES OF SLACK CONDUCTOR FOR THE TELEPHONE COMPANIES TO TERMINATE ON THEIR EQUIPMENT.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH CATEGORY 6 CABLE TO EACH DATA JACK LOCATED ON THE BOARD AND TERMINATE AT EACH.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH CATEGORY 6 CABLE TO THE SCADA CONTROL PANEL FOR THE SYSTEM INTEGRATOR TO INSTALL ON THE DATA JACK LOCATED IN THE SCADA CONTROL PANEL FOR FUTURE USE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L1, CKT #41 TO THE RECEPTACLE FOR TELEPHONE COMPANY USE.

(52) PROPOSED CEILING FANS CF-1, CF-2, CF-3 AND CF-4, FURNISHED, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR.

THE FANS SHALL BE INDUSTRIAL GRADE TYPES MANUFACTURED BY ENVIRO FAN CATALOG NUMBER GOLD LINE 160C-7 WITH MODEL NUMBER 150F INFINITE SPEED CONTROL, NO APPROVED EQUAL. THE MANUFACTURER'S PHONE NUMBER IS (800) 236-7080.

THE FANS SHALL BE MOUNTED TO THE CEILING WITH THE PROPER JUNCTION BOXES PER THE MANUFACTURER.

THE ELECTRICAL CONTRACTOR SHALL INSTALL AND WIRE CEILING FANS TO THE SPEED CONTROL SWITCH FSC-1 AS SHOWN ON THE PLANS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH SCHEDULE 80 PVC CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO THE SPEED CONTROLLER AND FANS FROM PANELBOARD L1, CKT #20.

(53) PROPOSED GAS WATER HEATER WH-1 FURNISHED AND INSTALLED BY PLUMBING CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A SINGLE POLE, 20 AMP RATED DISCONNECT SWITCH AND ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS & 1 #12 GROUND TO THE DISCONNECT SWITCH FROM PANELBOARD L1, CKT #22.

THE ELECTRICAL CONTRACTOR SHALL THE DISCONNECT SWITCH NEAR THE UNIT AND ROUTE A 3/4 INCH LIQUID-TIGHT FLEXIBLE METAL CONDUIT WITH 2 #12 CONDUCTORS & 1 #12 GROUND TO THE UNIT.

(54) PROPOSED GAS WATER HEATER WH-2 FURNISHED AND INSTALLED BY PLUMBING CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A SINGLE POLE, 20 AMP RATED DISCONNECT SWITCH AND ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS & 1 #12 GROUND TO THE DISCONNECT SWITCH FROM PANELBOARD L1, CKT #22, SAME AS FOR WH-1.

THE ELECTRICAL CONTRACTOR SHALL THE DISCONNECT SWITCH NEAR THE UNIT AND ROUTE A 3/4 INCH LIQUID-TIGHT FLEXIBLE METAL CONDUIT WITH 2 #12 CONDUCTORS & 1 #12 GROUND TO THE UNIT.

(55) PROPOSED RECIRCULATION PUMP P-1, FURNISHED AND INSTALLED BY PLUMBING CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A SINGLE POLE, 20 AMP RATED DISCONNECT SWITCH AND ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS & 1 #12 GROUND TO THE DISCONNECT SWITCH FROM PANELBOARD L1, CKT #24.

THE ELECTRICAL CONTRACTOR SHALL THE DISCONNECT SWITCH NEAR THE PUMP AND ROUTE A 3/4 INCH LIQUID-TIGHT FLEXIBLE METAL CONDUIT WITH 2 #12 CONDUCTORS & 1 #12 GROUND TO THE PUMP.

(56) PROPOSED GAS UNIT HEATER UH-1 FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A NON-FUSED DISCONNECT SWITCH ON THE GAS UNIT HEATER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO THE DISCONNECT SWITCH AND FROM THE DISCONNECT SWITCH TO THE GAS UNIT HEATER WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT #26.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE GAS UNIT HEATER TO THE THERMOSTAT LOCATION SHOWN ON THE MECHANICAL DRAWINGS FOR THE HVAC CONTRACTOR TO FURNISH, INSTALL AND WIRE THE THERMOSTAT CONTROL.

(57) PROPOSED GAS UNIT HEATER UH-2 FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A NON-FUSED DISCONNECT SWITCH ON THE GAS UNIT HEATER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO THE DISCONNECT SWITCH AND FROM THE DISCONNECT SWITCH TO THE GAS UNIT HEATER WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT #26.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE GAS UNIT HEATER TO THE THERMOSTAT LOCATION SHOWN ON THE MECHANICAL DRAWINGS FOR THE HVAC CONTRACTOR TO FURNISH, INSTALL AND WIRE THE THERMOSTAT CONTROL.

(58) PROPOSED GAS UNIT HEATER UH-3 FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A NON-FUSED DISCONNECT SWITCH ON THE GAS UNIT HEATER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO THE DISCONNECT SWITCH AND FROM THE DISCONNECT SWITCH TO THE GAS UNIT HEATER WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT#26.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE GAS UNIT HEATER TO THE THERMOSTAT LOCATION SHOWN ON THE MECHANICAL DRAWINGS FOR THE HVAC CONTRACTOR TO FURNISH, INSTALL AND WIRE THE THERMOSTAT CONTROL.

(59) PROPOSED CORD AND PLUG CONNECTED DEHUMIDIFIER D-1 LOCATED IN THE PUMP ROOM SHALL BE FURNISHED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 20 AMP, 120 VOLT YELLOW CORROSION RESISTANT RECEPTACLE LOCATED ON THE WALL FOR THE HI-E DRY DEHUMIDIFIER. THE RECEPTACLE SHALL BE MOUNTED 36 INCHES ABOVE FINISHED FLOOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO THE RECEPTACLE FROM PANELBOARD L1, CKT #28.

(60) PROPOSED CORD AND PLUG CONNECTED DEHUMIDIFIER D-2 LOCATED IN THE BACKWASH TANK ROOM SHALL BE FURNISHED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 20 AMP, 120 VOLT YELLOW CORROSION RESISTANT RECEPTACLE LOCATED ON THE WALL FOR THE HI-E DRY DEHUMIDIFIER. THE RECEPTACLE SHALL BE MOUNTED 36 INCHES ABOVE FINISHED FLOOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO THE RECEPTACLE FROM PANELBOARD L1, CKT #30.

(61) PROPOSED CORD AND PLUG CONNECTED DEHUMIDIFIER D-3 LOCATED IN THE MECHANICAL ROOM SHALL BE FURNISHED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 20 AMP, 120 VOLT YELLOW CORROSION RESISTANT RECEPTACLE LOCATED ON THE WALL FOR THE HI-E DRY DEHUMIDIFIER. THE RECEPTACLE SHALL BE MOUNTED 36 INCHES ABOVE FINISHED FLOOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO THE RECEPTACLE FROM PANELBOARD L1, CKT #32.

(62) PROPOSED ELECTRIC UNIT HEATER EH-1 WITH INTEGRAL THERMOSTAT FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A NEMA 4X STAINLESS STEEL 480 VOLT, 3 PHASE, 3 POLE DISCONNECT SWITCH NEAR THE HEATER AND ROUTE CONDUIT AND WIRING SHOWN ON THE ONE-LINE DIAGRAM FROM MCC-1B. THE DISCONNECT SWITCH SHALL BE SURFACE MOUNTED.

THE ELECTRICAL CONTRACTOR SHALL ROUTE LIQUID-TIGHT FLEXIBLE METAL CONDUIT FROM THE DISCONNECT SWITCH TO WITHIN 18 INCHES OF THE UNIT HEATER.

(63) PROPOSED ELECTRIC UNIT HEATER EH-2 WITH INTEGRAL THERMOSTAT FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A NEMA 4X STAINLESS STEEL 480 VOLT, 3 PHASE, 3 POLE DISCONNECT SWITCH NEAR THE HEATER AND ROUTE CONDUIT AND WIRING SHOWN ON THE ONE-LINE DIAGRAM FROM MCC-1B. THE DISCONNECT SWITCH SHALL BE SURFACE MOUNTED.

THE ELECTRICAL CONTRACTOR SHALL ROUTE LIQUID-TIGHT FLEXIBLE METAL CONDUIT FROM THE DISCONNECT SWITCH TO WITHIN 18 INCHES OF THE UNIT HEATER.

(64) PROPOSED BUILDING LOW TEMPERATURE THERMOSTAT TEL-3-1 FURNISHED BY THE SYSTEM INTEGRATOR.

THE THERMOSTAT SHALL BE INSTALLED AND WIRED TO THE SCADA CONTROL PANEL BY ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE THERMOSTAT IN THE DEEP WELL PUMP ROOM AT 48 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE.

SEE SPECIFICATIONS FOR THE REQUIRED THERMOSTAT.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #14 & 1 #14 GROUND TO THE SCADA CONTROL PANEL FROM THE THERMOSTAT.

(65) PROPOSED EXHAUST FAN EF-5 FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE LIGHT SWITCH SHOWN ON THE LIGHTING PLANS AND ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO THE EXHAUST FAN FROM THE SWITCH AND 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND PANELBOARD L1, CKT #7 TO THE LIGHT SWITCH.

(66) PROPOSED CORD AND PLUG CONNECTED CHLORINE CHEMICAL WEIGHT SCALE WE-1-1/WE-1-2/WIT-1-1/WIT-1-2 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO (2) 2/C #18AWG TWISTED SHIELDED CABLE FROM THE SCALE CONTROLLER TO THE SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 20 AMP RATED CORROSION RESISTANT RECEPTACLE APPROXIMATELY 48 INCHES ABOVE FINISHED FLOOR TO POWER THE WEIGHT SCALE. THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT #8.

(67) PROPOSED CHLORINE SHUT DOWN CONTROL PANEL WITH SOLENOID VALVES SV-14-1 AND SV-14-2 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANEL L2, CKT #25 TO THE CHLORINE SHUT DOWN CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A DUPLEX RECEPTACLE FOR EACH SOLENOID VALVE AND CORD AND PLUG ON EACH SOLENOID VALVE WIRED TO THE CHLORINE SHUT DOWN CONTROL PANEL. COORDINATE THE INSTALLATION WITH THE ENGINEER IN THE FIELD.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #14 ALARM CONDUCTORS AND 1 #14 GROUND FROM THE SHUT DOWN CONTROL PANEL TO SCADA CONTROL PANEL GENERATED FROM A SIGNAL AT THE SCADA CONTROL PANEL INITIATED BY THE CHLORINE GAS DETECTOR.

(68) PROPOSED GAS DETECTION VISUAL AND AUDIBLE ALARM DEVICES FURNISHED BY THE SYSTEM INTEGRATOR, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR.

THE VISUAL DEVICE SHALL BE EDWARDS SIGNALING CATALOG NUMBER 107XBRBMR24D, NO APPROVED EQUAL. THE DEVICE SHALL INCLUDE AN INTEGRAL WALL BRACKET MOUNT, WITH RED STEADY ON, FIELD ADJUSTABLE TO FLASHING AT 65 FLASHES PER MINUTE, 120 VOLT, RATED NEMA 3R, TYPE 4 AND HAZARDOUS LOCATION RATED AND UL LISTED. THE UNIT SHALL BE MOUNTED 10 FEET AFG AT THE LOCATION SHOWN ON THE PLANS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 ALARM CONDUCTORS AND 1 #12 GROUND FROM THE GAS DETECTION CONTROL PANEL TO THE SIGNALING DEVICE AND WIRE TO ONE SET OF ALARM CONTACTS IN THE CONTROL PANEL.

THE AUDIBLE DEVICE SHALL BE EDWARDS SIGNALING CATALOG NUMBER 870P-N5, NO APPROVED EQUAL. THE DEVICE SHALL BE SEMI-FLUSH MOUNTED INTO A WALL BOX AND SHALL BE RATED NEMA 3R, TYPE 4 AND 4X RATED AND 120 VOLT POWERED WITH AN ADJUSTABLE RANGE OF 88 TO 113 Db @ 10 FEET. THE UNIT SHALL BE MOUNTED 10 FEET AFG AT THE LOCATION SHOWN ON THE PLANS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 ALARM CONDUCTORS AND 1 #12 GROUND FROM THE GAS DETECTION CONTROL PANEL TO THE SIGNALING DEVICE AND WIRE TO THE SAME SET OF ALARM CONTACTS IN THE CONTROL PANEL.

BOTH DEVICES SHALL BE LOCATED WITH IN 12 INCHES OF EACH OTHER.

(69) PROPOSED CORD AND PLUG CONNECTED FLUORIDE CHEMICAL WEIGHT SCALE WE-2-1/WIT-2-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO (2) 2/C #18 AWG TWISTED SHIELDED CABLE FROM THE SCALE CONTROLLER TO THE SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 20 AMP RATED CORROSION RESISTANT RECEPTACLE WITH GASKETED COVER PLATE APPROXIMATELY 48 INCHES ABOVE FINISHED FLOOR TO POWER THE WEIGHT SCALE. THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT #6.

(70) PROPOSED CORD AND PLUG CONNECTED FLUORIDE PUMP FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A CORROSION RESISTANT RECEPTACLE ON THE WALL WITH GASKETED COVER PLATE.

THE PUMP IS 120 VOLT (CORD & PLUG CONNECTED).

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANEL L1, CKT #29. THE ELECTRICAL CONTRACTOR SHALL MOUNT THE RECEPTACLE 42 INCHES AFF. THE RECEPTACLE WIRING SHALL BE ROUTED THROUGH THE SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO (2) 2/C #18 AWG TWISTED SHIELDED PAIR CABLES, ONE FOR PACING AND ONE FOR VERIFICATION OF SPEED TO THE SCADA CONTROL PANEL. (IF NOT USED, TAPE OFF IN JUNCTION BOX).

(71) PROPOSED CHLORINE GAS DETECTOR TRANSMITTER/GAS ELEMENT AND GAS DETECTION CONTROL PANEL WITH AUTO SHUT-OFF FURNISHED BY THE PROCESS CONTRACTOR AND INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR.

THE CHLORINE GAS DETECTOR TRANSMITTER/GAS ELEMENT SHALL BE MOUNTED SUCH THAT THE SENSOR IS 12 INCHES AFF AND THE GAS DETECTION CONTROL PANEL IS MOUNTED 60 INCHES AFF, MEASURED TO TOP OF ENCLOSURE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L1, CKT #10 TO THE GAS DETECTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO (2) 2/C #18 AWG TWISTED SHIELDED PAIR CABLE FROM THE GAS DETECTION CONTROL PANEL TO THE GAS DETECTOR TRANSMITTER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 4 #14 CONTROL CONDUCTORS, 2 #14 SPARE AND 1 #14 GROUND FROM THE GAS DETECTION CONTROL PANEL TO THE SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT FROM THE GAS DETECTOR TO THE SCADA CONTROL PANEL WITH TWO (2) 2/C #18 TWISTED SHIELDED CABLES FOR MONITORING CHLORINE GAS LEVELS.

(72) PROPOSED CHLORINE ROOM EXHAUST FAN EF-1 AND MOTORIZED DAMPER MD-5 SHALL BE FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 120 VOLT, 1 POLE, CORROSION RESISTANT EXHAUST FAN MANUAL STARTER ON THE WALL NEAR THE FAN TO OPERATE THE FAN MANUALLY.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT #34 TO THE MANUAL STARTER AND THEN TO THE EXHAUST FAN MANUAL SWITCH WITH LIQUID-TIGHT FLEXIBLE METAL CONDUIT.

(73) PROPOSED CHLORINE ROOM EXHAUST FAN EF-2 AND MOTORIZED DAMPERS MD-1 AND MD-2 SHALL BE FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

PROPOSED DOOR SWITCHES AND LIGHT AND EXHAUST FAN PUSHBUTTON STATIONS FURNISHED BY THE SYSTEM INTEGRATOR AND INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR.

THE CHLORINE ROOM EXHAUST FAN AND DAMPER SHALL BE CONTROLLED BY THE CHLORINE LIGHTING AND EXHAUST FAN CONTROL PANEL FURNISHED BY THE SYSTEM INTEGRATOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE CHLORINE ROOM LIGHTING AND EXHAUST FAN CONTROL PANEL TO CONTROL THE EXHAUST FAN, ROOM LIGHTS AND DAMPERS FROM THE PUSHBUTTON STATIONS SHOWN IN THE CHLORINE ROOM.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM THE CHLORINE ROOM LIGHTING AND EXHAUST FAN CONTROL PANEL TO THE EXHAUST FAN DISCONNECT SWITCH AND MOTORIZED DAMPERS FROM PANELBOARD L1, CKT #9.

THE ELECTRICAL CONTRACTOR SHALL ROUTE THE REQUIRED CONDUIT AND WIRING SHOWN ON THE SYSTEM INTEGRATOR'S CONTROL DIAGRAMS LISTED IN THE SHOP DRAWINGS. ALL CONTROL WIRING SHALL BE #14 AWG THWN STRANDED COPPER.

THE WIRING SHALL BE TERMINATED ON TERMINAL BLOCKS IN THE CHLORINE ROOM LIGHTING AND EXHAUST FAN CONTROL PANEL WITH ALL THE OTHER WIRING ENTERING OR LEAVING THE ENCLOSURE.

SEE THE CONTROL DIAGRAM FOR ADDITIONAL INFORMATION.

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc. @ (SEH)

SHEET TITLE
PROPOSED POWER AND SYSTEMS PLAN KEYED NOTES

SHEET
E12

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PROPOSED POWER, SYSTEMS AND INSTRUMENTATION PLAN KEYED NOTES:

74 PROPOSED FLOW ELEMENT FE-2-1 (M-RC-1) AND FLOW TRANSMITTER FIT-2-1 FURNISHED BY THE OWNER.

THE FLOW ELEMENT SHALL BE INSTALLED BY THE PROCESS CONTRACTOR AND THE FLOW TRANSMITTER FIT-2-1 INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR AT 54 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE TWO (2) 1 INCH CONDUITS FROM THE FLOW ELEMENT TO THE FLOW TRANSMITTER FOR THE SIGNAL AND COIL WIRING. COORDINATE EXACT WIRING WITH MANUFACTURER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #20 TO THE FLOW TRANSMITTER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE TRANSMITTER FIT-2-1 TO THE SCADA CONTROL PANEL WITH SHIELDED 6/C CABLE USING BLACK AND RED FOR THE ANALOG (4/20MA) SIGNAL AND GREEN/YELLOW FOR THE PULSE SIGNAL (TAPE OFF THIRD PAIR) FOR MONITORING INSTANTANEOUS FLOW AND TOTALIZED FLOW.

75 PROPOSED FLOW ELEMENT FE-5-1 (M-EF-1) AND FLOW TRANSMITTER FIT-5-1 FURNISHED BY THE OWNER.

THE FLOW ELEMENT SHALL BE INSTALLED BY THE PROCESS CONTRACTOR AND THE FLOW TRANSMITTER FIT-5-1 INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR AT 54 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE TWO (2) 1 INCH CONDUITS FROM THE FLOW ELEMENT TO THE FLOW TRANSMITTER FOR THE SIGNAL AND COIL WIRING. COORDINATE EXACT WIRING WITH MANUFACTURER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #26 TO THE FLOW TRANSMITTER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE TRANSMITTER FIT-5-1 TO THE SCADA CONTROL PANEL WITH SHIELDED 6/C CABLE USING BLACK AND RED FOR THE ANALOG (4/20MA) SIGNAL AND GREEN/YELLOW FOR THE PULSE SIGNAL (TAPE OFF THIRD PAIR) FOR MONITORING INSTANTANEOUS FLOW AND TOTALIZED FLOW.

76 PROPOSED FLUORIDE ROOM EXHAUST FAN EF-3 SHALL BE FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 120 VOLT, 1 POLE, CORROSION RESISTANT EXHAUST FAN MANUAL STARTER ON THE WALL NEAR THE FAN TO OPERATE THE FAN MANUALLY.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT #36 TO THE MANUAL STARTER AND THEN TO THE EXHAUST FAN MANUAL SWITCH WITH LIQUID-TIGHT FLEXIBLE METAL CONDUIT.

77 PROPOSED CHEMICAL ROOMS SUPPLY FAN SF-1 AND MD-6 SHALL BE FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 120 VOLT, 1 POLE, SUPPLY FAN MANUAL STARTER ON THE WALL NEAR THE FAN TO OPERATE THE FAN MANUALLY.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT #38 TO THE MANUAL STARTER AND THEN TO THE EXHAUST FAN MANUAL SWITCH WITH LIQUID-TIGHT FLEXIBLE METAL CONDUIT.

78 PROPOSED FUME HOOD EXHAUST FAN EF-6 SHALL BE FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 120 VOLT, 1 POLE, CORROSION RESISTANT EXHAUST FAN MANUAL STARTER ON THE WALL NEAR THE FAN TO OPERATE THE FAN MANUALLY.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT #40 TO THE MANUAL STARTER AND THEN TO THE EXHAUST FAN MANUAL SWITCH WITH LIQUID-TIGHT FLEXIBLE METAL CONDUIT.

79 PROPOSED GAS UNIT HEATER UH-6 FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A NON-FUSED DISCONNECT SWITCH ON THE GAS UNIT HEATER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO THE DISCONNECT SWITCH AND FROM THE DISCONNECT SWITCH TO THE GAS UNIT HEATER WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT #26.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE GAS UNIT HEATER TO THE THERMOSTAT LOCATION SHOWN ON THE MECHANICAL DRAWINGS FOR THE HVAC CONTRACTOR TO FURNISH, INSTALL AND WIRE THE THERMOSTAT CONTROL.

80 PROPOSED GAS UNIT HEATER UH-4 FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A NON-FUSED DISCONNECT SWITCH ON THE GAS UNIT HEATER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO THE DISCONNECT SWITCH AND FROM THE DISCONNECT SWITCH TO THE GAS UNIT HEATER WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L3, CKT#7.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE GAS UNIT HEATER TO THE THERMOSTAT LOCATION SHOWN ON THE MECHANICAL DRAWINGS FOR THE HVAC CONTRACTOR TO FURNISH, INSTALL AND WIRE THE THERMOSTAT CONTROL.

81 PROPOSED GAS UNIT HEATER UH-5 FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A NON-FUSED DISCONNECT SWITCH ON THE GAS UNIT HEATER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO THE DISCONNECT SWITCH AND FROM THE DISCONNECT SWITCH TO THE GAS UNIT HEATER WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L3, CKT #7.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE GAS UNIT HEATER TO THE THERMOSTAT LOCATION SHOWN ON THE MECHANICAL DRAWINGS FOR THE HVAC CONTRACTOR TO FURNISH, INSTALL AND WIRE THE THERMOSTAT CONTROL.

82 PROPOSED RADIANT HEATER RH-1 FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A NON-FUSED DISCONNECT SWITCH ON THE GAS UNIT HEATER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO THE DISCONNECT SWITCH AND FROM THE DISCONNECT SWITCH TO THE GAS UNIT HEATER WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L3, CKT #9.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE GAS UNIT HEATER TO THE THERMOSTAT LOCATION SHOWN ON THE MECHANICAL DRAWINGS FOR THE HVAC CONTRACTOR TO FURNISH, INSTALL AND WIRE THE THERMOSTAT CONTROL.

83 PROPOSED RADIANT HEATER RH-2 FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A NON-FUSED DISCONNECT SWITCH ON THE GAS UNIT HEATER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO THE DISCONNECT SWITCH AND FROM THE DISCONNECT SWITCH TO THE GAS UNIT HEATER WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L3, CKT #9.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FROM THE GAS UNIT HEATER TO THE THERMOSTAT LOCATION SHOWN ON THE MECHANICAL DRAWINGS FOR THE HVAC CONTRACTOR TO FURNISH, INSTALL AND WIRE THE THERMOSTAT CONTROL.

84 PROPOSED ELECTRIC UNIT HEATER EUH-3 WITH AN INTEGRAL DISCONNECT SWITCH AND THERMOSTAT FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO THE HEATER'S DISCONNECT AND ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L2, CKT'S #8 & 10.

85 PROPOSED ELECTRIC DUCT HEATER EDH-1 AND CONTROL PANEL FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A NON-FUSED DISCONNECT SWITCH ON OR NEAR THE DUCT.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO THE DISCONNECT SWITCH AND FROM THE DISCONNECT SWITCH TO THE ELECTRIC DUCT HEATER WITH 3 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L2, CKT'S #2, 4 & 6.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL 3/4 INCH CONDUITS FOR CONTROL WIRING FROM THE AIR FLOW SWITCH(S) AND THE TEMPERATURE CONTROLLER LOCATED ON OR NEAR THE EQUIPMENT. THE CONTROL WIRING WILL BE FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT #42 FOR CONTROL POWER.

86 PROPOSED MAU-1, MAU-1 CONTROL PANEL, MOTORIZED DAMPER MD-4 WITH GAS MONITOR CONTROL PANEL AND NOX SENSORS NO2-1-1, NO2-2-1 AND CO SENSORS CO-1-1 AND CO-2-1 FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A NEMA 4X STAINLESS STEEL 480 VOLT, 3 PHASE, 3 POLE DISCONNECT SWITCH NEAR MAU-1 AND ROUTE CONDUIT AND WIRING SHOWN ON THE ONE-LINE DIAGRAM FROM MCC-1B. THE DISCONNECT SWITCH SHALL BE SURFACE MOUNTED.

THE ELECTRICAL CONTRACTOR SHALL ROUTE LIQUID-TIGHT FLEXIBLE METAL CONDUIT FROM THE DISCONNECT SWITCH TO WITHIN 18 INCHES OF MAU-1.

THE MAU-1 CONTROL PANEL SHALL BE MOUNTED NEAR THE UNIT AND THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L3, CKT #11 FOR POWER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #14 CONDUCTORS, 2 #14 SPARES AND 1 #14 GROUND FROM THE GAS MONITOR CONTROL PANEL TO EACH NOX AND CO SENSOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L3, CKT #13 TO THE GAS MONITOR CONTROL PANEL FOR POWER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #14 CONDUCTORS, 6 #14 SPARE AND 1 #14 GROUND FROM THE GAS MONITOR CONTROL PANEL TO THE MAU-1 CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM MAU-1 CONTROL PANEL TO MOTORIZED DAMPER MD-4.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #14 CONDUCTORS AND 1 #14 GROUND FROM MAU-1 CONTROL PANEL TO EXHAUST FAN EF-4 AND MOTORIZED DAMPER MD-3 PER KEYED NOTE 87 BELOW.

THE STARTER FOR MAU-1 IS LOCATED IN MCC-1B, THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONTROL CONDUCTORS TO POWER THE 120 VOLT COIL AND 2 #14 CONDUCTORS FOR MONITORING FAILURE FROM MAU-1, 4 #14 SPARE CONDUCTORS AND 1 #14 GROUND.

87 PROPOSED ROOM EXHAUST FAN EF-4 AND MOTORIZED DAMPER MD-3 SHALL BE FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 240 VOLT, 2 POLE 30 AMP NEMA 4X STAINLESS STEEL MOTOR STARTER AND MOUNT ON THE WALL AS SHOWN. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A NEMA 4X STAINLESS 240 VOLT, 30 AMP, 2 POLE NEMA 4X STAINLESS STEEL MOTOR STARTER ON THE WALL NEAR THE DISCONNECT SWITCH TO OPERATE THE FAN REMOTELY FROM MAU-1 CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L3, CKT #15 TO THE DISCONNECT SWITCH AND THEN TO THE STARTER UP TO THE EXHAUST FAN AND MOTORIZED DAMPER AND CONNECT WITH LIQUID-TIGHT FLEXIBLE METAL CONDUIT WITHIN 18 INCHES OF EACH MOTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #14 CONDUCTORS AND 1 #14 GROUND FROM MAU-1 CONTROL PANEL TO CONTROL THE STARTER. VERIFY THE STARTER COIL VOLTAGE WITH THE HVAC CONTRACTOR.

SEE KEYED NOTE 86 ABOVE.

88 PROPOSED AIR HANDLER UNIT AHU-1 AND WALL MOUNTED AHU-1 CONTROL PANEL, FURNISHED AND INSTALLED BY THE HVAC CONTRACTOR.

THE STARTER AND DISCONNECT SWITCH FOR AHU-1 IS LOCATED IN MCC-1B. THE ELECTRICAL CONTRACTOR SHALL INSTALL A NEMA 12 PAINTED STEEL 480 VOLT, 3 PHASE, 3 POLE DISCONNECT SWITCH NEAR AHU-1 AND ROUTE CONDUIT AND WIRING SHOWN ON THE ONE-LINE DIAGRAM FROM MCC-1B. THE DISCONNECT SWITCH SHALL BE SURFACE MOUNTED.

THE ELECTRICAL CONTRACTOR SHALL ROUTE LIQUID-TIGHT FLEXIBLE METAL CONDUIT FROM MCC-1B DISCONNECT SWITCH TO WITHIN 18 INCHES OF AHU-1.

THE VFD FOR AHU-1 IS LOCATED IN MCC-1B, THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONTROL CONDUCTORS TO POWER THE 120 VOLT COIL AND 2 #14 CONDUCTORS FOR MONITORING FAILURE FROM AHU-1, 4 #14 SPARE CONDUCTORS AND 1 #14 GROUND.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4" CONDUIT FROM AHU-1 CONTROL PANEL WITH 4 #12 CONDUCTORS, (4 #12 SPARE) AND 1 #12 GROUND FOR POWER AND CONTROL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4" CONDUIT FROM THE FACP WITH 2#14 CONDUCTORS AND 1#14 GROUND TO THE VFD FOR THE PERMISSIVE SIGNAL TO OPERATE.

89 PROPOSED CORROSION RESISTANT GFI PROTECTED RECEPTACLES LOCATED IN THE STORAGE BUILDING.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE RECEPTACLES 36 INCHES AFF, MEASURED TO TOP OF BOX. PROVIDE GASKETED COVER PLATE FOR EACH RECEPTACLE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L3, CKT #2 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L3 IS A GFI TYPE.

ALL INTERIOR RECEPTACLES SHALL INCLUDE A STAINLESS STEEL COVER.

90 PROPOSED CORROSION RESISTANT GFI PROTECTED RECEPTACLES LOCATED IN THE STORAGE BUILDING.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE RECEPTACLES 36 INCHES AFF, MEASURED TO TOP OF BOX. PROVIDE GASKETED COVER PLATE FOR EACH RECEPTACLE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L3, CKT #4 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L3 IS A GFI TYPE.

ALL INTERIOR RECEPTACLES SHALL INCLUDE A STAINLESS STEEL COVER.

91 PROPOSED CORROSION RESISTANT GFI PROTECTED RECEPTACLES LOCATED IN THE STORAGE BUILDING.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE RECEPTACLES 36 INCHES AFF, MEASURED TO TOP OF BOX. PROVIDE GASKETED COVER PLATE FOR EACH RECEPTACLE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L3, CKT #6 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L3 IS A GFI TYPE.

ALL INTERIOR RECEPTACLES SHALL INCLUDE A STAINLESS STEEL COVER.

92 PROPOSED CORROSION RESISTANT GFI PROTECTED RECEPTACLES LOCATED IN THE STORAGE BUILDING.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE RECEPTACLES 36 INCHES AFF, MEASURED TO TOP OF BOX. PROVIDE GASKETED COVER PLATE FOR EACH RECEPTACLE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L3, CKT #8 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L3 IS A GFI TYPE.

ALL INTERIOR RECEPTACLES SHALL INCLUDE A STAINLESS STEEL COVER.

93 PROPOSED FUSIBLE DISCONNECT SWITCH AND FLUSH MOUNTED BACKBOX WITH WEATHERPROOF COVER FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A 30 AMP, 480 VOLT, 3 POLE, FUSED NEMA 4X DISCONNECT SWITCH ON THE WALL AT 48 INCHES AFF AND THE BACK BOX BELOW THE DISCONNECT SWITCH FOR THE FUTURE RECEPTACLE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE THE CONDUIT FROM MCC-1B TO THE DISCONNECT SWITCH AS SHOWN ON THE ONE-LINE DIAGRAM.

94 PROPOSED FLUSH MOUNTED BACKBOX WITH WEATHERPROOF COVER FOR FUTURE RECEPTACLE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE BACKBOX 48 INCHES AFF, MEASURED TO TOP OF BOX. PROVIDE A GASKETED BLANK WEATHERPROOF COVER PLATE FOR THE BACK BOX.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 3 #10 AND 1 #10 GROUND FROM PANELBOARD L3, CKT #10, 12 & 14.

95 PROPOSED TELEPHONE AND DATA PHONE JACK LOCATED IN THE PUMP ROOM.

THE ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL AND THE TELEPHONE DATA BACK BOX, PHONE JACK AND CONDUIT FROM THE TELEPHONE SERVICE TERMINATION PULL BOX TO THE BACK BOX. THE BACK BOX SHALL BE INSTALLED 24 INCHES ABOVE FINISHED GRADE, MEASURED TO THE TOP OF THE BOX.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH A NYLON PULL CABLE FROM THE BACK BOX TO THE TELEPHONE SERVICE TERMINATION PULL BOX FOR FUTURE CONNECTIONS.

96 PROPOSED OVERHEAD DOOR OPERATOR NO.1 FURNISH AND INSTALLED BY THE GENERAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A NEMA 12 250 VOLT, 3 PHASE, 3 POLE DISCONNECT SWITCH NEAR THE DOOR OPERATOR AND ROUTE A 1 INCH CONDUIT WITH 4 #12 CONDUCTORS WITH NEUTRAL (IF REQUIRED) AND 1 #12 GROUND FROM PANELBOARD L3, CKT'S #16, 18 & 20. THE DISCONNECT SWITCH SHALL BE SURFACE MOUNTED NEAR THE UNIT.

THE ELECTRICAL CONTRACTOR SHALL ROUTE LIQUID-TIGHT FLEXIBLE METAL CONDUIT FROM THE DISCONNECT SWITCH TO THE DOOR OPERATOR.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE CONTROL STATION AT 48 INCHES AFF MEASURED TO TOP OF ENCLOSURE AND ROUTE 6 #14 CONDUCTORS & 1 #14 GROUND FROM THE CONTROL STATION TO THE DOOR OPERATOR FOR LOCAL CONTROL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO EACH DOOR SENSOR AND INSTALL AND WIRE EACH SENSOR TO THE DOOR OPERATOR. VERIFY EXACT WIRING WITH DOOR OPERATOR MANUFACTURER AND INSTALL AS REQUIRED.

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc. @ (SEH)

SHEET TITLE
PROPOSED POWER AND SYSTEMS PLAN KEYED NOTES

SHEET
E13

PROPOSED POWER, SYSTEMS AND INSTRUMENTATION PLAN KEYED NOTES:

(97) PROPOSED OVERHEAD DOOR OPERATOR NO.2 FURNISH AND INSTALLED BY THE GENERAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A NEMA 12 250 VOLT, 3 PHASE, 3 POLE DISCONNECT SWITCH NEAR THE DOOR OPERATOR AND ROUTE A 1 INCH CONDUIT WITH 4 #12 CONDUCTORS WITH NEUTRAL (IF REQUIRED) AND 1 #12 GROUND FROM PANELBOARD L3, CKT'S #22, 24 & 26. THE DISCONNECT SWITCH SHALL BE SURFACE MOUNTED NEAR THE UNIT.

THE ELECTRICAL CONTRACTOR SHALL ROUTE LIQUID-TIGHT FLEXIBLE METAL CONDUIT FROM THE DISCONNECT SWITCH TO THE DOOR OPERATOR.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE CONTROL STATION AT 48 INCHES AFF MEASURED TO TOP OF ENCLOSURE AND ROUTE 6 #14 CONDUCTORS & 1 #14 GROUND FROM THE CONTROL STATION TO THE DOOR OPERATOR FOR LOCAL CONTROL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO EACH DOOR SENSOR AND INSTALL AND WIRE EACH SENSOR TO THE DOOR OPERATOR. VERIFY EXACT WIRING WITH DOOR OPERATOR MANUFACTURER AND INSTALL AS REQUIRED.

(98) PROPOSED 12 INCH SQUARE X 6 INCH DEEP NEMA 12 PULL BOX WITH TERMINAL BLOCKS MOUNTED 36 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE FOR POWER TO EACH GATE CONTROLLER. SEE DETAIL

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 2 INCH CONDUIT WITH 4 #8 CONDUCTORS AND 1 #8 GROUND FROM THE DISCONNECT SWITCHES LOCATED NEAR EACH GATE CONTROLLER AND TERMINATE AS REQUIRED. ROUTE ALL WIRING THROUGH HAND HOLE NO.1AS SHOWN ON THE PLANS.

(99) PROPOSED LOW LEVEL FLOAT LSL-2-1 AND HIGH LEVEL FLOAT LSH-2-1 TO MONITOR THE NORTH BACKWASH TANK LEVEL AND BACKWASH RECLAIM PUMP SHUTDOWN ON LOW LEVEL FURNISHED BY THE SYSTEM INTEGRATOR. SEE DETAIL.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 6 INCH X 6 INCH X 3 INCH NEMA 4X JUNCTION BOX WITH TERMINAL BLOCKS PER SPECIFICATIONS ON THE WALL SUCH THAT THE CONDUIT SHALL PENETRATE THE TANK AT ELEVATION 890.5. COORDINATE FLOAT LEVELS WITH ENGINEER IN THE FIELD.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 4 #14 CONDUCTORS & 1 #14 GROUND FROM THE SWITCHES TO THE SCADA CONTROL PANEL.

(100) PROPOSED LOW LEVEL FLOAT LSL-3-1 AND HIGH LEVEL FLOAT LSH-3-1 TO MONITOR THE SOUTH BACKWASH TANK LEVEL AND BACKWASH RECLAIM PUMP SHUTDOWN ON LOW LEVEL FURNISHED BY THE SYSTEM INTEGRATOR. SEE DETAIL.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 6 INCH X 6 INCH X 3 INCH NEMA 4X JUNCTION BOX WITH TERMINAL BLOCKS PER SPECIFICATIONS ON THE WALL SUCH THAT THE CONDUIT SHALL PENETRATE THE TANK AT ELEVATION 890.5. COORDINATE FLOAT LEVELS WITH ENGINEER IN THE FIELD.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 4 #14 CONDUCTORS & 1 #14 GROUND FROM THE SWITCHES TO THE SCADA CONTROL PANEL.

(101) PROPOSED PRESSURE LEVEL ELEMENT LE-3-1 FURNISHED BY THE SYSTEM INTEGRATOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE PRESSURE LEVEL ELEMENT IN THE STILLING WELL OF THE NORTH TANK PER THE LEVEL TRANSMITTER MOUNTING DETAIL.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 6 INCH X 6 INCH X 3 INCH NEMA 4X JUNCTION BOX ON THE WALL SUCH THAT THE CONDUIT SHALL PENETRATE THE TANK AT ELEVATION 890.5. COORDINATE THE LEVEL TRANSDUCER ELEVATION IN THE FIELD WITH THE ENGINEER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO 2/C #18 TWISTED SHIELDED PAIR CABLES FROM ELEMENT LE-3-1 TO THE SCADA CONTROL PANEL WITHOUT ADDITIONAL SPLICES. FIELD VERIFY EXACT CABLE LENGTH IN THE FIELD.

(102) PROPOSED PRESSURE LEVEL ELEMENT LE-4-1 FURNISHED BY THE SYSTEM INTEGRATOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE PRESSURE LEVEL ELEMENT IN THE STILLING WELL OF THE SOUTH TANK PER THE LEVEL TRANSMITTER MOUNTING DETAIL.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 6 INCH X 6 INCH X 3 INCH NEMA 4X JUNCTION BOX ON THE WALL SUCH THAT THE CONDUIT SHALL PENETRATE THE TANK AT ELEVATION 890.5. COORDINATE THE LEVEL TRANSDUCER ELEVATION IN THE FIELD WITH THE ENGINEER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO 2/C #18 TWISTED SHIELDED PAIR CABLES FROM ELEMENT LE-4-1 TO THE SCADA CONTROL PANEL WITHOUT ADDITIONAL SPLICES. FIELD VERIFY EXACT CABLE LENGTH IN THE FIELD.

(103) PROPOSED PACKAGED AIR COMPRESSOR NO.1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A NEMA 12 480 VOLT, 3 PHASE, 3 POLE DISCONNECT SWITCH AND ROUTE A 1 INCH SCHEDULE 80 PVC CONDUIT WITH THE POWER CONDUCTORS ROUTED FROM MCC-1B TO THE DISCONNECT SWITCH AND FROM THE DISCONNECT SWITCH TO THE AIR COMPRESSOR AS SHOWN ON THE ONE-LINE DIAGRAM.

THE ELECTRICAL CONTRACTOR SHALL ROUTE THE 1 INCH CONDUIT FOR THE CONTROL CONDUCTORS TO A 6 INCH X 6 INCH X 3 INCHES DEEP NEMA 1 JUNCTION BOX WITH COVER. THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH LIQUID-TIGHT FLEXIBLE METAL CONDUIT FROM THE JUNCTION BOX TO THE AIR COMPRESSOR CONTROL PANEL WITH 4 #14 CONDUCTORS AND 1 #14 GROUND FROM THE AIR COMPRESSOR TO THE SCADA CONTROL PANEL FOR MONITORING LOW (PSL-1-1)AND HIGH PRESSURE (PSH-1-1) AS SHOWN ON THE PLANS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #12 TO THE AUTOMATIC SOLENOID DRAIN SOLENOID VALVE SV-2-1 THAT IS SHARED WITH AIR COMPRESSOR NO.2.

SEE KEYED NOTE (113) BELOW.

(104) NOT USED

(105) PROPOSED CHLORINE BOOSTER PUMP P-CL-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A 30 AMP, 480 VOLT, NON-FUSED, 3 POLE, NEMA 4X, 316 STAINLESS STEEL DISCONNECT SWITCH NEAR THE PUMP AT A HEIGHT OF 48 INCHES ABOVE FINISHED FLOOR, MEASURED TO THE TOP OF THE ENCLOSURE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH SCHEDULE 80 PVC CONDUIT WITH THE CONDUCTORS ROUTED FROM MCC-1B TO THE CHLORINE BOOSTER PUMP DISCONNECT SWITCH AS SHOWN ON THE ONE-LINE DIAGRAM. THE ELECTRICAL CONTRACTOR SHALL 3/4 INCH LIQUID-TIGHT FLEXIBLE METAL CONDUIT WITH THE CONDUCTORS FROM THE DISCONNECT SWITCH TO THE PUMP MOTOR AS SHOWN ON THE ONE-LINE DIAGRAM.

(106) PROPOSED FILTER NO.1 SOLENOID CONTROL PANEL FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 2 #14 CONDUCTORS FOR EACH FILTER VALVE, VALVE POSITION A, VALVE POSITION B AND NEUTRAL TO EACH FROM THE SCADA CONTROL PANEL FOR THE FOLLOWING; V-3W-01, V-3W-02, V-3W-03, V-3W-04, V-3W-05, V-3W-06, V-3W-07 AND V-3W-08. A 2 INCH CONDUIT SHALL BE INSTALLED FROM THE FILTER SOLENOID PANEL TO THE SCADA CONTROL PANEL WITH 24 #14 CONDUCTORS, 8 #14 SPARE AND 1 #14 GROUND.

(107) PROPOSED FILTER NO.2 SOLENOID CONTROL PANEL FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 2 #14 CONDUCTORS FOR EACH FILTER VALVE, VALVE POSITION A, VALVE POSITION B AND NEUTRAL TO EACH FROM THE SCADA CONTROL PANEL FOR THE FOLLOWING; V-3W-09, V-3W-10, V-3W-11, V-3W-12, V-3W-13, V-3W-14, V-3W-15 AND V-3W-16. A 2 INCH CONDUIT SHALL BE INSTALLED FROM THE FILTER SOLENOID PANEL TO THE SCADA CONTROL PANEL WITH 24 #14 CONDUCTORS, 8 #14 SPARE AND 1 #14 GROUND.

(108) PROPOSED BACKWASH VALVE SOLENOID PANEL VSP FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 2 INCH CONDUIT WITH CONDUCTORS SHOWN FROM THE SCADA CONTROL PANEL TO THE VALVE SOLENOID PANEL FOR THE FOLLOWING WIRING:

THE ELECTRICAL CONTRACTOR SHALL ROUTE 3 #12 CONDUCTORS AND 1 #12 GROUND FROM SCADA CONTROL PANEL TO THE VALVE SOLENOID PANEL TO OPERATE V-BW-1 (SV-4-1) OPEN/CLOSED SOLENOID VALVE. SEE KEYED NOTE (129) BELOW FOR VALVE POSITION REQUIREMENTS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 3 #12 CONDUCTORS AND 1 #12 GROUND FROM SCADA CONTROL PANEL TO THE VALVE SOLENOID PANEL TO OPERATE V-BW-2 (SV-15-1) OPEN/CLOSED SOLENOID VALVE. SEE KEYED NOTE (130) BELOW FOR VALVE POSITION REQUIREMENTS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 3 #12 CONDUCTORS AND 1 #12 GROUND FROM SCADA CONTROL PANEL TO THE VALVE SOLENOID PANEL TO OPERATE V-RC-3 (SV-7-1) OPEN/CLOSED SOLENOID VALVE. SEE KEYED NOTE (111) BELOW FOR VALVE POSITION REQUIREMENTS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 3 #12 CONDUCTORS AND 1 #12 GROUND FROM SCADA CONTROL PANEL TO THE VALVE SOLENOID PANEL TO OPERATE V-RC-4 (SV-8-1) OPEN/CLOSED SOLENOID VALVE. SEE KEYED NOTE (112) BELOW FOR VALVE POSITION REQUIREMENTS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 3 #12 CONDUCTORS AND 1 #12 GROUND FROM SCADA CONTROL PANEL TO THE VALVE SOLENOID PANEL TO OPERATE V-BWW-1 (SV-5-1) OPEN/CLOSED SOLENOID VALVE. SEE KEYED NOTE (109) BELOW FOR MONITORING REQUIREMENTS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 3 #12 CONDUCTORS AND 1 #12 GROUND FROM SCADA CONTROL PANEL TO THE VALVE SOLENOID PANEL TO OPERATE V-BWW-2 (SV-6-1) OPEN/CLOSED SOLENOID VALVE. SEE KEYED NOTE (110) BELOW FOR MONITORING REQUIREMENTS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 3 #12 CONDUCTORS AND 1 #12 GROUND FROM SCADA CONTROL PANEL TO THE VALVE SOLENOID PANEL TO OPERATE V-RC-5 (SV-9-1) OPEN/CLOSED SOLENOID VALVE. SEE KEYED NOTE (113) BELOW FOR MONITORING REQUIREMENTS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 3 #12 CONDUCTORS AND 1 #12 GROUND FROM SCADA CONTROL PANEL TO THE VALVE SOLENOID PANEL TO OPERATE V-PSV-2 (SV-10-1) OPEN/CLOSED SOLENOID VALVE. SEE KEYED NOTE (114) BELOW FOR MONITORING REQUIREMENTS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 3 #12 CONDUCTORS AND 1 #12 GROUND FROM SCADA CONTROL PANEL TO THE VALVE SOLENOID PANEL TO OPERATE V-PSV-1 (SV-11-1) OPEN/CLOSED SOLENOID VALVE. SEE KEYED NOTE (115) BELOW FOR MONITORING REQUIREMENTS.

ALL SOLENOID VALVES SHALL BE CORD AND PLUG CONNECTED WITH A DEDICATED SINGLE YOKE RECEPTACLE LOCATED ADJACENT THE SOLENOID VALVE.

(109) PROPOSED VALVE V-BWW-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO (2) 2/C #16 TWISTED SHIELDED CABLES FROM SCADA CONTROL PANEL TO THE VALVE FOR MODULATING VALVE V-BWW-1 (ZX-5-1) AND (XS-5-1) FOR VERIFYING VALVE POSITION.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 4 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR MONITORING VALVE V-BWW-1 (ZS-5-1, OPEN AND ZS-5-1, CLOSED) VALVE POSITION.

(110) PROPOSED VALVE V-BWW-2 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO (2) 2/C #16 TWISTED SHIELDED CABLES FROM SCADA CONTROL PANEL TO THE VALVE FOR MODULATING VALVE V-BWW-2 (ZX-6-1) AND (XS-6-1) FOR VERIFYING VALVE POSITION.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 4 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR MONITORING VALVE V-BWW-2 (ZS-6-1, OPEN AND ZS-6-1, CLOSED) VALVE POSITION.

(111) PROPOSED VALVE V-RC-3 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 4 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR MONITORING VALVE V-RC-3 (ZS-7-1, OPEN AND ZS-7-1, CLOSED) VALVE POSITION.

(112) PROPOSED VALVE V-RC-4 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 4 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR MONITORING VALVE V-RC-4 (ZS-8-1, OPEN AND ZS-8-1, CLOSED) VALVE POSITION.

(113) PROPOSED PACKAGED AIR COMPRESSOR NO.2 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A NEMA 12 480 VOLT, 3 PHASE, 3 POLE DISCONNECT SWITCH AND ROUTE A 1 INCH SCHEDULE 80 PVC CONDUIT WITH THE POWER CONDUCTORS ROUTED FROM MCC-1B TO THE DISCONNECT SWITCH AND FROM THE DISCONNECT SWITCH TO THE AIR COMPRESSOR AS SHOWN ON THE ONE-LINE DIAGRAM.

THE ELECTRICAL CONTRACTOR SHALL ROUTE THE 1 INCH CONDUIT FOR THE CONTROL CONDUCTORS TO A 6 INCH X 6 INCH X 3 INCHES DEEP NEMA 1 JUNCTION BOX WITH COVER. THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH LIQUID-TIGHT FLEXIBLE METAL CONDUIT FROM THE JUNCTION BOX TO THE AIR COMPRESSOR CONTROL PANEL WITH 4 #14 CONDUCTORS AND 1 #14 GROUND FROM THE AIR COMPRESSOR TO THE SCADA CONTROL PANEL FOR MONITORING LOW (PSL-1-1)AND HIGH PRESSURE (PSH-1-1) AS SHOWN ON THE PLANS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #12 TO THE AUTOMATIC SOLENOID DRAIN SOLENOID VALVE SV-2-1 THAT IS SHARED WITH AIR COMPRESSOR NO.1.

SEE KEYED NOTE (103) ABOVE.

(114) PROPOSED VALVE V-PSV-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR VALVE V-PSV-1 (11-1) CLOSED POSITION.

(115) PROPOSED VALVE V-PSV-2 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH TWO (2) 2/C #16 TWISTED SHIELDED CABLES FROM SCADA CONTROL PANEL TO THE VALVE FOR MODULATING VALVE V-PSV-2 (ZX-10-1 AND XS-10-1) POSITIONING AND VERIFYING VALVE POSITION.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR VALVE V-PSV-2 (10-1) OPENED POSITION.

PROVIDE AN ADDITIONAL TWO (2) 2/C #16 TWISTED SHIELDED CABLES, TAPE OFF ONE SET) FOR 24 VDC POWER TO THE PILOT CONTROL.

(116) PROPOSED 12 INCH SQUARE X 6 INCH DEEP NEMA 12 PULL BOX MOUNTED 36 INCHES ABOVE FINISHED FLOOR MEASURED TO TOP OF ENCLOSURE FOR RESERVOIR CAMERA LOCATED ON THE WATER STORAGE TANK.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 2 INCH CONDUIT WITH A CATEGORY 6 CABLE FROM THE JUNCTION BOX LOCATED ON THE WATER STORAGE TANK TO THIS PULL BOX AND TERMINATE AT EACH END AS REQUIRED. DO NOT TERMINATE THE CATEGORY 6 CABLE AT THIS PULL BOX OR AT ANY HAND HOLE, IT SHALL BE CONTINUOUS FROM THE CAMERA TO THE PATCH PANEL LOCATED IN THE PUMP ROOM.

(117) PROPOSED FLUORIDE ROOM LIGHTING CONTROL PANEL AND PUSHBUTTON LIGHT SWITCHES AND ENCLOSURES FURNISHED BY THE SYSTEM INTEGRATOR AND INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM THE FLUORIDE ROOM LIGHTING CONTROL PANEL TO THE ROOM LIGHTS FROM PANELBOARD L1, CKT #11.

THE ELECTRICAL CONTRACTOR SHALL ROUTE 3/4 INCH CONDUIT WITH 8 #14 CONTROL CONDUCTORS AND 1 #14 GROUND FROM EACH GROUP OF PUSHBUTTON SWITCHES AND 3/4 INCH CONDUIT WITH 2 #14 CONDUCTORS AND 1 #14 GROUND FROM EACH DOOR SWITCH AS SHOWN ON THE FLUORIDE ROOM LIGHTING SYSTEM CONTROL DIAGRAM.

(118) PROPOSED FIBER ETHERNET PATCH PANEL FURNISHED BY THE SYSTEM INTEGRATOR AND INSTALLED AND TERMINATED BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE THE 1 INCH CONDUITS FROM EACH CAMERA AND INSTALL THE CATEGORY 6 CABLES AND TERMINATE SAME AT THE PATCH PANEL.

THE PATCH PANEL SHALL CONSIST OF A PANDUIT CAT 6 CATALOG NUMBER CP24688BL 24 PORT FOR RJ45 JACKS WITH A WBH1 6 INCH DEEP WALL BRACKET, MOUNTED INTO A 20 INCH HIGH X 24 INCH WIDE X 10 INCH DEEP NEMA 12 ENCLOSURE WITH HINGED COVER.

SEE KEYED NOTES (13) AND (119) FOR ADDITIONAL INFORMATION.

(119) OWNER FURNISHED ENCLOSURE WITH A COPPER ETHERNET SWITCH AND ENCLOSURE USING PoE TO POWER AT EACH CAMERA.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 4 INCH CONDUIT FROM THE ETHERNET PATCH PANEL TO THE OWNER FURNISHED PoE ENCLOSURE AND INSTALL THE REQUIRED ETHERNET PATCH CABLES AS SHOWN ON THE VIDEO SURVEILLANCE SYSTEM INTERCONNECT DIAGRAM.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM THE FLUORIDE ROOM LIGHTING CONTROL PANEL TO THE ROOM LIGHTS FROM PANELBOARD L2, CKT #7.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 4 INCH CONDUIT FROM THE FUTURE FIBER OPTIC JUNCTION BOX TO THE OWNER FURNISHED PoE ENCLOSURE FOR FUTURE USE.

SEE KEYED NOTE (13) FOR ADDITIONAL INFORMATION.

(120) PROPOSED PHONE JACK LOCATED IN STORAGE ROOM FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE BACK BOX WITH THE PHONE JACK AT 54 INCHES ABOVE FINISHED FLOOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT TO PHONE LOCATION IN THE PUMP ROOM AND INSTALL CAT 6 WIRING FROM THE JACK TO THE TELEPHONE BOARD AND TERMINATE THE WIRING AT EACH LOCATION.

(121) PROPOSED PHONE JACK LOCATED IN STORAGE ROOM FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL MOUNT THE BACK BOX WITH THE PHONE JACK AT 54 INCHES ABOVE FINISHED FLOOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT TO PHONE LOCATION IN THE STORAGE BUILDING AND INSTALL CAT 6 WIRING FROM THE JACK TO THE TELEPHONE BOARD AND TERMINATE THE WIRING AT EACH LOCATION.

(122) PROPOSED LIGHTNING PROTECTION SYSTEM FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR ON THE TANK AND THE BUILDING PER SPECIFICATIONS.

(123) PROPOSED TWIN GFI/WP PROTECTED RECEPTACLES LOCATED ON THE ROOF OF THE BACKWASH TANK.

THE ELECTRICAL CONTRACTOR SHALL FLUSH MOUNT THE RECEPTACLES 12 INCHES ABOVE THE ROOF IN THE PARAPIT, MEASURED TO TOP OF BOX NEAR THE NORTH HATCH.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #19 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L2 IS A GFI TYPE.

THE BACK BOXES AND CONDUITS SHALL BE LOCATED IN THE WALL CAVITY. THE EXTERIOR MOUNTED RECEPTACLES SHALL INCLUDE AN ALUMINUM LOCKABLE IN-USE COVER AS LISTED IN THE SPECIFICATIONS.

(124) PROPOSED TWIN GFI/WP PROTECTED RECEPTACLES LOCATED ON THE ROOF OF THE BACKWASH TANK.

THE ELECTRICAL CONTRACTOR SHALL FLUSH MOUNT THE RECEPTACLES 12 INCHES ABOVE THE ROOF IN THE PARAPIT, MEASURED TO TOP OF BOX NEAR THE SOUTH HATCH.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #21 TO THE RECEPTACLES. NOTE THAT THE CIRCUIT BREAKER IN PANELBOARD L2 IS A GFI TYPE.

THE BACK BOXES AND CONDUITS SHALL BE LOCATED IN THE WALL CAVITY. THE EXTERIOR MOUNTED RECEPTACLES SHALL INCLUDE AN ALUMINUM LOCKABLE IN-USE COVER AS LISTED IN THE SPECIFICATIONS.

(125) PROPOSED 36 INCH WIDE X 72 INCH HIGH DEDICATED WALL SPACE FOR OWNER FURNISHED FIBEROPTIC/COPPER ETHERNET SWITCH ENCLOSURE TO BE INSTALLED, PIPED AND CABLED BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE 2 INCH CONDUIT FOR FIBER OPTIC CABLE ENTRANCE FROM THE TERRACE BOX UNDER THE FLOOR INTO THE OWNER FURNISHED FIBEROPTIC/COPPER ETHERNET SWITCH ENCLOSURE. THE CONDUIT SHALL BE INSTALLED PER THE OWNER'S DIRECTIONS.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE 2 INCH CONDUIT FOR COPPER ETHERNET CABLE INTO THE SCADA CONTROL PANEL. THE CABLE SHALL BE INSTALLED, TERMINATED AND TESTED BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE 2 INCH CONDUIT FOR COPPER ETHERNET CABLES INTO THE VIDEO SURVEILLANCE CONTROL PANEL.

THE FIBER OPTIC CABLE SHALL BE INSTALLED, TERMINATED AND TESTED BY THE ELECTRICAL CONTRACTOR.

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc. @ (SEH)

SHEET TITLE
PROPOSED POWER AND SYSTEMS PLAN KEYED NOTES

SHEET
E14

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PROPOSED POWER, SYSTEMS AND INSTRUMENTATION PLAN KEYED NOTES:

(126) PROPOSED CHLORINE GAS FEEDER NO.1 AUTO-VALVE PANEL WITH SOLENOID VALVE SV-3-1 FURNISHED BY THE PROCESS CONTRACTOR AND INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR.

THE CHLORINE GAS FEEDER NO.1 AUTO-VALVE PANEL SHALL BE MOUNTED 60 INCHES AFF MEASURED TO TOP OF ENCLOSURE AND THE SOLENOID VALVE SHALL BE LOCATED NEAR THE PANEL IN THE CHLORINE PIPING AS DIRECTED BY THE ENGINEER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #25 TO THE GAS FEEDER NO.1 AUTO-VALVE PANEL. THIS SOLENOID SHALL TURN ON WITH THE CHLORINE PUMP P-CL-1.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A CORD AND PLUG ON THE SOLENOID VALVE AND AT THE CONTROL PANEL FOR TERMINATIONS. THE SOLENOID VALVE SHALL BE POWERED FROM THE SCADA CONTROL PANEL WITH A 1 INCH CONDUIT AND 2 #12 CONDUCTORS AND 1 #12 GROUND.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2/C #18 AWG TWISTED SHIELDED CABLE FROM THE SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 4 #14 CONTROL CONDUCTORS, 2 #14 SPARE AND 1 #14 GROUND FROM THE GAS FEEDER NO.1 AUTO-VALVE PANEL TO THE SCADA CONTROL PANEL SO THAT THIS PANEL IS TURNED ON WHEN SOLENOID VALVE SV-11-1 (V-PSV-1) IS ENERGIZED TO OPEN.

(127) PROPOSED CHLORINE GAS FEEDER NO.2 AUTO-VALVE PANEL WITH SOLENOID VALVE SV-3-2 FURNISHED BY THE PROCESS CONTRACTOR AND INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR.

THE CHLORINE GAS FEEDER NO.1 AUTO-VALVE PANEL SHALL BE MOUNTED 60 INCHES AFF MEASURED TO TOP OF ENCLOSURE AND THE SOLENOID VALVE SHALL BE LOCATED NEAR THE PANEL IN THE CHLORINE PIPING AS DIRECTED BY THE ENGINEER.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 AND 1 #12 GROUND FROM PANELBOARD L2, CKT #27 TO THE GAS FEEDER NO.1 AUTO-VALVE PANEL.

THE ELECTRICAL CONTRACTOR SHALL INSTALL A CORD AND PLUG ON THE SOLENOID VALVE AND AT THE CONTROL PANEL FOR TERMINATIONS. THE SOLENOID VALVE SHALL BE POWERED FROM THE SCADA CONTROL PANEL WITH A 1 INCH CONDUIT AND 2 #12 CONDUCTORS AND 1 #12 GROUND.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2/C #18 AWG TWISTED SHIELDED CABLE FROM THE SCADA CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 4 #14 CONTROL CONDUCTORS, 2 #14 SPARE AND 1 #14 GROUND FROM THE GAS FEEDER NO.1 AUTO-VALVE PANEL TO THE SCADA CONTROL PANEL SO THAT THIS PANEL IS TURNED ON WHEN SOLENOID VALVE SV-11-1 (V-PSV-1) IS ENERGIZED TO OPEN.

(128) PROPOSED INLINE FLUORIDE TANK BLOWER FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL 120 VOLT, 20 AMP, DISCONNECT SWITCH AND ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD L1, CKT #42 TO THE DISCONNECT SWITCH AND 3/4 INCH LIQUID TIGHT FLEXIBLE METAL CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO THE MOTOR.

(129) PROPOSED VALVE V-BW-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 4 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR MODULATING VALVE V-BW-1 (ZS-4-1, OPEN AND ZS-4-1, CLOSED) VALVE POSITION.

(130) PROPOSED VALVE V-BW-2 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 4 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR MODULATING VALVE V-BW-2 (ZS-15-1, OPEN AND ZS-15-1, CLOSED) VALVE POSITION.

(131) PROPOSED CHECK VALVE ZX-16-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR MONITORING THE CHECK VALVE (ZX-16-1, CLOSED) POSITION.

(132) PROPOSED CHECK VALVE ZX-17-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR MONITORING THE CHECK VALVE (ZX-17-1, CLOSED) POSITION.

(133) PROPOSED CHECK VALVE ZX-18-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR MONITORING THE CHECK VALVE (ZX-18-1, CLOSED) POSITION.

(134) PROPOSED CHECK VALVE ZX-19-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR MONITORING THE CHECK VALVE (ZX-19-1, CLOSED) POSITION.

(135) PROPOSED CORD AND PLUG CONNECTED LOSS OF VACUUM DETECTOR VS-1-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANEL L2, CKT #30 TO THE DETECTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS FROM THE SOLENOID VALVE AND 1 #12 GROUND TO THE VACUUM DETECTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 4 #14 VS-1-1 (LOW) AND (HIGH) ALARM CONDUCTORS AND 1 #14 GROUND FROM THE VACUUM DETECTOR TO SCADA CONTROL PANEL.

(136) PROPOSED CHECK VALVE ZX-20-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR MONITORING THE CHECK VALVE (ZX-17-1, CLOSED) POSITION.

(137) PROPOSED CHECK VALVE ZX-21-1 FURNISHED AND INSTALLED BY THE PROCESS CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 1 INCH CONDUIT WITH 2 #14 CONDUCTORS AND 1 #14 GROUND FROM SCADA CONTROL PANEL TO THE VALVE FOR MONITORING THE CHECK VALVE (ZX-17-1, CLOSED) POSITION.

GENERAL CONSTRUCTION NOTES:

1. ALL LIGHT SWITCHES AND RECEPTACLES SHALL BE FLUSH MOUNTED IN THE WALLS WHERE SHOWN AT 48 INCHES AND 36 INCHES RESPECTIVELY, UNLESS OTHERWISE NOTED.
2. ALL POWER AND DIGITAL CONTROL CONDUCTORS SHALL BE 600 VOLT RATED, STRANDED COPPER WITH TYPE XHHW INSULATION PER THE SPECIFICATIONS. THE MINIMUM SIZE CONDUCTORS SHALL BE #12 AWG.
3. EACH 20 AMP 120 VOLT CIRCUIT SHALL BE 2 #12 CONDUCTORS AND 1 #12 GROUND, UNLESS OTHERWISE NOTED.
4. ALL INSTRUMENTS SHALL BE WIRED WITH 2 #12 CONDUCTORS AND 1 #12 GROUND, UNLESS OTHERWISE NOTED.
5. ALL CONDUITS SHALL INCLUDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR.
6. ALL ANALOG AND ETHERNET CABLES SHALL MEET THE ELECTRICAL SPECIFICATIONS.
7. EACH DEVICE, ELECTRICAL EQUIPMENT AND INSTRUMENT SHALL BE WIRED PER THE ALARM LIST IN THE PLANS AND SPECIFICATIONS.
8. THE MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH FOR ABOVE FLOOR INSTALLATIONS AND 1 INCH CONDUIT BELOW FLOOR INSTALLATIONS, UNLESS OTHERWISE NOTED.
9. IN GENERAL, ALL CONDUITS SHALL BE INSTALLED UNDER THE FLOOR WHERE PRACTICABLE AND ALONG THE WALLS.
10. ALL CONDUITS LEAVING OR ENTERING THE PANELS, ENCLOSURES AND OTHER EQUIPMENT FROM EXTERIOR OR COLD AREAS SHALL BE DUX SEALED AT BOTH ENDS. SEE SPECIFICATIONS FOR CORROSIVE AREAS.
11. ALL HOLES THROUGH MASONRY SHALL BE MADE WITH CORE DRILLS IF NOT SLEEVED THROUGH THE WALLS. IF CONDUITS REQUIRE CORE DRILLING, OTHER METHODS SUCH AS CHISELING OR HAMMERED OUT OPENINGS ARE NOT ACCEPTABLE. THE HOLES SHALL MADE NOT LARGER THAN ¼ LARGER DIAMETER THEN THE CONDUIT O.D. ALL OPENINGS SHALL BE GROUTED WHERE INSTALLED THROUGH CONCRETE AND CAULKED WERE INSTALLED THROUGH SIDING MATERIALS.
12. USE STAINLESS STEEL FASTENERS FOR MOUNTING OF JUNCTION BOXES OR OTHER DEVICES LOCATED ON THE BUILDING EXTERIOR.
13. USE GALVANIZED OR ZINC COATED FASTENERS FOR MOUNTING OF JUNCTION BOXES OR OTHER DEVICES LOCATED ON THE INTERIOR OF THE BUILDING.
14. NOT ALL CONDUITS ARE SHOWN. THE CONDUITS SHOWN ARE INTENDED FOR GENERAL ROUTING ONLY. COORDINATE THE EXACT CONDUITS AND LOCATIONS WITH THE ENGINEER.

    THE ELECTRICAL CONTRACTOR SHALL SUBMIT CONDUIT AND EQUIPMENT LOCATION PLANS DURING SHOP DRAWING REVIEW.
15. THE ELECTRICAL CONTRACTOR SHALL FIELD COORDINATE WITH THE OTHER TRADES FOR LOCATIONS OF SUCH EQUIPMENT AS PROCESS PIPING, MECHANICAL EQUIPMENT, HVAC EQUIPMENT, FIXTURE LOCATIONS AND SUPPORTS, PULL BOXES, JUNCTION BOXES, VFD UNITS AND SIMILAR ELECTRICAL EQUIPMENT, DISCONNECT SWITCHES, CONTROL OR MONITORING STATIONS, PROCESS EQUIPMENT, RECEPTACLES AND LIGHT SWITCHES AND SIMILAR DEVICES SHOWN ON THE PLANS PRIOR TO CONSTRUCTION. ANY ELECTRICAL EQUIPMENT RELOCATIONS REQUIRED BY THE ENGINEER DUE TO IMPROPER PLANNING ON THE ELECTRICAL CONTRACTORS PART OR BY THE OTHER TRADES SHALL BE RELOCATED BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.
16. ALL NEW WORK SHALL CONSIDER FUTURE EXPANSION OF EQUIPMENT WHERE SHOWN ON THE PLANS. PROPER SPACING OF EQUIPMENT, LOCATIONS, AND ROUTING OF CONDUIT(S) SHALL BE PROVIDED. IF THE ENGINEER DETERMINES THAT THE INSTALLATION IS NOT ADEQUATE TO PROVIDE FOR FUTURE EXPANSION, THE ELECTRICAL CONTRACTOR SHALL RELOCATE THE EQUIPMENT AND CONDUIT AT NO ADDITIONAL COST TO THE CONTRACT.
17. THE INSTALLATIONS SHALL PROVIDE FOR EASE OF MAINTENANCE OF ALL EQUIPMENT INSTALLED. IF THE ENGINEER DETERMINES THAT THE INSTALLATION DOES NOT MEET THIS REQUIREMENT, THE ELECTRICAL CONTRACTOR SHALL RELOCATE THE ELECTRICAL EQUIPMENT AND CONDUIT AT NO ADDITIONAL COST TO THE CONTRACT.
18. ALL CONDUITS SHOWN FOR THE REQUIRED GROUNDING SHALL BE INSTALLED BEFORE THE FOUNDATION OR FOOTINGS ARE POURED. DO NOT INSTALL THE GROUNDING ELECTRODE CONDUCTORS IN DIRECT CONTACT WITH CONCRETE USING PVC CONDUIT WITH EXCEPTION OF WHERE THE CONDUCTOR IS EXOTHERMICALLY WELDED TO THE REBAR OR WIRE MESH.

    IF THE GROUNDING IS NOT INSTALLED AS SHOWN ON THE PLANS, IT SHALL BE THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO SAW CUT, DEMOLISH, OR OTHERWISE REMOVE THE EXISTING CONCRETE AND INSTALL THE GROUNDING REQUIRED. THIS WORK SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE CONTRACT.
19. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL HVAC AND PROCESS INSTALLATIONS WITH THE ELECTRICAL INSTALLATIONS WITH THE RESPECTIVE CONTRACTORS PRIOR TO BEGINNING WORK. THIS INCLUDES ALL INTERCONNECT WIRING AND EQUIPMENT NECESSARY TO PROVIDE PROPERLY OPERATING SYSTEMS WETHER IT IS SHOWN ON THE PLANS OR NOT. IT IS THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO VERIFY THE PROPER OR INTENDED OPERATION OF ALL EQUIPMENT AND TO WORK-OUT ALL NECESSARY EQUIPMENT, DETAILS AND HARDWARE WITH THE RESPECTIVE CONTRACTORS. THIS INFORMATION SHALL BE PROVIDED TO THE ENGINEER DURING SHOP REVIEW.
20. ALL FLOW METERS, ANALYZERS AND SOLENOID VALVES SHALL BE CORD AND PLUG CONNECTED USING A 120 VOLT, 20 AMP, 2 POLE, 3 WIRE TWIST LOCK RECEPTACLE AND PLUG USING LEVITON 2311 SERIES INCLUDING BOTH THE PLUG AND THE RECEPTACLE WITH STAINLESS STEEL COVER PLATE.
21. IN GENERAL SURFACE MOUNTED CONDUIT SHALL NOT BE USED, AND THEREFORE CONDUITS SHALL EXTEND FROM BELOW FLOOR AND WHERE HANDY BOXES ARE INSTALLED OR REQUIRED, WHETHER SHOWN OR NOT SHOWN ON THE PLANS AND SURFACE MOUNTED CONDUITS ARE NECESSARY FROM THAT POINT TO SUCH AS CONNECTIONS TO EXHAUST FANS, FLOWER METERS OR OTHER SIMILAR DEVICES, WALL BOX EXTENSIONS SHALL BE THOMAS & BETTS CAST ALUMINUM IHEF2-2 EXTENSION RING WITH 3/4 INCH CONDUIT HUBS IN NON-CORROSIVE AREAS ONLY, WHERE IN CORROSIVE AREAS USE STAINLESS STEEL TYPES.
22. THE ELECTRICAL CONTRACTOR SHALL INSTALL 3/4 INCH CONDUIT AND A BACK BOX FOR ALL THERMOSTATS OR OTHER CONTROL DEVICES REQUIRED FOR MECHANICAL EQUIPMENT (HVAC, PLUMBING AND PROCESS) IF NOT INCLUDED IN THE RESPECTIVE KEYED NOTES.

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	REVISIONS DESCRIPTION

SEH FILE NO.	129083
PROJECT NO.	53W10434
ISSUE DATE	JANUARY 13, 2017
DESIGNED BY	RICHARD J. BOYA
DRAWN BY	BRIAN E. FULLER

Short Elliott Hendrickson, Inc. @ (SEH)

SHEET TITLE
PROPOSED POWER AND SYSTEMS PLAN GENERAL CONSTRUCTION NOTES

SHEET
E15

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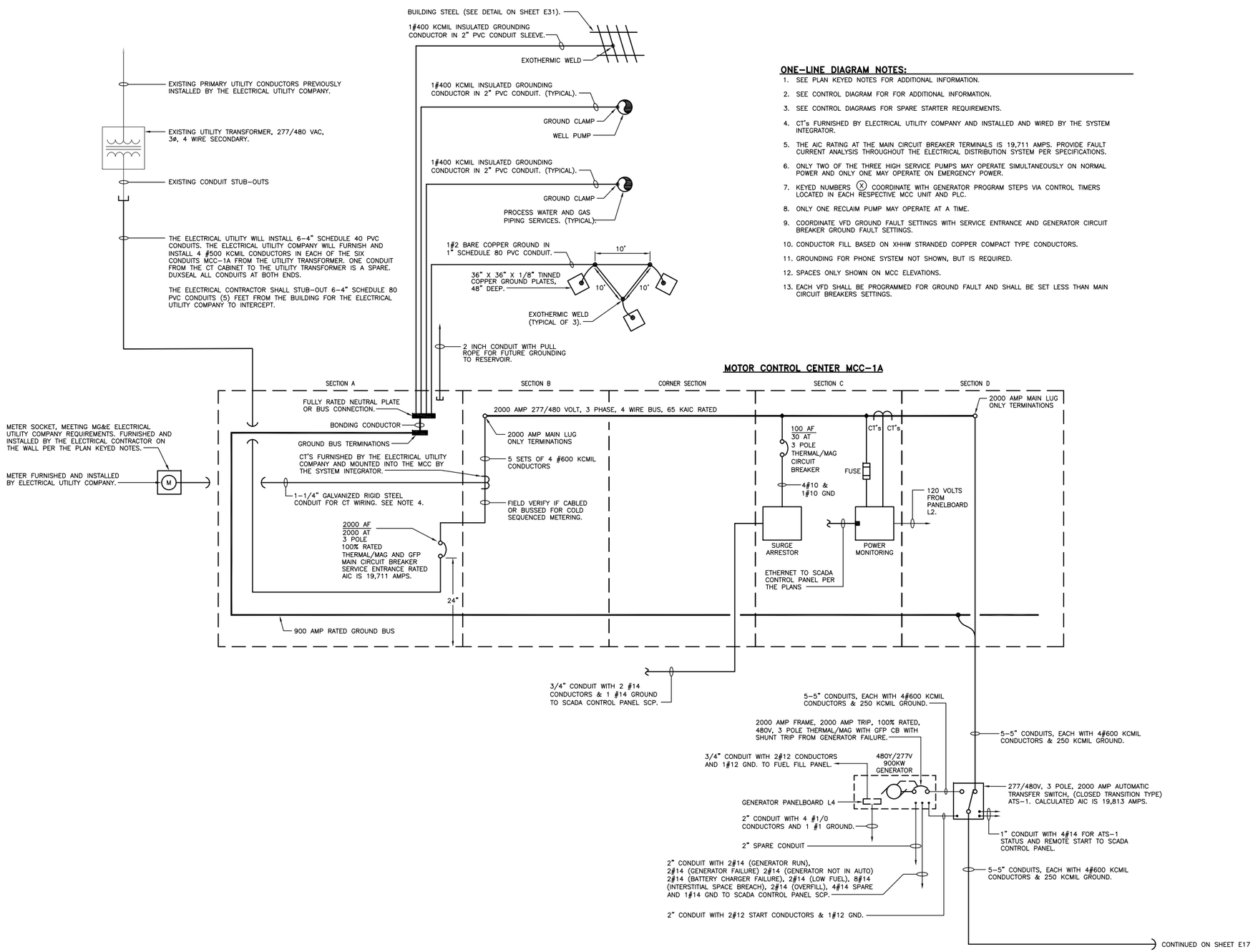

ONE-LINE DIAGRAM NOTES:

1. SEE PLAN KEYED NOTES FOR ADDITIONAL INFORMATION.
2. SEE CONTROL DIAGRAM FOR FOR ADDITIONAL INFORMATION.
3. SEE CONTROL DIAGRAMS FOR SPARE STARTER REQUIREMENTS.
4. CT's FURNISHED BY ELECTRICAL UTILITY COMPANY AND INSTALLED AND WIRED BY THE SYSTEM INTEGRATOR.
5. THE AIC RATING AT THE MAIN CIRCUIT BREAKER TERMINALS IS 19,711 AMPS. PROVIDE FAULT CURRENT ANALYSIS THROUGHOUT THE ELECTRICAL DISTRIBUTION SYSTEM PER SPECIFICATIONS.
6. ONLY TWO OF THE THREE HIGH SERVICE PUMPS MAY OPERATE SIMULTANEOUSLY ON NORMAL POWER AND ONLY ONE MAY OPERATE ON EMERGENCY POWER.
7. KEYED NUMBERS (X) COORDINATE WITH GENERATOR PROGRAM STEPS VIA CONTROL TIMERS LOCATED IN EACH RESPECTIVE MCC UNIT AND PLC.
8. ONLY ONE RECLAIM PUMP MAY OPERATE AT A TIME.
9. COORDINATE VFD GROUND FAULT SETTINGS WITH SERVICE ENTRANCE AND GENERATOR CIRCUIT BREAKER GROUND FAULT SETTINGS.
10. CONDUCTOR FILL BASED ON XHHW STRANDED COPPER COMPACT TYPE CONDUCTORS.
11. GROUNDING FOR PHONE SYSTEM NOT SHOWN, BUT IS REQUIRED.
12. SPACES ONLY SHOWN ON MCC ELEVATIONS.
13. EACH VFD SHALL BE PROGRAMMED FOR GROUND FAULT AND SHALL BE SET LESS THAN MAIN CIRCUIT BREAKERS SETTINGS.

PROPOSED ELECTRICAL ONE-LINE DIAGRAM

N.T.S.

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	REVISIONS DESCRIPTION

SEH FILE NO. 129083
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ISSUE DATE JANUARY 13, 2017
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DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc. @ (SEH)

SHEET TITLE
PROPOSED ELECTRICAL ONE-LINE DIAGRAM

SHEET
E16

ONE-LINE DIAGRAM NOTES:

1. SEE PLAN KEYED NOTES FOR ADDITIONAL INFORMATION.
2. SEE CONTROL DIAGRAM FOR FOR ADDITIONAL INFORMATION.
3. SEE CONTROL DIAGRAMS FOR SPARE STARTER REQUIREMENTS.
4. CT's FURNISHED BY ELECTRICAL UTILITY COMPANY AND INSTALLED AND WIRED BY THE SYSTEM INTEGRATOR.
5. THE AIC RATING AT THE MAIN CIRCUIT BREAKER TERMINALS IS 19,711 AMPS. PROVIDE FAULT CURRENT ANALYSIS THROUGHOUT THE ELECTRICAL DISTRIBUTION SYSTEM PER SPECIFICATIONS.
6. ONLY TWO OF THE THREE HIGH SERVICE PUMPS MAY OPERATE SIMULTANEOUSLY ON NORMAL POWER AND ONLY ONE MAY OPERATE ON EMERGENCY POWER.
7. KEYED NUMBERS (X) COORDINATE WITH GENERATOR PROGRAM STEPS VIA CONTROL TIMERS LOCATED IN EACH RESPECTIVE MCC UNIT AND PLC.
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9. COORDINATE VFD GROUND FAULT SETTINGS WITH SERVICE ENTRANCE AND GENERATOR CIRCUIT BREAKER GROUND FAULT SETTINGS.
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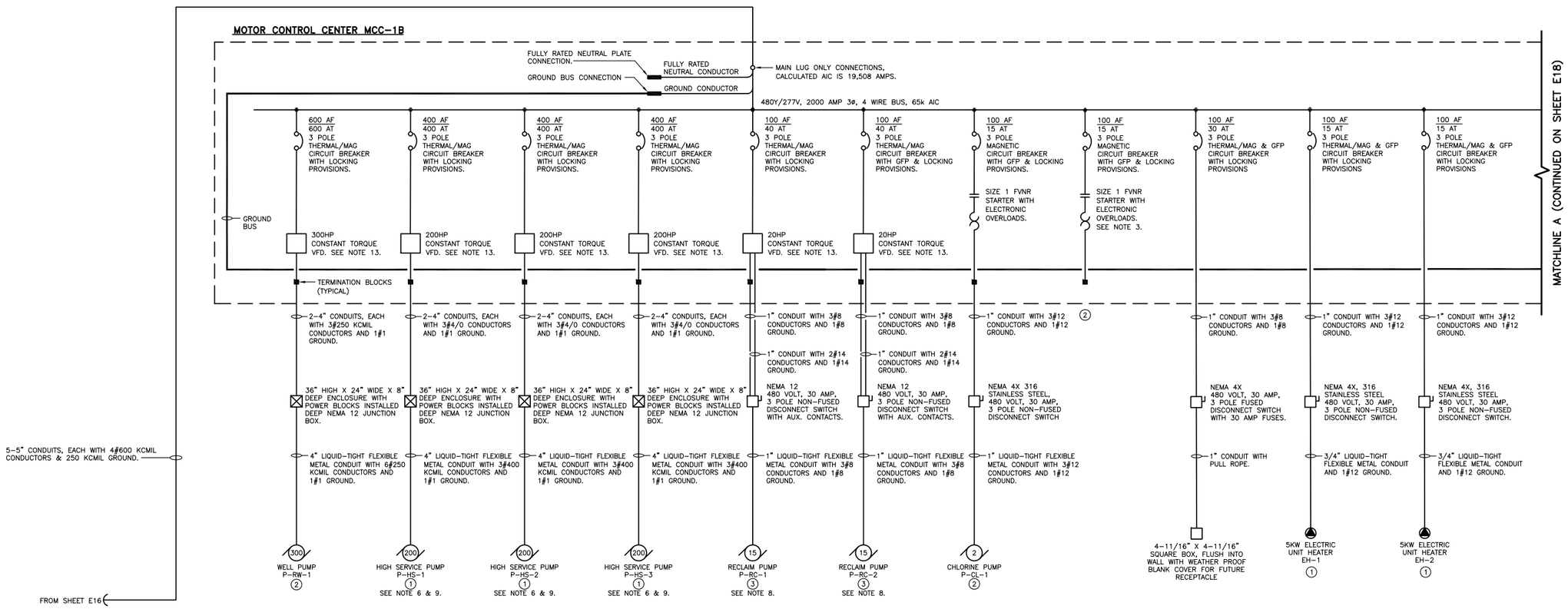
12. SPACES ONLY SHOWN ON MCC ELEVATIONS.
13. EACH VFD SHALL BE PROGRAMMED FOR GROUND FAULT AND SHALL BE SET LESS THAN MAIN CIRCUIT BREAKERS SETTINGS.



PROPOSED ELECTRICAL ONE-LINE DIAGRAM (CONTINUED)
N.T.S.

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SHEET TITLE
PROPOSED ELECTRICAL ONE-LINE DIAGRAM

SHEET
E17

MOTOR CONTROL CENTER MCC–1B

MATCHLINE A (CONTINUED FROM SHEET E17)

480Y/277V, 2000 AMP 3ø, 4 WIRE BUS, 65k AIC

GROUND BUS

TERMINATION BLOCKS (TYPICAL) ①

100 AF, 15 AT, 3 POLE MAGNETIC CIRCUIT BREAKER WITH GFP & LOCKING PROVISIONS. SIZE 1 FVNR STARTER WITH ELECTRONIC OVERLOADS. SEE NOTE 3. ①

100 AF, 30 AT, 3 POLE MAGNETIC CIRCUIT BREAKER WITH GFP & LOCKING PROVISIONS. SIZE 2 FVNR STARTER WITH ELECTRONIC OVERLOADS. SEE NOTE 3. ①

100 AF, 20 AT, 3 POLE THERMAL/MAG CIRCUIT BREAKER WITH GFP & LOCKING PROVISIONS. 7.5 HP CONSTANT TORQUE VFD (SEE NOTE 13).
- 1" CONDUIT WITH 3#12 CONDUCTORS AND 1#12 GROUND.
- 1" CONDUIT WITH 2#14 CONDUCTORS AND 1#14 GROUND.
- NEMA 12, 480 VOLT, 30 AMP, 3 POLE NON-FUSED DISCONNECT SWITCH WITH AUX. CONTACTS.
- 3/4" LIQUID-TIGHT FLEXIBLE METAL CONDUIT WITH 3#12 CONDUCTORS AND 1#12 GROUND.
- AIR HANDLER UNIT AHU–1 (7.5) ①

100 AF, 15 AT, 3 POLE THERMAL/MAG CIRCUIT BREAKER WITH GFP & LOCKING PROVISIONS. (CONNECT NEUTRAL CONDUCTOR TO NEUTRAL PALATE)
- 1" CONDUIT WITH 4#12 CONDUCTORS AND 1#12 GROUND.
- NEMA 12, 480 VOLT, 30 AMP, 3 POLE NON-FUSED DISCONNECT SWITCH
- 1" LIQUID-TIGHT FLEXIBLE METAL CONDUIT WITH 4#12 CONDUCTORS AND 1#12 GROUND.
- AIR COMPRESSOR NO.1 (3) ②

100 AF, 15 AT, 3 POLE THERMAL/MAG CIRCUIT BREAKER WITH GFP & LOCKING PROVISIONS. (CONNECT NEUTRAL CONDUCTOR TO NEUTRAL PALATE)
- 1" CONDUIT WITH 4#12 CONDUCTORS AND 1#12 GROUND.
- NEMA 12, 480 VOLT, 30 AMP, 3 POLE NON-FUSED DISCONNECT SWITCH
- 1" LIQUID-TIGHT FLEXIBLE METAL CONDUIT WITH 4#12 CONDUCTORS AND 1#12 GROUND.
- AIR COMPRESSOR NO.2 (3) ②

100 AF, 15 AT, 3 POLE THERMAL/MAG CIRCUIT BREAKER WITH GFP & LOCKING PROVISIONS. SIZE 1 FVNR STARTER WITH ELECTRONIC OVERLOADS.
- 1" CONDUIT WITH 3#12 CONDUCTORS AND 1#12 GROUND.
- NEMA 12, 480 VOLT, 30 AMP, 3 POLE NON-FUSED DISCONNECT SWITCH
- 3/4" LIQUID-TIGHT FLEXIBLE METAL CONDUIT WITH 3#12 CONDUCTORS AND 1#12 GROUND.
- MAKE UP AIR UNIT MAU–1 (1.5) ①

100 AF, 70 AT, 3 POLE THERMAL/MAG CIRCUIT BREAKER WITH GFP. TRANSFORMER T1, 45KVA, 480 VOLT, 3ø PRI., 120/208 VOLT, 3ø, 4W SEC. 1#4 GND.

42 SPACE PANELBOARD L1, SEE PANEL SCHEDULE FOR REQUIREMENTS. ①
- 2" CONDUIT WITH 4#1 CONDUCTORS AND 1#2 GROUND.
- PANELBOARD L3 ①

100 AF, 70 AT, 3 POLE THERMAL/MAG CIRCUIT BREAKER WITH GFP. TRANSFORMER T2, 45KVA, 480 VOLT, 3ø PRI., 120/208 VOLT, 3ø, 4W SEC. 1#4 GND.

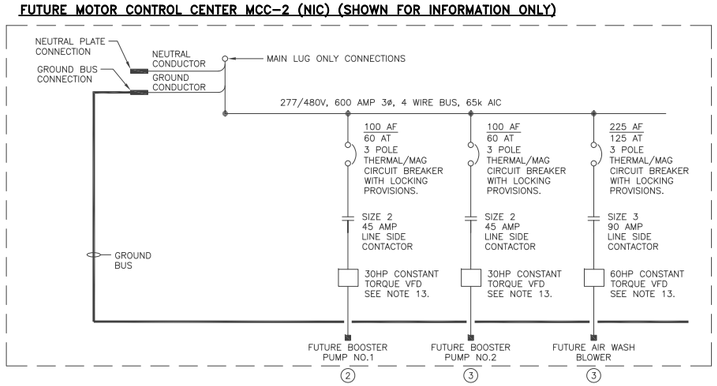
42 SPACE PANELBOARD L2, SEE PANEL SCHEDULE FOR REQUIREMENTS. ①
- 2" CONDUIT WITH 4#1 CONDUCTORS AND 1#2 GROUND.
- PANELBOARD L4 (SUPPLIED WITH GENERATOR) ①

TO PANEL L2, CKT's #11 & #13.
- 30 AMP 3 POLE EXTERIOR LIGHTING CONTACTOR LC–1 PER CONTROL DIAGRAM
- CONDUIT AND WIRING PER PLANS.

TO PANEL L2, CKTs #15 & #17 FOR EXTERIOR LIGHTING.
- 30 AMP 3 POLE EXTERIOR LIGHTING CONTACTOR LC–2 PER CONTROL DIAGRAM
- CONDUIT AND WIRING PER PLANS.

400 AF, 400 AT, 3 POLE THERMAL/MAG WITH GFP CIRCUIT BREAKER FOR FUTURE MCC–2
- 4" CONDUIT
- TO MCC–2 FUTURE LOCATION

FUTURE MOTOR CONTROL CENTER MCC–2 (NIC) (SHOWN FOR INFORMATION ONLY)



ONE–LINE DIAGRAM NOTES:

1. SEE PLAN KEYED NOTES FOR ADDITIONAL INFORMATION.
2. SEE CONTROL DIAGRAM FOR FOR ADDITIONAL INFORMATION.
3. SEE CONTROL DIAGRAMS FOR SPARE STARTER REQUIREMENTS.
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8. ONLY ONE RECLAIM PUMP MAY OPERATE AT A TIME.
9. COORDINATE VFD GROUND FAULT SETTINGS WITH SERVICE ENTRANCE AND GENERATOR CIRCUIT BREAKER GROUND FAULT SETTINGS.
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11. GROUNDING FOR PHONE SYSTEM NOT SHOWN, BUT IS REQUIRED.
12. SPACES ONLY SHOWN ON MCC ELEVATIONS.
13. EACH VFD SHALL BE PROGRAMMED FOR GROUND FAULT AND SHALL BE SET LESS THAN MAIN CIRCUIT BREAKERS SETTINGS.

PROPOSED ELECTRICAL ONE-LINE DIAGRAM (CONTINUED)
N.T.S.

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Madison Water Utility

UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

REVISIONS

MARK	DATE	DESCRIPTION

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER

SHEET TITLE
PROPOSED ELECTRICAL ONE-LINE DIAGRAM

SHEET
E18

PANELBOARD: L1																				
	BUS AMPS:	225		MAIN: 225 AF/150AT, 3 POLE			MOUNTING:				NOTES: LOCATED IN MCC-1B									
	VOLTAGE:	120/208		CIRCUIT BREAKER:		X	SURFACE:				42 SPACE PANELBOARD									
	PHASE:	3		MAIN LUG ONLY:			FLUSH:													
	WIRE:	4		SUB-FEED LUGS:							AIC RATING: 10KAIC									
CIRCUIT		AMPS	AMPS	AMPS	CB	CKT		CKT	CB	AMPS	AMPS	AMPS	CIRCUIT							
DESCRIPTION:		A	B	C	AMP				AMP	A	B	C	DESCRIPTION:							
PUMP ROOM AND EMERGENCY LIGHTING		3.00			20/1	1		2	20/1	4.50			RECEPTACLES (1)							
PUMP ROOM LIGHTING			1.30		20/1	3		4	20/1		3.00		REST ROOM RECEPTACLES (1)							
BACKWASH TANK ROOM LIGHTING				2.70	20/1	5		6	20/1			0.20	FLUORIDE SCALE RECEPTACLE (2)							
REST ROOM LIGHTING AND EXHAUST FAN		3.00			20/1	7		8	20/1	0.20			CHLORINE SCALE RECEPTACLE (2)							
CHLORINE ROOM LIGHTING AND EXHAUST FAN EF-2, MD-1 AND MD-2			3.00		20/1	9		10	20/1		0.10		CHLORINE GAS DETECTOR							
FLOURIDE ROOM LIGHTING CONTROL PANEL				1.00	20/1	11		12	20/1			0.20	CHLORINE ANALYZER NO.1							
RECEPTACLE CIRCUIT (1)		7.50			20/1	13		14	20/1	0.20			EXIT LIGHTS (3)							
RECEPTACLE CIRCUIT (1)			7.50		20/1	15		16	20/1		0.00		SPARE							
RECEPTACLE CIRCUIT (1)				3.00	20/1	17		18	20/1			0.00	SPARE							
RECEPTACLE CIRCUIT (1)		3.00			20/1	19		20	20/1	3.00			CEILING FANS CF-1, CF-2, CF-3 AND CF-4							
SCADA CONTROL PANEL SCP-31			15.00		30/1	21		22	20/1		8.40		WATER HEATERS WH-1 AND WH-2							
MECHANICAL ROOM LIGHTING AND RECEPTACLE				3.00	20/1	23		24	20/1			1.00	RECIRCULATING PUMP P-1							
FLUORIDE ROOM RECEPTACLES (1)		4.50			20/1	25		26	20/1	8.00			GAS UNIT HEATERS UH-1, UH-2, UH-3 & UH-6							
CHLORINE ROOM RECEPTACLES (1)			4.50		20/1	27		28	20/1		12.00		DEHUMIDIFER D-1							
SPARE				0.00	20/1	29		30	20/1			12.00	DEHUMIDIFER D-2							
PANELBOARD L3		46.50			100	31		32	20/1	12.00			DEHUMIDIFER D-3							
PANELBOARD L3			42.50			33		34	20/1		2.00		EXHAUST FAN EF-1 AND MD-5							
PANELBOARD L3				37.20	3	35		36	20/1			6.00	EXHAUST FAN EF-3							
VIDEO SURVEILLANCE CONTROL PANEL		5.00			20/1	37		38	20/1	3.00			SUPPLY FAN SF-1, MD-6 AND MD-7							
CARD READER CONTROL PANEL			4.00		20/1	39		40	20/1		2.00		FUME HOOD EF-6							
TELEPHONE SYSTEM RECEPTACLE				1.50	20/1	41		42	20/1			1.00	FLUORIDE TANK BLOWER							
	SUB-TOTAL:	72.50	77.80	48.40				SUB-TOTAL:		30.90	27.70	20.40								
								TOTAL:		103.40	105.50	68.80								

NOTES:
(1) PROVIDE GFI CIRCUIT BREAKER WITH 5ma GROUND FAULT TRIP SETTING AND CORROSION RESISTANT RECEPTACLES.
(2) PROVIDE CORROSION RESISTANT RECEPTACLES.
(3) LOCK CIRCUIT BREAKER ON.

PANELBOARD: L2																				
	BUS AMPS:	225		MAIN: 225 AF/150AT, 3 POLE			MOUNTING:				NOTES: LOCATED IN MCC-1B									
	VOLTAGE:	120/208		CIRCUIT BREAKER:		X	SURFACE:				42 SPACE PANELBOARD									
	PHASE:	3		MAIN LUG ONLY:			FLUSH:													
	WIRE:	4		SUB-FEED LUGS:							AIC RATING: 10KAIC									
CIRCUIT		AMPS	AMPS	AMPS	CB	CKT		CKT	CB	AMPS	AMPS	AMPS	CIRCUIT							
DESCRIPTION:		A	B	C	AMP				AMP	A	B	C	DESCRIPTION:							
GENERATOR PANELBOARD L4 (3)		50.00			125	1		2	30	18.00			ELECTRIC DUCT HEATER EDH-1							
GENERATOR PANELBOARD L4 (3)			50.00			3		4			18.00		ELECTRIC DUCT HEATER EDH-1							
GENERATOR PANELBOARD L4 (3)				50.00	3	5		6	3			18.00	ELECTRIC DUCT HEATER EDH-1							
VIDEO SURVEILLANCE ETHERNET SWITCH		0.10			20/1	7		8	15	7.20			ELECTRIC UNIT HEATER EUH-3							
FLOW METER FIT-6-1			0.01		20/1	9		10	2		7.20		ELECTRIC UNIT HEATER EUH-3							
TYPE DWLT, PA AND PB LIGHT FIXTURES				6.00	20/1	11		12	20/1			0.10	AIR COMPRESSOR SOLENOID VALVE SV-1-1							
TYPE WC,WA AND WB LIGHTING FIXTURES		6.00			20/1	13		14	20/1				SPARE							
TYPE PB POLE MOUNTED LIGHT FIXTURES			4.00		20/1	15		16	20/1				SPARE							
FLOW MWTWER FIT-7-1				0.01	20/1	17		18	20/1				SPARE							
NORTH ROOF HATCH RECEPTACLE (1)		1.50			20/1	19		20	20/1	0.01			FLOW METER FIT-2-1							
SOUTH ROOF HATCH RECEPTACLE (1)			1.50		20/1	21		22	20/1		0.01		FLOW METER FIT-3-1							
FLOW METER FIT-1-1				0.01	20/1	23		24	20/1			0.01	FLOW METER FIT-4-1							
CHLORINE GAS SHUT DOWN PANEL & SOLENOID RECEPTACLE		0.20			20/1	25		26	20/1	0.01			FLOW METER FIT-5-1							
CHLORINE GAS FEEDER NO.1			0.20		20/1	27		28	20/1		0.02		MCC-1A POWER MONITOR AND MCC-1B ETHERNET SWITCH							
CHLORINE GAS FEEDER NO.2				0.20	20/1	29		30	20/1			0.10	VACUUM DETECTOR & SOLENOID VALVE							
RECEPTACLE CIRCUIT (1)		4.50			20/1	31		32	20/1	6.00			FACP							
RECEPTACLE CIRCUIT (1)			3.00		20/1	33		34	20/1		0.20		CHLORINE ANALYZER NO.2							
SPARE					20/1	35		36	20/1			1.00	SPARE							
SPARE		0.00			20/1	37		38	20/1				SPARE							
SPARE			0.00		20/1	39		40	20/1				SPARE							
SPARE				0.00	20/1	41		42	20/1				SPARE							
	SUB-TOTAL:	61.30	58.71	56.22				SUB-TOTAL:		30.22	25.43	19.21								
								TOTAL:		91.52	84.14	76.43								

NOTES:
(1) PROVIDE GFI CIRCUIT BREAKER WITH 5ma GROUND FAULT TRIP SETTING AND CORROSION RESISTANT RECEPTACLES.
(2) PROVIDE CORROSION RESISTANT RECEPTACLES.
(3) PANELBOARD LOADS INCLUDED IN GENERATOR SPECIFICATIONS.

PANELBOARD: L3																				
	BUS AMPS:	125		MAIN:			MOUNTING:				NOTES: LOCATED IN STORAGE ROOM									
	VOLTAGE:	120/208		CIRCUIT BREAKER:			SURFACE:				42 SPACE PANELBOARD									
	PHASE:	3		MAIN LUG ONLY:		X	FLUSH:													
	WIRE:	4		SUB-FEED LUGS:							AIC RATING: 10KAIC									
CIRCUIT		AMPS	AMPS	AMPS	CB	CKT		CKT	CB	AMPS	AMPS	AMPS	CIRCUIT							
DESCRIPTION:		A	B	C	AMP				AMP	A	B	C	DESCRIPTION:							
INTERIOR BUILDING LIGHTING		2.50			20/1	1		2	20/1	4.50			STORAGE BUILDING RECEPTACLES (1)							
INTERIOR BUILDING LIGHTING			2.50		20/1	3		4	20/1		6.00		STORAGE BUILDING RECEPTACLES (1)							
EMERGENCY LIGHTING				0.20	20/1	5		6	20/1			6.00	STORAGE BUILDING RECEPTACLES (1)							
GAS UNIT HEATERS UH-4 & UH-5		4.00			20/1	7		8	20/1	4.50			STORAGE BUILDING RECEPTACLES (1)							
RADIANT HEATERS RH-1 & RH-2			2.00		20/1	9		10	30		10.00		FUTURE WELDING RECEPTACLE							
MAU-1 CONTROL PANEL				1.00	20/1	11		12				10.00	FUTURE WELDING RECEPTACLE							
GAS MONITOR \ONDINE CONTROL PANEL		1.00			20/1	13		14	3	10.00			FUTURE WELDING RECEPTACLE							
EXHAUST FAN EF-4 & MD-3			12.00		20/1	15		16	20		5.00		OVERHEAD DOOR OPERATOR NO.1							
ELECTRICALLY OPERATED VEHICLE GATE NO.1				10.00	20/1	17		18				5.00	OVERHEAD DOOR OPERATOR NO.1							
ELECTRICALLY OPERATED VEHICLE GATE NO.2		10.00			20/1	19		20	3	5.00			OVERHEAD DOOR OPERATOR NO.1							
GATE NO.1 RECEPTACLE			1.60		20/1	21		22	20		6.00		OVERHEAD DOOR OPERATOR NO.2							
GATE NO.2 RECEPTACLE				1.50	20/1	23		24				5.00	OVERHEAD DOOR OPERATOR NO.2							
SPARE					20/1	25		26	3	6.00			OVERHEAD DOOR OPERATOR NO.2							
SPARE					20/1	27		28	20/1		2.00		WATER STORAGE TANK RECEPTACLE (1)							
SPARE					20/1	29		30	20/1			1.00	WATER STORAGE TANK LIGHT							
SPARE					20/1	31		32	20/1	2.00			WATER STORAGE TANK RECEPTACLE (1)							
SPARE					20/1	33		34	20/1				SPARE							
SPARE					20/1	35		36	20/1				SPARE							
SPARE		0.00			20/1	37		38	20/1				SPARE							
SPARE			0.00		20/1	39		40	20/1				SPARE							
SPARE				0.00	20/1	41		42	20/1				SPARE							
	SUB-TOTAL:	17.50	18.00	12.70				SUB-TOTAL:		31.00	28.00	27.00								
								TOTAL:		48.50	46.00	39.70								

NOTES:
(1) PROVIDE GFI CIRCUIT BREAKER WITH 5ma GROUND FAULT TRIP SETTING AND CORROSION RESISTANT RECEPTACLES.
(2) PROVIDE CORROSION RESISTANT RECEPTACLES.

NOTE:
EACH RECEPTACLE SHALL INCLUDE A LEGEND PLATE INDICATING PANELBOARD, CIRCUIT NUMBER AND INCLUDE THE LETTERS "GFI", PER THE SPECIFICATIONS.

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Madison Water Utility

UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

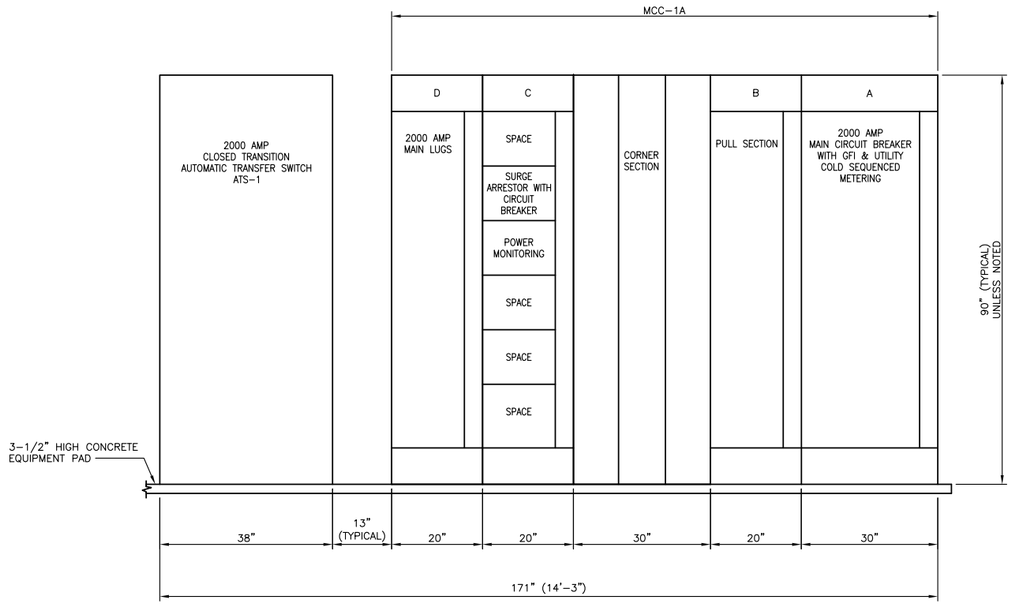
MARK	DATE	REVISIONS DESCRIPTION

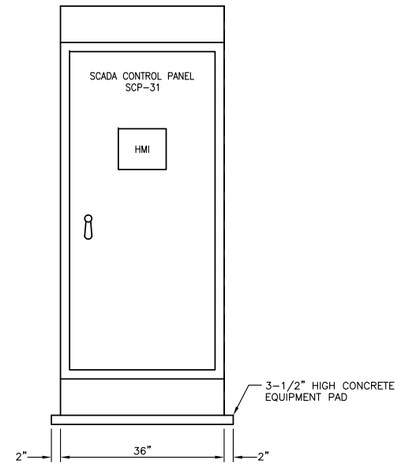
SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc., © (SEH)

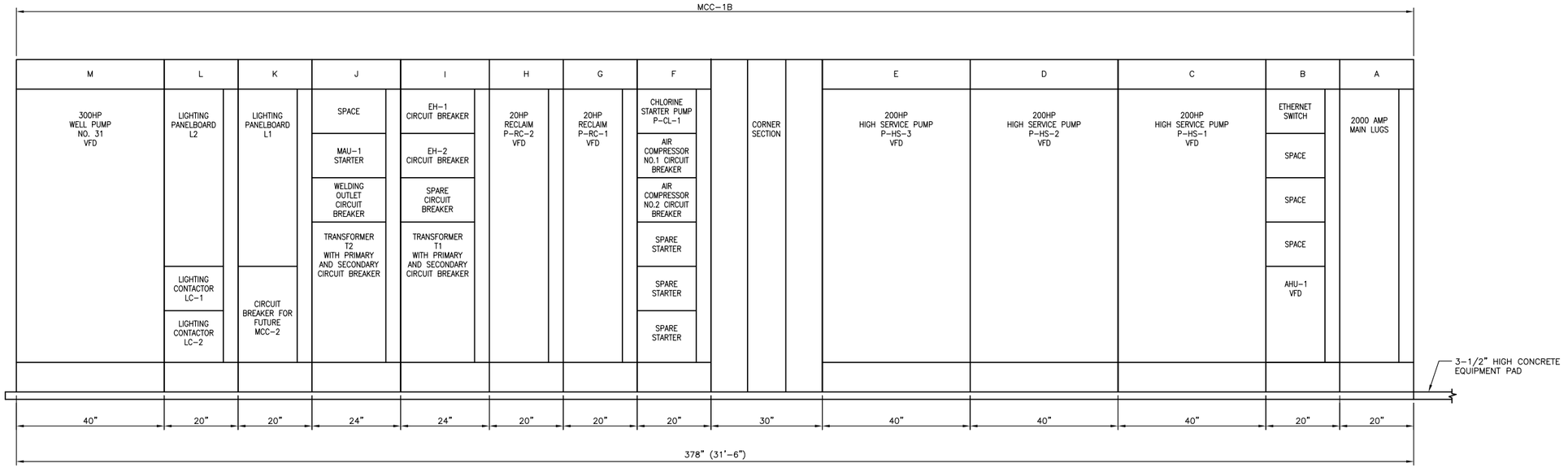
SHEET TITLE
PROPOSED ELECTRICAL ONE-LINE DIAGRAM

SHEET
E19

H:\PROJECTS\2284 - Madison Well No.31\2016 Redesign\Powrtek\E16_E20 - One-Line Diagram and Motor Control Center.dwg, 1/20/2017 2:29:20 PM







NOTES:

1. ALL MCC SECTIONS AND SCADA CONTROL PANEL ARE 20 INCHES DEEP.
2. ATS–1 IS 56.4" DEEP AND 90" HIGH.

PROPOSED MOTOR CONTROL CENTERS, ATS-1 AND SCADA CONTROL PANEL ELEVATIONS
N.T.S.

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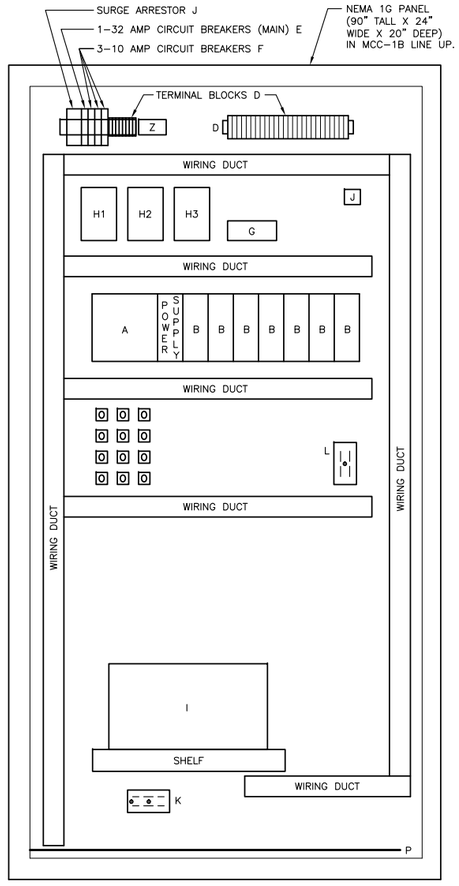
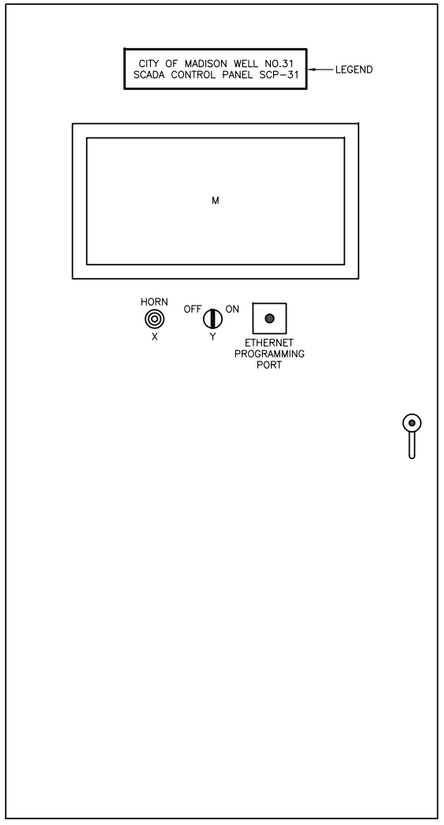
SHEET TITLE
PROPOSED MOTOR CONTROL CENTER ELEVATIONS

SHEET
E20

H:\PROJECTS\2284 - Madison Well No.31\2016 Redesign\Powrtek\E16_E20 - One-Line Diagram and Motor Control Center.dwg, 1/20/2017 2:29:29 PM



INTERIOR VIEW



EXTERIOR VIEW

SCADA CONTROL PANEL – SCP-31 LAYOUT
N.T.S.

BILL OF MATERIALS – FOR SCADA CONTROL PANEL SCP-31

"LEGEND"	NAME/DESCRIPTION	NO. REQ'D.	MANUFACTURER	CATALOG OR PART NO.
A	PROGRAMMABLE LOGIC CONTROLLER (PLC)	1	ALLEN BRADLEY	COMPACTLOGIX 1769-L33ER
B	DIGITAL AND ANALOG I/O	AS REQ'D	ALLEN BRADLEY	PROVIDE 30% SPARE I/O
	NOT USED			
D	TERMINAL BLOCKS, FINGER SAFE	AS REQ'D	PHOENIX CONTACT	LT SERIES, 800 VOLT, 32 AMP (1) (5)
E	CIRCUIT BREAKER 30 AMP (PANEL)	1	PHOENIX CONTACT	TMC SERIES, NORMAL BLOW
F	CIRCUIT BREAKER 10 AMP (CONTROLS)	AS REQ'D	PHOENIX CONTACT	TMC SERIES, NORMAL BLOW
G	ETHERNET SWITCH, 16 PORT, MANAGED	1	N-TRON	716TX
H1	POWER SUPPLY (HMI)	1	PHOENIX CONTACT	CM125-PS-120-230AC/24VDC/5/F
H2 & H3	PLC POWER SUPPLY PS2, PS3 & PLC INPUTS	2	PHOENIX CONTACT	CM125-PS-120-230AC/24VDC/5/F
I	UNINTERRUPTIBLE POWER SUPPLY 1.0KVA (UPS)	1	POWERWARE	1000VA, 900 WATT CATALOG 9130 WITH RELAY MONITOR CARD
J	ANTENNA SURGE ARRESTOR	1		
K	RECEPTACLE, 120 VOLT, 20 AMP	1	HUBBELL	HBL5352
L	RECEPTACLE, GFCI, 120 VOLT, 20 AMP	1	HUBBELL	GF5362
M	23" PANEL MOUNTED COMPUTER	1	HOPE/DELL	HIS-ML23 (4)
N	NOT USED			
O	INTERFACE RELAYS	AS REQ'D	ALLEN BRADLEY	700-HB32Z24-3-4
P	INTERNAL MCC GROUND BUSSING	AS SHOWN	CUTLER HAMMER/ ALLEN BRADLEY	N/A
Q	NOT USED			
W	NOT USED			
X	FRONT PANEL MOUNTED HORN	1	EDWARDS	E110A (3)
Y	TWO POSITION SELECTOR SWITCH	1	ALLEN BRADLEY	800T, 30.5MM
SCADA CONTROL PANEL (AS SHOWN)	PLASTIC WIRING DUCT, 2"x2" TYPE "G" SNAP-IN SLOT TYPE	AS REQ'D	PANDUIT	G2X2LG6, LIGHT GREY W/ COVER
(PARTIALLY SHOWN)	SUB-PANEL	1	MCC BACK PANEL	ALLEN BRADLEY
(PARTIALLY SHOWN)	ENCLOSURE, NEMA 1, GASKETED SECTION, 21"W X 21"DP X 90"H	1	MCC SECTION	ALLEN BRADLEY
N/A	120VAC WIRING, WHITE STRANDED #14 AWG	AS REQ'D	DISTRIBUTOR	TYPE MTW-THW
N/A	120VAC WIRING, RED STRANDED #14 AWG	AS REQ'D	DISTRIBUTOR	TYPE MTW-THW
N/A	GROUND WIRING, GREEN STRANDED #14 AWG	AS REQ'D	DISTRIBUTOR	TYPE MTW-THW
N/A	PLC INPUT WIRING, BLUE STRANDED #14 AWG	AS REQ'D	DISTRIBUTOR	TYPE MTW-THW
N/A	PLC CABLES	AS REQ'D	DISTRIBUTOR	N/A (4)
N/A	BLACK ON GREY, #16 AWG SHIELDED, TWISTED PAIR.	AS REQ'D	ANIXTER	317-023-1601-B
(NOT SHOWN)	COMPUTER GENERATED HEAT SHRINK TYPE WIRE MARKERS	AS REQ'D	BRADY	PSIDP-111-187
Z	SURGE ARRESTOR	1	CRITEC	PER SPECIFICATIONS
AA	NOT USED			

NOTES:

(1) PROVIDE RED FOR 120V WIRING. PROVIDE WHITE FOR NEUTRAL WIRING. PROVIDE GREEN FOR GROUND WIRING.

(2) PROVIDE 1/2" LETTERS.

(3) USE OUTPUT CONTACT ON PLC TO POWER ALARM SIGNAL DEVICE.

(4) PROVIDE CABLES PER MANUFACTURER'S RECOMMENDATIONS.

(5) QUANTITY OF TERMINAL BLOCKS SHOWN IS FOR LOCATION ONLY, PROVIDE AS REQUIRED. ADD 30% SPARE AFTER ALL WIRING INCLUDING SPARE CONDUCTORS.

GENERAL NOTES:

1. SUPPLIER'S NAME AND PART NUMBERS ARE PROVIDED AS A MEANS OF ESTABLISHING CONFORMANCE STANDARDS FOR PERFORMANCE AND RATING, TESTING, AND MATERIALS. OTHER EQUIPMENT MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.
2. ALL PANEL HARDWARE SHALL BE FASTENED TO BACK PANEL WITH STAINLESS STEEL THREADED SCREWS. DO NOT USE SELF-DRILLING OR SELF-TAPPING SCREWS.
3. PROVIDE INTERFACE RELAYS AS REQUIRED PER PLANS.
4. FRONT PANEL LAYOUT IS SHOWN FOR GENERAL CONFORMANCE ONLY.
5. PROVIDE 30% SPARE TERMINAL BLOCKS.
6. PROVIDE A MINIMUM OF 3" OF ISOLATION FOR ANALOG CABLES.
7. PROVIDE TWO (2) 4-20 MA INPUTS FOR FUTURE INSTRUMENTATION.
8. PROVIDE ALL REQUIRED CABLES AND PROGRAMMING.
9. SEE SPECIFICATIONS FOR I/O LIST.
10. PANEL SHALL BEAR UL LABEL.
11. INCLUDE ALL LEGEND PLATES AND GASKETS WITH ALL FRONT MOUNTED DEVICES.
12. PROVIDE 3 POINT LOCKING MECHANISM WITH FOUR (4) KEYES.
13. THE SYSTEM INTEGRATOR SHALL COORDINATE ALL WIRING AND NECESSARY CONDUITS WITH THE ELECTRICAL CONTRACTOR FOR INSTALLING ALL INTERCONNECT WIRING REQUIRED BETWEEN THE VFD's OR OTHER EQUIPMENT AND THE SCADA CONTROL PANEL.

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Madison Water Utility

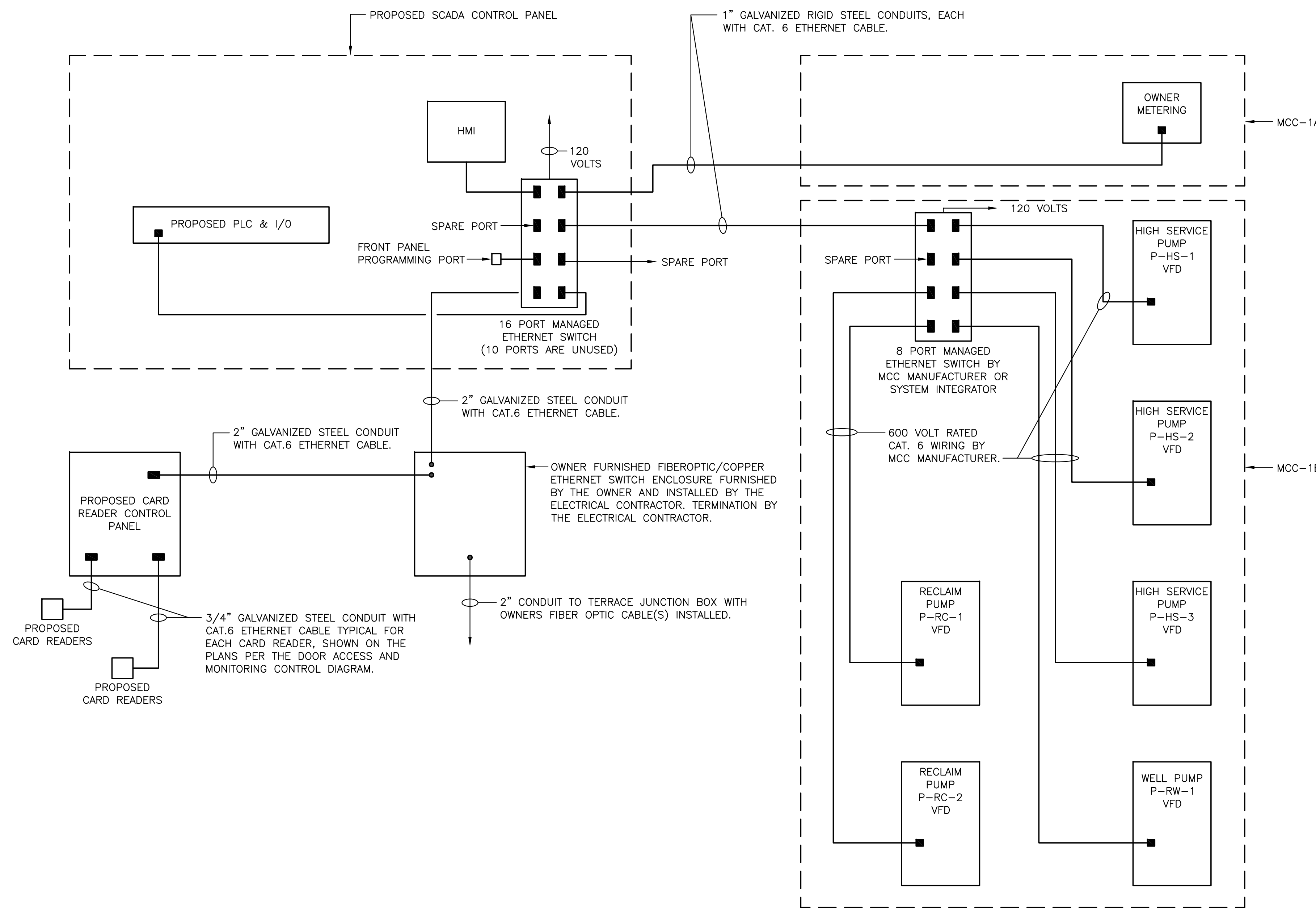
UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc. @ (SEH)

SHEET TITLE
SCADA CONTROL PANEL LAYOUT AND BILL OF MATERIALS

SHEET
E21



NOTES:

1. POWER WIRING NOT SHOWN.
2. SEE PROPOSED DOOR ACCESS AND MONITORING CONTROL DIAGRAM FOR ADDITIONAL INFORMATION.

PLC ETHERNET INTERCONNECT DIAGRAM

N.T.S.

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MADISON, WISCONSIN

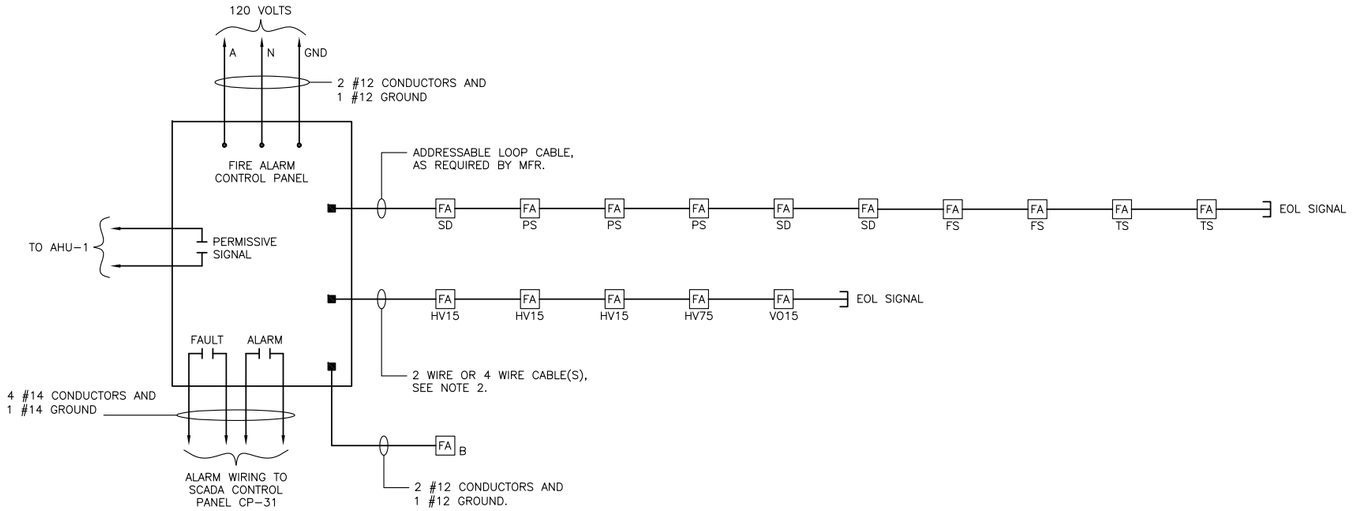
REVISIONS

MARK	DATE	DESCRIPTION

SEH FILE NO.	129083
PROJECT NO.	53W1043
ISSUE DATE	JANUARY 13, 2017
DESIGNED BY	RICHARD J. BOYA
DRAWN BY	BRIAN E. FULLER

SHEET TITLE
PLC ETHERNET INTERCONNECT DIAGRAM

SHEET
E22



NOTES:

1. GROUNDING CONDUCTORS REQUIRED, BUT NOT SHOWN.
2. FULLY ADDRESSABLE FIRE ALARM SYSTEM.
3. THE HORN/STROBE AND STROBE WIRING SHALL BE NO.12 THHW BLACK (-) AND NO.12 RED (+) FOR A 4 WIRE SYSTEM. FINAL VERIFICATION WITH MFR.
4. FAULT AND ALARM INTERFACE RELAY SHALL INCLUDE A 24VDC, FORM "C" TYPE, DPDT RATED FOR 300 VOLTS A.C.C. 10 AMPS, MINIMUM.
5. SEE PLANS FOR QUANTITY AND TYPE OF DEVICES. NOT ALL DEVICES ARE SHOWN HERE.
6. ALL WIRING SHALL BE INSTALLED INTO 3/4 INCH DIAMETER GALVANIZED RIGID STEEL CONDUIT AND PAINTED RED.
7. ALL JUNCTIONS BOXES SHALL BE PAINTED RED.

TYPICAL FIRE ALARM SYSTEM INTERCONNECT DIAGRAM

N.T.S.

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Madison Water Utility

UNIT WELL 31 WATER
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MADISON, WISCONSIN

REVISIONS

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DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
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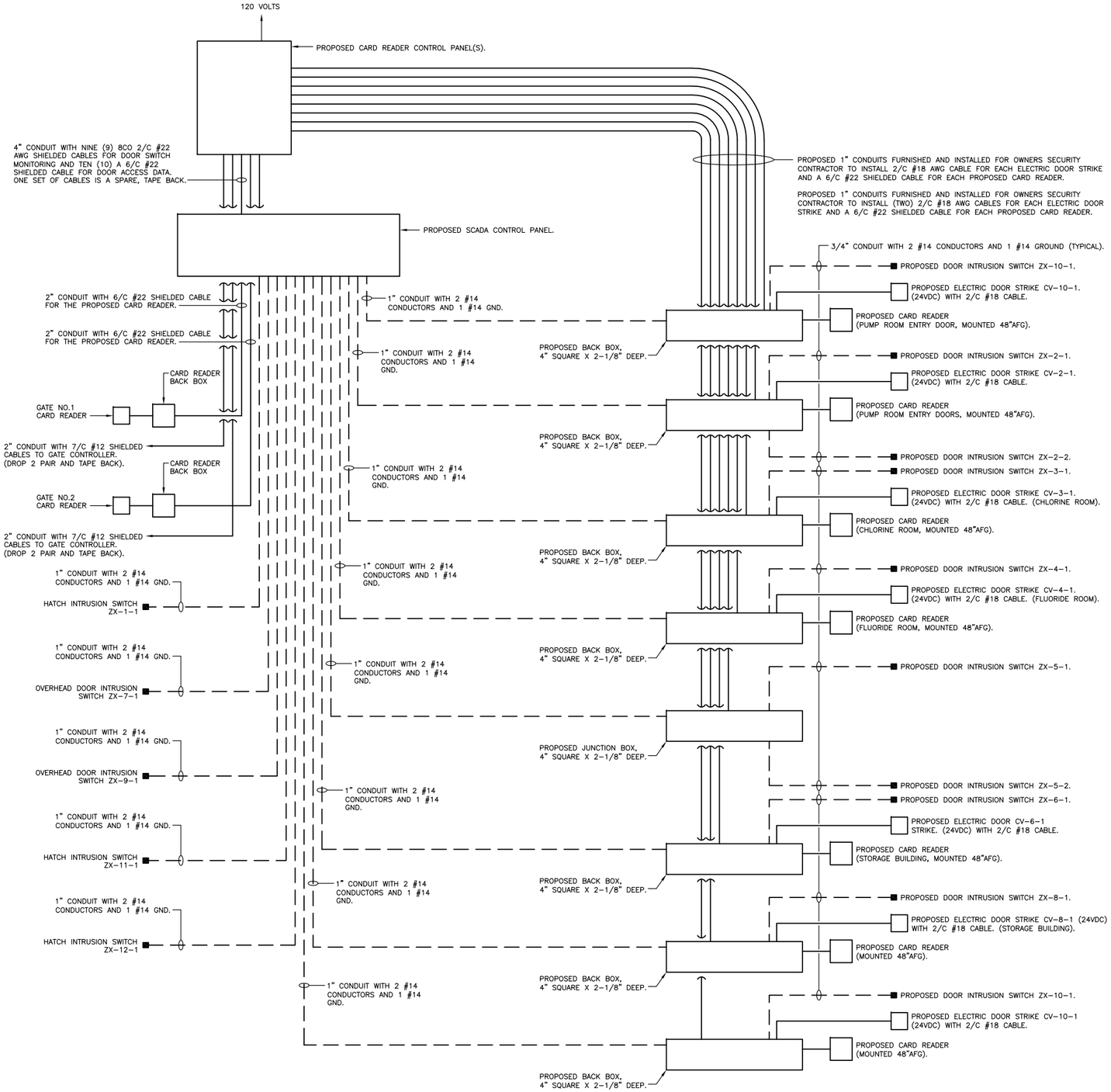
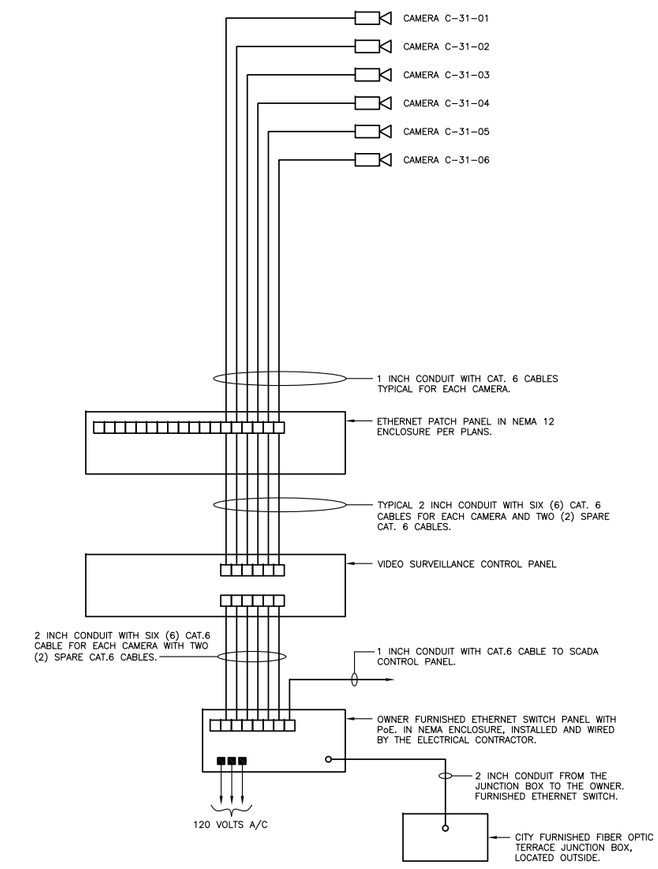
SHEET TITLE
FIRE ALARM SYSTEM INTERCONNECT DIAGRAM

SHEET
E23



PROPOSED DOOR ACCESS AND MONITORING CONTROL DIAGRAM
N.T.S.



VIDEO SURVEILLANCE SYSTEM INTERCONNECT DIAGRAM
N.T.S.

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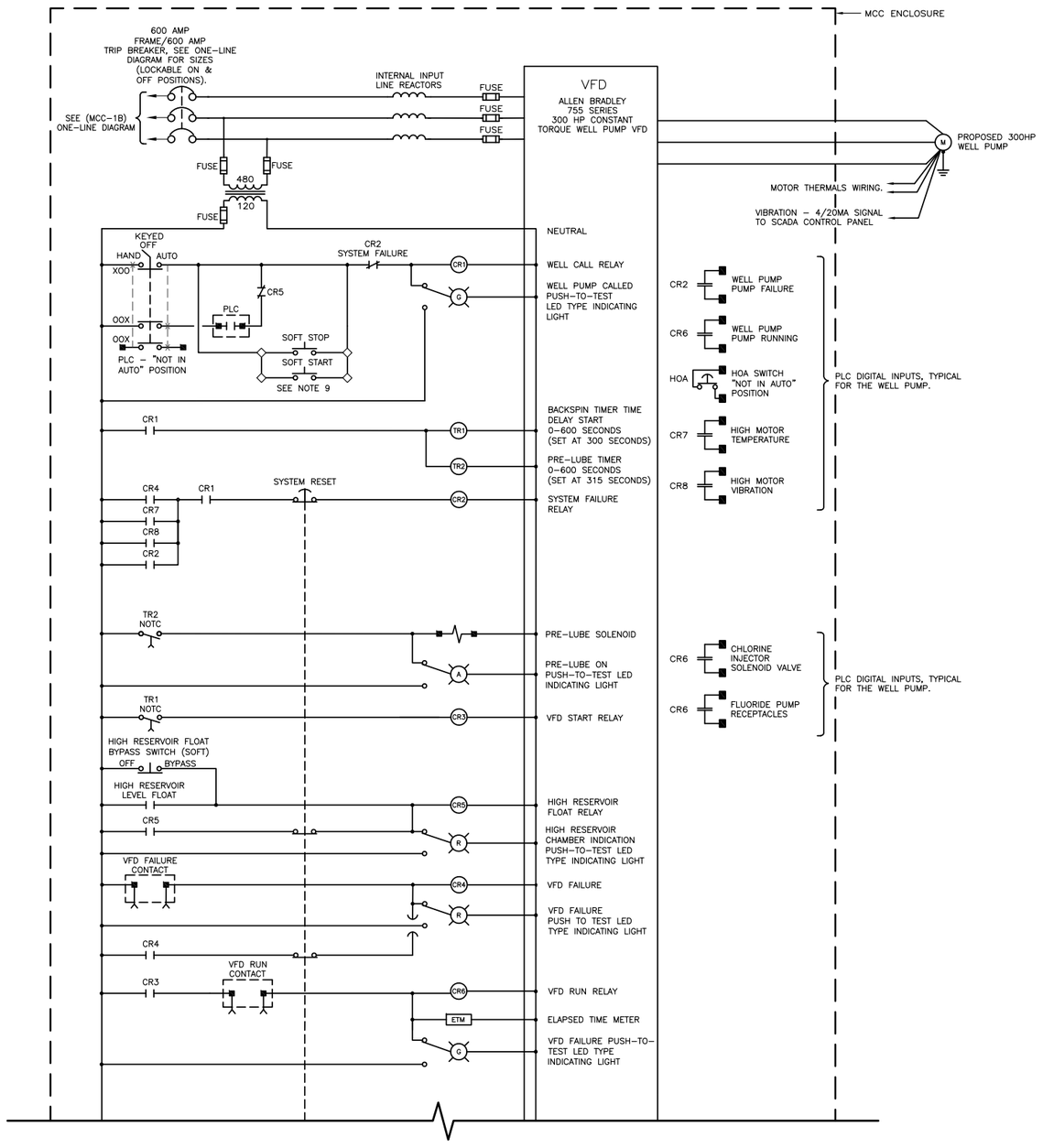
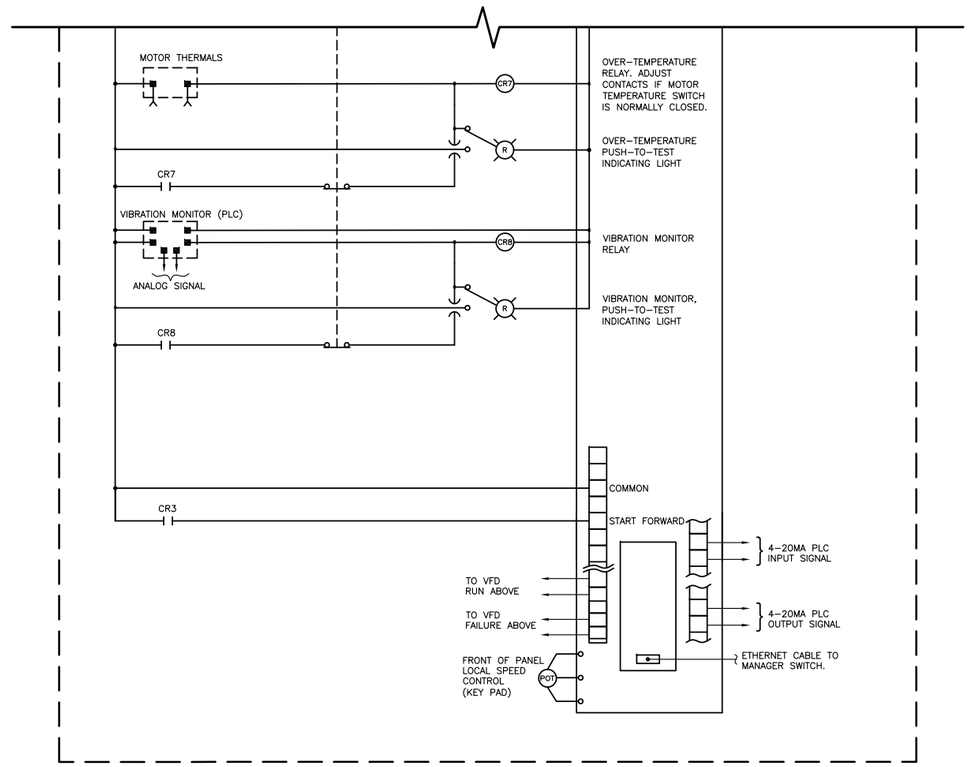
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc. ® (SEH)

SHEET TITLE
PROPOSED DOOR ACCESS MONITORING CONTROL DIAGRAM AND VIDEO SURVEILLANCE SYSTEM INTERCONNECT DIAGRAM

SHEET
E24





WELL PUMP P-RW-1 CONTROL DIAGRAM
N.T.S.

GENERAL NOTES:

1. SEE PLANS FOR CONDUIT AND CONDUCTOR SIZES.
2. NOT ALL CONTROL REQUIREMENTS MAY BE SHOWN. SEE SPECIFICATION SECTION 26 09 01 FOR ADDITIONAL CONTROL LOGIC REQUIREMENTS.
3. THE DELAY START TIMER FUNCTIONS VARY WITH EACH PUMP OR MOTOR LOAD.
4. TIMING RANGES & VFD PROGRAMMING TO BE FINALIZED IN THE FIELD TO OPTIMIZE WATER SYSTEM PERFORMANCE.
5. MCC SHALL BE NEMA 1G GASKETED FOR CONTROL RELAYS AND TIMERS. VFD DISPLAY, SELECTOR SWITCHES, RESET, LED TRANSFORMER TYPE INDICATING LIGHTS, AND ETM SHALL BE FRONT PANEL MOUNTED.
6. ALL SWITCHES, INDICATING LIGHTS AND PUSH BUTTONS SHALL BE NEMA 13 RATED, 30.5MM TYPE.
7. FINAL LEVELS AND SET POINTS TO BE FIELD DETERMINED. FINAL ADJUSTMENTS WILL ALSO BE MADE AT THAT TIME.
8. CONTROL DIAGRAM SHOWN FOR CUTLER HAMMER, IF USING ALLEN BRADLEY 700 SERIES VFD, MODIFY AS REQUIRED.
9. SOFT CONTROL REFERS TO HMI FUNCTIONS.
10. PUMPS SHUTDOWN ON HIGH RESERVOIR LEVEL.
11. SEE VFD SPECIFICATIONS FOR REQUIRED VFD OUTPUT REQUIREMENTS.

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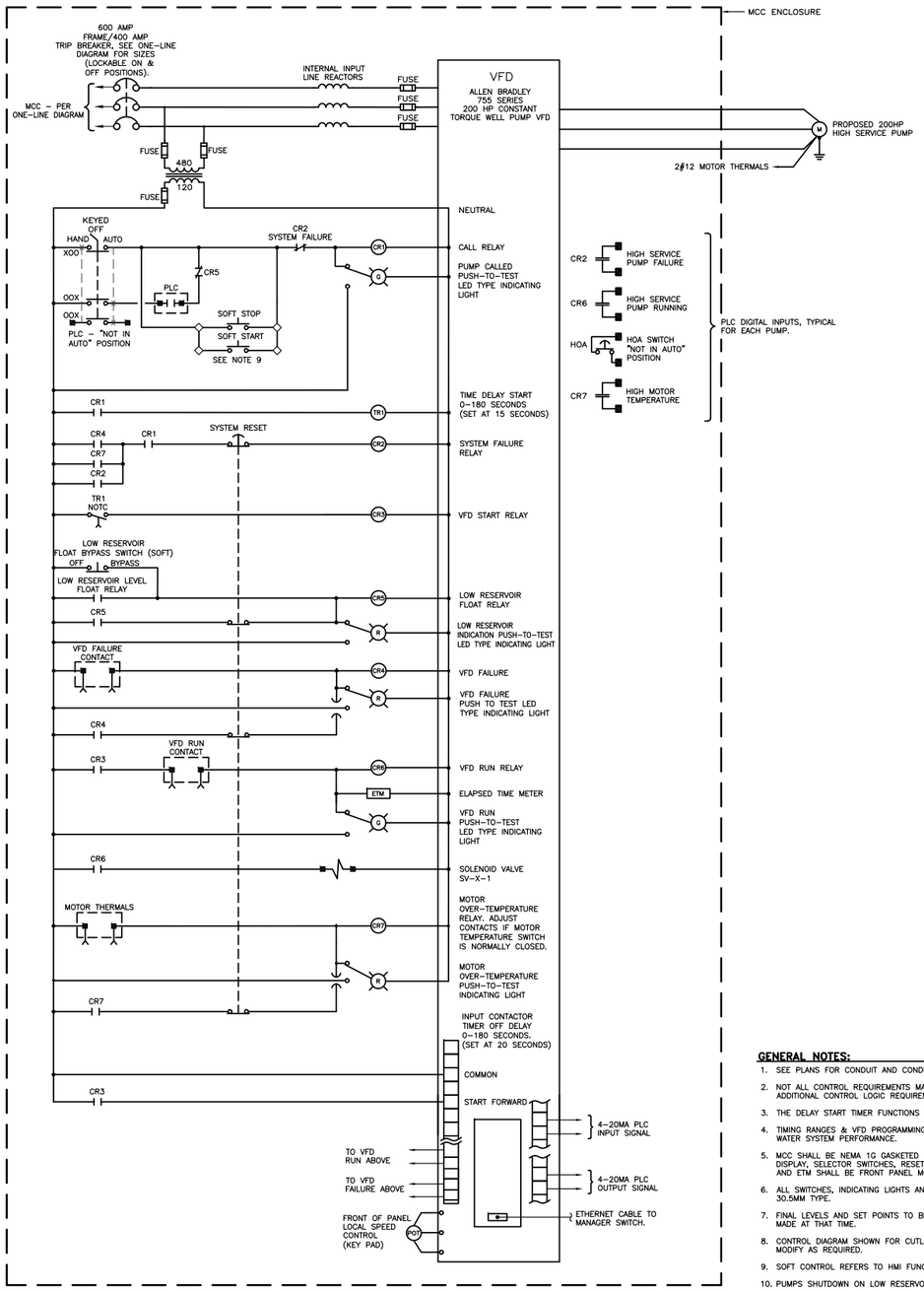
SHEET TITLE
WELL PUMP P-RW-1 CONTROL DIAGRAM

SHEET
E25



HIGH SERVICE PUMPS P-HS-1, P-HS-2 & P-HS-3 CONTROL DIAGRAM
N.T.S.

GENERAL NOTES:

1. SEE PLANS FOR CONDUIT AND CONDUCTOR SIZES.
2. NOT ALL CONTROL REQUIREMENTS MAY BE SHOWN. SEE SPECIFICATION SECTION 26 09 01 FOR ADDITIONAL CONTROL LOGIC REQUIREMENTS.
3. THE DELAY START TIMER FUNCTIONS VARY WITH EACH PUMP OR MOTOR LOAD.
4. TIMING RANGES & VFD PROGRAMMING TO BE FINALIZED IN THE FIELD TO OPTIMIZE WATER SYSTEM PERFORMANCE.
5. MCC SHALL BE NEMA 1G GASKETED FOR CONTROL RELAYS AND TIMERS. VFD DISPLAY, SELECTOR SWITCHES, RESET, LED TRANSFORMER TYPE INDICATING LIGHTS, AND ETM SHALL BE FRONT PANEL MOUNTED.
6. ALL SWITCHES, INDICATING LIGHTS AND PUSH BUTTONS SHALL BE NEMA 13 RATED, 30.5MM TYPE.
7. FINAL LEVELS AND SET POINTS TO BE FIELD DETERMINED. FINAL ADJUSTMENTS WILL ALSO BE MADE AT THAT TIME.
8. CONTROL DIAGRAM SHOWN FOR CUTLER HAMMER, IF USING ALLEN BRADLEY 700 SERIES VFD, MODIFY AS REQUIRED.
9. SOFT CONTROL REFERS TO HMI FUNCTIONS.
10. PUMPS SHUTDOWN ON LOW RESERVOIR LEVEL.
11. SEE VFD SPECIFICATIONS FOR REQUIRED VFD OUTPUT REQUIREMENTS.

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SHEET TITLE
TYPICAL HIGH SERVICE PUMP CONTROL DIAGRAM

SHEET
E26

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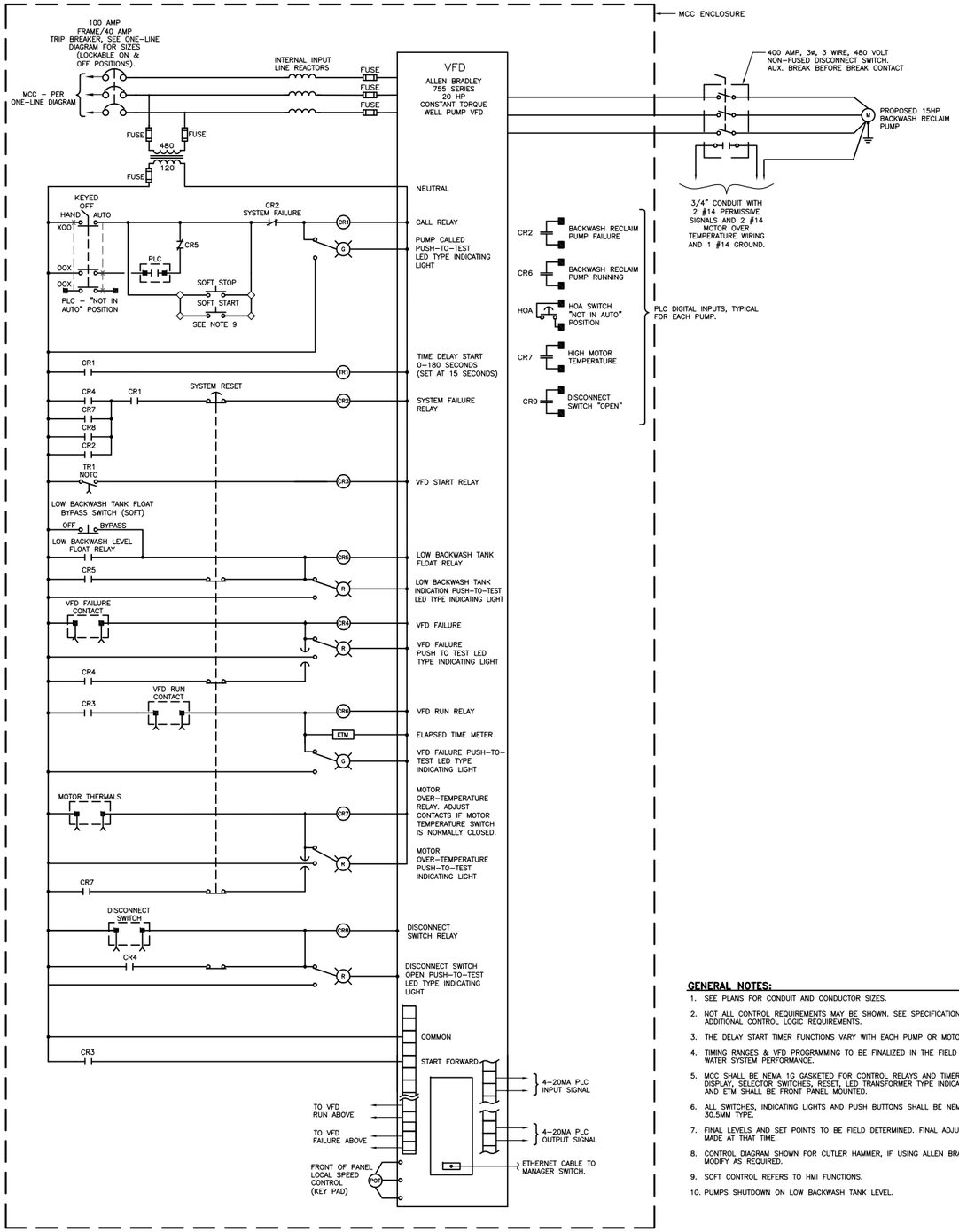

BACKWASH RECLAIM PUMPS P-RC-1 & P-RC-2 CONTROL DIAGRAM
N.T.S.

GENERAL NOTES:

1. SEE PLANS FOR CONDUIT AND CONDUCTOR SIZES.
2. NOT ALL CONTROL REQUIREMENTS MAY BE SHOWN. SEE SPECIFICATION SECTION 26 09 01 FOR ADDITIONAL CONTROL LOGIC REQUIREMENTS.
3. THE DELAY START TIMER FUNCTIONS VARY WITH EACH PUMP OR MOTOR LOAD.
4. TIMING RANGES & VFD PROGRAMMING TO BE FINALIZED IN THE FIELD TO OPTIMIZE WATER SYSTEM PERFORMANCE.
5. MCC SHALL BE NEMA 1G GASKETED FOR CONTROL RELAYS AND TIMERS. VFD DISPLAY, SELECTOR SWITCHES, RESET, LED TRANSFORMER TYPE INDICATING LIGHTS, AND ETM SHALL BE FRONT PANEL MOUNTED.
6. ALL SWITCHES, INDICATING LIGHTS AND PUSH BUTTONS SHALL BE NEMA 13 RATED, 30.5MM TYPE.
7. FINAL LEVELS AND SET POINTS TO BE FIELD DETERMINED. FINAL ADJUSTMENTS WILL ALSO BE MADE AT THAT TIME.
8. CONTROL DIAGRAM SHOWN FOR CUTLER HAMMER, IF USING ALLEN BRADLEY 700 SERIES VFD, MODIFY AS REQUIRED.
9. SOFT CONTROL REFERS TO HMI FUNCTIONS.
10. PUMPS SHUTDOWN ON LOW BACKWASH TANK LEVEL.

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Madison Water Utility

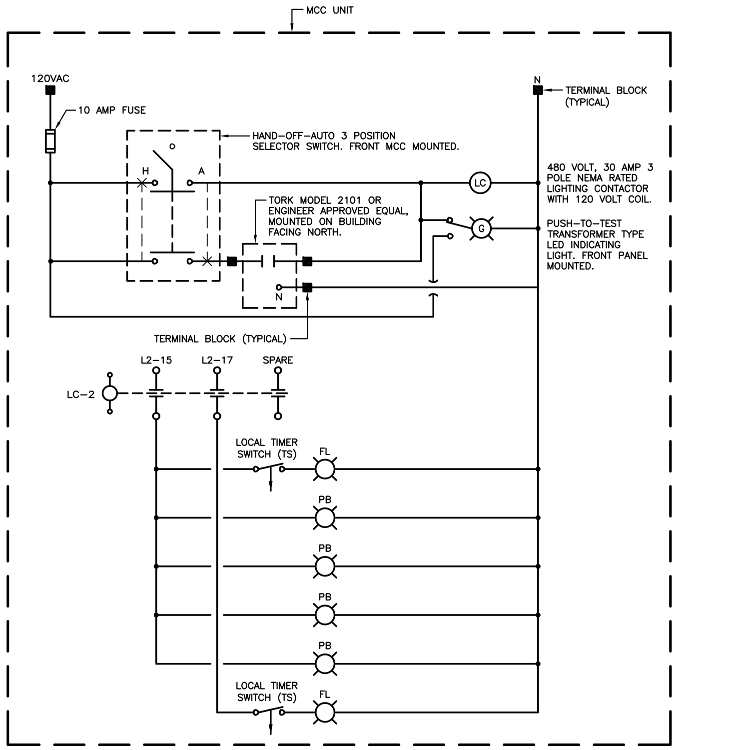
UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	REVISIONS DESCRIPTION

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc., @ (SEH)

SHEET TITLE
BACKWASH RECLAIM PUMP CONTROL DIAGRAM

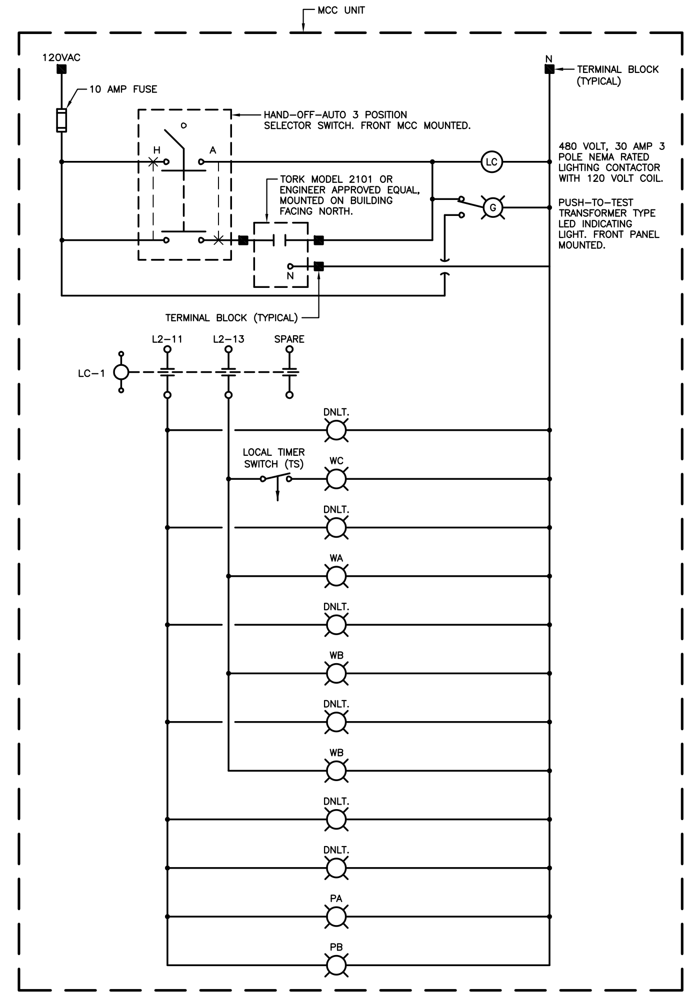
SHEET
E27



NOTES:

1. ALL CONTROL WIRING SHALL BE #14 AWG STRANDED THWN OR XHHW COPPER CONDUCTORS IN 1/2" CONDUIT.
1. MOUNT PHOTOCELL ON WEATHERPROOF JUNCTION BOX WITH GASKETED COVER.
2. LOCATE FUSE IN ENCLOSURE.
3. LIGHTING CONTROLLER FURNISHED BY SYSTEM INTEGRATOR.

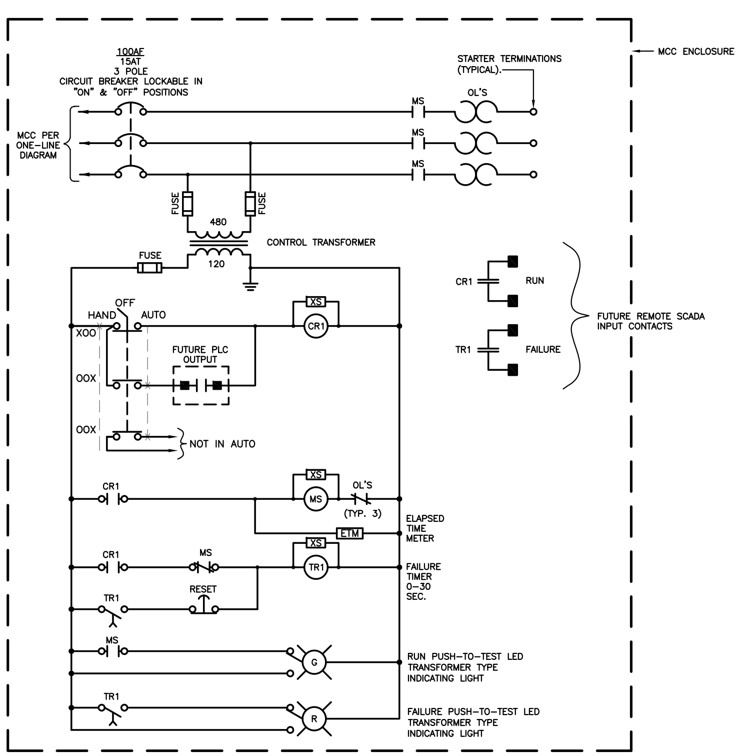
EXTERIOR LIGHTING CONTROL (LC-2) DIAGRAM
N.T.S.



NOTES:

1. ALL CONTROL WIRING SHALL BE #14 AWG STRANDED THWN OR XHHW COPPER CONDUCTORS IN 1/2" CONDUIT.
2. MOUNT PHOTOCELL ON WEATHERPROOF JUNCTION BOX WITH GASKETED COVER.
3. LOCATE FUSE IN ENCLOSURE.
4. LIGHTING CONTROLLER FURNISHED BY SYSTEM INTEGRATOR.

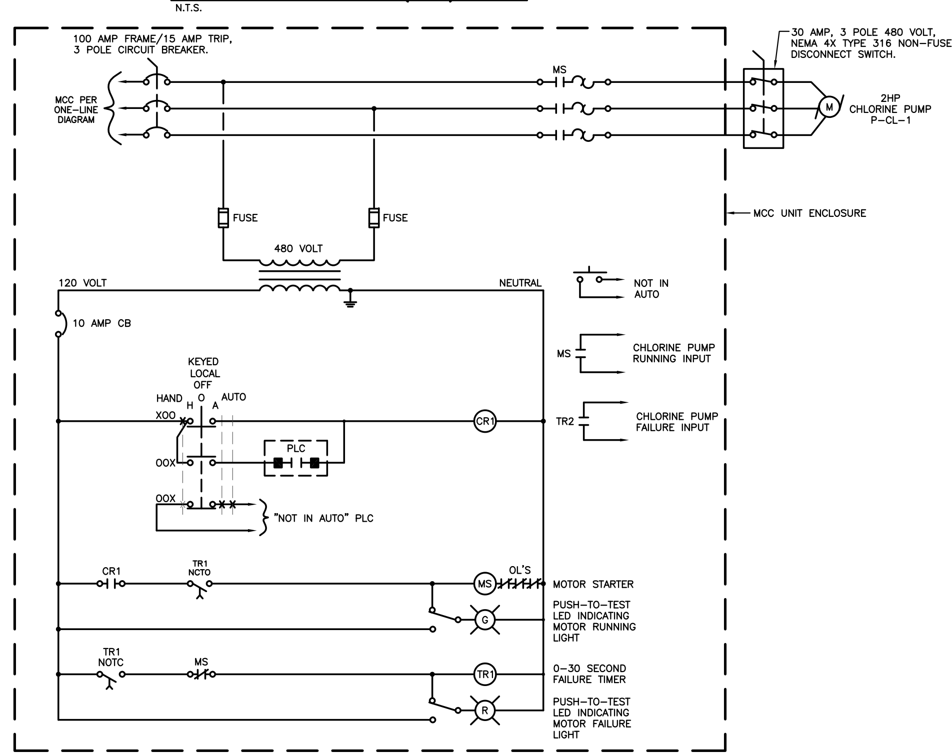
EXTERIOR LIGHTING CONTROL (LC-1) DIAGRAM
N.T.S.



SPARE STARTER NOTES:

1. MCC SHALL BE NEMA 1G GASKETED FOR CONTROL RELAYS AND TIMERS. SELECTOR SWITCH, RESET PUSH BUTTON, LED TRANSFORMER TYPE INDICATING LIGHTS, AND ETM SHOWN ON CONTROL DIAGRAM SHALL BE FRONT PANEL MOUNTED.
2. ALL SWITCHES, INDICATING LIGHTS AND PUSH BUTTONS SHALL BE NEMA 13 RATED, 30.5MM TYPE.
3. DIAGRAMS ARE SHOWN IN GENERAL ONLY. OTHER RELAYS, TIMERS, AND FIELD DEVICES MAY BE REQUIRED.

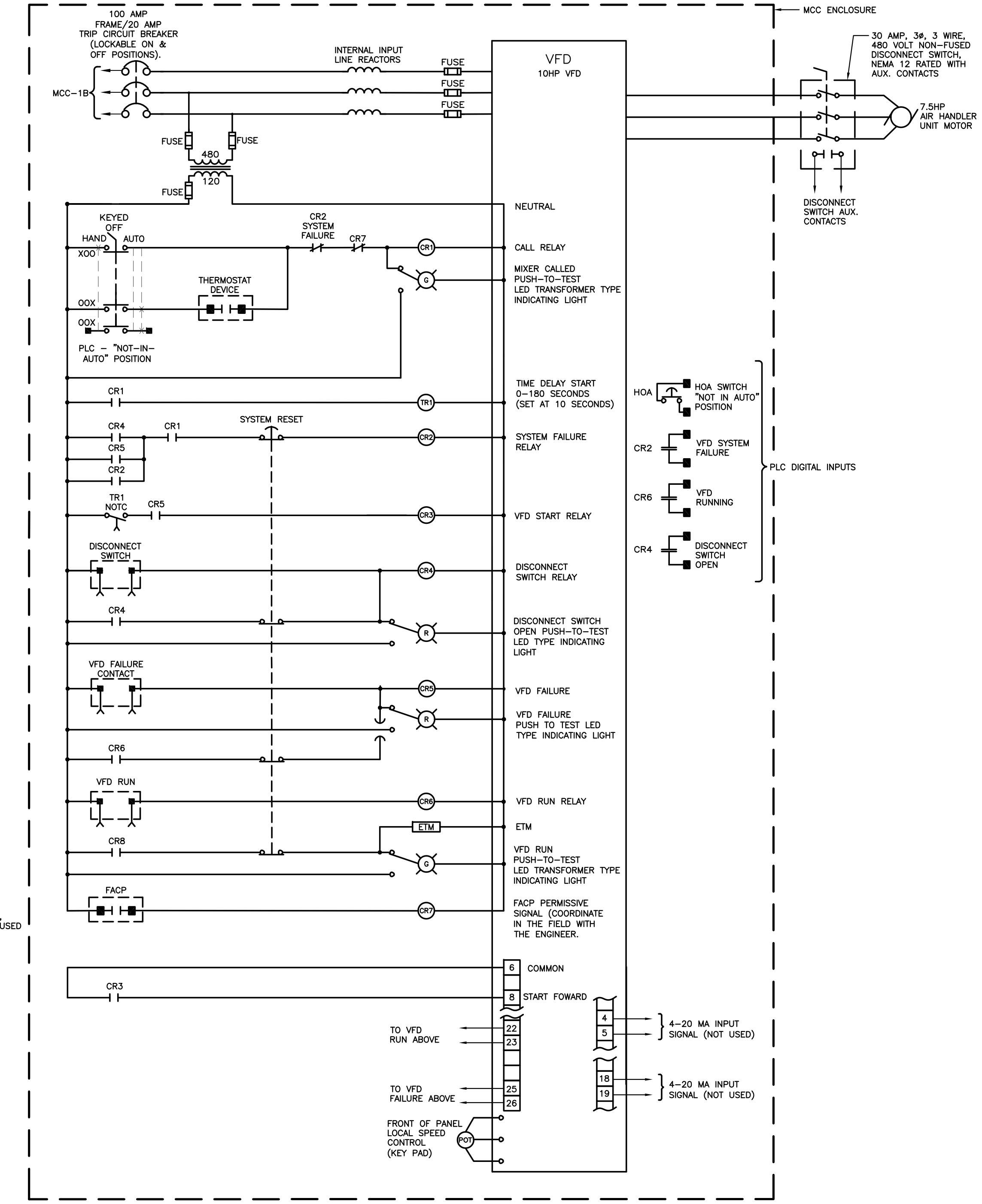
SPARE STARTER CONTROL DIAGRAM
N.T.S.



NOTES:

1. THE DELAY START TIMER FUNCTIONS VARY WITH EACH PUMP OR MOTOR LOAD. SEE ONE- LINE DIAGRAM FOR ADDITIONAL INFORMATION ON TIMING CYCLES FOR THE EMERGENCY GENERATOR.

CHLORINE PUMP P-CL-1 CONTROL DIAGRAM
N.T.S.



AIR HANDLER UNIT (AHU-1) CONTROL DIAGRAM
N.T.S.

GENERAL CONTROL DIAGRAM NOTES:

1. SEE PLANS FOR CONDUIT AND CONDUCTOR SIZES.
2. NOT ALL CONTROL REQUIREMENTS MAY BE SHOWN. SEE SPECIFICATION SECTION 26 09 01 FOR ADDITIONAL CONTROL LOGIC REQUIREMENTS.
3. THE DELAY START TIMER FUNCTIONS VARY WITH EACH PUMP OR MOTOR LOAD.
4. TIMING RANGES & VFD PROGRAMMING TO BE FINALIZED IN THE FIELD TO OPTIMIZE WATER SYSTEM PERFORMANCE.
5. MCC SHALL BE NEMA 1G GASKETED FOR CONTROL RELAYS AND TIMERS. VFD DISPLAY, SELECTOR SWITCHES, RESET, LED TRANSFORMER TYPE INDICATING LIGHTS, AND ETM SHALL BE FRONT PANEL MOUNTED.
6. ALL SWITCHES, INDICATING LIGHTS AND PUSH BUTTONS SHALL BE NEMA 13 RATED, 30.5MM TYPE.
7. SOFT CONTROL REFERS TO HMI FUNCTIONS.

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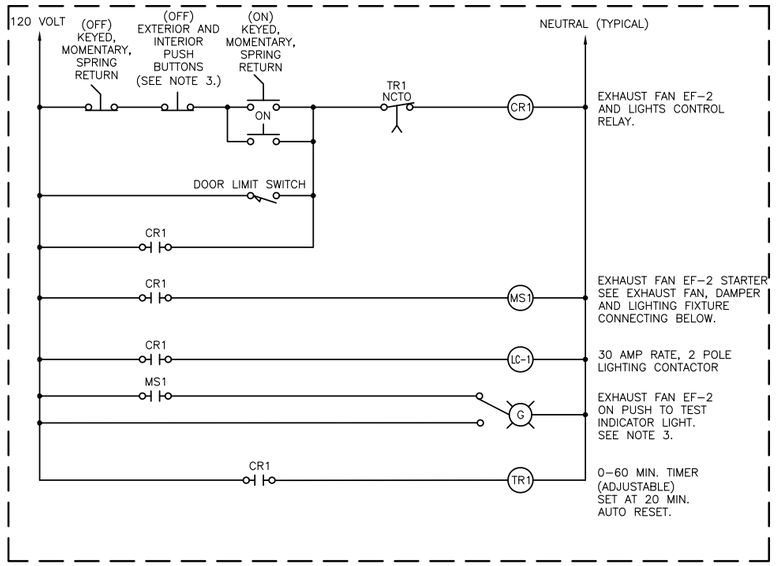
UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

SEH FILE NO. 129083
PROJECT NO. 53W1043A
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER

SHEET TITLE
SPARE STARTER AND EXTERIOR LIGHTING CONTROL DIAGRAMS

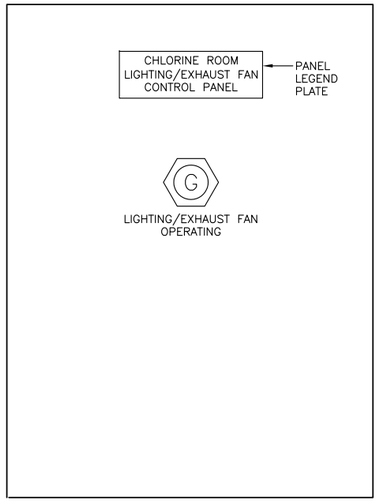
SHEET
E28



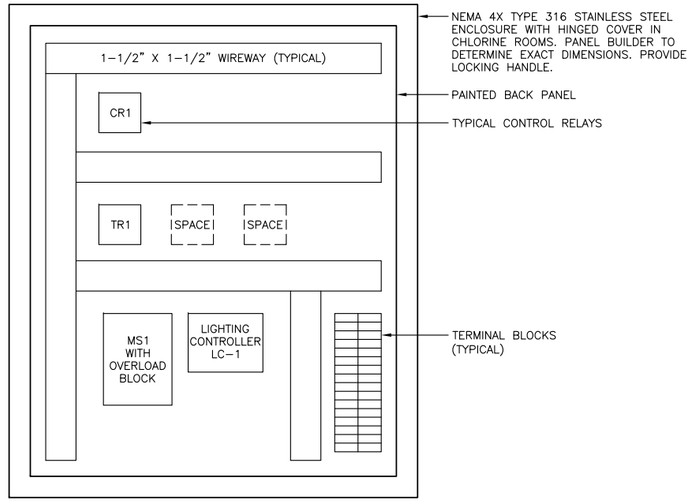
NOTES:

1. FOLLOW TYPICAL PUMP CONTROL PANEL DETAILS FOR CONSTRUCTION REQUIREMENTS FOR EACH PANEL. CHLORINE GAS DETECTOR IS LOCATED OUTSIDE ENCLOSURE AS SHOWN ON THE PLANS.
2. PROVIDE A 20" X 16" X 8" DP NEMA 4 STAINLESS STEEL ENCLOSURE WITH CONTROL RELAY AND TERMINAL BLOCKS. UNIT SHALL BE UL-508 CONSTRUCTED AND LISTED. PROVIDE HINGED COVER.
3. EXTERIOR KEYED SWITCHES AND INTERIOR PUSH BUTTON SWITCHES AND LED TRANSFORMER TYPE INDICATING LAMPS SHALL BE MOUNTED IN THE EXTERIOR AND INTERIOR FLUSH MOUNTED NEMA 4X ALLEN BRADLEY OR ENGINEER APPROVED EQUAL CONTROL STATION.

CHLORINE ROOM LIGHTING/EXHAUST FAN CONTROL DIAGRAM
N.T.S.



EXTERIOR VIEW
N.T.S.

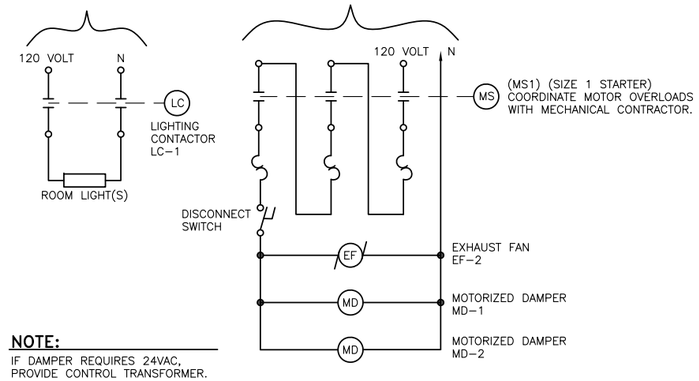


INTERIOR VIEW
N.T.S.

NOTES:

1. SEE RESPECTIVE CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION AND REQUIREMENTS
2. ALL PANELS SHALL BE UL-508 CONSTRUCTED AND LISTED. PANEL SHALL BEAR UL LABEL.
3. ALL LIGHTS ARE LED TYPE, TRANSFORMER, 120 VOLT WITH PUSH-TO-TEST FEATURE.
4. REFER TO MOTOR STARTER SPECIFICATIONS FOR ADDITIONAL INFORMATION.
5. ALL CONDUIT TO BE PVC COATED RIGID STEEL.

CHLORINE ROOM LIGHTING/EXHAUST FAN CONTROL PANEL DETAIL
N.T.S.



NOTE:
IF DAMPER REQUIRES 24VAC, PROVIDE CONTROL TRANSFORMER.

CHLORINE ROOM LIGHTING/EXHAUST FAN CONNECTIONS
N.T.S.

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Madison Water Utility

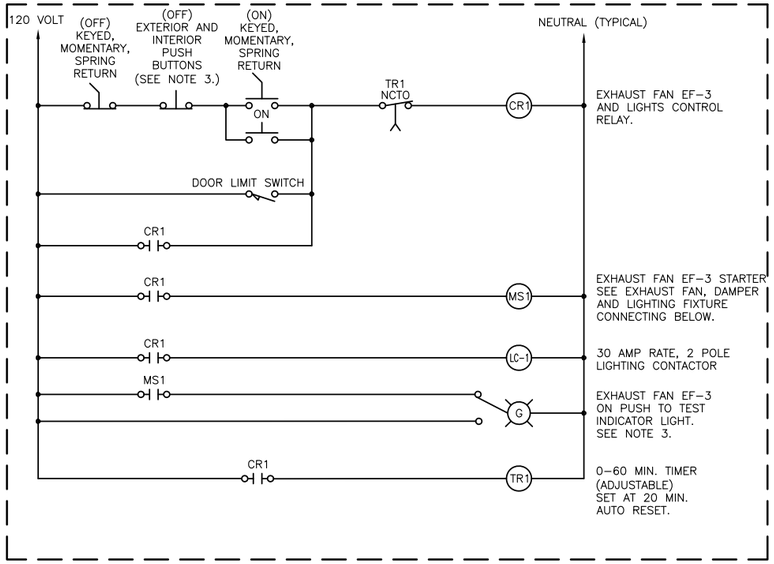
UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	REVISIONS DESCRIPTION

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc. @ (SEH)

SHEET TITLE
CHLORINE ROOM LIGHTING, EXHAUST FAN CONTROL DIAGRAMS AND PANEL DETAILS

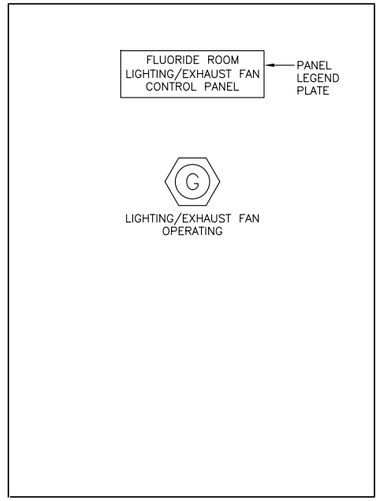
SHEET
E29



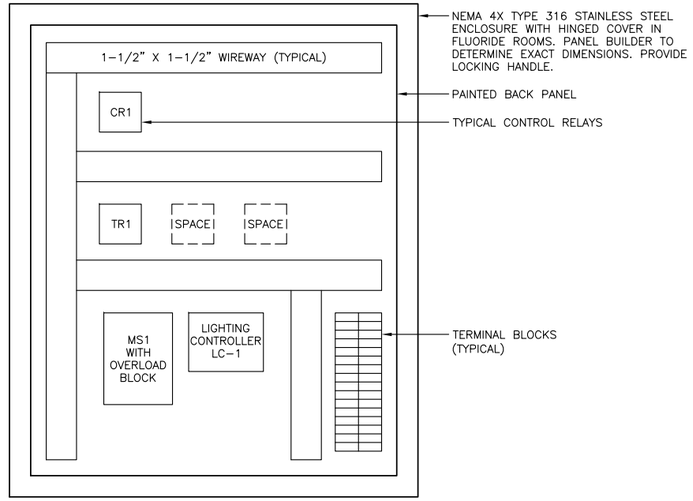
NOTES:

1. FOLLOW TYPICAL PUMP CONTROL PANEL DETAILS FOR CONSTRUCTION REQUIREMENTS FOR EACH PANEL. FLUORIDE GAS DETECTOR IS LOCATED OUTSIDE ENCLOSURE AS SHOWN ON THE PLANS.
2. PROVIDE A 20" X 16" X 8" DP NEMA 4 STAINLESS STEEL ENCLOSURE WITH CONTROL RELAY AND TERMINAL BLOCKS. UNIT SHALL BE UL-508 CONSTRUCTED AND LISTED. PROVIDE HINGED COVER.
3. EXTERIOR KEYED SWITCHES AND INTERIOR PUSH BUTTON SWITCHES AND LED TRANSFORMER TYPE INDICATING LAMPS SHALL BE MOUNTED IN THE EXTERIOR AND INTERIOR FLUSH MOUNTED NEMA 4X ALLEN BRADLEY OR ENGINEER APPROVED EQUAL CONTROL STATION.

FLUORIDE ROOM LIGHTING/EXHAUST FAN CONTROL DIAGRAM
N.T.S.



EXTERIOR VIEW
N.T.S.

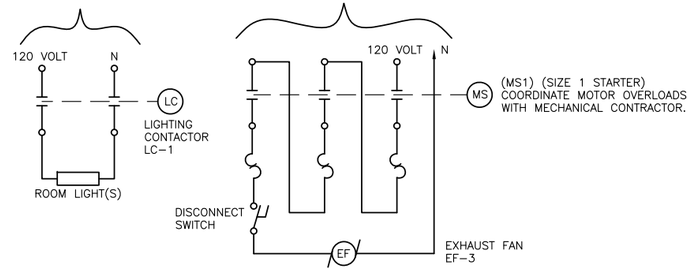


INTERIOR VIEW
N.T.S.

NOTES:

1. SEE RESPECTIVE CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION AND REQUIREMENTS
2. ALL PANELS SHALL BE UL-508 CONSTRUCTED AND LISTED. PANEL SHALL BEAR UL LABEL.
3. ALL LIGHTS ARE LED TYPE, TRANSFORMER, 120 VOLT WITH PUSH-TO-TEST FEATURE.
4. REFER TO MOTOR STARTER SPECIFICATIONS FOR ADDITIONAL INFORMATION.
5. ALL CONDUIT TO BE PVC COATED RIGID STEEL.

FLUORIDE ROOM LIGHTING/EXHAUST FAN CONTROL PANEL DETAIL
N.T.S.



FLUORIDE ROOM LIGHTING/EXHAUST FAN CONNECTIONS
N.T.S.

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Madison Water Utility

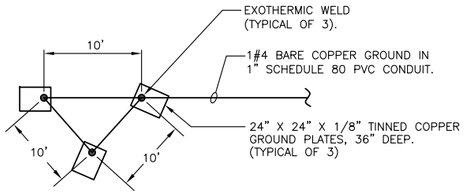
UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	REVISIONS DESCRIPTION

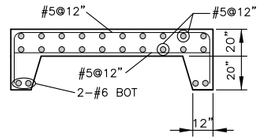
SEH FILE NO.	129083
PROJECT NO.	53W10434
ISSUE DATE	JANUARY 13, 2017
DESIGNED BY	RICHARD J. BOYA
DRAWN BY	BRIAN E. FULLER

SHEET TITLE
FLUORIDE ROOM LIGHTING CONTROL DIAGRAM AND DETAILS

SHEET
E30

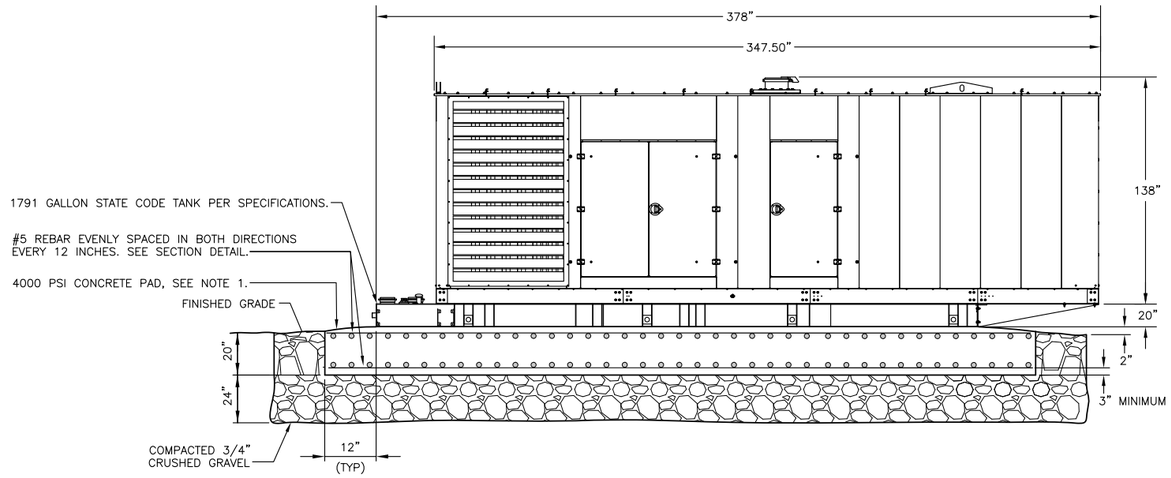


TYPICAL GROUNDING PLATE DETAIL
N.T.S.



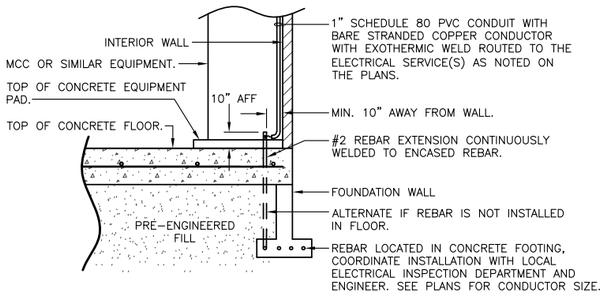
NOTE:
SLOPE CONCRETE PAD 1/16" PER FOOT TOWARD SIDEWALK. SEE CIVIL SITE PLAN FOR LOCATION.

CONCRETE BASE SECTION DETAIL
N.T.S.

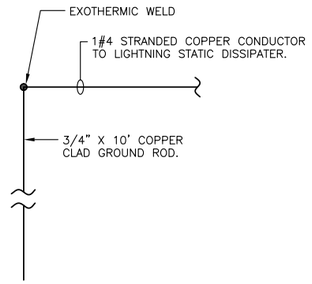


NOTES:
1. THE CONCRETE PAD SHALL BE SIZED 24" LARGER THAN FUEL TANK LENGTH AND WIDTH. CENTER FUEL TANK ON CONCRETE PAD PER DETAIL.
2. GENERATOR, ENCLOSURE AND FUEL TANK DIMENSIONS ARE BASED ON KOHLER SYSTEM DESIGN. IF A DIFFERENT MANUFACTURER IS PROVIDED, VERIFY ALL DIMENSIONS AND INSTALLATION REQUIREMENTS.
3. WIDTH OF GENERATOR AND STATE CODE FUEL TANK IS 104".
4. COORDINATE EXACT CONDUIT ENTRANCE LOCATION WITH GENERATOR MANUFACTURER.
5. CONDUITS THAT ENTER ENCLOSURE SHALL BE INSTALLED TO ELIMINATE ANY POSSIBILITY OF RODENTS FROM ENTERING SAME SPACE.
6. APPROXIMATE WEIGHT – 27,400 LBS. (NOT INCLUDING FUEL).

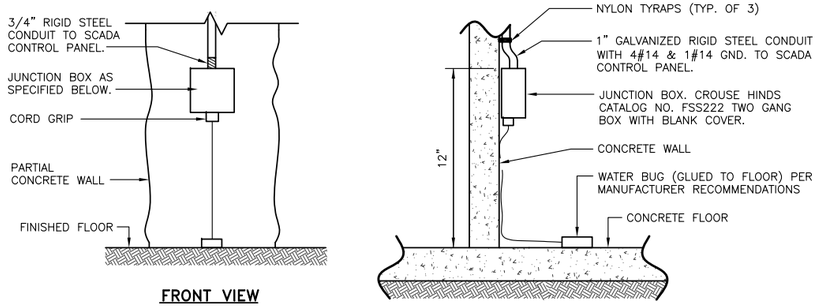
EXTERIOR MOUNTED 900KW GENERATOR INSTALLATION DETAIL
N.T.S.



TYPICAL CONCRETE ENCASED ELECTRODE
N.T.S.

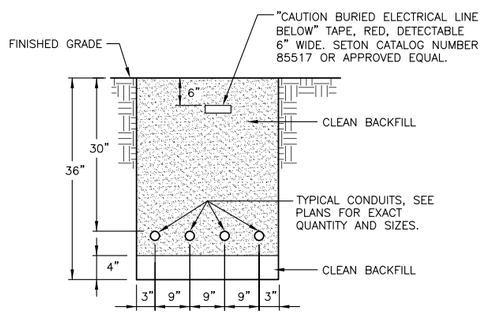


SINGLE ABOVE GROUND STORAGE TANK GROUND ROD DETAIL
N.T.S.

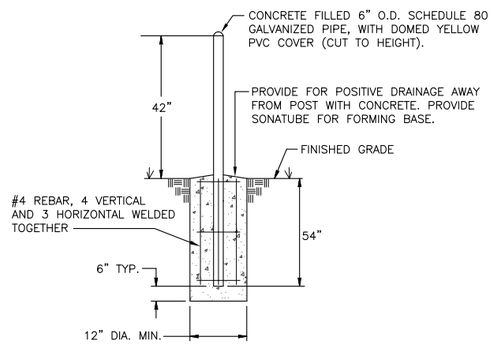


NOTE:
1. ALL MOUNTING HARDWARE SHALL BE 316 SST. USE WASHERS AND SPLIT LOCK WASHERS UNDER ALL NUTS AND BOLTS.

TYPICAL MOISTURE SENSOR (WATER BUG) MOUNTING DETAIL
N.T.S.



TYPICAL TRENCH DETAIL
N.T.S.



NOTE:
1. FOR GATES, GENERATOR AND TRANSFORMER PROTECTION).

TYPICAL PROTECTIVE BOLLARD/BASE DETAIL
N.T.S.

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Madison Water Utility

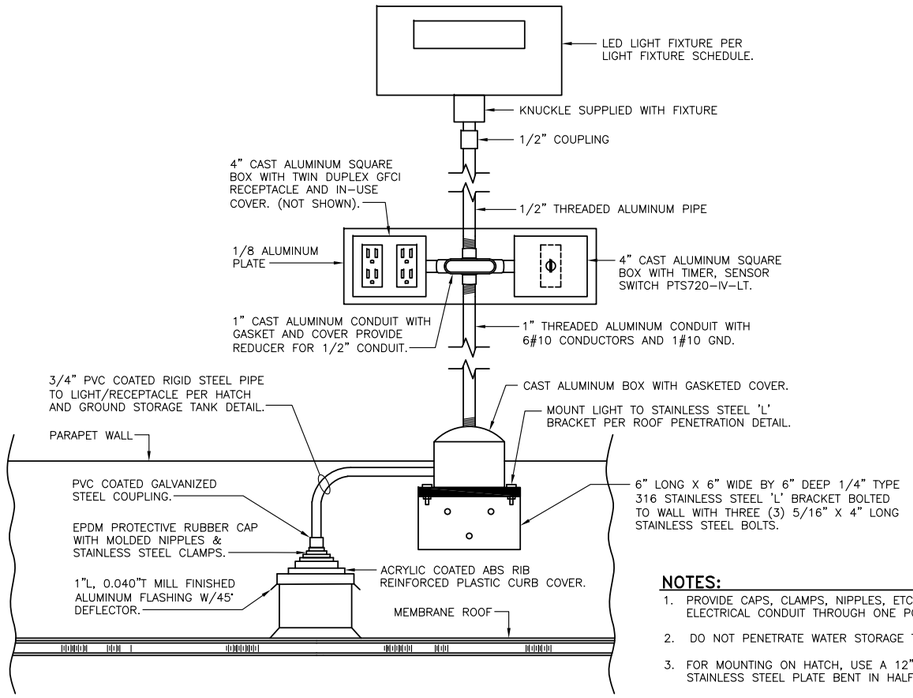
UNIT WELL 31 WATER
TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson Inc. © (SEH)

SHEET TITLE
ELECTRICAL DETAILS

SHEET
E31

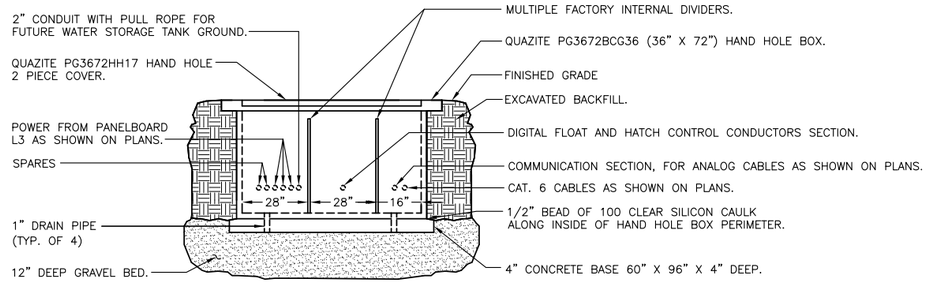


NOTES:

1. PROVIDE CAPS, CLAMPS, NIPPLES, ETC. AS REQUIRED TO ROUTE PIPING, ELECTRICAL CONDUIT THROUGH ONE PORTAL FOR PROJECT.
2. DO NOT PENETRATE WATER STORAGE TANK, DETAIL IS ONLY FOR HATCH AREAS.
3. FOR MOUNTING ON HATCH, USE A 12" LONG X 12" WIDE X 1/8" THICK STAINLESS STEEL PLATE BENT IN HALF.

ROOF PENETRATION, HATCH AND GROUND STORAGE TANK LIGHT MOUNTING DETAIL LIGHTING/RECEPTACLE UNIT

N.T.S.



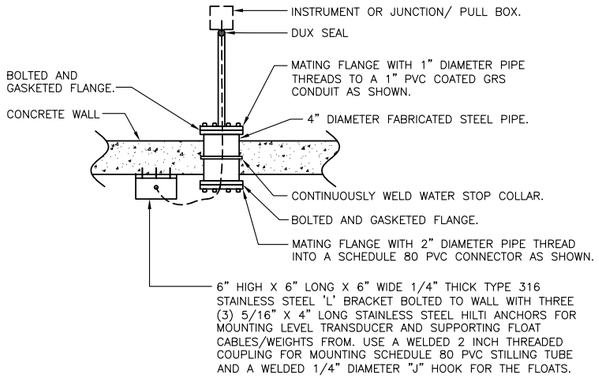
NOTES:

A. CONSTRUCTION ENCLOSURES SHALL BE MADE OF "COMPOSOLITE" TYPE MATERIAL AS MANUFACTURED BY QUAZITE CORPORATION OR APPROVED EQUAL.

1. ENCLOSURE WITH COVER SHALL BE CONCRETE GRAY COLOR AND RATED FOR 22,500 POUND DESIGN LOAD OVER A SPACE 10" X 10" AREA AND DESIGN AND TESTED TO TEMPERATURES OF -50°F.
2. BOX SHALL INCLUDE FACTORY INSTALLED ALONG THE LONG SIDE AS SHOWN ON THE DETAIL.
3. THE COVER SHALL CONTAIN THE LOGO "ELECTRIC".
4. ALL HARDWARE SHALL BE STAINLESS STEEL INCLUDING INSERTS AND BOLTS.
5. THE HAND HOLE SHALL BE UL LISTED.
6. CORE DRILL ALL HOLES, NOT LARGER THEN 1/8" GREATER THEN CONDUIT OUTSIDE DIMENSION. CAULK AROUND EACH CONDUIT.
7. SEE PLANS FOR FIELD CIRCUIT ROUTING REQUIREMENTS.
8. ORIENT HAND HOLE AS REQUIRED BY PLANS.
9. COIL 6 FEET OF EACH CABLE EXCEPT FIBER OPTIC IN EACH HAND HOLE UNLESS OTHERWISE NOTED ON THE PLANS, GROUP AND TAG ALL CABLE GROUPS PER SPECIFICATIONS.
10. VERIFY EXACT CATALOG NUMBERS WITH HAND HOLE MANUFACTURER WITH MULTIPLE DIVIDERS.
11. SEE TRENCH DETAILS FOR REQUIRED CONDUITS ENTERING OR LEAVING ENCLOSURES.

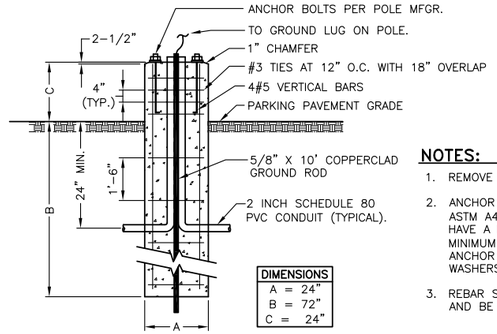
PROPOSED DIVIDED HAND HOLES NO.1 & NO.2 DETAIL

N.T.S.



TYPICAL CONDUIT SIDE WALL PENETRATION DETAIL (BACK WASH TANK)

N.T.S.

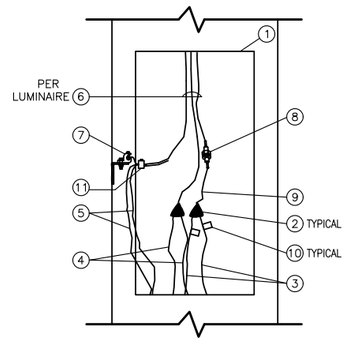


NOTES:

1. REMOVE ALL CONCRETE FORMS FROM POLE BASES.
2. ANCHOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A449 OR A687 (GRADE 105) ANCHOR BOLTS SHALL HAVE A MINIMUM YIELD STRENGTH OF 92,000 PSI AND A MINIMUM ELONGATION OF 14% IN 4". HOT DIP ENTIRE ANCHOR LENGTH OF ANCHOR BOLTS, AND NUTS AND WASHERS CONFORMING TO AASHTO M232.
3. REBAR SHALL CONFORM WITH AASHTO M31, GRADE 60 AND BE EPOXY COATED.

'PA' AND 'PB' POLE BASE DETAIL

N.T.S.



1. HANDHOLE AND COVER
2. INSULATED SPLICE
3. UNGROUNDED CONDUCTORS, 120 VOLT
4. GROUNDED CONDUCTORS
5. EQUIPMENT OR SYSTEM GROUNDING CONDUCTORS
6. 3#12 CONDUCTORS TO LUMINAIRE
7. HANDHOLE GROUNDING LUG
8. WEATHERPROOF INLINE FUSE ASSEMBLY W/5A KTK FUSE
9. 12" PIGTAIL BETWEEN SPLICE AND FUSE ASSEMBLY
10. CIRCUIT TAG
11. REVERSIBLE PRESSURE OR COMPRESSION GROUNDING CONNECTION (NOT INSULATED)

POLE WIRING DETAIL

N.T.S.

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Madison Water Utility

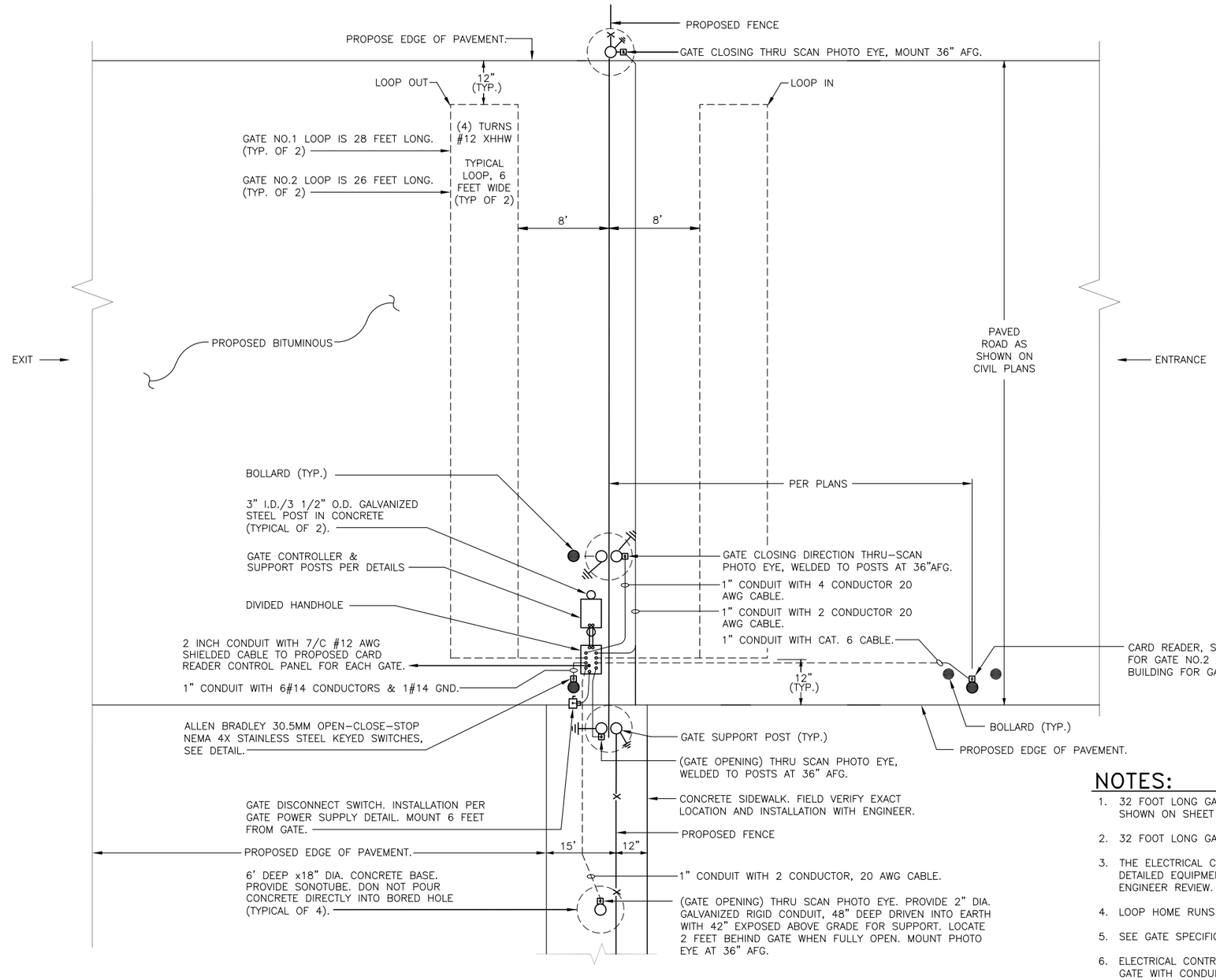
UNIT WELL 31 WATER TREATMENT PLANT
MADISON WATER UTILITY
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 129083
PROJECT NO. 53W10434
ISSUE DATE JANUARY 13, 2017
DESIGNED BY RICHARD J. BOYA
DRAWN BY BRIAN E. FULLER
Short Elliott Hendrickson, Inc. © (SEH)

SHEET TITLE
ELECTRICAL DETAILS

SHEET
E32



NOTES:

1. 32 FOOT LONG GATE NO.1 OPENS TOWARD STORAGE BUILDING AS SHOWN ON SHEET E4.
2. 32 FOOT LONG GATE NO.2 OPENS TOWARD WATER STORAGE TANK.
3. THE ELECTRICAL CONTRACTOR AND GATE SUPPLIER SHALL PROVIDE DETAILED EQUIPMENT LOCATIONS ON THE SHOP DRAWINGS FOR ENGINEER REVIEW.
4. LOOP HOME RUNS SHALL BE ISOLATED FROM POWER WIRING.
5. SEE GATE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
6. ELECTRICAL CONTRACTOR TO PROVIDE DETAILED LAYOUT OF EACH GATE WITH CONDUIT ROUTING, DEVICE LOCATIONS AND WIRING DIAGRAMS, COORDINATE WITH GATE SUPPLIER.

TYPICAL ELECTRICALLY OPERATED VEHICLE GATE INSTALLATION DETAIL

N.T.S.

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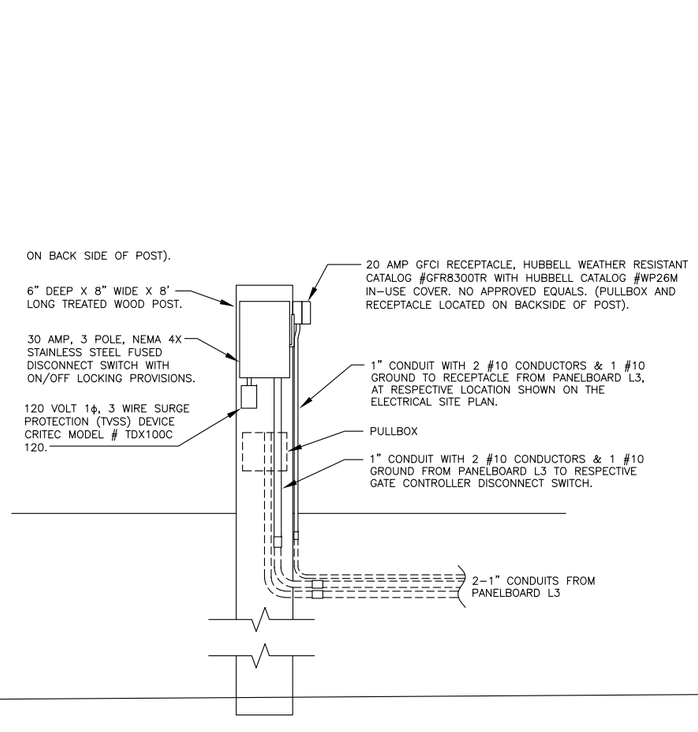
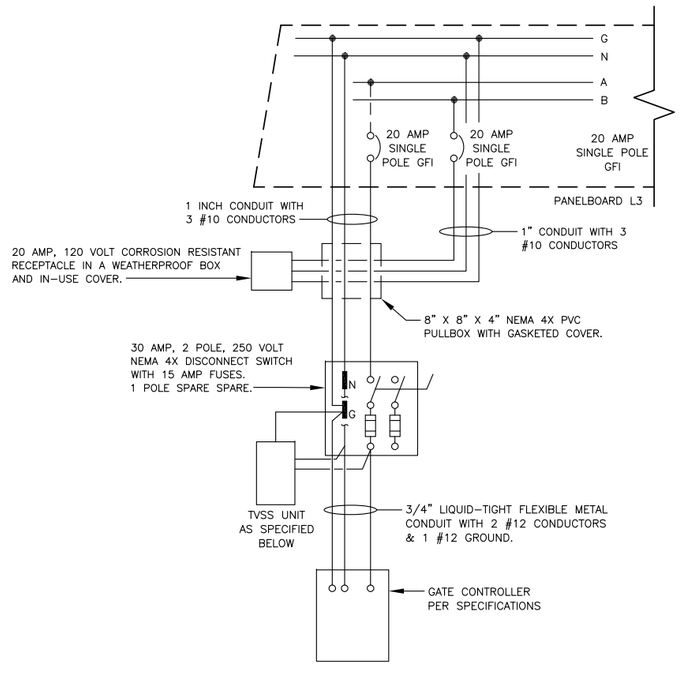
SHEET TITLE
ELECTRICALLY OPERATED VEHICLE GATE INSTALLATION DETAIL

SHEET
E33

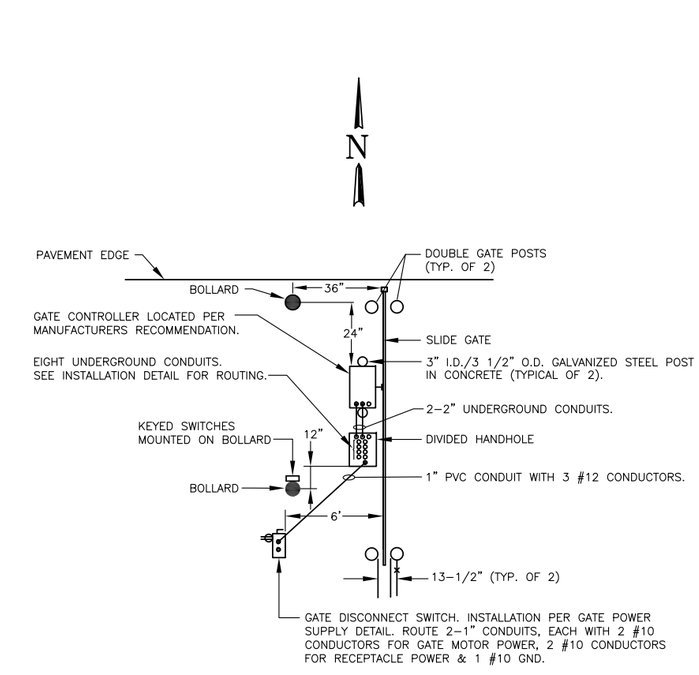


TYPICAL GATE POWER SUPPLY DETAIL
N.T.S.



NOTE:
SEE PLANS FOR CIRCUIT BREAKER NUMBERS.

TYPICAL GATE CONTROLLER WIRING DIAGRAM DETAIL
N.T.S.



GENERAL NOTE:
1. COORDINATE GATE CONTROLLER DIMENSIONS AND WIRING WITH MANUFACTURER.

TYPICAL VEHICLE GATE CONTROLLER LAYOUT
N.T.S.

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SHEET TITLE
PROPOSED GATE DETAILS

SHEET
E34

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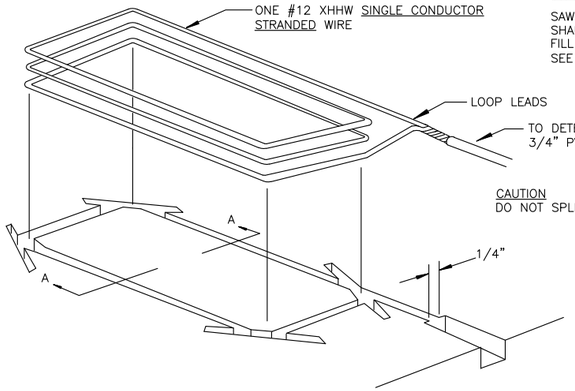
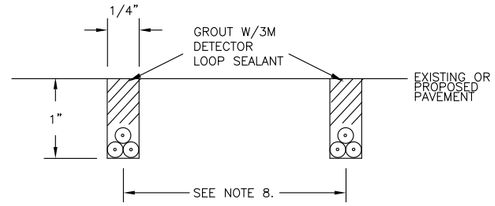


TYPICAL LAYOUT FOR LOOPS

SAW SLOT 1/4" X 1" DEEP. MAKE RECTANGULAR SHAPE TO SPECIFIED LOOP DIMENSIONS. FILL SAW CUT WITH 3M LOOP SEALANT. SEE PLANS FOR EXACT DIMENSIONS.

NOTES:

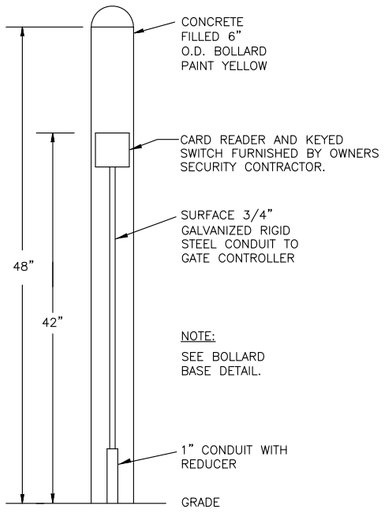
1. LOOP LEADS ARE LIMITED TO 100 FEET.
2. LOOP LEADS MUST HAVE 4 TWISTS PER FOOT MIN.
3. LOOP AND LOOP LEADS MUST BE LOCATED AT LEAST 18" FROM ANY ELECTRICAL POWER SERVICE OR RUNS.
4. LOOP LEADS MUST BE IN SEPARATE CONDUIT BETWEEN LOOP AND DETECTOR. THEY MUST NOT SHARE CONDUIT WITH OTHER WIRING OR LEADS FROM OTHER LOOPS.
5. USE #12 XHHW SINGLE CONDUCTOR STRANDED WIRE.
6. ALL WIRE TO BE CONTINUOUS WITHOUT SPLICING.
7. DO NOT SPAN EXPANSION JOINT WITH LOOP.
8. SEE PLAN SHEET FOR ACTUAL DIMENSIONS.



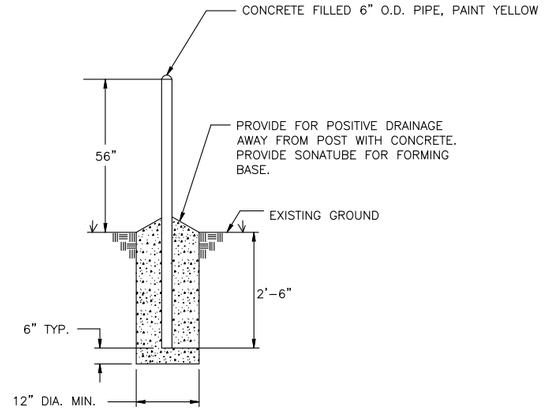
SECTION A
WITH WIRE PLACEMENT

CAUTION: DO NOT FRACTURE WIRE INSULATION. LOOPS SHORTED TO GROUND WILL CAUSE DETECTOR MALFUNCTION. WHEN PLACING WIRE IN SLOT, DO NOT USE SCREWDRIVER OR OTHER SHARP TOOLS.

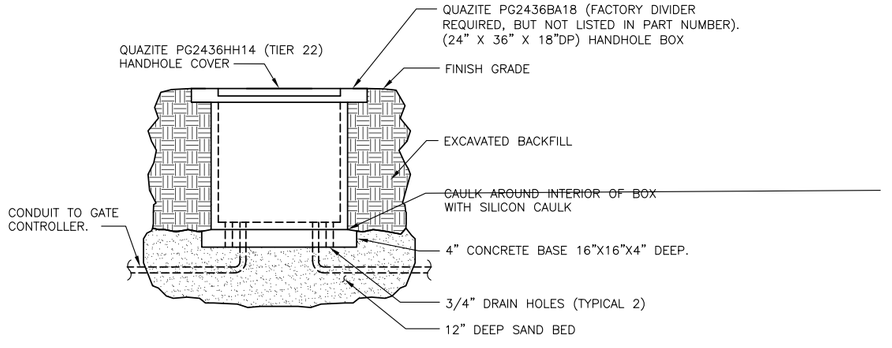
TYPICAL SAW CUT LOOP
N.T.S.



TYPICAL CARD READER READER DETAIL
N.T.S.



TYPICAL CARD READER BOLLARD OR PROTECTION BOLLARD BASE DETAIL
N.T.S.



TYPICAL LOOP HANDHOLE DETAIL
N.T.S.

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SHEET TITLE
PROPOSED GATE DETAILS

SHEET
E35

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