PLOTTED: 7-24-2014 6:31 PM
PLOT SCALE: 1:2

CONSTRUCTION DRAWINGS FOR
LAKEVIEW RESERVOIR REPLACEMENT PROJECT

CITY OF
MADISON, WISCONSIN

Quality and Reliability since 1882
Madison Water Utility mwu

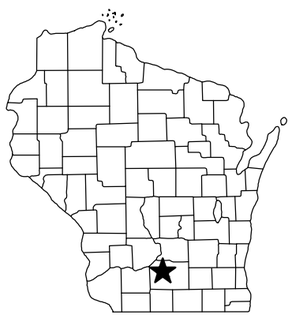
SHEET NUMBERING LEGEND

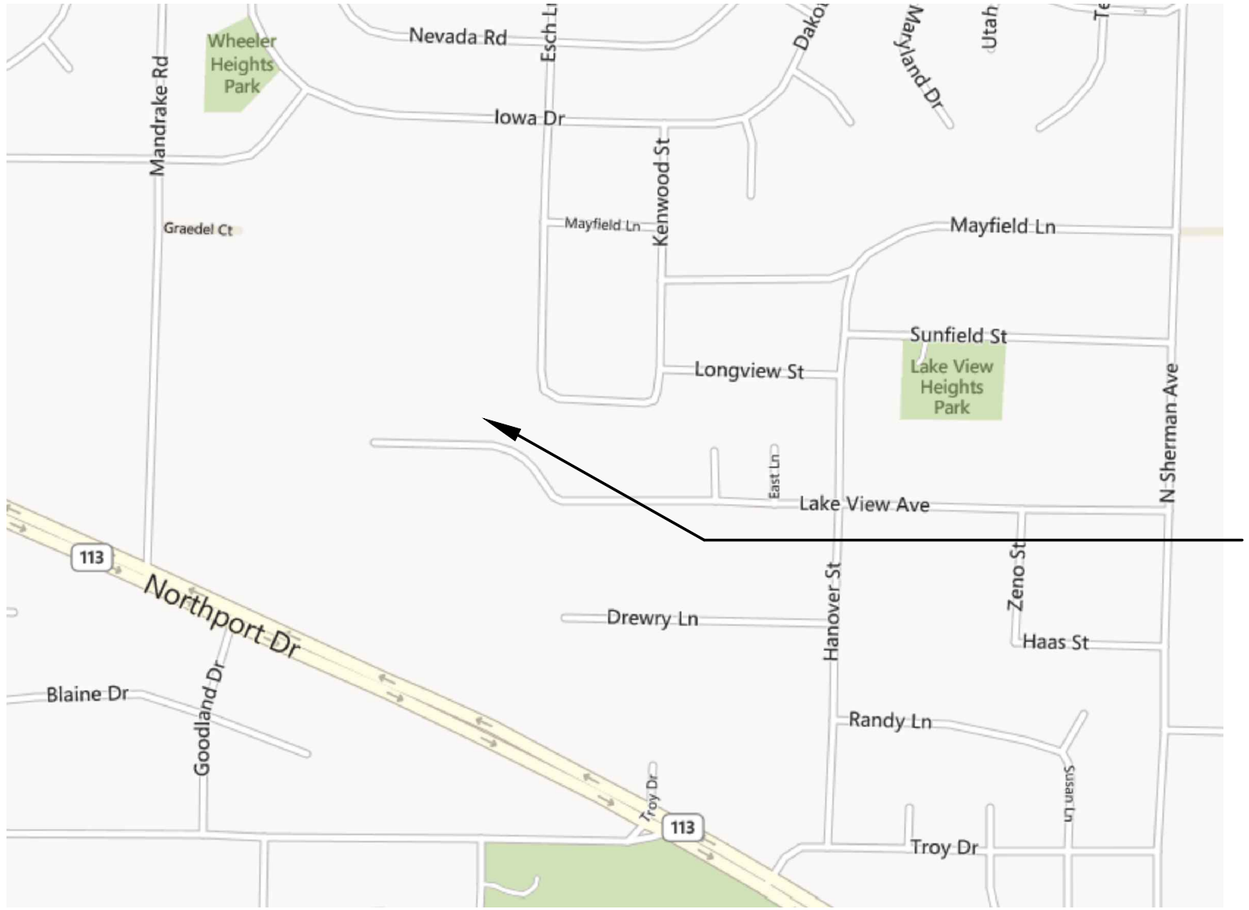
STRUCTURE IDENTIFIER OR SHEET TYPE

- G GENERAL INFORMATION
- 01 WATER TOWER
- D STANDARD DETAILS

SHEET 01 P2

- P2 — CONSECUTIVE SEQUENCE DRAWING NUMBER
- DISCIPLINE
  - G GENERAL
  - R REMOVAL
  - C CIVIL
  - S STRUCTURAL
  - P PROCESS
  - M MECHANICAL & PLUMBING
  - E ELECTRICAL





SHEET INDEX

N

PROJECT LOCATION

WISCONSIN
JON I. STRAND
29237
CHIPPEWA FALLS, WIS.
PROFESSIONAL ENGINEER

Jon I. Strand
07·25·2014

Madison Water Utility mwu
SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

MARK	DATE	REVISIONS DESCRIPTION

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE: TITLE SHEET

SHEET G1

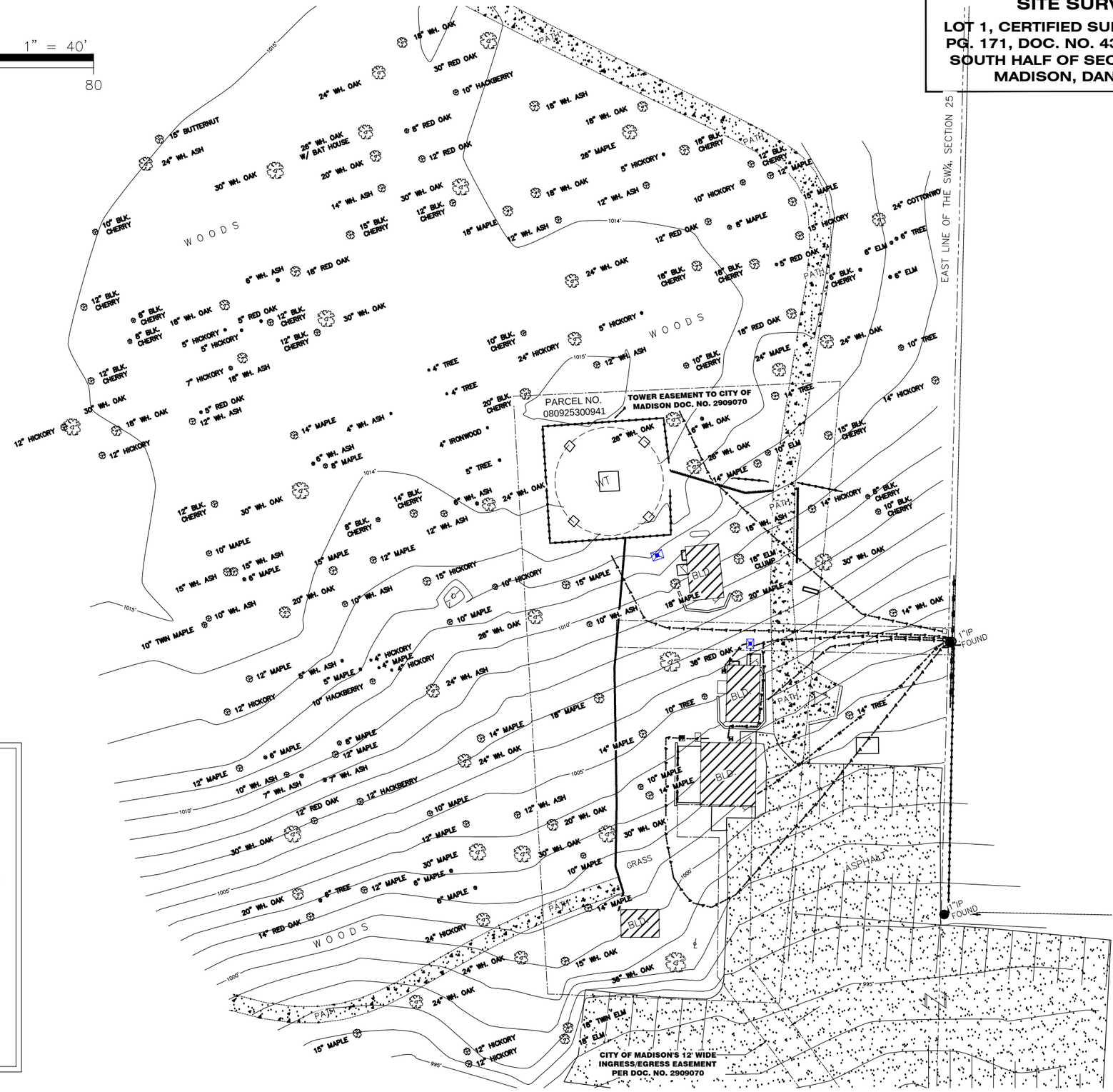
P:\KO\W\MADWU\126154\5-DESIGN\51-DRAWINGS\TANK DWG\01.TITLE SHEET.DWG
SAVED: 7-24-2014 6:31 PM USER: SIDNEY LARSON
XREFs: P:\KO\W\Madwu\126154\5-Design\51-drawings\Tank dwg\z-new border

PLOTTED: 7-23-2014 4:08 PM
PLOT SCALE: 1:2

SCALE: 1" = 40'
0 40 80

SITE SURVEY FOR SEH INC.

LOT 1, CERTIFIED SURVEY MAP NO. 12189, VOL. 75, PG. 171, DOC. NO. 4328930; BEING A PART OF THE SOUTH HALF OF SECTION 25, T.8N. R.9E., CITY OF MADISON, DANE COUNTY, WISCONSIN



BEARINGS REFERENCED TO THE DANE COUNTY COORDINATE SYSTEM

— LEGEND —

- = COUNTY PLSS CORNER
- = ELECTRIC POWER POLE
- = ELECTRIC METER
- = GROUNDING PORT
- = LIGHT POLE
- = METAL/WOOD POST
- = ELECTRIC TRANSFORMER
- = TELEPHONE PEDESTAL
- = DECIDUOUS TREE
- = PROPERTY LINE
- = BURIED ELECTRIC
- = BURIED TELEPHONE
- = BURIED FIBER OPTIC
- = EXISTING FENCELINE
- = BURIED TELEVISION
- = EDGE OF WOODS
- 733.0'× = SPOT ELEVATION
- P.O.B. = POINT OF BEGINNING

PREPARED FOR:
SHORT ELLIOT HENDRICKSON (SEH) INC.
1312 SOUTH THIRD STREET
LA CROSSE, WISCONSIN 54601

PROPERTY OWNER:
DANE COUNTY HUMAN SERVICE
LAKEVIEW OFFICES
210 MARTIN LUTHER KING JR. BLVD. #114
MADISON, WISCONSIN 53703

PARCEL NO. 080925300991

MARK	DATE	DESCRIPTION
1	03-28-14	TOPOGRAPHY/TREES

DRAWING FILE: LVWT
PROJECT NUMBER: 2140313
DRAWN BY: BJB CHECKED BY: BAB
NOTEBOOK: P-357 PAGES: 29-31

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(formerly known as AeroMetric, Inc.) y & Design
920-457-3631 800-558-6707
4020 TECHNOLOGY PARKWAY
SHEBOYGAN, WISCONSIN 53083

SITE NAME:
MADISON LAKEVIEW WT

1202 NORTHPORT DRIVE
MADISON, WISCONSIN 53704
DANE COUNTY

QS MAP NO. D-1777
SHEET 2 OF 3

Madison Water Utility

SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE
CERTIFIED SURVEY MAP

SHEET
C1

SAVED: 7-23-2014 4:08 PM USER: SIDNEY LARSON
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TEMPORARY CONSTRUCTION EASEMENT
8' HIGH TEMPORARY CHAIN LINK FENCE
NATURE TRAIL WOOD CHIP
EASEMENT TO CITY
30.00
PILASTERS
TEMPORARY WOOD CHIP PATH BY COUNTY
EXISTING YARD FENCE
LIMESTONE BOULDER RETAINING WALL
CRUSHED LIMESTONE ACCESS DRIVE
FOREST ROAD GATE
TELECOMMUNICATIONS POLE LOCATION
30.00
CONCRETE SPLASH PAD
ACCESS GATE
1" COPPER SAMPLE PIPE CONNECT TO 12" w/ CORP AND CURB STOP
CITY BLDG
CELL BLDG
TERMINATION POINT FOR WATER MAIN CONTRACTOR
ROLL OVER CURB
HANDICAP PARKING MARKING AND SIGN
HEAVY LIMESTONE RIP RAP
RELOCATE BIKE RACK, CONFIRM LOCATION ON SITE WITH OWNER
CELL BLDG
PERV. CONC. PAVING@ < 2%
PROPOSED TEMPORARY FENCE
NEW CONCRETE CURB (TYPE A)
NEW PAVEMENT MARKINGS
BITUMINOUS REMOVAL
RELOCATED NATURE TRAIL WOOD CHIP
SHED
NEW CONCRETE CURB
9.00
18.00
FLUSH CONCRETE CURB, 12" WIDE X12" DEEP TO PREVENT UNDERMINING ASPHALT
NEW ASPHALT PAVING
NEW PAVEMENT MARKINGS
NEW CONC. CURB
SAW CUT
EXISTING POWER POLE
APPROX. EXISTING PATH

NOTE:
(1) RELOCATE FIRE HYDRANT, GATE VALVE AND LEAD TO NEW LOCATION AS SHOWN ON PLANS. REPAINT AFTER INSTALLATION. PROVIDE 16" x 8" TEE & 12" x 6" TEE. RETURN UNUSED WATER MAIN PARTS TO CITY.

POROUS PAVEMENT
8 INCHES CONCRETE
12 INCHES DRAINABLE AGGREGATE BASE

ASPHALT PAVEMENT
4 INCHES ASPHALT PAVEMENT
8 INCHES CRUSHED AGGREGATE BASE COURSE

CRUSHED LIMESTONE
8 INCHES CRUSHED LIMESTONE

N
0 40 80

— LEGEND —

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- = TELEPHONE PEDESTAL
- = DECIDUOUS TREE
- = PROPERTY LINE
- ----E---- = BURIED ELECTRIC
- ----T---- = BURIED TELEPHONE
- ----F---- = BURIED FIBER OPTIC
- = EXISTING FENCELINE
- = EDGE OF WOODS
- 733.0'× = SPOT ELEVATION
- P.O.B. = POINT OF BEGINNING
- = SOIL BORINGS (5)
- = TREE & STUMP REMOVAL

Madison Water Utility

SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE
SITE PLAN

SHEET
C2

PLOTTED: 7-24-2014 7:23 PM
PLOT SCALE: 1:2

SAVED: 7-24-2014 5:42 PM
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USER: SIDNEY LARSON

TEMPORARY CONSTRUCTION EASEMENT

EASEMENT TO CITY

TRAIL ACCESS GATE

8' HIGH TEMPORARY CHAIN LINK FENCE

LAY DOWN AREA

LAY DOWN BETWEEN PROTECTED TREES

TEMPORARY WOOD CHIP PATH BY COUNTY

EXISTING YARD FENCE

30' X 30' CRANE DEMO PAD MAX 2° SLOPE

TREE PROTECTION FENCE, TYP.

RIBBON

CONCRETE JERSEY BARRIERS FOR TREE PROTECTION

TEMPORARY CONSTRUCTION FENCE

CONSTRUCTION ROAD

APPROXIMATE LOCATION 15' WIDE TEMPORARY CONSTRUCTION ROAD (12" THICK BREAKER ROCK) CONTRACTOR TO VERIFY

8' HIGH TEMPORARY CHAIN LINK FENCE. (CAN BE MOVED TO EDGE OF PARKING LOT DURING CONSTRUCTION TIME PERIODS – FENCE TO BE POSITIONED TO FORM A TRAIL ROUTE DURING NON-CONSTRUCTION TIME PERIODS.)

LAY DOWN AREA

BREAKER RUN

TRAIL ACCESS GATE

DESIGNATED CONTRACTOR PARKING

NO PARKING

20' WIDE CONSTRUCTION GATE

DANE COUNTY PARKING

APPROX. EXISTING PATH

SHRUBS

ASPHALT

N

0 40 80

— LEGEND —

- = COUNTY PLSS CORNER
- = ELECTRIC POWER POLE
- = ELECTRIC METER
- = GROUNDING PORT
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- = SOIL BORINGS (5)
- = TREE & STUMP REMOVAL

NOTE:
TREE REMOVAL, CRANE PAD AND FENCING BY OTHERS

Madison Water Utility

SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE
TREE REMOVAL AND CRANE PAD PLAN

SHEET
C3

PLOTTED: 7-31-2014 10:49 AM
PLOT SCALE: 1:2

SAVED: 7-31-2014 10:47 AM USER: CHRIS EPSTEIN
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LIMESTONE BOULDER RETAINING WALL DETAIL

NOT TO SCALE

Madison Water Utility

SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

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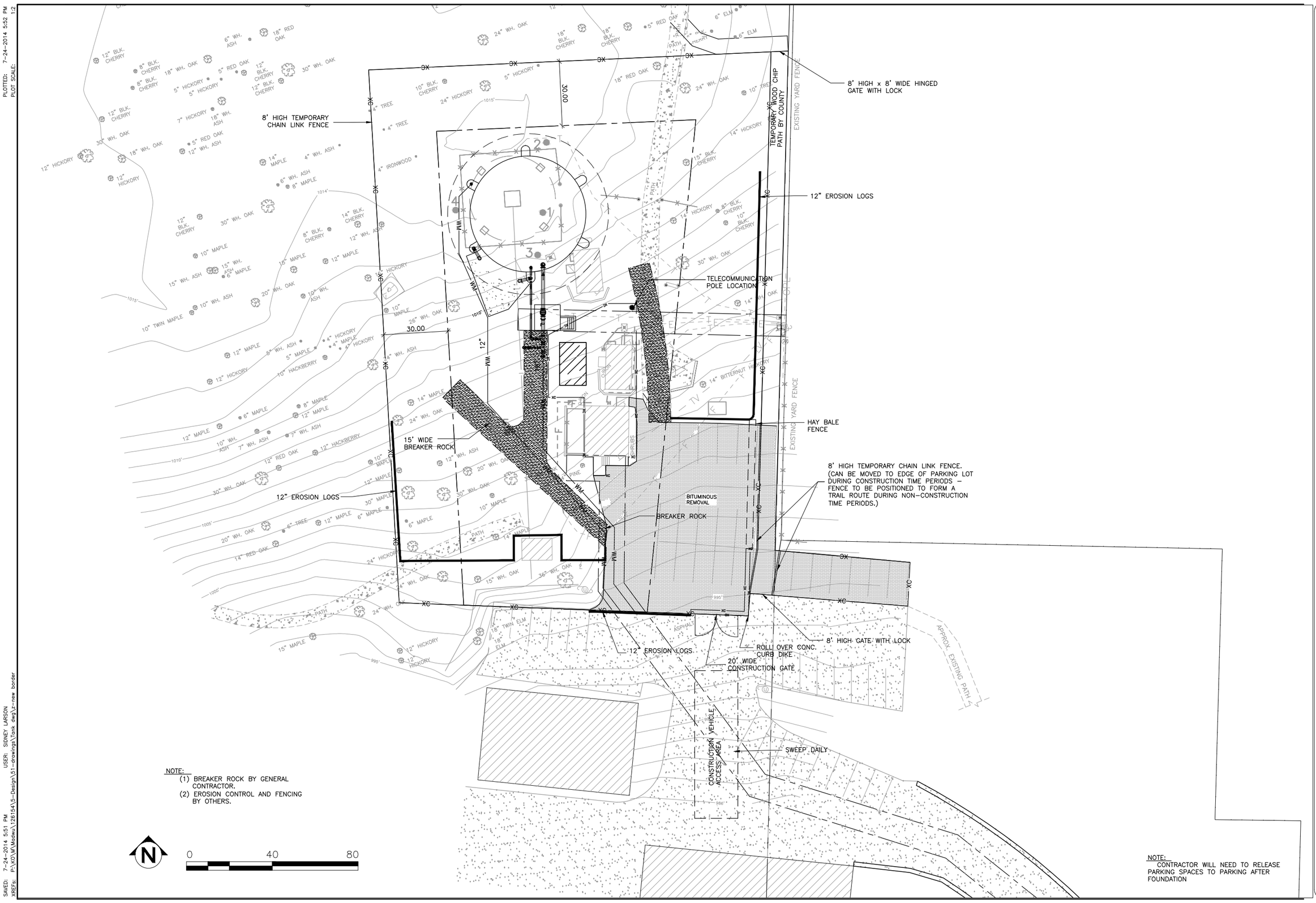
		REVISIONS

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE
GRADING PLAN

SHEET
C4



NOTE:
(1) BREAKER ROCK BY GENERAL CONTRACTOR.
(2) EROSION CONTROL AND FENCING BY OTHERS.

NOTE:
CONTRACTOR WILL NEED TO RELEASE PARKING SPACES TO PARKING AFTER FOUNDATION

Madison Water Utility

SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

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		REVISIONS

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PROJECT NO.
ISSUE DATE 07-25-14
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DRAWN BY SID LARSON

SHEET TITLE
EROSION CONTROL PLAN

SHEET
C5

PLOTTED: 7-24-2014 5:52 PM
PLOT SCALE: 1:2
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SAVED: 7-24-2014 5:51 PM
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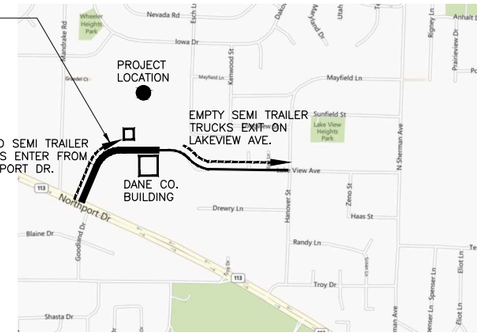
TEMPORARY CONSTRUCTION EASEMENT

EASEMENT TO CITY

TRAIL ACCESS GATE

TRUCK RESTRICTION AREA, SEMI TRAILER TRUCKS SHALL MAKE DELIVERIES FROM NORTHPORT ONLY BETWEEN HOURS OF 5 PM OR AND 8 PM. ALL OTHER CONSTRUCTION TRAFFIC SHALL USE ONLY SHERMAN AVE., LAKEVIEW AVE. FOR ACCESS. SEE FULL RESTRICTION REQUIREMENT IN SPECIAL PROVISIONS.



CONTRACTOR SEMI TRAILER TRUCK ROUTE ACCESS PLAN

8' HIGH TEMPORARY CHAIN LINK FENCE

LAY DOWN AREA

30' X 30' CRANE DEMO PAD MAX 2% SLOPE

LAY DOWN BETWEEN PROTECTED TREES

TEMPORARY WOOD CHIP PATH BY COUNTY

EXISTING YARD FENCE

TREE PROTECTION FENCE, TYP.

CONCRETE JERSEY BARRIERS FOR TREE PROTECTION

TEMPORARY CONSTRUCTION FENCE

CONSTRUCTION ROAD

APPROXIMATE LOCATION 15' WIDE TEMPORARY CONSTRUCTION ROAD (12" THICK BREAKER ROCK) CONTRACTOR TO VERIFY

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LAY DOWN AREA

BREAKER RUN

TRAIL ACCESS GATE

DESIGNATED CONTRACTOR PARKING

NO PARKING

20' WIDE CONSTRUCTION GATE

DANE COUNTY PARKING

APPROX. EXISTING PATH

SHRUBS

N

0 40 80

NOTE:

(1) NO CONTRACTOR PARKING ALLOWED IN DANE COUNTY PARKING LOT. CONTRACTOR SHALL UTILIZE OFF SITE PARKING AND SHUTTLE WORKERS TO AND FROM SITE.

(2) FENCING AND TREE BARRIERS BY OTHERS.

Madison Water Utility

SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

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		REVISIONS

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SHEET TITLE
CONTRACTOR USE PLAN

SHEET
C6

TEMPORARY CONSTRUCTION EASEMENT
8' HIGH TEMPORARY CHAIN LINK FENCE

EASEMENT TO CITY

30.00

(1) BLACK OAK

FOREST ROAD GATE

(3) BLADDERNUT

FILL IN LOW AREA

(1) BLACK OAK

30.00

(1) BLACK OAK

(3) WITCH HAZEL

REMOVE CONCRETE CURB BLOCKS

(1) WHITE OAK

RELOCATED NATURE TRAIL WOOD CHIP

SHED

ACCESS GATE

CITY BLDG

CELL BLDG

CELL BLDG

PROPOSED TEMPORARY FENCE

PERV. CONC. PAVING @ < 2%

NEW ASPHALT PAVING

FLUSH CONCRETE CURB 12" WIDE X 12" DEEP TO PREVENT UNDERMINING ASPHALT

NEW CONCRETE CURB

RELOCATE BIKE RACKS CONFIRM LOCATION ON-SITE WITH OWNER

RAIN GARDEN PLANTINGS, TYP.

(1) BLACK OAK

PROTECT EXISTING 14" BITTERNUT HICKORY

CRUSHED LIMESTONE WALK SLOPE TO MEET ADA REQS.

NEW TIMBER EDGING MATCH EXISTING SIZE AND MATERIAL

RELOCATED KIOSK

(3) AMERICAN HAZELNUT

MADISON PARKS SEED MIX

TELECOMMUNICATIONS POLE LOCATION

(1) WHITE OAK

CRUSHED LIMESTONE ACCESS DRIVE

(2) WITCH HAZEL

RELOCATED SPLIT RAIL FENCE AND PARK TRAIL GATE

(1) BLACK OAK

(3) WITCH HAZEL

TEMPORARY WOOD CHIP PATH BY COUNTY

EXISTING YARD FENCE

EXISTING TREE
SEE CONTRACT USE PLAN FOR TREE PROTECTION

PROPOSED SHADE TREE
6' HEIGHT

PROPOSED LARGE SHRUBS
3' HEIGHT

RAIN GARDEN PLANTINGS

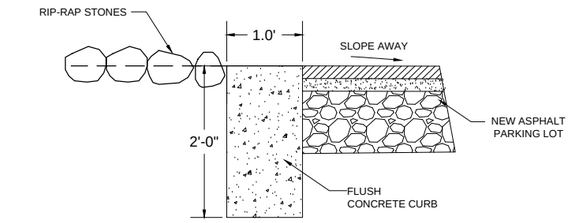
NOTE:
1. RESTORE WITH MADISON PARKS SEED MIX LAWN WHERE INDICATED ON PLANS AND CONFIRM LIMITS OF MIX WITH OWNER. SEED MIX SHALL BE PER MADISON PARKS STANDARDS, OR APPROVED EQUAL.
2. DISTURBED AREAS NOT INDICATED SHALL BE RE-SEEDED WITH WOODLAND EDGE SEED MIX BY PRAIRIE NURSERY.
3. ALL PLANT MATERIALS SHALL BE OBTAINED FROM NATIVE STOCK NURSERIES WITHIN THE SAME PLANT ZONE & 100 MILES OF THE JOB SITE
4. LANDSCAPING (TREES, SHRUBS, SEEDING) BY OTHERS.
5. ALL OTHER WORK ITEMS BY GENERAL CONTRACTOR.

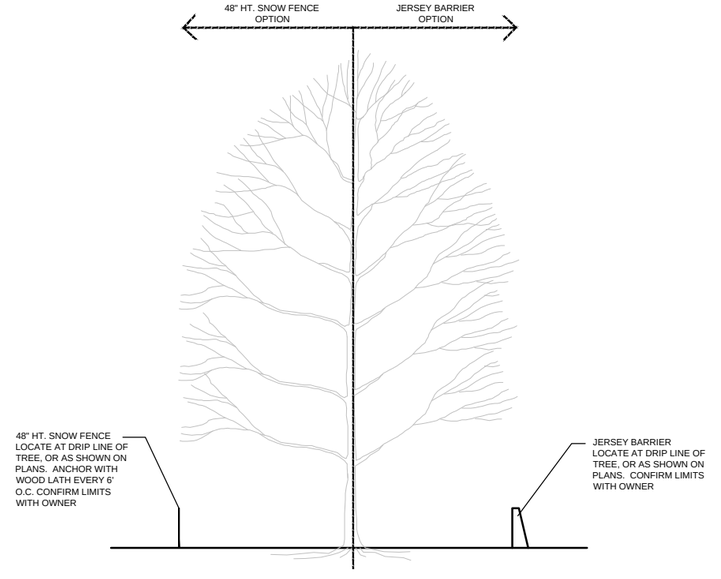
Lakeview Reservoir Replacement Project Planting List

Code	QTY	Botanical Name	Common Name	Size	Spacing
SHADE TREES					
QUE-A	2	*Quercus alba*	White Oak	6' Ht.	
QUE-V	8	*Quercus velutina*	Black Oak	6' Ht.	
SHRUBS					
COR-A	3	*Corylus americana*	American Hazelnut	#5	6'
HAM-V	8	*Hamamelis virginiana*	American Witch Hazel	#5	6'
STA-T	3	*Staphylea trifolia*	American Bladdernut	#5	6'

Landscape Worksheet

Element	Point Value	Quantity Proposed	Quantity Existing	Points
Overstory Deciduous Tree	35	*10*		350
Shrub, deciduous	2	*14*		28
				378





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0 40 80

Madison Water Utility

SEH

LAKEVIEW RESERVOIR
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MADISON, WISCONSIN

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SEH FILE NO. MADWU 126154
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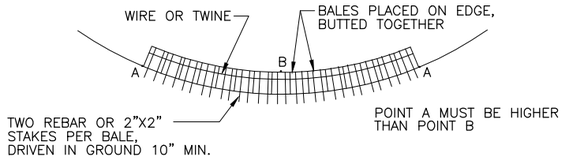
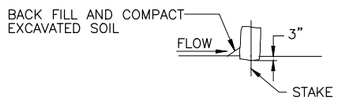
SHEET TITLE
LANDSCAPE PLAN

SHEET
L1

PLOTTED: 7-28-2014 12:50 PM
PLOT SCALE: 1:2



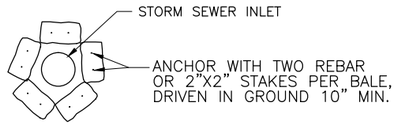
SECTION THRU DITCH



SECTION

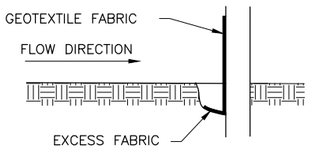
BALE DITCH CHECK

NOTE: CONTRACTOR SHALL REFER TO THE WDOT FACILITIES DEVELOPMENT MANUAL FOR SPECIFIC DETAILS RELATING TO EROSION BALES. S.D.D. "TYPICAL INSTALLATIONS OF EROSION BALES"

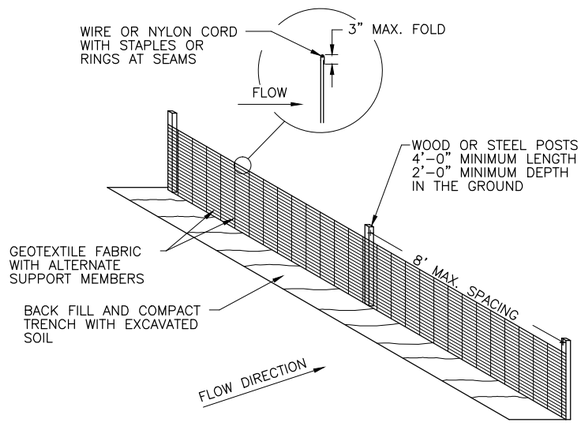


STORM SEWER INLET PROTECTION

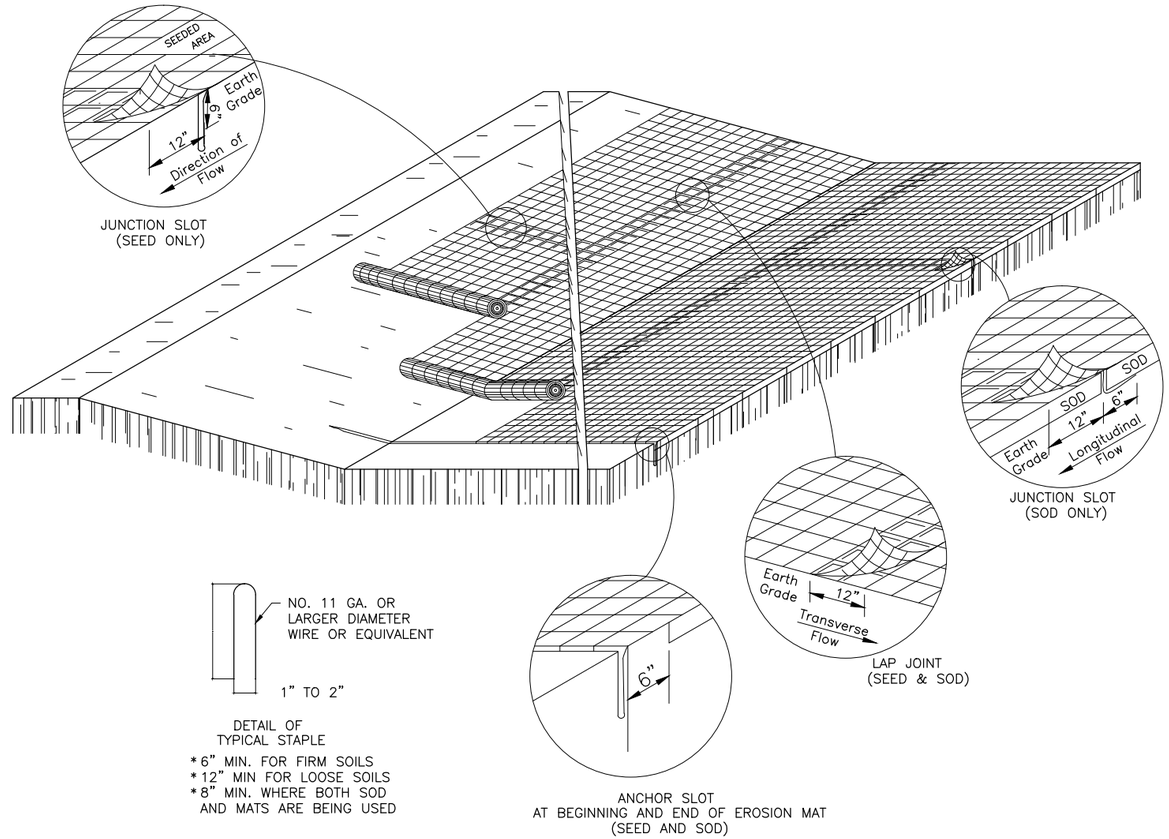
EROSION BALES



TRENCH DETAIL



SILT FENCE



EROSION CONTROL

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 SPECIFICATIONS.

VARIATIONS IN THE DIMENSIONS OF 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 DITCHED.

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

EDGES OF THE EROSION MAT SHALL BE IMPRESSED IN THE SOIL.

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

EROSION MAT OVER SOD:

A: ONLY JUTE FABRIC WILL BE PERMITTED OVER SOD.
B: ROAD STAKES FOR THE SOD MAY BE OMITTED BY THE ENGINEER IF THE EXISTING SLOPE AND SOIL CONDITIONS SO WARRANT.
C: THE WIDTH OF EROSION MAT SHALL ALWAYS EQUAL THE SOD WIDTH.
D: SOD STRIPS MAY BE PLACED EITHER LONGITUDINALLY OR TRANSVERSELY TO THE FLOW LINE OF THE DITCH.

EROSION MAT OVER SEEDING:

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

EROSION MAT OVER SEEDING

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SHEET TITLE
SITE DETAILS

SHEET
D1

\\SEHCF1\PROJECTS\KO\MA\MADWU\126154\5-DESIGN\51-DRAWINGS\TANK DWG\09.01001MAD.DWG
7-28-2014 12:30 PM USER: CHRIS EPSTEIN
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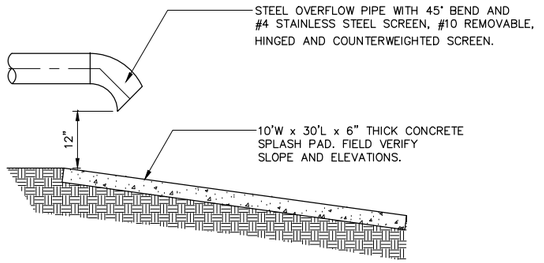
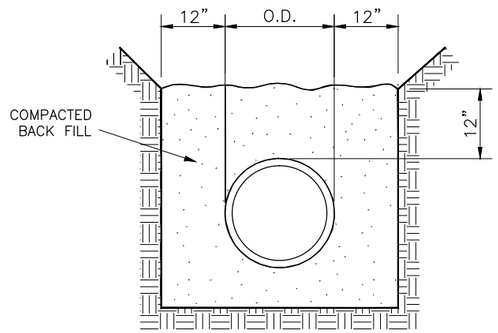
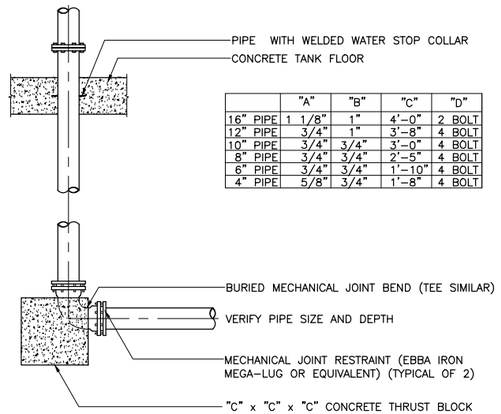


A D2 **OVERFLOW SPLASH PAD DETAIL**
SCALE: NONE
DT159

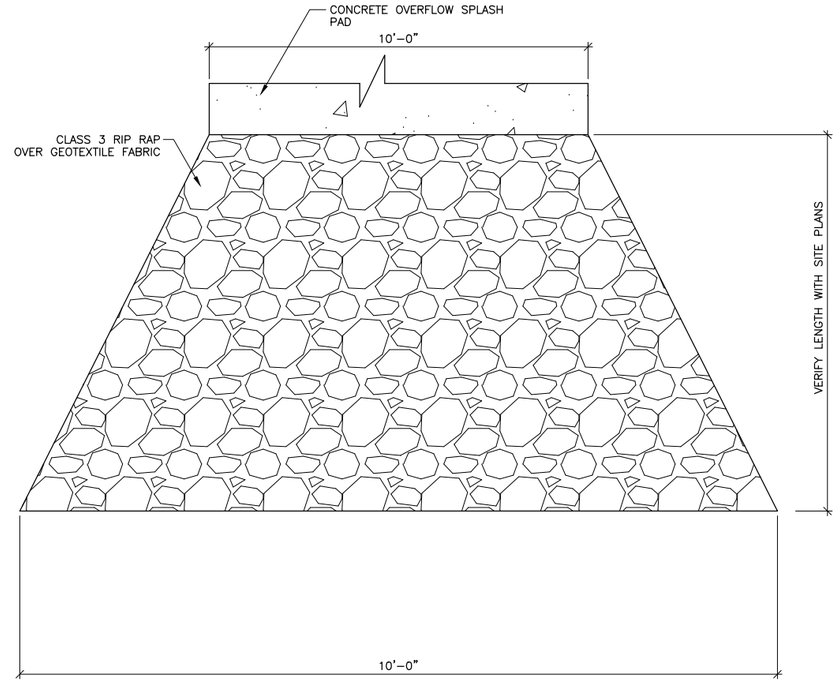


B D2 **TYPICAL PIPE EMBEDMENT**
SCALE: NONE

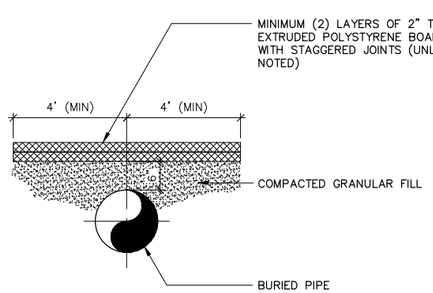


	"A"	"B"	"C"	"D"
16" PIPE	1 1/8"	1"	4'-0"	2 BOLT
12" PIPE	3/4"	1"	3'-8"	4 BOLT
10" PIPE	3/4"	3/4"	3'-0"	4 BOLT
8" PIPE	3/4"	3/4"	2'-5"	4 BOLT
6" PIPE	3/4"	3/4"	1'-10"	4 BOLT
4" PIPE	5/8"	3/4"	1'-8"	4 BOLT

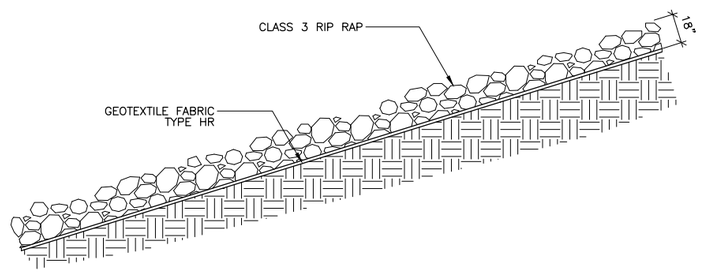
C D2 **JOINT RESTRAINT DETAIL**
SCALE: NONE
PPIPE001



E D2 **HEAVY RIP RAP DETAIL**
NOT TO SCALE



D D2 **PIPE INSULATION DETAIL**
SCALE: NONE



F D2 **HEAVY RIP RAP SECTION**
NOT TO SCALE

Madison Water Utility
SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE
SITE DETAILS

SHEET
D2

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7-24-2014 6:06 PM USER: SIDNEY LARSON
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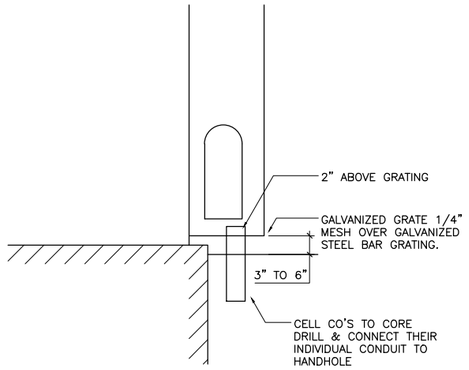
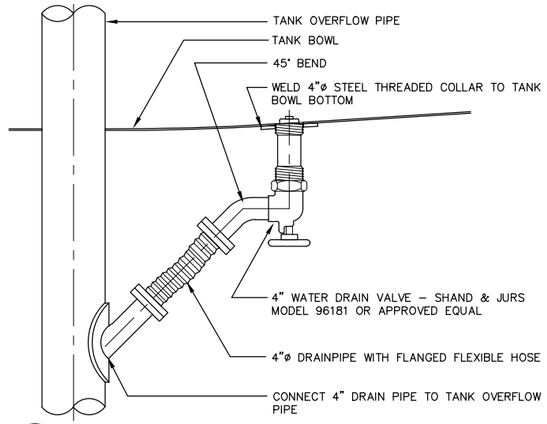


A D3 PILASTER AND HAND HOLE DETAIL

SCALE: NONE

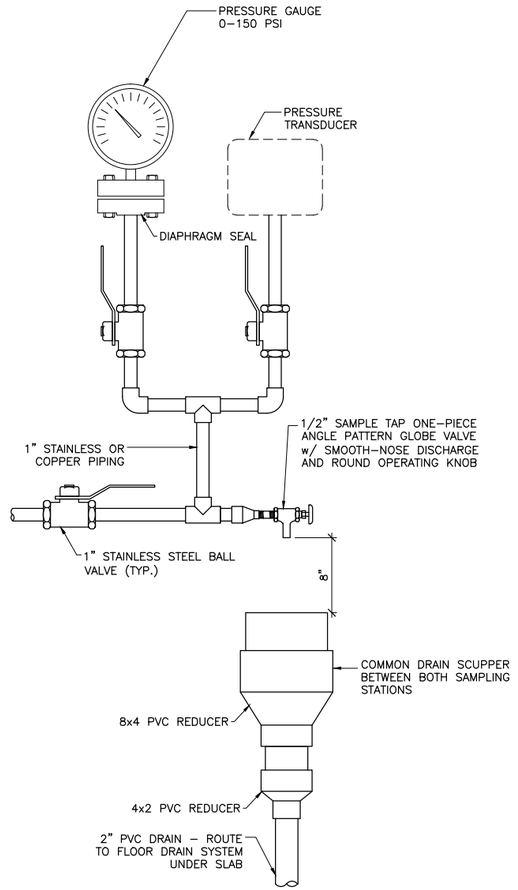
PPIPE021



B D3 DRAIN VALVE DETAIL

SCALE: NONE

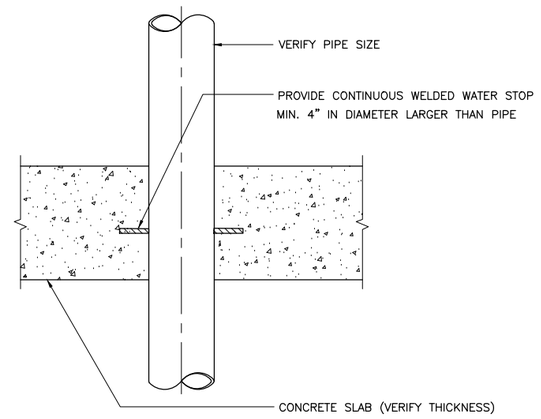
DT215



C D3 SAMPLE TAP DETAIL

SCALE: NONE

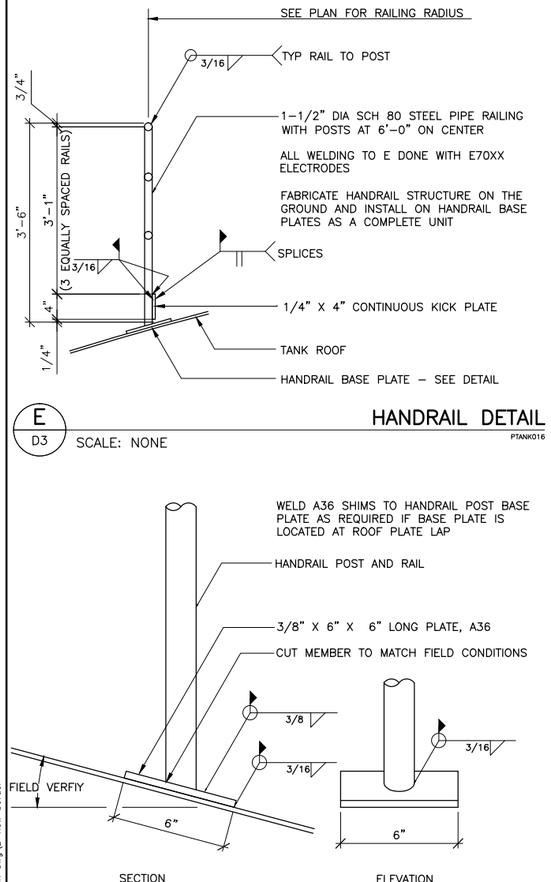
PPIPE021



D D3 PIPE PENETRATION THROUGH FLOOR DETAIL

SCALE: NONE

PPIPE037



E D3 HANDRAIL DETAIL

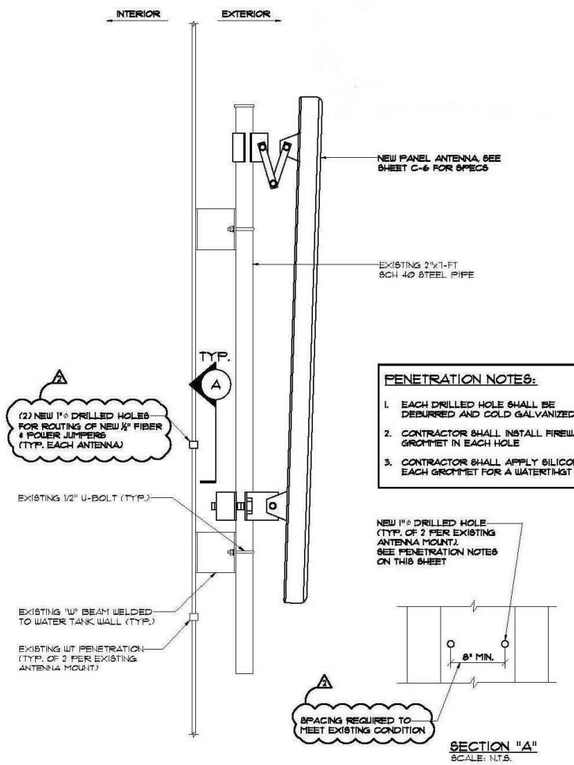
SCALE: NONE

PTANK016

F D3 HANDRAIL BASE PLATE DETAIL

SCALE: NONE

PTANK015

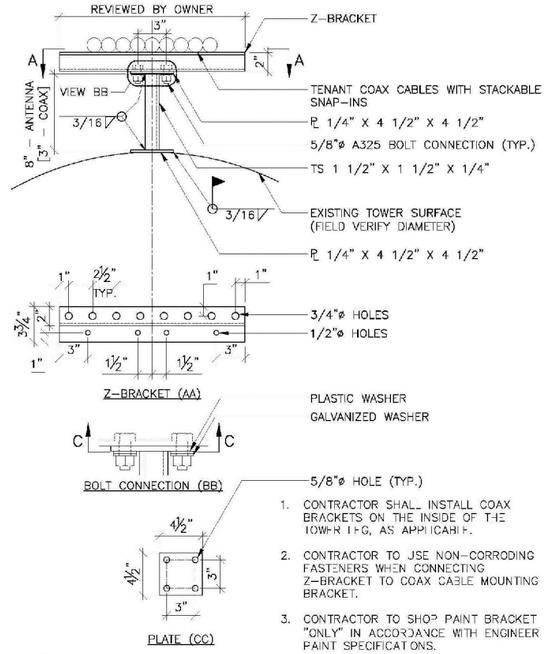


PENETRATION NOTES:

1. EACH DRILLED HOLE SHALL BE DEBURRED AND COLD GALVANIZED
2. CONTRACTOR SHALL INSTALL FIREWALL GROMMET IN EACH HOLE
3. CONTRACTOR SHALL APPLY SILICON TO EACH GROMMET FOR A WATERTIGHT SEAL

G D3 ANTENNA MOUNTING DETAIL

NOT TO SCALE



1. CONTRACTOR SHALL INSTALL COAX BRACKETS ON THE INSIDE OF THE TOWER LEG, AS APPLICABLE.
2. CONTRACTOR TO USE NON–CORRODING FASTENERS WHEN CONNECTING Z–BRACKET TO COAX CABLE MOUNTING BRACKET.
3. CONTRACTOR TO SHOP PAINT BRACKET "ONLY" IN ACCORDANCE WITH ENGINEER PAINT SPECIFICATIONS.

H D3 COAX CABLE MOUNTING BRACKET

NOT TO SCALE

Madison Water Utility

SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE
PROCESS PIPING DETAILS

SHEET
D3

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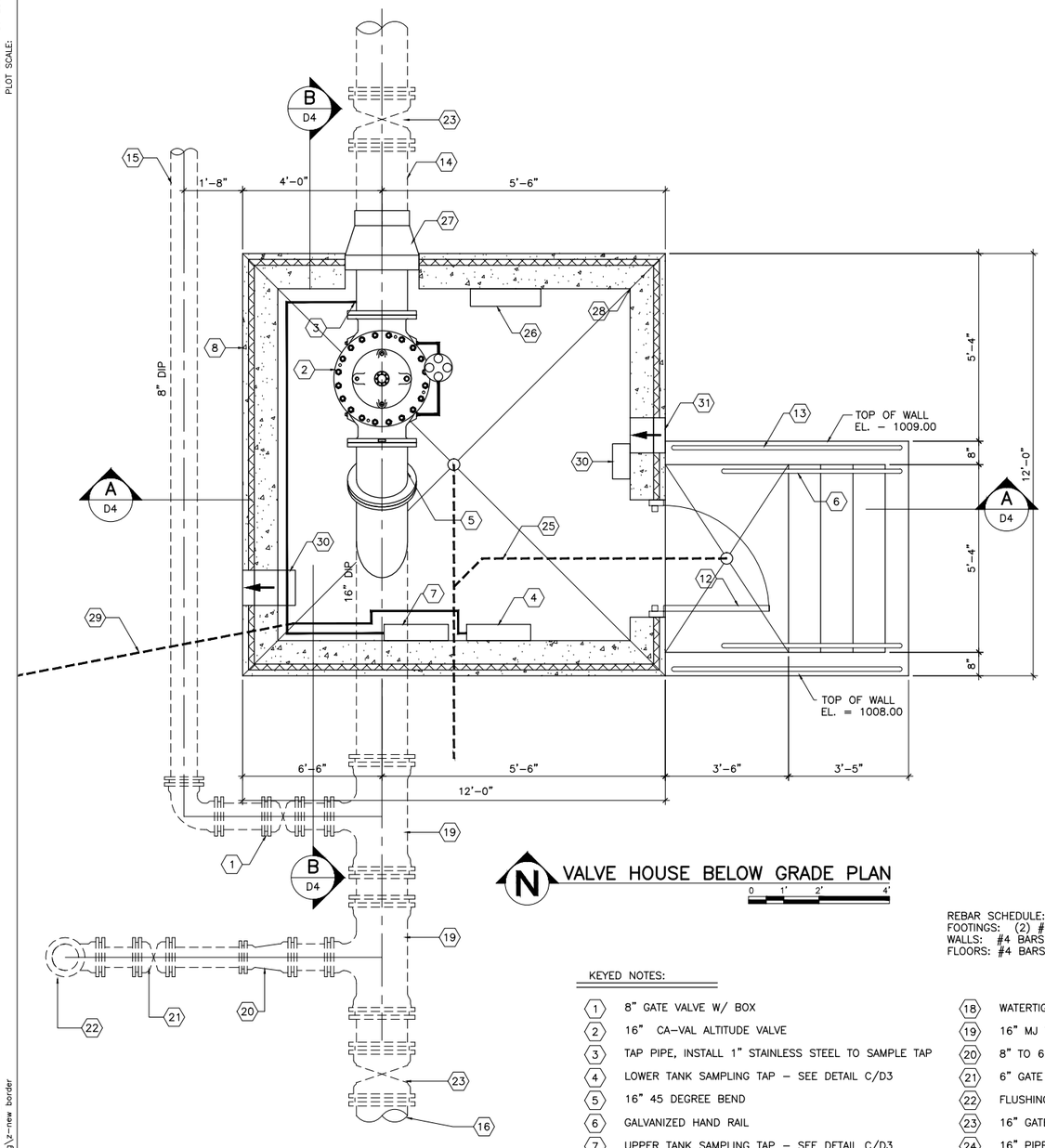
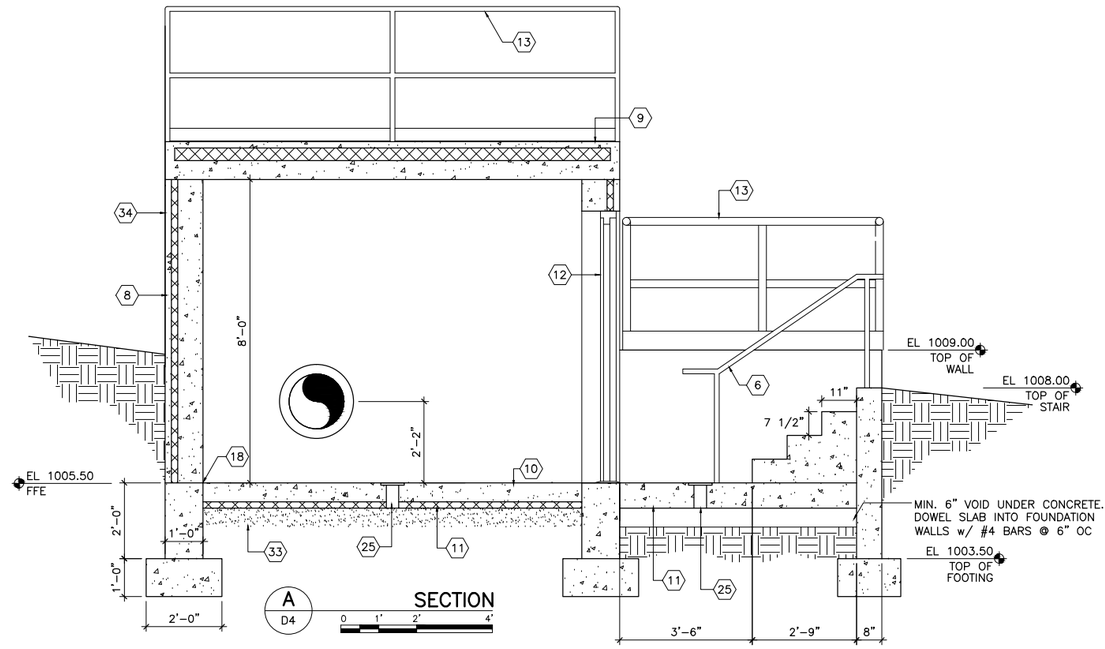
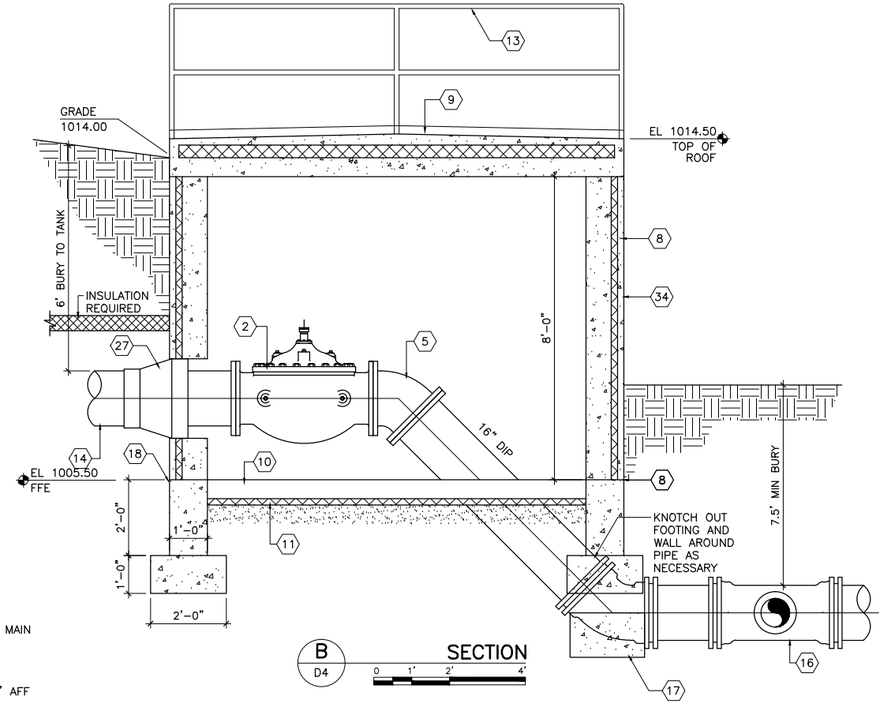


REBAR SCHEDULE:
FOOTINGS: (2) #4 BARS CONT.
WALLS: #4 BARS @ 6" E.W. CENTERED
FLOORS: #4 BARS @ 6" E.W.

KEYED NOTES:

1. 8" GATE VALVE W/ BOX
2. 16" CA–VAL ALTITUDE VALVE
3. TAP PIPE, INSTALL 1" STAINLESS STEEL TO SAMPLE TAP
4. LOWER TANK SAMPLING TAP – SEE DETAIL C/D3
5. 16" 45 DEGREE BEND
6. GALVANIZED HAND RAIL
7. UPPER TANK SAMPLING TAP – SEE DETAIL C/D3
8. 12" THICK PRECAST WALLS W/ 2" INSULATION
9. 12" THICK PRECAST ROOF W/ 4" INSULATION TAPER ROOF TOWARD NORTH & SOUTH 1/4"/FT
10. 6" CONCRETE SLAB W/ REINFORCEMENT
11. 2" INSULATION UNDER 6" CONCRETE SLAB
12. 3'–0" x 7'–0" DOOR AND FRAME
13. GALVANIZED SAFETY RAILING W/ TOE PLATE
14. 16" PIPE FROM VALVE HOUSE TO TANK RISER PIPE
15. 8" PIPE FROM VALVE HOUSE TO TANK DRAIN
16. 16" PIPE FROM VALVE HOUSE TO WATER SYSTEM
17. 45 DEGREE BEND W/ THRUST BLOCK REQ'D
18. WATERTIGHT SEAL AT ALL WALL TO SLAB JOINTS
19. 16" MJ TEE W/ 8" BRANCH
20. 8" TO 6" MJ REDUCER
21. 6" GATE VALVE W/ BOX
22. FLUSHING HYDRANT, SEE SITE PLAN FOR LOCATION
23. 16" GATE VALVE W/ BOX
24. 16" PIPE FROM VALVE HOUSE TO WATER SYSTEM
25. DRAIN TO DAYLIGHT – SEE C4 FOR CONTINUATION
26. ELECTRICAL PANEL – SEE ELECTRICAL
27. PIPE BOOT SEAL
28. WATERTIGHT JOINTS AT ALL WALL INTERSECTIONS
29. 1" COPPER SAMPLE LINE FROM BUILDING TO 12" WATER MAIN SEE SITE PLAN FOR CONTINUATION
30. WALL MOUNTED ELECTRIC UNIT HEATER
31. 12" SQUARE INSULATED VANE GRAVITY INTAKE DAMPER 7' AFF
32. 12" EXHAUST FAN WITH LOUVER 7' AFF
33. 60 MIL POLY VAPOR BARRIER OVER 6" COMPACTED SAND FILL
34. PROVIDE LANNON STONE FINISH ON EXPOSED EXTERIOR WALLS





Madison Water Utility
SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
REVISIONS		

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07–25–14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE
VALVE HOUSE PLAN AND SECTIONS

SHEET
D4

PLOTTED: 7–31–2014 10:56 AM
PLOT SCALE: 1:2
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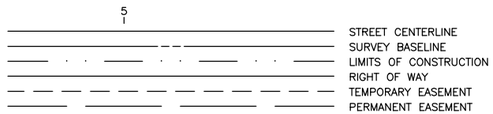
PLOT SCALE: 1:2

GENERAL DRAWINGS ABBREVIATION LIST

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

GENERAL DRAWINGS SITE LEGEND



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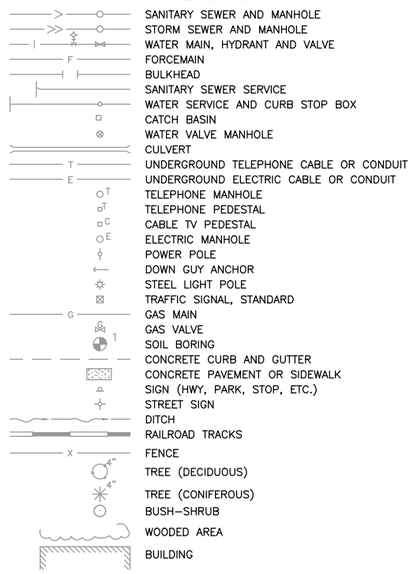
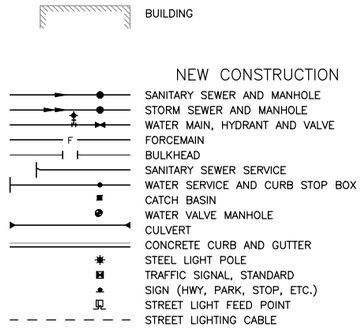
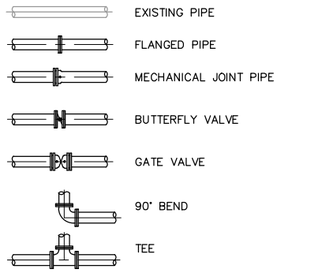


NEW CONSTRUCTION



GENERAL PIPING LEGEND



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. ALL WORK SHALL BE CONDUCTED WITHIN THE LIMITS OF CONSTRUCTION. CONTRACTOR SHALL REPAIR AND RESTORE ANY PAVEMENT, UTILITIES, OR OTHER FEATURES OUTSIDE THE LIMITS OF CONSTRUCTION THAT ARE DAMAGED DUE TO THE CONTRACTOR'S ACTS OR NEGLIGENCE AT THE CONTRACTOR'S OWN EXPENSE.

5. THE CONTRACTOR SHALL COMPLY WITH ALL CITY, COUNTY, AND STATE ROAD RESTRICTIONS FOR HAULING AND EQUIPMENT MOBILIZATION.

6. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY ADDITIONAL COSTS WHICH MAY RESULT FROM UNAUTHORIZED DEVIATIONS FROM THE CONTRACT DOCUMENTS.

7. 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.

8. ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS AND ORDINANCES SHALL BE ADHERED TO THROUGHOUT THE CONSTRUCTION PROJECT.

9. STANDARD DETAILS ARE INTENDED TO SHOW GENERAL DESIGN CONCEPTS. REFER TO THE SPECIFIC STRUCTURE DRAWINGS FOR DIMENSIONS AND SIZES.

10. 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.

11. SIZE OF FITTINGS AND VALVES SHALL CORRESPOND TO THE SIZE OF ADJACENT PIPING. JOINTS AND FITTING MATERIAL SHALL BE AS SHOWN FOR ADJACENT PIPING.

12. PROVIDE PROPER PLUGS, CAPS, AND RESTRAINTS WHEN ANY PIPING IS TERMINATED.

13. THE EXACT LOCATION OF UNDERGROUND UTILITIES SUCH AS NATURAL GAS, TELEPHONE, FIBER OPTIC, ELECTRIC, CABLE TV, AND PIPE LINES ARE UNKNOWN. CONTRACTOR SHALL CONTACT DIGGERS HOTLINE, CALL AT (800) 242-8511 BEFORE COMMENCING ANY EXCAVATION.

14. THE 2014 EDITION OF THE WISCONSIN DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR HIGHWAY & STRUCTURE CONSTRUCTION" SHALL GOVERN EXCEPT AS MODIFIED BY THE SPECIFICATIONS FOR THIS PROJECT.

15. ALL SUBMERGED OR EARTH COVEREDANCHOR BOLTS, NUTS, FASTENERS, ETC., SHALL BE 304 STAINLESS STEEL UNLESS OTHERWISE NOTED.

16. ALUMINUM SURFACES IN CONTACT WITH CONCRETE SHALL RECEIVE TWO COATS OF BITUMASTIC OR ZINC CHROMATE.

17. SOME ITEMS HAVE ROTATED INTO THE PLANE OF PROJECTION ON TYPICAL SECTIONS FOR CLARITY.

18. THE PVC DRAIN LINE SHALL BE INSTALLED IN ACCORDANCE WITH ASTM STANDARD D2321.

19. ALL STEEL SHALL COMPLY WITH "BUY AMERICAN" CLAUSE AS INDICATED WITHIN THE SPECIFICATIONS.

Madison Water Utility

SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE
STEEL WATER TOWER
GENERAL NOTES

SHEET
01

P:\KO\M\MADWU\126154\5-DESIGN\51-DRAWINGS\TANK DWG\13.01G01MA0.DWG
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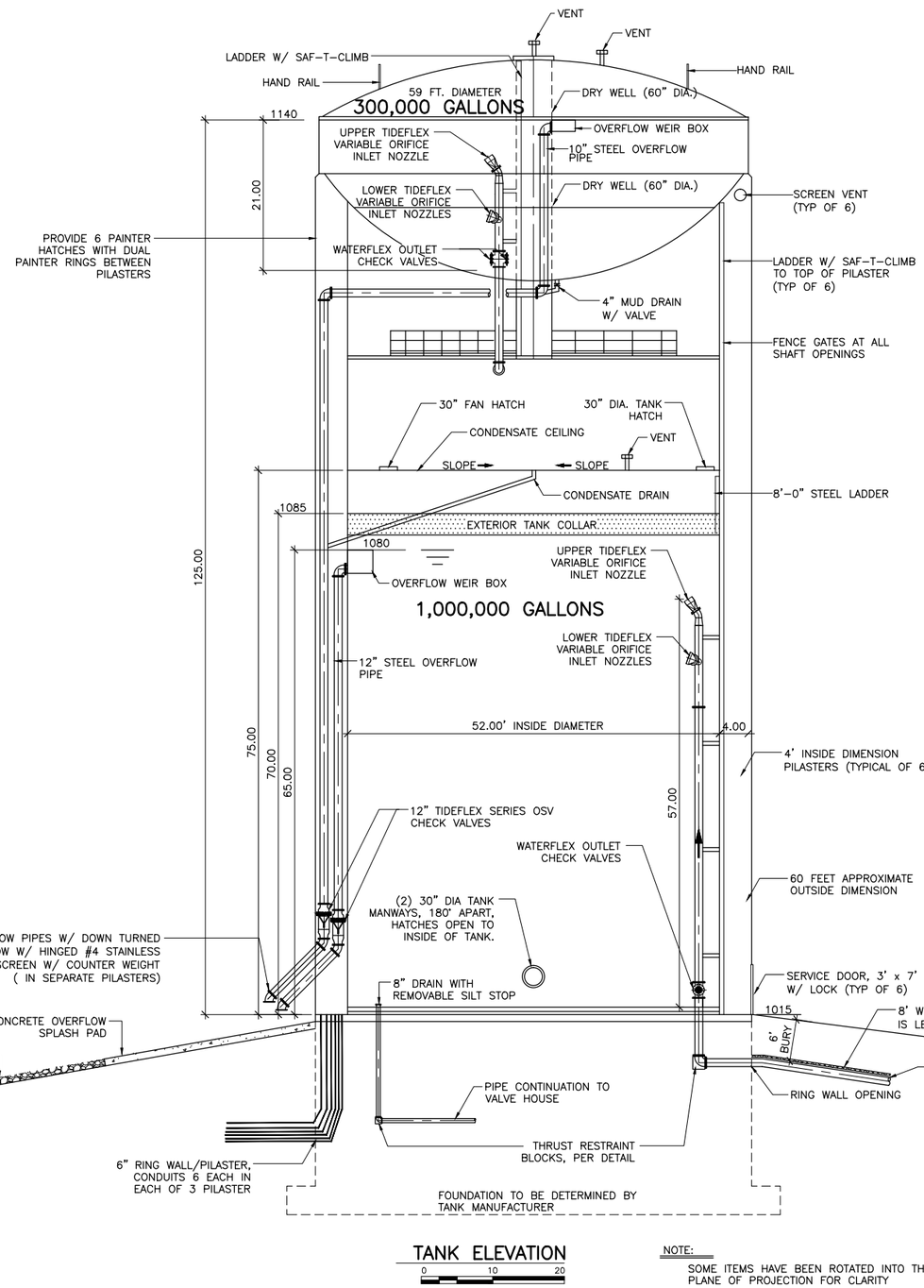
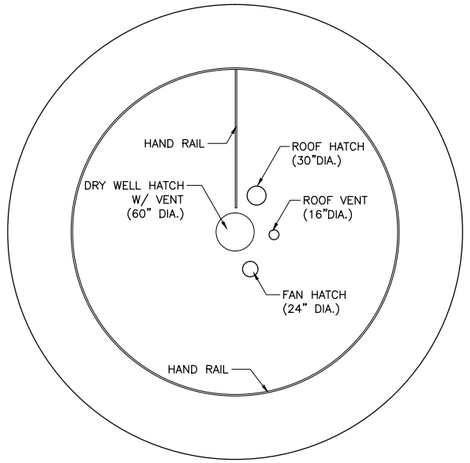


TANK ELEVATION

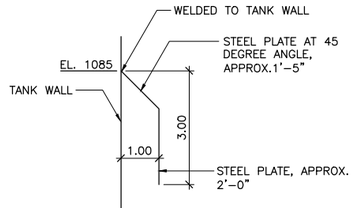
0 10 20

NOTE:
SOME ITEMS HAVE BEEN ROTATED INTO THE PLANE OF PROJECTION FOR CLARITY



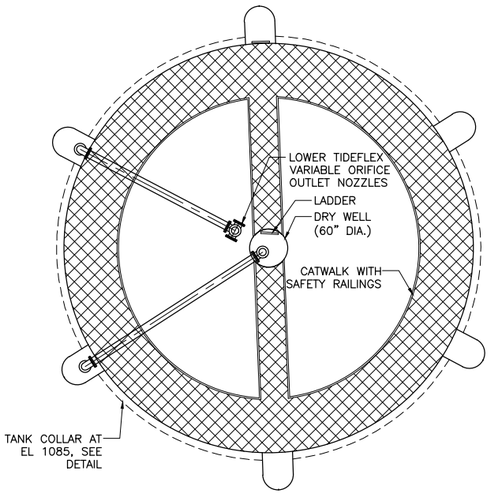
ROOF/BOWL ORIENTATION PLAN

0 10 20



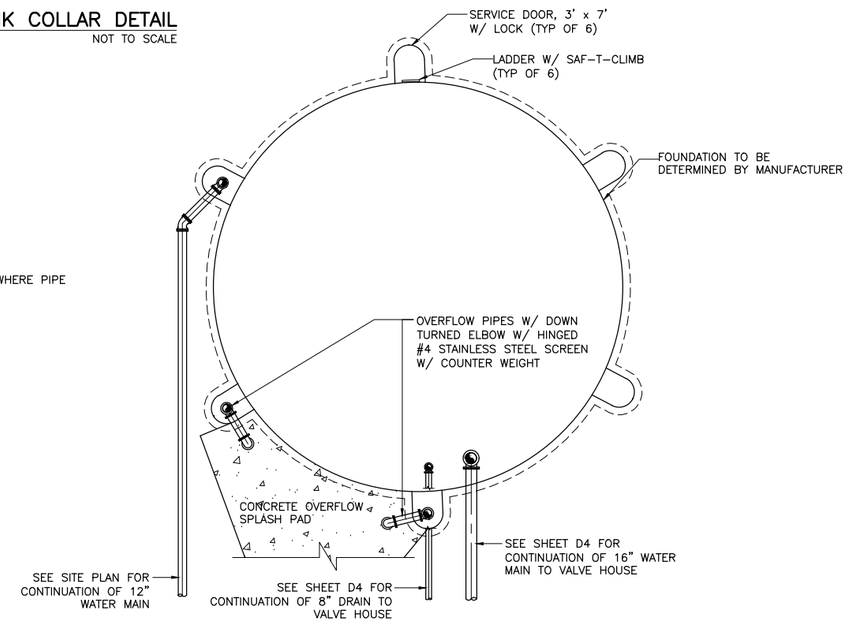
TANK COLLAR DETAIL

NOT TO SCALE



SHAFT ORIENTATION PLAN

0 10 20



SHAFT ORIENTATION PLAN

0 10 20

Madison Water Utility

SEH

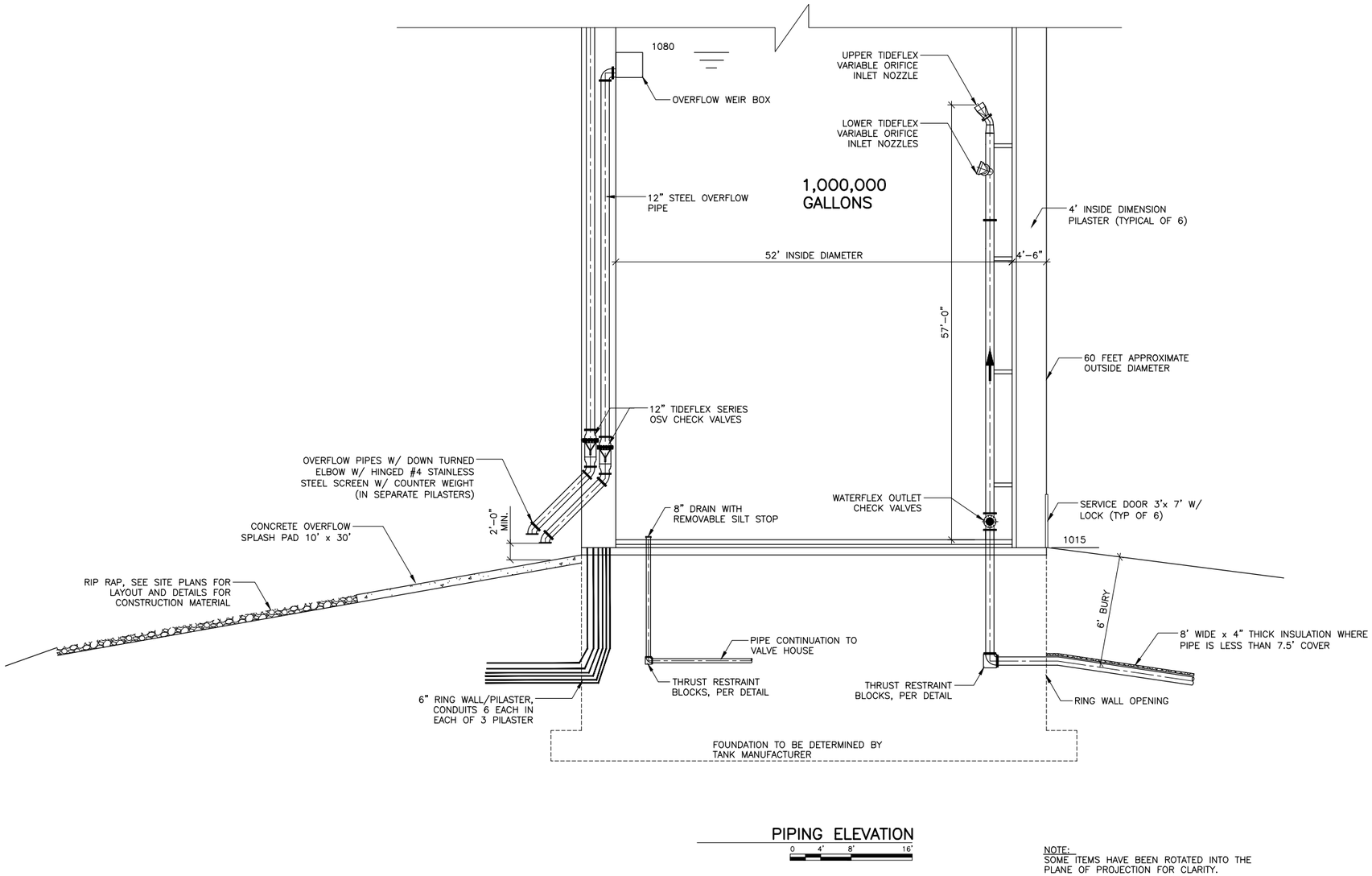
LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
REVISIONS		

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE
STEEL TANK ELEVATION AND PLAN VIEW

SHEET
02



PIPING ELEVATION

0 4' 8' 16'

NOTE:
SOME ITEMS HAVE BEEN ROTATED INTO THE PLANE OF PROJECTION FOR CLARITY.

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PLOT SCALE: 1:2

\\SEHCF1\PROJECTS\KO\M\MADWU\126154\5-DESIGN\51-DRAWINGS\TANK DWG\15.01G03MA0.DWG
SAVED: 7-31-2014 11:21 AM USER: CHRIS EPSTEIN
XREFs: P:\KO\M\Madwu\126154\5-Design\51-drawings\Tank dwg\z-new border

Madison Water Utility
SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

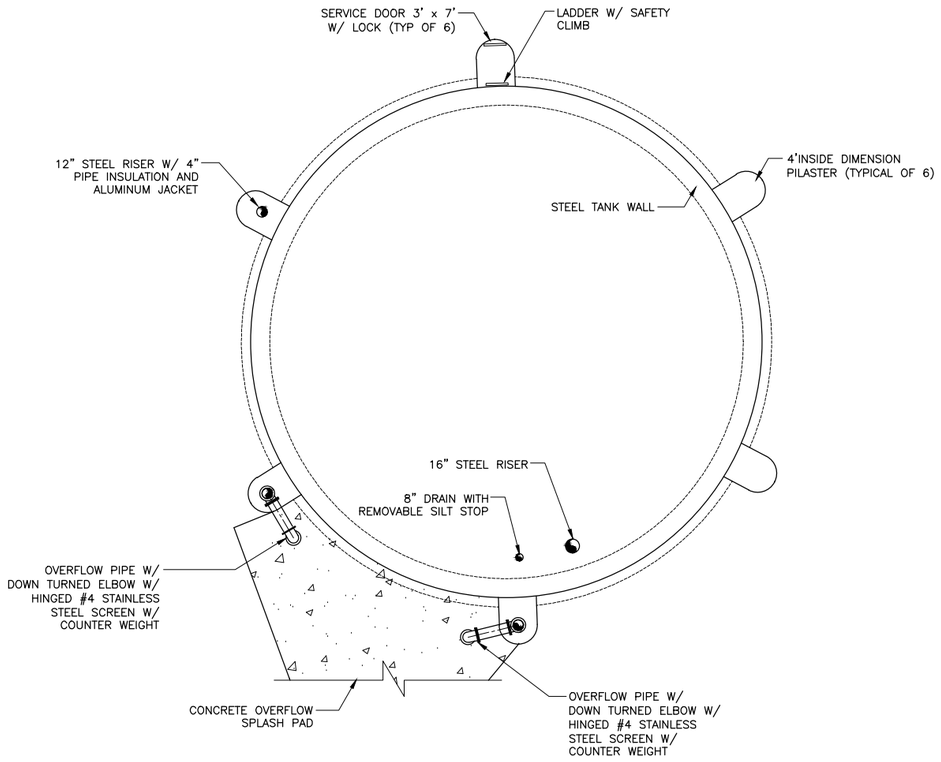
MARK	DATE	DESCRIPTION
		REVISIONS

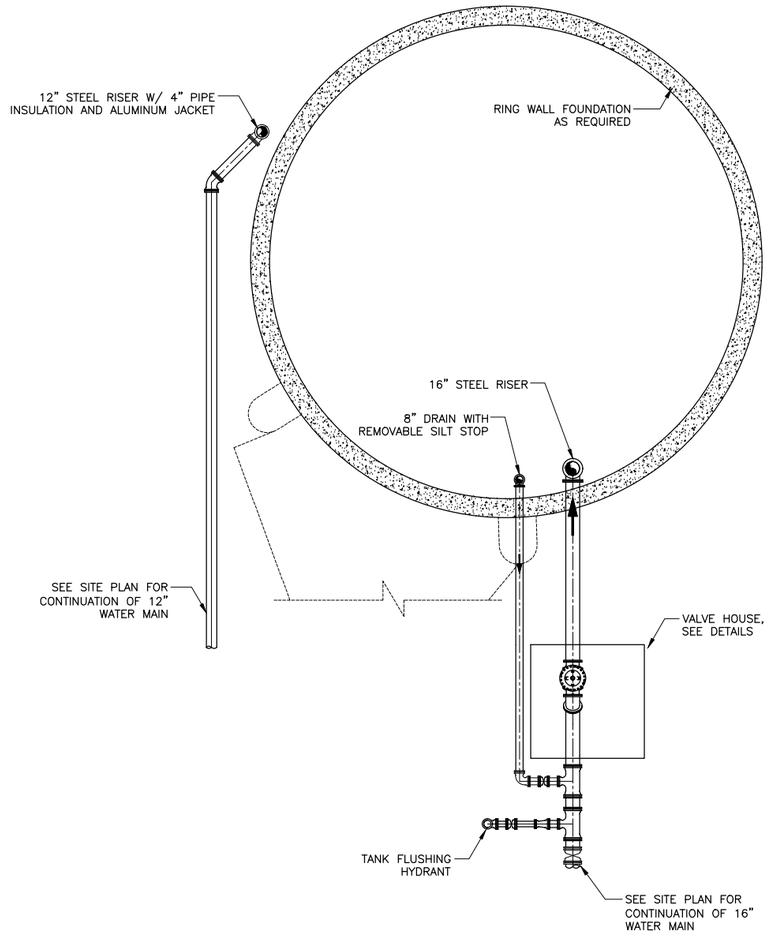
SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE
STEEL TANK PROCESS
PIPING SECTION

SHEET
03

PLOTTED: 7-31-2014 11:31 AM
PLOT SCALE: 1:2





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Madison Water Utility

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REPLACEMENT PROJECT
MADISON, WISCONSIN

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		REVISIONS

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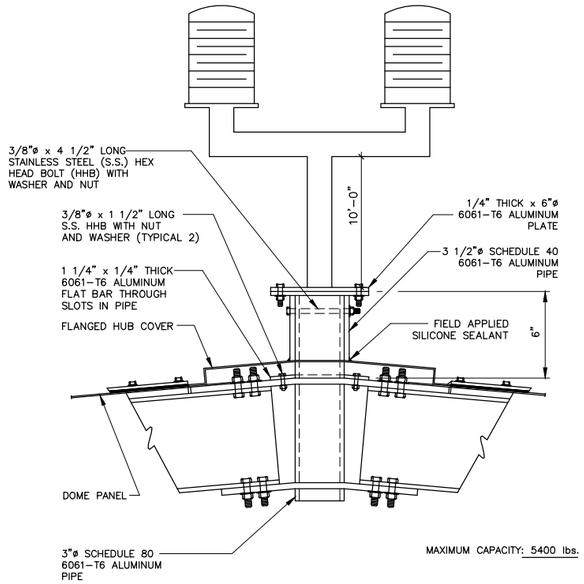
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

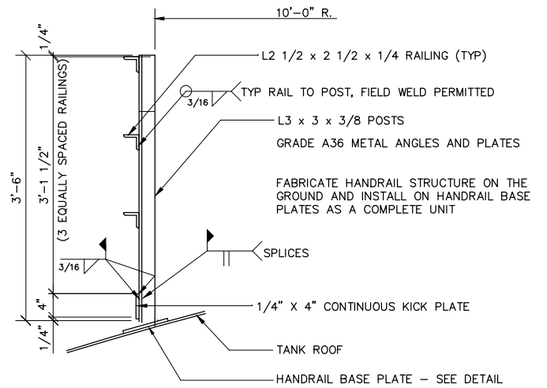
SHEET TITLE
STEEL TANK PROCESS
PIPING PLAN

SHEET
04

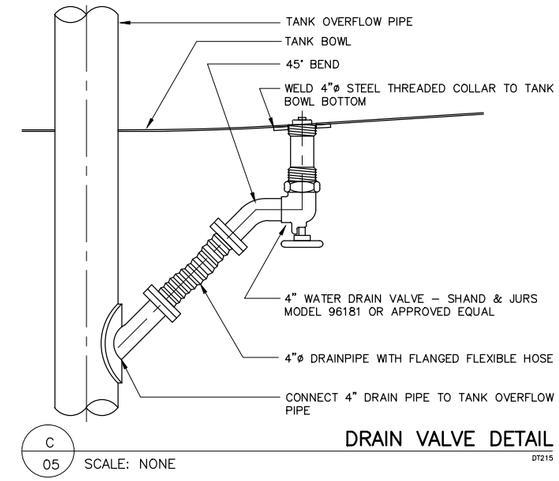
PLOTTED: 7-24-2014 12:35 PM
PLOT SCALE: 1:2



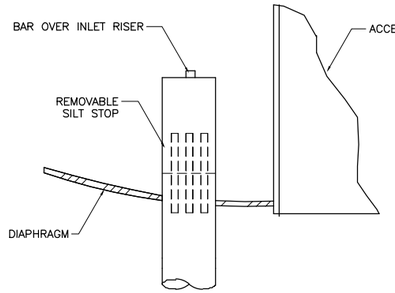
A / 05 **FAA OBSTRUCTION LIGHTS (ALTERNATE)**
NOT TO SCALE



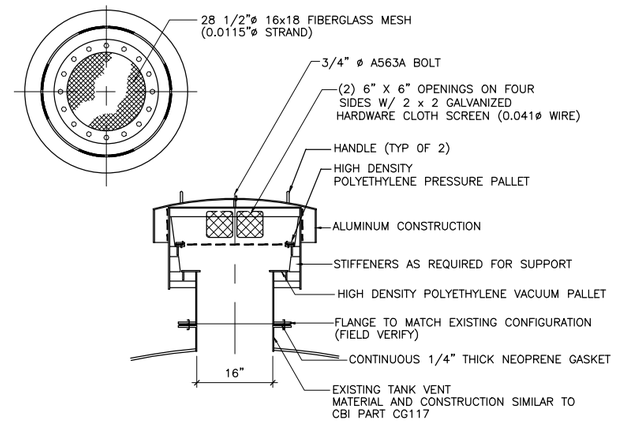
B / 05 **HANDRAIL DETAIL (ALTERNATE)**
SCALE: NONE
DT155



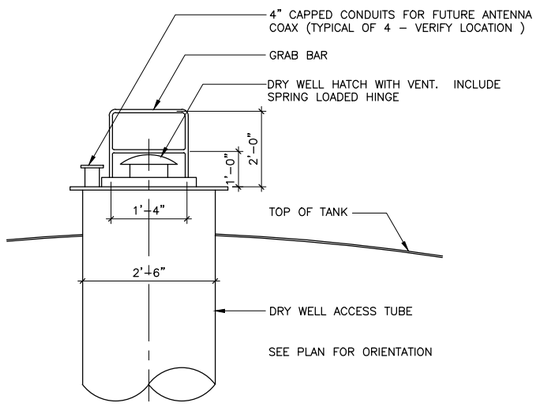
C / 05 **DRAIN VALVE DETAIL**
SCALE: NONE
DT215



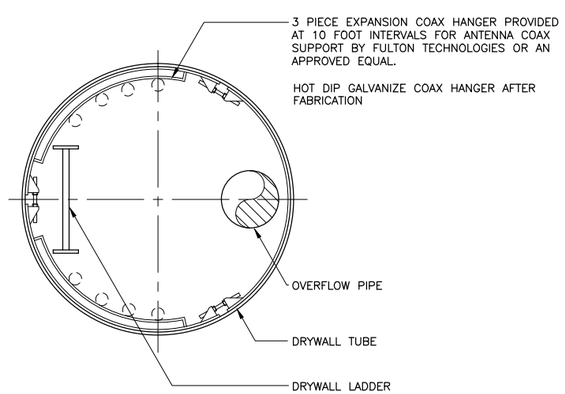
D / 05 **SILT STOP DETAIL**
SCALE: NONE



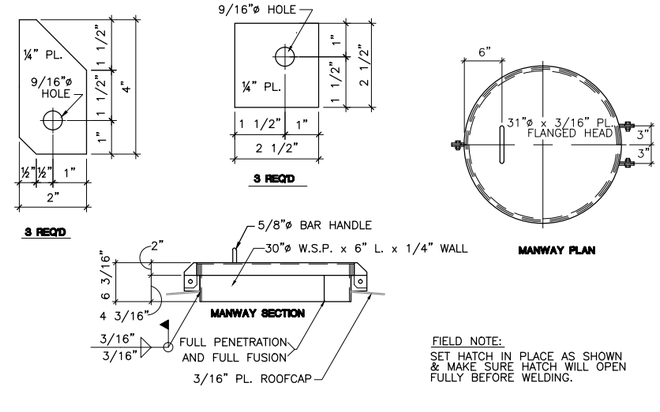
E / 05 **TANK VENT DETAIL**



F / 05 **DRY WELL ACCESS TUBE DETAIL**
SCALE: NONE
PTANK005



G / 05 **COAX SUPPORT HANGER DETAIL**
SCALE: NONE
PTANK004



FIELD NOTE:
SET HATCH IN PLACE AS SHOWN & MAKE SURE HATCH WILL OPEN FULLY BEFORE WELDING.

H / 05 **TANK MANWAY**
NOT TO SCALE

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

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		REVISIONS

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE
STEEL TANK DETAILS

SHEET
05

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SAVED: 7-24-2014 12:34 PM USER: SIDNEY LARSON
XREFs: P:\KO\M\Madwu\126154\5-Design\51-drawings\Tank dwg\z-new border

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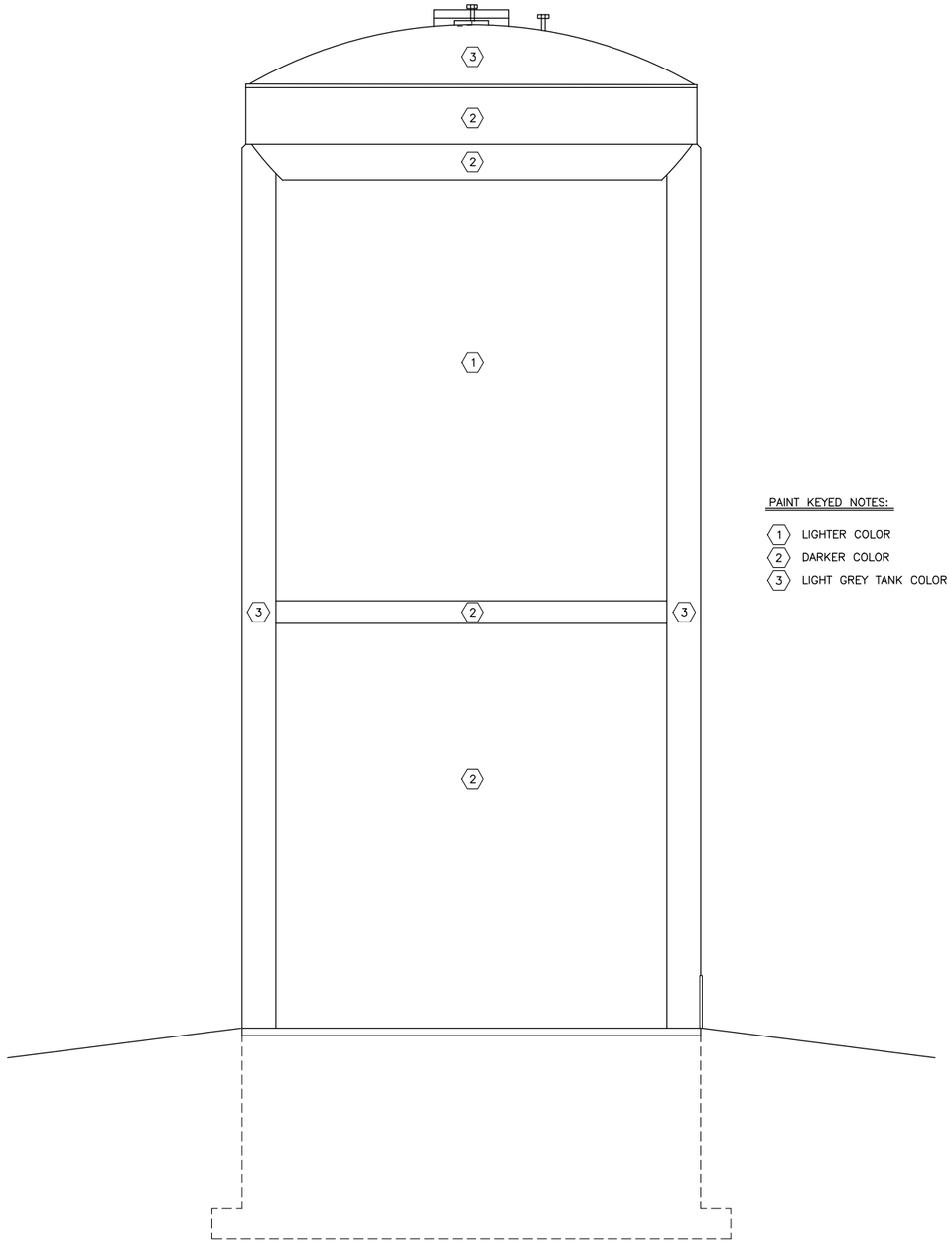

TYPICAL ELEVATION

0 10 20

PAINT KEYED NOTES:

1. LIGHTER COLOR
2. DARKER COLOR
3. LIGHT GREY TANK COLOR

NOTE:

(1) SOME ITEMS HAVE BEEN ROTATED INTO THE PLANE OF PROJECTION FOR CLARITY

(2) COLORS OF WATER RESERVOIR TO BE DETERMINED BY CITY

P:\KO\M\MADWU\126154\5-DESIGN\51-DRAWINGS\TANK DWG\18.01GGMAD.DWG
SAVED: 7-24-2014 12:38 PM USER: SIDNEY LARSON
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Madison Water Utility

SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION

REVISIONS

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE
PAINTING DETAILS

SHEET
06

PLOTTED: 7-23-2014 4:45 PM
PLOT SCALE: 1:2

GENERAL NOTES

MISCELLANEOUS

1. THE WATER TANK SUPPORT PEDESTAL IS DESIGNED AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THESE GENERAL NOTES AND THE APPLICABLE PORTIONS OF THE FOLLOWING CODES AND STANDARDS:

   1.1 THE 2009 INTERNATIONAL BUILDING CODE (IBC) AS PUBLISHED BY THE INTERNATIONAL CODE COUNCIL (ICC).

   1.2 ANSI/ASCE 7–05 (2005) MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES PUBLISHED BY THE AMERICAN SOCIETY OF CIVIL ENGINEERS.

   1.3 AMERICAN CONCRETE INSTITUTE (ACI) BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318–05).

   1.4 AMERICAN CONCRETE INSTITUTE (ACI) GUIDE FOR THE ANALYSIS, DESIGN AND CONSTRUCTION OF CONCRETE–PEDESTAL WATER TOWERS (ACI 371R–08), AS APPLICABLE.

   1.5 AMERICAN CONCRETE INSTITUTE (ACI) GUIDE TO FORM WORK FOR CONCRETE (ACI 347R–04).

   1.6 AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION, ALLOWABLE STRESS DESIGN (NINTH EDITION) AND SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS DATED JUNE 1, 1989.

   1.7 ANSI/AWS D1.1–2008, 2008 STRUCTURAL WELDING CODE–STEEL, PUBLISHED BY THE AMERICAN NATIONAL STANDARDS INSTITUTE AS PREPARED BY THE AMERICAN WELDING SOCIETY.

2. PROPER LOCATION OF THE PEDESTAL CENTERLINES SHALL BE ESTABLISHED AT THE START OF CONSTRUCTION. THE PEDESTAL CONTRACTOR SHALL LOCATE THE PEDESTAL CENTERLINES ON THE SUPPORT SLAB AND/OR ON THE PEDESTAL WALL, (FOUR POINTS ON THE WALL) AFTER COMPLETION OF THE PEDESTAL CONSTRUCTION. (NOTE: CARDINAL CENTERLINES AT THE TOP OF THE PEDESTAL ARE THE SAME AS THOSE AT THE BOTTOM OF PEDESTAL, AS INDICATED ON THE DRAWINGS BY CARDINAL GRID LOCATIONS Ⓐ, Ⓑ, Ⓒ, Ⓓ AND Ⓔ).

3. USE LATEST EDITIONS FOR ALL REFERENCED SPECIFICATIONS AS OF SEPTEMBER 2004, UNLESS NOTED OTHERWISE.

4. ALL FABRICATION OR CONSTRUCTION SHALL PROCEED FROM DRAWINGS "ISSUED FOR CONSTRUCTION" ONLY.

5. DESIGN LIVE LOADS IN ADDITION TO THE WATER TANK LOADS INDICATED OR REFERENCED ON DRAWINGS ARE AS FOLLOWS FOR THE WATER TANK PEDESTAL STRUCTURE:

   WIND: ASCE STANDARD 7–05 (2005)
   BASIC WIND SPEED 90 MPH
   WIND IMPORTANCE FACTOR I $_W$ 1.15
   EXPOSURE C
   TOPOGRAPHICAL FACTOR (KZt=1.0)
   GUST EFFECT FACTOR (G=0.85)
   DIRECTIONALITY FACTOR (K $_d$ 0.95) ROUND TANK
   FORCE COEFF.– – – – – – – INTERPOLATED FOR h/d RATIOS
   ROUND CROSS SECTION – – – – – – – – – 0.6 TO 0.7
   (INTERPOLATED BETWEEN MODERATELY SMOOTH TO ROUGH)

   SEISMIC: 2009 INTERNATIONAL BUILDING CODE
   SEISMIC IMPORTANCE FACTOR I $_E$ 1.5
   SEISMIC USE GROUP III
   SOIL SITE CLASS D (PER GME CONSULTANTS, INC. GEOTECH ENGINEER)
   S_{DS} = 0.059

   S_{D1} = 0.042
   SEISMIC DESIGN CATEGORY A
   RESPONSE MODIFICATION FACTOR R = 2.0

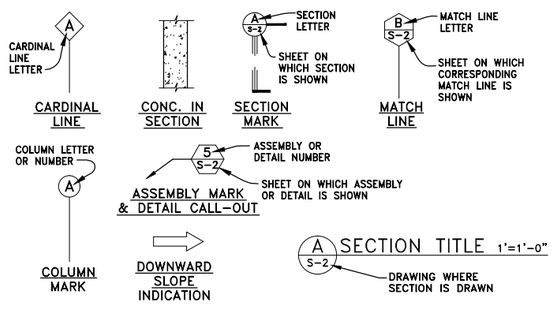
   SNOW LOAD: 40 PSF (GROUND SNOW LOAD)

   WALKWAY LIVE LOAD: 60 PSF

6. THE PEDESTAL WALL IS DESIGNED BASED ON JUMP FORM TECHNIQUES OF CONSTRUCTION.

7. THE PVC DRAIN LINE SHALL BE INSTALLED IN ACCORDANCE WITH ASTM STANDARD D2321.

SYMBOLS



CONCRETE

1. CONCRETE CONSTRUCTION SHALL MEET ACI 318–05, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE". CONCRETE WORK SHALL CONFORM TO ACI 301–05, "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS". FORM WORK SHALL CONFORM TO ACI 347R–01, "GUIDE TO FORM WORK FOR CONCRETE", WHERE APPLICABLE.
2. THE SPECIFIED CONCRETE COMPRESSIVE STRENGTH (f'c) SHALL BE 4000 PSI UNLESS NOTED OTHERWISE ON THE DESIGN DRAWINGS. THE CONCRETE STRENGTHS NOTED ARE AT 28 DAYS. THE CONCRETE MIXES SHALL BE PROPORTIONED IN COMPLIANCE WITH THE REQUIREMENTS OF ACI 301–05, AND ACI 318–05.
3. ALL CONCRETE SHALL BE AIR ENTRAINED AS PER ACI 318–05 (SECTION 4.2). AIR ENTRAINING ADMIXTURES SHALL CONFORM TO "SPECIFICATIONS FOR AIR ENTRAINING ADMIXTURES FOR CONCRETE" (ASTM C260).
4. KEEP ONE COPY OF "FIELD REFERENCE MANUAL" (ACI PUBLICATION SP–15 [2004]) AT THE PROJECT FIELD OFFICE.
5. CURING AND PROTECTION OF ALL CONCRETE SHALL FOLLOW THE REQUIREMENTS OF ACI 301–05. CURING COMPOUNDS, IF USED, SHALL CONFORM TO ASTM C309. THE METHOD FOR CURING CONCRETE SHALL BE DETERMINED IN ACCORDANCE WITH ACI 308–05.
6. HOT WEATHER CONCRETING SHALL CONFORM TO ACI 305R–05.
7. COLD WEATHER CONCRETING SHALL CONFORM TO ACI 306R–05, EXCEPT CONCRETING MAY BEGIN WHEN THE TEMPERATURE IS 24° FAHRENHEIT AND RISING AND A PROTECTION METHOD IS ADEQUATE TO ALLOW 500 PSI STRENGTH GAIN BEFORE CONCRETE TEMPERATURE DROPS BELOW 32° FAHRENHEIT.
8. REINFORCEMENT STEEL SHALL BE DEFORMED AND MANUFACTURED TO ASTM A615 STANDARDS WITH A MINIMUM YIELD STRENGTH OF 60 KSI, EXCEPT AS NOTED OTHERWISE ON THE DESIGN DRAWINGS.
9. REINFORCEMENT STEEL SHALL NOT BE WELDED OR TACK WELDED WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER.
10. LAP REINFORCEMENT STEEL AS INDICATED ON DRAWINGS.
11. ADMIXTURES, IF USED, SHALL CONFORM TO ACI 318–05 UNLESS APPROVED BY THE ENGINEER. NO CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CHLORIDE ARE TO BE USED AT ANY TIME.
12. UNLESS NOTED, MINIMUM CONCRETE COVER FOR REINFORCEMENT STEEL SHALL BE AS FOLLOWS:

    3" FOR CONCRETE AGAINST GROUND
    2" FOR FORMED OR SLIPPED SURFACES EXPOSED TO WEATHER OR GROUND
    8" SLAB AND WALL NOT EXPOSED TO WEATHER
    11" FOR ALL OTHER

13. PROVIDE 1.5" X 45° CHAMFER ON ALL EXPOSED CORNERS OF CONCRETE, UNLESS NOTED.
14. REPORT ANY CONSTRUCTION JOINTS NOT INDICATED ON DRAWINGS TO STRUCTURAL ENGINEER FOR REVIEW, PRIOR TO CONSTRUCTION.
15. PEDESTAL WALL REINFORCEMENT STEEL SHALL BE PLACED AS INDICATED ON DRAWINGS. TIE ALL HOOP BARS AT 8" MINIMUM C/C TO VERTICALS, OR AS NEEDED TO MAINTAIN THE SPECIFIED COVER. STAGGER ALL HOOP BAR LAPS UNLESS LAP LOCATION IS NOTED ON DRAWINGS. SEE DEFINITIONS OF TERMS AND TOLERANCES ON DWG. GN–1 FOR PLACEMENT OF HOOP BARS IN WALL.
16. SETTING OF ALL WELD PLATES, ANCHOR BOLTS, SLEEVES OR INSERTS SHALL BE VERIFIED WITH ALL AFFECTED PARTIES WHERE POSSIBLE BEFORE CASTING CONCRETE.
17. ALL CONCRETE SHALL BE TESTED IN ACCORDANCE WITH ACI 301–05.
18. THE JUMP FORMED WALL SHALL HAVE A SMOOTH, AS FORMED FINISH WITH UNIFORMLY SPACED HORIZONTAL AND VERTICAL RUSTICATION STRIPS FOR AN EMBOSSED ARCHITECTURAL FINISH.
    (NO GRINDING, RUBBING OR GROUT FINISH IS NECESSARY). ALL WALL SURFACES SHALL BE INSPECTED FOR DEFECTS SUCH AS HONEYCOMBED CONCRETE, ETC. AS DEFINED BY ACI 309.2R–05 AND REPAIRED.
19. THE SURFACE OF THE FOUNDATION, GRADE SLAB AND SUPPORT SLAB SHALL HAVE A WOOD FLOAT FINISH.

REINFORCEMENT STEEL BAR MARK NOMENCLATURE FOR BENT BARS ONLY

W – PEDESTAL WALL STEEL
F – FOUNDATION STEEL
R – ROOF STEEL
S – SLAB STEEL
C – COLUMN STEEL
FIRST LETTER OF BAR MARK

FIRST NUMBER INDICATES BAR SIZE
LAST TWO NUMBERS INDICATE MARK NUMBER
WALL STEEL – BAR SIZE
EXAMPLE: W 5 01 – MARK NO.

INFORMATION IN BAR LISTS:
NO MARK NUMBER AND (–) FOR BAR TYPE INDICATES A STRAIGHT BAR
ALL DIMENSIONS ARE OUT–TO–OUT FOR BENT BARS

STRUCTURAL STEEL

1. COMPLY WITH THE REQUIREMENTS AND SPECIFICATIONS FOR FURNISHING, DETAILING, FABRICATING, AND ERECTION OF STRUCTURAL STEEL AS OUTLINED IN THE FOLLOWING DOCUMENTS (INCLUDING ALL SUPPLEMENTS, AND ADDENDA), UNLESS NOTED OTHERWISE ON THE DESIGN DRAWINGS:

   1.1 AISC (AMERICAN INSTITUTE OF STEEL CONSTRUCTION) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS", ADOPTED JUNE 1, 1989.

   1.2 AISC "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES", ADOPTED SEPTEMBER 1, 1986.

   1.3 AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", APPROVED NOVEMBER 13, 1985.

   1.4 AWS "STRUCTURAL WELDING CODE" (ANSI/AWS D1.1–2002), PREPARED BY THE AMERICAN WELDING SOCIETY, APPROVED BY AMERICAN NATIONAL STANDARDS INSTITUTE AUGUST 31, 2001.

2. THE REQUIRED STEEL TYPES AND MINIMUM YIELD POINTS ARE NOTED ON THE DRAWINGS. ANY DEVIATION FROM THE SPECIFIED STEEL DESIGNATION MUST BE APPROVED BY FACILITY DESIGN, INC. WHERE THE STEEL TYPE IS NOT SPECIFIED, USE 36 KSI MINIMUM YIELD POINT MATERIAL (ASTM A36).
3. ALL WELDING SHALL COMPLY WITH APPLICABLE ANSI/AWS, STRUCTURAL WELDING CODE SPECIFICATIONS. ALL WELDING SHALL BE PERFORMED WITH ANSI/AWS QUALIFIED WELDERS.
4. WELDING ELECTRODES FOR A36, A572 AND A992 STEEL SHALL BE E70XX, ER70S–X, OR E7XT–X AS APPLICABLE FOR THE WELD PROCESS SELECTED BY THE CONTRACTOR. THE MINIMUM YIELD STRENGTH OF THE WELDING ELECTRODES SHALL BE 60 KSI, AND THEY SHALL MEET THE REQUIREMENTS OF ANSI/AWS D1.1–2002. ELECTRODES HAVING LOW HYDROGEN COVERINGS SHALL BE PROTECTED AGAINST MOISTURE ACCORDING TO ANSI/AWS D1.1–2002.
5. USE 8" DIAMETER HIGH STRENGTH BOLTS (A325), EXCEPT AS NOTED ON DRAWINGS. EXCLUDE THREADS FROM THE SHEAR PLANES.
6. WELD SHOP CONNECTIONS AND BOLT FIELD CONNECTIONS TO DEVELOP FULL CAPACITY OF MEMBERS, UNLESS NOTED OTHERWISE.
7. BEAMS SHALL BE FABRICATED WITH ANY SPECIFIED OR NATURAL CAMBER UPWARD, AS NOTED ON THE DRAWINGS.
8. ALL GROUT FOR BASE PLATES OR BEARING PLATES SHALL BE PREMIXED, NON–SHRINK, NONMETALLIC GROUT WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 6,000 PSI.
9. SHOP FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER PRIOR TO FABRICATION FOR COMPLIANCE WITH THE DESIGN INTENT SHOWN ON THE DESIGN DRAWINGS.

PAINTING

STRUCTURAL STEEL FLOOR FRAMING SHALL BE PREPARED AND PAINTED IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS.

1. PRIOR TO PAINTING, ALL STEEL SHALL BE CLEAN AND FREE OF OIL, GREASE, DIRT, ETC. THE SURFACE OF ALL STEEL SHALL BE COMMERCIALLY BLAST CLEANED IN ACCORDANCE WITH SSPC–SP–6 SPECIFICATION.
2. SHOP PRIMER COAT: RUST INHIBITIVE PRIMER – 3 MILS DFT.
3. FINISH COAT: EPOXY OR POLYURETHANE – 3 MILS DFT.

GALVANIZING

1. ITEMS TO BE GALVANIZED

   THE STEEL ITEMS TO BE HOT–DIP GALVANIZED (ZINC COATED) SHALL INCLUDE THE FOLLOWING:

   1.1 ALL EXPOSED EXTERIOR MILD STEEL ITEMS.

   1.2 STEEL DECK.

   1.3 ANCHOR BOLTS & NUTS.

2. THE PREPARATION OF THE STEEL SURFACE AND THE APPLICATION OF THE GALVANIZING SHALL BE IN ACCORDANCE WITH ASTM A153, OR A653 AND A924 FOR STEEL DECK, FOR THE ABOVE NOTED ITEMS AND ANY OTHER ITEMS NOTED ON THE DESIGN DRAWINGS.

ALUMINUM

1. USE THE FOLLOWING ALUMINUM ALLOYS AS NOTED:

   1.1 STRUCTURAL SHAPES, BARS, & PLATES: 6061–T6

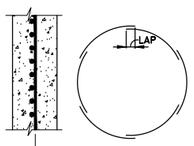
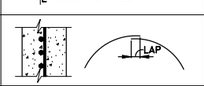
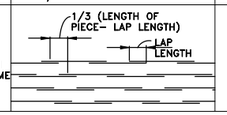
   1.2 PIPE AND TUBING: 6061–T6

   1.3 SHEET ALUMINUM: 6061–T6

   (MINIMUM YIELD STRENGTH Fy = 35 KSI.)

2. FOR WELDING ALUMINUM USE GMAW WITH 5356 WELD FILLER OR GTAW WITH 5356 WELD FILLER.
3. WALKWAY FRAMING, GRATING, PLATFORMS, LADDERS, AND HANDRAIL ARE TO BE CONSTRUCTED OF ALUMINUM.
4. HANDRAIL POSTS SHALL BE SCHEDULE 80 ALUMINUM PIPE.

DEFINITION OF TERMS AND TOLERANCES FOR WALL REINFORCEMENT

		ILLUSTRATION	PLACING TOLERANCES
PIECE	ONE LENGTH OF BENT BAR ROLLED TO A SPECIFIC RADIUS		
HOOP	ONE COMPLETE CIRCLE MADE UP OF SEVERAL PIECES. EACH PIECE MUST LAP WITH THE ADJACENT PIECE BY THE SPECIFIED LAP. LAP LOCATIONS SHALL BE STAGGERED AS SPECIFIED BELOW.		SEPARATE SPACING OF VERT. STL. SHALL BE ±6". ANY SINGLE HOOP SPACING MAY VARY ±25%, BUT NO MORE THAN 3". THE TOTAL NO. OF HOOPS WITHIN A GIVEN HEIGHT OF WALL MAY VARY NO MORE THAN: ±10% IN 5'–0"OF WALL HT. ±5% IN 10'–0"OF WALL HT. ±1% IN ENTIRE WALL HT. CLEAR COVER TO WALL FACE ± 1/2"
PARTIAL HOOP	A PARTIAL CIRCLE MADE UP OF TWO OR MORE PIECES		SAME AS HOOP
LAP STAGGER	AMOUNT OF OFFSET OF LAPS OF ADJACENT HOOPS AS ILLUSTRATED IN WALL ELEVATION AT RIGHT. LAPS IN ADJACENT HOOPS AT THE SAME ELEVATION NEED NOT BE STAGGERED.		LAP LOCATION ±2'–0". LAP LENGTH – 0" OF MINIMUM LAP SPECIFIED

ABBREVIATIONS

APPROX.	–Approximate	FLG.	–Flange	PC.	–Piece
A.R.	–Abrasion Resistant	FLR.	–Floor	PED.	–Pedestal
A.B.	–Anchor Bolt	FTG.	–Footing	PERP.	–Perpendicular
@	–At	FDN.	–Foundation	℔	–Plate
B.P.	–Base or Bearing Plate	Fy	–Steel Yield Strength	PLATF.	–Platform
BM.	–Beam	GA.	–Gage	PSF	–Lbs. Per Sq.Ft.
BRG.	–Bearing	GALV.	–Galvanized	PSI	–Lbs. Per Sq.In.
BT.	–Bent	GEN.	–General	PROJ.	–Projection
BOT/	–Bottom Of	GRT'G.	–Grating	QTY.	–Quantity
CAP.	–Capacity	GRD.	–Grade	RAD.	–Radius
C.S.	–Carbon Steel	H.R.	–Handrail	R.C.	–Raw Coal
CTR.	–Center	HB	–Header Beam	REINF.	–Reinforcing
℄	–Centerline	HEX.	–Hexagon	REQD.	–Required
CHD.	–Chord	H.S.	–High Strength	REV.	–Revision
C.C.	–Clean Coal	HT.	–Height	SECT.	–Section
CLR.	–Clear	HORIZ.	–Horizontal	SCH.	–Schedule
COL.	–Column	I.D.	–Inside Diameter	SHT.	–Sheet
CONC.	–Concrete	I.DIM.	–Inside Dimension	SPA.	–Spaces
CONSTRU.	–Construction	I.F.	–Inside Face	SPA.	–Spacing
C.J.	–Construction Joint	INT.	–Interior	SPEC.	–Specifications
CONT.	–Continuous	JT.	–Joint	SF	–Square Feet
CONV.	–Conveyor	K	–Kip (1000 lb.)	SQ.FT.	–Square Feet
CORR.	–Corrugated	KSF	–Kip Per Sq. Ft.	S.S.	–Stainless Steel
C.Y.	–Cubic Yards	LDG.	–Landing	STD.	–Standard
DET.	–Detail	LOC.	–Location	STL.	–Steel
DIA.	–Diameter	LONG.	–Longitudinal	STIFF.	–Stiffener
DIM.	–Dimension	L.L.H.	–Long Leg Horiz.	STOR.	–Storage
DWL.	–Dowel	L.L.V.	–Long Leg Vert.	STR.	–Structural
DWG.	–Drawing	LG.	–Long or Length	SYMM.	–Symmetry
EA.	–Each	MK.	–Mark	THK.	–Thickness
E.E.	–Each End	MATL.	–Material	TSF	–Ton Per Sq.Ft.
E.F.	–Each Face	MAX.	–Maximum	T/	–Top Of
E.S.	–Each Side	M.S.	–Mild Steel	TRANS.	–Transverse
E.W.	–Each Way	MIN.	–Minimum	TYP.	–Typical
ELEV.	–Elevated	MISC.	–Miscellaneous	U.N.	–Unless Noted
EL.	–Elevation	N.S.	–Near Side	U.N.O.	–Unless Noted Otherwise
EQ.	–Equal	N.T.S.	–Not To Scale	VERT.	–Vertical
EXIST.	–Existing	NO.	–Number	W.W.F.	–Welded Wire Fabric
E.J.	–Expansion Joint	O/C	–On Center	W/	–With
EXT.	–Exterior	C/C	–Center to Center	W/O	–Without
F.S.	–Far Side	OPG.	–Opening	W.P.	–Workpoint
FAB.	–Fabricate	OPP.	–Opposite	⌖	–Workpoint
f'c	–Concrete Strength	O.D.	–Outside Diameter	⌀	–Diameter
FIN.	–Finish	O.F.	–Outside Face		
		PART.	–Partial		

ACI – American Concrete Institute
AISC– American Institute of Steel Construction
ANSI– American National Standards Institute
ASCE – American Society of Civil Engineers
ASA– American Standards Association
AWS– American Welding Society
ASTM – American Society of Testing Materials
AISE– Association of Iron & Steel Engineers

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Madison Water Utility
SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07–25–14
DESIGNED BY JON STRAND
DRAWN BY SID LARSON

SHEET TITLE
CONCRETE TANK
GENERAL NOTES

SHEET
07

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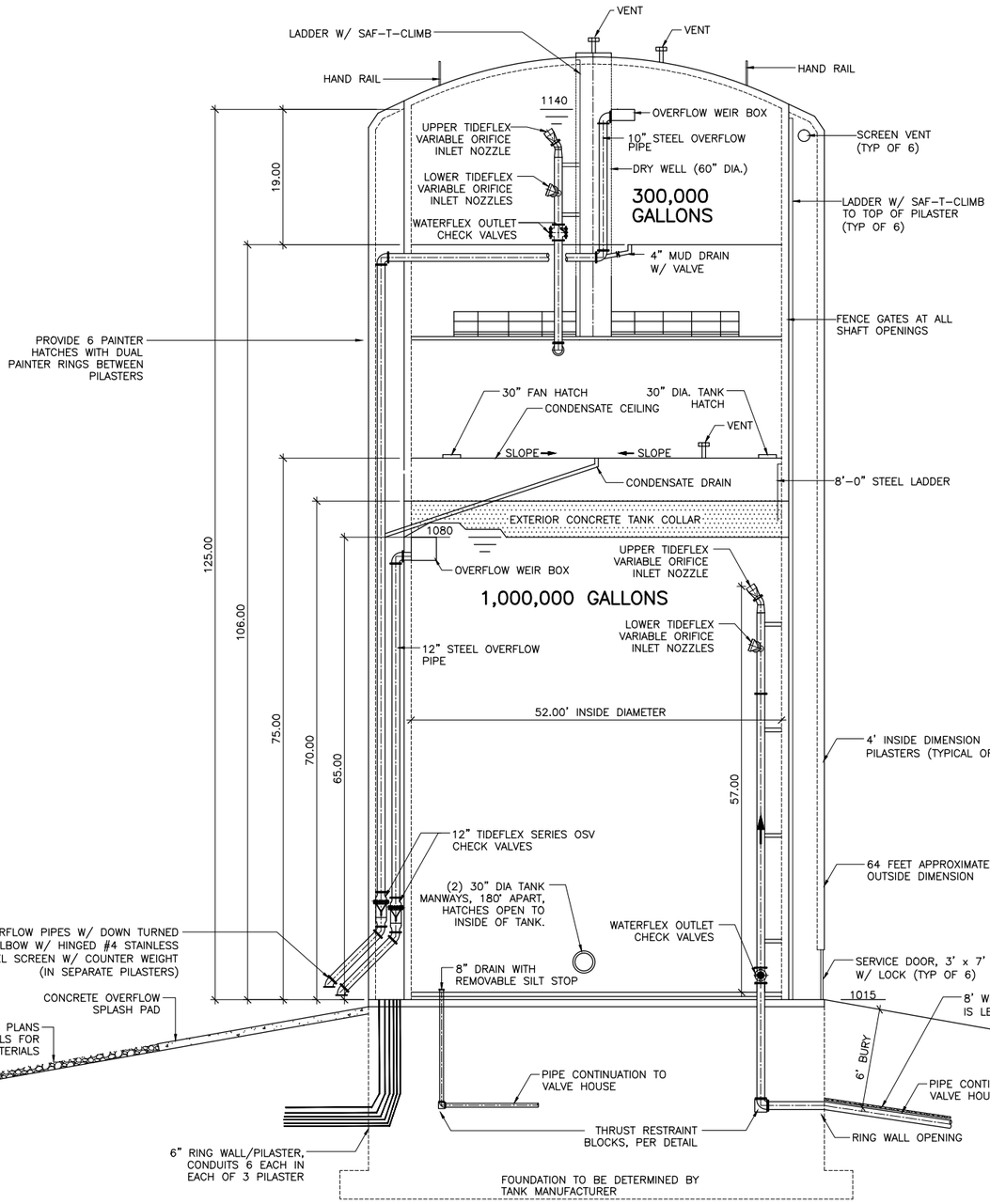
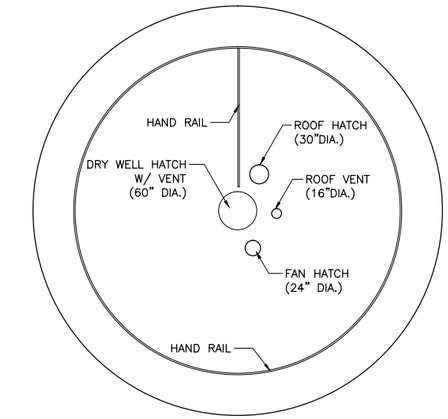


TANK ELEVATION

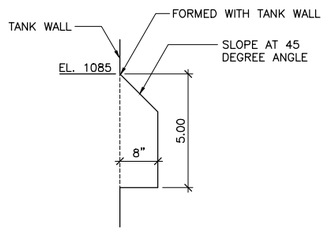
0 10 20

NOTE:
SOME ITEMS HAVE BEEN ROTATED INTO THE PLANE OF PROJECTION FOR CLARITY



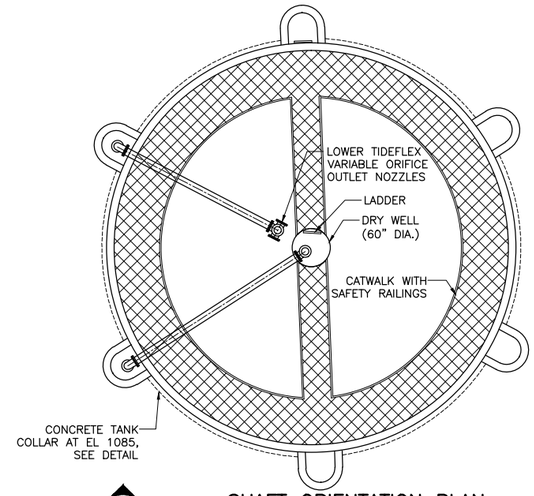
ROOF/BOWL ORIENTATION PLAN

0 10 20



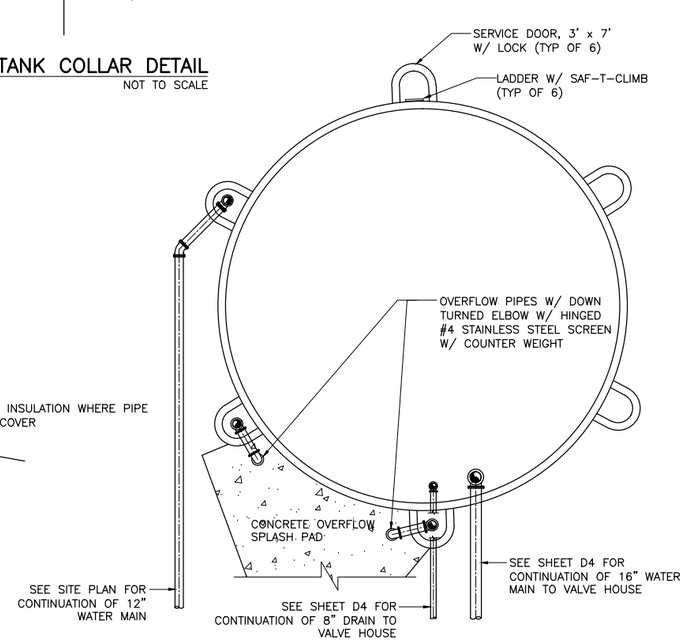
TANK COLLAR DETAIL

NOT TO SCALE



SHAFT ORIENTATION PLAN

0 10 20



SHAFT ORIENTATION PLAN

0 10 20

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

MARK	DATE	REVISIONS DESCRIPTION

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
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SHEET TITLE
CONCRETE TANK ELEVATION AND PLAN VIEW

SHEET
08

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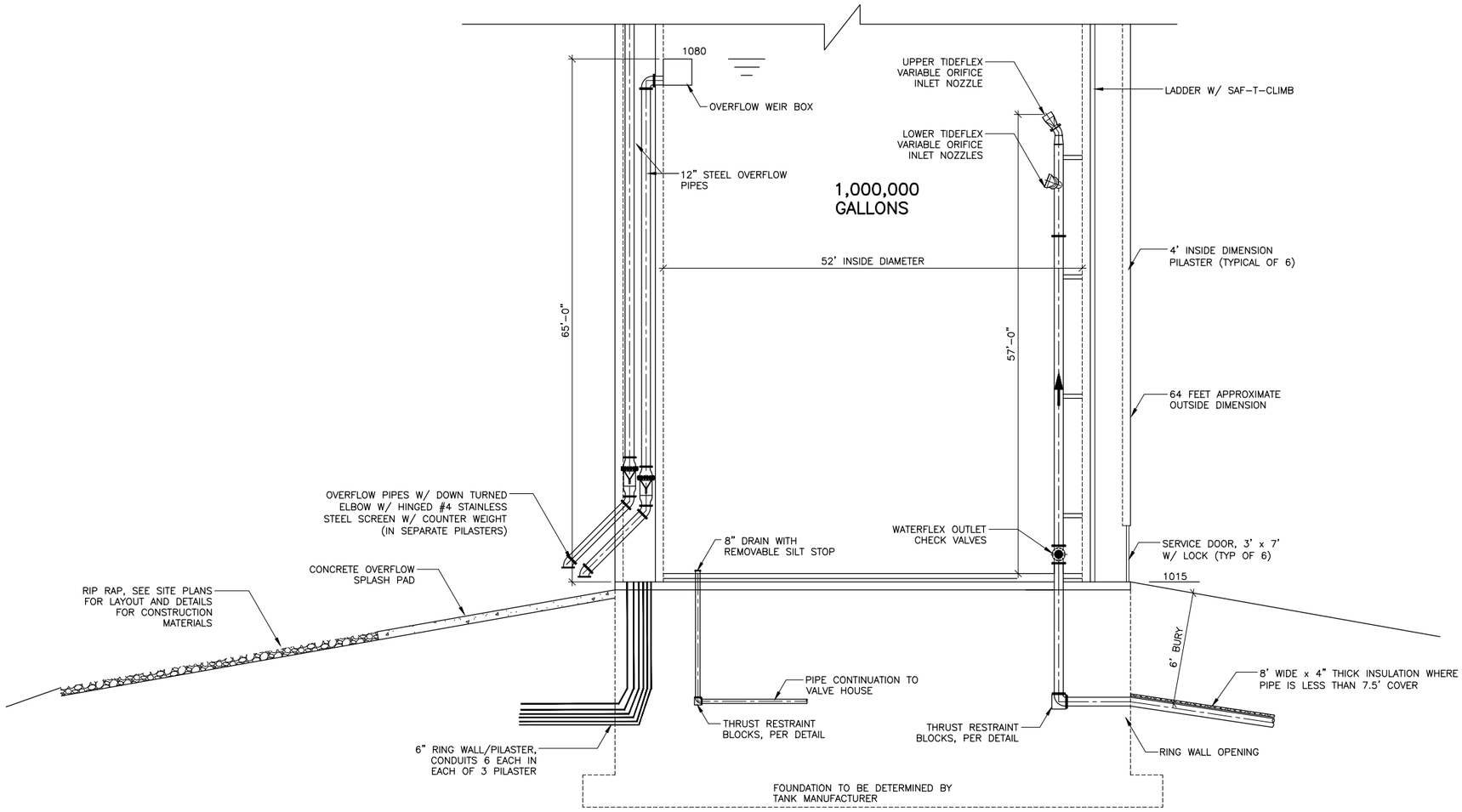

PIPING ELEVATION

0 4' 8' 16'

NOTE:
SOME ITEMS HAVE BEEN ROTATED INTO THE PLANE OF PROJECTION FOR CLARITY

Madison Water Utility

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LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

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		REVISIONS

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PROJECT NO.
ISSUE DATE 07-25-14
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SHEET TITLE
CONCRETE TANK
PROCESS PIPING SECTION

SHEET
09

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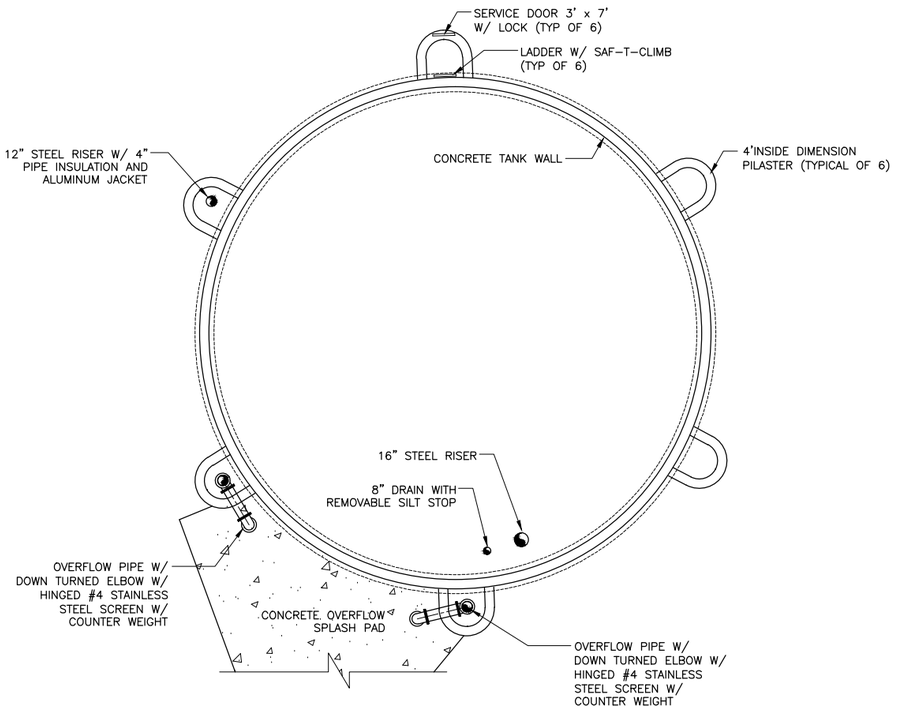

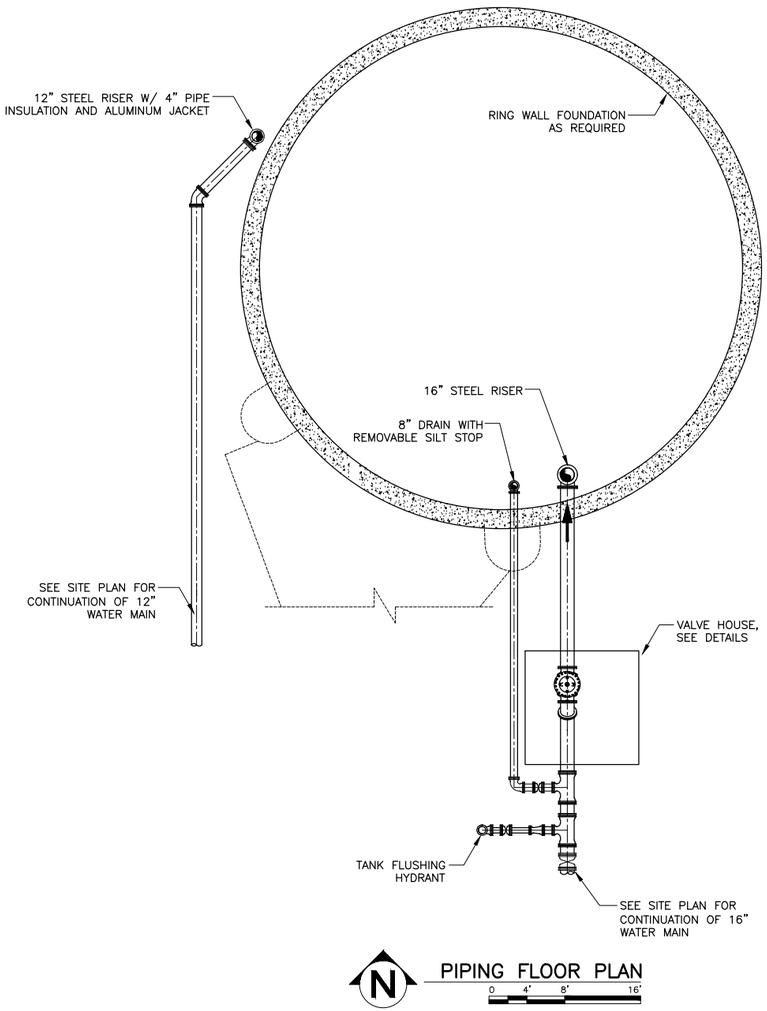

Madison Water Utility

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LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

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REVISIONS

SEH FILE NO. MADWU 126154
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SHEET TITLE
CONCRETE TANK PROCESS PIPING PLAN

SHEET
10

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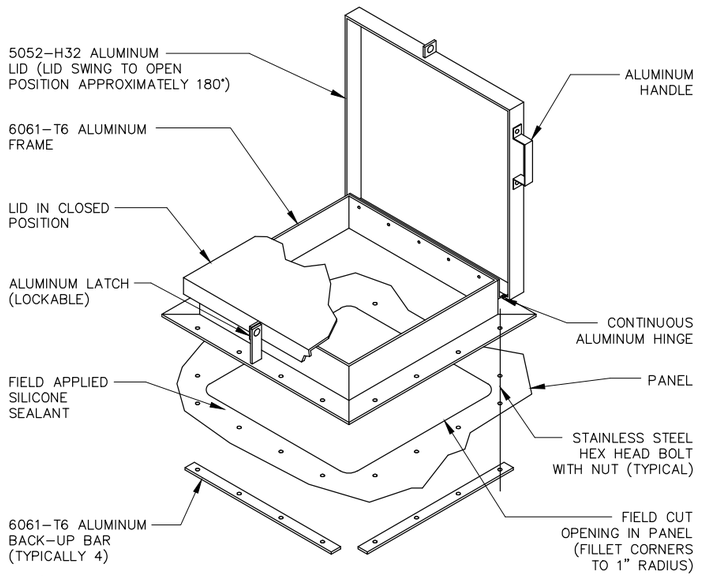
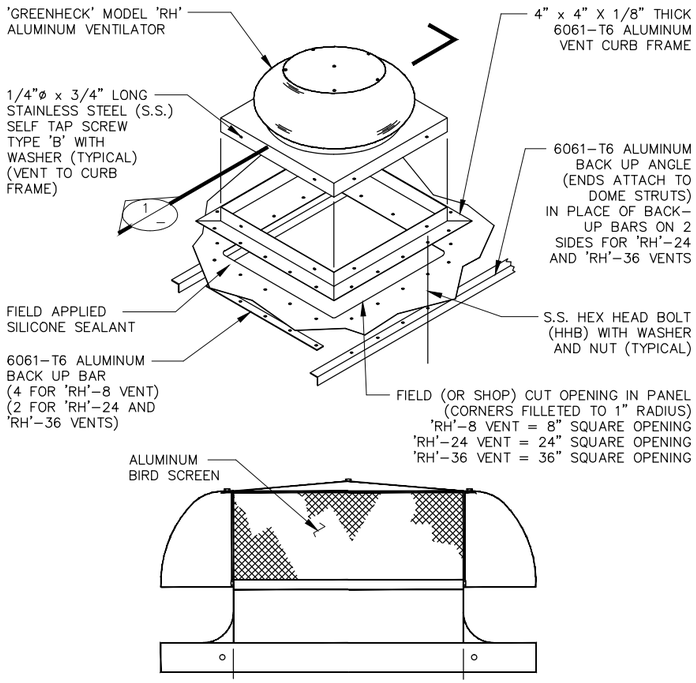


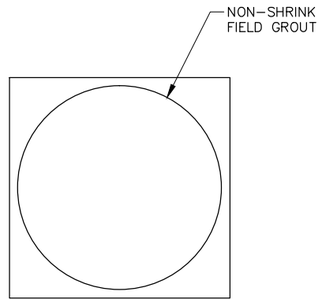
A/11 STANDARD SQUARE ACCESS HATCH CONFIGURATION

STANDARD INSIDE CLEAR OPENING SIZE: 24"

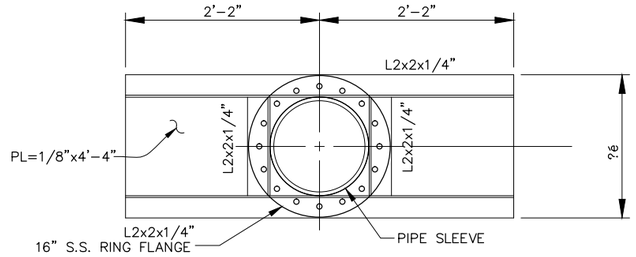
* CUSTOM SIZES AVAILABLE

ACCESS HATCH LOCATIONS, QUANTITIES AND CLEAR OPENING DIMENSIONS SHOULD BE SHOWN ON THE PLANS. THE HATCH FRAME SHALL HAVE A VERTICAL DIMENSION OF AT LEAST 4" ABOVE THE DOME SURFACE. THE LID SHALL HAVE A DOWNWARD OVERLAP OF 2" BELOW THE TOP OF THE FRAME AND BE CONSTRUCTED OF 0.09" THICK 5052-H32 ALUMINUM. THE DOME PANEL OPENING AT THE HATCH SHALL BE REINFORCED BY 1/4" THICK x 1 1/4" ALUMINUM REINFORCING BARS FROM THE UNDERSIDE OF THE DOME PANEL.

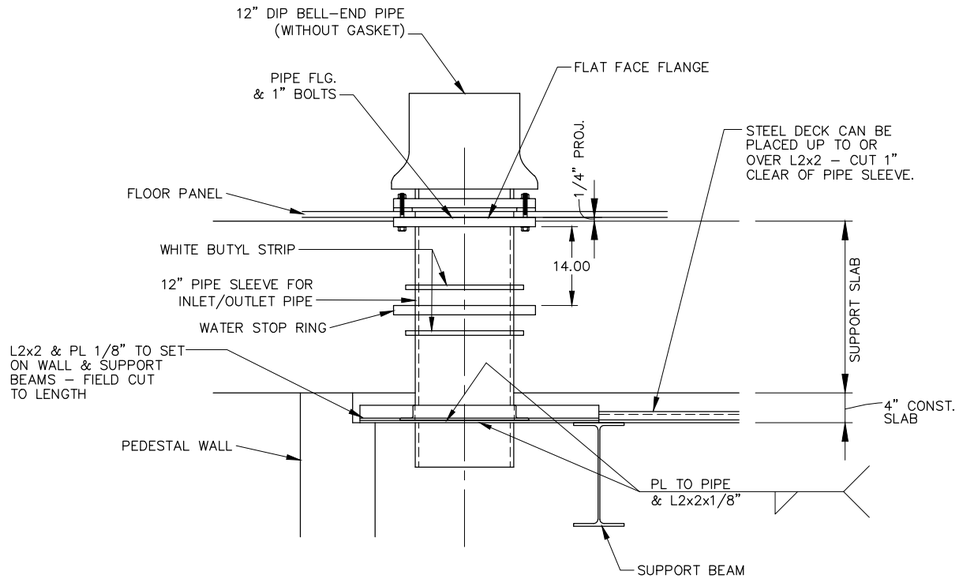




B/11 12" x 12" OVER FLOW KNOCK OUT



PLAN

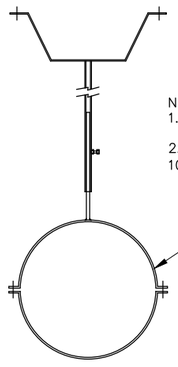


ELEV.

D/11 12" PIPE SLEEVE AND REMOVABLE SILT RING DETAIL

N.T.S.

- ONE 12" PIPE SLEEVE REQ'D.
- PLACE PIPE SLEEVE BEFORE SETTING STEEL DECK.



NOTE:
1. FINISH HOT DIPPED GALVANIZED.

2. GENERALLY PLACED EVERY 10'-0"

C/11 PIPE BRACKET
12" INLET & OUTLET BRACKET
12" OVER FLOW BRACKET

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

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		REVISIONS

SEH FILE NO. MADWU 126154
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DRAWN BY SID LARSON

SHEET TITLE
CONCRETE TANK DETAILS

SHEET
11

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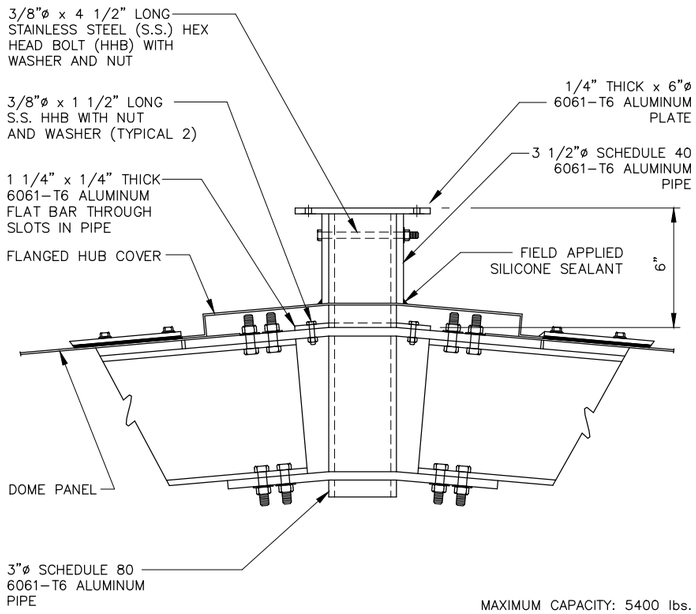
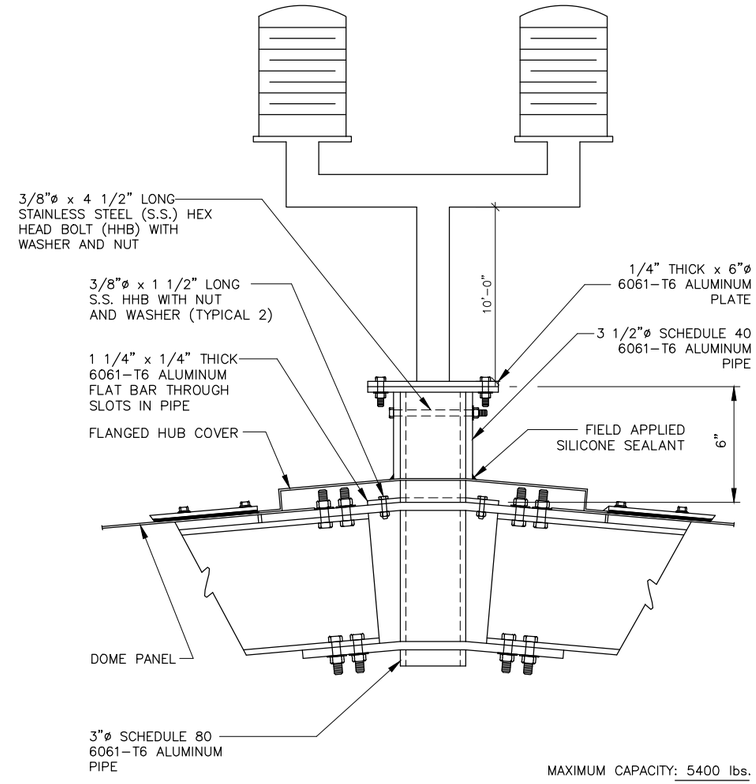


MAXIMUM CAPACITY: 5400 lbs.

SCADA ANTENNA MOUNT
N.T.S.



MAXIMUM CAPACITY: 5400 lbs.

FAA OBSTRUCTION LIGHTS
N.T.S.

Madison Water Utility

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LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

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		REVISIONS

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SHEET TITLE
CONCRETE TANK DETAILS

SHEET
12

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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.
	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.
$X	LOCAL LINE VOLTAGE SWITCH – MOUNTED 48" AFF DLS – DUAL LEVEL SWITCHING (INNER/OUTER LAMPS) PL – PILOT LIGHT 3 – 3 WAY
OS X	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
LS X	LOW VOLTAGE SWITCH STATION DLS – DUAL LEVEL SWITCHING K – KEYED SWITCH OR – OVERRIDE
PC	PHOTOCELL
	PUSH BUTTON
C 1	CONTACTOR, NUMBERED AS SHOWN
TC 1	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
	SPECIAL PURPOSE OUTLET OR DEVICE
	BRACKET SYMBOL INDICATES COMMON ENCLOSURE AND PLATE
KL	KEYPAD, BACK LITE, FLUSH WALL MOUNTED.
	MOTOR – REFER TO SCHEDULE, INTERNAL NUMBER INDICATES HORSE POWER.
$M	MOTOR STARTER SWITCH (MANUAL)
$VC	VARIABLE SPEED CONTROL – FAN
	MAGNETIC MOTOR STARTER
	COMBINATION MOTOR STARTER/DISCONNECT SWITCH
$MCL	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
T	TRANSFORMER
	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
SD	DUCT–MOUNTED SMOKE DETECTOR
FASD	FIRE ALARM SMOKE DETECTOR
FAHD	FIRE ALARM HEAT DETECTOR
SD 2	DOUBLE CONTACT SMOKE DETECTOR
FAPS	FIRE ALARM MANUAL PULL STATION
FA B	FIRE ALARM SIGNAL – BELL
FAVG	FIRE ALARM SIGNAL – VISUAL INDICATOR
FA CP	FIRE ALARM CONTROL PANEL
	END OF LINE RESISTOR
FA S	SPEAKER FOR FIRE ALARM COMMUNICATION SYSTEM
NF/DP	DISCONNECT SWITCH, NON–FUSED, NEMA 7
SV	ELECTRICALLY OPERATED SOLENOID VALVE
BV	ELECTRICALLY OPERATED BALL VALVE
SV E	SOLENOID VALVE, EXPLOSION PROOF
D	DIAPHRAGM PUMP
H	WEATHER PROOF HORN
S X	SECURITY, ACCESS CONTROL AND DOOR MONITORING – PROVIDE ROUGH–IN ONLY. VERIFY EXACT LOCATION OF DEVICES WITH SECURITY CONTRACTOR. DENOTES THE FOLLOWING: CR – CARD READER ES – ELECTRIC STRIKE MS – MOTION SENSOR

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.

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
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 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
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
SIG	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

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Madison Water Utility

SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

MARK	DATE	DESCRIPTION
		REVISIONS

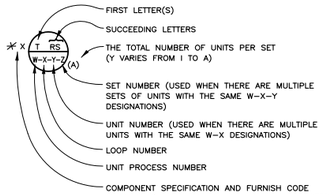
SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07–25–14
DESIGNED BY R.J.B.
DRAWN BY B.E.F.

SHEET TITLE
ELECTRICAL SYMBOLS AND ABBREVIATIONS

SHEET
E1

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
01	= OWNER FURNISHED, OWNER INSTALLED (OFOI)
02	= 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)			
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

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 (O)
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

GENERAL NOTE:

1. THIS IS A STANDARD LEGEND. NOT ALL INFORMATION SHOWN MAY BE USED ON THIS PROJECT.

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Madison Water Utility

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LAKEVIEW RESERVOIR
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MADISON, WISCONSIN

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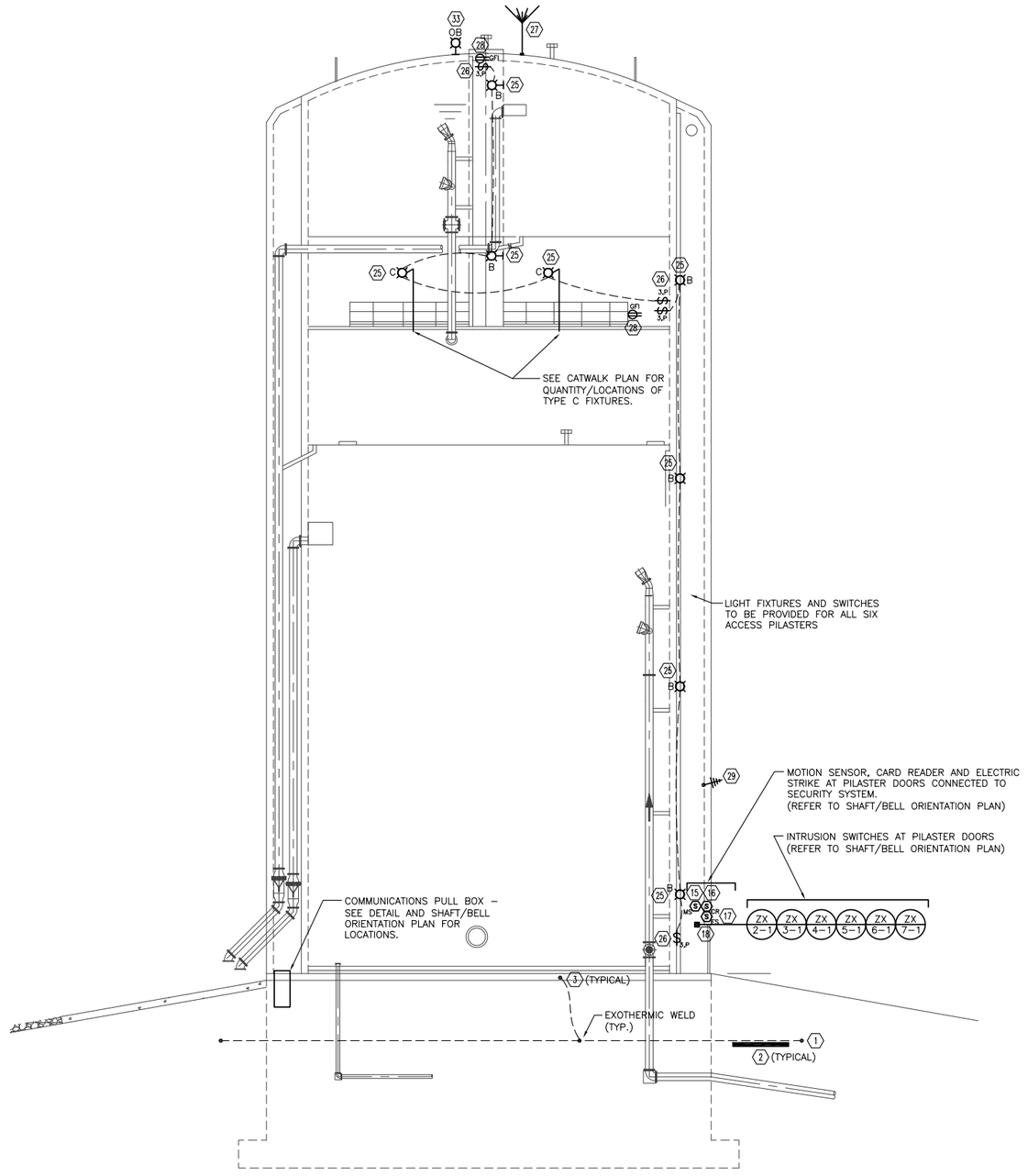
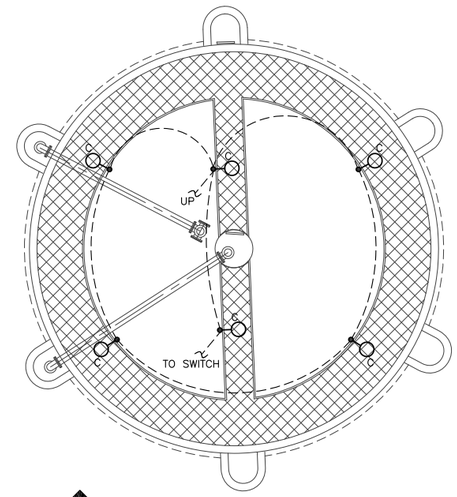
SHEET TITLE
INSTRUMENTATION SYMBOLS AND ABBREVIATIONS

SHEET
E2



TANK ELEVATION

0 10 20

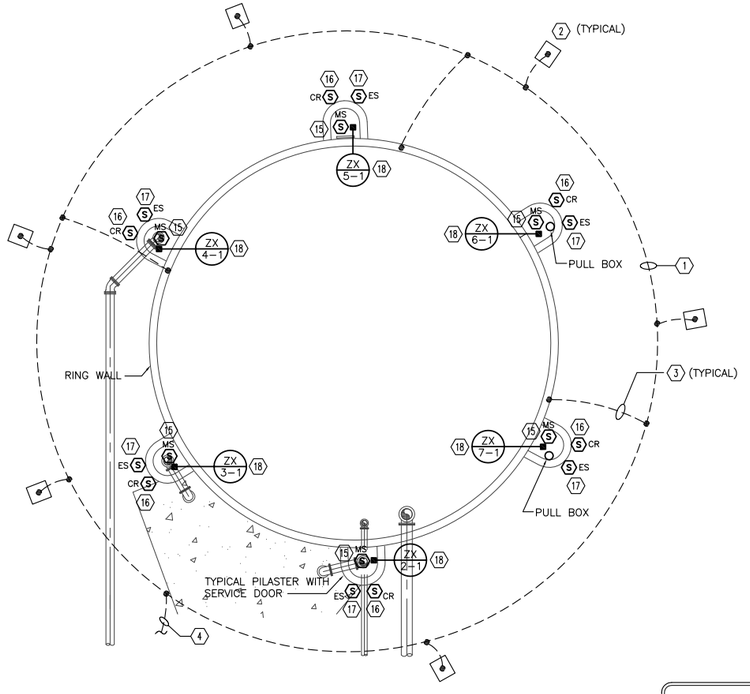


CATWALK PLAN

0 10 20

NOTES:

1. SEE SHEET E5 FOR KEYED NOTES.
2. OWNER'S SCADA INTEGRATOR IS LW ALLEN.
3. OWNER'S SECURITY SYSTEM INTEGRATOR IS INNOVATIVE SYSTEMS (9880 SOUTH RIDGEWAY DRIVE, OAK CREEK, WI, 53154, 1–800–750–7350). A $20,000 ALLOWANCE SHALL BE INCLUDED IN BID TO BE ADJUSTED AT FINAL PAYMENT IN ACCORDANCE WITH THE ACTUAL CHARGES FOR ALL EQUIPMENT REQUIRED FOR A COMPLETE SYSTEM.
4. PROVIDE REQUIRED CONDUIT/WIRING BETWEEN SCADA AND SECURITY PANELS AS REQUIRED FOR OPERATION OF ACCESS/INTRUSION CONTROLS. COORDINATE EXACT INSTALLATION REQUIREMENTS WITH SCADA AND SECURITY INTEGRATORS FOR ALL WORK.
5. DRAWINGS ARE BASED ON STEEL TANK STRUCTURE. ANY ADDITION GROUNDING, BONDING AND LIGHTNING PROTECTION SHALL BE PROVIDED AS APPROPRIATE FOR A CONCRETE TANK STRUCTURE.



SHAFT/BELL ORIENTATION PLAN

0 10 20

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SHEET TITLE
PROPOSED ELECTRICAL
WATER TOWER PLANS

SHEET
E3

NOTES:

1. SEE SHEET E5 FOR KEYED NOTES.
2. OWNER'S SCADA INTEGRATOR IS LW ALLEN.
3. OWNER'S SECURITY SYSTEM INTEGRATOR IS INNOVATIVE SYSTEMS (9880 SOUTH RIDGEWAY DRIVE, OAK CREEK, WI, 53154, 1-800-750-7350). A $20,000 ALLOWANCE SHALL BE INCLUDED IN BID TO BE ADJUSTED AT FINAL PAYMENT IN ACCORDANCE WITH THE ACTUAL CHARGES FOR ALL EQUIPMENT REQUIRED FOR A COMPLETE SYSTEM.
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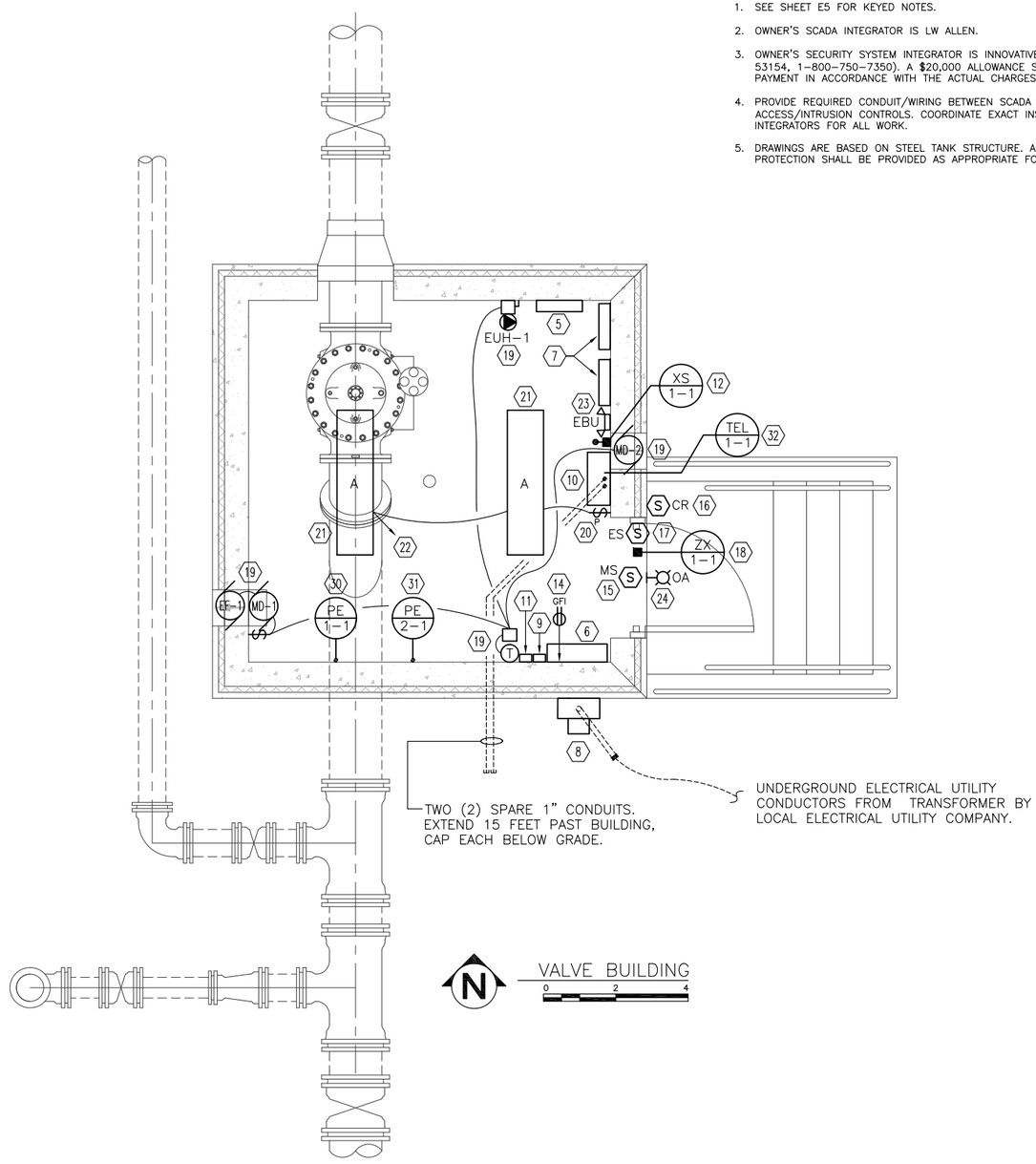

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SHEET TITLE
VALVE BUILDING
ELECTRICAL PLAN

SHEET
E4

SPHEROID TANK KEYED NOTES:

(1) PROPOSED 4/0 BARE COPPER GROUND LOOP (COUNTERPOISE) LOCATED 60 INCHES DEEP, EXOTHERMICALLY WELD CONDUCTOR ENDS TOGETHER. THE DIAMETER OF THE COUNTERPOISE SHALL BE 80 FEET.

(2) PROPOSED 36 INCH SQUARE X 1/8 INCH THICK TINNED COPPER GROUND PLATES INSTALLED 60 DEGREES APART AS SHOWN. THE 4/0 CONDUCTOR COUNTERPOISE SHALL BE EXOTHERMICALLY WELDED TO THE PLATES. THE PLATES SHALL BE BURIED A MINIMUM OF 60 INCHES BELOW FINISHED GRADE PER THE DETAIL.

(3) PROPOSED 4/0 BARE COPPER GROUND CONDUCTOR FROM THE COUNTERPOISE AND ROUTED INTO THE STRUCTURE WHERE IT SHALL BE BOLTED USING UL LISTED LUGS TO THE STEEL BASE EVERY 90 DEGREES. THE CONDUCTOR SHALL BE EXOTHERMICALLY WELDED TO THE COUNTERPOISE CONDUCTOR.

(4) PROPOSED #2 AWG BARE COPPER GROUNDING CONDUCTOR ROUTED FROM THE COUNTERPOISE TO PANELBOARD A.

(5) PROPOSED SECURITY PANEL AND POWER SUPPLY PROVIDED BY THE OWNER'S SYSTEM INTEGRATOR.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND FROM PANELBOARD A, CKT. ?? TO POWER THE SECURITY CONTROL PANEL AND POWER SUPPLY.

(6) PROPOSED PANELBOARD A FURNISHED, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR. MOUNT THE PANELBOARD 60 INCHES ABOVE FINISHED FLOOR, MEASURED TO TOP OF ENCLOSURE. SEE ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.

(7) CATHODIC PROTECTION (RECTIFIER) PANEL. (TYPICAL OF 2).

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #10 CONDUCTORS AND 1 #10 GROUND FROM PANELBOARD A, CKTs #16 & 18 TO POWER THE RECTIFIER PANELS.

(8) PROPOSED SERVICE ENTRANCE 0-200 AMP RATED METER SOCKET WITH LEVER BYPASS FURNISHED, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR. COORDINATE METER SOCKET MANUFACTURER & MODEL NUMBER WITH LOCAL ELECTRICAL UTILITY COMPANY. THE UTILITY METER WILL BE FURNISHED AND INSTALLED BY LOCAL ELECTRICAL UTILITY COMPANY. THE CONDUIT STUB OUT SHALL EXTEND 5 FEET BEYOND UNDERGROUND COUNTERPOISE CONDUCTOR, AND SECONDARY CONDUCTORS WILL BE FURNISHED, INSTALLED AND TERMINATED BY LOCAL ELECTRICAL UTILITY COMPANY. PROVIDE TEMPORARY CONDUIT CAP DURING CONSTRUCTION FOR CONDUIT BELOW GRADE, NO GLUE, PRESSURE FIT ONLY. PROVIDE PLASTIC BUSHING BEFORE UTILITY CONDUCTORS ARE INSTALLED.

(9) PROPOSED SURGE ARRESTOR FURNISHED, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR. MOUNT THE SURGE ARRESTOR UNDER THE PANELBOARD AS SHOWN WITH THE SHORTEST POSSIBLE LEAD LENGTH. THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 3 #10 CONDUCTORS & 1 #10 GROUND FROM THE SURGE ARRESTOR TO PANELBOARD A, CIRCUITS #2 & 4.

(10) PROPOSED SCADA PANEL FURNISHED BY THE OWNERS SYSTEM INTEGRATOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. MOUNT THE SCADA PANEL 60 INCHES ABOVE FINISHED FLOOR, MEASURED TO TOP OF ENCLOSURE. SEE SCADA PANEL DETAILS FOR I/O LIST AND REQUIRED FIELD EQUIPMENT WIRING. THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS & 1 #12 GROUND FROM THE SCADA PANEL TO PANELBOARD A, CIRCUIT #13.

(11) PROPOSED PHASE LOSS RELAY WITH ENCLOSURE FURNISHED BY THE OWNERS SYSTEM INTEGRATOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. SEE DIAGRAM FOR INFORMATION.

(12) PROPOSED WATER BUG XS-1-1 FURNISHED BY THE OWNERS SYSTEM INTEGRATOR, INSTALLED AND WIRED TO THE SCADA PANEL BY THE ELECTRICAL CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 4 #14 CONDUCTORS & 1 #14 GROUND TO THE SCADA PANEL.

(13) PROPOSED LOW TEMPERATURE THERMOSTAT TEL-1-1 FURNISHED, INSTALLED AND WIRED ON THE FRONT OF SCADA PANEL BY THE OWNERS SYSTEM INTEGRATOR.

(14) PROPOSED RECEPTACLE (GFI CB PROTECTED) LOCATED IN THE VALVE BUILDING FURNISHED, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR. THE RECEPTACLES SHALL BE MOUNTED AT THE LOCATIONS SHOWN AND SHALL INCLUDE METAL COVERS.

THE RECEPTACLES SHALL BE WIRED TO PANELBOARD A, CIRCUIT #5 AS SHOWN ON THE PANEL SCHEDULE WITH 3/4 INCH CONDUIT WITH 2 #10 CONDUCTORS & 1 #10 GROUND. NOTE THE CIRCUIT BREAKER IS A GFI TYPE PER THE SCHEDULE.

(15) PROPOSED SECURITY MOTION DETECTOR FURNISHED BY THE OWNER'S SECURITY SYSTEM INTEGRATOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

THE MOTION SENSOR SHALL BE GE SECURITY MODEL 6187CTXN OR ENGINEER APPROVED EQUAL.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FOR 4 #14 CONDUCTORS (2 FOR POWER/2 FOR CONTROL) FROM THE MOTION DETECTOR TO THE SECURITY CONTROL PANEL.

(16) PROPOSED SECURITY CARD READER LOCATED AT EXTERIOR OF BUILDING OR PILASTER DOOR. PROVIDED BY THE OWNER'S SECURITY SYSTEM INTEGRATOR.

THE CARD READERS SHALL BE INDALA TYPE.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FOR CARD READER CABLE FROM THE CARD READER TO THE SECURITY CONTROL PANEL.

(17) ELECTRIC STRIKE. STRIKE PROVIDED BY OTHERS.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT FOR 2 #14 CONDUCTORS FROM THE ELECTRIC STRIKE TO THE SECURITY CONTROL PANEL.

(18) PROPOSED INTRUSION SWITCH MOUNTED AT BUILDING OR PILASTER DOOR. FURNISHED BY THE OWNERS SYSTEM INTEGRATOR AND INSTALLED AND WIRED TO THE SCADA PANEL BY THE ELECTRICAL CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #14 CONDUCTORS TO THE SCADA PANEL.

(19) PROPOSED 5 KW, 240 VOLT 1 PHASE ELECTRIC UNIT HEATER WITH INTEGRAL DISCONNECT SWITCH, EXHAUST FAN EF-1 WITH FILTERED MOTORIZED INTAKE DAMPER MD-2 AND EXHAUST DAMPER MD-1 AND THERMOSTAT, FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

THE OWNER'S SYSTEM INTEGRATOR SHALL FURNISH THE HEATING AND COOLING CONTROL ENCLOSURE AS SHOWN ON THE HEAT/COOL CONTROL DIAGRAM. THE HEATER SHALL BE PROVIDED BY A 5.0 KW VERTICAL DELIVERY PROJECTION UNIT. THE UNIT HEATER SHALL BE Q-MARK MODEL MUH05-21, WITH NO SHARP EDGES ON ITS OUTER SHELL OR ENGINEER APPROVED EQUAL. THE HEATER SHALL BE COMPLETE WITH INTEGRAL AUTOMATIC RESET HIGH LIMIT THERMAL CUTOUTS, CONTACTOR WITH 24-VOLT COIL, 24 VOLT CONTROL TRANSFORMER, INTEGRAL DISCONNECT SWITCH AND NECESSARY WALL MOUNTING BRACKET(S) AND HARDWARE. THE AIR DISCHARGE SHALL INCLUDE ADJUSTABLE DIRECTIONAL LOUVERS.

THE HEATER SHALL BE DESIGNED FOR 240 VOLT, SINGLE-PHASE OPERATION. THE HEATER SHALL BE LOCATED AS SHOWN ON THE PLANS AND SHALL BE INSTALLED ON THE INTERIOR WALL USING THE MANUFACTURER'S STANDARD WALL BRACKET. THE ELECTRICAL CONTRACTOR SHALL INSTALL A JUNCTION BOX ON THE WALL NEAR THE HEATER LOCATION AND ROUTE A 3/4 INCH CONDUIT WITH 2 #10 CONDUCTORS AND 1 #10 GROUND FROM PANELBOARD A, CKT #6 & 8 TO THE UNIT HEATER'S INTERGRAL DISCONNECT SWITCH. THE ELECTRICAL CONTRACTOR SHALL INSTALL THE JUNCTION BOX ON THE WALL, 84 INCHES AFF TO CONVERT FROM CONDUIT TO FLEXIBLE LIQUID TIGHT CONDUIT. THE ELECTRICAL CONTRACTOR SHALL FURNISH 18 INCHES OF LIQUID-TIGHT FLEXIBLE METAL CONDUIT TO THE ELECTRIC UNIT HEATER FOR FLEXIBILITY.

VENTILATION SHALL BE PROVIDED BY A 500 CFM OR HIGHER AT .250" S.P. WALL MOUNTED EXHAUST FAN WITH FACTORY ELECTRICALLY OPERATED DAMPERS WITH MOTORS, OSHA FAN GUARD, WALL MOUNT COLLAR AND WEATHER HOOD IN CONJUNCTION WITH TWO (2) 120V MOTORIZED DAMPER DEEP STORM PROOF ALUMINUM LOUVER/DAMPERS WITH FLANGE. THE EXHAUST FAN SHALL BE GREENHECK OR ENGINEER APPROVED EQUAL MOUNTED 7'-0" ABOVE FINISHED FLOOR AND THE LOUVER SHALL BE AMERICAN WARMING OR ENGINEER APPROVED EQUAL FACTORY PAINTED WHITE ENAMEL AND MOUNTED 7'-0" ABOVE FINISHED FLOOR. THE INTAKE AND EXHAUST SHALL BE EQUIPPED WITH BUG SCREENS AND THE INTAKE SHALL INCLUDE A REPLACEABLE AIR FILTER WITH EASY ACCESS.

THE ELECTRICAL CONTRACTOR SHALL INSTALL THE EXHAUST FAN SYSTEM AND ROUTE 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS & 1 #12 GROUND FROM EACH MOTORIZED DAMPER AND THE EXHAUST FAN TO THE HEATING AND COOLING CONTROL ENCLOSURE AND A 3/4 INCH CONDUIT WITH 2 #12 & 1 #12 GROUND FROM PANEL L1, CKT #19 TO THE DISCONNECT SWITCH. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE 15 AMP, 120, 1 PHASE, NEMA 1, DISCONNECT SWITCH FOR THE EXHAUST FAN AND MOTORIZED DAMPERS FROM THE HEATING AND COOLING CONTROL PANEL.

THE ELECTRICAL CONTRACTOR SHALL MOUNT AN ELECTRICAL JUNCTION BOX ON THE WALL FOR THE THERMOSTAT AND INSTALL THE CONDUIT FOR THE THERMOSTAT AND ALL RELATED CONTROL WIRING FROM THE HEATING AND COOLING CONTROL ENCLOSURE. THE LOW VOLTAGE WIRING (24VAC) SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A LINE VOLTAGE RATED THERMOSTAT WITH AUTOMATIC CHANGEOVER HEATING-COOLING CONTROL AND MANUAL FAN SWITCH. THERMOSTAT SHALL BE RATED 8 AMPERES AT 240-VOLTS WITH 46 TO 84 DEGREE FAHRENHEIT RANGE. THERMOSTAT SHALL BE HONEYWELL T605B1013 WITH Q651A1009 SUB-BASE OR ENGINEER APPROVED EQUAL. THE THERMOSTAT SHALL OPERATE ON 24 VAC. THE UNIT HEATER SHALL BE SET TO OPERATE AT 55 DEGREES OR LOWER AND THE FAN/LOUVER SHALL BE SET TO OPERATE AT 80 DEGREES.

(20) PROPOSED SINGLE POLE LIGHT SWITCH WITH PILOT LIGHT THAT IS ON WHEN THE SWITCH IS IN THE OFF POSITION FURNISHED, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR. THE SWITCH SHALL BE LOCATED NEAR THE ENTRANCE (MANDOOR) 48 INCHES ABOVE FINISHED FLOOR, MEASURED TO TOP OF THE BACK BOX.

(21) PROPOSED CEILING MOUNTED LIGHT FIXTURES PER THE FIXTURE SCHEDULE FURNISHED, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR.

(22) THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO EACH FIXTURE AND FROM THE LIGHT SWITCH AND CIRCUIT BREAKER LOCATED IN PANELBOARD A, CIRCUIT #1.

(23) PROPOSED INTERIOR MOUNTED TYPE EBU EMERGENCY LIGHT FIXTURE FURNISHED, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR. MOUNT 8 FEET AFF. THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO THE FIXTURE AND FROM THE LIGHT SWITCH AND CIRCUIT BREAKER LOCATED IN PANELBOARD A, CIRCUIT #1.

(24) PROPOSED EXTERIOR MOUNTED TYPE OA LIGHT FIXTURE FURNISHED, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR. MOUNT 1-FOOT ABOVE DOOR. THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO EACH FIXTURE AND FROM THE LIGHT SWITCH AND CIRCUIT BREAKER LOCATED IN PANELBOARD A, CIRCUIT #3.

(25) PROPOSED LIGHT FIXTURE MOUNTED ALONG THE LENGTH OF THE SHAFT OR CATWALK, FURNISHED, 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 TO EACH FIXTURE AND FROM THE LIGHT SWITCH AND CIRCUIT BREAKER LOCATED IN PANELBOARD A, CIRCUIT #11.

(26) PROPOSED 3-WAY LIGHT SWITCH(ES) AS INDICATED WITH PILOT LIGHTS THAT ARE ON WHEN THE SWITCHES ARE IN THE OFF POSITION FOR THE FIXTURE(S) TYPE 'B' FURNISHED, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR. THE SWITCH SHALL BE LOCATED NEAR THE LADDER IN AN ACCESSIBLE LOCATION.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 3 #12 CONDUCTORS AND 1 #12 GROUND FROM EACH SWITCH IN THE PROPER WIRING METHODS TO THE CIRCUIT BREAKER LOCATED IN PANELBOARD A, CIRCUIT #11 AND TO THE LIGHT FIXTURES.

(27) PROPOSED STATIC DISSIPATOR FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS SHOWN ON THE DETAIL. THE STATIC DISSIPATOR SHALL BE THE MANUFACTURER AND MODEL SHOWN OR ENGINEER APPROVED EQUAL

(28) PROPOSED RECEPTACLE (GFI CB PROTECTED) LOCATED IN THE WATER TOWER FURNISHED, INSTALLED AND WIRED BY THE ELECTRICAL CONTRACTOR. THE RECEPTACLES SHALL BE MOUNTED AT THE LOCATIONS SHOWN AND SHALL INCLUDE METAL COVERS.

THE RECEPTACLES SHALL BE WIRED TO PANELBOARD A, CIRCUIT #12 AS SHOWN ON THE PANEL SCHEDULE WITH 3/4 INCH CONDUIT WITH 2 #10 CONDUCTORS & 1 #10 GROUND. NOTE THE CIRCUIT BREAKER IS A GFI TYPE PER THE SCHEDULE.

(29) PROPOSED SCADA ANTENNA AND ANTENNA CABLE FURNISHED BY THE OWNER'S SYSTEM INTEGRATOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL INSTALL A 2" SCHEDULE 80 PVC CONDUIT AS A CONTINUOUS SLEEVE FOR SUPPORTING THE CABLE AND TIE THE CABLE TO THE REMAINING STRUCTURE AS DIRECTED BY THE TANK MANUFACTURER AND OWNER'S SYSTEM INTEGRATOR.

(30) PROPOSED UPPER ELEVATED TANK LEVEL TRANSDUCER PE-1-1 WITH GATE VALVE FURNISHED BY THE OWNER'S SYSTEM INTEGRATOR AND MOUNTED BY THE ELECTRICAL CONTRACTOR.

THE TRANSDUCER SHALL BE FOXBORO MODEL IGP20 OR ENGINEER APPROVED EQUAL WITH 4/20 MADC OUTPUT, LOOP POWERED MADE FROM 316L STAINLESS STEEL, SILICON FILLED FLUID, 0-180 DEGREES F AND 0-100% HUMIDITY WITH A +/-.10% ACCURACY AND LESS THAN 1% DRIFT OVER A 12 MONTH PERIOD. THE TRANSDUCER SHALL INCLUDE A 1/2 INCH CONDUIT CONNECTION. THE TRANSDUCER SHALL INCLUDE THE APPROPRIATE LENGTH OF CABLE FROM THE TRANSDUCER LOCATION TO THE SCADA CONTROL PANEL. THE OWNER'S SYSTEM INTEGRATOR SHALL FIELD VERIFY IN THE FIELD BEFORE ORDERING.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO A NEMA 4X PVC JUNCTION BOX TO THE SCADA CONTROL PANEL AND A 1/2 INCH LIQUID TIGHT FLEXIBLE METAL CONDUIT TO THE TRANSDUCER FROM THE JUNCTION BOX. THE ELECTRICAL CONTRACTOR SHALL ROUTE THE TRANSDUCER CABLE INTO THE SCADA CONTROL PANEL FOR THE OWNER'S SYSTEM INTEGRATOR TO TERMINATE.

(31) PROPOSED LOWER ELEVATED TANK LEVEL TRANSDUCER PE-2-1 WITH GATE VALVE FURNISHED BY THE OWNER'S SYSTEM INTEGRATOR AND MOUNTED BY THE ELECTRICAL CONTRACTOR.

THE TRANSDUCER SHALL BE FOXBORO MODEL IGP20 OR ENGINEER APPROVED EQUAL WITH 4/20 MADC OUTPUT, LOOP POWERED MADE FROM 316L STAINLESS STEEL, SILICON FILLED FLUID, 0-180 DEGREES F AND 0-100% HUMIDITY WITH A +/-.10% ACCURACY AND LESS THAN 1% DRIFT OVER A 12 MONTH PERIOD. THE TRANSDUCER SHALL INCLUDE A 1/2 INCH CONDUIT CONNECTION. THE TRANSDUCER SHALL INCLUDE THE APPROPRIATE LENGTH OF CABLE FROM THE TRANSDUCER LOCATION TO THE SCADA CONTROL PANEL. THE OWNER'S SYSTEM INTEGRATOR SHALL FIELD VERIFY IN THE FIELD BEFORE ORDERING.

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT TO A NEMA 4X PVC JUNCTION BOX TO THE SCADA CONTROL PANEL AND A 1/2 INCH LIQUID TIGHT FLEXIBLE METAL CONDUIT TO THE TRANSDUCER FROM THE JUNCTION BOX. THE ELECTRICAL CONTRACTOR SHALL ROUTE THE TRANSDUCER CABLE INTO THE SCADA CONTROL PANEL FOR THE OWNER'S SYSTEM INTEGRATOR TO TERMINATE.

(32) PROPOSED LOW TEMPERATURE THERMOSTAT TEL-1-1 FURNISHED, INSTALLED AND WIRED ON THE FRONT OF SCADA PANEL BY THE OWNERS SYSTEM INTEGRATOR.

(33) PROPOSED OBSTRUCTION LIGHT/PHOTOCONTROL

THE ELECTRICAL CONTRACTOR SHALL ROUTE A 3/4 INCH CONDUIT WITH 2 #12 CONDUCTORS AND 1 #12 GROUND TO THE CIRCUIT BREAKER LOCATED IN PANEL A, CKT. #7

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Madison Water Utility

SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

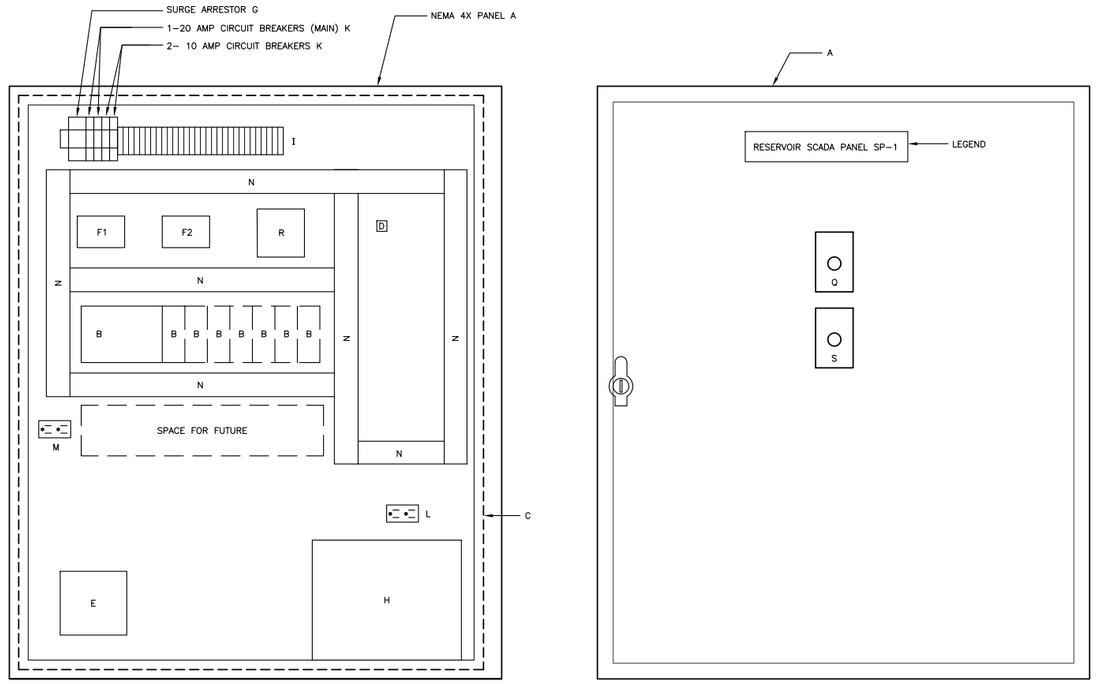
REVISIONS

MARK	DATE	DESCRIPTION

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY R.J.B.
DRAWN BY B.E.F.

SHEET TITLE
ELECTRICAL KEYED NOTES

SHEET
E5



INTERIOR VIEW

EXTERIOR VIEW

RESERVOIR SCADA PANEL SP-1 LAYOUT
N.T.S.

RESERVOIR SCADA PANEL SP-1 - BILL OF MATERIALS

KEYED LETTER	NAME OR DESCRIPTION OF EQUIPMENT	NO. REQ'D	RECOMMENDED SUPPLIER OF EQUIPMENT	PART OR CATALOG NUMBER	NOTES:
A	ENCLOSURE, NEMA 4X, RIGHT HAND HINGE, WALL MOUNTED, TYPE 304	1	HOFFMAN	A42H3010SSLP	42 INCHES HIGH X 30 INCHES WIDE & 10 INCHES DEEP, WITH BACK PANEL
B	PROGRAMMABLE LOGIC CONTROLLER (PLC) WITH I/O	1	ALLEN BRADLEY	MICROLOGIX 1400	PROVIDE ALL CABLES, SEE NOTE 8.
C	1/2" FIBERGLASS INSULATION WITH FOIL BACKING	AS REQ'D	SYSTEM INTEGRATOR		FRONT, BACK, SIDES, TOP & BOTTOM
D	WATCHDOG RELAY	1	CUTLER-HAMMER	D7PR31A/E42AF1124120	INCLUDES PLUG-IN BASES
E	PANEL HEATER	1	HOFFMAN	DAH2001A	WITH INTEGRAL THERMOSTAT
F1 & F2	120 VOLT/24VDC POWER SUPPLIES	2	PHEONIX CONTACT	CM 62-PS-120AC/24 DC/1-GN	UPS CONNECTED
G	TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS)	1	PHEONIX CONTACT	2807586 VAL-MS 120 ST	
H	1000 VA UPS, SHELF MOUNTED	1	CUTLER-HAMMER	EATON 9130 UPS UNIT	TOWER MOUNT WITH RELAY INTERFACE CARD
I	TERMINAL BLOCKS/ACCESSORIES	AS REQ'D	PHOENIX CONTACT	TYPE UK	
J	NOT USED				
K	PANEL CIRCUIT BREAKERS	AS REQ'D	PHEONIX CONTACT	TMC SERIES	20 AMP & 10 AMP
L	RECEPTACLE	1	HUBBELL	5261	UPS POWER
M	GFCI PANEL RECEPTACLE	1	HUBBELL	GF5262	USER RECEPTACLE
N	WIRE DUCT	AS REQ'D	PANDUIT	G1.5XG2LG6	LIGHT GREY WITH COVERS
O	WIRE MARKERS	AS REQ'D	BRADY	PS1DP-111-187	NOT SHOWN
P	WIRE, 600 VOLT, MTW	AS REQ'D	DISTRIBUTOR	#14 AWG STRANDED COPPER	NOT SHOWN
Q	LOW TEMPERATURE ALARM	1	JOHNSON CONTROLS	A19BAC-1	
R	RADIO, TRANSNET SPREAD SPECTRUM TRANSCEIVER	1	GE	9810	PROVIDE SURGE ARRESTOR AND ANTENNA WITH CABLES
S	INTRUSION ENABLE/DISABLE BUTTON	1			

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 HOFFMAN C-WHK KEY LOCK KIT WITH ENCLOSURE.
5. PROVIDE CABLES PER MANUFACTURER'S RECOMMENDATIONS.
6. QUANTITY OF TERMINAL BLOCKS SHOWN IS FOR, PROVIDE AS REQUIRED. ADD 30% SPARE AFTER ALL WIRING INCLUDING SPARE CONDUCTORS ARE ACCOUNTED FOR.
7. PROVIDE PROCESSOR BACK PLANE, 24 VDC POWER SUPPLY. COMMUNICATION CARD AND DIGITAL & ANALOG I/O AS SHOWN.

GENERAL NOTES:

1. SUPPLIER'S NAME AND PART OR CATALOG 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. THE PART OR CATALOG NUMBERS ARE CURRENT. IF PART NUMBERS ARE UPDATED OR DISCONTINUED BY THE SUPPLIER, FURNISH EQUIPMENT THAT MEETS OR EXCEEDS THE PART OR CATALOG NUMBER SHOWN.
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 PLAN SHEET E7 FOR REQUIRED I/O.
10. PANEL SHALL BEAR UL LABEL.
11. ROUTE PRESSURE TRANSDUCER CABLES TO PANEL IN CONDUIT.
12. THE ANTENNA SHALL BE MOUNTED ON THE TOP OF THE WATER TOWER AS SHOWN ON THE DETAIL. THE ELECTRICAL CONTRACTOR SHALL ROUTE ANTENNA CABLE UP TO THE TOP OF TANK FROM THE PANEL.
13. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL THE STATIC DISSIPATER SHOWN ON THE DETAIL.
14. THE ELECTRICAL CONTRACTOR SHALL REPLACE THE EXISTING PRESSURE TRANSDUCER LOCATED IN THE WATER TOWER.
15. THE SCADA PANEL SHALL BE LOCATED ON THE EQUIPMENT BACKBOARD AS SHOWN ON THE PLANS.
16. SEE SHEET E8 FOR 1/O LIST.
17. OWNER'S SCADA CONTRACTOR TO VERIFY AND ADJUST EQUIPMENT AS REQUIRED.

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Madison Water Utility

SEH

LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

REVISIONS

MARK	DATE	DESCRIPTION

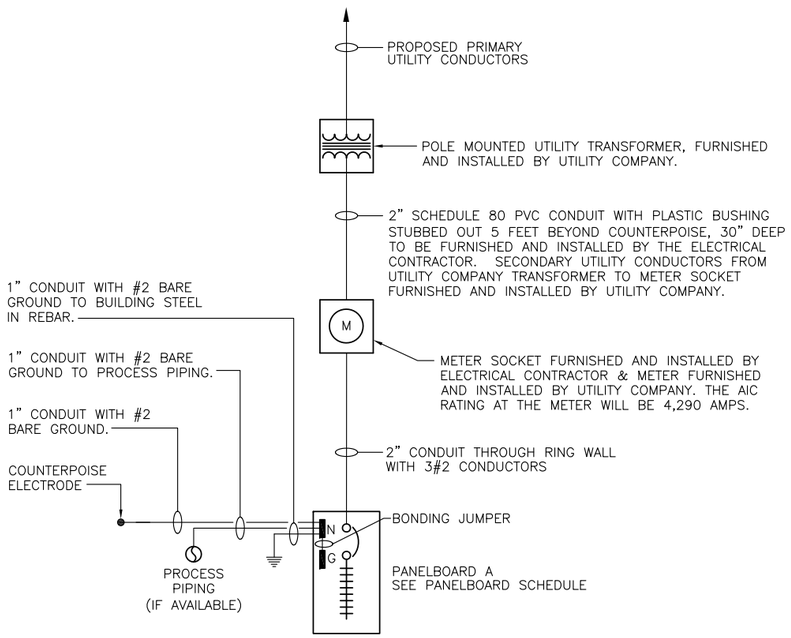
SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY R.J.B.
DRAWN BY B.E.F.

SHEET TITLE
SCADA PANEL DETAILS

SHEET
E6

PANELBOARD A												
	BUS AMPS:	125	MAIN:				MOUNTING:	NOTES: 1. PANELBOARD IS 10KAIC RATED.				
	VOLTAGE:	120/240	CIRCUIT BREAKER:			100	SURFACE: X	2. PROVIDE 4 KEYS FOR LOCK.				
	PHASE:	1	MAIN LUG ONLY:				FLUSH:	3. PROVIDE TINNED COPPER BUSSING (ALL)				
	WIRE:	3	SUB-FEED LUGS:					AIC RATING:				
CIRCUIT		AMPS	AMPS	CB	CKT		CKT	CB	AMPS	AMPS	CIRCUIT	
DESCRIPTION		A	B	AMP				AMP	A	B	DESCRIPTION	
INTERIOR LIGHTING		8.00		20/1	1		2	20	0.00		SURGE ARRESTOR	
EXTERIOR DOOR LIGHTING			0.10	20/1	3		4	2		0.00	SURGE ARRESTOR	
VALVE BUILDING RECEPT. (1)		1.50		20/1	5		6	30	21.00		ELECTRIC UNIT HEATER NO.1	
OBSTRUCTION LIGHT			1.00	20/1	7		8	2		21.00	ELECTRIC UNIT HEATER NO.1	
SPARE				20/1	9		10	20/1	0.01		PHASE LOSS RELAY POWER	
WATER TOWER LIGHTING			1	20/1	11		12	20/1		7.50	TANK RECEPTACLES (1)	
SCADA PANEL		5		20/1	13		14	20/1	5.00		SECURITY PANEL/POWER SUPPLY	
PHASE LOSS RELAY (PLR)			0.1	15	15		16	30/1		10.00	CATHODIC PROTECTION PANEL NO.1	
PHASE LOSS RELAY (PLR)		0.1		2	17		18	30/1	10.00		CATHODIC PROTECTION PANEL NO.2	
EXHAUST FAN NO.1 AND MOTORIZIED DAMPERS			10	20/1	19		20	20/1			SPARE	
SPARE				20/1	21		22	20/1			SPARE	
SPARE				20/1	23		24	20/1			SPARE	
SPARE				20/1	25		26	20/1			SPARE	
SPARE				20/1	27		28	20/1			SPARE	
SPARE				20/1	29		30	20/1			SPARE	
	SUB-TOTAL:	14.60	12.20				SUB-TOTAL:		36.01	38.50		
							TOTAL:		50.61	50.70		

(1) PROVIDE 4-6MA GFI CIRCUIT BREAKER TO PROTECT CIRCUIT SHOWN.



ONE-LINE DIAGRAM
N.T.S.

RESERVOIR I/O LIST

PLC DIGITAL INPUTS:	LOCATION OF EQUIPMENT:	CONDITION:	VOLTAGE:	CONDUCTORS:	DEVICE:
PLC INPUT 0	BUILDING LOW TEMPERATURE	BUILDING LOW TEMPERATURE	24VDC	2 #14 CONDUCTORS	THERMOSTAT
PLC INPUT 1	SCADA PANEL	CONTROL POWER FAILURE	24VDC	2 #14 CONDUCTORS	PHASE LOSS RELAY
PLC INPUT 2	SCADA PANEL	UPS FAILURE	24VDC	2 #14 CONDUCTORS	UPS RELAY CARD
PLC INPUT 3	VALVE BLDG.	FLOOD	24VDC	2 #14 CONDUCTORS	WATER BUG
PLC INPUT 4	SCADA PANEL	COMMUNICATION FAILURE	24VDC	2 #14 CONDUCTORS	PLC/WATCHDOG
PLC INPUT 5	VALVE BLDG. DOOR	INTRUSION SWITCH	24VDC	2 #14 CONDUCTORS	DCOR LIMIT SWITCH
PLC INPUT 6	PILASTER SERVICE DOOR NO.1	INTRUSION SWITCH	24VDC	2 #14 CONDUCTORS	DCOR LIMIT SWITCH
PLC INPUT 7	PILASTER SERVICE DOOR NO.2	INTRUSION SWITCH	24VDC	2 #14 CONDUCTORS	DCOR LIMIT SWITCH
PLC INPUT 8	PILASTER SERVICE DOOR NO.3	INTRUSION SWITCH	24VDC	2 #14 CONDUCTORS	DCOR LIMIT SWITCH
PLC INPUT 9	PILASTER SERVICE DOOR NO.4	INTRUSION SWITCH	24VDC	2 #14 CONDUCTORS	DCOR LIMIT SWITCH
PLC INPUT 10	PILASTER SERVICE DOOR NO.5	INTRUSION SWITCH	24VDC	2 #14 CONDUCTORS	DCOR LIMIT SWITCH
PLC INPUT 11	PILASTER SERVICE DOOR NO.6	INTRUSION SWITCH	24VDC	2 #14 CONDUCTORS	DCOR LIMIT SWITCH
PLC INPUT 12	SURGE ARRESTOR	FAILURE	24VDC	2 #14 CONDUCTORS	SURGE ARRESTOR
PLC INPUT 13	CATHODIC PROTECTION PANEL NO.1	FAILURE	24VDC	2 #14 CONDUCTORS	PANEL
PLC INPUT 14	CATHODIC PROTECTION PANEL NO.2	FAILURE	24VDC	2 #14 CONDUCTORS	PANEL
PLC INPUT 15	SPARE				
PLC INPUT 16	SPARE				
PLC INPUT 17	SPARE				
PLC DIGITAL OUTPUTS:	LOCATION OF EQUIPMENT:	CONDITION:	VOLTAGE:	CONDUCTORS:	DEVICE:
PLC OUTPUT 0	SPARE				
PLC OUTPUT 1	SPARE				
PLC OUTPUT 3	SPARE				
PLC OUTPUT 4	SPARE				
ANALOG INPUTS:	LOCATION OF EQUIPMENT:	CONDITION:	VOLTAGE:	CONDUCTORS:	DEVICE:
PLC INPUT 0	PRESSURE TRANSDUCER PE-1-1	UPPER RESERVOIR LEVEL	4-20MA	2/C TRANSMITTER CABLE	TRANSDUCER
PLC INPUT 1	PRESSURE TRANSDUCER PE-2-1	LOWER RESERVOIR LEVEL	4-20MA	2/C TRANSMITTER CABLE	TRANSDUCER
PLC INPUT 2	SPARE				
ANALOG OUTPUTS:	LOCATION OF EQUIPMENT:	CONDITION:	VOLTAGE:	CONDUCTORS:	DEVICE:
PLC OUTPUT 0	SPARE				
PLC OUTPUT 1	SPARE				
PLC OUTPUT 3	SPARE				

NOTES:
1. EQUIPMENT GROUNDING CONDUCTORS NOT SHOWN, BUT ARE REQUIRED.
2. NOT ALL SPARE INPUTS OR OUTPUTS ARE SHOWN, USING STANDARD 8 OR 16 POINT CARDS.

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	8' FIBERGLASS INDUSTRIAL	–	L.E.D.	MVOLT	–	LITHONIA	FEM4LED–4L–IMAFL–WLFEND	S	ES	
B	ENCLOSED VAPORTIGHT – WALL MOUNT	1	L.E.D. LAMP	120	–	CROUSE–HINDS	VXHBF22GP	W	ES	1
C	ENCLOSED VAPORTIGHT – STANCHION MOUNT	1	L.E.D. LAMP	120	–	CROUSE–HINDS	VXHA42GP	PIPE	RAIL	1,2
EBU	12V EMERGENCY BATTERY UNIT	2	50 PAR36	120	–	LITHONIA	IND12100–H5012S–ULT	W	ES	
OA	CUTOFF WALL LIGHT WITH MOTION/LIGHT SENSOR	–	L.E.D.	MVOLT	–	LITHONIA	DSXW1LED–10C–530–40K–TFTM–MVOLT–PIR–DDBXD	W	C	
OB	OBSTRUCTION LIGHT WITH PHOTOCONTROL	–	L.E.D.	120	–	DIALIGHT	860–1R01–002	S	ES	3
						UNIMAR	18001–001			

LIGHTING FIXTURE SCHEDULE NOTES:

1. FIXTURE TO INCLUDE SYLVANIA ULTRA L.E.D. OMNI DIRECTIONAL, 2700K COLOR TEMPERATURE, 1600 LUMENS, 20 WATT, 25,000 HOUR RATED, CATALOG #LED20A21/DIM/0/827, NO APPROVED EQUAL.
2. PROVIDE 1–1/4" ALUMINUM PIPE FOR SUPPORT FOR FIXTURE. ATTACH TO RAIL WITH STAINLESS STEEL HARDWARE AND SUPPORTS. FIXTURE TO BE MOUNTED 8 FEET ABOVE CATWALK.
3. MOUNT LIGHT TO (ABOVE) PHOTOCONTROL.

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Madison Water Utility
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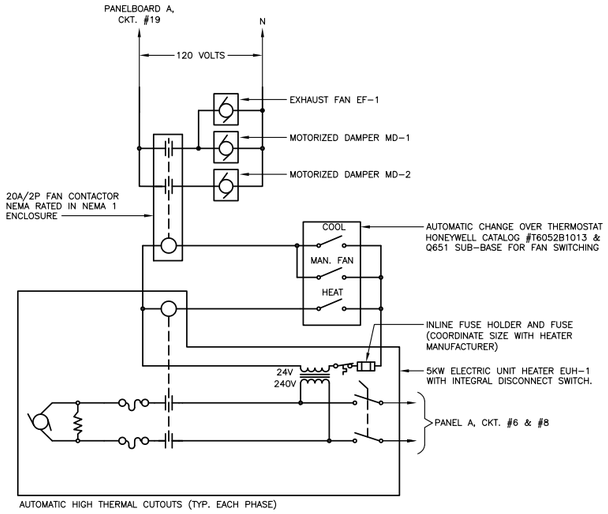
LAKEVIEW RESERVOIR
REPLACEMENT PROJECT
MADISON, WISCONSIN

REVISIONS
MARK | DATE | DESCRIPTION

SEH FILE NO. MADWU 126154
PROJECT NO.
ISSUE DATE 07-25-14
DESIGNED BY R.J.B.
DRAWN BY B.E.F.

SHEET TITLE
ELECTRICAL SCHEDULES AND ONE-LINE DIAGRAM

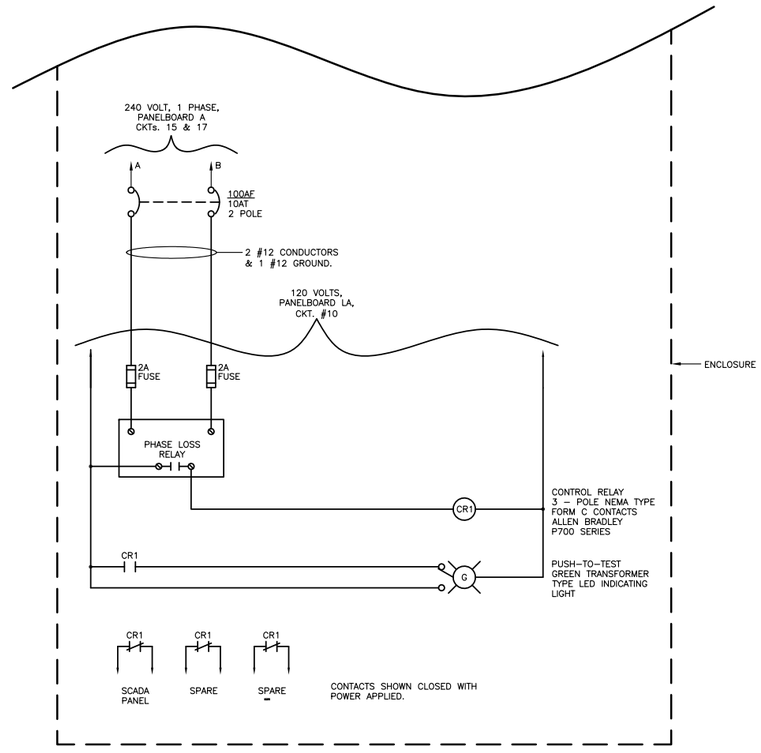
SHEET
E7



NOTE:

1. ALL CONTROL WIRING SHALL BE A 14 AWG TYPE THWN STRANDED COPPER.

HEAT/COOL CONTROL DIAGRAM
N.T.S.



TYPICAL VOLTAGE MONITOR RELAY (VMR) CONTROL DIAGRAM
N.T.S.

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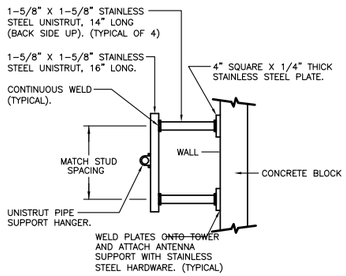
SHEET TITLE
ELECTRICAL CONTROL DIAGRAMS

SHEET
E8

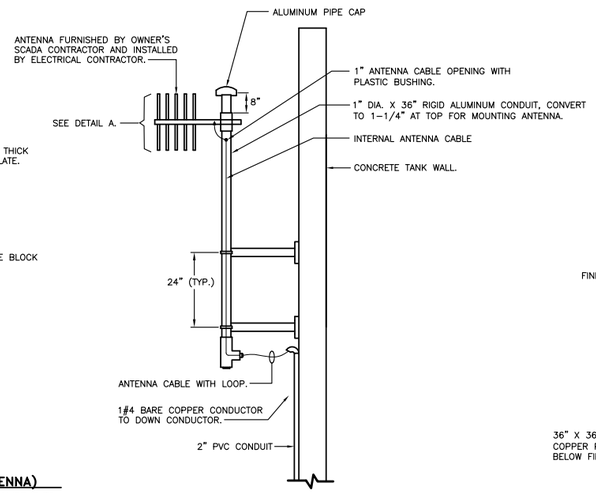


PLAN VIEW

ANTENNA MOUNTING DETAIL
N.T.S.

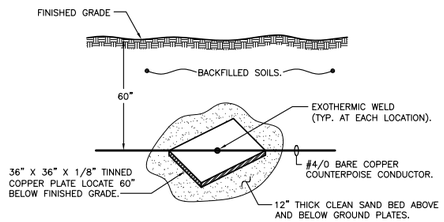
GENERAL NOTES: (WELL HOUSE ANTENNA)

1. INSTALL ALL EQUIPMENT PER MANUFACTURES REQUIREMENTS. FURNISH AND INSTALL ALL CONNECTORS, STRAPS, AND ECT TO PROVIDE A COMPLETE INSTALLATION.
2. ALL STAINLESS STEEL TO BE TYPE 316L.

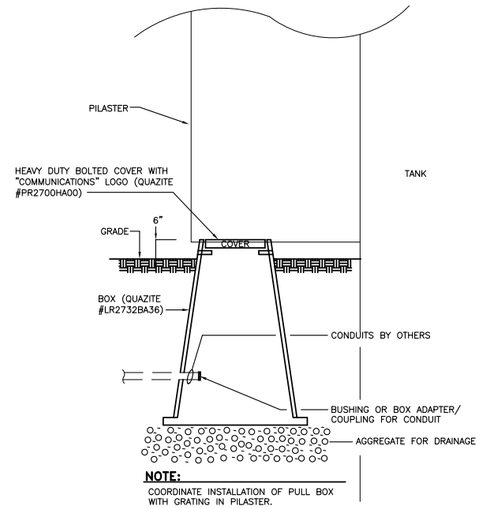


ANTENNA VIEW

CONCRETE TANK ANTENNA MOUNTING DETAIL
N.T.S.

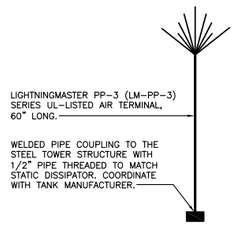


COUNTERPOISE GROUND PLATE INSTALLATION DETAIL
N.T.S.

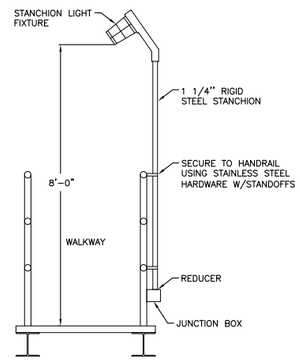


NOTE:
COORDINATE INSTALLATION OF PULL BOX WITH GRATING IN PILASTER.

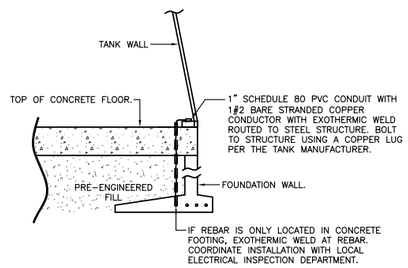
COMMUNICATIONS PULL BOX DETAIL
NO SCALE



WATER TOWER STATIC DISSAPATOR DETAIL
N.T.S.

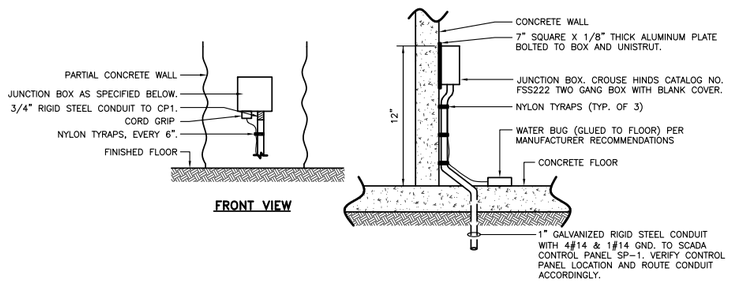


STANCHION LIGHT FIXTURE DETAIL
N.T.S.



NOTES:
1. SEE TANK MANUFACTURER'S FOOTING DESIGN FOR EXACT INFORMATION AND LOCATION OF REBAR.

TYPICAL CONCRETE ENCASED ELECTRODES
N.T.S.



FRONT VIEW

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.

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