SINGLE LINE DIAGRAM SYMBOLOGY

MEDIUM VOLTAGE VACUUM DRAWOUT STARTER

52 — MEDIUM VOLTAGE DRAWOUT BREAKER

THERMAL MAGNETIC CIRCUIT BREAKER
X = LOCATION
LOC
100 — FRAME (AMPS)
20 — TRIP (AMPS)

MCP CIRCUIT BREAKER
X = LOCATION
LOC
7 — CONTINUOUS AMPS
MCP — TRIP SETTING BASED ON MOTOR HORSEPOWER

LOW VOLTAGE DRAWOUT CIRCUIT BREAKER
800/400 (L-S-I-G)
L LONG TIME
S SHORT TIME
I INSTANTANEOUS
G GROUND FAULT

COMBINATION NEMA RATED STARTER WITH MCP DISCONNECT AND CONTROL POWER TRANSFORMER
X
40/MCP
ROMAN NUMERAL = NEMA SIZE
X = LOCATION
* = STARTER TYPE
(BLANK) FULL VOLTAGE NON-REVERSING
FVR FULL VOLTAGE REVERSING
2S2W TWO SPEED TWO WINDING
2S1W TWO SPEED ONE WINDING

X VFD — VARIABLE FREQUENCY DRIVE
X = AMPERE RATING

X RVSS — REDUCED VOLTAGE SOLID STATE STARTER
X = AMPERE RATING

X / Y — PACKAGED EQUIPMENT
X = EQUIPMENT SIZE
Y = TYPE (KW, KVA, OR HP AS INDICATED)

K — KEY INTERLOCK

GENERATOR
RATINGS AS INDICATED

TRANSFER SWITCH (MANUAL OR AUTOMATIC)
RATINGS AS INDICATED

AS — AMMETER SWITCH

VS — VOLTMETER SWITCH

X — METERING DEVICE
X = METER TYPE
WHM WATT HOUR METER
WM WATT METER
AM AMMETER
VM VOLTMETER
PFM POWER FACTOR METER

480/120 (3) — POTENTIAL TRANSFORMER
RATIO AND NUMBER OF PT'S AS INDICATED

100/5 (3) — CURRENT TRANSFORMER
RATIO AND NUMBER OF CT'S AS INDICATED

GROUND FAULT CURRENT TRANSFORMER
RATIO AS INDICATED

5A — FUSE
SIZE AS INDICATED

X — MOTOR
X = HORSEPOWER
* = FULL LOAD AMPS

DELTA-WYE TRANSFORMER WITH SECONDARY KVA SIZE AND VOLTAGE RATIO AS INDICATED

X AMPS
Y SECONDS
51G — DELTA-WYE TRANSFORMER WITH RESISTANCE GROUNDED SECONDARY AND GROUND FAULT RELAYING
X - GROUNDING RESISTOR AMPS
Y - GROUNDING RESISTOR SECONDS

FUSED CONTROL POWER TRANSFORMER

MOV — ELECTRICAL MOTOR OPERATED VALVE, WITH INTEGRAL REVERSING STARTER

30A — DISCONNECT SWITCH
SIZE AS INDICATED

30A / 30A — FUSED DISCONNECT SWITCH
SIZE AS INDICATED

CAPACITOR

SPD — SURGE PROTECTIVE DEVICE

SSM — SOLID STATE METERING DEVICE

SSMP — SOLID STATE MOTOR PROTECTIVE DEVICE

LIGHTNING ARRESTOR AND SURGE CAPACITOR

(#) — ANSI RELAY DEVICE
(#) = QUANTITY
* = ANSI DEVICE
25 SYNCHRONISM CHECK RELAY
27 UNDERVOLTAGE
27/47 UNDERVOLTAGE, PHASE SEQUENCE, UNBALANCED VOLTAGE
32 DIRECTIONAL POWER RELAY
41 FIELD CONTACTOR
43 SELECTOR SWITCH
49 HIGH OIL TEMPERATURE
50/51 INSTANTANEOUS AND TIME OVERCURRENT
50/51N INSTANTANEOUS AND TIME RESIDUALLY CONNECTED GROUND OVERCURRENT
51G GROUND FAULT
60 VOLTAGE BALANCE
62 TIME DELAY
63 SUDDEN PRESSURE
67 AC DIRECTIONAL CURRENT RELAY
71L LOW OIL LEVEL
81 FREQUENCY RELAY
83 CONTROL POWER TRANSFORMER
86 LOCKOUT
87TL TRANSFORMER DIFFERENTIAL
87M MOTOR DIFFERENTIAL

SCHEMATIC DIAGRAM SYMBOLOGY

L O R — THREE - POSITION SELECTOR SWITCH

L R — TWO - POSITION SELECTOR SWITCH

THREE - POSITION SPRING RETURN-TO-CENTER MOMENTARY CONTACT SWITCH

SINGLE POLE TOGGLE SWITCH

VACUUM OR PRESSURE SWITCH
CLOSE ON RISING PRESSURE

VACUUM OR PRESSURE SWITCH
OPEN ON RISING PRESSURE

FLOAT LEVEL SWITCH
CLOSE ON RISING LEVEL

FLOAT LEVEL SWITCH
OPEN ON RISING LEVEL

NORMALLY OPEN

NORMALLY CLOSED

NORMALLY OPEN HELD CLOSED

NORMALLY CLOSED HELD OPEN

MAINTAINED POSITION

TEMPERATURE SWITCH
CLOSE ON RISING TEMPERATURE

TEMPERATURE SWITCH
OPEN ON RISING TEMPERATURE

FLOW SWITCH
CLOSE ON INCREASING FLOW

FLOW SWITCH
OPEN ON INCREASING FLOW

TORQUE SWITCH
OPEN ON INCREASING TORQUE

1 — LOCATION SYMBOL
LEGEND SHOWN ON SCHEMATIC DRAWINGS
ALL DEVICES ARE LOCATED IN THE MCC
UNLESS INDICATED OTHERWISE

DI — DIGITAL INPUT TO PLC/RTU/DCS

DIGITAL OUTPUT FROM PLC/RTU/DCS
NORMALLY OPEN

DIGITAL OUTPUT FROM PLC/RTU/DCS
NORMALLY CLOSED

AI — ANALOG INPUT TO PLC/RTU/DCS
4-20 mA (UNLESS INDICATED OTHERWISE)

AO — ANALOG OUTPUT FROM PLC/RTU/DCS
4-20 mA (UNLESS INDICATED OTHERWISE)

SV — SOLENOID VALVE

SOLENOID VALVE

E-STOP PUSHBUTTON

X — CONTROL RELAY OR COIL
X = DEVICE
CR CONTROL RELAY
TD TIME DELAY RELAY
(TIMING RANGE AS INDICATED)
M MOTOR STARTER
PC PHOTOCELL

NORMALLY OPEN CONTACT

NORMALLY CLOSED CONTACT

XXXX — NORMALLY OPEN CONTACT LINE REFERENCE

XXXX — NORMALLY CLOSED CONTACT LINE REFERENCE

TIMED CONTACTS
CONTACT ACTION IS DELAYED AFTER COIL IS:

ENERGIZED

TD1 — NORMALLY OPEN WITH TIME DELAY CLOSING

TD1 — NORMALLY CLOSED WITH TIME DELAY OPENING

DE-ENERGIZED

TD1 — NORMALLY OPEN WITH INSTANT CLOSING AND TIME DELAY OPENING

TD1 — NORMALLY CLOSED WITH INSTANT OPENING AND TIME DELAY CLOSING

START — NORMALLY OPEN PUSHBUTTON

STOP — NORMALLY CLOSED PUSHBUTTON

OFF ON — NO/NC MAINTAINED PUSHBUTTON

X — PILOT LIGHT
X = LENS COLOR
R RED
G GREEN
A AMBER
W WHITE

X — PILOT LIGHT (PUSH-TO-TEST)
X = LENS COLOR (SEE ABOVE)

HORN

ETM — ELAPSED TIME METER

HEATER

GROUND CONNECTION

CROSSING OF CONDUCTORS - NOT CONNECTED

CROSSING OF CONDUCTORS - CONNECTED

FUSE

VOLTAGE SURGE SUPPRESSOR

Stantec

BOWEN COLLINS & ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
No 6677342-2202
KEITH E. SMITH
12/09/22
STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

PROJECT
MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

REVIEW
CHECKED STANTEC
APPROVED STANTEC

DESIGN
DESIGN STANTEC
DRAWN STANTEC

ELECTRICAL

SYMBOLS - I

PROJECT NUMBER 483-20-02

DATE: DECEMBER 2022

DRAWING NO.
E-01

SHEET 067 OF 126

REV 010119

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PLAN SYMBOLOGY

RECEPTACLES

- X-# — 120V DUPLEX RECEPTACLE, NEMA CONFIGURATION 5-20R (WALL MOUNT)
  X = PANELBOARD DESIGNATION
  # = CIRCUIT DESIGNATION
  * = TYPE
  WP WEATHERPROOF
  XP EXPLOSION PROOF
  GFCI GROUND FAULT CIRCUIT INTERRUPTER
- 120V DUPLEX RECEPTACLE, NEMA CONFIGURATION 5-20R (FLOOR MOUNT)
- X — SINGLE SPECIAL PURPOSE RECEPTACLE, 240V 1 PHASE
  X = AMPERAGE
- X — WELDING RECEPTACLE
  X = AMPERAGE
- X — SPECIAL PURPOSE RECEPTACLE, 480 VAC
  X = AMPERAGE
- TELEPHONE OUTLET - FLOOR TYPE
- TELEPHONE OUTLET - WALL TYPE
- COMPUTER/DATA OUTLET - FLOOR TYPE
- COMPUTER/DATA OUTLET - WALL TYPE

CONDUIT AND RACEWAY SYMBOLOGY

- EXPOSED OR CONCEALED CONDUIT
- CONDUIT RUN (UNDERGROUND OR IN CONCRETE)
- CONDUIT RUN (CHANGE IN ELEVATION)
- CONDUIT TURNING UP
- CONDUIT TURNING DOWN
- CONDUITS GROUPED TOGETHER BUT SHOWN AS A SINGLE LINE FOR CLARITY
- CONDUIT FROM FLOOR ABOVE TO FLOOR BELOW
- CONDUIT CAPPED, OR SEALED
- HOMERUN TO EQUIPMENT INDICATED (3/4 " CONDUIT, 2 #12, 1 #12 GND UNLESS INDICATED OTHERWISE)
- X — RACEWAY BOX
  X = BOX TYPE
  MH MANHOLE
  HH HANDHOLE
  PB PULLBOX
- J — JUNCTION BOX OR FITTING

MISCELLANEOUS ELECTRICAL SYMBOLOGY

- POWER PANEL
- DISCONNECT SWITCH
- M — MOTOR
- T — THERMOSTAT
- HORN
- COMBINATION STARTER
- $M — MANUAL MOTOR STARTER

REV 010119

FIRE PROTECTION SYMBOLOGY

- F — FIRE ALARM HORN WITH STROBE
- A F — FIRE ALARM LOUDSPEAKER WITH AMPLIFIER
- FA — FIRE ALARM PULL STATION
- F — FIRE ALARM STROBE
- F — FIRE ALARM BELL WITH STROBE
- FS — FIRE SUPPRESSION SWITCH
- ER — END-OF-LINE TERMINATOR
- * — DETECTOR
  X = TYPE
  SD SMOKE DETECTOR
  HD HEAT DETECTOR
  CD COMBINATION DETECTOR

SECURITY & COMM SYSTEMS SYMBOLOGY

- I — INTERCOM SPEAKER
  * = TYPE (REFER TO SPECIFICATIONS)
- I — INTERCOM SPEAKER WITH STROBE LIGHT
  * = TYPE (REFER TO SPECIFICATIONS)
- I — INTERCOM WALL JACK
- HS I — INTERCOM HANDSET - WALL MOUNTED
- VC * — VIDEO CAMERA
  * = TYPE
  F FIXED
  PTZ PAN-TILT-ZOOM
- * — SECURITY ACCESS DEVICE
  * = TYPE
  CR CARD READER
  KS KEY SWITCH
  PS DIGITAL KEYPAD

LIGHTING SYMBOLOGY

- A / X-#a — PENDANT OR CEILING MOUNT LUMINAIRE
  A = LUMINARE TYPE
  X = LIGHTING PANEL DESIGNATION
  # = CIRCUIT NUMBER
  a = SWITCH DESIGNATION
- PENDANT OR CEILING MOUNT LUMINAIRE - UNSWITCHED (NIGHT LIGHT)
- WALL MOUNTED LUMINAIRE
- POLE, BRACKET, ARM, AND STREETLIGHT
- LINEAR LUMINAIRE
- LINEAR LUMINAIRE - UNSWITCHED
- EMERGENCY LUMINAIRE
  BATTERY OPERATED
- EXIT LIGHT, ARROW INDICATE DIRECTION OF EXIT, SHADING INDICATES FACE
- A / * — LUMINAIRE CALLOUT
  A = LUMINAIRE TYPE
  * = APPROXIMATE MOUNTING HEIGHT AFF
  CLG = CEILING MOUNT
  (SEE LUMINAIRE SCHEDULE FOR MORE DETAILS)
- $ X-#a / * — LIGHT SWITCH
  X = LIGHTING PANEL DESIGNATION
  # = CIRCUIT DESIGNATION
  a = SWITCH DESIGNATION
  * = SWITCH TYPE
  3 3-WAY
  4 4-WAY
  D DIMMER
  M MANUAL MOTOR STARTER
- LIGHTING PANEL

GROUNDING SYMBOLOGY

- GROUND ROD AND GROUND WELL
- GROUND ROD (3/4" X 10'-0")
- GROUND CONNECTION - BOLTED TYPE
- GROUND CONNECTION - EXOTHERMIC TYPE
- BARE COPPER GROUND TO GROUND WIRE IN SLAB, OR UNDERGROUND GROUND GRID, SIZE AS NOTED
- EARTH GROUNDING

Stantec

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ELECTRICAL

SYMBOLS - II

PROJECT NUMBER 483-20-02

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DRAWING NO.
E-02

SHEET 068 OF 126

ELECTRICAL ABBREVIATIONS

A	AMPERE, AUTOMATIC
AC	ALTERNATING CURRENT
AF	CIRCUIT BREAKER FRAME SIZE
AM	AMMETER
ANN	ANNUNCIATOR
AS	ADJUSTABLE SPEED
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BC	BARE COPPER
BKR	BREAKER
C	CONDUIT, CLOSED
CAP	CAPACITOR
CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLF	CURRENT LIMITING FUSE
COM	COMMON
COMM	COMMUNICATIONS
COMP	COMPARTMENT
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY, CARD READER
CT	CURRENT TRANSFORMER
DCS	DISTRIBUTED CONTROL SYSTEM
DISC	DISCONNECT
DISTR	DISTRIBUTION
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
E	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
ETM	ELAPSED TIME METER
F	FREQUENCY, FUSE, FIXED
FDR	FEEDER
FLA	FULL LOAD AMPS
FLUOR	FLUORESCENT
FM	FREQUENCY METER
FO	FIBER OPTIC
FVR	FULL VOLTAGE REVERSING
FVNR	FULL VOLTAGE NON-REVERSING
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
H	HAND
HD	HEAT DETECTOR
HH	HAND HOLE
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HPS	HIGH PRESSURE SODIUM
HS	HAND SWITCH
HZ	HERTZ
IMC	INTERMEDIATE METALLIC CONDUIT
INCAND	INCANDESCENT
IND	INDICATION
INST	INSTANTANEOUS
I/O	INPUT/OUTPUT
Isc	SHORT CIRCUIT CURRENT, AMPS
ISO	ISOLATION
J, JB	JUNCTION BOX
KA	KILO AMPERES
KAIC	KILO AMP INTERRUPTING CURRENT
KCMIL	KILO CIRCULAR MILS
KVA	KILOVOLT AMPERE
L	LOCAL
LCP	LOCAL CONTROL PANEL
LCS	LOCAL CONTROL STATION
LOC	LOCAL
LOR	LOCAL-OFF-REMOTE
LOS	LOCKOUT STOP PUSHBUTTON
LP	LIGHTING PANEL
LRA	LOCKED ROTOR AMPS
LS	LEVEL SWITCH
LTG	LIGHTING
LTS	LIGHTS

M	MOTOR CONTACTOR COIL
mA	MILLIAMPERE
MCP	MOTOR CIRCUIT PROTECTOR
MLO	MAIN LUGS ONLY
MOV	MOTOR OPERATED VALVE
MS	MANUAL MOTOR STARTER
MTS	MANUAL TRANSFER SWITCH
NEUT	NEUTRAL
NP	NAMEPLATE
O	OPEN, OFF
OL	OVERLOAD
PA	PUBLIC ADDRESS
PB	PUSHBUTTON, PULLBOX
PC	PHOTOCELL
PCM	PROCESS CONTROL MODULE
PF	POWER FACTOR
PFM	POWER FACTOR METER
PH	PHASE
PL	PILOT LIGHT
PNLBD	PANELBOARD
PP	POWER PANELBOARD
POS	POSITION
POT	POTENTIOMETER
PRI	PRIMARY
PT	POTENTIAL TRANSFORMER
PTZ	PAN-TILT-ZOOM
PWR	POWER
R	REMOTE
RECPT	RECEPTACLE
RGS	RIGID GALVANIZED STEEL
RMS	ROOT MEAN SQUARE
RTU	REMOTE TERMINAL UNIT
RVSS	REDUCED VOLTAGE SOLID STATE
SEL SW	SELECTOR SWITCH
SEQ	SEQUENCE
SHLD	SHIELDED
SIG	SIGNAL
SP	SPARE
SP HTR	SPACE HEATER
SPDT	SINGLE POLE DOUBLE THROW
SPST	SINGLE POLE SINGLE THROW
SSM	SOLID STATE METER
SSMP	SOLID STATE MOTOR PROTECTOR
ST, SH	SHUNT TRIP
STR	STARTER
SSTU	SOLID STATE TRIP UNIT
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TACH	TACHOMETER
TB	TERMINAL BOX
TERM	TERMINAL
TM	REPEAT CYCLE TIMER
TD	TIME DELAY RELAY
TS	TEMPERATURE SWITCH
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTAGE, VOLTS
VA	VOLT AMPERE
VAR	VOLT AMPERE REACTIVE
VFD	VARIABLE FREQUENCY DRIVE
VM	VOLTMETER
VP	VAPOR PROOF
W	WATTS, WIRE
WM	WATT METER
WP	WEATHERPROOF
XFMR	TRANSFORMER
XMTR	TRANSMITTER
XP	EXPLOSION PROOF

GENERAL ELECTRICAL NOTES

1. ALL RACEWAYS AND EQUIPMENT SHALL BE INSTALLED AND GROUNDED IN ACCORDANCE WITH THE 2020 EDITION OF THE NATIONAL ELECTRICAL CODE AND APPLICABLE LOCAL CODES.
2. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF TERMINAL BOXES AND CONDUIT ENTRANCES OF ALL EQUIPMENT AGAINST APPROVED SHOP DRAWINGS BEFORE STUBBING UP CONDUITS.
3. REFER TO SPECIFICATION SECTION 260533 FOR REQUIREMENTS RELATED TO FLEXIBLE CONDUIT INSTALLATION
   CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT OR STRUCTURAL CONDITIONS. EXPOSED CONDUIT SHALL BE INSTALLED PARALLEL OR PERPENDICULAR TO BEAMS AND WALLS. REFER TO SPECIFICATION SECTION 260533.
4. CONDUIT STUB-UPS SHALL NOT BE MORE THAN 6 INCHES FROM THE CENTERLINE OF TERMINAL BOXES.
5. IN THE EVENT OF INTERFERENCE BETWEEN ELECTRICAL EQUIPMENT SHOWN ON THE DRAWINGS AND OTHER EQUIPMENT, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING AND THE ENGINEER SHALL APPROVE PROPOSED CHANGES BEFORE THEY ARE MADE.
6. ALL SURFACE MOUNTED PANELS AND PANELBOARDS ON THE INTERIOR OF EXTERIOR WALLS ABOVE GRADE OR IN OTHER LOCATIONS CONSIDERED DAMP OR WET SHALL BE MOUNTED SO AS TO MAINTAIN A 1/4 INCH (MINIMUM) AIR SPACE BETWEEN THE ENCLOSURE AND THE WALL.
7. LOCATION OF PULLBOXES ARE APPROXIMATE. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION WITH MECHANICAL PIPING AND SHALL BE 6 INCHES (MINIMUM) AWAY FROM MECHANICAL PIPING FLOW LINES.
8. ONLY MAJOR PULLBOXES ARE SHOWN. THE CONTRACTOR SHALL PROVIDE ADDITIONAL PULLBOXES WHERE REQUIRED TO MAKE A WORKABLE INSTALLATION.
9. THE WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE DETAILS WHETHER OR NOT THEY ARE REFERENCED ON THE DRAWINGS.
10. ALL CONDUIT RUNS CROSSING EXPANSION JOINTS SHALL HAVE EXPANSION OR EXPANSION AND DEFLECTION TYPE FITTINGS. FOR LOCATIONS OF EXPANSION JOINTS, REFER TO THE STRUCTURAL DWGS.
11. LUMINAIRES SHALL BE MOUNTED ACCORDING TO THE MOUNTING HEIGHT GIVEN ON THE DRAWINGS, WITH THE DISTANCE BEING MEASURED FROM THE BOTTOM OF THE LUMINAIRE TO THE FINISHED FLOOR. THE APPROPRIATE MOUNTING BRACKETS AND HARDWARE SHALL BE SUPPLIED.
12. ALL PANELBOARDS SHALL BE MOUNTED SO THAT THE DISTANCE FROM THE CENTERLINE OF THE TOP CIRCUIT BREAKER OPERATING HANDLE IN THE UPPERMOST POSITION TO THE FINISHED FLOOR SHALL NOT EXCEED 6'-7".
13. THE WIRING DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUIT REPRESENT A SUGGESTED ARRANGEMENT BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS ACCEPTABLE TO THE ENGINEER MAY BE MADE BY THE CONTRACTOR TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED. THE BASIC SEQUENCE AND METHOD OF CONTROL MUST BE MAINTAINED AS INDICATED ON THE DRAWINGS AND/OR SPECIFICATIONS.
14. CONNECTIONS BETWEEN RIGID CONDUIT AND MOTOR TERMINAL BOXES OR SIMILAR EQUIPMENT SUBJECT TO VIBRATION SHALL BE FLEXIBLE LIQUID-TIGHT CONDUIT.
15. CONDUITS SHALL BE TERMINATED SO AS TO PERMIT NEAT CONNECTION TO MOTORS AND OTHER EQUIPMENT.
16. CONDUITS FOR FUTURE EQUIPMENT OR EXTENSIONS SHALL BE TERMINATED AS SHOWN IN DETAIL OR AS SPECIFIED.
17. MCC AND SWITCHGEAR COMPARTMENT DESIGNATIONS SHALL BE AS FOLLOWS:

    BLANK/SPACE: CONTAINS NECESSARY BUS AND HARDWARE FOR FUTURE ADDITION OF BREAKERS OR STARTERS.

    SPARE: CONTAINS A COMPLETE INSTALLED BREAKER OR STARTER AVAILABLE FOR FUTURE USE.
18. ALL MOTOR STARTER CONTROL POWER TRANSFORMERS SHALL BE SIZED TO PROVIDE SUFFICIENT VOLT-AMPERE CAPACITY FOR OPERATING ALL LOCAL AND REMOTE ELECTRICAL DEVICES ASSOCIATED WITH CONTROL OF THE MOTOR IN ADDITION TO THE STARTER COIL.
19. MOTOR CONTROL CENTERS AND ALL FREE STANDING PANELS SHALL BE SET ON CONCRETE HOUSEKEEPING PADS WITH LEVELING CHANNELS EMBEDDED IN THE PAD.
20. ALL RECEPTACLES IN OUTDOOR AND ANTICIPATED WET AREAS SHALL BE GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLES WITH WEATHERPROOF COVERS.
21. ELECTRICAL CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING THE PROJECT TO VERIFY THE SCOPE OF WORK WITH FIELD CONDITIONS. PARTICULAR ATTENTION SHOULD BE GIVEN TO NEW CONDUIT RUNS IN EXISTING BUILDINGS.
22. EQUIPMENT LOCKOUTS SHALL BE IN STRICT ACCORDANCE WITH OWNER'S REQUIREMENTS.
23. FOR LIGHTING AND RECEPTACLE SYSTEMS, ONLY CIRCUIT NUMBERS ARE SHOWN. CONTRACTOR SHALL PROVIDE ALL NECESSARY CONDUITS, WIRES, FITTINGS, JUNCTION BOXES AND ALL NECESSARY COMPONENTS SHOWN OR NOT SHOWN ON THE DRAWINGS, TO MAKE THE ELECTRICAL INSTALLATION COMPLETE AND OPERATIONAL. ALL CONDUIT RUNS SHALL BE CONCEALED UNLESS INDICATED OTHERWISE. CIRCUIT LOADING SHALL BE AS INDICATED IN THE PANEL SCHEDULES. ALL LIGHTING AND RECEPTACLE CIRCUITS SHALL INCLUDE GROUND WIRE.
24. HVAC TEMPERATURE CONTROL WIRING SHALL BE THE RESPONSIBILITY OF THE TEMPERATURE CONTROLS SUBCONTRACTOR UNDER DIVISION 23, AND IS NOT SHOWN ON THE ELECTRICAL DRAWINGS. 120, 208, AND 420 VOLT POWER WIRING SHALL BE PROVIDED AS INDICATED AND AS A PART OF THE ELECTRICAL DIVISION 28 WORK.

LIGHTNING PROTECTION NOTES

1. GENERAL
   A SYSTEM OF LIGHTNING PROTECTION SHALL BE PROVIDED AND INSTALLED IN COMPLIANCE WITH THE PROVISIONS OF THE LATEST EDITION OF NFPA 780 LIGHTNING PROTECTION CODE AS ADOPTED BY THE NATIONAL FIRE PROTECTION ASSOCIATION.
2. AIR TERMINALS
   AIR TERMINALS SHALL BE 1/2IN x 24IN SOLID COPPER AND SHALL EXTEND AT LEAST 18 INCHES ABOVE THE TOP OF THE TANK. AIR TERMINALS BASES SHALL BE CAST BRONZE WITH STAINLESS STEEL BOLT PRESSURE CABLE CONNECTIONS.
3. CONDUCTORS
   CONDUCTORS SHALL CONSIST OF U.L. LISTED 29 STRANDS OF 17 GAUGE COPPER WIRE WEIGHING 190 LBS. PER 1000 FEET AND INSTALLED IN ACCORDANCE WITH THE U.L. CODE. (CLASS 1)
4. GROUND TERMINALS
   ALL GROUNDING TERMINALS (RODS) SHALL BE NO LESS THAN 3/4 IN DIA AND 10 FT LONG, AND SHALL BE COPPER-CLAD STEEL OR SOLID COPPER. GROUND TERMINALS SHALL BE DRIVEN TO A MINIMUM DEPTH OF 10 FT. GROUNDING TERMINALS SHALL BE LOCATED AT THE BASE OF THE STRUCTURE AND GROUND CONNECTIONS SHALL BE MADE AROUND THE PERIMETER OF THE STRUCTURE AND IN NO CASE SHALL AVERAGE OVER 100 FT APART.
5. CABLE CONNECTORS
   ALL CABLE CONNECTORS SHALL BE CAST BRONZE WITH SCREW TYPE STAINLESS STEEL BOLTS AND NUTS. CONDUCTOR FASTENERS SHALL BE AN APPROVED TYPE OF NON-CORROSIVE METAL, HAVE AMPLE STRENGTH TO SUPPORT CONDUCTORS AND SHALL BE SPACED 3 FT ON CENTERS.
6. INTERCONNECTION OF METALS
   ALL METAL BODIES WITHIN 6 FT OF THE CONDUCTOR SHALL BE BONDED TO THE SYSTEM WITH APPROVED FITTINGS AND CONDUCTORS. CONNECTIONS BETWEEN DISSIMILAR METALS SHALL BE MADE WITH APPROVED BIMETALLIC CONNECTIONS. PRIMARY BONDS FOR CONDUCTING METAL BODIES SHALL BE BONDED WITH APPROPRIATE FITTINGS AND FULL SIZE CONDUCTORS, AND SHALL CONSIST OF, BUT NOT LIMITED TO THE FOLLOWING: LADDER AND RAIL SYSTEMS, TANK VENTS AND PIPING. ALUMINUM TO COPPER CONNECTIONS SHALL BE MADE WITH BIMETALLIC CONNECTORS.
7. COMMON GROUNDING
   ALUMINUM TO COPPER CONNECTIONS SHALL BE MADE WITH BIMETALLIC CONNECTORS. GROUNDS FOR ELECTRICAL AND TELEPHONE SERVICES, AND LIGHTNING GROUNDS SHALL BE TIED TOGETHER TO FORM A COMMON GROUND.
8. MATERIALS
   ALL LIGHTNING PROTECTION EQUIPMENT SHALL BE MANUFACTURED BY HEARY BROTHERS LIGHTNING PROTECTION CO., THOMPSON LIGHTNING PROTECTION CO., CAPITAL LIGHTNING PROTECTION CO., OR EQUAL.
9. LOCATION
   INSTALL LIGHTNING PROTECTION AT THE FOLLOWING FACILITIES:

   A. REUSE PUMP STATION

GROUNDING NOTES

1. ALL GROUNDING CABLES SHALL BE #4/0 SOFT DRAWN BARE STRANDED COPPER CONDUCTOR UNLESS OTHERWISE NOTED.
2. INSTALL GROUND CABLE AT THE BOTTOM OF THE GRADE BEAM OR A MINIMUM 36" BELOW GRADE.
3. GROUNDING CABLE SHALL BE INSTALLED WITH SUFFICIENT SLACK SO AS TO AVOID DAMAGE TO THE CONDUCTORS.
4. ANY GROUNDING CONDUCTOR EMERGING FROM BELOW GRADE SHALL BE PROTECTED BY PVC SCHEDULE 80 SLEEVE.
5. RESISTANCE TO GROUND MUST BE MEASURED AT 5 OHMS OR LESS. ADDITIONAL GROUND RODS SHALL BE DRIVEN TO OBTAIN THIS VALUE. MEASUREMENT SHALL BE TAKEN IN DRY WEATHER CONDITION, A MINIMUM 48 HOURS AFTER RAINFALL.
6. CONNECT ALL DUCTBANK GROUND CONDUCTORS TO BUILDING GROUND LOOP.
7. PROVIDE BONDING CONNECTION TO ALL UNDERGROUND WATER PIPES (NOT SHOWN).
8. EXTEND THE GROUND CONDUCTORS INTO THE STRUCTURE AND INSTALL ADDITIONAL CONNECTIONS AS REQUIRED BY THE NEC AND THE CONTRACT DOCUMENTS. THESE CONNECTIONS SHALL INCLUDE, BUT ARE NOT LIMITED TO
   THE FOLLOW ING :
   - METALLIC PIPING
   - METALLIC EQUIPMENT/ FRAMES
   - STRUCTURAL STEEL
   - STAIRS AND LADDER
   - ACCESS HATCHES
   - LCP, LCS, VCP
   - LIGHTING AND POWER PANELS
   - INSTRUMENTATION AND COMMUNICATION SYSTEMS
   - ISOLATED GROUND(S) FOR PLC AND CONTROL PANELS.

   CONNECTION CABLES SHALL BE SIZED AS REQUIRED BY THE NEC.
9. GROUNDING SYSTEM SHALL BE COORDINATED WITH THE LIGHTNING PROTECTION SYSTEM IN ACCORDANCE WITH NFPA 70 AND NFPA 780.

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BOWEN COLLINS & ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
No 6677342-2202
KEITH E. SMITH
12/09/22
STATE OF UTAH

REVISIONS

NO.	DATE	REV. BY	DESCRIPTION

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW
CHECKED STANTEC
APPROVED STANTEC

DESIGN
DESIGN STANTEC
DRAWN STANTEC

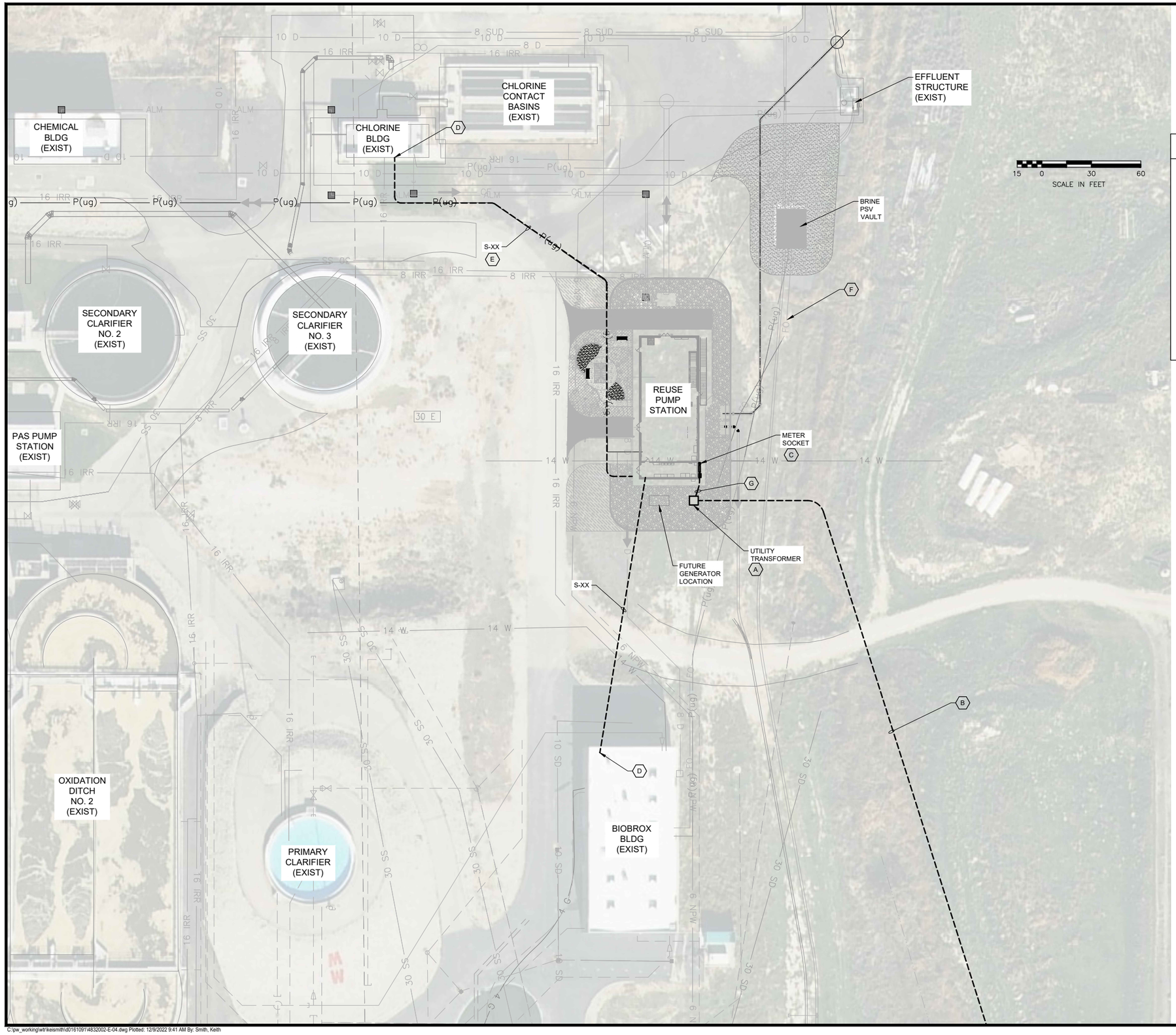
ELECTRICAL

NOTES AND ABBREVIATIONS

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
E-03
SHEET 069 OF 126

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REV 010119



SHEET KEYNOTES

A. PROVIDE AND INSTALL TRANSFORMER PAD PER UTILITY STANDARDS. COORDINATE WITH UTILITY DESIGN.
B. PROVIDE AND INSTALL 1-4" CONDUIT IN DUCTBANK PER UTILITY STANDARDS FROM TRANSFORMER PAD TO UTILITY POLE LOCATED ON 2100 S STREET. COORDINATE WITH UTILITY DESIGN
C. PROVIDE AND INSTALL METER SOCKET PER ROCKY MOUNTAIN POWER REQUIREMENTS. COORDINATE WITH UTILITY DESIGN
D. EXTEND CONDUIT AND CABLE TO PLC INSIDE BUILDING. COORDINATE WITH OWNER FOR PLC LOCATION INSIDE BUILDING.
E. CONDUIT SHALL BE INSTALLED IN THE SAME TRENCH AS THE NEW CHEMICAL LINES.
F. REMOVE EXISTING FIBER OPTIC CABLE BETWEEN BIOBROX BUILDING PLC AND LOCAL PANEL AT EFFLUENT STRUCTURE FROM CONDUIT PRIOR TO STARTING EXCAVATION. REMOVE CONDUIT AS NECESSARY FOR EXCAVATION AND CLEANLY CUT AND CAP ENDS FOR FUTURE USE.
G. PROVIDE AND INSTALL 5-4" CONDUITS FROM TRANSFORMER TO UTILITY CT CABINET IN DUCTBANK PER UTILITY STANDARDS. COORDINATE WITH UTILITY DESIGN.

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MAGNA WRF REUSE PROJECT
MAGNA, UTAH

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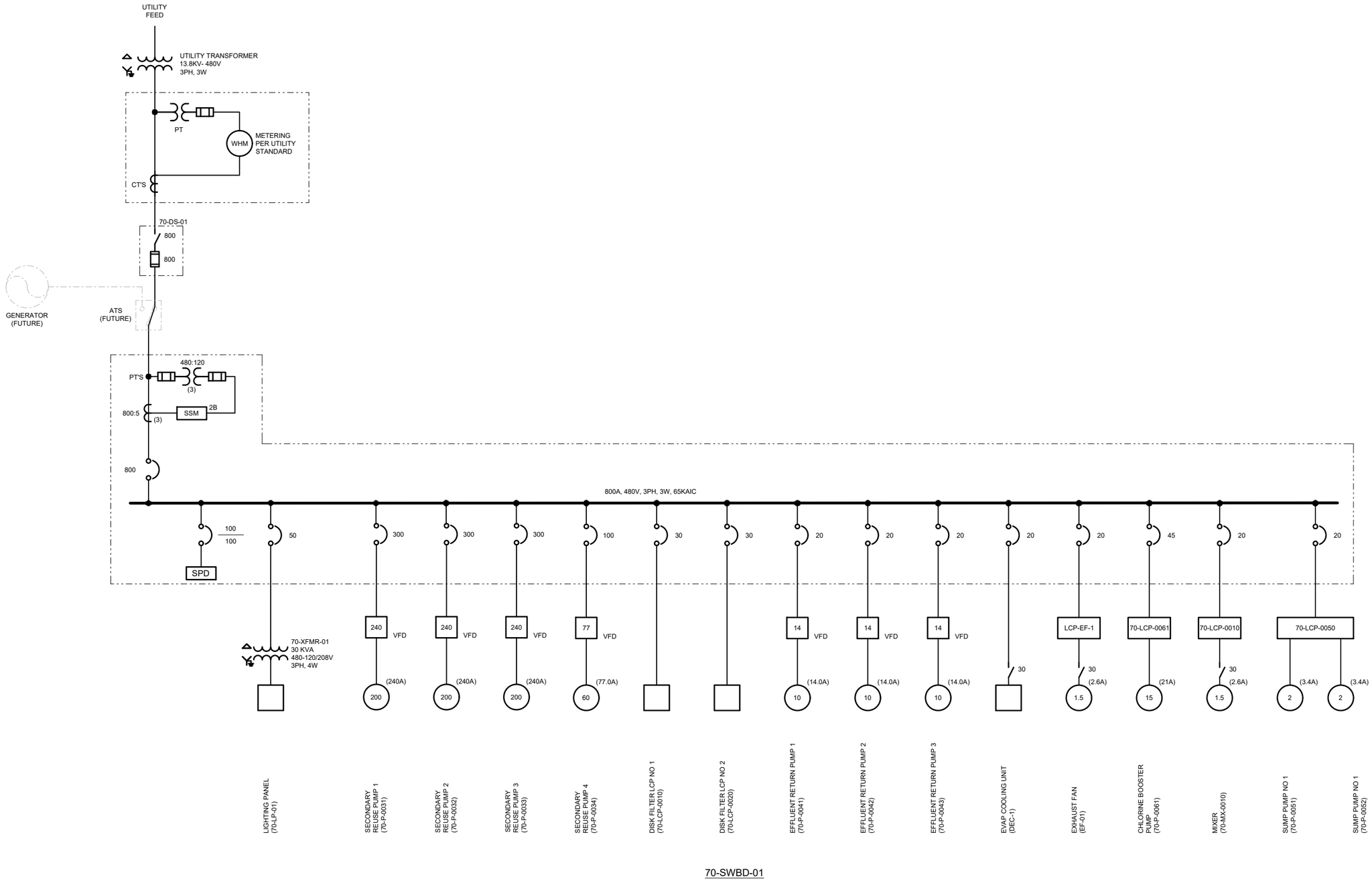
DESIGN K. SMITH
DRAWN K. SMITH
REVIEW
CHECKED K. XXXXXX
APPROVED C. ROGERS

ELECTRICAL
SITE PLAN

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
E-04
SHEET 070 OF 126

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70-SWBD-01

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MAGNA, UTAH

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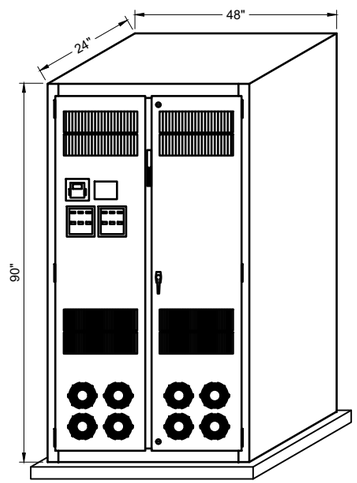
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DRAWN K. SMITH
CHECKED B. BUCHANAN
APPROVED C. ROGERS
REVIEW

ELECTRICAL

SINGLE LINE DIAGRAM

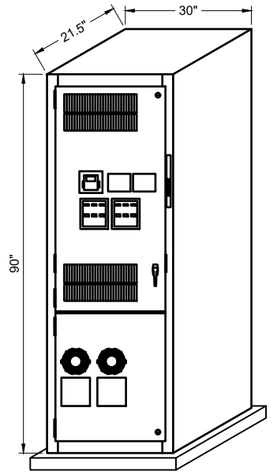
DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
E-05
SHEET 071 OF 126



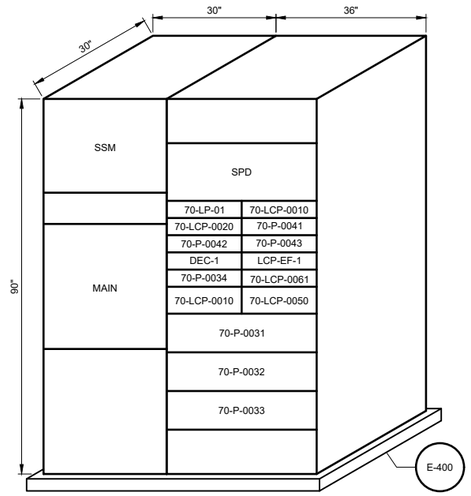
VFD (200HP) ELEVATION

DIMENSIONS BASED ON
EATON "CPX" SERIES VFD



VFD (50 HP) ELEVATION

DIMENSIONS BASED ON
EATON "CPX" SERIES VFD



70-SWBD-01 ELEVATION

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DRAWN K. SMITH

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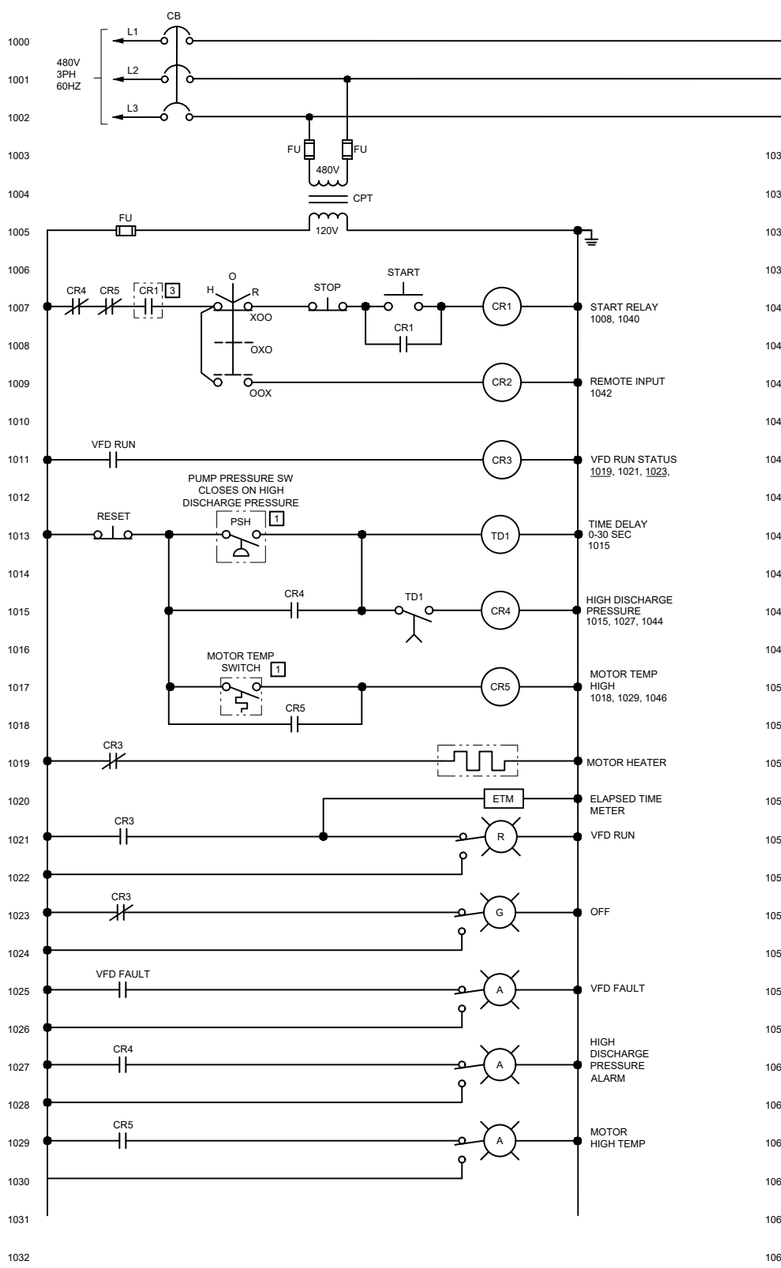
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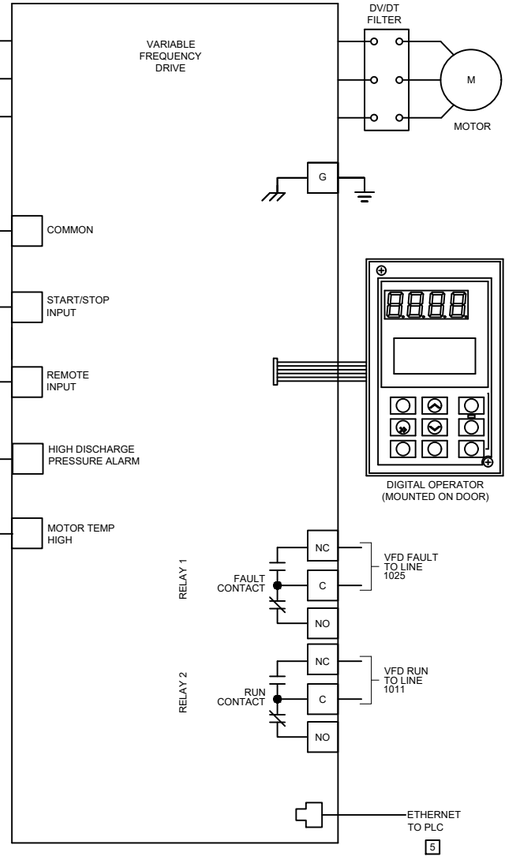
EQUIPMENT ELEVATIONS

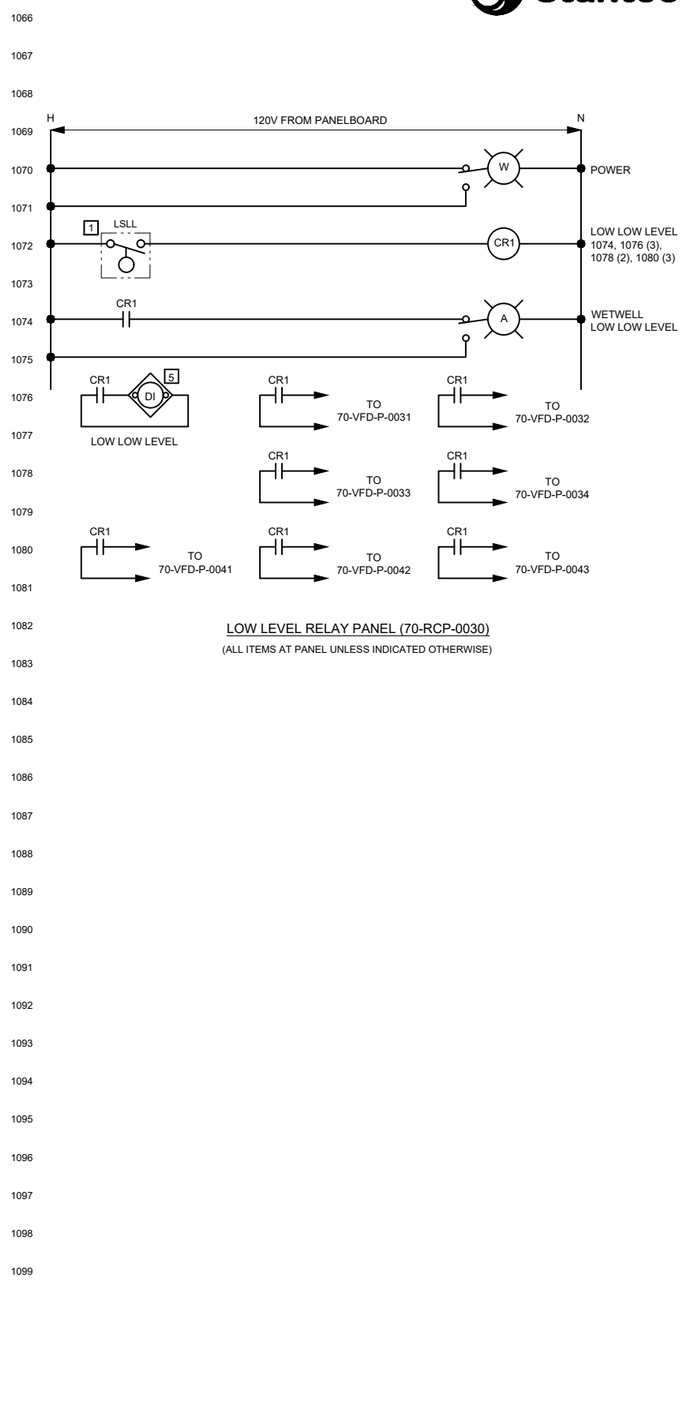
DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
E-06
SHEET 072 OF 126

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LOW LEVEL RELAY PANEL (70-RCP-0030)

(ALL ITEMS AT PANEL UNLESS INDICATED OTHERWISE)

SECONDARY REUSE PUMP NO 1 (70-P-0031)

TYPICAL FOR 70-P-0032, 70-P-0033 AND 70-P-0034
(ALL ITEMS LOCATED AT VFD UNLESS OTHERWISE NOTED)

EFFLUENT RETURN PUMP NO 1 (70-P-0041)

TYPICAL FOR 70-P-0042 AND 70-P-0043
(ALL ITEMS LOCATED AT VFD UNLESS OTHERWISE NOTED)

LOCATION LEGEND	
1	FIELD
2	LCS
3	LCP
4	MCC
5	PLC
6	VFD

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SCHEMATICS - I

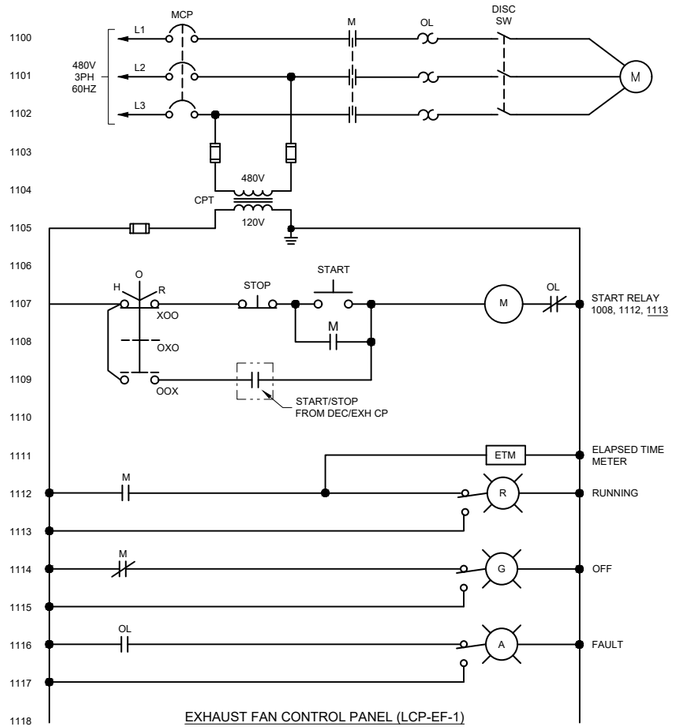
PROJECT NUMBER 483-20-02

DATE: DECEMBER 2022

DRAWING NO.
E-07

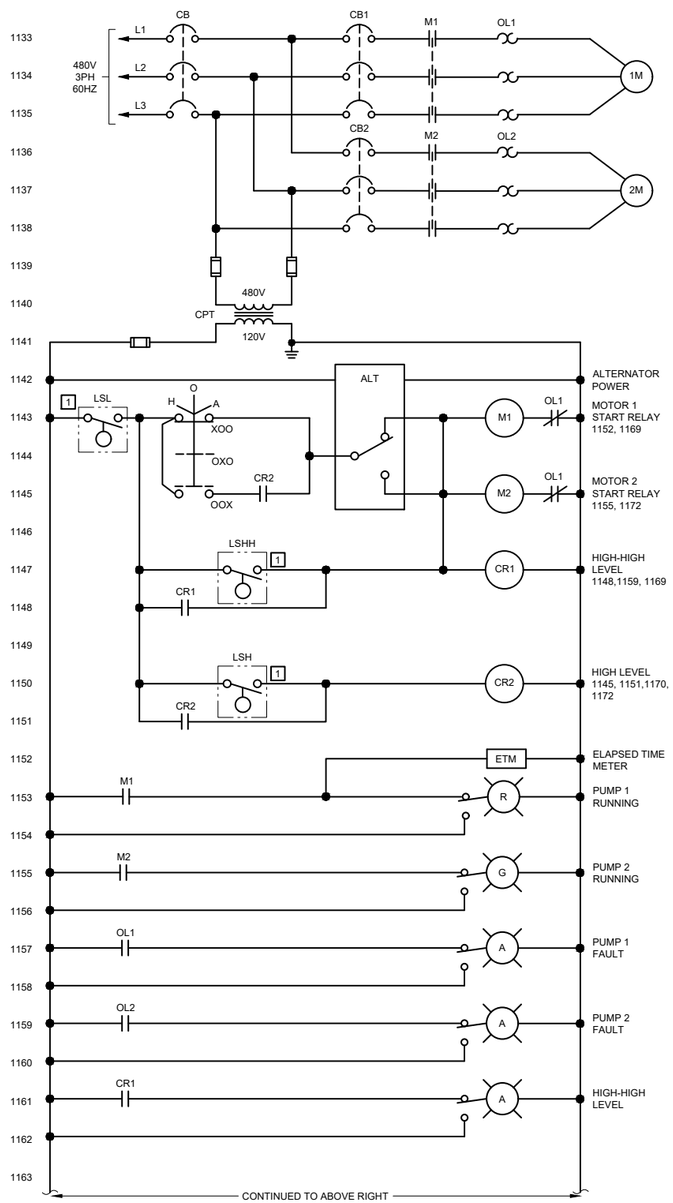
SHEET 073 OF 126

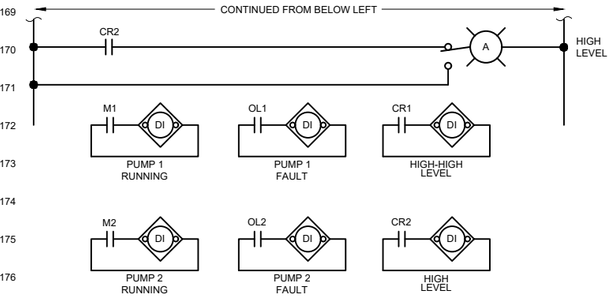
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EXHAUST FAN CONTROL PANEL (LCP-EF-1)

(ALL ITEMS AT LCP UNLESS INDICATED OTHERWISE)





SUMP PUMP CONTROL PANEL (70-LCP-0050)

(ALL ITEMS AT LCP UNLESS INDICATED OTHERWISE)

LOCATION LEGEND	
1	FIELD
2	LCS
3	LCP
4	MCC
5	PLC
6	VFD

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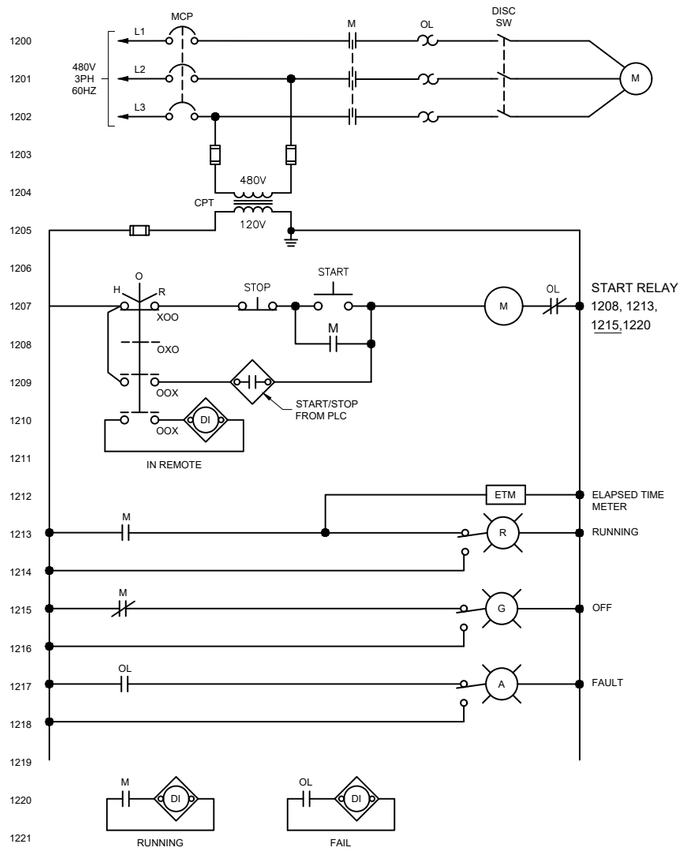
SCHEMATICS – II

DATE: DECEMBER 2022

PROJECT NUMBER 483-20-02

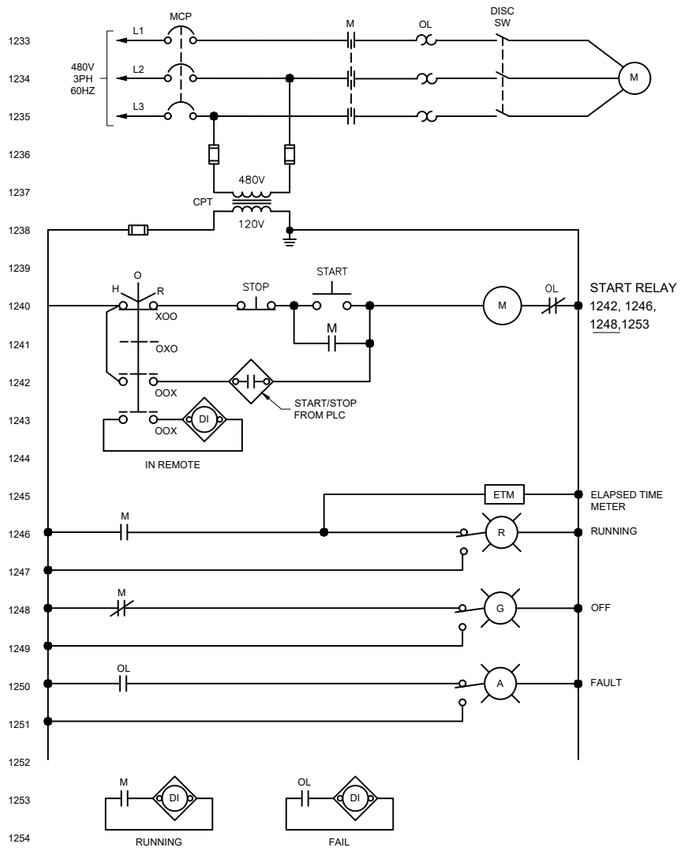
DRAWING NO.
E-08

SHEET 074 OF 126



MIXER CONTROL PANEL (70-MX-0010)

(ALL ITEMS AT LCP UNLESS INDICATED OTHERWISE)



CHLORINE BOOSTER PUMP PANEL (70-P-0061)

(ALL ITEMS AT LCP UNLESS INDICATED OTHERWISE)

LOCATION LEGEND	
1	FIELD
2	LCS
3	LCP
4	MCC
5	PLC
6	VFD

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SCHEMATICS - III

DATE: DECEMBER 2022

PROJECT NUMBER 483-20-02

DRAWING NO.
E-09

SHEET 075 OF 126

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120/208 VOLTS
100 A MAIN BREAKER

3 PH
4 W
150 A

PANELBOARD: 70-LP-01
LOCATION: ELECTRICAL ROOM

FEED: BOTTOM
MOUNTING: SURFACE

LOAD DESCRIPTION	KVA PH A	KVA PH B	KVA PH C	LTG	REC	MIS	CIR	BKR		BKR	CIR	MIS	REC	LTG	KVA PH A	KVA PH B	KVA PH C	LOAD DESCRIPTION
GUH-1	0.3			_	_	1	1	15		20	2	_	_	4	0.23			ELEC RM LIGHTS
GUH-2		0.3		_	_	1	3	15		20	4	_	3	_		0.54		ELEC RM RECPTS
GUH-3			0.3	_	_	1	5	15		20	6	_	_	24			1.35	PUMP RM LIGHTS
WH-1	0.3			_	_	1	7	20		20	8	_	10	_	1.8			PUMP RM RECEPTS
RP-1		0.3		_	_	1	9	20		20	10	_	_	5		0.31		EXTERIOR LIGHTS
DEC/EXH FAN CONTROL PANEL			0.5	_	_	_	11	20		20	12	_	3	_			0.54	EXTERIOR RECPTS
FCU-1	0.15			_	_	1	13	15/2P		20	14	_	_	4	0.23			LOWER RM LIGHTS
		0.15		_	_	_	15			20	16	_	2	_		0.36		LOWER RM RECEPTS
EF-2			0.86	_	_	1	17	15		20	18	1	_	_			0.4	70-PLC-0100
FCU-2	0.15			_	_	1	19	15/2P		20	20	1	_	_	0.25			70-FIT-030
		0.15		_	_	_	21			20	22	1	_	_		0.25		70-FIT-040
SPARE			0.0	_	_	_	23	20		20	24	1	_	_			0.25	70-AIT-030
HP-1	3.0			_	_	1	25	50/2P		20	26	_	_	_	0.07			EFFLUENT CHANNEL LIGHT
		3.0		_	_	_	27			20	28	_	_	_		0.1		70-FSH-0030
SPARE			0.0	_	_	_	29	20		20	30	_	_	_			____	SPARE
HP-2	3.0			_	_	1	31	50/2P		20	32	_	_	_	____			SPARE
		3.0		_	_	_	33			20	34	_	_	_		____		SPARE
SPARE			0.0	_	_	_	35	20		20	36	_	_	_			____	SPARE
SPARE	0.0			_	_	_	37	20		20	38	_	_	_	____			SPARE
SPARE		0.0		_	_	_	39	20		20	40	_	_	_		____		SPARE
SPARE			0.0	_	_	_	41	20		20	42	_	_	_			____	SPARE
	6.9	6.9	1.66				TOTAL			TOTAL					2.58	1.59	2.54	
	PHASE LOAD									TOTAL LOAD								
	9.48	8.49	4.20							22.17 KVA								

LUMINAIRE SCHEDULE

TYPE	WATTS	LAMP TYPE	VOLTS	MOUNTING	MANUFACTURER AND CATALOG NUMBER OR APPROVED EQUAL	DESCRIPTION
C	56.26W	LED	120V	PENDANT	LITHONIA - ZL1F-L48-6000LM-MDD-MVOLT-40K-80CRI-WH	48" LOW PROFILE LED STRIPLIGHT, WHITE, UL LISTED FOR DAMP LOCATIONS
E	10.6W	LED	120V	WALL	LITHONIA - ELM6L-UVOLT-LTP-SDRT	WALL MOUNTED, TWO LAMP, EMERGENCY LIGHT. SEALED LITHIUM IRON PHOSPHATE BATTERY SHALL PROVIDE A MINIMUM OF 90 MINUTE EMERGENCY OPERATION. UNIT SHALL HAVE SELF DIAGNOSTIC AND REMOTE TESTING AND MINIMUM OF 1100 LUMEN OUTPUT
W	39W	LED	120V	WALL	HOLOPHANE - W4GLED-10C1000-30K-T3M-MVOLT-SPD-PCB-GYSPD	WALLPACK, LED, MEDIUM LIGHT DISTRIBUTION, GREY, WITH INEGRAL PHOTOCELL
X		LED	120V	WALL	HOLOPHANE - MEX-S-W-1-R-ELN	EXIT SIGN, UL LISTED FOR DAMP LOCATION, WHITE FACE WITH RED LETTERS, DIE-CAST ALUMINUM COMPACT HOUSING, BRUSHED ALUMINUM FACEPLATE WITH MATTE BLACK TRIM AND CLEAR LACQUER FINISH . DUAL VOLTAGE INPUT, NICKEL CADMIUM EMERGENCY BATTERY BACK UP.
P	42W	LED	120V	WALL	VLT- ILLUMINATOR - LGL42-4-28-W/W-D-MVOLT FIXTURE - RF-MX-AD-PG-SS-303 (REEF SERIES) CABLE - F-MF-EL-PM-8 (MEGOFLEX FIBER)	UNDERWATER LIGHTING SYSTEM CONSISTING OF WALL MOUNTED ILLUMINATOR, FIBER OPTIC CABLES INSTALLED IN CONDUIT AND WALL MOUN UNDERWATER FIXTURES. RATED FOR FULL SUBMERGENCE UP TO 3'. MADE OF MARINE GRADE 316 STAINLESS STEEL.

Stantec

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APPROVED C. ROGERS

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SCHEDULES

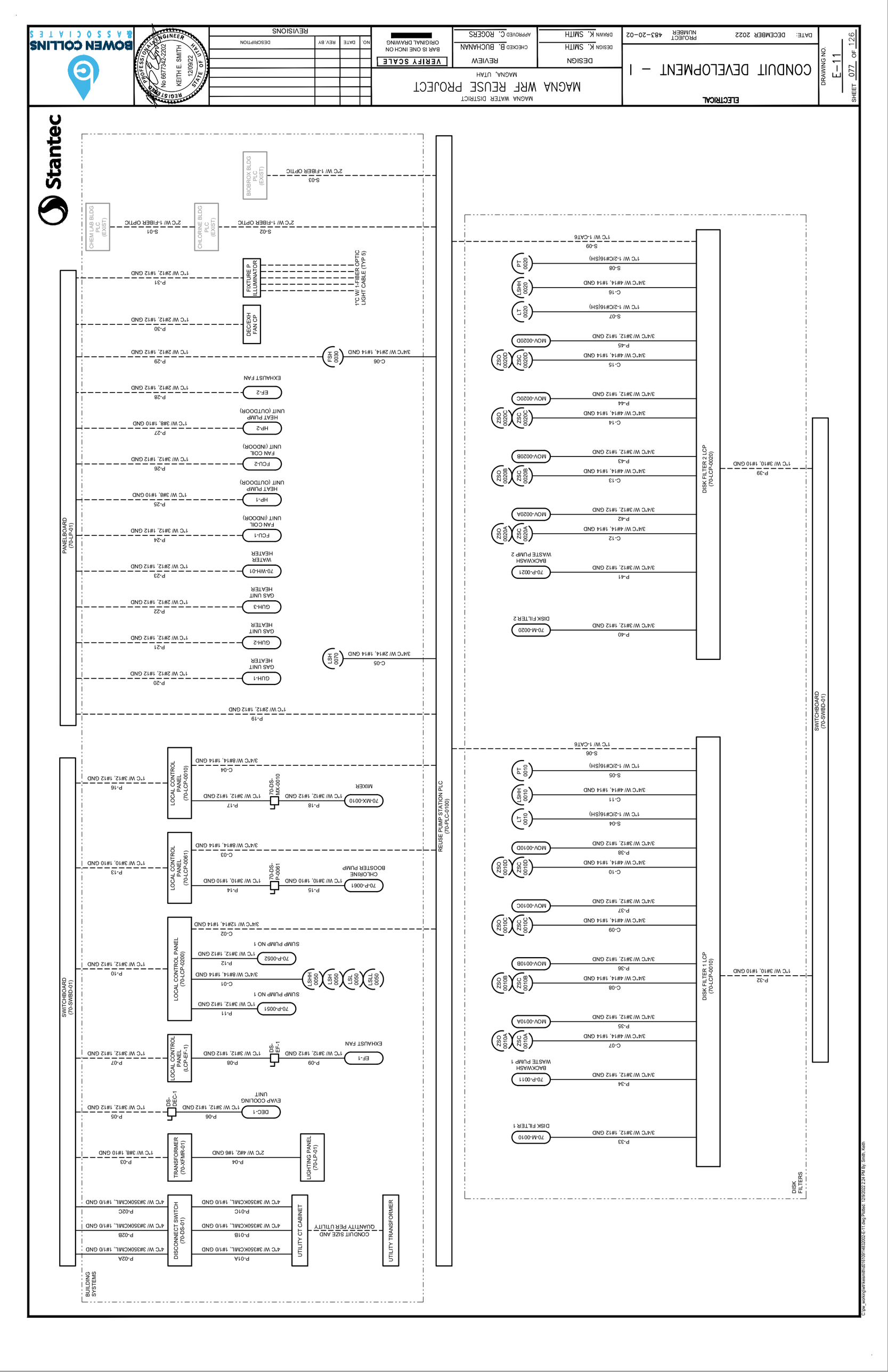
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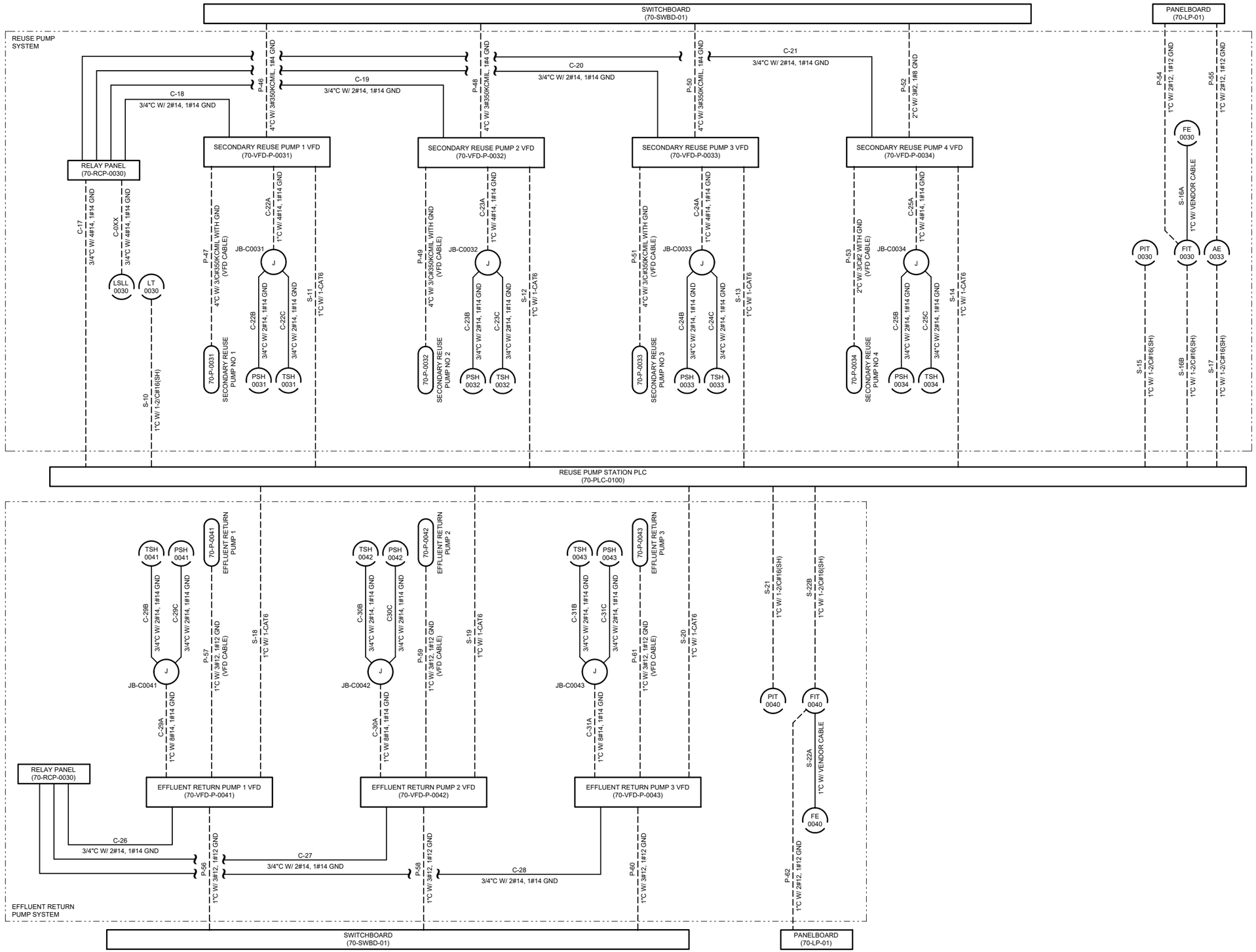
PROJECT NUMBER 483-20-02

DRAWING NO.
E-10

SHEET 076 OF 126

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APPROVED C. ROGERS
DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02
CONDUIT DEVELOPMENT - 1
ELECTRICAL
DRAWING NO. E-11
SHEET 077 OF 126
Stantec
BUILDING SYSTEMS
SWITCHBOARD (70-SWBD-01)
PANELBOARD (70-LP-01)
CHEM LAB BLDG PLC (EXIST)
CHLORINE BLDG PLC (EXIST)
BIOBROX BLDG PLC (EXIST)
2"C W/ 1-FIBER OPTIC
S-01
S-02
S-03
FIXTURE P ILLUMINATOR
1"C W/ 4 FIBER OPTIC LIGHT CABLE (TYP 5)
DEC/EXH FAN CP
FSH 0030
LSH 0070
GUH-1 GAS UNIT HEATER
GUH-2 GAS UNIT HEATER
GUH-3 GAS UNIT HEATER
70-WH-01 WATER HEATER
FCU-1 FAN COIL UNIT (INDOOR)
HP-1 HEAT PUMP UNIT (OUTDOOR)
FCU-2 FAN COIL UNIT (INDOOR)
HP-2 HEAT PUMP UNIT (OUTDOOR)
EF-2 EXHAUST FAN
1"C W/ 2#12, 1#12 GND
3/4"C W/ 2#14, 1#14 GND
1"C W/ 3#8, 1#10 GND
P-19
P-20
P-21
P-22
P-23
P-24
P-25
P-26
P-27
P-28
P-29
P-30
P-31
C-05
C-06
REUSE PUMP STATION PLC (70-PLC-0100)
1"C W/ 1-CAT6
S-09
S-06
DISK FILTER 2 LCP (70-LCP-0020)
DISK FILTER 1 LCP (70-LCP-0010)
PT 0020
LSHH 0020
LT 0020
ZSC 0020D
ZSO 0020D
MOV-0020D
ZSC 0020C
ZSO 0020C
MOV-0020C
ZSC 0020B
ZSO 0020B
MOV-0020B
ZSC 0020A
ZSO 0020A
MOV-0020A
70-P-0021 BACKWASH WASTE PUMP 2
70-M-0020 DISK FILTER 2
PT 0010
LSHH 0010
LT 0010
ZSC 0010D
ZSO 0010D
MOV-0010D
ZSC 0010C
ZSO 0010C
MOV-0010C
ZSC 0010B
ZSO 0010B
MOV-0010B
ZSC 0010A
ZSO 0010A
MOV-0010A
70-P-0011 BACKWASH WASTE PUMP 1
70-M-0010 DISK FILTER 1
1"C W/ 3#10, 1#10 GND
P-32
P-33
P-34
P-35
P-36
P-37
P-38
P-39
P-40
P-41
P-42
P-43
P-44
P-45
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C-08
C-09
C-10
C-11
C-04
C-12
C-13
C-14
C-15
C-16
S-04
S-05
S-07
S-08
DISK FILTERS
SWITCHBOARD (70-SWBD-01)
LOCAL CONTROL PANEL (70-LCP-0200)
LOCAL CONTROL PANEL (70-LCP-0061)
LOCAL CONTROL PANEL (70-LCP-0010)
LOCAL CONTROL PANEL (LCP-EF-1)
70-DS-MX-0010
70-DS-P-0061
DS-EF-1
70-MX-0010 MIXER
70-P-0061 CHLORINE BOOSTER PUMP
70-P-0052 SUMP PUMP NO 1
70-P-0051 SUMP PUMP NO 1
EF-1 EXHAUST FAN
3/4"C W/ 12#14, 1#14 GND
3/4"C W/ 8#14, 1#14 GND
HHSH 0050
LSH 0050
TST 0050
TSLL 0050
C-01
C-02
C-03
P-10
P-11
P-12
P-13
P-14
P-15
P-16
P-17
P-18
P-07
P-08
P-09
DEC-1 EVAP COOLING UNIT
DS-DEC-1
P-05
P-06
TRANSFORMER (70-XFMR-01)
LIGHTING PANEL (70-LP-01)
2"C W/ 4#2, 1#6 GND
P-03
P-04
DISCONNECT SWITCH (70-DS-01)
UTILITY CT CABINET
CONDUIT SIZE AND QUANTITY PER UTILITY
UTILITY TRANSFORMER
4"C W/ 3#350KCMIL, 1#1/0 GND
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Stantec

BOWEN COLLINS & ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
No 6677342-2202
KEITH E. SMITH
12/09/22
STATE OF UTAH

NO	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

DESIGN K. SMITH
DRAWN K. SMITH
CHECKED B. BUCHANAN
APPROVED C. ROGERS
REVIEW

ELECTRICAL

CONDUIT DEVELOPMENT – II

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
E-12
SHEET 078 OF 126

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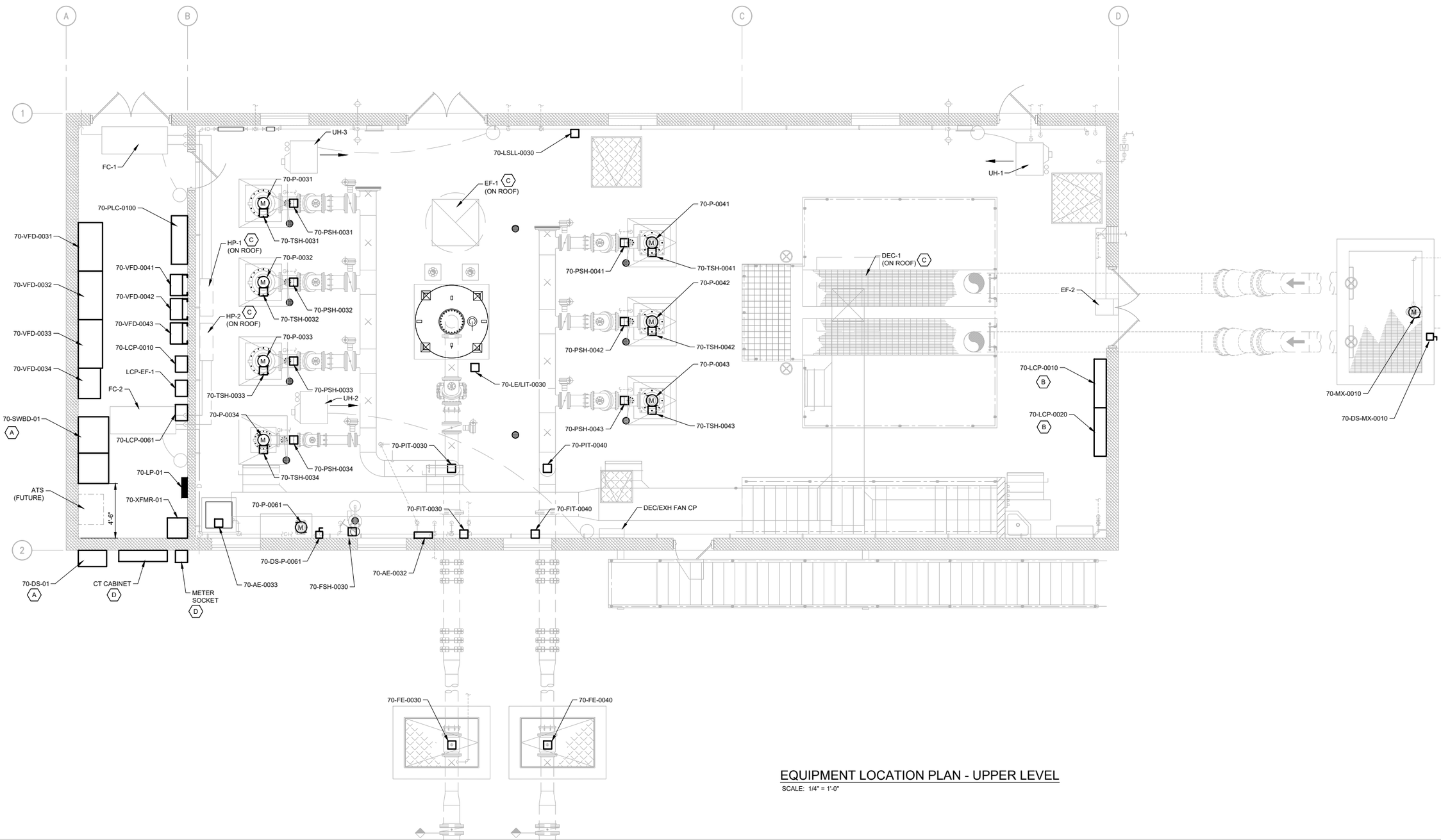
SHEET KEYNOTES

A. CONDUITS BETWEEN 70-DS-01 AND 70-SWBD-01 TO BE EXPOSED ABOVE GROUND TO ALLOW FOR FUTURE INSTALLATION OF ATS BETWEEN THEM.

B. PROVIDE 3-1" CONDUITS FROM EACH FILTER PANEL THROUGH FLOOR TO LOWER LEVEL FOR FUTURE USE. CAP CONDUITS AT BOTH ENDS.

C. LOCATE DISCONNECT SWITCH ON ROOF NEAR UNIT.

D. PROVIDE CT CABINET AND METER SOCKET PER UTILITY STANDARDS



EQUIPMENT LOCATION PLAN - UPPER LEVEL

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

Stantec

BOWEN COLLINS & ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
No 6677342-2202
KEITH E. SMITH
12/09/22
STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
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MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

VERIFY SCALE
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REVIEW
CHECKED B. BUCHANAN
APPROVED C. ROGERS

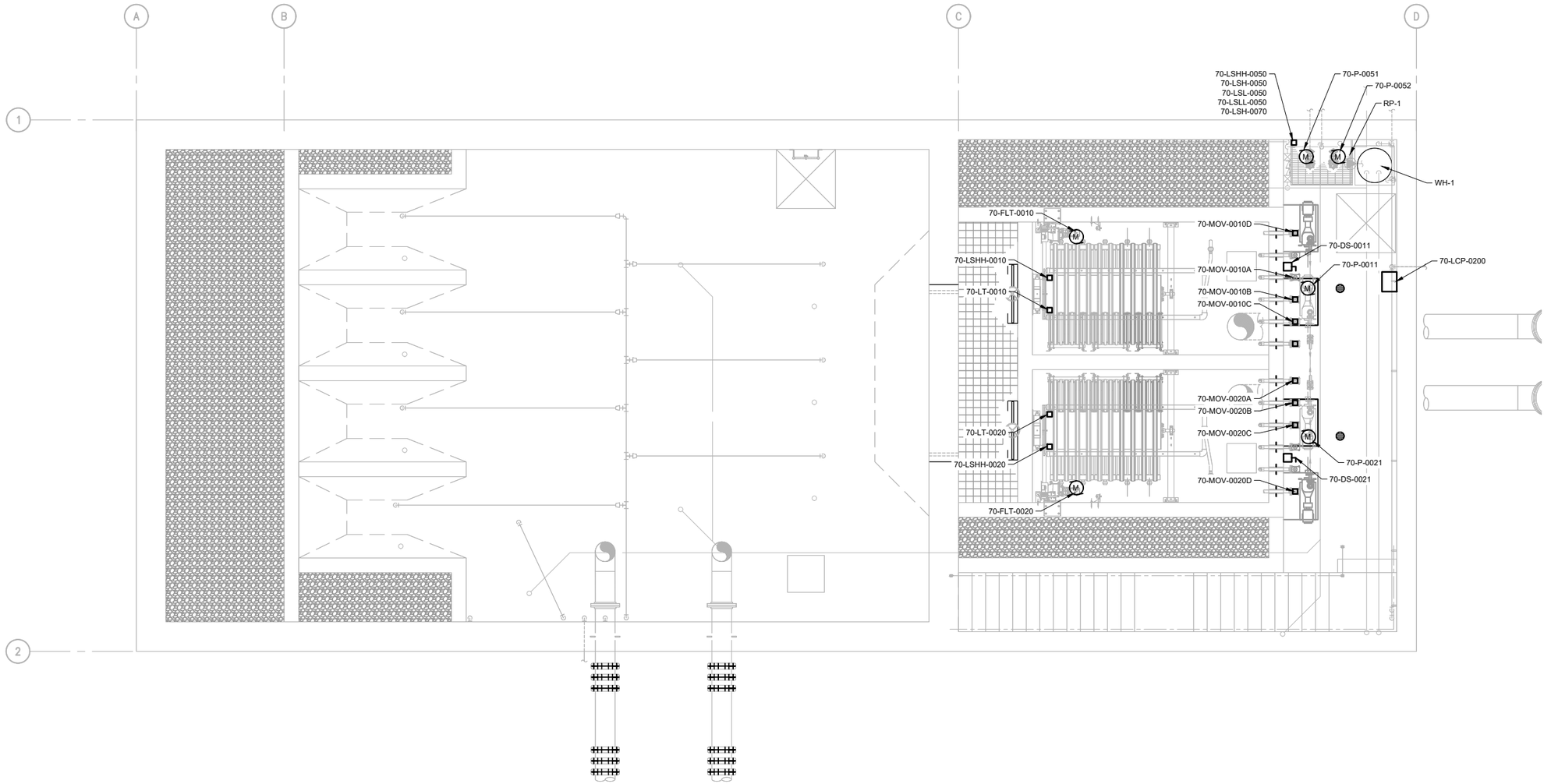
DESIGN
DESIGN K. SMITH
DRAWN K. SMITH

ELECTRICAL
UPPER LEVEL
EQUIPMENT LOCATION PLAN

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
E-13
SHEET 079 OF 126

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EQUIPMENT LOCATION PLAN - LOWER LEVEL

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

Stantec

BOWEN COLLINS & ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
No 6677342-2202
KEITH E. SMITH
12/09/22
STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION

REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

DESIGN
DESIGN K. SMITH
DRAWN K. SMITH

REVIEW
CHECKED B. BUCHANAN
APPROVED C. ROGERS

ELECTRICAL
LOWER LEVEL
EQUIPMENT LOCATION PLAN

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
E-14

SHEET 080 OF 126

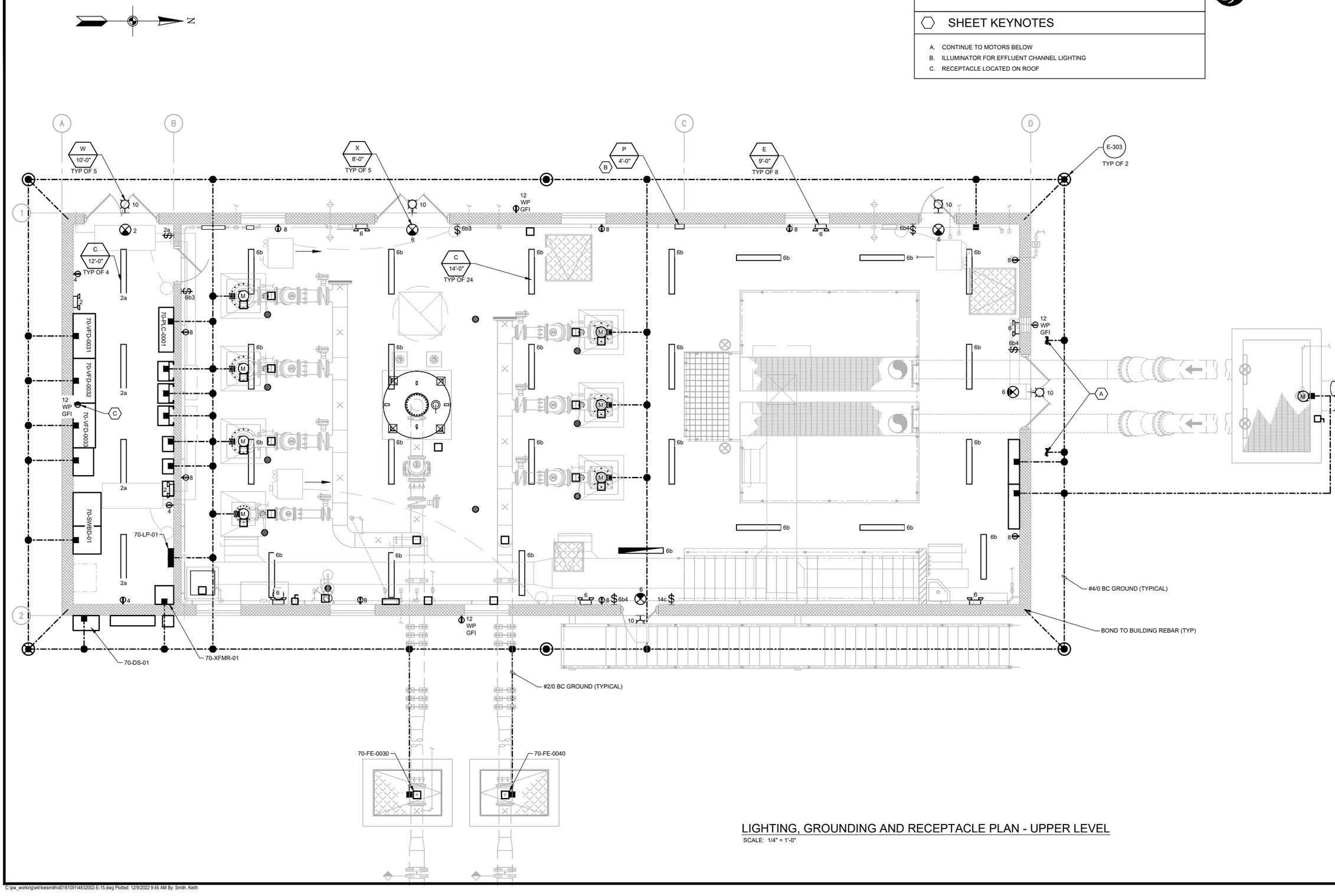
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GENERAL SHEET NOTES

1. ALL LIGHTS AND RECEPTACLES POWERED FROM PANEL 70-LP-01

SHEET KEYNOTES

A. CONTINUE TO MOTORS BELOW
B. ILLUMINATOR FOR EFFLUENT CHANNEL LIGHTING
C. RECEPTACLE LOCATED ON ROOF



LIGHTING, GROUNDING AND RECEPTACLE PLAN - UPPER LEVEL
SCALE: 1/4" = 1'-0"

Stantec

BOWEN COLLINS & ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
No 6677342-2202
KEITH E. SMITH
12/09/22
STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW
CHECKED B. BUCHANAN
APPROVED C. ROGERS

DESIGN
DESIGN K. SMITH
DRAWN K. SMITH

ELECTRICAL
UPPER LEVEL
LIGHTING, RECEPTACLE, AND GROUNDING PLAN

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
E-15
SHEET 081 OF 126

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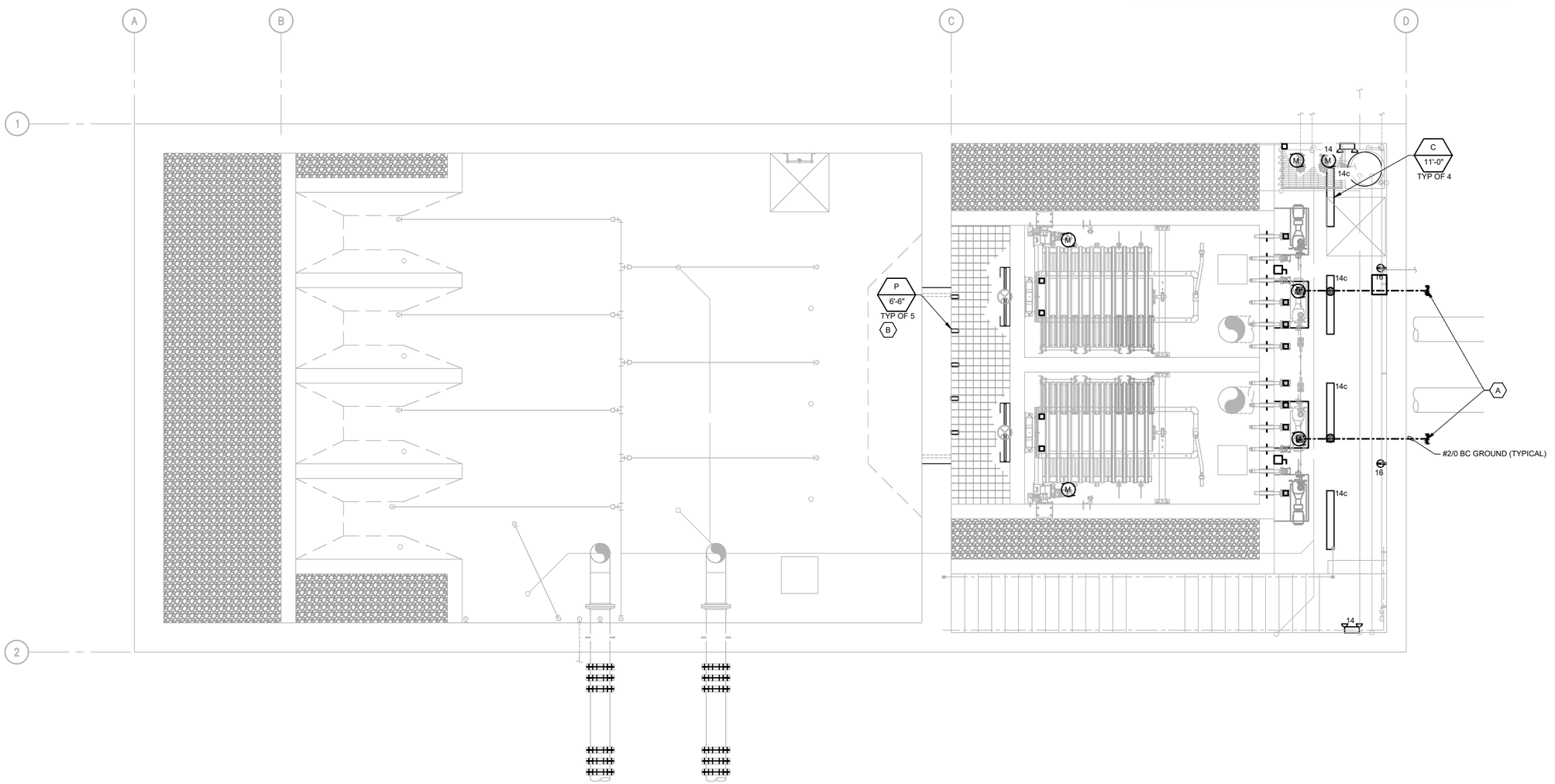
GENERAL SHEET NOTES

1. ALL LIGHTS AND RECEPTACLES POWERED FROM PANEL RP-LP-01

SHEET KEYNOTES

A. CONTINUE TO GROUND GRID ABOVE

B. FIXTURES FOR EFFLUENT CHANNEL LIGHTING. LOCATE FIXTURE APPROXIMATELY 1' BELOW BOTTOM OF WEIR. ROUTE FIBER OPTIC CABLES ALONG WALL UNDER WEIR TO THE WEST THEN UP TO CONDUITS LOCATED NEAR TOP OF EFFLUENT STRUCTURE. SECURE FIBER OPTIC CABLES TO WALL TO PREVENT THEM FROM MOVING.



LIGHTING, GROUNDING AND RECEPTACLE PLAN - LOWER LEVEL

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

Stantec

BOWEN COLLINS & ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
No 6677342-2202
KEITH E. SMITH
12/09/22
STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

DESIGN
DESIGN K. SMITH
DRAWN K. SMITH

REVIEW
CHECKED B. BUCHANAN
APPROVED C. ROGERS

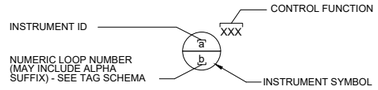
ELECTRICAL
LOWER LEVEL
LIGHTING, RECEPTACLE, AND GROUNDING PLAN

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
E-16
SHEET 082 OF 126

C:\pw_working\wtr\keismith\d01610914832002-E-16.dwg Plotted: 12/9/2022 9:46 AM By: Smith, Keith

INSTRUMENTATION CALL - OUT



INSTRUMENT SYMBOLS

XXX a b — FIELD MOUNTED INSTRUMENT

XXX a b — FIELD MOUNTED SHARED DISPLAY/CONTROL

XXX a b — FRONT OF PANEL INSTRUMENT

XXX a b — CONTROL SYSTEM SHARED DISPLAY/CONTROL (ACCESSIBLE VIA OI / HMI)

XXX a b — INSTRUMENT MOUNTED WITHIN PANEL

XXX a b — CONTROL SYSTEM SHARED DISPLAY/CONTROL (ACCESSIBLE FROM WITHIN PANEL)

XXX XXX — SINGLE INSTRUMENT WITH MULTIPLE FUNCTIONS

I — RELAY INTERLOCK LOGIC

I — GENERIC SOFTWARE INTERLOCK / CONTROL LOGIC (NORMALLY ACCESSIBLE TO OPERATOR) *

I — GENERIC SOFTWARE INTERLOCK / CONTROL LOGIC (OPERATOR INACCESSIBLE) *

DATA ROUTING ARROW

CR — CONTROL RELAY

1 — ON-PAGE LOGIC LINK REFERENCE

SPD — LIGHTNING SURGE ARRESTOR

a — INSTRUMENT IDENTIFICATION / TAG NUMBER (SEE MODIFIED ISA TABLE FOR MORE INFO)

XXXV — PRIMARY ELECTRICAL POWER (e.g. 24VDC, 120VAC, 220VAC, 480VAC)

b — INSTRUMENT LOOP NUMBER

NOTE: IF INSTRUMENT POWER NOT INDICATED, REFER TO INSTRUMENT SCHEDULE FOR CONFIRMATION.

XXX — CONTROL FUNCTION

* REFER TO SPEC SECTION 409300 (PROJECT CONTROL PHILOSOPHY) FOR DETAILS.

PLC / REMOTE I/O POINTS

ANALOG INPUT | DISCRETE INPUT | DATA SIGNAL ANALOG INPUT * | DATA SIGNAL DISCRETE INPUT *

ANALOG OUTPUT | DISCRETE OUTPUT | DATA SIGNAL ANALOG OUTPUT * | DATA SIGNAL DISCRET OUTPUT *

* FIELD NETWORK INTERFACE. SEE SPECIFICATION FOR MORE INFORMATION

COMPUTING OR CONVERTING FUNCTIONS

COMPUTING

CONVERTING

Σ	SUMMING	D	DERIVATIVE
X	MULTIPLYING	A	AVERAGING
÷	DIVIDING	1:1	RATIO
√	SQ ROOT EXTRACTION	Δ	DIFFERENCE
P	PROPORTIONAL	>	HIGH SELECTING
J	INTEGRAL	<	LOW SELECTING
X^n	EXPONENTIAL	±	BIAS
▷	HIGH LIMITING	◁	LOW LIMITING
⌐	LINEARIZER		

E	VOLTAGE
I	CURRENT
P	PNEUMATIC
R	RESISTANCE (ELECT)
D	DIGITAL
A	ANALOG
B	BINARY
H	HYDRAULIC

CONTROL FUNCTION DESIGNATIONS

AHC	AUTO / HOLD / CLOSE	OLH	OFF / LOW / HIGH
AM	AUTO / MANUAL	O/O	ON / OFF
AS	AIR SUPPLY	O/R	OVERRIDE
BEAR	BEARING	OOR	OUT OF RANGE
CLSD	CLOSED	OSC	OPEN / STOP / CLOSE
CV	CONTROL VARIABLE	PID	PROPORTIONAL / INTEGRAL / DERIVATIVE
DEV	DEVIATION	POT	POTENTIOMETER
E-STOP	EMERGENCY STOP	PV	PROCESS VARIABLE
ETM	ELAPSED TIME METER	RDY	READY
FOR	FORWARD /OFF /REVERSE	R/L	RAISE / LOWER
HML	HIGH / MID / LOW	RSL	RAISE / STOP / LOWER
HOA	HAND / OFF / AUTO	RST	RESET
HOR	HAND / OFF / REMOTE	RTD	RESISTANCE TEMPERATURE DETECTOR
LEAK	MOISTURE INTRUSION	SD	SHUTDOWN
LOR	LOCAL / OFF / REMOTE	SEL	SELECT
L/R	LOCAL / REMOTE	SP	SET POINT
LSR	LOCAL / STOP / REMOTE	S/R	START / RESET
MOA	MANUAL / OFF / AUTO	S/S	START / STOP
MN	MAINTENANCE / NORMAL	STR	START
O/C	OPEN / CLOSE	STP	STOP
OCA	OPEN / CLOSE / AUTO	TMR	TIMER
OL	OVERLOAD	WIND	WINDING

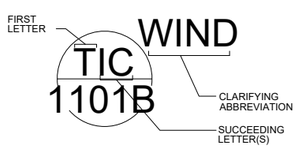
NOTE: 1. REFER TO DRAWING GI-2 FOR ANALYTICAL INSTRUMENT DESIGNATIONS.

ISA TABLE (MODIFIED)

	FIRST LETTER		SUCCEEDING LETTER(S)		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION				
C	CONDUCTIVITY			CONTROL	CLOSED
D	DENSITY	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			FORWARD
G			GAUGE, GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOISTURE	MOMENTARY			MIDDLE, INTERMEDIATE
N	TORQUE		ISOLATE	ISOLATOR	
O			ORIFICE, RESTRICTION		OPEN
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		REVERSE
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	INTRUSION	X AXIS			
Y	EVENT, STATE, OR PRESENCE	Y AXIS		COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, FINAL CONTROL ELEMENT	

TAG SCHEMA

TYPICAL INSTRUMENT & CONTROL VALVE TAGGING



TYPICAL INSTRUMENT & CONTROL VALVE TAGGING

10-TIC-1101B – – INSTRUMENT SCHEDULE (FULL TAG)
TIC-1101B – – P&ID (PARTIAL TAG)
10 – – – – – – – PROCESS AREA
TIC – – – – – – INSTRUMENT / VALVE ID
1101 – – – TAG NUMBER
B – – SUFFIX

NOTE: REFER TO GENERAL SHEET I-02 FOR STANDARD SYMBOLS.

TYPICAL EQUIPMENT TAG FORMAT



10-P-1101B

TYPICAL EQUIPMENT TAG FORMAT

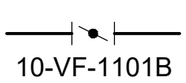
10-P-1101B – – EQUIPMENT SCHEDULE (FULL TAG)
10 – – – – – – PROCESS AREA
P – – – – – EQUIPMENT ID
1101 - – – TAG NUMBER
B – - SUFFIX

NOTE: REFER TO GENERAL SHEET I-03 FOR STANDARD SYMBOLS.

TYPICAL PIPE LINE TAG FORMAT (REFER MECHANICAL DRAWING M-01 AND M-02 FOR PIPE SPECIFICATION)

12"-RW (CS08) - - - - - PIPE LINE SCHEDULE (FULL TAG)
12" – – – – – – – – – – NOMINAL PIPE DIAMETER
RW – – – – – – – – FLUID CODE
CS08 - - - - - PIPE SPEC

TYPICAL VALVE TAG / SPEC FORMAT



10-VF-1101B — VALVE TAG

TYPICAL MANUAL VALVE TAG FORMAT

10-VLV-1101B– – MANUAL VALVE SCHEDULE (FULL TAG)
10 – – – – – – – PROCESS AREA
VLV – – – – – VALVE
1101 - – – TAG NUMBER
B – - SUFFIX

NOTE: REFER TO GENERAL SHEET I-03 FOR STANDARD VALVE CALLOUTS.

GENERAL INSTRUMENTATION NOTES

1. THE SYMBOLS AND NOMENCLATURE SHEETS ARE REPRESENTATIVE OF A GENERAL STANDARD. THEREFORE, IT SHOULD BE UNDERSTOOD THAT NOT ALL INFORMATION PRESENTED WILL BE RELEVANT TO THIS PROJECT.
2. ADDITIONAL INSTRUMENTATION AND CONTROL SYMBOLS MAY BE USED ASREQUIRED. SYMBOLS AND NOMENCLATURE WILL BE EITHER BASED ON ISA STANDARD 5.1-INSTRUMENTATION SYMBOLS AND IDENTIFICATION OR DEFINED ELSEWHERE IN THE P&ID SET.
3. SEE ELECTRICAL AND PROJECT GENERAL SHEETS FOR ADDITIONAL SYMBOLS AND ABBREVIATIONS.
4. TO CAPTURE THE COMPLETE PROCESS CONTROL INTENT, THE P&IDS MUST TO BE REVIEWED IN CONJUNCTION WITH THE PROJECT CONTROL PHILOSOPHY (SPEC SECTION 409010), THE PROJECT I/O AND INSTRUMENT SCHEDULES AND OTHER SECTIONS REFERENCED HEREIN.

INSTRUMENTATION LINE SYMBOLOGY

NEW WORK (UNSCREENED)

EXISTING (SCREENED)

EXISTING TO BE DEMOLISHED

FUTURE EQUIPMENT (DASH)

VENDOR SKID LIMIT

INSTRUMENT LINE DEFINITIONS (UNLESS SPECIFICALLY NOTED OTHERWISE PER DRAWING LEGEND)

DATA LINK OR SYSTEM BUS BETWEEN DEVICES

ELECTRIC (PULSE SIGNAL)

ELECTRICAL SIGNAL

ULTRASONIC SIGNAL

HYDRAULIC SIGNAL

MECHANICAL LINK

PNEUMATIC SIGNAL

PROCESS

AS — AIR SUPPLY

COMMUNICATION LINE DEFINITIONS (UNLESS SPECIFICALLY NOTED OTHERWISE PER DRAWING LEGEND)

UTP (CAT 5e OR CAT 6 AS NOTED)

P — P — PROFIBUS

F — F — FOUNDATION FIELD BUS

M — M — MODBUS (RS485)

SINGLE MODE FIBER

MULTIMODE FIBER

VENDOR SIGNAL CABLE

D — D — DEVICENET (THIN - DROP)

D — D — DEVICENET (THICK - TRUNK)

SIGNAL AND PROCESS OFF-PAGE CONNECTORS

PROCESS OR LOGIC CONNECTION TO DRAWING I-02 — I-02 (A)

PROCESS OR LOGIC CONNECTION FROM DRAWING I-02 — I-02 (A)

PROCESS OR LOGIC CONNECTION TO/FROM DRAWING I-02 — I-02 (A)

PROCESS OR LOGIC CONNECTION CONTINUES TO UNREPRESENTED DRAWING

NOTE: REFER TO INSTRUMENTATION LINE SYMBOLOGY FOR PROCESS AND LOGIC LINESTYLE DEFINITION.

Stantec

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — No.11965314 — BARBARA CHOPADE — 12/13/22 — STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

NO SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

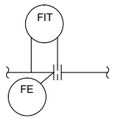
DESIGN S. KEEN | DRAWN P. CHOPADE | CHECKED D. STEFFES | APPROVED B. HERRERA | REVIEW

INSTRUMENTATION AND CONTROL
SYMBOLS AND NOMENCLATURE – I

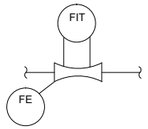
PROJECT NUMBER 483-20-02
DATE: DECEMBER 2022

DRAWING NO. I-01
SHEET 83 OF 126

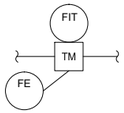
FLOW INSTRUMENTS



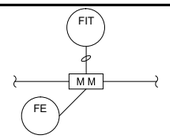
ORIFICE PLATE WITH VENA CONTRACTA, RADIUS, OR PIPE TAPS CONNECTED TO DIFFERENTIAL-PRESSURE -TYPE FLOW TRANSMITTER



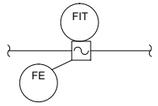
VENTURI TUBE WITH (DIFFERENTIAL PRESSURE) FLOW TRANSMITTER



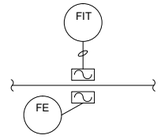
THERMAL MASS FLOW METER



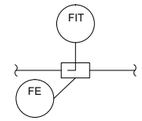
MAGNETIC FLOWMETER WITH REMOTE FLOW TRANSMITTER



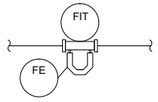
SONIC FLOWMETER DOPPLER OR TRANSIT TIME



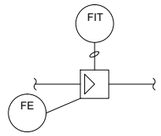
SONIC FLOWMETER CLAMP ON TYPE



SINGLE PORT PITOT TUBE OR PITOT-VENTURI TUBE



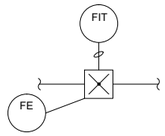
CORIOLIS FLOWMETER



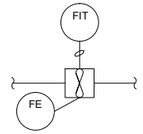
VORTEX FLOW METER



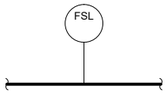
VARIABLE AREA FLOW INDICATOR (ROTAMETER)



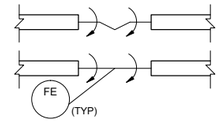
PADDLE WHEEL FLOW METER



TURBINE OR PROPELLER TYPE FLOW METER

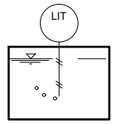


FLOW DETECTION SWITCH THERMAL TYPE

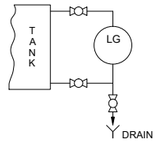


WEIR

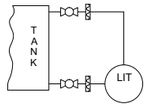
LEVEL INSTRUMENTS



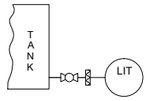
LEVEL TRANSMITTER BUBBLER TYPE



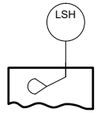
GAUGE GLASS (EXTERNALLY CONNECTED)



LEVEL TRANSMITTER, SEALED DIFFERENTIAL PRESSURE TYPE (MOUNTED ON TANK)



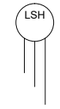
LEVEL TRANSMITTER PRESSURE ACTUATED



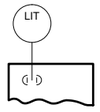
LEVEL DETECTION SWITCH FLOAT ACTUATED TYPE



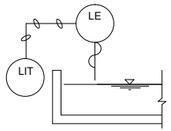
LEVEL DETECTION SWITCH VIBRATING FORK TYPE



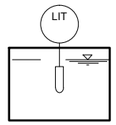
LEVEL DETECTION SWITCH CONDUCTANCE TYPE



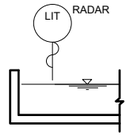
LEVEL TRANSMITTER CAPACITANCE OR DIELECTRIC OR RF ADMITTANCE TYPE



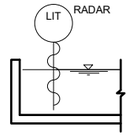
LEVEL TRANSMITTER NON-CONTACTING ULTRASONIC TYPE REMOTE MOUNTED



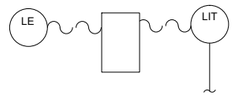
LEVEL TRANSMITTER HYDROSTATIC TYPE



LEVEL TRANSMITTER NON-CONTACTING RADAR TYPE

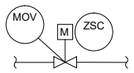


LEVEL TRANSMITTER GUIDED WAVE RADAR TYPE

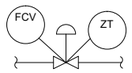


LEVEL TRANSMITTER RADIOACTIVE OR SONIC TYPE WITH INTEGRAL SENSOR

POSITION INSTRUMENTS

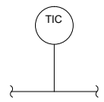


LIMIT SWITCH ON MOTORIZED VALVE INDICATING CLOSED POSITION

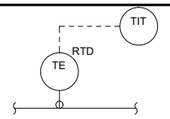


VALVE POSITION TRANSMITTER ON PNEUMATIC ACTUATED VALVE

TEMPERATURE INSTRUMENTS

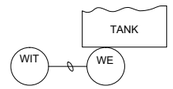


BIMETALLIC TYPE THERMOMETER, GLASS THERMOMETER, OR OTHER LOCAL UNCLASSIFIED TEMPERATURE INDICATOR

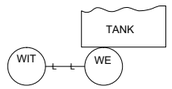


THERMOCOUPLE, RESISTANCE BULB (RTD) OR THERMISTOR (TH) TEMPERATURE TRANSMITTER WITH THERMOWELL

WEIGHT INSTRUMENTS

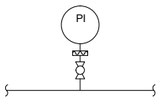


STRAIN GAUGE CONNECTED TO SEPARATE WEIGHT TRANSMITTER (TAG STRAIN GAUGE WE)

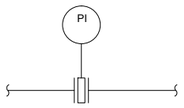


HYDRAULIC ACTUATED WEIGHT TRANSMITTER

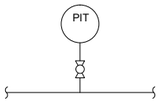
PRESSURE OR VACUUM INSTRUMENTS



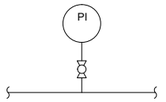
PRESSURE GAUGE WITH DIAPHRAGM SEAL



PRESSURE GAUGE WITH LIQUID FILLED ANNULAR SEAL SYSTEM

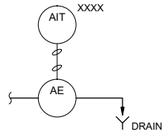


PRESSURE INDICATING TRANSMITTER



PRESSURE INDICATOR DIRECT - CONNECTED

ANALYTICAL INSTRUMENTS



FLOW THROUGH ANALYZING ELEMENT WITH REMOTE TRANSMITTER

ALK	ALKALINITY
CL_2	CHLORINE CONCENTRATION
COMB	COMBUSTIBLE GAS
COND	CONDUCTIVITY
COD	CHEMICAL OXYGEN DEMAND
DO	DISSOLVED OXYGEN
HC	HYDROCARBON
H_2O_2	HYDROGEN PEROXIDE
H_2S	HYDROGEN SULFIDE
LEL	LOWER EXPLOSIVE LIMIT
NO_3 / NO_2	NITRATE / NITRITE
NH_3 / NH_4	AMMONIA / AMMONIUM
O_2	OXYGEN CONCENTRATION
O_3	OZONE
ORP	OXIDATION - REDUCTION POTENTIAL
PC	PARTICLE COUNTER
pH	HYDROGEN ION CONCENTRATION
SCU	STREAMING CURRENT UNIT
SO	SULFUR DIOXIDE
TH 2	TOTAL HARDNESS
TKN	TOTAL KJELDAHL NITROGEN
TN	TOTAL NITROGEN
TOC	TOTAL ORGANIC CARBON
TURB	TURBIDITY
TSS	TOTAL SUSPENDED SOLIDS
UVI	ULTRA VIOLET INTENSITY
UVT	ULTRA VIOLET TRANSMITTANCE

NOTE : IN THE CASE WHERE MULTIPLE SENSORS ARE TIED TO A SINGLE TRANSMITTER OR IN THE CASE OF GAS DETECTION, THE ANALYTIC CALLOUT WILL BE ASSIGNED TO THE SENSOR.

Stantec

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
No. 11965314
BARBARA HERRERA
12/13/22
STATE OF UTAH

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			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

NO SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW CHECKED D. STEFFES APPROVED B. HERRERA

DESIGN DESIGN S. KEEN DRAWN P. CHOPADE

INSTRUMENTATION AND CONTROL
SYMBOLS AND NOMENCLATURE - II

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
I-02
SHEET 84 OF 126

C:\PlantCache\181301171-Magna Water Reuse Facility\PID DWG\I-02.dwg Plotted: 12/14/2022 10:33 AM By: Chopade, Pandurang

VALVES

- 3 WAY MULTI-PORT VALVE
- 4 WAY MULTI-PORT VALVE
- AIR VACUUM, AIR RELEASE, OR COMBINATION AIR VACUUM AND AIR RELEASE ASSEMBLY
- ANGLE VALVE
- BACK-PRESSURE VALVE
- BACKFLOW PREVENTER VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- CONE VALVE
- DIAPHRAGM VALVE
- FLAP VALVE
- GATE VALVE
- GLOBE VALVE
- HOSE BIBB VALVE
- NEEDLE VALVE
- PINCH VALVE
- PLUG VALVE
- PRESSURE REGULATING VALVE
- PRESSURE RELIEF VALVE
- SLEEVE VALVE
- TELESCOPING VALVE
- FLOAT VALVE
- BALL CHECK VALVE
- MUD VALVE

VALVE AND GATE ACTUATORS

- DIAPHRAGM ACTUATOR
- E/H = ELECTROHYDRAULIC
  P = PNEUMATIC
  S = SOLENOID
- MOTOR ACTUATOR
- PISTON ACTUATOR
- WEIGHT BALANCED ACTUATOR

GATES

- SLIDE GATE
- STOP GATE OR SHEAR GATE

WASTEWATER EQUIPMENT

- BELT FILTER PRESS
- SHAFTLESS CONVEYOR
- SCREW CONVEYOR
- CENTRIFUGE
- GRAVITY BELT THICKENER
- BELT CONVEYOR
- SLUDGE GRINDER

HVAC

- AIR CONDITIONING UNIT
- DUCT AIR FILTER
- AIR HANDLING UNIT
- NON-MOTORIZED DAMPER
- MOTORIZED DAMPER
- DEHUMIDIFIER
- DUCT SMOKE DETECTOR
- EVAPORATIVE COOLER
- HEATER
- HVAC BOILER
- HVAC FAN
- VENT FAN
- HVAC LOUVER
- THERMOSTAT
- STEAM GENERATOR
- UNIT HEATER
- WATER HEATER
- AFTER COOLER

PUMPS & COMPRESSORS

- SLUDGE DIAPHRAGM PUMP
- HORIZONTAL CENTRIFUGAL PUMP
- GENERIC PUMP
- CHEMICAL METERING PUMP
- DRUM PUMP
- ROTARY GEAR PUMP
- SPLIT-CASE PUMP
- HOSE / PERISTALTIC PUMP
- PLUNGER / PISTON PUMP
- PROGRESSIVE CAVITY PUMP
- ROTARY LOBE PUMP
- SUBMERSIBLE SUMP PUMP
- SUBMERSIBLE TURBINE PUMP
- VERTICAL TURBINE PUMP
- VERTICAL CENTRIFUGAL PUMP
- INCLINED ARCHIMEDES SCREW PUMP
- VERTICAL SUMP PUMP
- RECIPROCATING COMPRESSOR
- ROTARY SCREW COMPRESSOR

PIPING ACCESSORIES

- ANNULAR SEAL
- ATMOSPHERIC VENT
- BLIND FLANGE
- CAP - BREATHER
- CAP - SCREW / THREADED
- CAP - WELDED
- CAP - QUICK DISCONNECT
- CHLORINE INJECTOR OR CHEMICAL EDUCTOR
- DIAPHRAGM SEAL
- DRAIN
- EXPANSION CHAMBER WITH RUPTURE DISK
- EDUCTOR
- FLANGED
- OR — FLEXIBLE CONNECTION - BELLOWS TYPE
- FLAME ARRESTOR
- FCO / FCO — FLOOR CLEANOUT
- FILTER
- HUB DRAIN
- INLINE MIXER
- PIPE MATERIAL CHANGE
- PULSATION DAMPENER
- REDUCER - CONCENTRIC
- REDUCER - ECCENTRIC
- REMOVABLE SPOOL PIECE
- UNION
- RUPTURE DISK
- STRAINER - BASKET TYPE
- STRAINER - DUPLEX BASKET TYPE
- STRAINER - WYE TYPE
- SLOPE
- TRAP
- OR WCO / WCO — WALL CLEANOUT
- TP — TIE-IN POINT

BLOWERS

- AERATOR
- BLOWER
- POSITIVE DISPLACEMENT BLOWER
- SINGLE STAGE CENTRIFUGAL BLOWER

MISCELLANEOUS

- BRIDGE CRANE
- CALIBRATION COLUMN
- CONTAINER SCALE
- CARTRIDGE FILTER
- DEMISTOR
- FIRE HYDRANT
- GAS BOTTLE
- HEAT EXCHANGER - PLATE TYPE
- HEAT EXCHANGER - STRAIGHT TYPE
- HEAT EXCHANGER - U TUBE
- HEATER
- HORN
- PANEL-MOUNTED HORN
- BEACON
- MISCELLANEOUS EQUIPMENT
- MIXER
- M — MOTOR SYMBOL
- HORIZONTAL PRESSURE VESSEL
- VERTICAL PRESSURE VESSEL
- RADIO ANTENNA
- REFRIGERATOR DRYER
- SAMPLE COOLER
- AUTO-BACKWASHING STRAINER
- TANK WITH CONE SHAPED ROOF
- TANK WITH DOME ROOF
- TANK WITH FLOATING COVER
- TANK, VESSEL, OR BIN
- TEMPERING TANK
- TOTE TANK
- WATER LEVEL
- GENERATOR

Stantec

BOWEN COLLINS & ASSOCIATES

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BARBARA HERRERA
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MAGNA, UTAH

DESIGN
DESIGN S. KEEN
DRAWN P. CHOPADE

REVIEW
CHECKED D. STEFFES
APPROVED B. HERRERA

INSTRUMENTATION AND CONTROL
SYMBOLS AND NOMENCLATURE - III

PROJECT NUMBER 483-20-02
DATE: DECEMBER 2022

DRAWING NO.
I-03
SHEET 85 OF 126

C:\PlantCache\181301171-Magna Water Reuse Facility\PID DWG\I-03.dwg Plotted: 12/14/2022 10:33 AM By: Chopade, Pandurang

PROCESS ABBREVIATIONS

AERATION	A
ALUMINUM SULFATE (LIQUID ALUM)	ALS
AMMONIUM HYDROXIDE (AQUEOUS AMMONIA)	AMH
AUTOMATIC SPRINKLER RISER	ASR
BLEND	B
BALLASTED FLOCCULATION POLYMER	BFP
BALLASTED FLOCCULATION SOLIDS	BFS
BLENDED PRODUCT	BP
CONDENSATE	C
CALCIUM HYDROXIDE (HYDRATED LIME)	CAH
CALCIUM OXIDE (QUICK LIME)	CAO
CHANNEL AGITATION WATER	CAW
MEMBRANE CLEANING CONCENTRATE RETURN	CCR
CHEMICAL DRAIN	CD
CONDENSER WATER RETURN	CDR
CONDENSER WATER SUPPLY	CDS
CHILLED WATER RETURN	CHR
CHILLED WATER SUPPLY	CHS
CORROSION INHIBITOR	CI
CHLORINE (GAS OR LIQUID)	CL
CHLORINE SOLUTION	CLS
CHLORINE GAS UNDER VACUUM	CLV
CENTRATE	CN
CONDENSATE DRAIN	CND
CHEMICAL CONTAINMENT	CP
MEMBRANE CLEANING PERMEATE RETURN	CPR
CIRCULATED SLUDGE	CSL
CITRIC ACID	CTA
CALCIUM THIOSULFATE	CTH
CHLORINATOR VENT AND DETECTION	CV
CHEMICAL DRAIN VENT	CVT
COAGULATED WATER	CW
COOLING WATER RETURN	CWR
COOLING WATER SUPPLY	CWS
DEFOAMING CHEMICAL	DC
DOMESTIC COLD WATER	DCW
DIESEL FUEL OIL	DFO
DEMINERALIZED WATER	DMW
DECANT	DN
DRAIN	DR
DIGESTED SLUDGE	DSL
DOMESTIC HOT WATER RETURN	DWR
DOMESTIC HOT WATER SUPPLY	DWS
ENGINE EXHAUST	EE
ENGINE COOLING WATER RETURN	EWR
ENGINE COOLING WATER SUPPLY	EWS
FOUL AIR	FA
FILTER AIR WASH	FAW
FILTER BACKWASH	FBW
FINAL EFFLUENT	FE
FERRIC CHLORIDE	FEC
FERRIC SULFATE	FES
FILTER INFLUENT	FI
FILTERED WATER	FLW
FORCE MAIN	FM
FUEL OIL RETURN	FOR
FUEL OIL SUPPLY	FOS
FIRE PROTECTION	FP
FROTH	FR
FROTH SPRAY	FS
FILTER SURFACE WASHWATER	FSW
FILTER TO WASTE	FTW
FINISHED WATER	FW
FILTER WASTE WASHWATER	FWW
GRIT	G
GRANULAR ACTIVATED CARBON	GAC
GASEOUS OXYGEN	GOX
HYDROCHLORIC ACID	HCA
HYDROGEN PEROXIDE	HDP
HYDROFLUOSILICIC ACID	HFA
HEATING WATER RETURN	HWR
HEATING WATER SUPPLY	HWS
INSTRUMENT AIR	IA
INTERMEDIATE EFFLUENT	IE
LANDFILL GAS	LFG
LUBE OIL	LO
LIQUID OXYGEN	LOX
LIQUEFIED PETROLEUM GAS	LPG
LIME SLURRY	LS
LANDSCAPING SPRINKLER SYSTEM	LSP
MEMBRANE CONCENTRATE	MC
MEMBRANE CLEANING RETURN	MCR
MEMBRANE CLEANING SUPPLY	MCS
MEMBRANE CLEANING WASTE	MCW
MECHANICAL DEWATERING POLYMER	MDP
MEMBRANE FEED	MF
METHANE GAS	MG
MIXED LIQUOR	ML
MIXED LIQUOR RECYCLE	MLR
MEMBRANE PERMEATE	MP
MURIATIC ACID	MRA
NATURAL GAS	NG
NON-LEADED GASOLINE	NLG
OVERFLOW	OF
OFFGAS	OG
OXIDATION TOWER EFFLUENT	OTE
OZONE	OZG
OZONATED WATER	OZW
PLANT AIR	PA
POWDERED ACTIVATED CARBON	PAC
POLYALUMINUM CHLORIDE	PCL
PLANT DRAIN	PDR
PRIMARY EFFLUENT	PE
PLANT INFLUENT	PI
PLANT EFFLUENT	PLE
PLANT OVERFLOW	PO
ANIONIC POLYMER	POA
CATIONIC POLYMER	POC
FILTER AID POLYMER	POF
NONIONIC POLYMER	PON
THICKENER POLYMER	POT
PRESSURIZED RECYCLE	PRR
PRESSATE	PRS
POTASSIUM PERMANGANATE	PTP
POTABLE WATER	PW
RETURN ACTIVATED SLUDGE	RAS
RECLAIMED WATER	REW
REFRIGERANT LIQUID	RFL
REFRIGERANT SUCTION	RFS
REFRIGERANT SUCTION	RSL
RETURN SECONDARY SLUDGE	RSS
RAW WATER	RW
RAINWATER LEADER	RWL
RAINWATER LEADER OVERFLOW	RWO
SCUM	S
SAMPLE	SAM
SUBNATANT	SBN
SUBNATANT OVERFLOW	SBO
SCAVENGER SYSTEM DISCHARGE	SCV
SANITARY DRAIN	SD
SODIUM BISULFITE	SDB
SODIUM HYDROXIDE (CAUSTIC SODA)	SDH
STORM DRAIN	SDR
SANITARY DRAIN VENT	SDV

PROCESS ABBREVIATIONS

SECONDARY EFFLUENT	SE
SLUDGE FILTRATE	SF
SULFURIC ACID	SFA
SLUDGE GAS	SG
SODIUM HYPOCHLORITE	SHC
SCALE INHIBITOR	SI
SLUDGE	SL
SUPERNATANT	SN
SAND SLURRY	SND
SULFUR DIOXIDE (GAS OR LIQUID)	SO
SULFUR DIOXIDE SOLUTION	SOS
SULFUR DIOXIDE GAS UNDER VACUUM	SOV
SPARE CHEMICAL	SP
SUMP PUMP DISCHARGE	SPD
SANITARY SEWER	SS
SODIUM SILICOFLUORIDE	SSF
STEAM	STM
STRUCTURE UNDERDRAIN	SU
STRUCTURE UNDERDRAIN COLLECTOR	SUC
SETTLED WATER	SW
SCRUBBER WATER RETURN	SWR
TRICKLING FILTER EFFLUENT	TFE
TRICKLING FILTER INFLUENT	TFI
TRICKLING FILTER RECYCLE	TFR
THICKENED SLUDGE	TSL
TREATED WATER	TW
UNDERDRAIN	UD
UTILITY WATER (NON-POTABLE WATER)	UW
VACUUM	V
VENT	VT
WASTE ACTIVATED SLUDGE	WAS
WASTE LUBE OIL	WLO
WASTE SECONDARY SLUDGE	WSS

EQUIPMENT ABBREVIATIONS

AIR HANDLING UNIT	AHU
AIR RELEASE VALVE	ARV
BACK FLOW PREVENTER	BFP
BACK PRESSURE SUSTAINING VALVE	BPV
BEACON	BCN
BLENDING UNIT	BLU
BLOWER	BLW
BULK STORAGE TANK	BTK
CARTRIDGE FILTER	CF
CHECK VALVE	CV
CLEAN IN PLACE	CIP
CONVEYOR	CN
DAY TANK	DTK
DEGASIFIER	DG
EXHAUST FAN	EF
FILTER (GENERAL)	F
HEATER	HTR
HIGH SERVICE PUMP	HSP
LOUVER	LOU
MECHANICAL EQUIPMENT (GENERAL)	ME
MIXER	MX
MOTOR OPERATOR VALVE	MOV
PNEUMATIC OPERATOR VALVE	POV
PRESSURE REDUCING VALVE	PRV
PRESSURE SAFETY VALVE	PSV
PUMP (GENERAL)	P
RUPTURE DISK	RD
SAMPLE PUMP	SP
SAND SEPARATOR	SS
SLIDE GATE	SG
SOLENOID OPERATOR VALVE	SOV
TANK	TK
TRANSFER PUMP	TP
VALVE (MANUAL)	V

AREA NUMBERING

- GENERAL SHEETS:
  - GENERAL SYMBOLS AND NOMENCLATURE SHEETS I-01 THRU I-04
  - NETWORK ARCHITECTURE SHEET I-08
  - FIELD NETWORK LAYOUT AND CONNECTIVITY SHEET I-07
  - CONTROL PANEL DETAILS AND ELEVATIONS SHEET I-09
  - INSTRUMENT INSTALLATION DETAILS SHEETS GI-01 THRU GI-05
  - SAMPLE WIRING DIAGRAMS SHEET I-05 AND I-06

- WWTP AREA NUMBERING:
  - AREA 20 : ALUM AND CHLORINE SYSTEM
  - AREA 70 : REUSE FILTER BUILDING

VALVE ABBREVIATIONS

GATE VALVE	VG
BALL VALVE	VB
BUTTERFLY VALVE	VF
CHECK VALVE	VC
DIAPHRAGM VALVE	VD
GLOBE VALVE	VO
NEEDLE VALVE	VN
PLUG VALVE	VP
SPECIALITY VALVES	VX

CONTROL EQUIPMENT ABBREVIATIONS

ATMOSPHERE	ATM
AUTO TRANSFER CONTROLLER	ATC
CONTACT TIME	CT
CONTROL PANEL	CP
DISTRIBUTED CONTROL SYSTEM	DCS
DIRECT ONLINE STARTER	DOL
FAIL CLOSED	FC
FIBER OPTIC CABLE	FOC
FIBER OPTIC TRANSCEIVER	FOT
FULL VOLTAGE NON-REVERSING STARTER	FVNR
FIBER OPTIC PATCH PANEL	FOPP
HUMAN MACHINE INTERFACE	HMI
LOCKED CLOSED	LC
LOCAL CONTROL PANEL	LCP
LOCAL CONTROL STATION	LCS
LOCKED OPEN	LO
LIGHTNING SURGE ARRESTOR	LSA
MOTOR CONTROL CENTER	MCC
MAIN CONTROL PANEL	MCP
MULTIMODE FIBER	MMF
MOTOR STARTER	MS
MOTOR	MTR
NOT APPLICABLE	N/A
NORMALLY CLOSED	NC
NOT IN CONTRACT	NIC
NORMALLY OPEN	NO
OPERATOR INTERFACE	OI
OPERATOR INTERFACE TERMINAL	OIT
PERSONAL COMPUTER	PC
PROGRAMMABLE LOGIC CONTROLLER	PLC
PLANT CONTROL NETWORK	PCN
POWER DISTRIBUTION UNIT	PDU
REMOTE I/O	RIO
REDUCED VOLTAGE SOLID-STATE STARTER	RVSS
REMOTE TERMINAL UNIT	RTU
SINGLE MODE FIBER	SMF
SOLID STATE METER	SSM
SHIELDED TWISTED PAIR	STP
THERMOCOUPLE	TC
UNINTERRUPTABLE POWER SUPPLY	UPS
UNSHIELDED TWISTED PAIR	UTP
VENDOR CONTROL PANEL	VCP
VARIABLE FREQUENCY DRIVE	VFD
VARIABLE SPEED DRIVE	VSD

GENERAL SHEET NOTES

1. NOT ALL ABBREVIATIONS USED

Stantec

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MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

NO SCALE
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DESIGN S. KEEN
DRAWN P. CHOPADE
REVIEW CHECKED D. STEFFES
APPROVED B. HERRERA

INSTRUMENTATION AND CONTROL
SYMBOLS AND NOMENCLATURE – IV

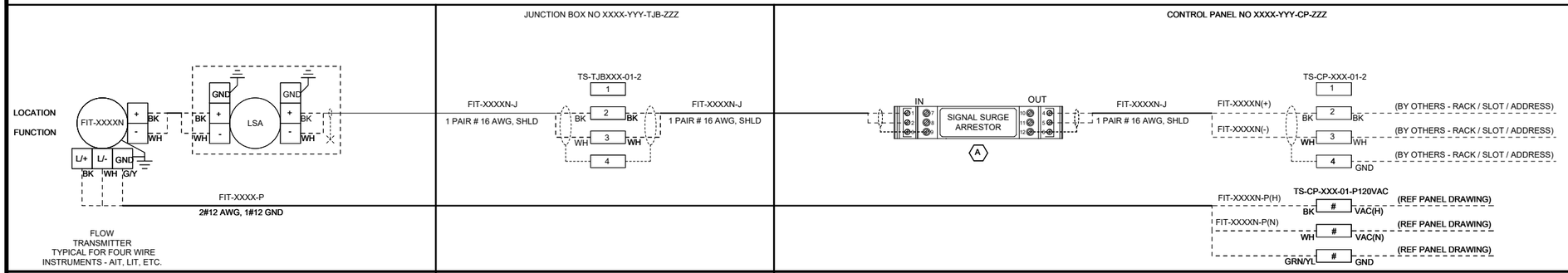
DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

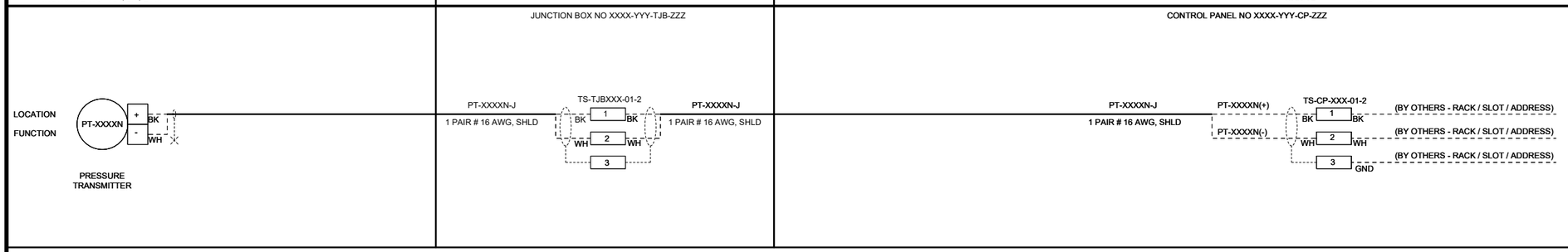
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I-04
SHEET 86 OF 126

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FIELD		CONTROL PANEL
FIELD DEVICE	FIELD JUNCTION BOX	

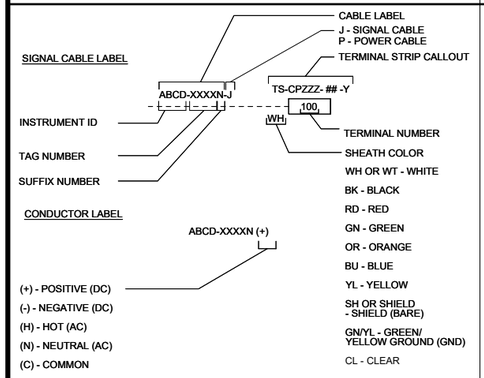
SAMPLE ANALOG INSTRUMENT WIRING DIAGRAM (HARDWIRE)



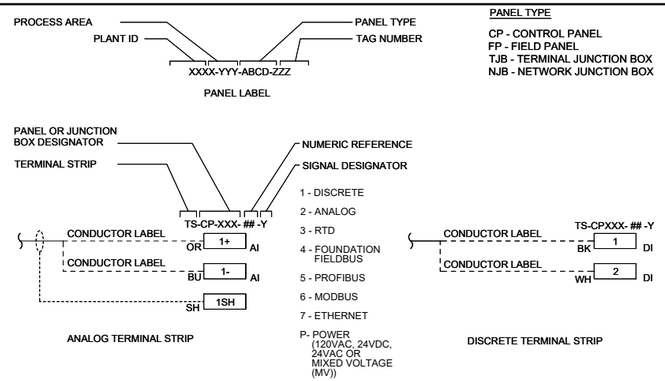


LEGENDS

SIGNAL CABLE / CONDUCTOR LABEL



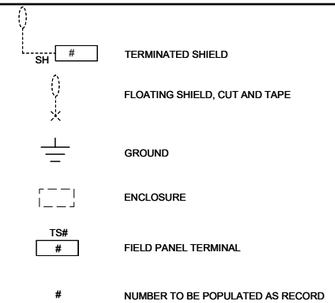
PANEL AND TERMINAL STRIP LABEL



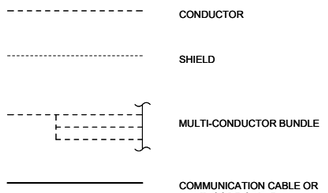
PANEL TYPE

CP - CONTROL PANEL
FP - FIELD PANEL
TJB - TERMINAL JUNCTION BOX
NJB - NETWORK JUNCTION BOX

MISCELLANEOUS SYMBOLS



WIRING DIAGRAM LINE SYMBOLOGY



GENERAL SHEET NOTES

1. WIRING INTERNAL TO THE CONTROL PANEL (BETWEEN THE FIELD TERMINALS AND THE CONTROLLER), SHALL BE FURNISHED, INSTALLED, TERMINATED, LABELED, AND TESTED BY THE CONTROL PANEL SUPPLIER. CONTROL PANEL SUPPLIER SHALL ALSO POPULATE THE RACK / SLOT / ADDRESS OF EACH POINT.
2. SHEATH CUTBACK TO BE MINIMIZED WHERE APPLICABLE.
3. CABLES SHALL HAVE APPROVED CABLE MARKERS AT BOTH ENDS, TAGGED AS SHOWN.
4. REFER TO SPECIFICATION SECTION 26_05_19 FOR CABLE AND WIRING GUIDELINES.
5. CABLE SHIELD AND OVERALL SHIELD TO BE CUT BACK AND TAPED IN THE FIELD.
6. INTERNAL JUNCTION BOX WIRES SHALL BE FERRULED AND LABELED IN ACCORDANCE WITH DIVISION 26 SPECIFICATIONS.
7. SPARE CONDUCTORS SHALL BE TERMINATED AND LABELED AS SPARE.

SHEET KEYNOTES

A. REFER TO SPECIFICATION SECTION 40_91_00 FOR LIGHTNING AND SURGE ARRESTOR SUPPLY REQUIREMENTS.

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BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
No. 11965314
BARBARA CHEVRON
12/13/22
STATE OF UTAH

REVISIONS

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NO SCALE
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MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

REVIEW
CHECKED D. STEFFES
APPROVED B. HERRERA

DESIGN
DESIGN S. KEEN
DRAWN P. CHOPADE

INSTRUMENTATION AND CONTROL
SAMPLE WIRING DIAGRAM – I

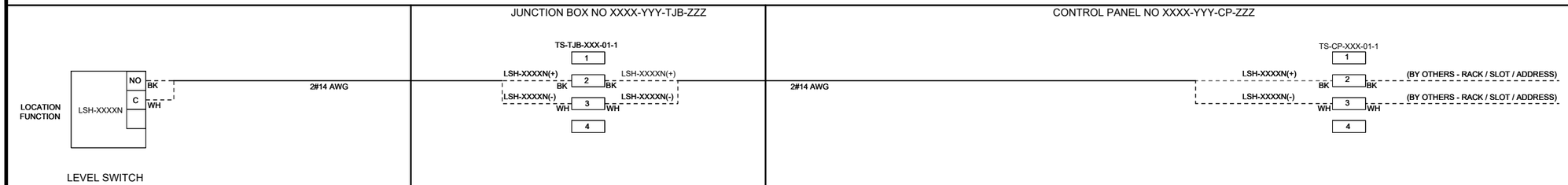
PROJECT NUMBER 483-20-02
DATE: DECEMBER 2022

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FIELD		CONTROL PANEL
FIELD DEVICE	FIELD JUNCTION BOX	

SAMPLE DISCRETE INSTRUMENT WIRING DIAGRAM (HARDWIRE)



GENERAL SHEET NOTES

1. WIRING INTERNAL TO THE CONTROL PANEL(BETWEEN THE FIELD TERMINALS AND THE CONTROLLER), SHALL BE FURNISHED, INSTALLED,TERMINATED, LABELED, AND TESTED BY THE CONTROL PANEL SUPPLIER. CONTROL PANEL SUPPLIER SHALL ALSO POPULATE THE RACK / SLOT / ADDRESS OF EACH POINT.
2. SHEATH CUTBACK TO BE MINIMIZED WHERE APPLICABLE.
3. CABLES SHALL HAVE APPROVED CABLE MARKERS AT BOTH ENDS, TAGGED AS SHOWN.
4. REFER TO SPECIFICATION SECTION 26_05_19 FOR CABLE AND WIRING GUIDELINES.
5. INTERNAL JUNCTION BOX WIRES SHALL BE FERRULED AND LABELED IN ACCORDANCE WITH DIVISION 26 SPECIFICATIONS.
6. SPARE CONDUCTORS SHALL BE TERMINATED AND LABELED AS SPARE.

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BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
No.11965314
BARBARA HERRERA
12/13/22
STATE OF UTAH

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MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

NO SCALE
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DESIGN S. KEEN
DRAWN P. CHOPADE
REVIEW CHECKED D. STEFFES
APPROVED B. HERRERA

INSTRUMENTATION AND CONTROL
SAMPLE WIRING DIAGRAM - II

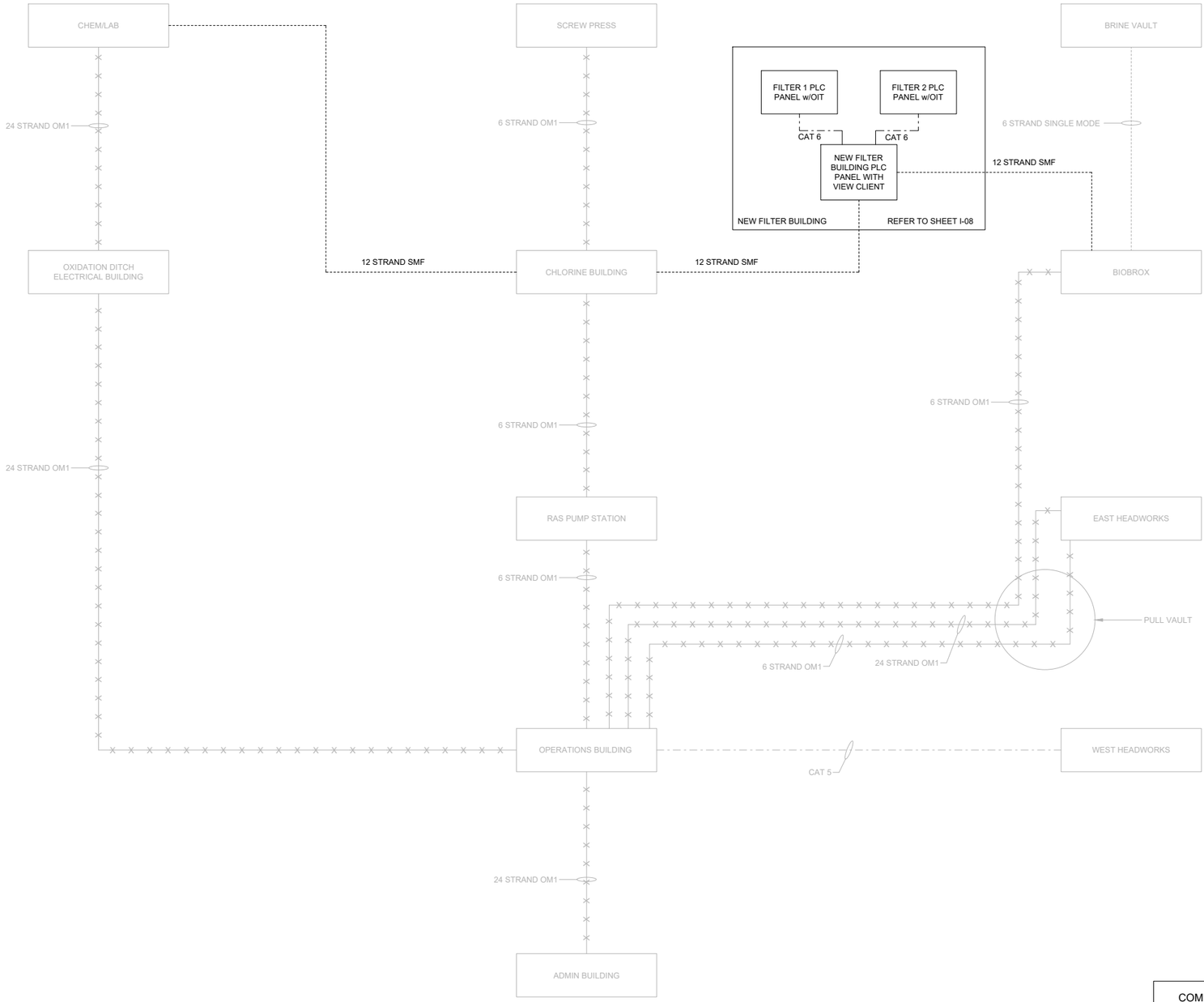
DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
I-06

SHEET 88 OF 126

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MAGNA WWTP SCADA FIBER BLOCK DIAGRAM



GENERAL SHEET NOTES

1. CONTRACTOR SHALL PROVIDE SIGNAL MODE FIBER CONNECTIVITY IN EXISTING FACILITIES ARE NEEDED TO TERMINATE NEW FIBER TO/FROM FILTER BUILDING.
2. CONTRACTOR SHALL FIELD VERIFY CONDITION OF EXISTING FIBER ,TEST AND REPLACE AS NEEDED TO PROVIDE PLANT SCADA COMMUNICATION TO FILTER BUILDING.

COMMUNICATION LINE DEFINITIONS
(UNLESS SPECIFICALLY NOTED OTHERWISE PER DRAWING LEGEND)

- —·—·—·— UTP (CAT 5e OR CAT 6 AS NOTED)
- ---------- SINGLE MODE FIBER
- —X—X—X— MULTIMODE FIBER

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BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
No. 11965314
BARBARA HERRERA
12/13/22
STATE OF UTAH

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MAGNA WRF REUSE PROJECT
MAGNA, UTAH

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REVIEW
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APPROVED B. HERRERA

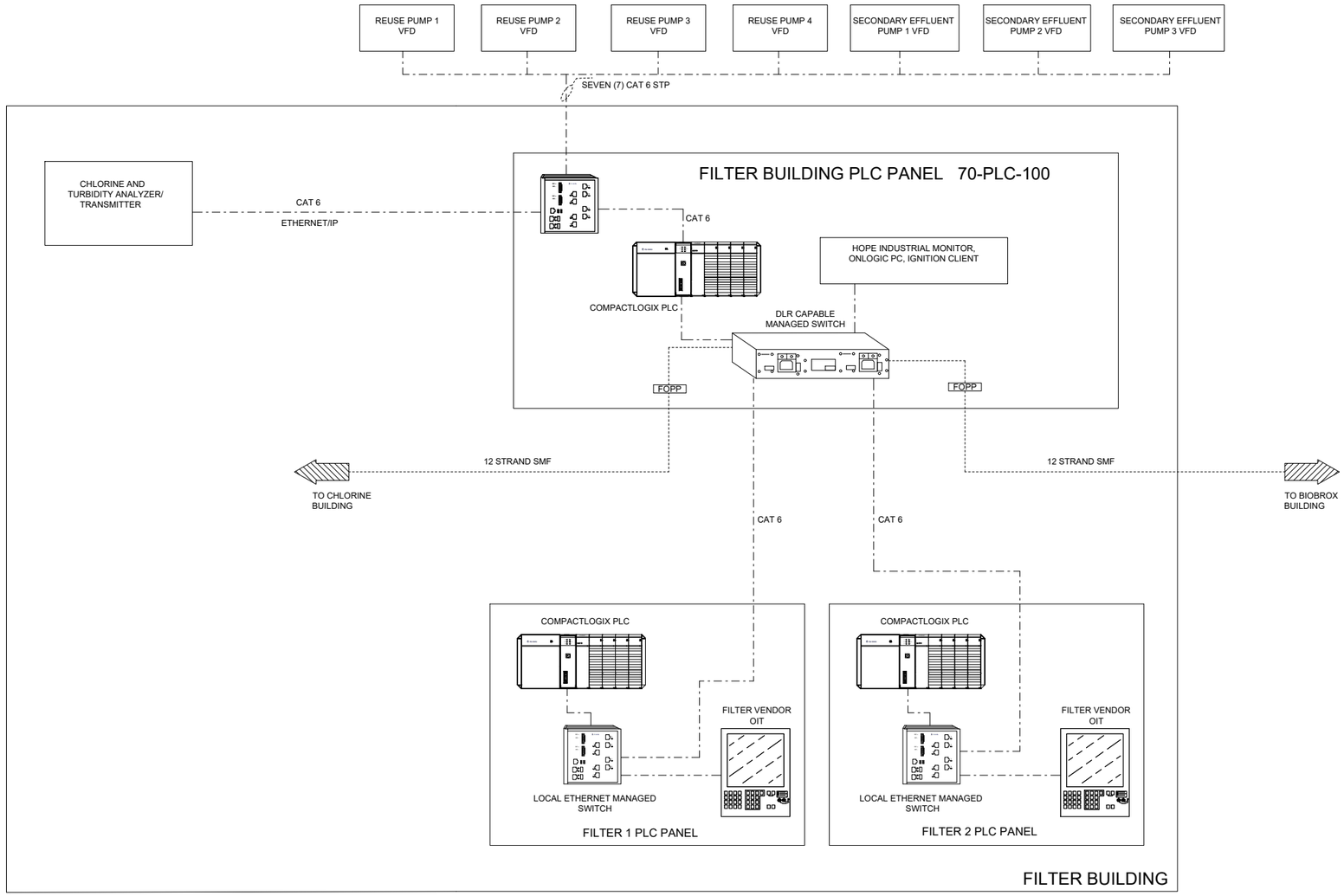
DESIGN
DESIGN S. KEEN
DRAWN P. CHOPADE

INSTRUMENTATION AND CONTROL
NETWORK ARCHITECTURE – I

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
I-07
SHEET 89 OF 126

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GENERAL SHEET NOTES

1. PLCS IN FILTER BUILDING ALL COMPACTLOGIX.
2. CONTRACTOR SHALL ADD SINGLE-MODE FIBER FROM CHEMICAL BUILDING TO CHLORINE BUILDING, CHLORINE BUILDING TO FILTER BUILDING, AND FILTER BUILDING TO BIOBROX.
3. SYSTEM INTEGRATOR TO INTEGRATE FINAL DETAILED NETWORK DESIGN INTO EXISTING PLANT NETWORK IN COORDINATION WITH PLANT NETWORK ADMINISTRATOR. AND FILTER CONTROL PANEL SUPPLIER ,INCLUDING IP. ADDRESS ASSIGNMENTS.
4. OWNER'S SYSTEM INTEGRATOR SHALL ADD AND/OR MODIFY EXISTING NETWORK EQUIPMENT AS NEEDED TO CREATE A RING NETWORK IN COORDINATION WITH OWNER.

COMMUNICATION LINE DEFINITIONS
(UNLESS SPECIFICALLY NOTED OTHERWISE PER DRAWING LEGEND)

- —·—·—·— UTP (CAT 5e OR CAT 6 AS NOTED)
- ---------- SINGLE MODE FIBER
- —x—x—x— MULTIMODE FIBER

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BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER No.11965314 BARBARA HERRERA 12/13/22 STATE OF UTAH

REVISIONS

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MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

REVIEW CHECKED D. STEFFES APPROVED B. HERRERA

DESIGN DESIGN S. KEEN DRAWN P. CHOPADE

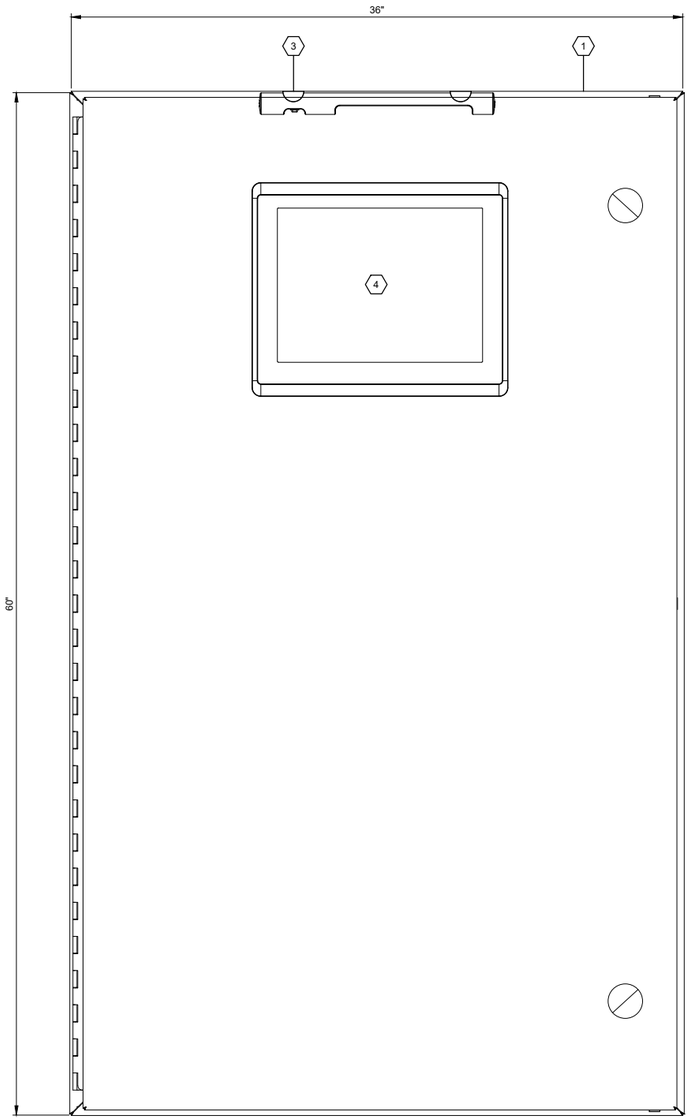
INSTRUMENTATION AND CONTROL
NETWORK ARCHITECTURE – II

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

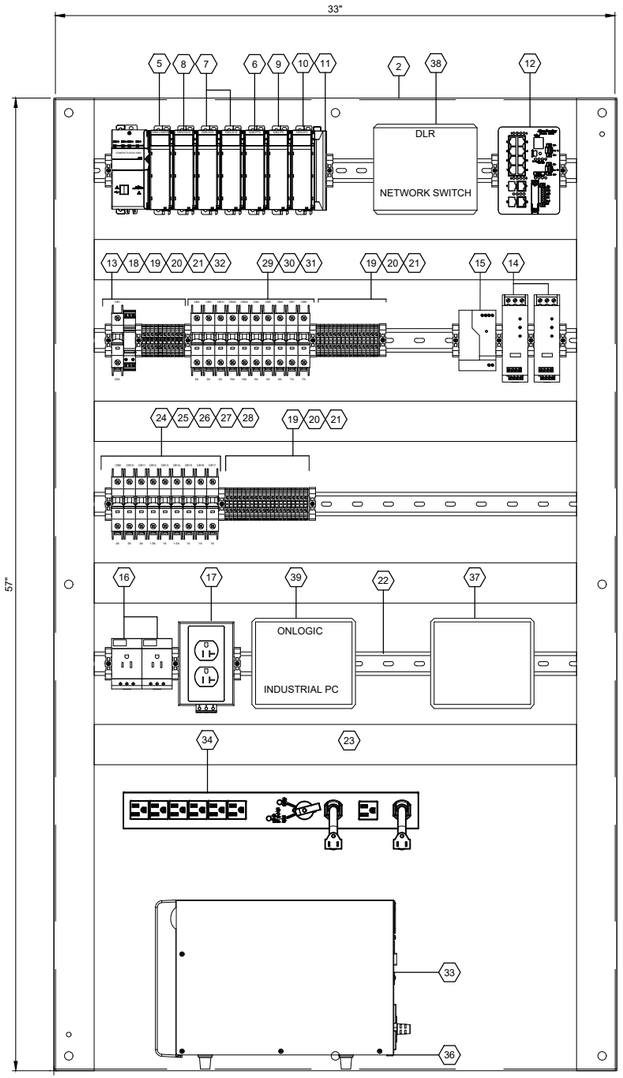
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SHEET 90 OF 126

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FRONT ELEVATION
SCALE : NTS



GENERAL ARRANGEMENT
SCALE : NTS

BILL OF MATERIALS

ITEM #	QTY	MANUFACTURER	PART NUMBER	PART DESCRIPTION
1	1	HOFFMAN	CSD603612 OR EQUAL	SINGLE DOOR ENCLOSURE, WALL MOUNT, NEMA TYPE 12 STEEL, CONTINUOUS HINGE, 60"H X 36"W X 12"D
2	1	HOFFMAN	A60P36	BACK PANEL, STEEL, 57" X 33"
3	1	HOFFMAN	LEDA1S35	ENCLOSURE, ACCESSORY, LIGHT, LED, 120VAC
4	1	HOPE INDUSTRIAL	HIS-ML15-STTH	HOPE INDUSTRIAL MONITOR, 15" TOUCH SCREEN ,24 VDC
5	1	ALLEN-BRADLEY	5069-L306ER	COMPACTLOGIX PROCESSOR
6	1	ALLEN-BRADLEY	5069-FPD	FIELD POTENTIAL DISTRIBUTER
7	2	ALLEN-BRADLEY	5069-IB16	16 POINT INPUT CARD, 24VDC
8	1	ALLEN-BRADLEY	5069-OW16	16 POINT OUTPUT CARD
9	1	ALLEN-BRADLEY	5069-IF8	ANALOG INPUT CARD
10	1	ALLEN-BRADLEY	5069-OF4	ANALOG OUTPUT CARD
11	1	ALLEN-BRADLEY	5069-ECR	PLC END CAP
12	1	ALLEN-BRADLEY	1783-BMS10CGN	10 PORT STRATIX MANAGED ETHERNET SWITCH
13	1	PHOENIX CONTACT	2856812	SURGE SUPPRESSOR
14	2	PHOENIX CONTACT	VENDOR ASSIGN	24 VOLT DC POWER SUPPLY
15	1	PHOENIX CONTACT	VENDOR ASSIGN	24 VDC REDUNDANCY MODULE
16	2	PHOENIX CONTACT	VENDOR ASSIGN	SIMPLEX PLUG SOCKET, 120V
17	1	PHOENIX CONTACT	5600525	DUPLEX RECEPTACLE 20A
18	5	PHOENIX CONTACT	3044115	TERMINAL BLOCK - BLUE
19	40	PHOENIX CONTACT	3044102	TERMINAL BLOCK - GRAY
20	3	PHOENIX CONTACT	3047028	END COVER
21	19	PHOENIX CONTACT	0800886	END HOLDER
22	A/R	PHOENIX CONTACT	1201730	DIN RAIL
23	A/R	PHOENIX CONTACT	3240263	WIRE DUCT WITH COVER 2" X 4"
24	1	EATON	FAZ-C0.5/1-NA-L	CIRCUIT BREAKER, 1 POLE, 0.5 AMP, C CURVE
25	4	EATON	FAZ-C1/1-NA-L	CIRCUIT BREAKER, 1 POLE, 1 AMP, C CURVE
26	1	EATON	FAZ-C1.5/1-NA-L	CIRCUIT BREAKER, 1 POLE, 1.5 AMP, C CURVE
27	2	EATON	FAZ-C2/1-NA-L	CIRCUIT BREAKER, 1 POLE, 2 AMP, C CURVE
28	1	EATON	FAZ-C3/1-NA-L	CIRCUIT BREAKER, 1 POLE, 3 AMP, C CURVE
29	6	EATON	FAZ-C5/1-NA-L	CIRCUIT BREAKER, 1 POLE, 5 AMP, C CURVE
30	2	EATON	FAZ-C7/1-NA-L	CIRCUIT BREAKER, 1 POLE, 7 AMP, C CURVE
31	2	EATON	FAZ-C15/1-NA-L	CIRCUIT BREAKER, 1 POLE, 15 AMP, C CURVE
32	1	EATON	FAZ-C20/1-NA-L	CIRCUIT BREAKER, 1 POLE, 20 AMP, C CURVE
33	1	EATON	9SX700	TOWER STYLE UPS 700VA, 120V
34	1	EATON	EHBPL1500R-PDUIU	HOT SWAP MAINTENANCE BYPASS
35	-	-	-	-
36	1	HOFFMAN	E19SWM12U24	BACKPLATE MOUNTED SHELF
37	1	CORNING	SPH-01P	FIBER PATCH PANEL
38	1	UNIFI	VENDOR ASSIGN	8 PORT MANAGED SWITCH,DLR CAPABLE, MINIMUM
39	1	ONLOGIC	VENDOR ASSIGN	PANEL MOUNT INDUSTRIAL PC, IGNITION CLIENT

GENERAL SHEET NOTES

1. CONTROL PANEL LAYOUT IS DIAGRAMMATIC. PANEL SUPPLIER SHALL SIZE THE ENCLOSURE AND BACK PANEL TO CONTAIN THE EQUIPMENT REQUIRED TO MAKE THE INSTALLATION COMPLETE AND SUITABLE FOR ITS INTENDED PURPOSE. THE CONTROL PANEL SUBMITTAL SHALL REFLECT AN ACCURATE LAYOUT AND BILL OF MATERIALS FOR THE EQUIPMENT IN THE PANEL.

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BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
No.11965314
BARBARA HERRERA
12/13/22
STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

NO SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

REVIEW
CHECKED D. STEFFES
APPROVED B. HERRERA

DESIGN
DESIGN S. KEEN
DRAWN P. CHOPADE

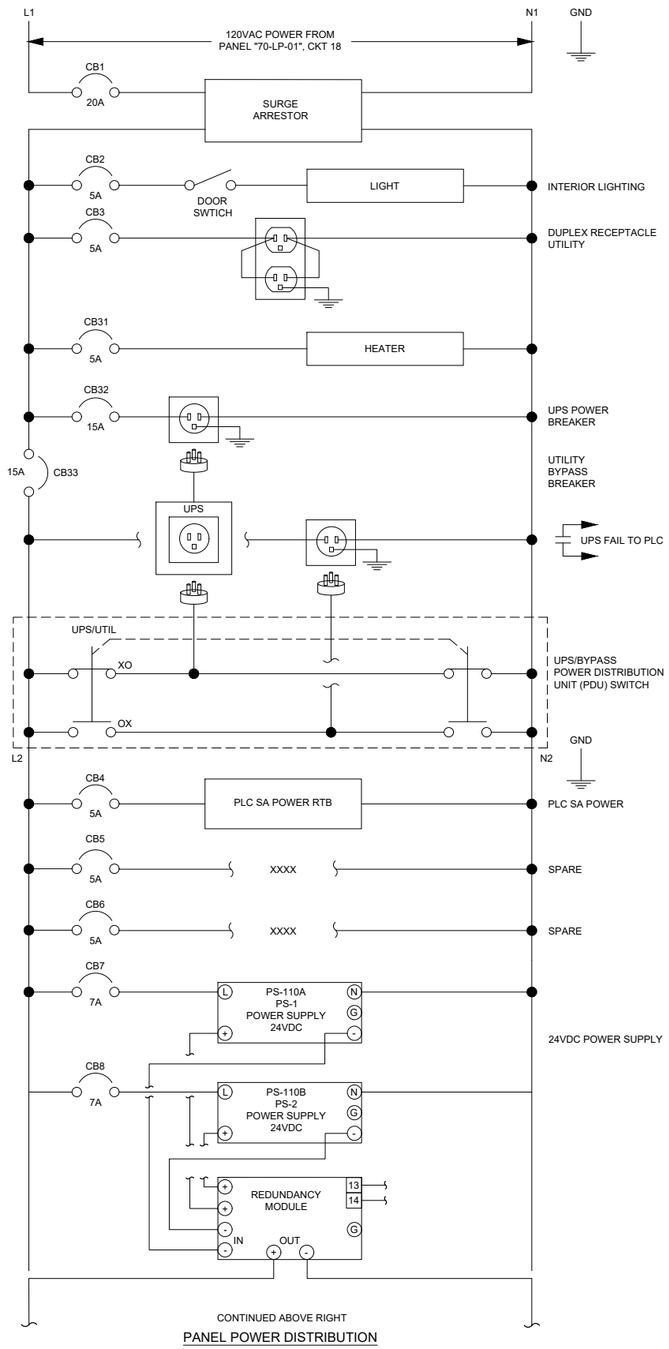
INSTRUMENTATION AND CONTROL
CONTROL PANEL ELEVATIONS

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

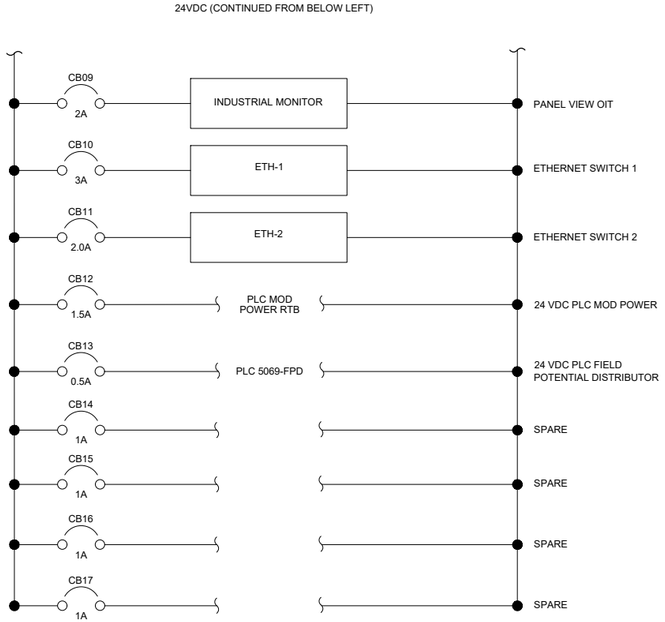
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I-09

SHEET 91 OF 126

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PANEL POWER DISTRIBUTION



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No. 11965314
BARBARA HERRERA
12/13/22
STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
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MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

NO SCALE
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DESIGN S. KEEN
DRAWN P. CHOPADE
REVIEW CHECKED D. STEFFES
APPROVED B. HERRERA

INSTRUMENTATION AND CONTROL
PLC PANEL POWER DISTRIBUTION

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
I-10
SHEET 92 OF 126

HMI

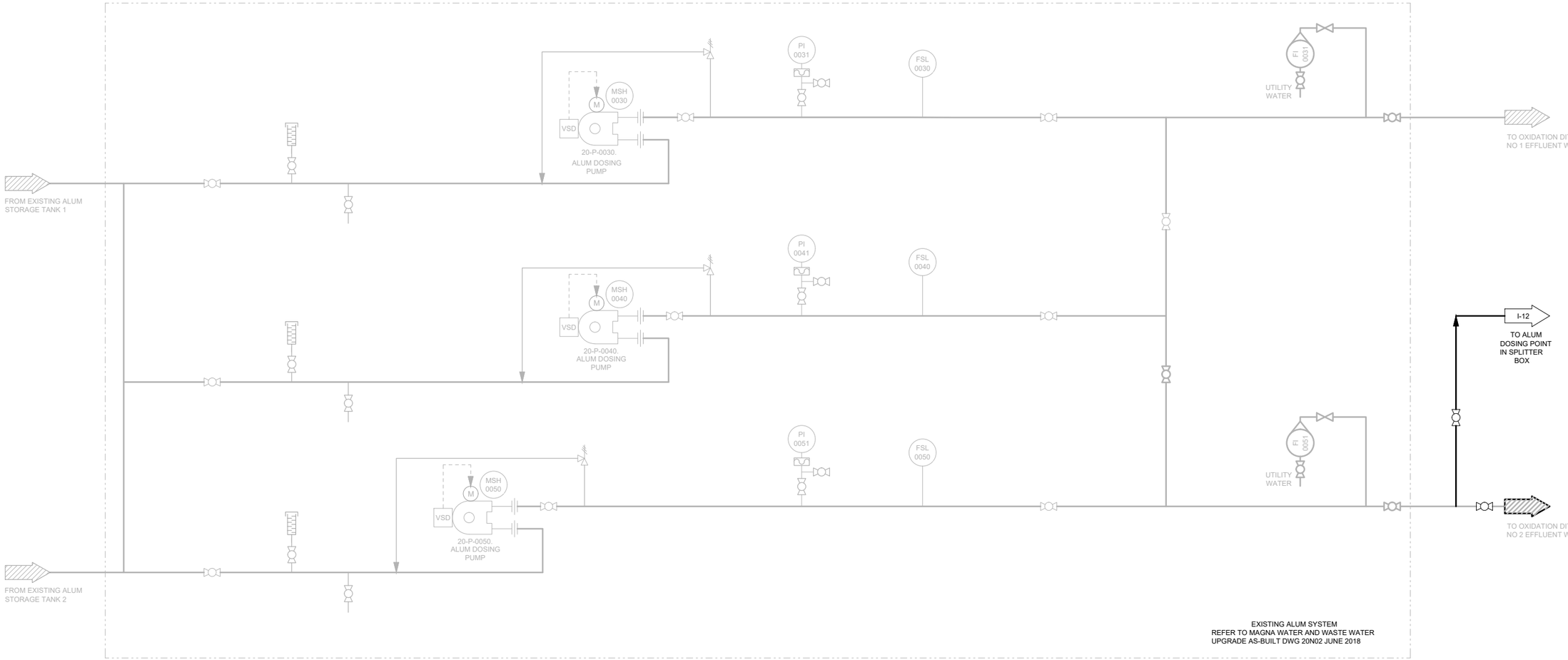
HMI

XX-PLC-XXXX

XX-PLC-XXXX

FIELD

FIELD



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BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
No. 11965314
BARBARA HERRERA
12/13/22
STATE OF UTAH

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MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

REVIEW CHECKED D. STEFFES APPROVED B. HERRERA

DESIGN DESIGN S. KEEN DRAWN P. CHOPADE

INSTRUMENTATION AND CONTROL
ALUM FEED SYSTEM

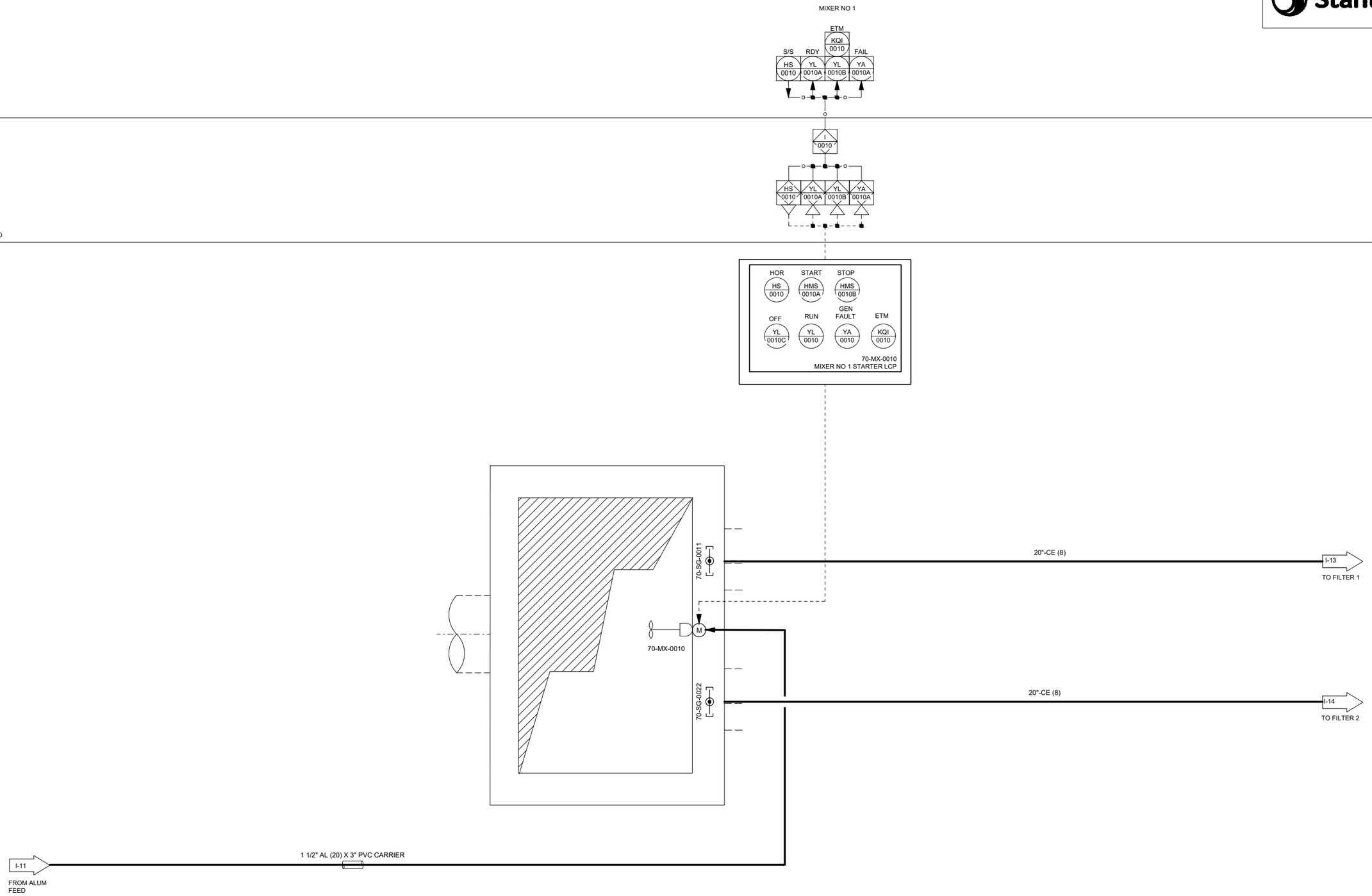
PROJECT NUMBER 483-20-02

DATE: DECEMBER 2022

DRAWING NO.
I-11

SHEET 93 OF 126

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DRAWN P. CHOPADE
REVIEW
CHECKED D. STEFFES
APPROVED B. HERRERA

INSTRUMENTATION AND CONTROL
SPLITTER BOX

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

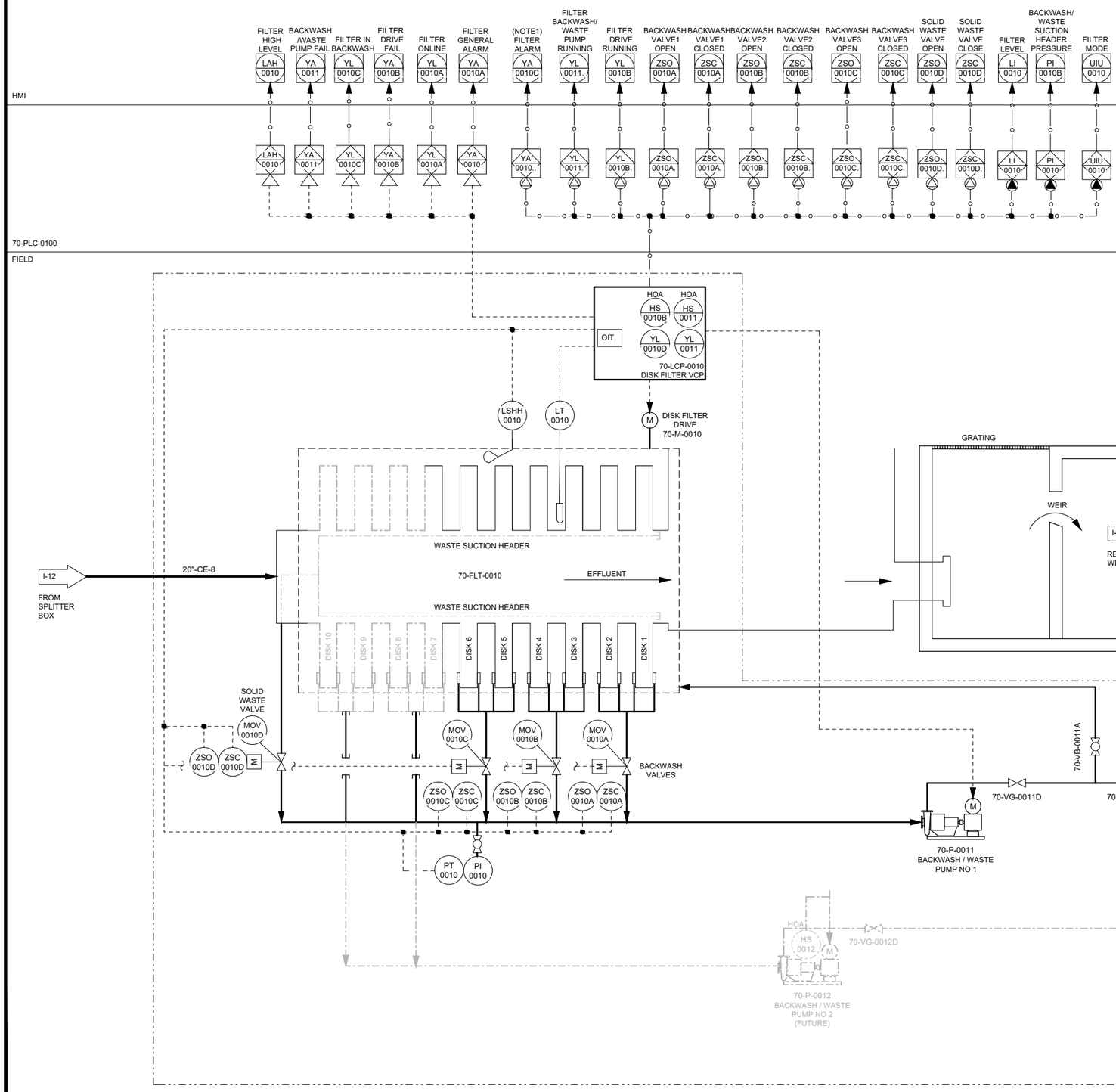
DRAWING NO.
I-12
SHEET 94 OF 126

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GENERAL SHEET NOTES

1. COORDINATE WITH FILTER VENDOR FOR ALARM LIST. APPROXIMATELY 25 ALARMS.

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BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
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REVIEW CHECKED D. STEFFES
APPROVED B. HERRERA

INSTRUMENTATION AND CONTROL
FILTER BAY – 1

PROJECT NUMBER 483-20-02
DATE: DECEMBER 2022

DRAWING NO. I-13
SHEET 95 OF 126

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GENERAL SHEET NOTES

1. COORDINATE WITH FILTER VENDOR FOR ALARM LIST APPROXIMATELY 25 ALARMS.

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HMI

FILTER HIGH LEVEL LAH 0020
BACKWASH /WASTE PUMP FAIL YA 0021
FILTER IN BACKWASH YL 0020C
FILTER DRIVE FAIL YA 0020B
FILTER ONLINE YL 0020A
FILTER GENERAL ALARM YA 0020A
(NOTE1) FILTER ALARM YA 0020C
FILTER BACKWASH/ WASTE PUMP RUNNING YL 0021
FILTER DRIVE RUNNING YL 0020B
BACKWASH VALVE1 OPEN ZSO 0020A
BACKWASH VALVE1 CLOSED ZSC 0020A
BACKWASH VALVE2 OPEN ZSO 0020B
BACKWASH VALVE2 CLOSED ZSC 0020B
BACKWASH VALVE3 OPEN ZSO 0020C
BACKWASH VALVE3 CLOSED ZSC 0020C
SOLID WASTE VALVE OPEN ZSO 0020D
SOLID WASTE VALVE CLOSE ZSC 0020D
FILTER LEVEL LI 0020
BACKWASH/ WASTE SUCTION HEADER PRESSURE PI 0020B
FILTER MODE UIU 0020

SUMP HIGH HIGH LEVEL LAHH 0051
SUMP HIGH LEVEL LAH 0051
SUMP PUMP 1 RUNNING YL 0051
SUMP PUMP 1 FAIL YA 0051A
SUMP PUMP 2 RUNNING YL 0052
SUMP PUMP 2 FAIL YA 0052A
BASEMENT FLOOD LAHH 0070

HMI

70-PLC-0100

FIELD

70-PLC-0100

FIELD

HOA HS 0020B
HOA HS 0021
OIT
YL 0020B
YL 0021
70-LCP-0020
DISK FILTER VCP

LSHH 0020
LT 0020
M
DISK FILTER DRIVE 70-M-0020

WASTE SUCTION HEADER
70-FLT-0020
EFFLUENT
WASTE SUCTION HEADER

I-12
FROM SPLITTER BOX
20"-CE (8)

DISK 10
DISK 9
DISK 8
DISK 7
DISK 6
DISK 5
DISK 4
DISK 3
DISK 2
DISK 1

SOLID WASTE VALVE
MOV 0020D
ZSO 0020D
ZSC 0020D
M

MOV 0020C
MOV 0020B
MOV 0020A
BACKWASH VALVE

ZSO 0020 C
ZSC 0020 C
ZSO 0020B
ZSC 0020B
ZSO 0020 A
ZSC 0020 A

PT 0020
PI 0020

GRATING
WEIR
I-15
REUSE WET WELL

70-VB-0011A
70-VG-0021D
70-VC-0011
70-VB-0011B
TO PLANT DRAIN

M
70-P-0021
BACKWASH / WASTE PUMP NO 1

HOA
HS 0022
M
70-VG-0022D
70-VG-0022G
70-VG-0022C
70-P-0022
BACKWASH / WASTE PUMP NO 2 (FUTURE)

VENDOR DISK FILTER PACKAGE

HOA HS 0051
HOA HS 0052
HIGH LEVEL LAH 0051
RUNNING YL 0051
RUNNING YL 0052
HIGH HIGH LEVEL LAHH 0051
FAIL YA 0051
FAIL YA 0052
70-LCP-0200
FILTER SUMP PUMP LCP

70-VB-0053
70-VB-0054
LSHH 0051
LSH 0051
LSL 0051
LSHH 0070
M
70-P-0051
70-VC-0051
M
70-P-0052
70-VC-0052
FILTER DRYWELL SUMP

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
No.11965314
BARBARA HERRERA
12/13/22
STATE OF UTAH

REVISIONS

NO.	DATE	REV. BY	DESCRIPTION

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

NO SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW
CHECKED D. STEFFES
APPROVED B. HERRERA

DESIGN
DESIGN S. KEEN
DRAWN P. CHOPADE

INSTRUMENTATION AND CONTROL
FILTER BAY – 2

PROJECT NUMBER 483-20-02
DATE: DECEMBER 2022

DRAWING NO.
I–14
SHEET 96 OF 126

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Stantec

SECONDARY REUSE PUMP NO 1 — ETM KQI 0031 — S/S RDY SPD CTRL SPD IND FAIL — HS 0031 | YL 0031A | SK 0031 | SI 0031 | YL 0031B | YA 0031A | II 0031 | PAH 0031 | TAH 0031

SECONDARY REUSE PUMP NO 2 — ETM KQI 0032 — S/S RDY SPD CTRL SPD IND FAIL — HS 0032 | YL 0032A | SK 0032 | SI 0032 | YL 0032B | YA 0032A | II 0032 | PAH 0032 | TAH 0032

SECONDARY REUSE PUMP NO 3 — ETM KQI 0033 — S/S RDY SPD CTRL SPD IND FAIL — HS 0033 | YL 0033A | SK 0033 | SI 0033 | YL 0033B | YA 0033A | II 0033 | PAH 0033 | TAH 0033

SECONDARY REUSE PUMP NO 4 — ETM KQI 0034 — S/S RDY SPD CTRL SPD IND FAIL — HS 0034 | YL 0034A | SK 0034 | SI 0034 | YL 0034B | YA 0034A | II 0034 | PAH 0034 | TAH 0034

LEVEL — LAH 0030 | LAL 0030 | LI 0030 | LALL 0030

RESERVOIR HIGH HIGH LEVEL — LAHH 0050

PRESSURE — PAHH 0030 | PAH 0030 | PI 0030

FLOW — FQI 0030 | FI 0030 | FAL 0030 | FALL 0030

HMI

I 0031 — I 0032 — I 0033 — I 0034

GI-04 — TURBIDITY AAHH, CHLORINE AALL, OR AAHH STOP PUMPS

NOTE 1 — FROM RESERVOIR HIGH HIGH LEVEL

LIT 0030 — LSLL 0030 — LAHH 0050 — FC 0033 — PIT 0030 — FIT 0030

70-PLC-0100

FIELD

HOR HS 0031B — START HMS 0031A — STOP HMS 0031B — DRIVE TRIP CIRCUIT I 0031 — SPD CTRL SC 0031 — VFD RESET HMS 0031C — RUN YL 0031B — AMPS II 0031 — SPD SI 0031 — PAH 0031 — VFD AVAIL YL 0031A — GEN FAULT YA 0031B — TAH 0031 — OI — VFD CP

70-VFD-0031
SECONDARY REUSE PUMP NO 1 VFD

HOR HS 0032 — START HMS 0032A — STOP HMS 0032B — DRIVE TRIP CIRCUIT I 0032 — SPD CTRL SC 0032 — VFD RESET HMS 0032C — RUN YL 0032B — AMPS II 0032 — SPD SI 0032 — PAH 0032 — VFD AVAIL YL 0032A — GEN FAULT YA 0032B — TAH 0032 — OI — VFD CP

70-VFD-0032
SECONDARY REUSE PUMP NO 2 VFD

HOR HS 0033 — START HMS 0033A — STOP HMS 0033B — DRIVE TRIP CIRCUIT I 0033 — SPD CTRL SC 0033 — VFD RESET HMS 0023C — RUN YL 0033B — AMPS II 0033 — SPD SI 0033 — PAH 0033 — VFD AVAIL YL 0033A — GEN FAULT YA 0033B — TAH 0033 — OI — VFD CP

70-VFD-0033
SECONDARY REUSE PUMP NO 3 VFD

HOR HS 0034 — START HMS 0034A — STOP HMS 0034B — DRIVE TRIP CIRCUIT I 0034 — SPD CTRL SC 0034 — VFD RESET HMS 0034C — RUN YL 0034B — AMPS II 0034 — SPD SI 0034 — PAH 0034 — VFD AVAIL YL 0034A — GEN FAULT YA 0034B — TAH 0034 — OI — VFD CP

70-VFD-0034
SECONDARY REUSE PUMP NO 4 VFD

FILTER BUILDING ELECTRICAL ROOM

POWER — JL 0030 — LEVEL ALARM — LALL 0030 — LALL 0030

70-RCP-0030
LOW LEVEL RELAY PANEL

I-16 — TO EFFLUENT PUMP LALL INTERLOCKS

PI 0035

70-TK-0030 — SURGE TANK — 70-VF-0030

120VAC — FIT 0030

PIT 0030 — PI 0030

16"-SR (8) — 16"x12" — 12"-SR (8) — M M — 16"-SR (8) — 12"x16" — TO SECONDARY RESERVOIR

SECONDARY REUSE METER VAULT

2"-CLS (20) — 2"-CLS (20) X 3" PVC CARRIER — I-18 — FROM CHLORINE BOOSTER PUMP

1 1/2"-SR (24) — GI-4 — SAMPLE TO ANALYZER WET PANEL

TSH 0031 — M — ARV 0031 — PSH 0031 — PI 0031 — 12"x16" — 12"-SR (8) — 70-VC-0031A — 70-VF-0031B

70-P-0031.
SECONDARY REUSE PUMP NO 1

TSH 0032 — M — ARV 0032 — PSH 0032 — PI 0032 — 12"x16" — 12"-SR (8) — 70-VC-0032A — 70-VF-0032B

70-P-0032.
SECONDARY REUSE PUMP NO 2

TSH 0033 — M — ARV 0033 — PSH 0033 — PI 0033 — 12"x16" — 12"-SR (8) — 70-VC-0033A — 70-VF-0033B

70-P-0033.
SECONDARY REUSE PUMP NO 3

TSH 0034 — M — ARV 0034 — PSH 0034 — PI 0034 — 8"x16" — 8"-SR (8) — 70-VC-0034A — 70-VF-0034B

70-P-0034.
SECONDARY REUSE PUMP NO 4

JOCKEY PUMP

120VAC — LI 0030 — RADAR — LT 0030 — LSLL 0030

EFFLUENT AUTO SAMPLER AE-0033

I-13 — FROM FILTER 1 EFFLUENT

I-14 — FROM FILTER 2 EFFLUENT

WEIR

CONTINUED TO DWG I-16

WET WELL

GENERAL SHEET NOTES

1. CONTRACTOR SHALL COORDINATE INTEGRATION OF THE RESERVOIR HIGH HIGH LEVEL WIRELESS I/O SIGNAL FROM RESERVOIR PRESSURE INSTRUMENT.

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — No.11965314 — BARBARA HERRERA — 12/15/22 — STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

NO SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW — CHECKED D. STEFFES — APPROVED B. HERRERA

DESIGN — DESIGN S. KEEN — DRAWN P. CHOPADE

INSTRUMENTATION AND CONTROL
REUSE BUILDING NO – 1

DATE: DECEMBER 2022

PROJECT NUMBER 483-20-02

DRAWING NO. I-15

SHEET 97 OF 126

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BOWEN COLLINS & ASSOCIATES

EFFLUENT RETURN PUMP NO 1

EFFLUENT RETURN PUMP NO 2

EFFLUENT RETURN PUMP NO 3

EMERGENCY EYEWASH SHOWER

HMI

FIELD

70-PLC-0100

I-15
FROM CHLORINE AALL OR AAHH

I-15
FROM WET WELL LALL INTERLOCKS

FROM PLANT WATER

EMERGENCY EYEWASH SHOWER

PRESSURE

FLOW

120VAC

EFFLUENT RETURN METER VAULT

16-EFR (8)

12"-EFR (8)

16"-EFR (8)

12"x16"

16x12"

10"x16"

10"-EFR (8)

70-VC-0041A

70-VF-0041B

70-VC-0034A

70-VF-0042B

70-VC-0043A

70-VF-0043B

70-P-0041, EFFLUENT RETURN PUMP NO 1

70-P-0042, EFFLUENT RETURN PUMP NO 2

70-P-0043, EFFLUENT RETURN PUMP NO 3

EFFLUENT TO C-7 DITCH

ELECTRICAL ROOM

VFD CP

70-VFD-0041
EFFLUENT RETURN PUMP NO 1 VFD

70-VFD-0042
EFFLUENT RETURN PUMP NO 2 VFD

70-VFD-0043
EFFLUENT RETURN PUMP NO 3 VFD

CONTINUED FROM DRAWING I-15

WET WELL

PROFESSIONAL ENGINEER
No. 11965314
BARBARA HERRERA
12/13/22
STATE OF UTAH

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			REVISIONS

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MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

REVIEW
CHECKED D. STEFFES
APPROVED B. HERRERA

DESIGN
DESIGN S. KEEN
DRAWN P. CHOPADE

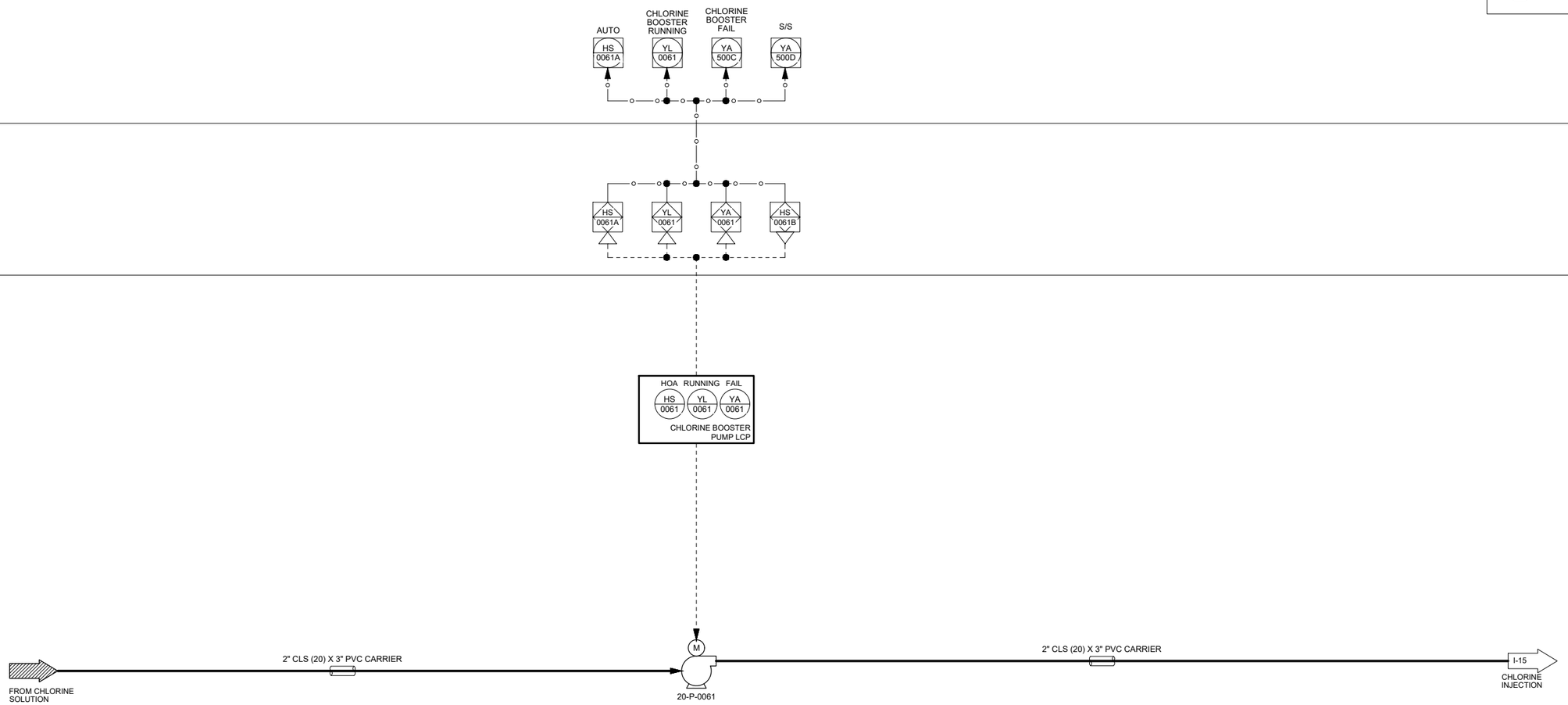
INSTRUMENTATION AND CONTROL
REUSE BUILDING NO - 2

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
I-16

SHEET 98 OF 126

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Stantec

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
No. 11965314
BARBARA HERRERA
12/13/22
STATE OF UTAH

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			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

NO SCALE
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DESIGN S. KEEN
DRAWN P. CHOPADE

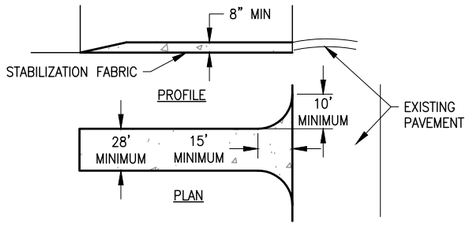
REVIEW
CHECKED D. STEFFES
APPROVED B. HERRERA

INSTRUMENTATION AND CONTROL
CHLORINE BOOSTER PUMP P&ID

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
I-17
SHEET 99 OF 126

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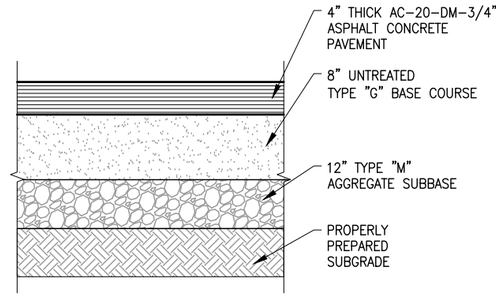
NOTES:

1. STONE SIZE – USE 2'–4" STONE, OR RECLAIMED CONCRETE EQUIVALENT.
2. LENGTH – AS REQUIRED, BUT NOT LESS THAN 50 FEET
3. THICKNESS – NOT LESS THAN EIGHT (8) INCHES.
4. WIDTH – 28 FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. STABILIZATION FABRIC – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SIDE SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS TO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

STABILIZED CONSTRUCTION ENTRANCE

SCALE: NTS

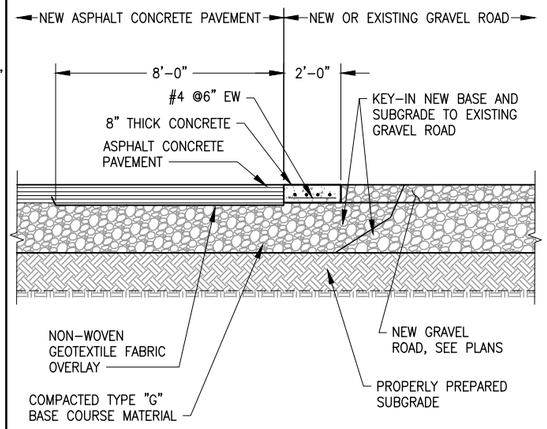
C 2105



ASPHALT PAVEMENT

SCALE: NTS

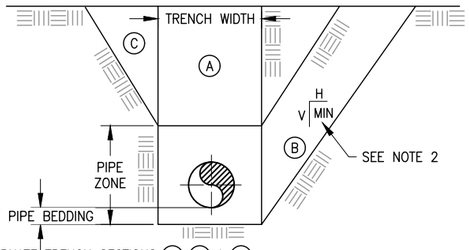
C 2109



ASPHALT CONCRETE PAVEMENT – GRAVEL TRANSITION

SCALE: NTS

C 2120



ALTERNATE TRENCH SECTIONS (A) (B) & (C)

(A) VERTICAL TRENCH WALL
1. MAX UNSUPPORTED HEIGHT = 3.5 FT.
2. FOR DEPTH OVER 3.5 FT SHORING OR SHEATHING REQUIRED.

(B) SLOPING TRENCH WALL
1. NOT TO BE USED WITHOUT APPROVAL OF ENGINEER.
2. REQUIRES IMPROVED PIPE ZONE BACKFILL OR INCREASE IN PIPE CLASS

(C) COMBINATION VERTICAL/SLOPING TRENCH
1. TRENCH IN PIPE ZONE SHALL HAVE VERTICAL WALLS WHERE STABLE SOIL EXISTS

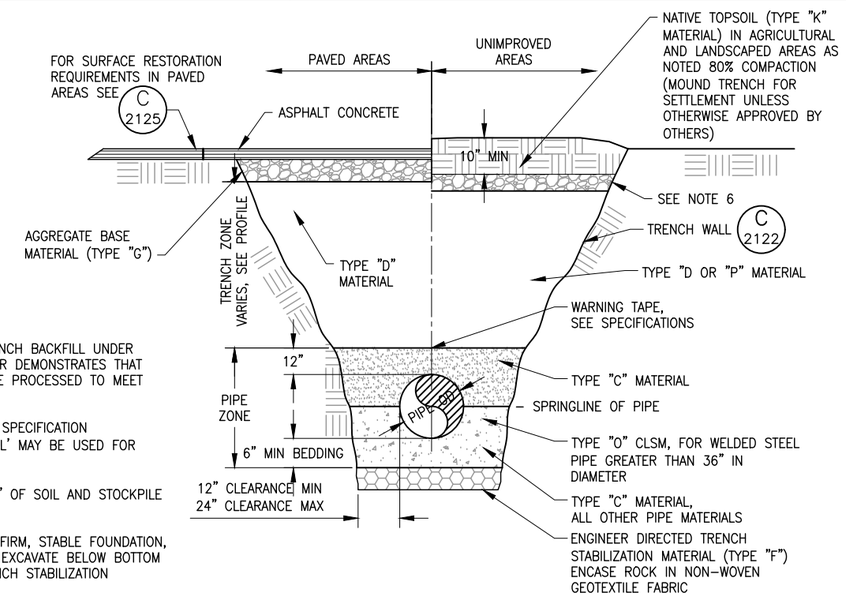
NOTES:

1. TRENCH EXCAVATIONS TO BE IN ACCORDANCE WITH OSHA SAFETY AND HEALTH STANDARDS FOR CONSTRUCTION. (29 CFR 1926).
2. CONTRACTOR TO PROVIDE SHORING OR TRENCH BOX IN ROADWAY AREAS TO MINIMIZE TRENCH WIDTH.
3. CONTRACTOR TO PROVIDE ALL DEWATERING MEASURES AS REQUIRED. GROUNDWATER ELEVATION SHALL BE MAINTAINED AT LEAST 2' BELOW BOTTOM OF TRENCH UNTIL BACKFILL IS COMPLETE.
4. SLIDE SLOPES SHALL MEET MINIMUM REQUIREMENTS OF THE GEOTECHNICAL INVESTIGATION.

TYPICAL TRENCH EXCAVATION SECTION

NTS

C 2122



NOTES:

1. IMPORT BACKFILL REQUIRED FOR TRENCH BACKFILL UNDER ROADWAY AREAS, UNLESS CONTRACTOR DEMONSTRATES THAT SUITABLE ON–SITE MATERIAL CAN BE PROCESSED TO MEET SPECIFIED BACKFILL REQUIREMENTS.
2. SCREENED NATIVE MATERIAL MEETING SPECIFICATION REQUIREMENT FOR 'SUITABLE MATERIAL' MAY BE USED FOR TRENCH ZONE BACKFILL.
3. IN UNIMPROVED AREAS, STRIP TOP 8" OF SOIL AND STOCKPILE PRIOR TO TRENCH EXCAVATION.
4. IF NATIVE SOILS DO NOT PROVIDE A FIRM, STABLE FOUNDATION, AS DETERMINED BY ENGINEER, OVER EXCAVATE BELOW BOTTOM OF TRENCH AND BACKFILL WITH TRENCH STABILIZATION MATERIAL AS SHOWN.
5. TOP 6" OF TRENCH BACKFILL BENEATH THE TOPSOIL LAYER SHOULD BE INSTALLED, SMOOTHED, BUT LEFT UN–COMPACTED.

TYPICAL TRENCH BACKFILL SECTION

NTS

C 2124

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
NATHAN ROGERS
No. 11694201
STATE OF UTAH
12-15-2022

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW
CHECKED J. BECKMAN
APPROVED N. ROGERS

DESIGN
DESIGN R. GARCIA
DRAWN R. GARCIA

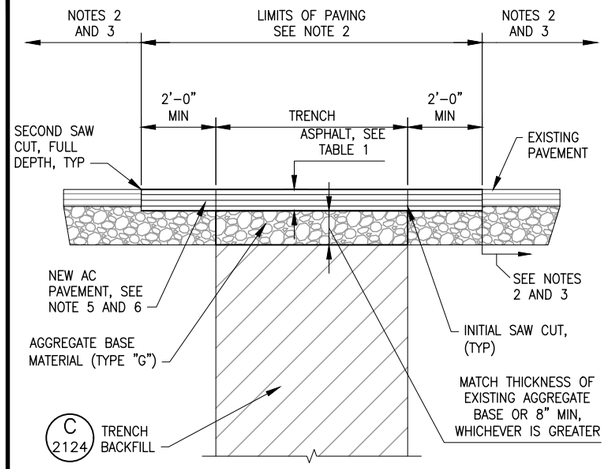
GENERAL CIVIL DETAILS

GENERAL CIVIL DETAILS - 1

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
GC-01
SHEET 100 OF 126

P:\Magna Water District\483-20-02 Reuse Projects\FINAL DESIGN\2.0 Design Phase\2.9 Drawings\sht\4832002_GC-01.dwg Plotted: 12/9/2022 11:30 AM By: Nate Rogers

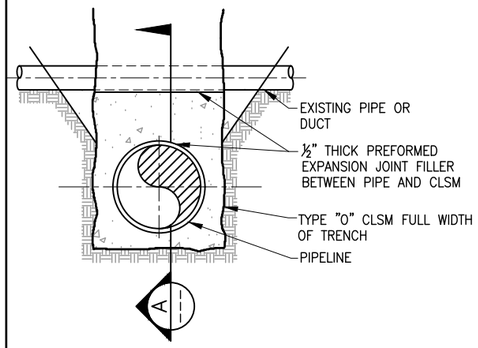


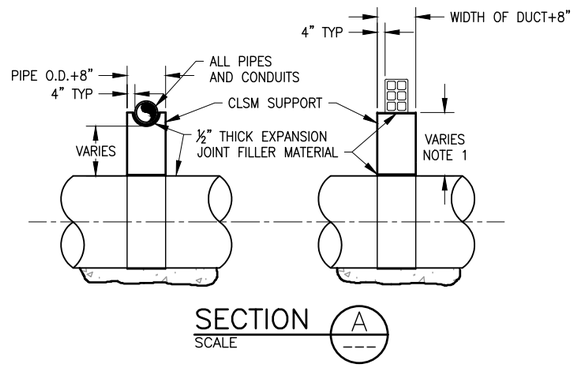
NOTES:

1. CONTRACTOR SHALL PERMANENTLY REPLACE ALL PAVEMENT SURFACES, STRIPING, AND TRAFFIC CONTROLS IN ACCORDANCE WITH STANDARDS PRIOR TO REMOVING DETOURS.
2. REMOVE ADDITIONAL PAVEMENT TO A PAINTED LANE STRIPE, A LIP OF GUTTER, A CURB, AN EXISTING PAVEMENT PATCH, OR AN EDGE OF THE PAVEMENT IF SUCH A FEATURE IS WITHIN FIVE FEET OF THE SECOND SAW CUT. IN NO CASE SHALL ASPHALT SEAM BE PLACED IN WHEEL PATH. IF MORE THAN 50% OF THE PERMANENT SURFACING OF A TRAVELED LANE IS IMPACTED BY THE EXCAVATION, THE ENTIRE LANE WIDTH SHALL BE SAW CUT, REMOVED, AND REPLACED.
3. ALL CONTRACTOR DAMAGED PAVEMENT OUTSIDE OF THE LIMITS SHOWN SHALL BE REMOVED AND REPLACED AT CONTRACTORS EXPENSE.
4. AMBIENT TEMPERATURE MUST BE 45° F AND RISING IN ORDER TO PLACE ASPHALT. ASPHALT PLACEMENT BETWEEN OCTOBER 1ST AND APRIL 1ST MUST HAVE ENGINEERS APPROVAL.
5. HOT ASPHALTIC CONCRETE PAVEMENT SHALL BE PLACED IN A MINIMUM TWO LIFTS. A TACK COAT SHALL BE PLACED BETWEEN LIFTS AND ALONG ALL VERTICAL SURFACES OF EXISTING PAVEMENT.
6. ASPHALT MIX DESIGN SHALL MEET LATEST VERSION OF THE GOVERNING AGENCIES CONSTRUCTION SPECIFICATIONS, SEE TABLE. MIX DESIGN MUST BE SUBMITTED AND APPROVED PRIOR TO PLACEMENT.

LOCATION	PAVEMENT THICKNESS	ASPHALT TYPE
MAIN ACCESS ROAD	4"	AC-20-DM-3/4"

TRENCH BACKFILL AND SURFACE RESTORATION IN PAVED AREAS
NTS — C 2125



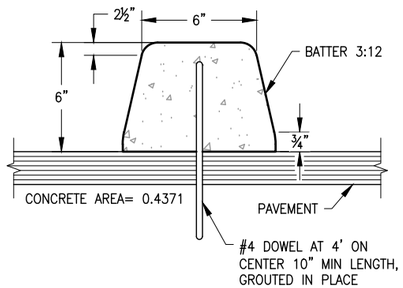


SECTION A
SCALE

NOTES:

1. BACKFILL TO BE BROUGHT UP UNIFORMLY ON BOTH SIDES OF CLSM SUPPORT.
2. CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE TO DETERMINE THE REQUIREMENTS OF PROVIDING ALL TEMPORARY SUPPORTS TO SUSPEND EXISTING UTILITIES IN OR ACROSS TRENCH DURING THE CONSTRUCTION OF THE NEW PIPE AND PRIOR TO THE COMPLETION OF THIS NEW SUPPORT.

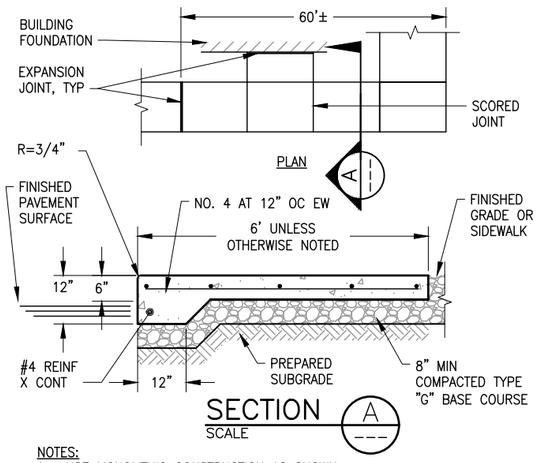
UNDERGROUND UTILITY SUPPORT
SCALE:NTS — C 2128



NOTES:

1. EPOXY CEMENT COAT SHALL BE APPLIED TO PAVEMENT SURFACE PRIOR TO INSTALLATION OF BUMPER.
2. ALL EXPOSED CORNERS SHALL BE ROUNDED WITH A 1/2" RADIUS.

CONCRETE BUMPER
SCALE:NTS — C 2160

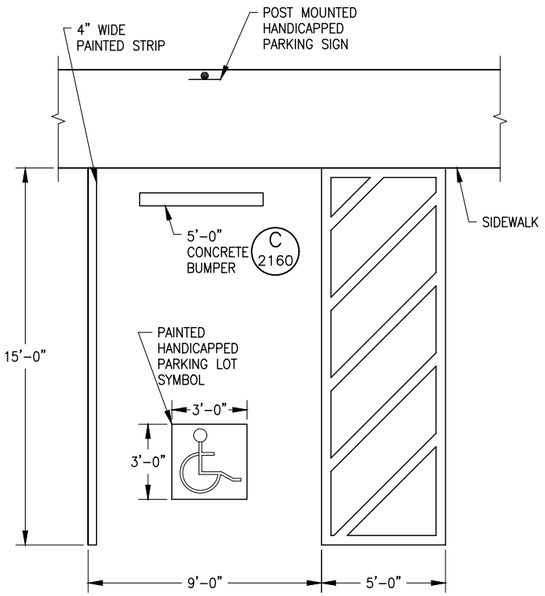


SECTION A
SCALE

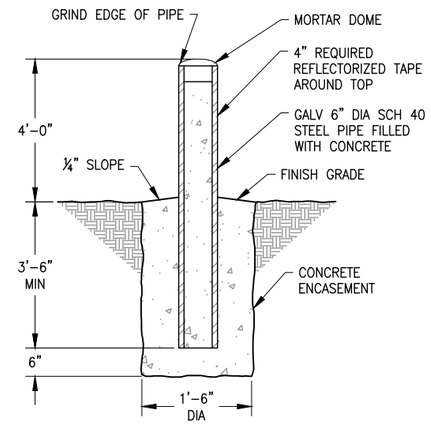
NOTES:

1. USE MONOLITHIC CONSTRUCTION AS SHOWN.
2. EXPANSION JOINTS OF ½" PREMOLDED JOINT FILLER SHALL BE PLACED 60' ON CENTER.
3. PLACE CONTROL JOINTS AT INTERVALS EQUAL TO 1 TO 1½" TIMES THE WIDTH OF THE SIDEWALK UNIFORMLY PLACED ALONG LENGTH OF SIDEWALK. DEPTH OF JOINT SHALL BE 1" MINIMUM.
4. EDGE SIDEWALK WITH ½" RADIUS EDGING TOOL, UNLESS OTHERWISE NOTED. ROUND EDGES AT EXPANSION JOINTS TO A RADIUS OF ½".

CONCRETE SIDEWALK-THICKENED EDGE
SCALE:NTS — C 2163



ADA PARKING STALL
SCALE:NTS — C 2200



BOLLARD
SCALE:NTS — C 2205

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — NATHAN ROGERS — NO. 11680307 — STATE OF UTAH — 12-15-2022

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

REVIEW
CHECKED J. BECKMAN
APPROVED N. ROGERS

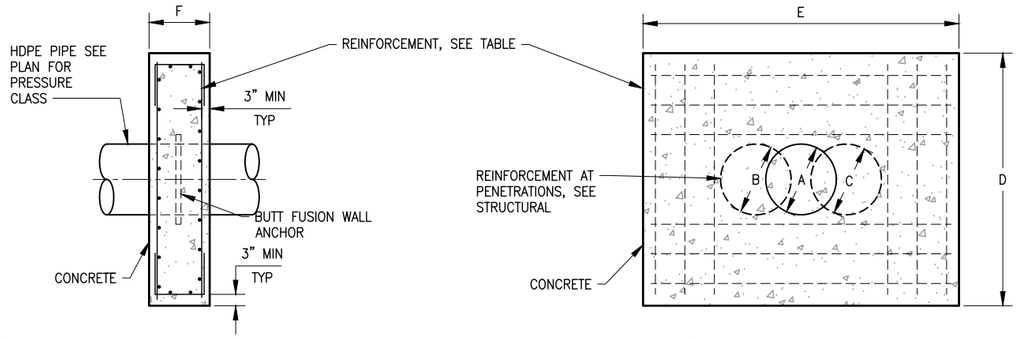
DESIGN
DESIGN R. GARCIA
DRAWN R. GARCIA

GENERAL CIVIL DETAILS

GENERAL CIVIL DETAILS - 2

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
GC-02
SHEET 101 OF 126



DIMENSIONS

PIPE DIAMETER						REINFORCEMENT	RESTRAINTS		
SINGLE PIPE	DOUBLE PIPE								
A	B	C	D	E	F		PIPE A	PIPE B	PIPE C
42"	--	--	8'-6"	8'-6"	24"	#4 BARS @ 8" EW EF	20	--	--
--	42"	42"	8'-6"	16'-4"	24"	#4 BARS @ 8" EW EF	--	20	20
30"	--	--	6'-0"	6'-0"	18"	#4 BARS @ 12" EW EF	7	--	--
28"	--	--	6'-0"	6'-0"	18"	#4 BARS @ 12" EW EF	6	--	--
--	28"	12"	6'-6"	5'-8"	18"	#4 BARS @ 12" EW EF	--	6	2
24"	--	--	5'-0"	5'-0"	18"	#4 BARS @ 12" EW EF	5	--	--
20"	--	--	4'-6"	4'-6"	18"	#4 BARS @ 12" EW EF	4	--	--
--	12"	12"	4'-0"	5'-0"	18"	#4 BARS @ 12" EW EF	--	2	2
≥16"	--	--	4'-0"	4'-0"	16"	#4 BARS @ 12" EW EF	3	--	--

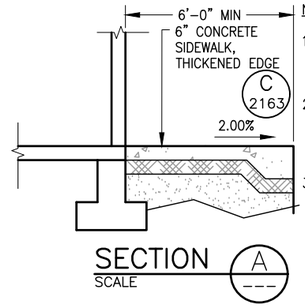
NOTES:

1. STEEL REINFORCEMENT SHALL BE GRADE 60 DEFORMED BARS.
2. ANCHOR BLOCKS SHALL BE FORMED AND POURED PRIOR TO BACKFILL BEING PLACED. CONCRETE SHALL HAVE 90% OF DESIGN STRENGTH PRIOR TO PLACING BACKFILL. BACKFILL SHALL BE PLACED EVENLY ON EACH SIDE OF BLOCK.

HDPE PIPE ANCHOR BLOCK

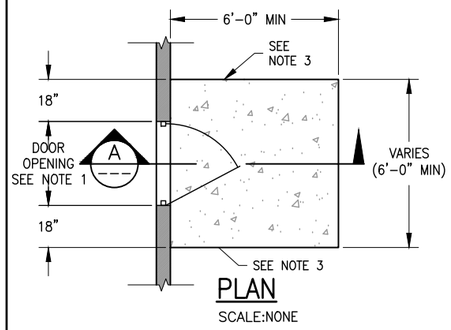
SCALE:NTS

C 2223



NOTES:

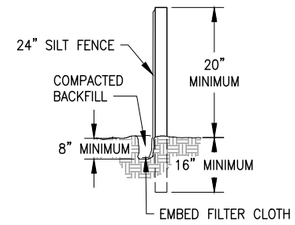
1. SINGLE LEAF DOOR IS SHOWN, DOUBLE LEAF DOOR IS SIMILAR WITH WIDTH SHOWN ON PLAN.
2. ENSURE FINISH GRADE OF APRON ALLOWS DOOR TO FREELY SWING THROUGHOUT ITS TRAVEL PATH.
3. FRONT EDGE SHALL HAVE A CURB HEIGHT OF 6", UNO. SIDE EDGES SHALL HAVE A VARYING CURB HEIGHT OF 0" TO 6", UNO.



CONCRETE DOORWAY APRON

SCALE:NTS

C 2242



NOTES:

1. POSTS SPACED 10' OC. MAXIMUM.
2. FILTER CLOTH TO BE TIED TO MESH EVERY 24" AT TOP AND MIDDLE WITH 6" FOLDED OVERLAP AT VERTICAL SEAMS.
3. FENCE SHALL BE MAINTAINED AND ACCUMULATED MATERIAL REMOVED.
4. FENCE SHALL BE REMOVED AFTER CONSTRUCTION AND SITE RESTORED.

SILT FENCE

SCALE:NTS

C 2281

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER NATHAN ROGERS NO. 11698021 STATE OF UTAH 12-15-2022

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

DESIGN
DESIGN R. GARCIA
DRAWN R. GARCIA

REVIEW
CHECKED J. BECKMAN
APPROVED N. ROGERS

GENERAL CIVIL DETAILS

GENERAL CIVIL DETAILS - 3

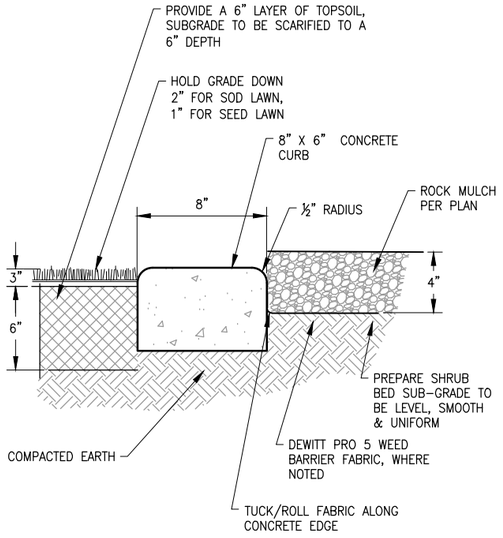
DATE: DECEMBER 2022

PROJECT NUMBER 483-20-02

DRAWING NO.
GC-03

SHEET 102 OF 126

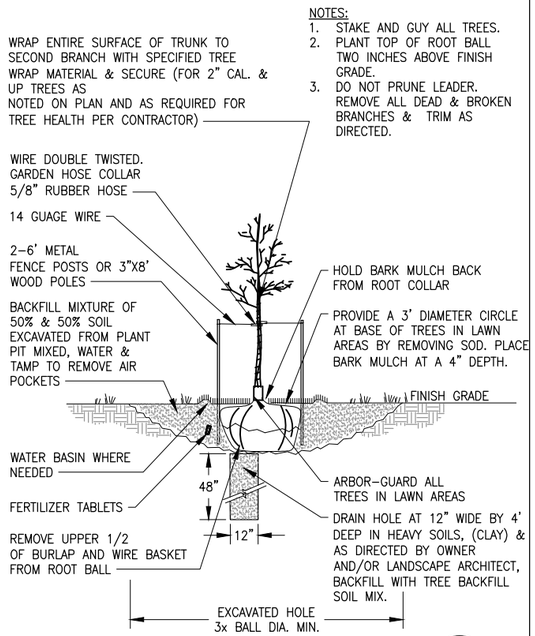
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8" CONCRETE CURB & MULCH

SCALE: NTS

L 2801



TREE PLANTING DETAIL

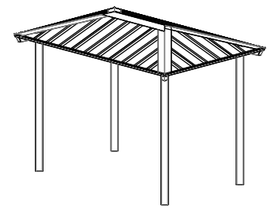
SCALE: NTS

L 2862

poligon

STOP!!
NOT FOR CONSTRUCTION
USE FOR PRELIMINARY PLANNING AND ESTIMATING ONLY

DRAWING: COVER SHEET
SCALE: 1:24
REV LEVEL: A
poligon (616)399-1963 www.poligon.com
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PORTERCORP 4340 N. 136th AVE HOLLAND, MI 49424
by PORTERCORP
SHEET CS



PROJECT:
LOCATION:
BUILDING TYPE: RAM-8X12
ROOF TYPE: MULTI-RIB

FABRICATOR APPROVALS:
CITY OF PHOENIX, AZ APPROVED FABRICATOR #C08-2010
CITY OF LOS ANGELES, CA APPROVED FABRICATOR #1596
CITY OF RIVERSIDE, CA APPROVED FABRICATOR #SP06-0033
CITY OF HOUSTON, TX APPROVED FABRICATOR #470
CLARK COUNTY, NV APPROVED FABRICATOR #264
STATE OF UTAH APPROVED FABRICATOR 02008-14

CERTIFICATES:
MIAMI-DADE COUNTY CERTIFICATE OF COMPETENCY NO. 16-1025.01
PCI (POWDER COATING INSTITUTE) 4000 CERTIFIED

MATERIALS:

DESCRIPTION	ASTM DESIGNATION
TUBE STEEL	A500 (GRADE B)
SCHEDULE PIPE	A53 (GRADE B)
RMT PIPE	A519
LIGHT GAGE COLD FORMED	A1003 (GRADE 50)
STRUCTURAL STEEL PLATE	A36
ROOF PANELS (STEEL)	A653

GENERAL NOTES:
UNLESS NOTED OTHERWISE, THIS STRUCTURE WAS DESIGNED TO ONLY SUPPORT WHAT IS SHOWN ON THESE DRAWINGS. POLIGON MUST BE CONTACTED IF ANYTHING ELSE IS TO BE ATTACHED TO THIS STRUCTURE (WALLS, COLUMN WRAPS, RAILINGS, ETC.) SO THE DESIGN OF THIS STRUCTURE CAN BE REVIEWED AND POSSIBLY REVISED.

UNLESS NOTED OTHERWISE, THIS STRUCTURE WAS DESIGNED ASSUMING A 20' SEPARATION BETWEEN ANY ADJACENT STRUCTURE WITH AN EAVE HEIGHT EQUAL TO OR GREATER THAN THE EAVE HEIGHT OF THIS STRUCTURE. IF THAT SEPARATION DOES NOT EXIST, POLIGON MUST BE CONTACTED SO THE DESIGN OF THIS STRUCTURE CAN BE REVIEWED AND POSSIBLY REVISED.

STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) SPECIFICATION MANUAL.

ALL WELDING IS PERFORMED BY AMERICAN WELDING SOCIETY CERTIFIED WELDERS AND CONFORMS TO THE LATEST EDITION OF AWS D1.1 OR D1.3 AS REQUIRED.

PARTS SHOWN MAY BE UPGRADED DUE TO STANDARDIZED FABRICATION. REFER TO THE SHIPPING BILL OF MATERIALS FOR POSSIBLE SUBSTITUTIONS.

FOR PROPER FIELD INSTALLATION OF THE BUILDING IT IS RECOMMENDED THAT THE PRIMARY FRAME INSTALLER AND THE ROOF INSTALLER HAVE A MINIMUM FIVE (5) YEARS DOCUMENTED EXPERIENCE INSTALLING THIS TYPE OF PRODUCT.

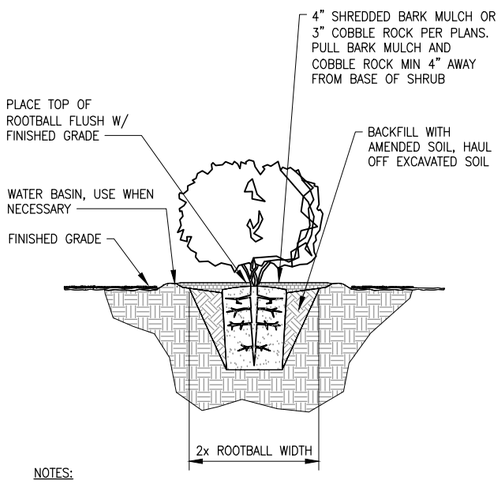
FOR PROPER FIELD INSTALLATION OF THE BUILDING IT IS RECOMMENDED THAT ELECTRIC WIRING, IF REQUIRED, BE RUN THROUGH THE STRUCTURAL MEMBERS BEFORE THE BUILDING IS ERECTED.

NOTES:
1. FOR REFERENCE ONLY. COLORS TO BE SELECTED BY OWNER. CONTRACTOR TO SUBMIT FOOTING DETAILS AS A SUBMITTAL FOR REVIEW AND APPROVAL BASED ON POLIGON'S STANDARDS AND RECOMMENDATIONS FOR SITE CONDITIONS.

PAVILION

SCALE: NTS

L 2813



NOTES:

1. SCARIFY SIDES OF PLANTER PIT PRIOR TO PLANTING SHRUB SO AS TO AVOID ANY GLAZING OR HARDENED AREAS THAT WILL BE DIFFICULT FOR ROOTS TO GROW THROUGH.
2. AMEND SOIL SHALL CONTAIN 3 PARTS GOOD TOPSOIL EXCAVATED FROM PIT AND 1 PART "SOIL PREP" SOIL CONDITIONER.

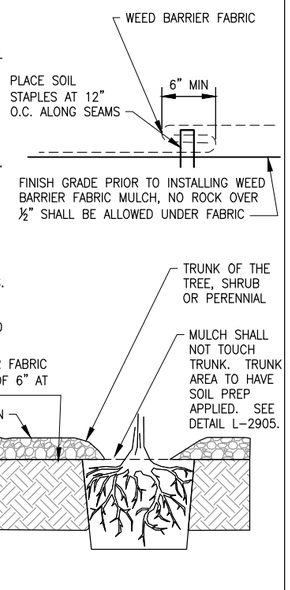
SHRUB PLANTING DETAIL

SCALE: NTS

L 2866

IMAGE: GOOGLE EARTH 9-11-2018

NOTES:
1. INSTALL 6" SOIL STAPLE IN WEED BARRIER FABRIC AT 5' O.C. TRIANGULAR SPACING. INSTALL 6" SOIL STAPLE AT 12" O.C. ALONG ALL WEED BARRIER FABRIC SEAMS. OVERLAP FABRIC MINIMUM 6" AT ALL SEAMS.
2. BEFORE PLACING WEED BARRIER FABRIC AND MULCH (COBBLE ROCK AREAS ONLY). APPLY A PRE-EMERGENCY HERBICIDE TO SOIL. AFTER PLACING WEED BARRIER FABRIC AND MULCH, RAKE MULCH LEVEL AND WET MULCH TO ENTIRE DEPTH. ALLOW TO DRY, THEN APPLY A SECONDARY APPLICATION OF PRE-EMERGENT HERBICIDE TO TOP OF MULCH. KEEP TOP OF MULCH 1" BELOW ADJACENT WALKS AND CURBS. DO NOT ALLOW MULCH TO TOUCH THE TRUNK OF ANY PLANT. INSTALL MULCH AFTER INSTALLATION OF WEED BARRIER FABRIC AND PLANT MATERIAL.



COBBLE ROCK/BARK MULCH AND WEED BARRIER FABRIC DETAIL

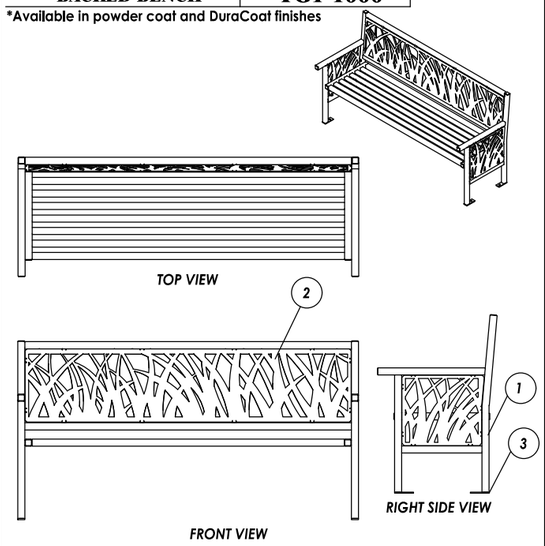
SCALE: NTS

L 2818

siteScapes
P.O. Box 22326
Lincoln, NE 68542

TITLE	PRODUCT NO.
TALLGRASS BACKED BENCH	TG1-1000

*Available in powder coat and DuraCoat finishes



BENCH

SCALE: NTS

L 2812

BOWEN COLLINS & ASSOCIATES

LICENSED LANDSCAPE ARCHITECT No. 5276822 JAMES R. JACOBSEN STATE OF UTAH 12-15-2022

REVISIONS

NO.	DATE	REV. BY	DESCRIPTION

MAGNA WRF REUSE PROJECT
MAGNA WATER DISTRICT
MAGNA, UT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW
CHECKED J. BECKMAN
APPROVED J. TSANDES

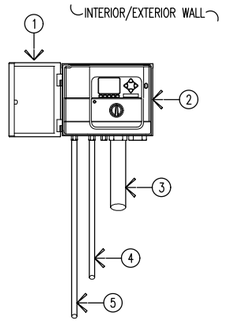
DESIGN
DESIGN R. JACOBSEN
DRAWN R. JACOBSEN

LANDSCAPE
LANDSCAPE DETAILS

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
GL-01
SHEET 103 OF 126

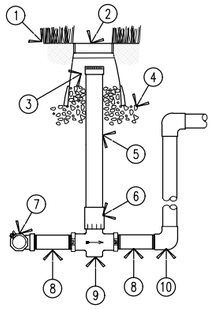
P:\Magna Water District\483-20-02 Reuse Projects\FINAL DESIGN\2.0 Design Phase\2.9 Drawings\sht\4832002_GL-01.dwg Plotted: 12/9/2022 9:08 AM By: Nate Rogers



1. ALLOW FOR MINIMUM DOOR OPENING CLEARANCE ON LEFT SIDE OF CONTROLLER
2. CONTROLLER
3. CONTROL WIRE CONDUIT, UP TO 2" SIZE.
4. SUPPLEMENTAL GROUND WIRE CONDUIT
5. POWER SUPPLY CONDUIT J-BOX AT CONTROLLER CONNECT PER LOCAL CODE

WALL MOUNT CONTROLLER

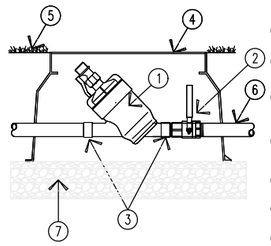
SCALE: NTS — SECTION DETAIL A



1. FINISH GRADE
2. 10" ROUND BOX
3. PLASTIC CAP
4. 3/4" WASHED GRAVEL MIN. 8" DEEP
5. S/40 PVC PIPE
6. S/40 FEMALE ADAPTOR
7. PAC JOINT FITTING
8. 6" BRASS NIPPLE
9. STOP AND WASTE VALVE
10. S/80 SLIP X THREAD ELBOW

STOP & WASTE VALVE

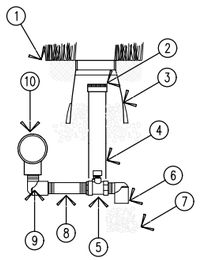
SCALE: NTS — SECTION DETAIL C1



1. AMIAD PLASTIC FILTER
2. BRASS FULL PORT BALL VALVE
3. ACTION MANIFOLD FITTINGS ON EACH SIDE OF FILTER
4. STANDARD VALVE BOX (OR SIZE TO FIT)
5. FINISH GRADE
6. MAIN LINE PIPE
7. 3/4" GRAVEL, 6" DEPTH

SMALL FILTER (1")

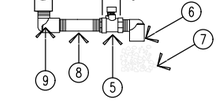
SCALE: NTS — SECTION DETAIL C2



1. FINISH GRADE
2. IRRICAP
3. CARSON BROOKS 10" ROUND BOX
4. 2" SCH 40 PIPE
5. 3/4" CURB STOP VALVE FORD B11-333M
6. MARLEX STREET ELL
7. 1 CU/FT 3/4" GRAVEL
8. 3/4" X 6" S/80 NIPPLE
9. 3/4" SCH 40 STREET ELL
10. MAIN LINE PIPE

MANUAL DRAIN VALVE-SMALL

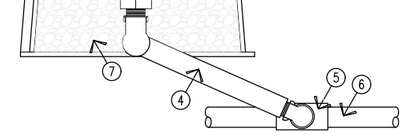
SCALE: NTS — SECTION DETAIL C3



1. FINISH GRADE
2. IRRICAP
3. CARSON BROOKS 10" ROUND BOX
4. 2" SCH 40 PIPE
5. FORD B11-333 CORP VALVE
6. MARLEX STREET ELL
7. 1 CU/FT 3/4" GRAVEL
8. 3/4" X 6" S/80 NIPPLE
9. 3/4" SCH 40 STREET ELL
10. MAIN LINE PIPE

MANUAL DRAIN VALVE

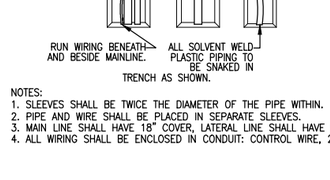
SCALE: NTS — SECTION DETAIL C5



1. FINISH GRADE
2. QUICK COUPLER VALVE
3. 10" ROUND VALVE BOX
4. FACTORY MFG SWING JOINT
5. MAIN LINE TEE OR ELL
6. MAIN LINE PIPE
7. 3/4' MINUS GRAVEL

QUICK COUPLER VALVE

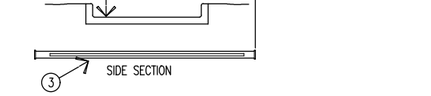
SCALE: NTS — SECTION DETAIL C6



NOTES:
1. SLEEVES SHALL BE TWICE THE DIAMETER OF THE PIPE WITHIN.
2. PIPE AND WIRE SHALL BE PLACED IN SEPARATE SLEEVES.
3. MAIN LINE SHALL HAVE 18" COVER, LATERAL LINE SHALL HAVE 8-12" MIN. COVER.
4. ALL WIRING SHALL BE ENCLOSED IN CONDUIT: CONTROL WIRE, 2-WIRE, POWER WIRE.

PIPE/WIRE IN TRENCH

SCALE: NTS — LANDSCAPE & IRRIGATION DETAIL D1

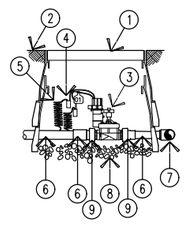


1. 4" MINIMUM CLEARANCE
2. FINISH GRADE
3. 18" MINIMUM, 24" MAXIMUM PIPE COVER
4. 6" MINIMUM, 18" MAXIMUM

SLEEVES TO BE 2X PIPE SIZE WITHIN. JOINTS TO BE WATERTIGHT. MECHANICALLY TAMP TO 95% PROCTOR.
ALL WIRE SLEEVING SHALL BE GRAY S/40 ELECTRICAL CONDUIT. NO EXCEPTIONS.

SLEEVING

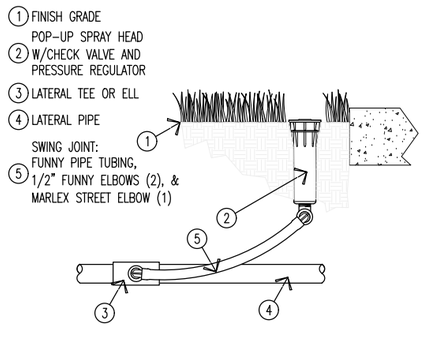
SCALE: NTS — LANDSCAPE & IRRIGATION DETAIL D2



1. STANDARD VALVE BOX
2. FINISH GRADE
3. REMOTE CONTROL VALVE
4. PAIGE WIRE CONNECTORS (2)
5. CONTROL WIRE (DECODER WIRE, INSTALL PER MFG SPECS)
6. SCH 40 PIPE & FITTINGS
7. SCH 80 FITTINGS
8. 3/4" MINUS WASHED GRAVEL
9. ACTION MANIFOLD FITTINGS (2 EACH) 18011-X, 18012-X

REMOTE CONTROL VALVE

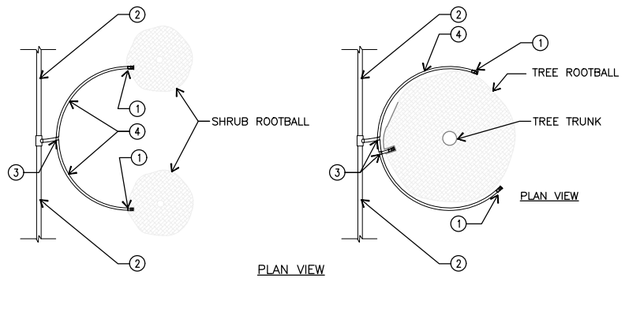
SCALE: NTS — SECTION DETAIL E3



1. FINISH GRADE
2. POP-UP SPRAY HEAD W/CHECK VALVE AND PRESSURE REGULATOR
3. LATERAL TEE OR ELL
4. LATERAL PIPE
5. SWING JOINT: FUNNY PIPE TUBING, 1/2" FUNNY ELBOWS (2), & MARLEX STREET ELBOW (1)

SPRAY HEAD

SCALE: NTS — SECTION DETAIL F1



1. BUBBLER WITH PRV & CHECK VALVE AND SBA-050 BARB ADAPTER FITTING.
2. IRRIGATION LATERAL LINE
3. SPIRAL BARB TEE
4. SWING PIPE, NOT TO EXCEED 10' LENGTH

TREE & SHRUB BUBBLER LAYOUT

SCALE: NTS — IRRIGATION DETAIL F2

BOWEN COLLINS & ASSOCIATES

LICENSED LANDSCAPE ARCHITECT No. 5278822 JAMES R. JACOBSEN STATE OF UTAH
12-15-2022

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW
CHECKED J. BECKMAN
APPROVED J. TSANDES

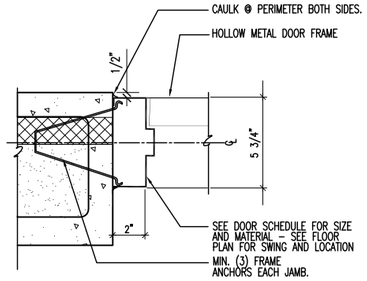
DESIGN
DESIGN R. JACOBSEN
DRAWN R. JACOBSEN

LANDSCAPE

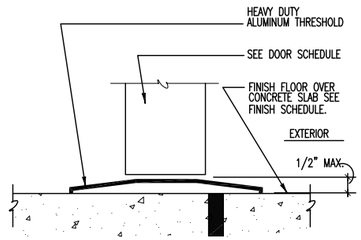
IRRIGATION DETAILS

PROJECT NUMBER 483-20-02
DATE: DECEMBER 2022

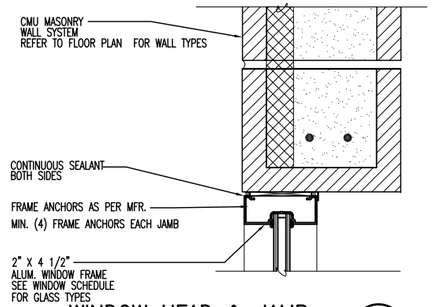
DRAWING NO.
GL-02
SHEET 104 OF 126



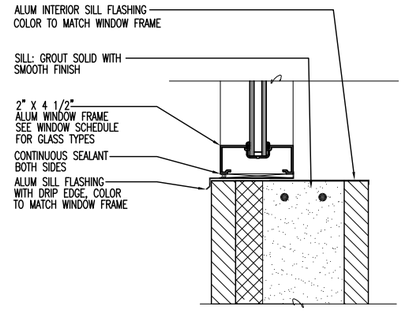
DOOR JAMB & HEAD
NTS — 1 / A-10



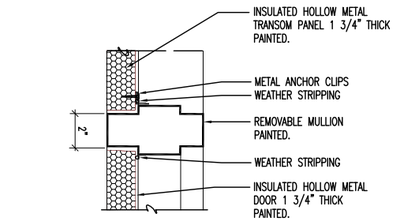
DOOR THRESHOLD
NTS — 2 / A-10



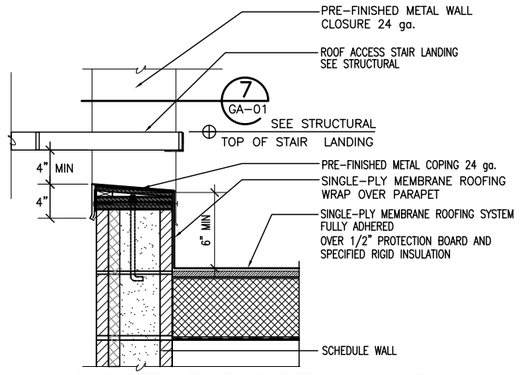
WINDOW HEAD & JAMB
NTS — 3 / A-10



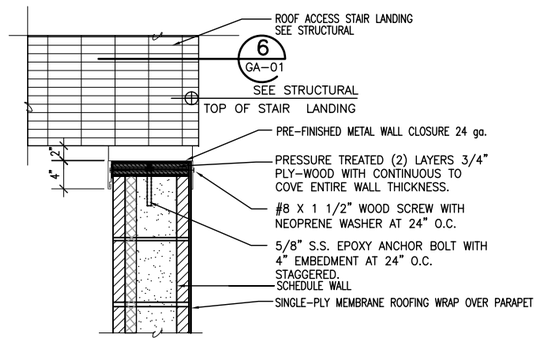
WINDOW SILL
NTS — 4 / A-10



DOOR HEAD AT TRANSOM
NTS — 5 / A-10

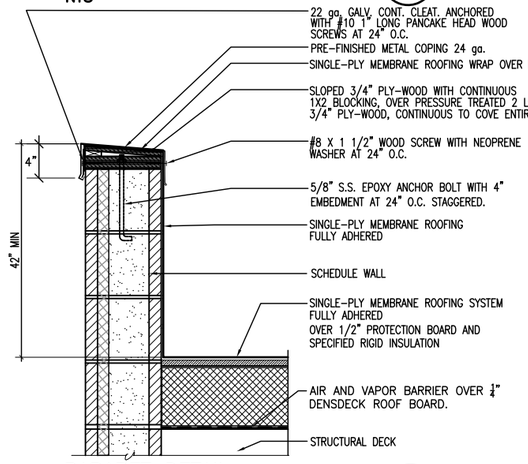


PARAPET AT STAIR DETAIL
NTS — 6 / A-04

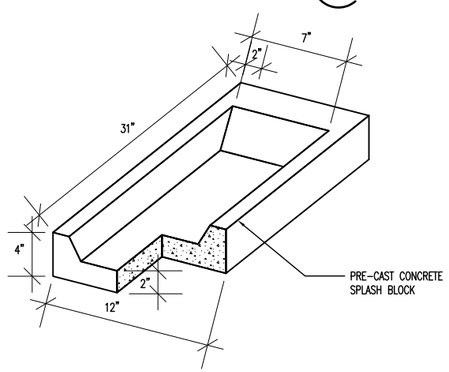


PLAN VIEW

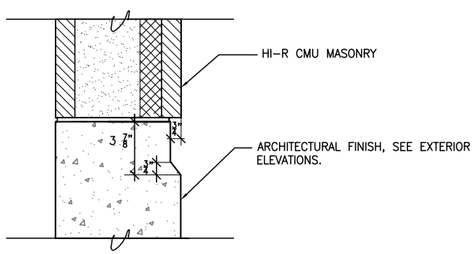
PARAPET WALL CLOSURE
NTS — 7 / A-04



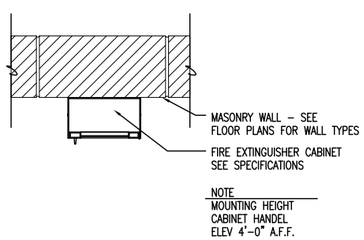
PARAPET DETAIL
NTS — 8 / A-04, A-09



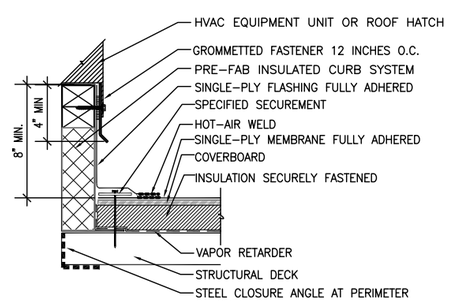
CONCRETE SPLASH BLOCK
NTS — 9 / GA-02



FOUNDATION TO CMU
NTS — 10 / A-09



FIRE EXT. CABINET
NTS — 11 / A-02, A-03



HVAC EQUIP. CURB FLASHING
NTS — 12 / A-04

THALMANN ARCHITECT
2 Pepperwood Pointe
Sandy, Utah 84092
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Email: fthalmann@msn.com

BOWEN COLLINS & ASSOCIATES

FRED L. THALMANN 129331 12/15/2022 STATE OF UTAH

REVISIONS

NO.	DATE	REV. BY	DESCRIPTION

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

REVIEW
CHECKED J. BECKMAN
APPROVED F. THALMANN

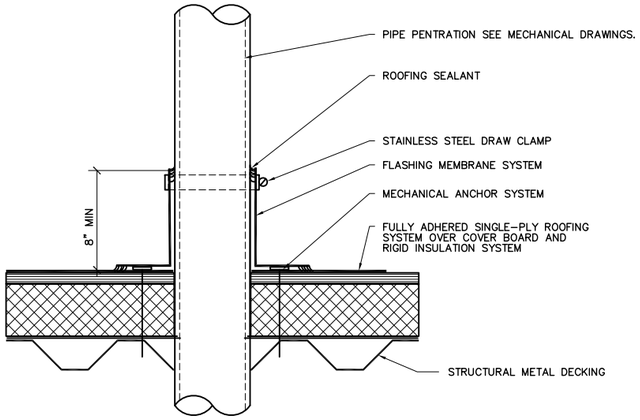
DESIGN
DESIGN F. THALMANN
DRAWN F. THALMANN

ARCHITECTURAL
GENERAL ARCHITECTURAL STANDARD DETAILS-1

PROJECT NUMBER 483-20-02
DATE: DECEMBER 2022

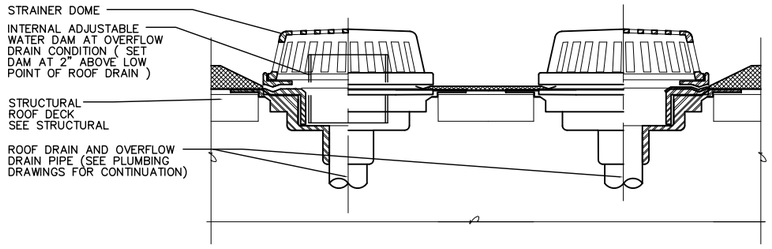
DRAWING NO.
GA-01
SHEET 105 OF 126

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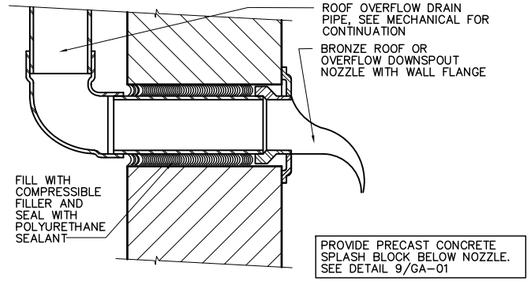
PIPE PENETRATION FLASHING
NTS

13 A-04



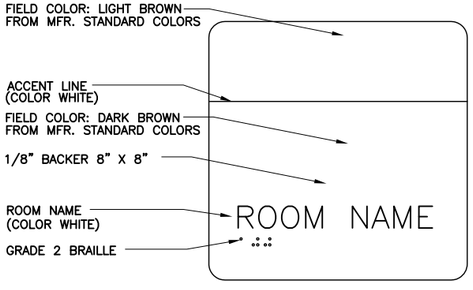
ROOF DRAIN & OVERFLOW DRAIN
NTS

14 A-04



ROOF DRAIN NOZZLE
NTS

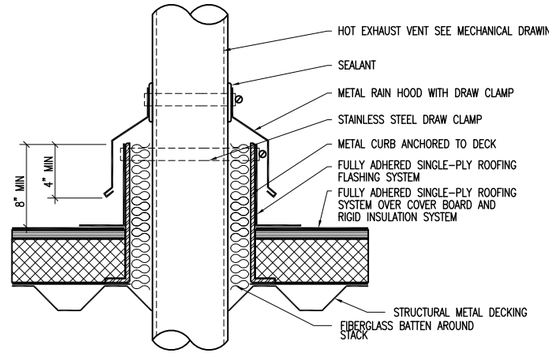
15 A-03



1/16" ROWLMARK BRAND FACE WITH 1/32" PROFILE TACTILE LETTERING AND GRADE 2 BRAILLE

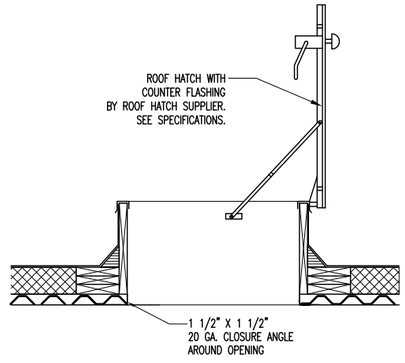
DOOR SIGN 8"X8"
NTS

16 A-10



HOT EXHAUST PENETRATION
NTS

17 A-04



ROOF HATCH DETAIL
NTS

18 A-04

THALMANN ARCHITECT
2 Pepperwood Pointe
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BOWEN COLLINS & ASSOCIATES

FRED L. THALMANN 129331 12/15/2022 STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW
CHECKED J. BECKMAN
APPROVED F. THALMANN

DESIGN
DESIGN F. THALMANN
DRAWN F. THALMANN

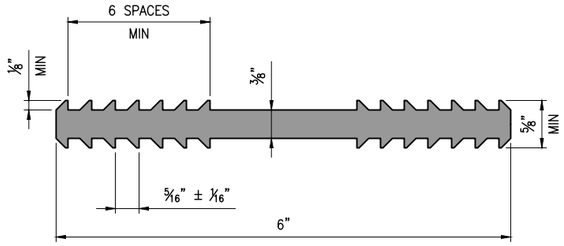
ARCHITECTURAL
GENERAL ARCHITECTURAL STANDARD DETAILS-2

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

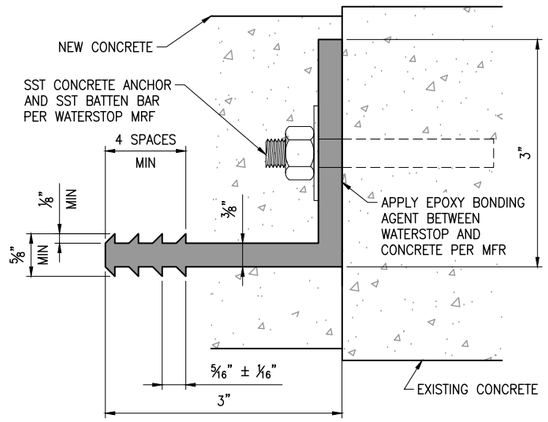
DRAWING NO.
GA-02

SHEET 106 OF 126

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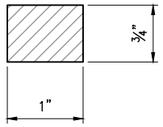


WATERSTOP
NOT TO SCALE — S 4001

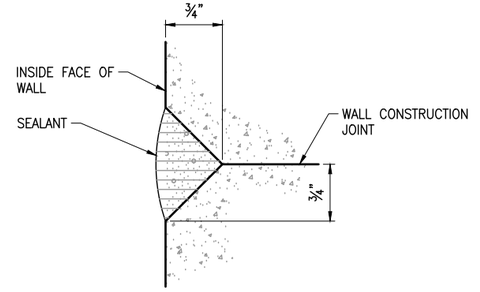


WATERSTOP
NOT TO SCALE — S 4003

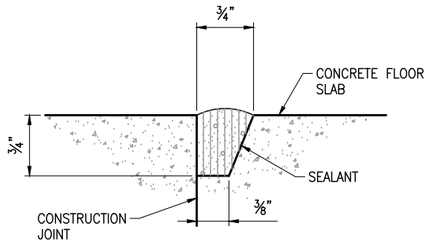
NOTE: WATERSTOP IS PREFORMED PLASTIC ADHESIVE TYPE.



WATERSTOP
NOT TO SCALE — S 4005

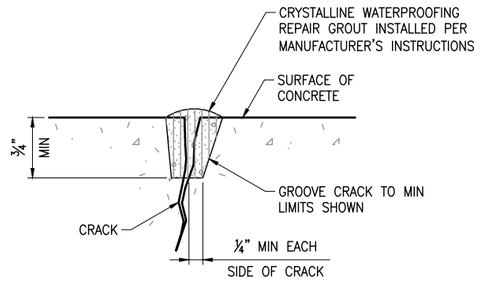


SEALANT
NOT TO SCALE — S 4006



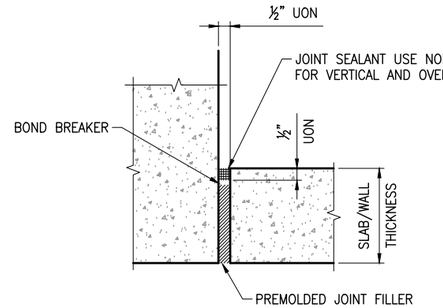
NOTE:
1. AT CONTRACTOR'S OPTION, SEALANT GROOVES MAY CONTINUE STRAIGHT ACROSS CONSTRUCTION JOINT INTERSECTION OR BE STAGGERED UPON APPROVAL OF THE ENGINEER.
2. NO BOND BREAKER WHERE SEALANT GROVE IS CONSTRUCTED.

SEALANT
NOT TO SCALE — S 4007



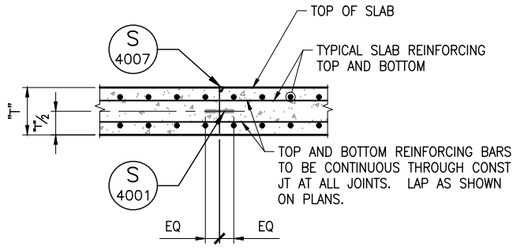
NOTE:
ALL CRACKS IN FLOOR SLABS, WALLS, AND ROOF SLABS ARE TO BE REPAIRED PER THIS DETAIL OR AS INSTRUCTED BY THE ENGINEER PRIOR TO FILLING WITH WATER.

CRACK REPAIR
NOT TO SCALE — S 4010



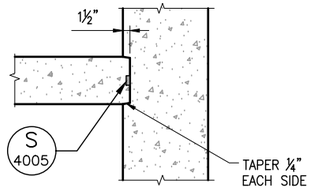
NOTE:
DISCONTINUE ALL REINFORCING AT JOINT.
REINFORCING IS NOT SHOWN FOR CLARITY.

EXPANSION JOINT
NOT TO SCALE — S 4012



ELEVATED SLAB JOINTS W/ WATERSTOP
NOT TO SCALE — S 4025

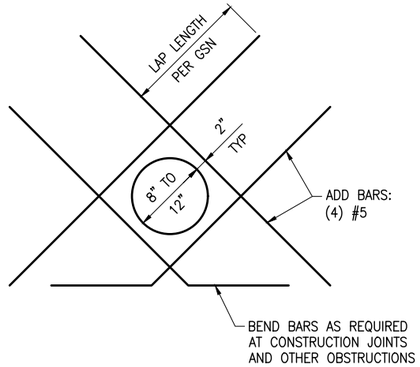
ELEVATED SLAB JOINTS W/O WATERSTOP
NOT TO SCALE — S 4026



DETAIL NOTES:
1. CONSTRUCTION JOINT SHOWN APPLIES FOR BOTH VERTICAL AND HORIZONTAL JOINTS, KEYWAYS TO BE CONTINUOUS.
2. REINFORCING NOT SHOWN FOR CLARITY. WHEN JOINT INTERSECTS REINFORCING STEEL, USE BAR COUPLERS AT THIS JOINT AND LAP/EMBED REINFORCING ON EACH SIDE OF JOINT.

CONST JT W/ WATERSTOP
NOT TO SCALE — S 4027

CONST JT W/O WATERSTOP
NOT TO SCALE — S 4028



DIAGONAL REINFORCEMENT AT CIRCULAR OPENINGS
NOT TO SCALE — S 4030

DETAIL NOTES:
1. THIS DETAIL TO BE USED WHEN CALLED FOR ON THE DRAWINGS OR WHEN NO OTHER DETAIL IS SPECIFIED.
2. CUT NORMAL REINFORCING 2" CLEAR OF OPENING.
3. DIAGONAL BARS TO BE PLACED:
   - AT CENTERLINE OF WALL OR SLAB WHERE SINGLE MAT OF REINFORCEMENT IS PROVIDED.
   - AT EACH FACE OF WALL OR SLAB WHERE TWO MATS OF REINFORCEMENT ARE PROVIDED.
   - NO ADDITIONAL REINFORCING REQUIRED FOR OPENINGS SMALLER THAN 8".

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — No. 12029530 — KYLE ROBERT SMOOT — STATE OF UTAH — 12-9-2022

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

REVIEW — CHECKED S. COHEN — APPROVED K. SMOOT

DESIGN — DESIGN K. SMOOT — DRAWN K. SMOOT

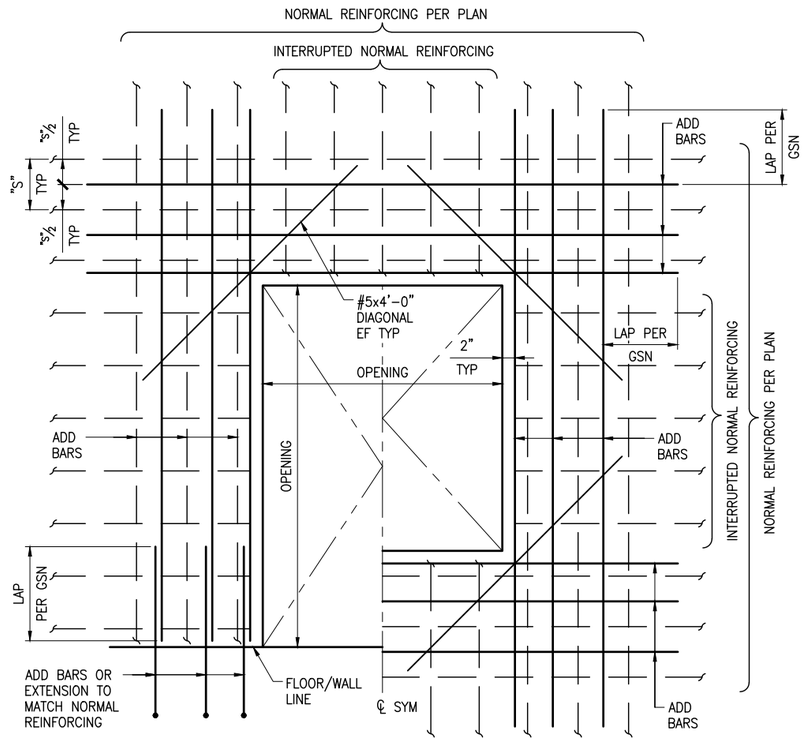
STRUCTURAL
GENERAL STRUCTURAL DETAILS - 1

DATE: DECEMBER 2022 — PROJECT NUMBER 483-20-02

DRAWING NO. GS-01

SHEET 107 OF 126

P:\MAGNA WATER DISTRICT\483-20-02 REUSE PROJECTS\FINAL DESIGN\2.0 DESIGN PHASE\2.9 DRAWINGS\SHT\4832002_GS-01.dwg Plotted: 12/9/2022 2:49 PM By: Kyle Smoot



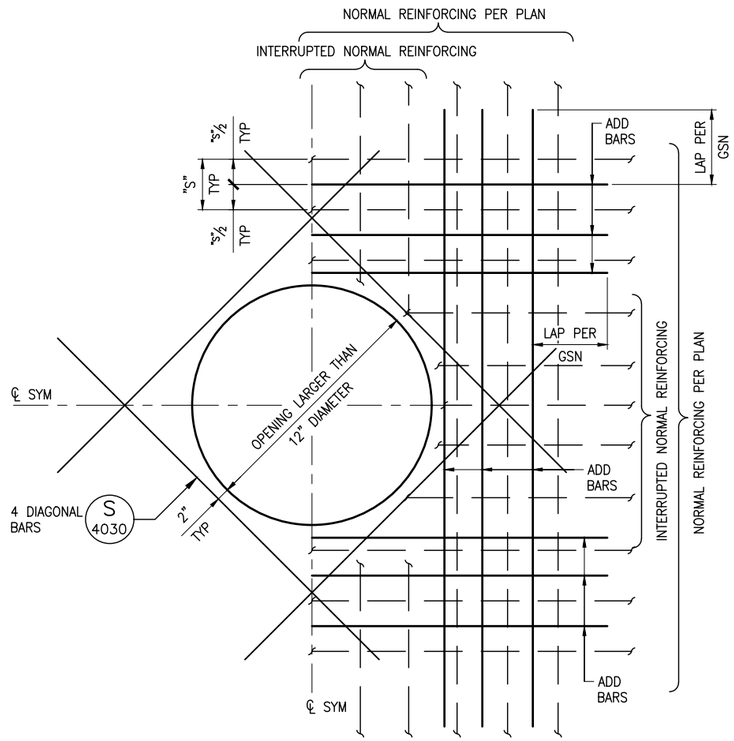
DETAIL NOTES:

1. THIS DETAIL TO BE USED WHEN CALLED FOR ON THE DRAWINGS OR WHEN NO OTHER ADDITIONAL REINFORCING IS SPECIFIED.
2. AREA OF ADD BARS AT EACH EDGE OF OPENING IN EACH DIRECTION SHALL MATCH ½ THE CROSS SECTIONAL AREA OF THE INTERRUPTED BARS. BARS UP TO TWO BAR SIZES LARGER THAN NORMAL REINFORCING MAY BE USED. FIT ADD BARS WITHIN A DISTANCE OF 2X WALL/SLAB THICKNESS FROM EDGE OF OPENING.
3. CUT NORMAL REINFORCING 2" CLEAR OF OPENING.
4. PROVIDE STANDARD ACI HOOKS ON BARS/DOWELS IF STRAIGHT EXTENSION PAST THE OPENING CANNOT BE ACHIEVED.
5. PLACE ADD BARS IN SAME PLANES AS NORMAL REINFORCING INDICATED.
6. PLACE #5 ADD DIAGONAL CORNER BARS UNDER NORMAL REINFORCING INDICATED.
7. NO ADDITIONAL REINFORCING REQUIRED FOR OPENINGS SMALLER THAN 12" SQUARE.
8. WHEN AN INTERSECTING SLAB OR WALL OCCURS WITHIN ONE WALL/SLAB THICKNESS OF THE EDGE OF OPENING, NO ADD BARS ARE REQUIRED ON THAT SIDE.

ADDITIONAL REINFORCING AT RECTANGULAR OPENINGS IN WALLS/SLABS

NOT TO SCALE

S 4034



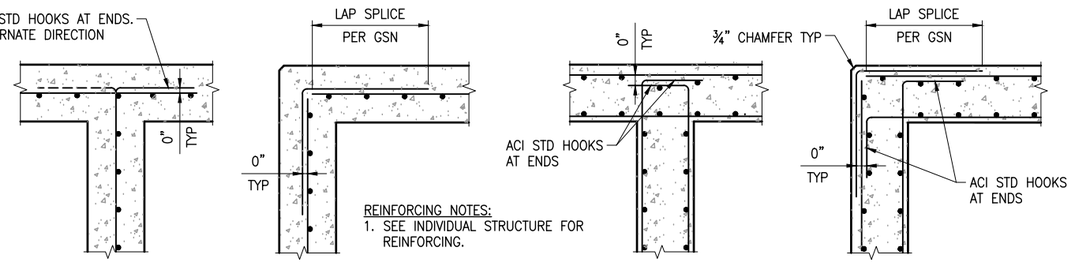
DETAIL NOTES:

1. THIS DETAIL TO BE USED FOR OPENINGS LARGER THAN 12"ø AND WHEN CALLED FOR ON THE DRAWINGS OR WHEN NO OTHER ADDITIONAL REINFORCING IS SPECIFIED. FOR OPENINGS SMALLER THAN 12"ø, USE DETAIL S/4030.
2. AREA OF ADD BARS AT EACH EDGE OF OPENING IN EACH DIRECTION SHALL MATCH ½ THE CROSS SECTIONAL AREA OF THE INTERRUPTED BARS. BARS UP TO TWO BAR SIZES LARGER THAN NORMAL REINFORCING MAY BE USED. FIT ADD BARS WITHIN A DISTANCE OF 2X WALL/SLAB THICKNESS FROM EDGE OF OPENING.
3. CUT NORMAL REINFORCING 2" CLEAR OF OPENING.
4. PROVIDE STANDARD ACI HOOKS ON BARS/DOWELS IF STRAIGHT EXTENSION PAST THE OPENING CANNOT BE ACHIEVED.
5. PLACE ADD BARS IN SAME PLANES AS NORMAL REINFORCING INDICATED.
6. PLACE #5 ADD DIAGONAL CORNER BARS UNDER NORMAL REINFORCING INDICATED.
7. WHEN AN INTERSECTING SLAB OR WALL OCCURS WITHIN ONE WALL/SLAB THICKNESS OF THE EDGE OF OPENING, NO ADD BARS ARE REQUIRED ON THAT SIDE.

ADDITIONAL REINFORCING AT CIRCULAR OPENINGS IN WALLS/SLABS

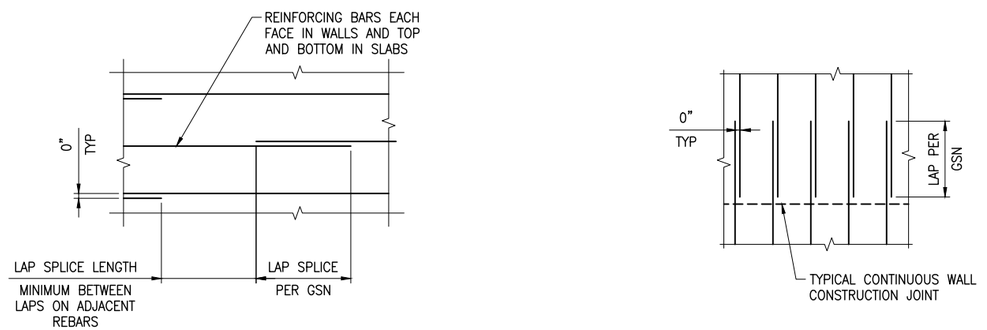
NOT TO SCALE

S 4036



SINGLE–CURTAIN REINFORCING

DOUBLE–CURTAIN REINFORCING



HORIZONTAL REINFORCING

VERTICAL REINFORCING

WALL REINFORCING AT CORNERS AND JUNCTIONS

NOT TO SCALE

S 4039

REINFORCING STEEL LAP SPLICES

NOT TO SCALE

S 4040

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — No. 12629530 — KYLE ROBERT SMOOT — STATE OF UTAH — 12-15-2022

NO.	DATE	REV. BY	DESCRIPTION

REVISIONS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

REVIEW
CHECKED S. COHEN
APPROVED K. SMOOT

DESIGN
DESIGN K. SMOOT
DRAWN K. SMOOT

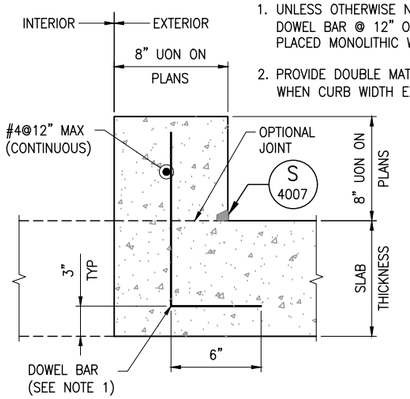
STRUCTURAL
GENERAL STRUCTURAL DETAILS - 2

PROJECT NUMBER 483-20-02
DATE: DECEMBER 2022

DRAWING NO.
GS-02
SHEET 108 OF 126

DETAIL NOTES:

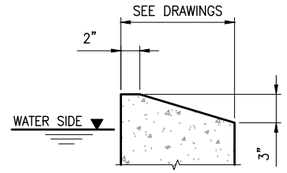
1. UNLESS OTHERWISE NOTED, PROVIDE #4 DOWEL BAR @ 12" OC IF CURB IS NOT PLACED MONOLITHIC WITH SLAB.
2. PROVIDE DOUBLE MAT OF REINFORCING WHEN CURB WIDTH EXCEEDS 9"



CONCRETE CURB

NOT TO SCALE

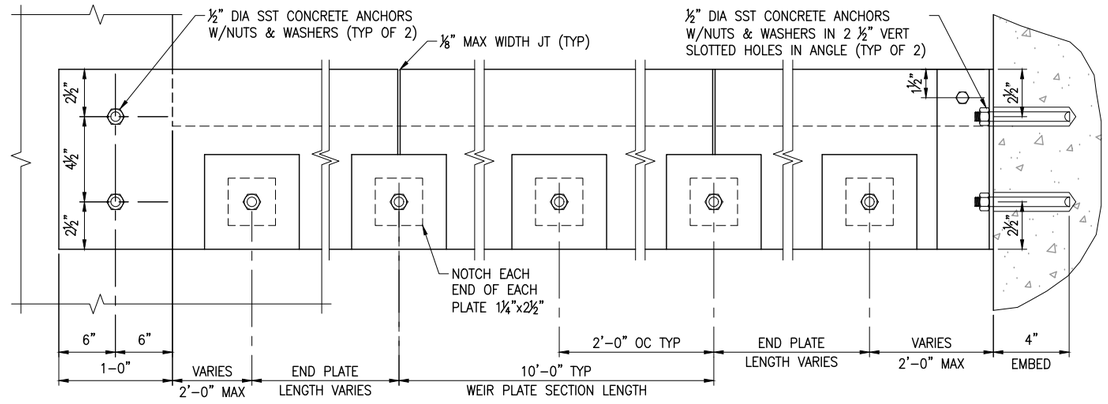
S 4041



CONCRETE WEIR

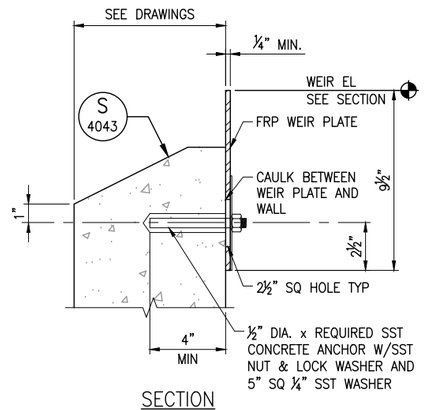
NOT TO SCALE

S 4043

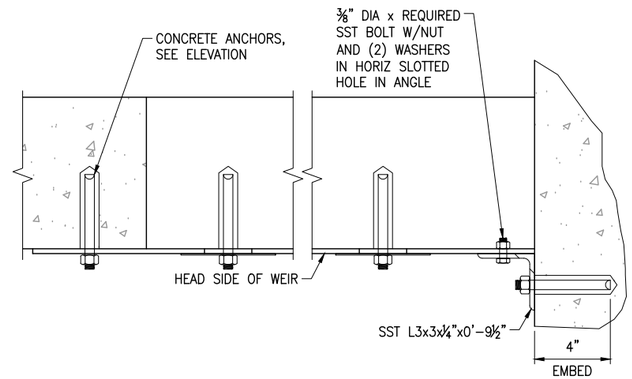


ELEVATION @ CONTINUOUS WALL

ELEVATION @ INTERSECTING WALL



SECTION



PLAN @ CONTINUOUS WALL

PLAN @ INTERSECTING WALL

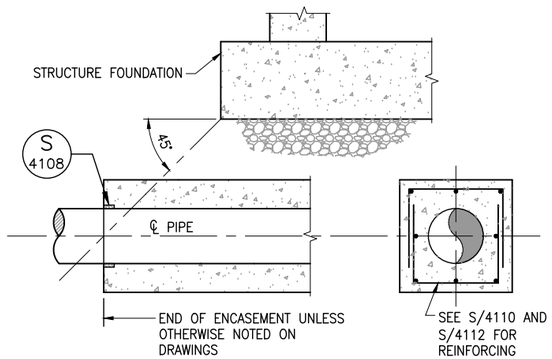
NOTES:

1. WEIR PLATE SHALL BE FRP AS SPECIFIED. ALL FASTENERS AND WASHERS SHALL BE SST AS SPECIFIED.
2. PROVIDE PROTECTION FOR DISSIMILAR METALS.
3. STEEL TROWEL TOP OF CONCRETE TO OBTAIN SMOOTH DENSE FINISH.

STRAIGHT EDGE WIER

NOT TO SCALE

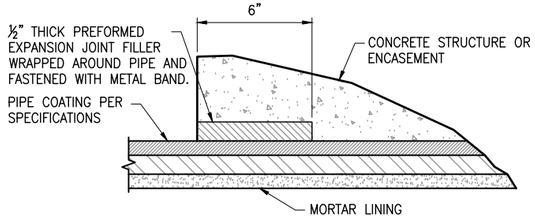
S 4046



PIPE ENCASEMENT END

NOT TO SCALE

S 4107



PIPE ENCASEMENT END

NOT TO SCALE

S 4108

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER No. 12029530 KYLE ROBERT SMOOT STATE OF UTAH 12-15-2022

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

DESIGN K. SMOOT
DRAWN K. SMOOT
REVIEW
CHECKED S. COHEN
APPROVED K. SMOOT

STRUCTURAL

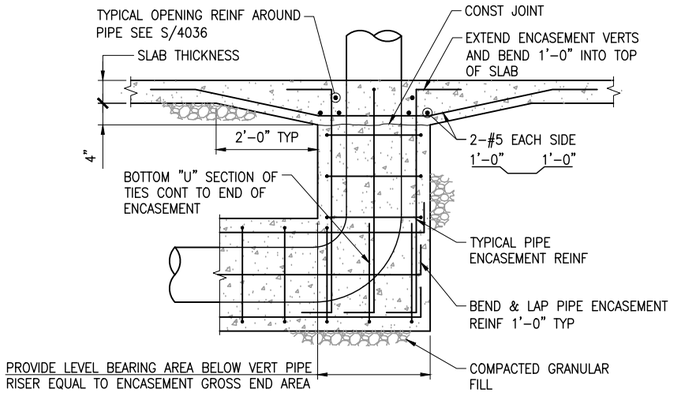
GENERAL STRUCTURAL DETAILS - 3

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

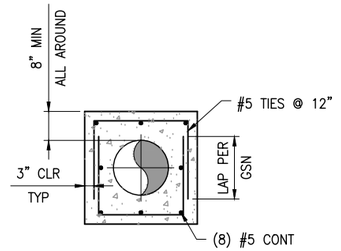
DRAWING NO. GS-03

SHEET 109 OF 126

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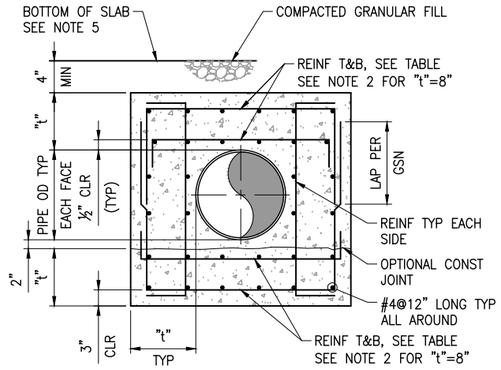


ELEVATION



SECTION

DETAIL NOTE:
SECTION APPLIES TO PIPES W/ DIAMETERS SMALLER THAN 18". FOR 20" DIAMETER PIPES AND LARGER, SEE S/4112.



SECTION

PIPE ENCASEMENT TABLE								
PIPE DIA (IN)	H = 10 FEET		H = 20 FEET		H = 30 FEET		H = 40 FEET	
	"t" (IN)	REINF	"t" (IN)	REINF	"t" (IN)	REINF	"t" (IN)	REINF
20 THRU 30	8	#5@12"	10	#5@12"	10	#5@12"	10	#6@12"
36 THRU 42	10	#5@12"	10	#6@12"	10	#7@12"	10	#6@6"
48 THRU 54	10	#6@12"	10	#7@12"	10	#7@6"	12	#6@6"
UP TO 72	10	#6@12"	10	#6@6"	14	#7@6"	14	#6@6"

HEAVY DARK LINE INDICATES BREAK BETWEEN ONE LAYER OF REINFORCING AND TWO. SEE NOTE 2 BELOW

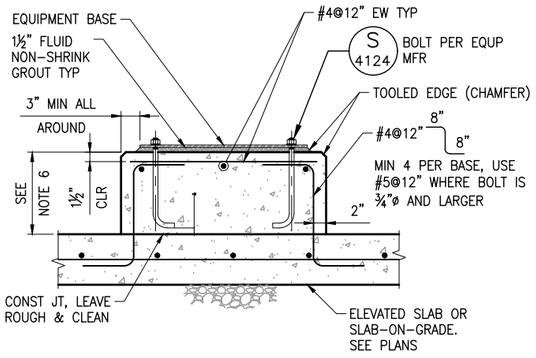
DETAIL NOTES:

1. THIS DETAIL APPLIES TO PIPE DIAMETER OF 20" AND LARGER. FOR SMALLER THAN 20", SEE DETAIL S/4110
2. FOR "t"=8" REINFORCING SHALL BE ONE LAYER AND CENTERED IN SLABS OR WALLS SIM S/4110.
3. SEE S/4110 FOR ENCASEMENT AT PIPE RISER
4. "H" IS FILL HEIGHT OR WATER DEPTH OR COMBINATION ABOVE.
5. WHEN PIPE ENCASEMENT IS CLOSER THAN 4" TO SLAB ABOVE, THICKEN SLAB OVER ENCASEMENT TO BEAR DIRECTLY ON ENCASEMENT, CONSTRUCTION JOINT ALLOWED.

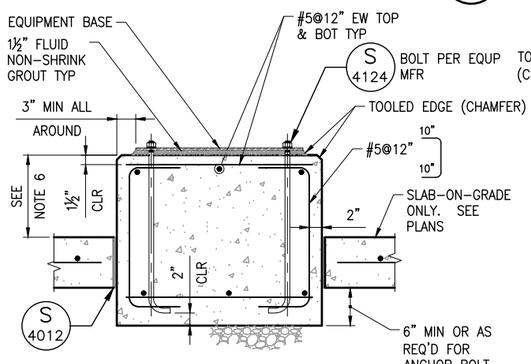
PIPE ENCASEMENT UNDER STRUCTURES

NOT TO SCALE

S 4110



TYPE A

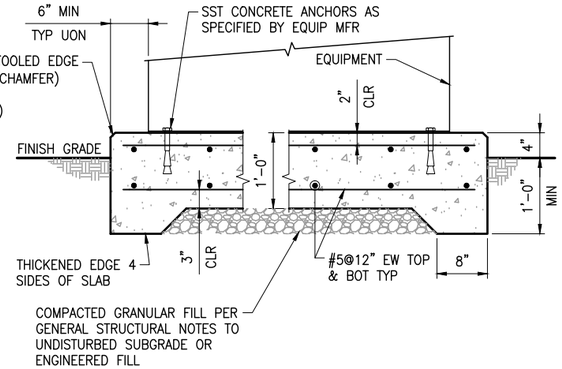


TYPE C

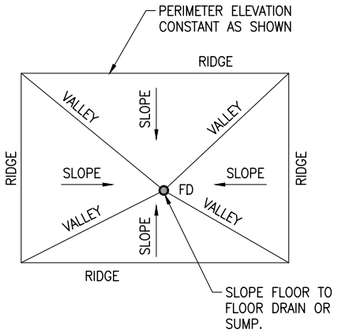
PIPE ENCASEMENT UNDER STRUCTURES

NOT TO SCALE

S 4112



TYPE E



EQUIPMENT PAD NOTES

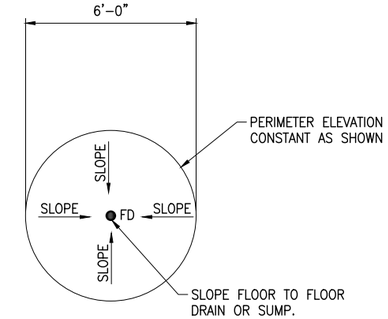
1. PAD SIZE SHALL BE MINIMUM INDICATED OR AS SHOWN ON THE DRAWINGS. VERIFY ALL PAD SIZE REQUIREMENTS WITH EQUIPMENT SHOP DRAWINGS OF ACTUAL EQUIPMENT FURNISHED AND OBTAIN ENGINEER'S APPROVAL OF FINAL DIMENSIONS.
2. THE SIZE, NUMBER, TYPE, LOCATION, AND THREAD PROJECTION OF THE ANCHOR BOLTS SHALL BE DETERMINED BY THE EQUIPMENT MANUFACTURER, AND SHALL BE AS APPROVED BY THE ENGINEER. ANCHOR BOLTS SHALL BE HELD IN POSITION WITH TEMPLATES MATCHING THE EQUIPMENT BASE PLATE, WHILE PAD IS BEING POURED.
3. INSTALL EQUIPMENT BASES LEVEL UNLESS SPECIFIED OTHERWISE.
4. TYPE "C" DETAIL SHALL BE USED ONLY FOR SLABS ON GRADE AND AT GRADE. THE SURROUNDING FLOOR SLAB SHALL NOT BE PLACED UNTIL THE EXACT SIZE AND LOCATION OF THE EQUIPMENT PAD IS KNOWN.
5. WEDGES OR SHIMS SHALL BE USED TO SUPPORT THE BASE WHILE THE NON-SHRINK GROUT IS PLACED. TEMPORARY LEVELING NUTS SHALL BE BACKED OFF. IF LEFT IN PLACE, THE WEDGES AND SHIMS SHALL NOT BE EXPOSED TO VIEW.
6. HEIGHT OF PADS SHALL BE MINIMUM REQUIRED FOR ANCHOR BOLT CLEARANCE TO KEEP ANCHOR BOLT OUT OF SLAB (SEE TABLE BELOW). WHERE EQUIPMENT OR PIPING ELEVATIONS REQUIRE A PAD HEIGHT LESS THAN THE MINIMUM SHOWN, USE TYPE B WITH BLOCKOUT.

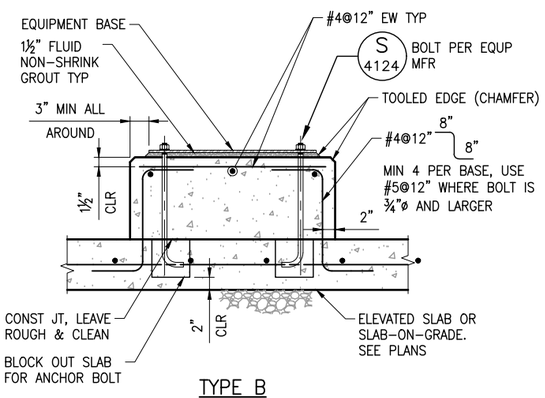
BOLT DIA (IN)	½	⅝	¾	⅞	1
MIN PAD HEIGHT	9	11	13	17	21

FLOOR SLOPE

NOT TO SCALE

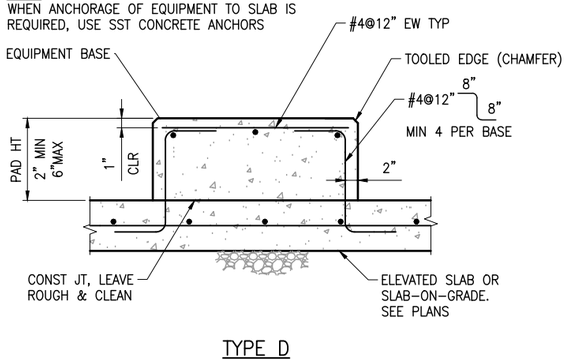
S 4115





TYPE B

NOTE:
WHEN ANCHORAGE OF EQUIPMENT TO SLAB IS REQUIRED, USE SST CONCRETE ANCHORS



TYPE D

EQUIPMENT PAD DETAILS

NOT TO SCALE

S 4113

FLOOR SLOPE

NOT TO SCALE

S 4116

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER No. 12629530 KYLE ROBERT SMOOT STATE OF UTAH 12-9-2022

REVISIONS

NO.	DATE	REV. BY	DESCRIPTION

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

PROJECT
MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECTS
MAGNA, UT

REVIEW
CHECKED S. COHEN
APPROVED K. SMOOT

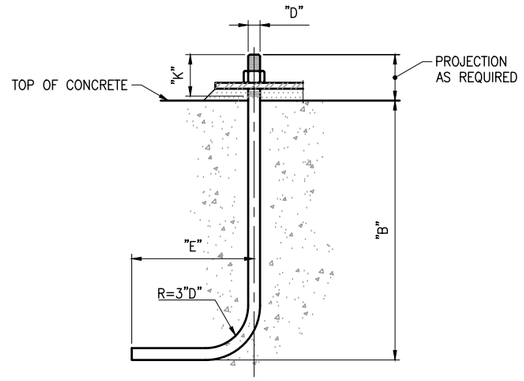
DESIGN
DESIGN K. SMOOT
DRAWN K. SMOOT

STRUCTURAL
GENERAL STRUCTURAL DETAILS - 4

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
GS-04
SHEET 110 OF 126

P:\MAGNA WATER DISTRICT\483-20-02 REUSE PROJECTS\FINAL DESIGN\2,0 DESIGN PHASE\2,9 DRAWINGS\SHT\4832002_GS-04.dwg Plotted: 12/9/2022 2:49 PM By: Kyle Smoot

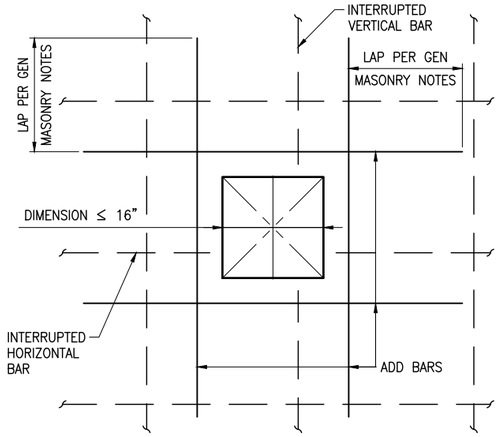


ANCHOR BOLT SCHEDULE			
"D"	"E"	"B"	REMARKS
⅜"	1½"	8"	
½"	1½"	10"	
⅝"	3"	12"	
¾"	3"	14"	
⅞"	4"	16"	
1"	4"	20"	

ANCHOR BOLT (TYPE VI)

NOT TO SCALE

S 4124



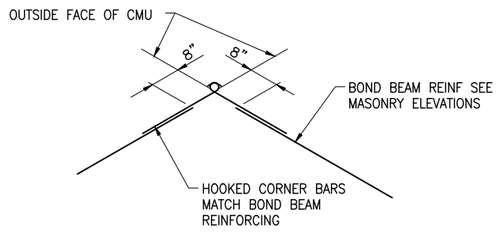
DETAIL NOTES:

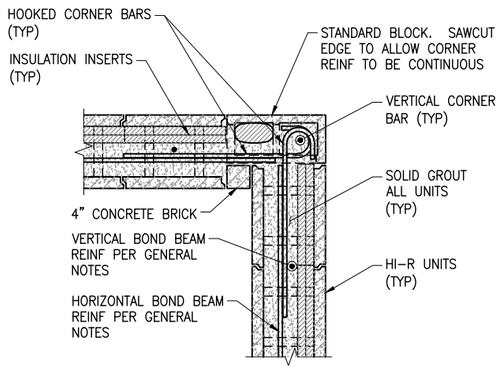
1. THIS DETAIL IS TO BE USED FOR OPENINGS LESS THAN 16" IN ANY DIRECTION AND WHEN CALLED FOR ON THE DRAWINGS OR WHEN NO OTHER ADDITIONAL REINFORCING IS SPECIFIED. SEE ELEVATIONS FOR OPENINGS LARGER THAN 16".
2. ADD BARS AT EACH EDGE OF OPENING IN EACH DIRECTION SHALL MATCH THE CROSS SECTIONAL AREA OF THE INTERRUPTED BAR. WHERE NO BARS ARE INTERRUPTED PROVIDE #4 MINIMUM. FIT ADD BARS WITHIN THE ADJACENT CELLS FROM THE EDGE OF THE OPENING.
3. CUT NORMAL REINFORCING 2" CLEAR OF OPENING.
4. PROVIDE STANDARD ACI HOOKS ON BARS/DOWELS IF STRAIGHT EXTENSION PAST THE OPENING CANNOT BE ACHIEVED.
5. PLACE ADD BARS IN SAME PLANES AS NORMAL REINFORCING INDICATED.

REINFORCEMENT AT MASONRY OPENING

NOT TO SCALE

S 4211

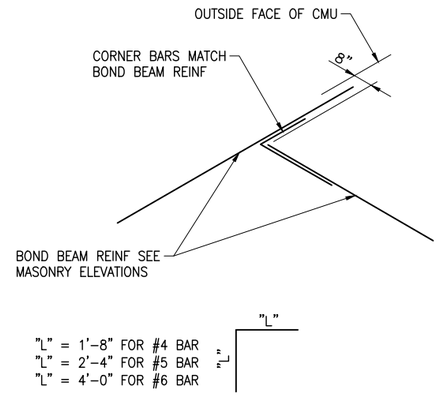




BOND BEAM CORNER DETAIL

NOT TO SCALE

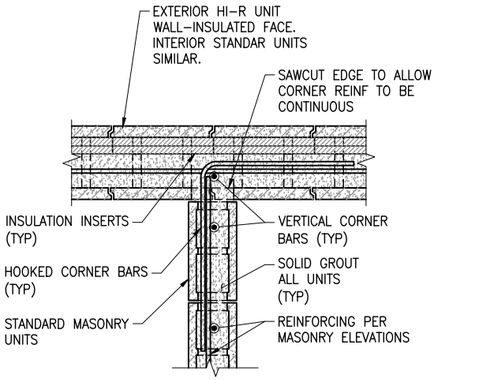
S 4212

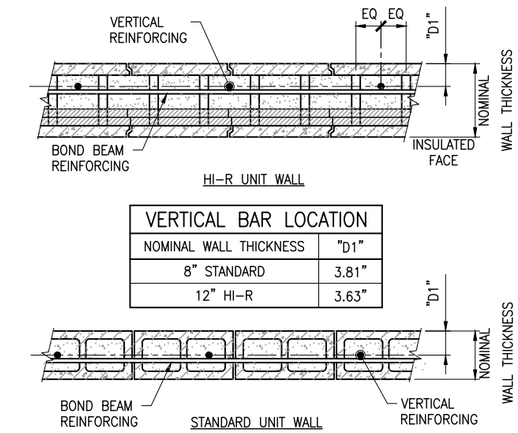


BOND BEAM INTERSECTION DETAIL

NOT TO SCALE

S 4213



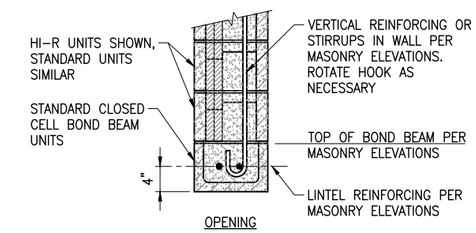


VERTICAL BAR LOCATION	
NOMINAL WALL THICKNESS	"D1"
8" STANDARD	3.81"
12" HI-R	3.63"

VERTICAL WALL STEEL LOCATION

NOT TO SCALE

S 4214



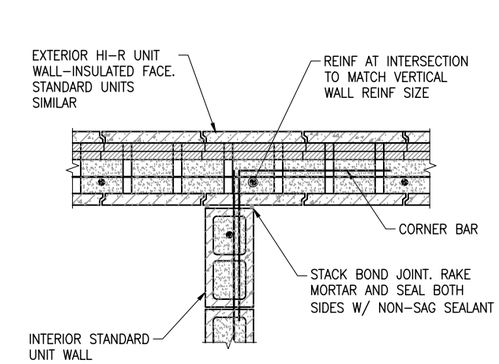
DETAIL NOTES:

1. SEE MASONRY ELEVATIONS FOR REQUIRED LINTEL BARS. MINIMUM IS (1) #5 BAR.
2. NO LAPS ALLOWED IN LINTEL REINFORCING WITHIN 2'-0" OF EDGE OF OPENING.

LINTEL BEAM SECTION

NOT TO SCALE

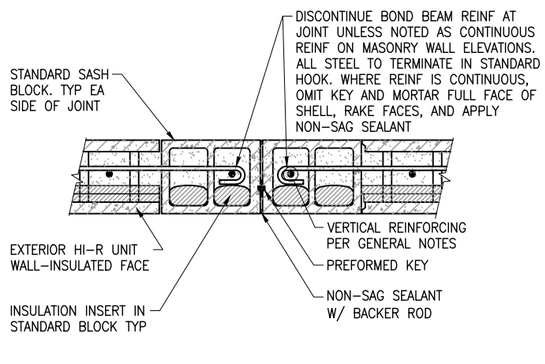
S 4215



MASONRY CONTROL JOINT

NOT TO SCALE

S 4217



MASONRY CONTROL JOINT

NOT TO SCALE

S 4218

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER No. 12029530 KYLE ROBERT SMOOT STATE OF UTAH 12-15-2022

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT

MAGNA WRF REUSE PROJECT

MAGNA, UT

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING

DESIGN K. SMOOT
DRAWN K. SMOOT
CHECKED S. COHEN
APPROVED K. SMOOT
REVIEW

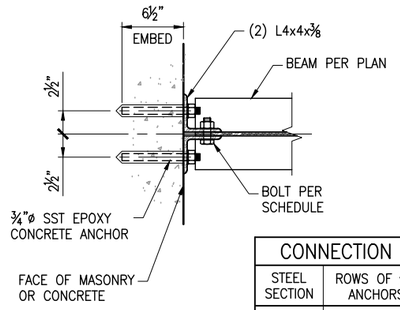
STRUCTURAL

GENERAL STRUCTURAL DETAILS - 5

PROJECT NUMBER 483-20-02
DATE: DECEMBER 2022

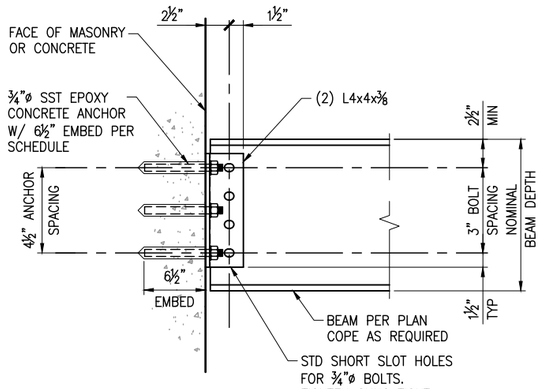
DRAWING NO. GS-05

SHEET 111 OF 126

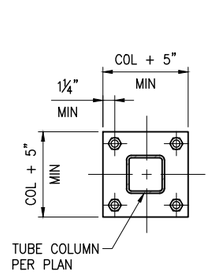


PLAN

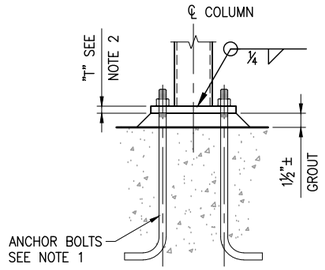
CONNECTION SCHEDULE		
STEEL SECTION	ROWS OF ¾" ANCHORS	ROWS OF A325N BOLTS
W8	2	2
W10	2	2
W12	2	3
W14	2	3
W16	3	4



ELEVATION



PLAN



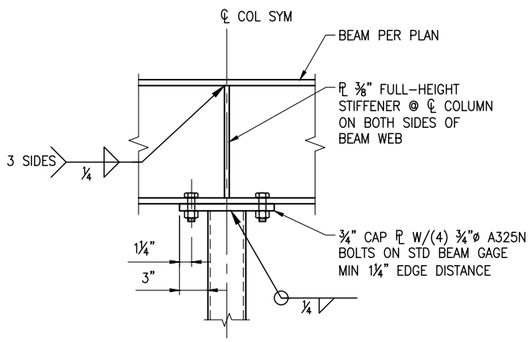
ELEVATION

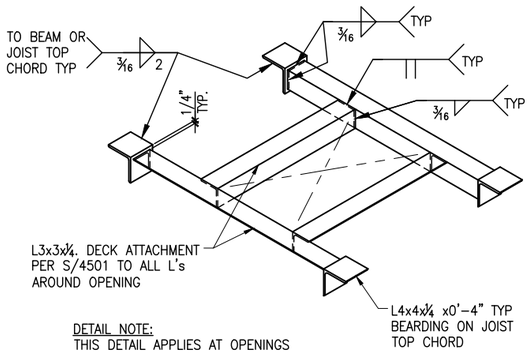
DETAIL NOTES

1. ANCHOR BOLTS SHALL BE ¾"ø TYPE VI PER S/4124 W/ LEVELING NUTS AND WASHERS UNLESS OTHERWISE NOTED.
2. BASE PLATE TO BE ¾" THICK UNLESS OTHERWISE NOTED.
3. GROUT SHALL BE NONSHRINK AND FLOWABLE AS PER SPECIFICATIONS.

EMBEDDED BEAM CONNECTION

NOT TO SCALE — S 4301

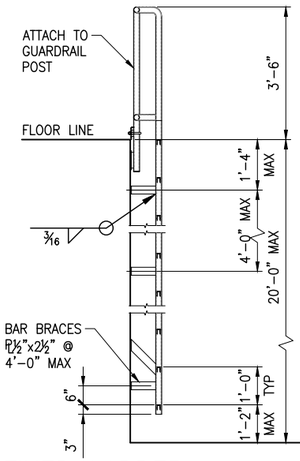


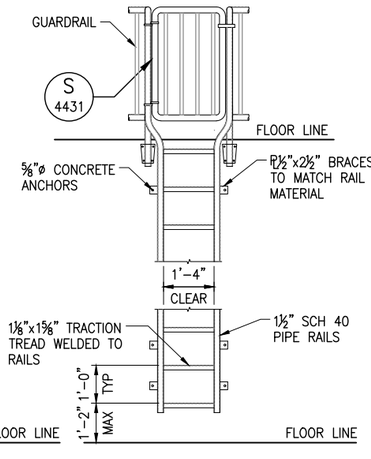


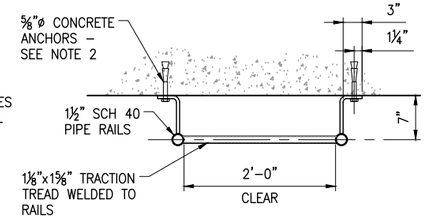
DETAIL NOTE:
THIS DETAIL APPLIES AT OPENINGS IN ROOF OVER 24" WIDE, WHETHER SPECIFICALLY REFERENCED OR NOT.

COLUMN BASE

NOT TO SCALE — S 4304





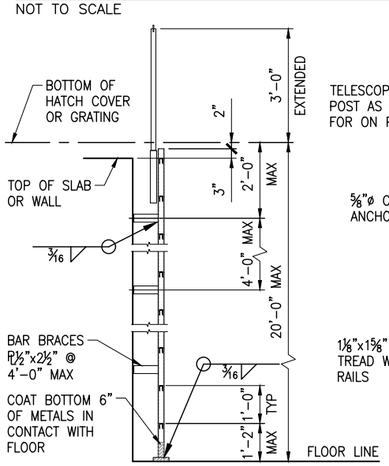


LADDER NOTES:

1. LADDER MATERIAL SHALL MATCH GUARDRAIL MATERIAL FOR PARTICULAR LOCATION/APPLICATION.
2. USE 316 STAINLESS STEEL FOR ANCHORS & FASTENERS EXCEPT FASTENERS FOR GALVANIZED STEEL LADDERS SHALL BE GALVANIZED STEEL.
3. FABRICATE AND INSTALL LADDERS TO COMPLY WITH OSHA AND ANSI STANDARDS.

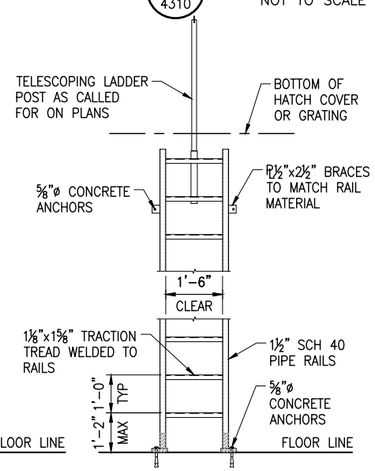
COLUMN CAP

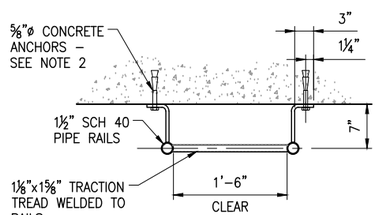
NOT TO SCALE — S 4310



SUPPORT FRAME AT ROOF

NOT TO SCALE — S 4312





LADDER NOTES:

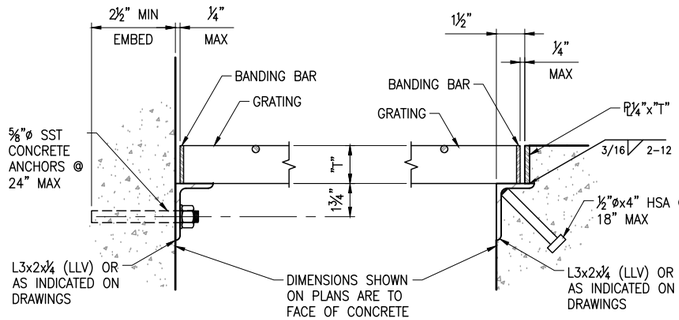
1. LADDER MATERIAL SHALL BE GALVANIZED STEEL UNLESS INDICATED OTHERWISE ON THE PLANS.
2. USE 316 STAINLESS STEEL FOR ANCHORS & FASTENERS EXCEPT FASTENERS FOR GALVANIZED STEEL LADDERS SHALL BE GALVANIZED STEEL.
3. FABRICATE AND INSTALL LADDERS TO COMPLY WITH OSHA AND ANSI STANDARDS.

FIXED LADDER

NOT TO SCALE — S 4411

FIXED LADDER

NOT TO SCALE — S 4410



DETAIL NOTES:

1. GRATING DEPTH "T" AS NOTED ON DRAWINGS.
2. ALL EDGES AND OPENINGS ARE TO BE BANDED.
3. WEIGHT OF INDIVIDUAL GRATING SECTION SHALL NOT EXCEED 80 LBS.
4. METAL BEARING BARS ARE TO BE DEPTH "T"x3/16" @ 1 3/16" OC. CROSS BARS ARE TO BE AT 4" OC.
5. PROVIDE A MINIMUM OR 4 CLIPS PER GRATING PANEL AND LOCATE APPROXIMATELY 4" FROM PANEL CORNERS. MAXIMUM SPACING OF CLIPS IS 3'-0".
6. MATERIALS:
   ALUMINUM GRATING – USE ALUMINUM ANGLE SUPPORTS AND STAINLESS STEEL BOLTS AND CLIPS.
   GALVANIZED STEEL GRATING – USE GALVANIZED STEEL SUPPORTS, BOLTS, AND CLIPS. HOT-DIP GALVANIZE AFTER FABRICATION.
   STAINLESS STEEL GRATING – USE 316 STAINLESS STEEL ANGLE SUPPORTS, BOLTS, AND CLIPS.

METAL GRATING

NOT TO SCALE — S 4416

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — No. 12629530 — KYLE ROBERT SMOOT — STATE OF UTAH — 12-15-2022

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

DESIGN K. SMOOT
DRAWN K. SMOOT
CHECKED S. COHEN
APPROVED K. SMOOT
REVIEW

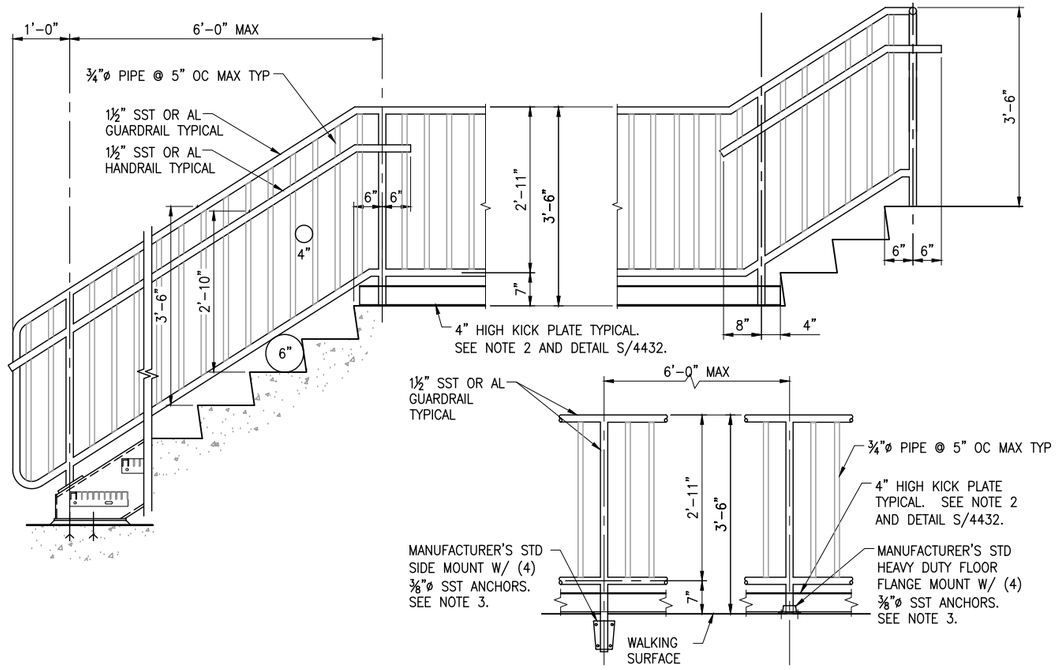
STRUCTURAL

GENERAL STRUCTURAL DETAILS - 6

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO. GS-06

SHEET 112 OF 126

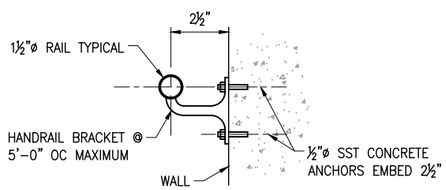


NOTES:

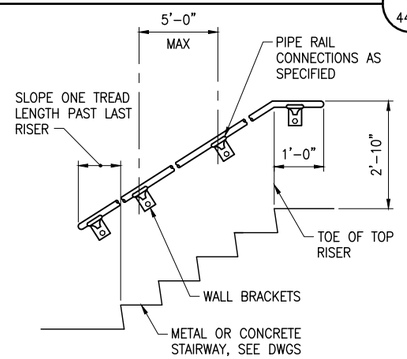
1. PLACE CENTER OF FLOOR FLANGE MOUNTED POSTS 4" FROM EDGE OF CONCRETE OR 6" FROM STAIR NOSINGS UNLESS OTHERWISE NOTED ON DRAWINGS.
2. KICKPLATE MAY BE EXTRUDED SHAPE OR BENT PLATE AND SHALL BE ATTACHED WITH STAINLESS STEEL BOLTS. BOLT KICKPLATE TO POSTS WITH BOTTOM ¼" CLEAR FROM WALKING SURFACE. FOR SIDE MOUNTED HANDRAIL, PROVIDE STANDARD SPACER BLOCK BETWEEN POST AND KICKPLATE TO MAINTAIN ¼" MAXIMUM CLEAR SPACING. PROVIDE KICKPLATE AT ALL PLACES WHERE DROP FROM ONE LEVEL TO ANOTHER EXCEEDS 2'-6" AND WHERE INDICATED ON THE DRAWINGS. HAND TIGHTEN AND CENTER PUNCH BOLT THREADS TO LOCK. KICKPLATE MAY BE OMITTED WHERE RAILING IS MOUNTED ON MINIMUM 4" HIGH CURB.
3. VARIOUS POST MOUNTINGS ARE SHOWN IN THIS DETAIL. SIDE MOUNTING IS PREFERRED. REFER TO DRAWINGS FOR SPECIFIC MOUNTING REQUIREMENTS.
4. PLACE RAIL POSTS OPPOSITE EACH OTHER WHEN POSSIBLE AND WHERE GUARDRAILS ARE PARALLEL.
5. COAT ALL SURFACES OF ALUMINUM IN CONTACT WITH CONCRETE IN ACCORDANCE WITH SPECIFICATIONS. PLACE NEOPRENE GASKET BETWEEN ALUMINUM AND STEEL.
6. ALL GUARDRAILS ARE FIXED UNLESS OTHERWISE NOTED ON DRAWINGS. FOR REMOVABLE RAILING SECTIONS SEE S/4435 FOR ANCHORAGE DETAILS.
7. HANDRAILS ALONG WALLS SHALL BE SINGLE RAIL PER DETAIL S/4428 WITH TOP OF RAIL AT 2'-10" ABOVE TREAD NOSINGS AND LANDINGS.
8. ALL JOINTS IN SHALL BE COPED, WELDED, AND GROUND SMOOTH.
9. FOR RAIL POSTS MOUNTED TO BEAM OR STAIR CHANNEL, PROVIDE MANUFACTURER'S STANDARD REINFORCED CONNECTION FROM POST TO PLATE. BOTH THE PLATE AND REINFORCED INSERT TO BE ALUMINUM OR STAINLESS STEEL.
10. SEE DRAWINGS AND SPECIFICATIONS FOR GUARDRAIL MATERIALS.

PICKET GUARDRAIL

NOT TO SCALE — S 4425

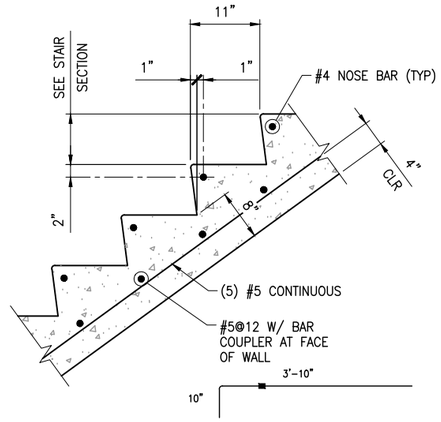


DETAIL NOTE:
ATTACHED HANDRAIL TO BRACKET AS REQUIRED PER MANUFACTURER'S STANDARD.



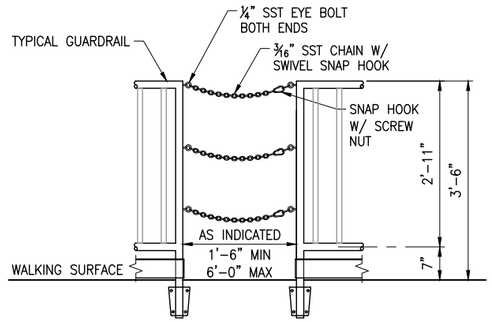
SINGLE RAIL (WALL)

NOT TO SCALE — S 4428



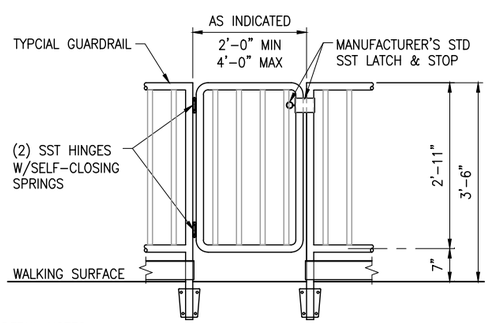
CONCRETE STAIR

NOT TO SCALE — S 4429



CHAINED OPENING

NOT TO SCALE — S 4430

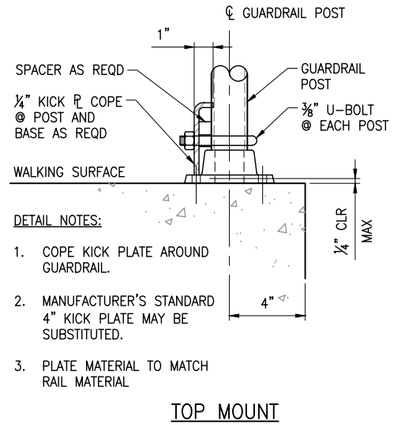


DETAIL NOTES:

1. GATE MATERIAL AND FINISH TO MATCH ADJACENT GUARDRAIL.
2. GATE TO OPEN TOWARD WALKWAY AND AWAY FROM LADDER.

GUARDRAIL GATE

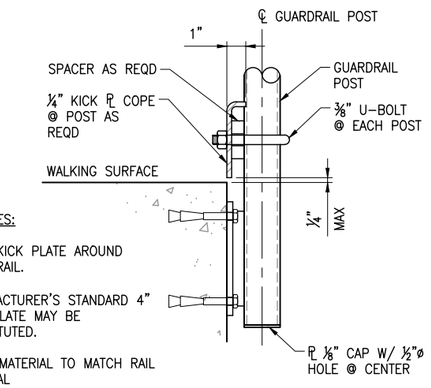
NOT TO SCALE — S 4431



DETAIL NOTES:

1. COPE KICK PLATE AROUND GUARDRAIL.
2. MANUFACTURER'S STANDARD 4" KICK PLATE MAY BE SUBSTITUTED.
3. PLATE MATERIAL TO MATCH RAIL MATERIAL

TOP MOUNT



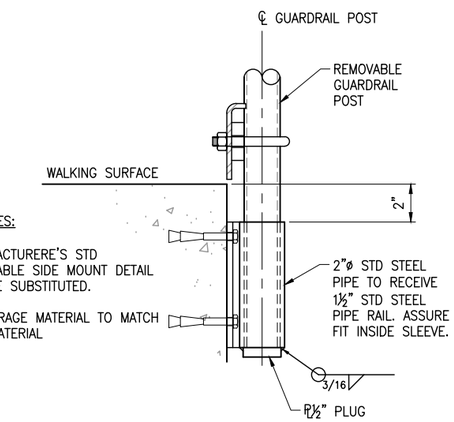
DETAIL NOTES:

1. COPE KICK PLATE AROUND GUARDRAIL.
2. MANUFACTURER'S STANDARD 4" KICK PLATE MAY BE SUBSTITUTED.
3. PLATE MATERIAL TO MATCH RAIL MATERIAL

SIDE MOUNT

KICK PLATE

NOT TO SCALE — S 4432



DETAIL NOTES:

1. MANUFACTURERE'S STD REMOVABLE SIDE MOUNT DETAIL MAY BE SUBSTITUTED.
2. ANCHORAGE MATERIAL TO MATCH RAIL MATERIAL

REMOVABLE RAIL ANCHORAGE

NOT TO SCALE — S 4435

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — No. 12629530 — KYLE ROBERT SMOOT — STATE OF UTAH — 12-9-2022

NO.	DATE	REV. BY	REVISIONS DESCRIPTION

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

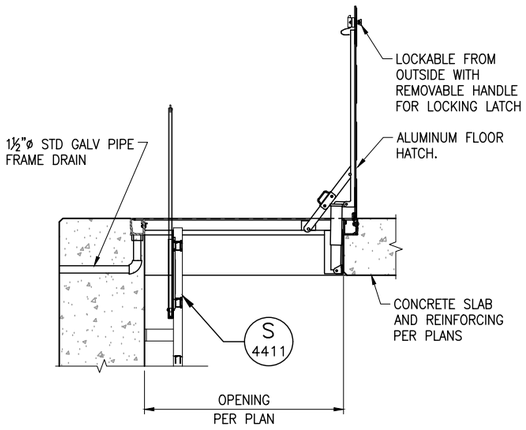
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

DESIGN K. SMOOT
DRAWN K. SMOOT
CHECKED S. COHEN
APPROVED K. SMOOT
REVIEW

STRUCTURAL
GENERAL STRUCTURAL DETAILS - 7
DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO. GS-07
SHEET 113 OF 126

P:\MAGNA WATER DISTRICT\483-20-02 REUSE PROJECTS\FINAL DESIGN\2.0 DESIGN PHASE\2.9 DRAWINGS\SHT\4832002_GS-07.dwg Plotted: 12/9/2022 2:49 PM By: Kyle Smoot



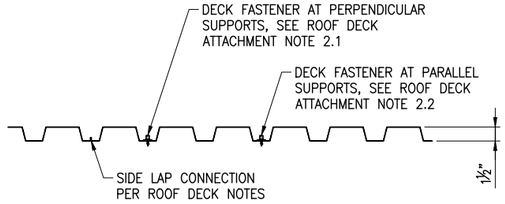
DETAIL NOTES:

1. FLOOR HATCH TO BE RATED AT MININUM 150 PSF UNLESS NOTED OTHERWISE.
2. HATCH TO BE SUPPLIED WITH MANUFACTURER'S STANDARD FALL PROTECTION GRATING, MEETING THE REQUIREMENTS OF OSHA STANDARD 29 CFR 1910.23.
3. HARDWARE SHALL BE TYPE 316 STAINLESS STEEL
4. INSTALLED LADDER AND LADDER UP DEVICE WHEN SHOWN ON PLANS.

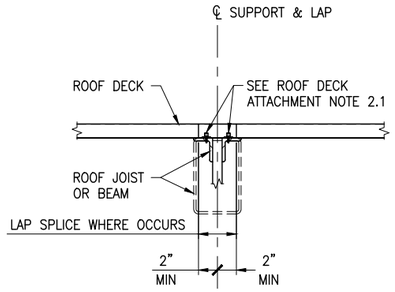
HATCH

NOT TO SCALE

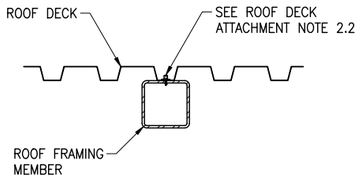
S 4447



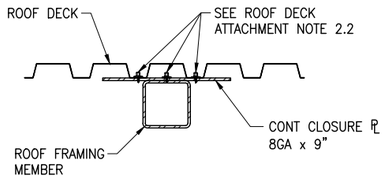
DETAIL 1



DETAIL 2



OPTION 1



OPTION 2

DETAIL 3

ROOF DECK NOTES

1. ROOF DECK ASSEMBLY TO BE PER PROJECT SPECIFICATIONS AND AS SHOWN IN DETAIL 1 HEREIN. ATTACHMENT TO SUPPORT FRAMING PER "ROOF DECK ATTACHMENT NOTES."
2. DECK SHALL BE CONTINUOUS OVER A MINIMUM OF 3 SPANS AND PERPENDICULAR TO LINE OF STEEL SUPPORTS.
3. ALL ROOF DECKS IN THIS STRUCTURE ARE ZONE 1. MINIMUM PROPERTIES FOR STEEL DECK ARE AS FOLLOWS:

ZONE 1	THICKNESS –	18 GAGE
	WEIGHT (PSF) –	2.9
	I (IN4/FT) –	0.302
	+S (IN3/FT) –	0.314
	–S (IN3/FT) –	0.331

SIDE LAP TYPE & SPACING: PUNCHLOK II CONNECTION (VSC2) @ 12"

4. DECK SHALL HAVE A MINIMUM ALLOWABLE DIAPHRAGM SHEAR VALUE OF 2790 PLF.

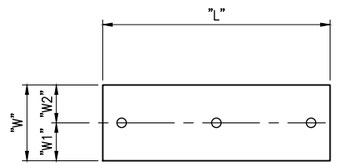
ROOF DECK ATTACHMENT NOTES

1. ALL FASTENERS TO BE HILTI X–HSN 24 POWER–ACTUATED FASTENERS OR ENGINEER APPROVED EQUAL.
2. FASTEN DECK TO SUPPORTING FRAMING WITH POWER–ACTUATED FASTENERS AS FOLLOWS:
   - 2.1. INTERIOR SUPPORTS PERPENDICULAR TO RIBS OF DECK: (7) POWER–ACTUATED FASTENERS PER 36" WIDE PANEL. WHERE DOUBLE ANGLE CHORDS ARE USED, ALTERNATE FASTENERS BETWEEN EACH ANGLE OF THE TOP CHORD OF SUPPORTS.
   - 2.2. SUPPORTS PARALLEL TO RIBS OF DECK: POWER–ACTUATED FASTENERS @ 9" MAX.
   - 2.3. END LAPS AT PANEL SPLICES: 2" MINIMUM LAP EACH SIDE OF ℄ OF SUPPORT PER DETAIL 1
   - 2.4. SIDE LAPS: REFER TO ROOF DECK NOTES PER ZONE FOR SPACING AND TYPE.
3. FASTEN DECK TO SUPPORTING FRAMING AT OPENINGS AS FOLLOWS:
   - 3.1. (7) POWER–ACTUATED FASTENERS PER 36" PANEL WIDTH AT PERPENDICULAR SUPPORTS. WHERE DOUBLE ANGLE CHORDS ARE USED, ALTERNATE FASTENERS BETWEEN EACH ANGLE OF THE TOP CHORD OF SUPPORTS.
   - 3.2. POWER–ACTUATED FASTENERS @ 9" MAX AT PARALLEL SUPPORTS.
4. FASTEN DECK TO TOP OF INTERIOR MASONRY WALL AS FOLLOWS:
   - 4.1. INTERIOR SUPPORTS PERPENDICULAR TO RIBS OF DECK: (7) ¾"ø (½"ø EFFECTIVE) PUDDLE WELDS PER 36" WIDE PANEL.
   - 4.2. SIDE LAPS: REFER TO ROOF DECK NOTES PER ZONE FOR SPACING AND TYPE.

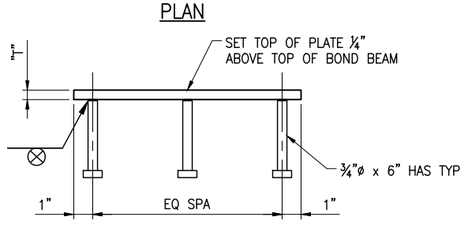
STEEL ROOF DECKING

NOT TO SCALE

S 4501



PLAN



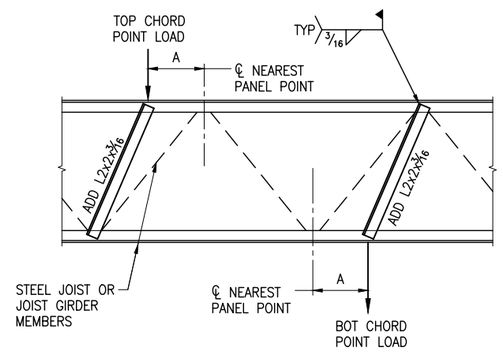
ELEVATION

EMBEDDED CONNECTION PLATE SCHEDULE						
PLATE MARK	WIDTH (IN)			LENGTH "L" (IN)	ℙ THICK "T" (IN)	NUMBER OF HAS
	"W"	"W1"	"W2"			
P1	6	4	2	8	5/8	2

MASONRY CONNECTION PLATE

NOT TO SCALE

S 4502



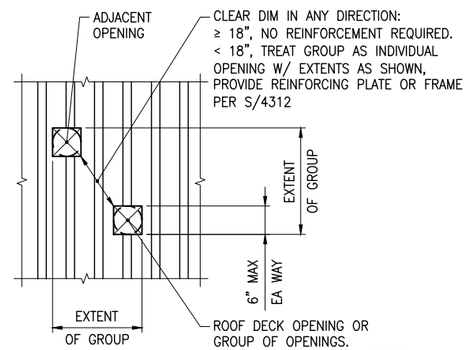
DETAIL NOTES:

1. NO LOADS SHALL BE HUNG FROM THE TOP OR BOTTOM CHORDS, UNLESS SHOWN ON PLAN OR APPROVED BY THE ENGINEER.
2. ADDED DIAGONAL BRACE IS NOT REQUIRED WHERE A < 6".

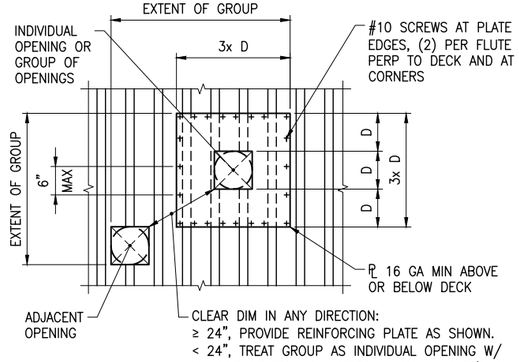
CONCENTRATED LOAD ON JOIST

NOT TO SCALE

S 4504



AT OPENINGS UP TO 6"



AT OPENINGS LARGER THAN 6" UP TO 13"

STEEL DECK OPENINGS

NOT TO SCALE

S 4506

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — No. 12629530 — KYLE ROBERT SMOOT — STATE OF UTAH — 12-15-2022

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT

MAGNA WRF REUSE PROJECT

MAGNA, UT

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING

DESIGN S. COHEN — CHECKED S. COHEN — REVIEW S. COHEN — APPROVED K. SMOOT

DESIGN K. SMOOT — DRAWN K. SMOOT

STRUCTURAL

GENERAL STRUCTURAL DETAILS - 8

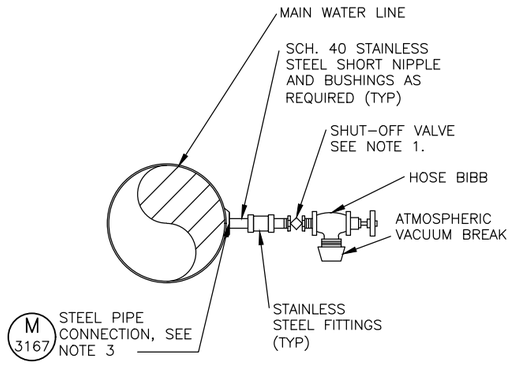
DATE: DECEMBER 2022

PROJECT NUMBER 483-20-02

DRAWING NO. GS-08

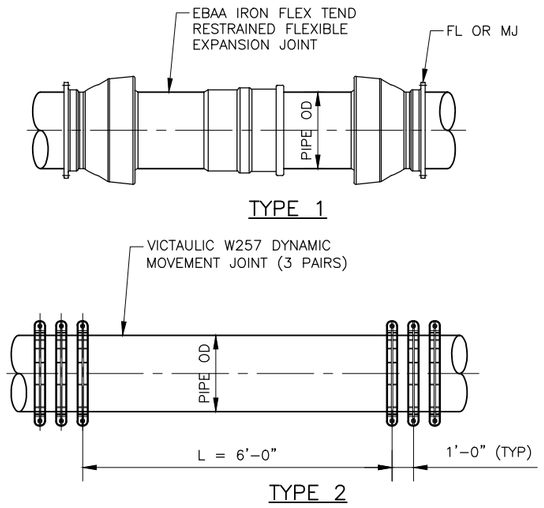
SHEET 114 OF 126

P:\MAGNA WATER DISTRICT\483-20-02 REUSE PROJECTS\FINAL DESIGN\2.0 DESIGN PHASE\2.9 DRAWINGS\SHT\4832002_GS-08.dwg Plotted: 12/9/2022 2:50 PM By: Kyle Smoot



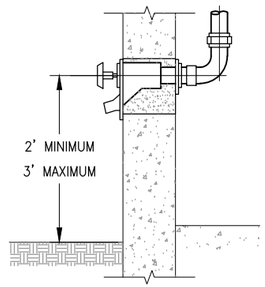
NOTES:
1. ALL HOSE BIBBS SHALL BE ASSE 1019 APPROVED OR HAVE AND ASSE 1011 HOSE BIBB VACUUM BREAKER AND ARE TO BE CONTROLLED BY INDIVIDUAL SHUT-OFF VALVES (BALL VALVES) EXCEPT WHERE INDIVIDUALLY CONTROLLED BRANCH MAIN SERVES HOSE BIBBS ONLY.
2. FOR SIZE AND LOCATION SEE DRAWINGS.
3. ALL FITTINGS, VALVES, NIPPLES, GAUGES AND WELDS SHALL BE ABLE TO MEET OR EXCEED TEST PRESSURE.
4. ROTATE AS DIRECTED BY OWNER.

HOSE BIB/SAMPLE TAP
NTS — M 3000

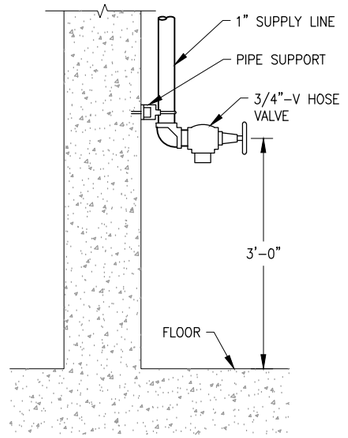


NOTES:
1. BURIED BOLTS, NUTS AND WASHERS SHALL BE TYPE 316 STAINLESS STEEL.
2. GREASE AND WRAP COUPLINGS AND HARDWARE WITH WAX TAPE COATING PER NOTE 16, DRAWING G-05.

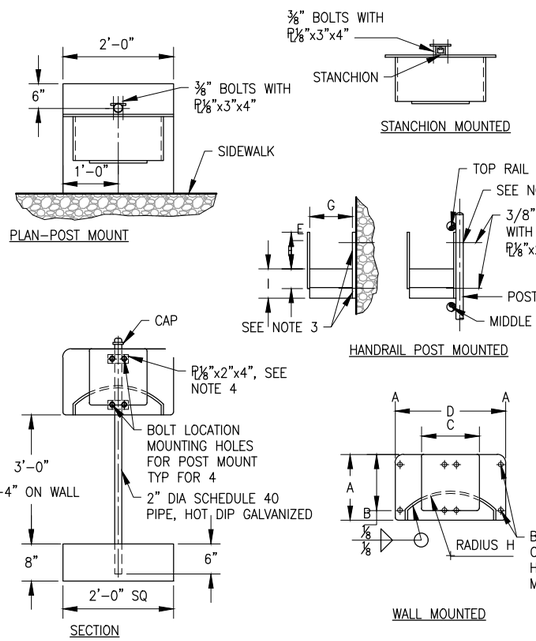
RESTRAINED FLEXIBLE COUPLING
SCALE: NTS — M 3007



NON-FREEZE WALL HYDRANT
SCALE: NTS — M 3101



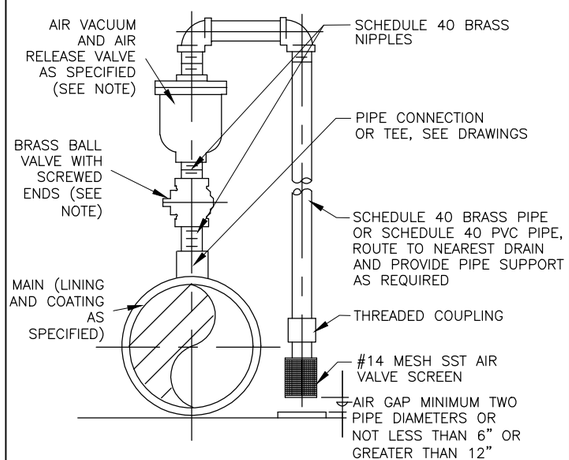
INTERIOR HOSE BIBB
SCALE: NTS — M 3110



RACK TYPE	DIMENSIONS IN INCHES								
	A	B	C	D	E	F	G	H	I
TYPE A – 3/4" & 1" HOSE	10½	9	9	18	3	6	7½	9¾	1½
TYPE B – 1½" HOSE	14	12	12	24	4	8	10	13	2

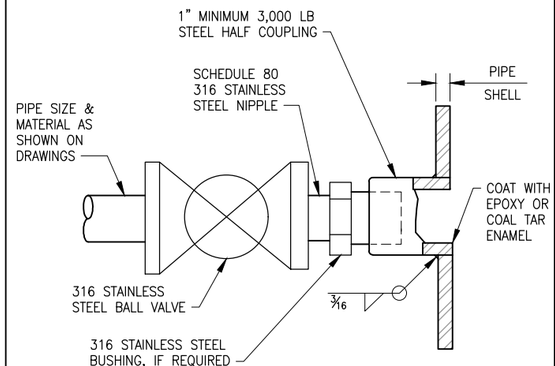
NOTES:
1. INTERIOR UNITS SHALL BE FABRICATED FROM ⅛" A-36 STEEL PLATE AND ENTIRE UNIT SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
2. EXTERIOR UNITS SHALL BE FABRICATED FROM 3/16" 6061-T6 ALUMINUM ALLOY PLATE.
3. ATTACH TO CONCRETE WALL WITH (4)-¼" STAINLESS STEEL STUD TYPE WEDGE ANCHORS.
4. ATTACH TO VERTICAL HANDRAIL OR INDIVIDUAL POST WITH PLATES AND (4)-¼" STAINLESS STEEL BOLTS.
5. ATTACH TO STEEL COLUMN WITH (4)-¼" ROUND HEAD BOLTS, ONE IN EACH CORNER. INSERT DOUBLE SPACER NUTS BETWEEN COLUMN AND HOSE RACK.

HOSE RACK DETAILS
SCALE: NTS — M 3116



NOTES:
1. FOR PIPING SYSTEM WITH SERVICE PRESSURE CLASS GREATER THAN 150 PSI. ALL COMPONENTS FURNISHED SHALL BE SUITABLE FOR THE HIGHER PRESSURE.
2. AIR RELEASE VALVE SIMILAR.

AIR VACUUM AND AIR RELEASE VALVE ASSEMBLY
SCALE: NTS — M 3143



NOTE:
IF PIPE MATERIAL IS STAINLESS STEEL, SAME TYPE MATERIAL ATTACHMENT SHALL BE USED.

PIPE CONNECTION 2 1/2" AND SMALLER
SCALE: NTS — M 3167

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — NATHAN ROGERS — NO. 11682307 — STATE OF UTAH — 12-5-2022

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

VERIFY SCALE — BAR IS ONE INCH ON ORIGINAL DRAWING

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

REVIEW — CHECKED J. BECKMAN — APPROVED N. ROGERS

DESIGN N. ROGERS — DRAWN R. GARCIA

MECHANICAL

GENERAL MECHANICAL DETAILS - 1

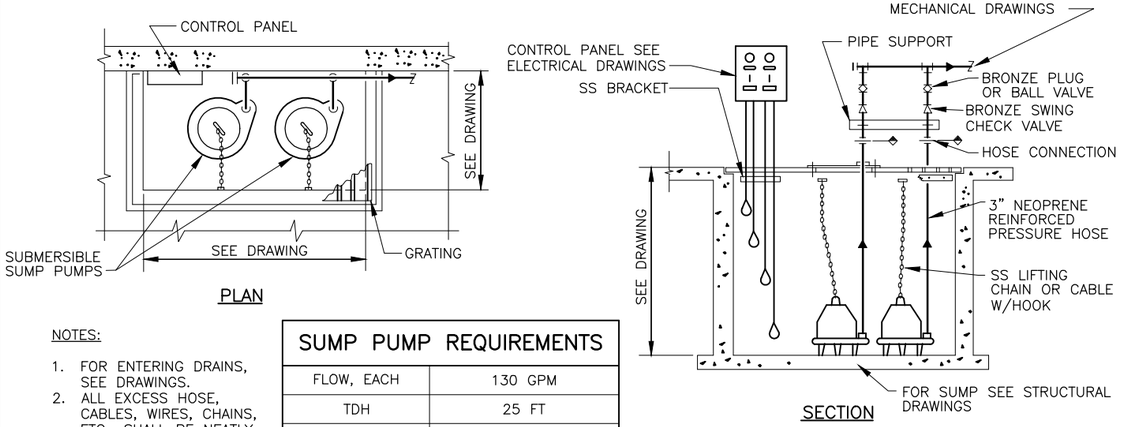
PROJECT NUMBER 483-20-02

DATE: DECEMBER 2022

DRAWING NO. GM-01

SHEET 115 OF 126

P:\Magna Water District\483-20-02 Reuse Projects\FINAL DESIGN\2.0 Design Phase\2.9 Drawings\sht\4832002_GM-01.dwg Plotted: 12/13/2022 4:58 PM By: Nate Rogers



NOTES:

1. FOR ENTERING DRAINS, SEE DRAWINGS.
2. ALL EXCESS HOSE, CABLES, WIRES, CHAINS, ETC., SHALL BE NEATLY COILED AND SECURED ABOVE GRADE IN A PROFESSIONAL MANNER.

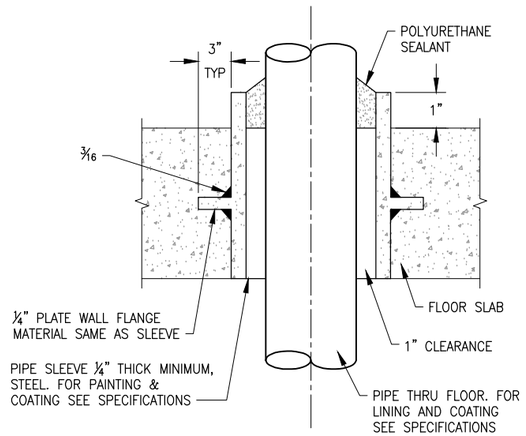
SUMP PUMP REQUIREMENTS	
FLOW, EACH	130 GPM
TDH	25 FT
HP, EACH	1
POWER REQ.	460/3/60

DRAINAGE SUMP W/ DUPLEX PUMPS

SCALE: NTS

M 3202

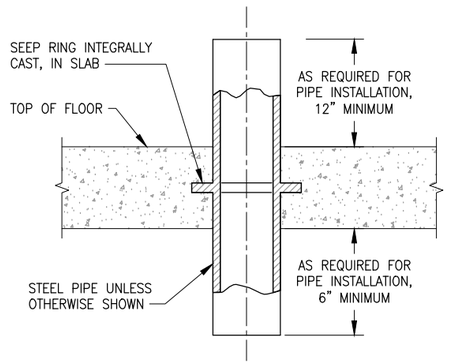
NOTE:
THIS SLEEVE IS TO BE USED BETWEEN DRY SPACES ONLY.



FLOOR PIPE SLEEVE

SCALE: NTS

M 3300

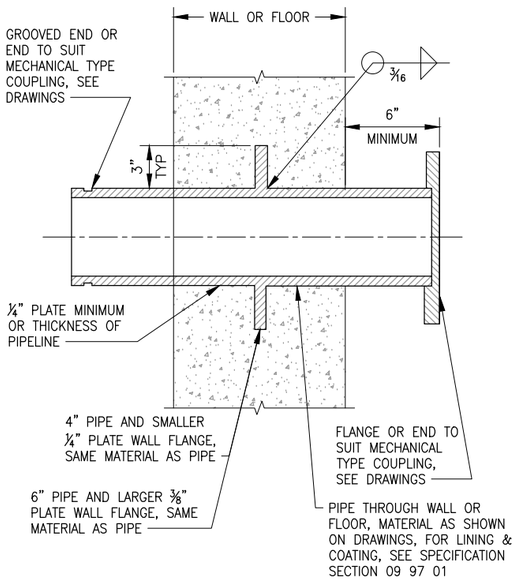


NOTE:
COAT FLOOR PIPE WITH SPECIFIED PAINT SYSTEM PRIOR TO CONCRETE PLACEMENT.

FLOOR PIPE

SCALE: NTS

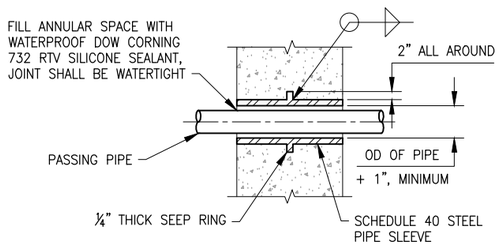
M 3301



FABRICATED PIPE THIMBLE

SCALE: NTS

M 3302

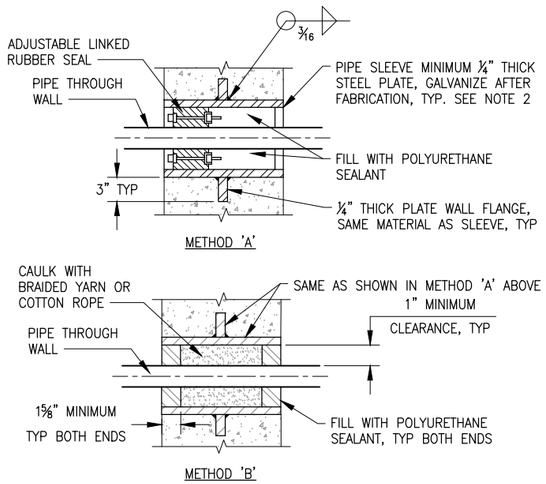


NOTE:
DO NOT USE WHERE SUBJECT TO HYDROSTATIC PRESSURE. PAINT ENTIRE SLEEVE AND SEEP RING AS SPECIFIED.

PIPE SLEEVE

SCALE: NTS

M 3306



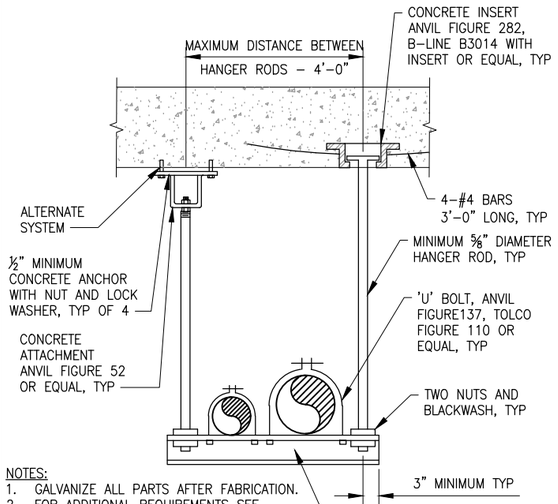
NOTES:

1. FOR WATER BEARING WALLS, USE METHOD 'A' WITH ADJUSTABLE LINKED RUBBER SEAL AT BOTH ENDS.
2. SLEEVES ARE NOT REQUIRED IN CORE DRILLED WALLS, PENETRATIONS THROUGH EXISTING WALLS, OR FLOORS

SLEEVED PIPE OPENING

SCALE: NTS

M 3307



NOTES:

1. GALVANIZE ALL PARTS AFTER FABRICATION.
2. FOR ADDITIONAL REQUIREMENTS SEE SPECIFICATION SECTION 'PIPE SUPPORTS'.
3. THIS PIPE HANGER IS LIMITED TO PIPE SIZES ½" THRU 6" DIAMETER.
4. THIS PIPE HANGER NOT SUITABLE FOR PRECAST TEE BEAMS.
5. FOR PVC OR FIBERGLASS PIPES PROVIDE STEEL SHIELD AROUND PIPE AT 'U' BOLT WITH LOOSE FIT, WRAP. FIX TEXT WRAP. COPPER TUBES 360° WITH 2" WIDE ⅛" THICK STRIP OF RUBBER FABRIC.

TRAPEZE PIPE HANGER

SCALE: NTS (FOR PIPE 6" DIAMETER AND SMALLER)

M 3351

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
NATHAN ROGERS
NO. 11683
STATE OF UTAH
12-5-2022

REVISIONS

NO.	DATE	REV. BY	DESCRIPTION

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW
CHECKED J. BECKMAN
APPROVED N. ROGERS

DESIGN
DESIGN N. ROGERS
DRAWN R. GARCIA

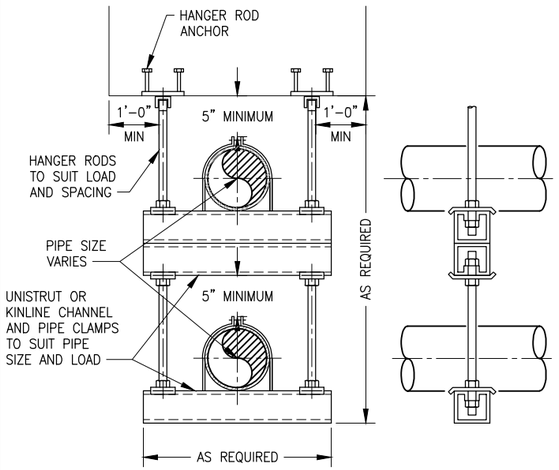
MECHANICAL

GENERAL MECHANICAL DETAILS - 2

DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
GM-02

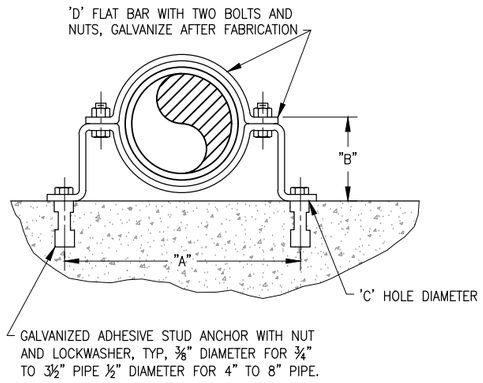
SHEET 116 OF 126



TYPICAL STACKED TRAPEZE PIPE HANGER

SCALE: NTS

M 3352



DIMENSION TABLE					
PIPE SIZE	A	B (SEE NOTE 3)	C HOLE DIAMETER	D FLAT BAR SIZE	LOAD RATING LBS *
¾"	5 5/16"	2½"	7/16"	3/16"x1¼"	300
1"	6¼"	2⅝"	7/16"	3/16"x1¼"	300
1¼"	6 1/16"	2¾"	7/16"	3/16"x1¼"	300
1½"	6 5/16"	3"	7/16"	3/16"x1¼"	300
2"	8 5/16"	3 3/16"	7/16"	¼"x1¼"	500
2½"	8⅞"	3 7/16"	7/16"	¼"x1¼"	500
3"	9⅛"	3¾"	7/16"	¼"x1¼"	500
3½"	10 1/16"	4"	7/16"	¼"x1¼"	500
4"	10 9/16"	4¼"	9/16"	¼"x1¼"	600
5"	11¾"	4¾"	9/16"	¼"x1¼"	600
6"	14⅜"	5 5/16"	9/16"	⅜"x1¼"	850
8"	16⅝"	6 5/16"	9/16"	⅜"x1¼"	850

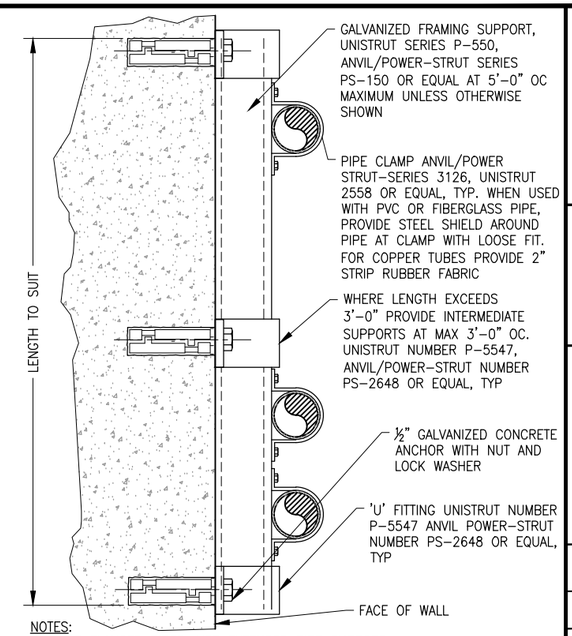
* SAFETY FACTOR OF 5

NOTES:
1. WHERE SUBMERGED, OR WHERE SHOWN ON DRAWINGS, PIPE CLAMP, ANCHOR, SHIELD, NUTS, AND LOCKWASHERS TO BE TYPE 316 STAINLESS STEEL.
2. WHEN USED WITH PVC OR FIBERGLASS PIPE, PROVIDE STEEL SHIELD AROUND PIPE AT CLAMP, WITH LOOSE FIT, WRAP COPPER TUBES WITH 2" STRIP OF RUBBER FABRIC.
3. FOR FLANGED PIPING, INCREASE 'B' DIMENSION AS REQUIRED.

PIPE CLAMP FOR INDIVIDUAL PIPES

SCALE: NTS

M 3372

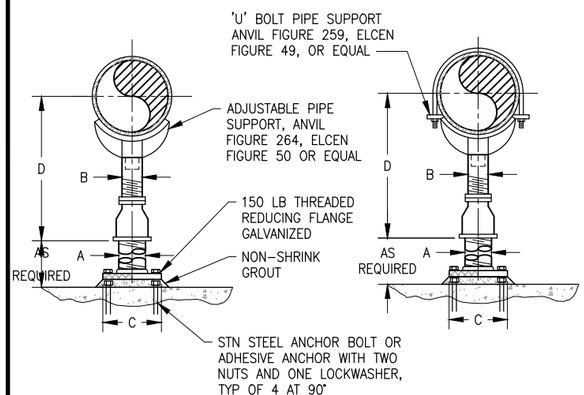


NOTES:
1. FOR FLANGED PIPES, USE EXTENDED PIPE SUPPORT.
2. THIS PIPE SUPPORT IS LIMITED FOR PIPES UP TO 6-INCHES IN DIAMETER, INCLUSIVE.
3. FOR ADDITIONAL REQUIREMENTS SEE SPECIFICATION SECTION 'PIPE SUPPORTS'.
4. IN SUBMERGED APPLICATIONS, UNISTRUT AND ANCHORS TO BE SST

FLUSH MOUNTED PIPE SUPPORT

SCALE: NTS

M 3364



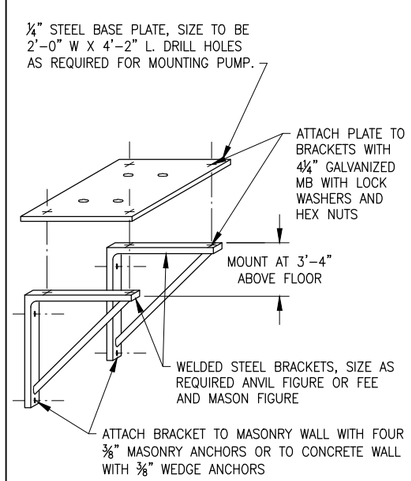
DIMENSION TABLE					
PIPE SIZE	A	B	C	D MIN	D MAX
2½"	2½"	1½"	9"	8"	11½"
3"	2½"	1½"	9"	8¼"	11¾"
3½"	2½"	1½"	9"	8½"	12"
4"	3"	2½"	9"	10¼"	14"
6"	3"	2½"	9"	11⅝"	15¼"
8"	3"	2½"	9"	13⅝"	16½"
10"	3"	2½"	9"	14⅝"	18¼"
12"	3"	2½"	9"	15⅝"	19¾"
14"	4"	3"	11"	18⅞"	20¾"
16"	4"	3"	11"	19⅞"	22¼"
18"	6"	3½"	13½"	21¼"	24"
20"	6"	3½"	13½"	23¼"	25½"
24"	6"	4"	13½"	26½"	28¼"
30"	6"	4"	13½"	29⅝"	31½"
32"	6"	4"	13½"	30⅝"	32¾"
36"	6"	4"	13½"	32⅝"	34¾"

NOTE:
1. ENTIRE UNIT SHALL BE GALVANIZED AFTER FABRICATION.
2. PROVIDE HALF ROUND RIGID INSULATION AND INSULATION PROTECTION SHIELD, SIMILAR TO ANVIL FIGURE 167 OR ELCEN FIGURE 219, WHERE PIPING IS INSULATED.
3. PROVIDE NEOPRENE WAFFLE ISOLATION PAD, SIMILAR TO MASON TYPE "W" OR KORFUND WHEN PIPING IS ISOLATED OR SUPPORT IS ADJACENT TO MECHANICAL EQUIPMENT.
4. FOR BASE, HEIGHT AND FLANGE DIMENSIONS, SEE TABLE.

ADJUSTABLE PIPE SUPPORT WITH OR WITHOUT U-BOLT

SCALE: NTS

M 3389

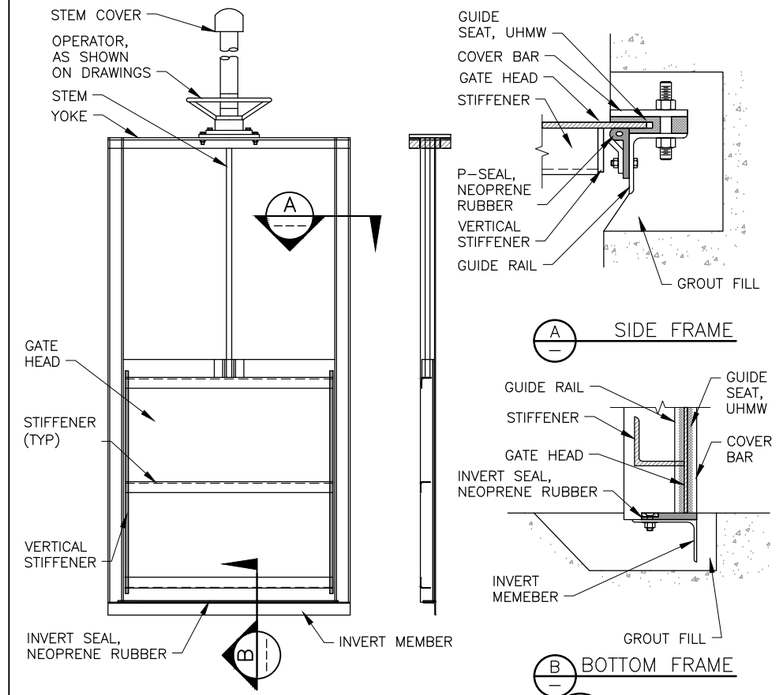


NOTES:
1. HOT DIP GALVANIZE ENTIRE ASSEMBLY AFTER FABRICATION.
2. WHERE LOCATED IN CHEMICAL OR CORROSIVE AREAS, PARTS SHALL BE FRP OR TYPE 316L STAINLESS STEEL.
3. CONTRACTOR SHALL VERIFY ANCHORS AND BRACKETS ARE SIZED TO ACCOMMODATE PUMP WEIGHT.

SMALL PUMP SUPPORT

SCALE: NTS

M 3394



STAINLESS STEEL SLIDE GATE

SCALE: NTS

M 3498

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — NATHAN ROGERS — NO. 11684802 — STATE OF UTAH — 12-5-2022

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW CHECKED J. BECKMAN APPROVED N. ROGERS

DESIGN N. ROGERS DRAWN R. GARCIA

MECHANICAL

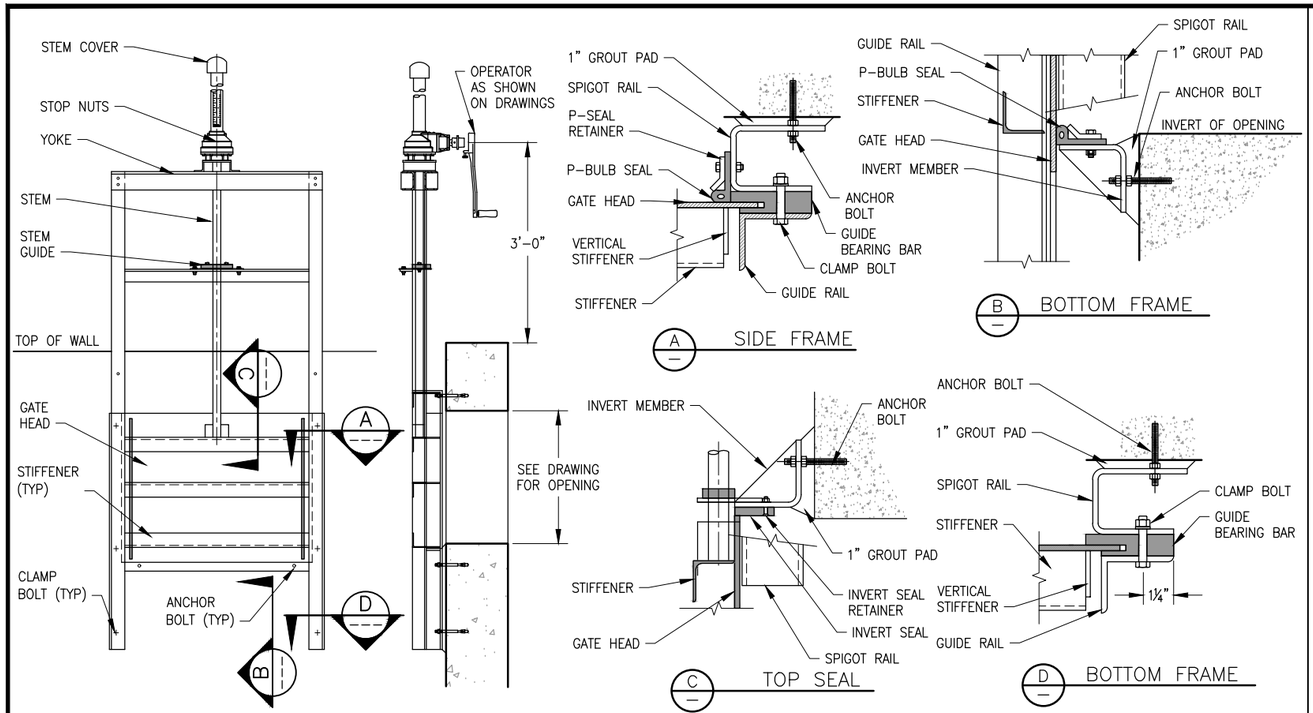
GENERAL MECHANICAL DETAILS - 3

DATE: DECEMBER 2022 PROJECT NUMBER 483-20-02

DRAWING NO. GM-03

SHEET 117 OF 126

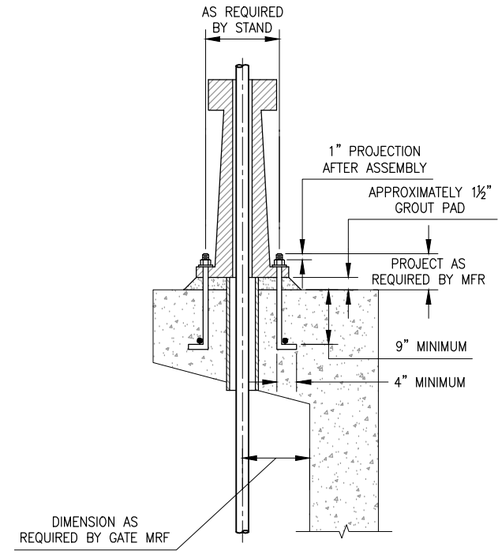
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STAINLESS STEEL WEIR GATE

SCALE: NTS

M 3499

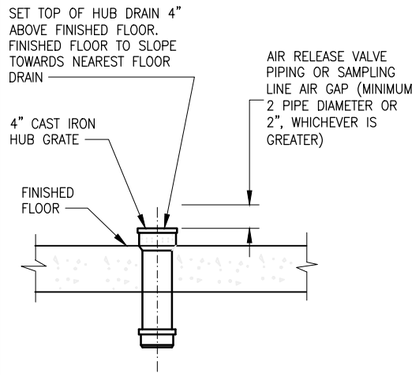


NOTE: FLOOR STAND IS REPRESENTATIVE ONLY.

FLOOR STAND INSTALLATION

SCALE: NTS

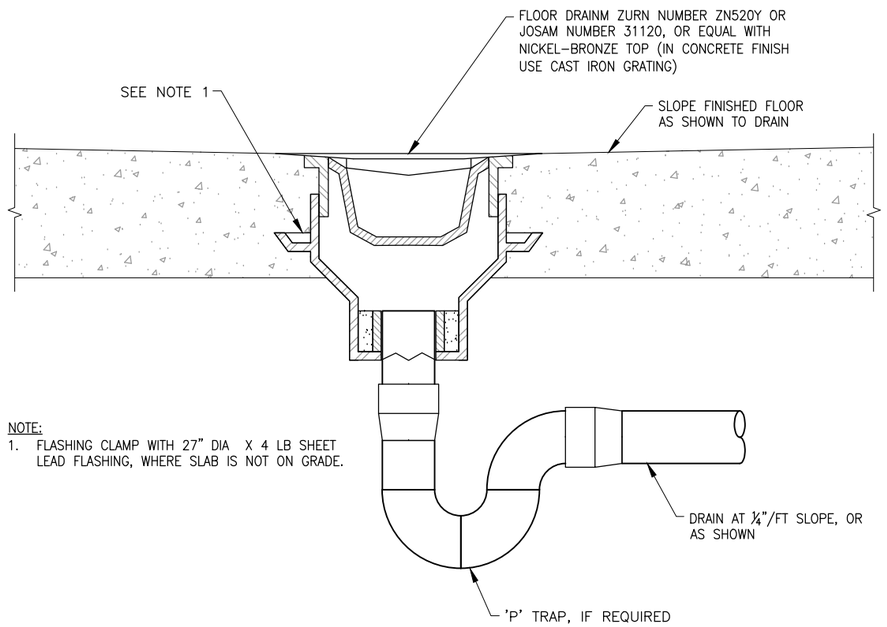
M 3500



FLOOR HUB DRAIN

SCALE: NTS

M 3806

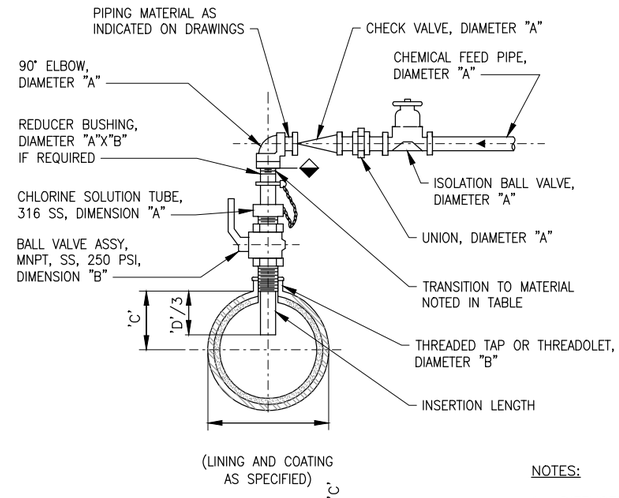


NOTE:
1. FLASHING CLAMP WITH 27" DIA X 4 LB SHEET LEAD FLASHING, WHERE SLAB IS NOT ON GRADE.

FLOOR DRAIN

SCALE: NTS

M 3802



TAG NO.	CHEMICAL	MATERIAL	FLOW (GPM)	DIMENSIONS (INCHES)			
				'A'	'B'	'C'	'D'
70-CV-0030	SODIUM HYPOCHLORITE, 0.8%	316 SST	50.0	2	2-1/2	8	16

NOTES:

1. DIFFUSER/INJECTION ASSEMBLY TO BE MANUFACTURER BY SAF-T-FLO, MODEL HS-250. EXCESS HOSE, CABLES, WIRES, CHAINS, ETC., INCLUDED. SHALL BE NEATLY COILED AND SECURED ABOVE GRADE IN A PROFESSIONAL MANNER.

CHEMICAL DIFFUSER/INJECTION – RETRACTABLE TYPE

SCALE: NTS

M 3911

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
NATHAN ROGERS
NO. 16
STATE OF UTAH
12-5-2022

NO.	DATE	REV. BY	DESCRIPTION

REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

DESIGN N. ROGERS
DRAWN R. GARCIA
REVIEW
CHECKED J. BECKMAN
APPROVED N. ROGERS

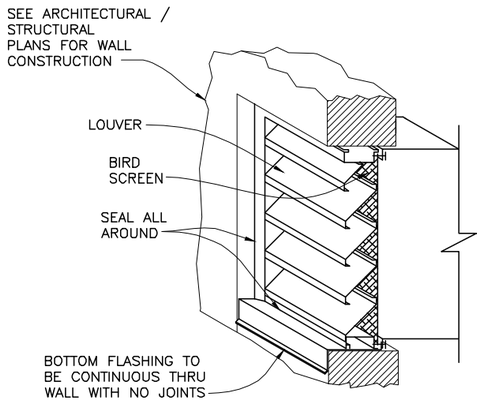
MECHANICAL

GENERAL MECHANICAL DETAILS - 4

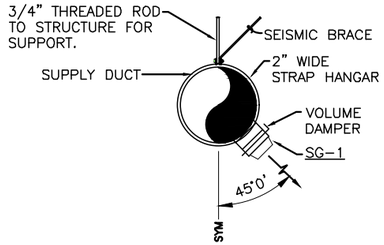
DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
GM-04

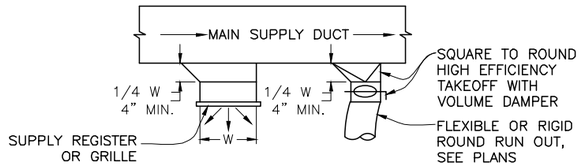
SHEET 118 OF 126



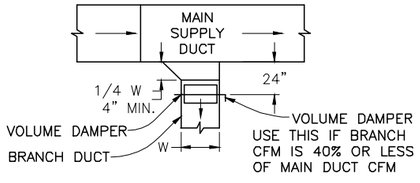
LOUVER DETAIL (A / GH-01)
NOT TO SCALE



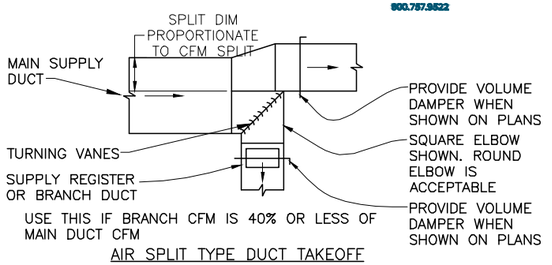
SUPPLY DIFFUSER DETAIL (B / GH-01)
NOT TO SCALE



SUPPLY REGISTER & RUN OUT TAKEOFF

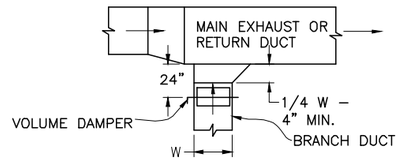


BRANCH DUCT TAKEOFF



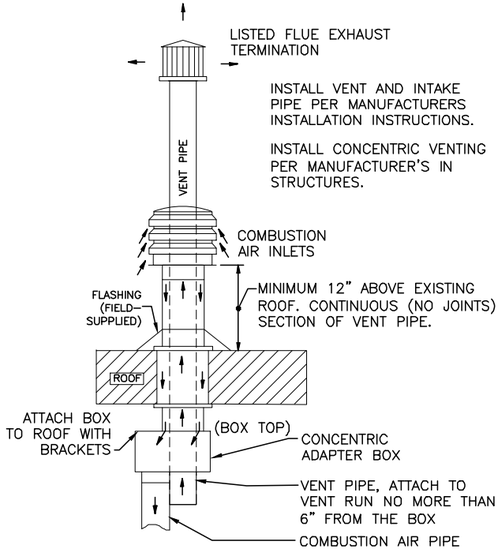
AIR SPLIT TYPE DUCT TAKEOFF

SUPPLY DUCT TAKEOFFS

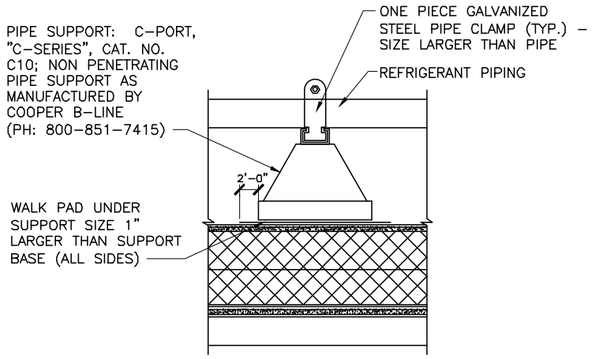


EXHAUST AND/OR RETURN BRANCH DUCT

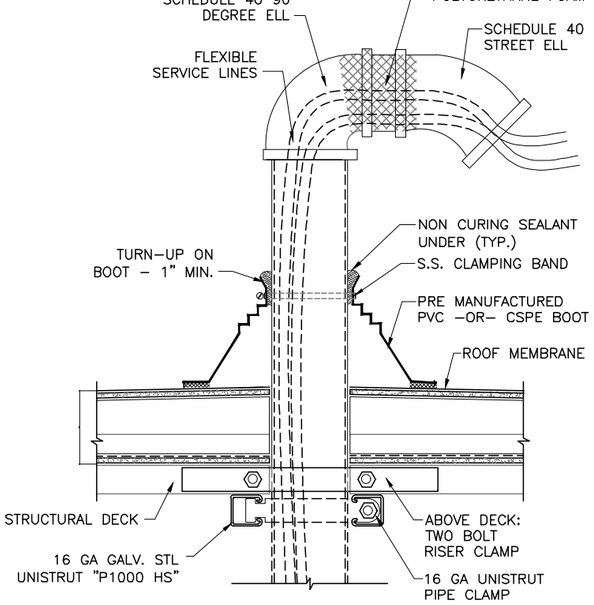
LOW VELOCITY DUCTWORK DETAIL (C / GH-01)
NOT TO SCALE



GAS FIRED UNIT HEATER VENT DETAIL (D / GH-01)
NOT TO SCALE



ROOF PIPE SUPPORT DETAIL (E / GH-01)
NOT TO SCALE



SLEEVE DETAIL (F / GH-01)
NOT TO SCALE

Cushing Terrell
cushingterrell.com
800.787.9522

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
NO. 7020476-2202
LAURA L. RANKIN
STATE OF UTAH
12-15-2022

NO.	DATE	REV. BY	DESCRIPTION
#1	#1	#1	#1
#2	#2	#2	#2
#3	#3	#3	#3
#4	#4	#4	#4
#5	#5	#5	#5

REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW
CHECKED L. RANKIN
APPROVED L. RANKIN

DESIGN
DESIGN L. RANKIN
DRAWN J. WILSON

HVAC

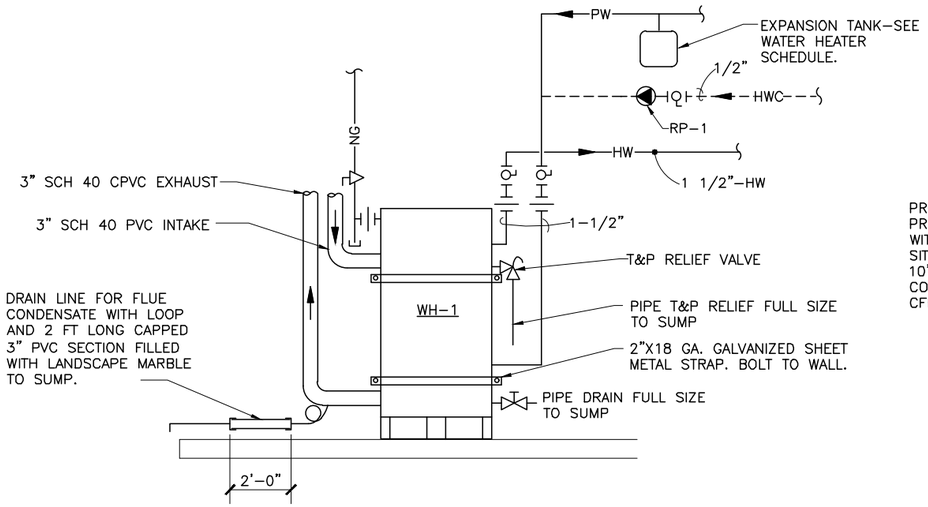
GENERAL HVAC DETAILS

PROJECT NUMBER 483-20-02

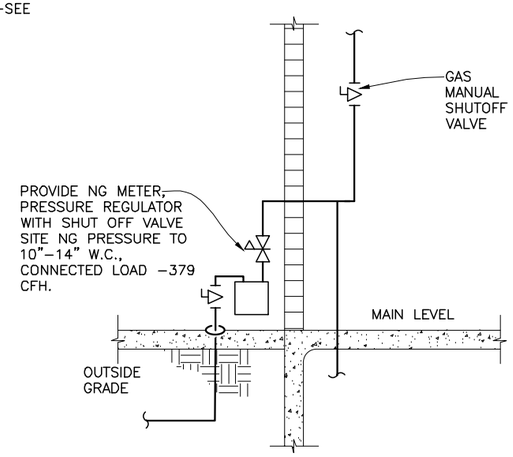
DATE: DECEMBER 2022

DRAWING NO.
GH-01

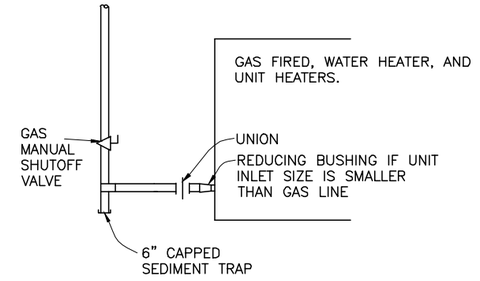
SHEET 119 OF 126



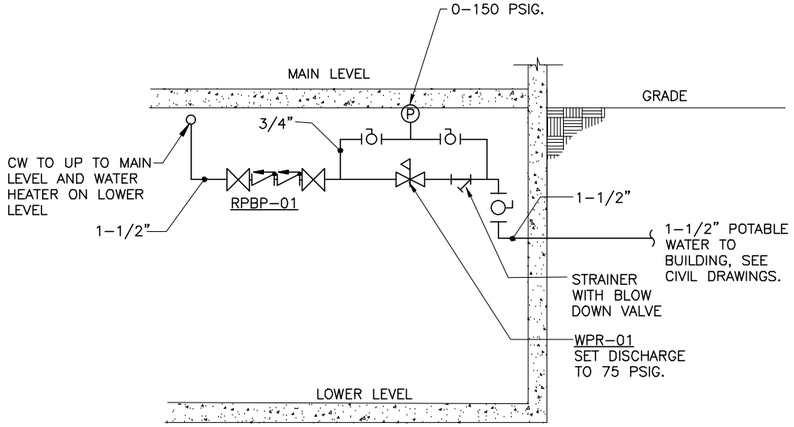
WATER HEATER DETAIL A
NOT TO SCALE — GP–01



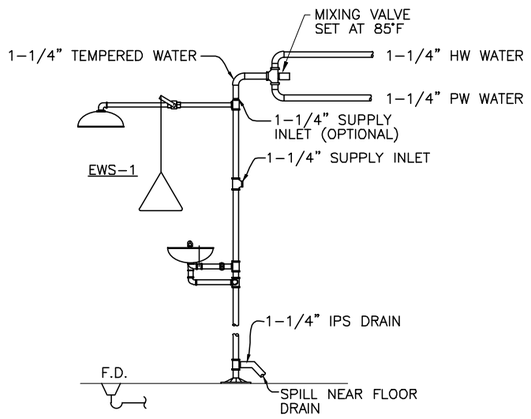
NATURAL GAS ENTRANCE DETAIL B
NOT TO SCALE — GP–01



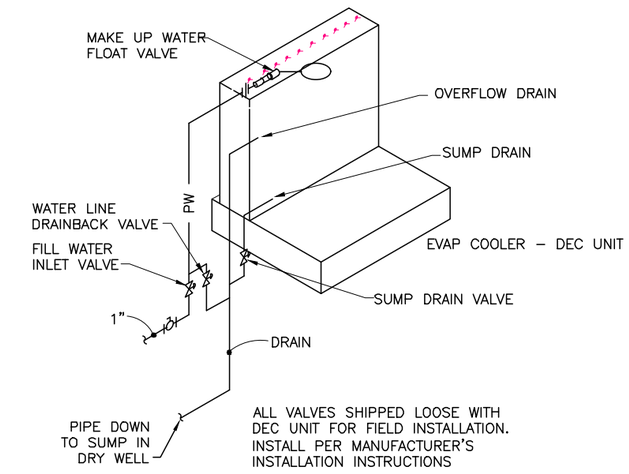
NATURAL GAS CONNECTION DETAIL C
NOT TO SCALE — GP–01



WATER ENTRANCE DETAIL D
NOT TO SCALE — GP–01



EMERGENCY SHOWER PIPING DETAIL E
NOT TO SCALE — GP–01



EVAPORATIVE COOLER PIPING DETAIL F
NOT TO SCALE — GP–01

Cushing Terrell
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BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — NO. 7020476/2202 — LAURA L. RANKIN — STATE OF UTAH
12-15-2022

NO.	DATE	REV. BY	DESCRIPTION
#1	#1	#1	#1
#2	#2	#2	#2
#3	#3	#3	#3
#4	#4	#4	#4
#5	#5	#5	#5

REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW
CHECKED L. RANKIN
APPROVED L. RANKIN

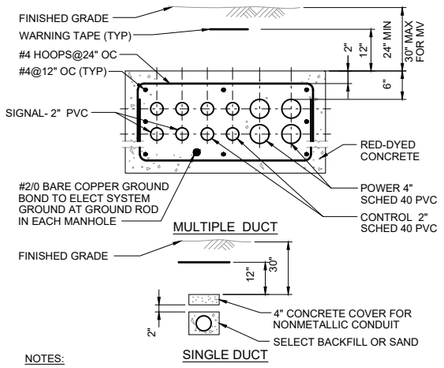
DESIGN
DESIGN L. RANKIN
DRAWN J. WILSON

PLUMBING
GENERAL PLUMBING DETAILS

PROJECT NUMBER 483-20-02
DATE: DECEMBER 2022

DRAWING NO.
GP-01
SHEET 120 OF 126

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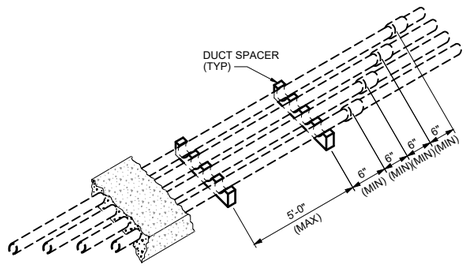


NOTES:

1. AT INTERSECTIONS WITH STRUCTURES HOOK #4'S INTO THE FOOTING OR WALL (TYP.).
2. SEE DUCT BANK SECTIONS AND DETAILS FOR NUMBER AND ARRANGEMENT OF DUCTS.

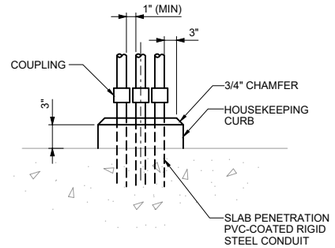
TYPICAL DUCTBANK

REV 110112 — E-103



TYPICAL DUCTBANK

JOINT/SUPPORT SPACING — REV 110112 — E-108

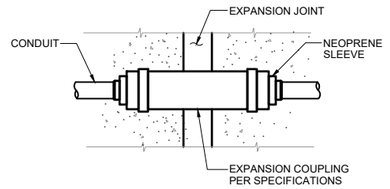


NOTE:

HOUSEKEEPING CURB REQUIRED AT ALL LOCATIONS FOR SINGLE AND MULTIPLE RISERS.

CONCRETE HOUSEKEEPING CURB

NON-HAZARDOUS LOCATIONS — REV 110112 — E-203

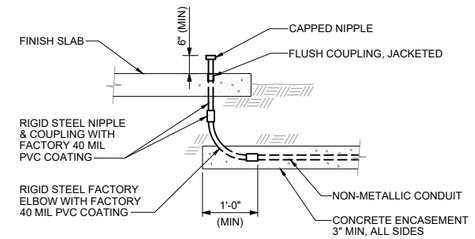


NOTE:

PROVIDE EXTERNAL BONDING JUMPER WITH METALLIC CONDUIT AND WHEN COUPLING HAS NO INTERNAL JUMPER.

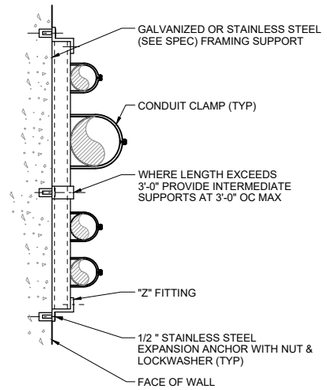
EXPANSION COUPLING

REV 110112 — E-204



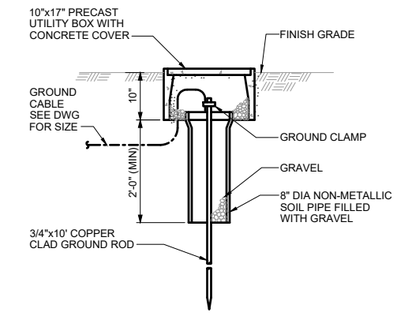
RISER FROM NON-METALLIC DUCT

REV 110112 — E-205



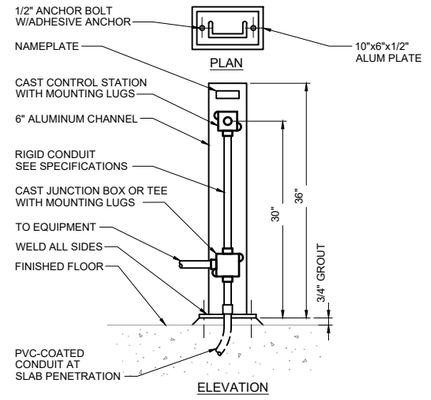
CONDUIT SUPPORT

FLUSH MOUNT — REV 110112 — E-212



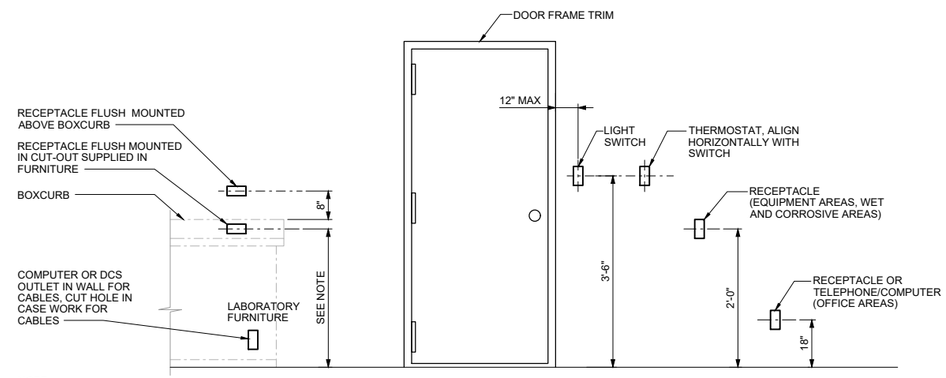
GROUND ROD AND WELL

REV 110112 — E-303



PEDESTAL MOUNTED CONTROL STATION

REV 100114 — E-406

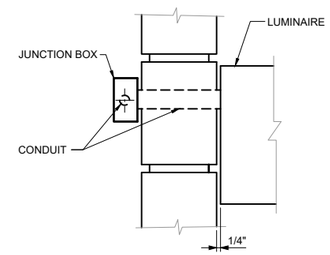


NOTE:

CONTRACTOR SHALL DETERMINE OUTLET BOX MOUNTING HEIGHT TO SUIT LABORATORY EQUIPMENT FURNISHED FOR INSTALLATION

OUTLET BOX MOUNTING

REV 110112 — E-450



NOTES:

1. PROVIDE GASKET BETWEEN LUMINAIRE AND CONDUIT.
2. INSTALLATION SHALL BE WATERTIGHT.

WALL MOUNT LUMINAIRE

EXTERIOR WALL — REV 110112 — E-605

Stantec

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER — REGISTERED — No 6677342-2202 — KEITH E. SMITH — 12/09/22 — STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW
CHECKED STANTEC
APPROVED STANTEC

DESIGN
DESIGN STANTEC
DRAWN STANTEC

ELECTRICAL

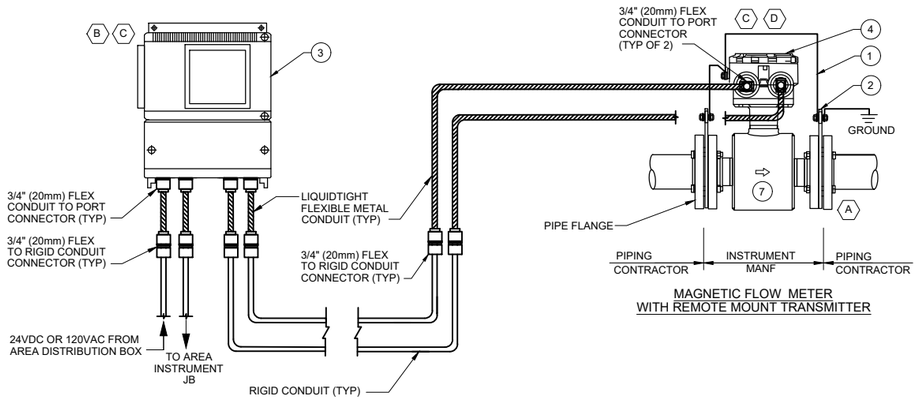
STANDARD DETAILS

PROJECT NUMBER 483-20-02
DATE: DECEMBER 2022

DRAWING NO. GE-01
SHEET 121 OF 126

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REV 010119



MAGNETIC FLOW METER
WITH REMOTE MOUNT TRANSMITTER

GENERAL NOTES:

1. REFER TO P&IDS AND DATA SHEETS FOR PROCESS PIPING SIZE AND MATERIAL.
2. BIDIRECTIONAL APPLICATION REQUIRES 5 PIPE DIAMETERS ON BOTH SIDES OF METER, MINIMUM. UNIDIRECTIONAL APPLICATION REQUIRES 5 PIPE DIAMETERS UPSTREAM AND 2 PIPE DIAMETERS DOWNSTREAM WITH STABLE PROCESS CONDUCTIVITY.
3. INSTALLATION OF MATING FLANGES WITH THE FLOW METER SHALL BE CARRIED OUT IN COOPERATION WITH THE PIPING CONTRACTOR USING UPSTREAM AND DOWNSTREAM PIPE REDUCERS AS NECESSARY.
4. PROVIDE MECHANICAL SUPPORT FOR ROUTED CONDUIT.

⬡ KEYNOTES:

A. GROUNDING RINGS REQUIRED FOR METALLIC AND NON-METALLIC PIPE INSTALLATIONS TO SUPPORT PROPER SOLUTION GROUNDING AND / OR LINING PROTECTION.

B. WALL OR INSTRUMENT-STAND MOUNT PER DETAIL I-948.

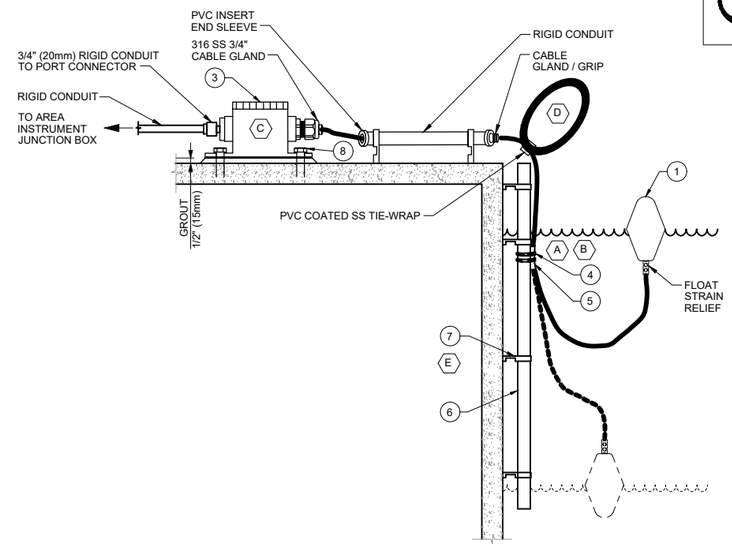
C. CONFIGURE FOR EMPTY PIPE DETECTION.

D. WHERE TEMPORARY SUBMERGENCE IS POSSIBLE, ELECTRONIC HOUSING SHALL BE POTTED AND SEALED BY MANUFACTURER PRIOR TO SHIPPING TO SITE.

E. SELECTED GROUNDING RING MATERIAL TO MATCH MEASURING ELECTRODE MATERIAL.

BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	SUPPLY	MATERIAL/RATING (WATER)	MATERIAL/RATING (CHEMICAL)
1	1	AWG # 8 GROUNDING CONDUCTOR TO GROUND GRID	CONT	COPPER	COPPER
2	2	GROUNDING RING	MANF	316 SS (E)	316 SS OR HASTELLOY C (E)
3	1	INTEGRAL TRANSMITTER WITH DISPLAY AND DUAL CONDUIT PORTS	MANF	POWDER COATED ALUMINUM	POWDER COATED ALUMINUM
4	1	REMOTE TRANSMITTER WITH DISPLAY	MANF	POWDER COATED ALUMINUM	POWDER COATED ALUMINUM
5	1	METER REMOTE WIRE HOUSING FOR REMOTE TRANSMITTER WITH DUAL CONDUIT PORTS	MANF	POWDER COATED ALUMINUM	POWDER COATED ALUMINUM
6	1 EACH	COIL DRIVE AND ELECTRODE SIGNAL CABLES (SEPARATE CABLES; LENGTH AS REQUIRED)	CONT	PER MANF SPEC	PER MANF SPEC
7	-	METER MEASURING TUBE / FLANGES (LINER PER MANF RECOMMENDATION)	MANF	304 SS	—
8	2	INSULATING GASKET	CONT	EPDM / NEOPRENE	EPDM / NEOPRENE

I-101 MAGNETIC FLOW METER
REV 010119



SUSPENDED FLOAT

GENERAL NOTES:

1. PROVIDE MECHANICAL SUPPORT AND FITTINGS FOR ROUTED CONDUIT.
2. SWITCHES SHALL BE MOUNTED AND ORIENTED IN ACCORDANCE WITH THE MANUFACTURER REQUIREMENTS.
3. WETTED MATERIALS SHALL BE CHEMICALLY INERT TO THE PROCESS.
4. REFER TO DIVISION 26 SPECIFICATIONS FOR FLEX AND RIGID CONDUIT MATERIAL AND USAGE LIMITATIONS.
5. USE PVC COATED SS TIE-WRAPS TO NEATLY COIL AND SECURE ANY EXCESS FLOAT CABLING AS SHOWN.

⬡ KEYNOTES:

A. POSITION THE ADJUSTABLE STRAIN RELIEF ON THE CABLE TO ALLOW ONE HALF THE DISTANCE OF THE DIFFERENTIAL BAND BETWEEN THE END OF THE ADJUSTABLE STRAIN RELIEF AND THE END OF THE STRAIN RELIEF ON THE FLOAT.

B. FOR SUSPENDED FLOAT, PROVIDE CABLE TIE AT MIDPOINT AND TOP OF ADJUSTABLE STRAIN RELIEF AS SHOWN, PLUS ONE CABLE TIE FOR EVERY 12" (300mm) OF CABLE LENGTH.

C. TERMINAL JUNCTION BOX SHALL BE WALL OR FLOOR MOUNTED IN EASILY ACCESSED LOCATION WITHIN 30 FEET (10 METERS) OF INSTRUMENT INSTALLATION. FOR FLOOR MOUNT PROVIDE 1/2" (15mm) THICK GROUTING. FOR WALL MOUNT, LOCATE APPROXIMATELY 36" (1 METER) ABOVE GRADE. IF AREA INSTRUMENT JUNCTION BOX IS WITHIN 33 FEET (10 METERS) OF INSTRUMENT INSTALLATION, TERMINAL BOX WILL NOT BE REQUIRED AND INSTRUMENT CABLE MUST BE ROUTED WITHOUT SPLICE OF ANY KIND.

D. MAINTENANCE LOOP SHALL INCLUDE 3 FEET (1 METER) LENGTH OF CABLE SECURED WITH PVC-COATED SS TIE WRAPS, BEND RADIUS NO LESS THAN 8" (200mm).

E. PROVIDE MOUNTING BRACKET SUPPORT FOR EVERY 3FT (1M) OF PIPE LENGTH.

BILL OF MATERIALS					
ITEM	QTY	DESCRIPTION	SUPPLY	MATERIAL/RATING (WATER)	MATERIAL/RATING (CHEMICAL)
1	1	SUSPENDED BALL FLOAT SWITCH WITH INTEGRAL CABLE	MANF	PVC	PVC
2	1	FLOAT SWITCH HOUSING	MANF	EPOXY COATED ALUMINUM	EPOXY COATED ALUMINUM
3	AR	LOCKABLE SCREW LID TERMINAL JUNCTION BOX WITH DIN-RAIL MOUNTED TERMINAL BLOCK (MIN DIMENSIONS: 2" (53mm) (h)x4" (110mm) (Ø))	MANF	NEMA 4X / GRP	NEMA 4X / GRP
4	AR	CABLE TIES	CONT	PVC COATED 316 SS	PVC COATED 316 SS
5	1	ADJUSTABLE STRAIN RELIEF	MANF	NEOPRENE	NEOPRENE
6	1	FLOAT SUPPORT PIPE	CONT	PVC (SCH 80)	PVC (SCH 80)
7	AR	MOUNTING BRACKET WITH 5/8" (16mm) SS ANCHOR BOLTS (F)	CONT	316 SS	316 SS
8	AR	SS BOLTS / ANCHORS	CONT	316 SS	316 SS

I-151 FLOAT LEVEL DETECTION SWITCH
REV 010119

Stantec

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER No.11965314 BARBARA HERRERA 12/13/22 STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

NO SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

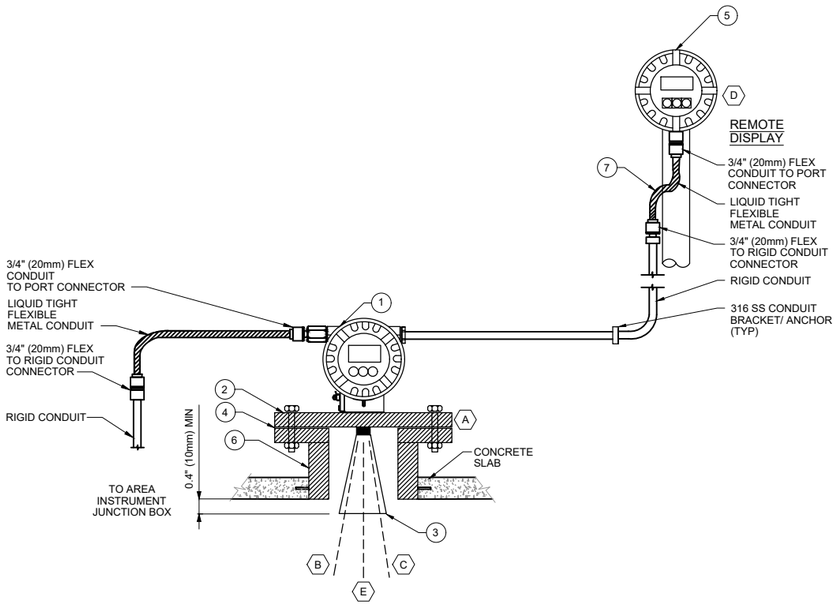
REVIEW CHECKED D. STEFFES APPROVED B. HERRERA

DESIGN DESIGN S. KEEN DRAWN P. CHOPADE

INSTRUMENTATION AND CONTROL
INSTALLATION DETAILS - I

PROJECT NUMBER 483-20-02
DATE: DECEMBER 2022

DRAWING NO.
GI-01
SHEET 122 OF 126



CONCRETE TANK - TOP MOUNT WITH LOCAL DISPLAY

GENERAL NOTES:

1. PROVIDE MECHANICAL SUPPORT AND FITTINGS FOR ROUTED CONDUIT.
2. IN APPLICATIONS WITH HEAVY CONDENSATION ANTICIPATED OR TURBULENT LIQUID SURFACE, EMPLOY MANUFACTURER RECOMMENDED LOW FREQUENCY MODEL. SELECTED WAVELENGTH SHOULD BE LARGER THAN ANTICIPATED RIPPLE SIZE.
3. VENDOR FURNISHED CABLING SHALL BE RATED WATERTIGHT AND FOR CONTINUOUS UV EXPOSURE WITHOUT DEGRADATION.
4. ELECTRONIC SUPPRESSION OF INTERFERENCE ECHOES USING MANF. TRANSMITTER TOOLS MAY BE REQUIRED.
5. REFER TO DIVISION 26 SPECIFICATIONS FOR FLEX AND RIGID CONDUIT MATERIAL AND USAGE LIMITATIONS.
6. REFER TO TANK MECHANICAL DATA SHEETS OR DETAILS FOR TANK NOZZLE SIZE AND SPACING. INSTRUMENT INSTALLATION IN THE TANK MANWAY IS NOT PERMITTED.
7. USE PVC COATED SS TIE-WRAPS TO NEATLY COIL AND SECURE ANY EXCESS SENSOR CABLING AS SHOWN.

KEYNOTES:

A. INSTRUMENT SHALL BE FLANGE MOUNTED, AT OR 12 INCHES FROM TANK WALL (BUT SUBJECT TO MANUFACTURER REQUIREMENTS) AND OPPOSITE TO ANY TOP FILL FACILITIES. FOR TANKS CONSTRUCTED OF NON-CONDUCTIVE MATERIAL, BEAM ANGLE SHOULD BE CONTAINED WITHIN THE TANK TO AVOID INTERFERENCE FROM REFLECTIVE MATERIAL LOCATED OUTSIDE THE TANK.

B. THE SENSOR HORN BOTTOM RIM SHALL BE INSTALLED NO LESS THAN 12" (300mm) ABOVE THE MAXIMUM TANK LEVEL AND PROPERLY ALIGNED PER THE MANUFACTURER'S REQUIREMENTS.

C. SENSOR SHALL BE INSTALLED SUCH THAT THE BEAM ANGLE DOES NOT ENCOUNTER ANY PHYSICAL DEVICE OR FLOW STREAM IN THE BEAM'S SENSING PATH.

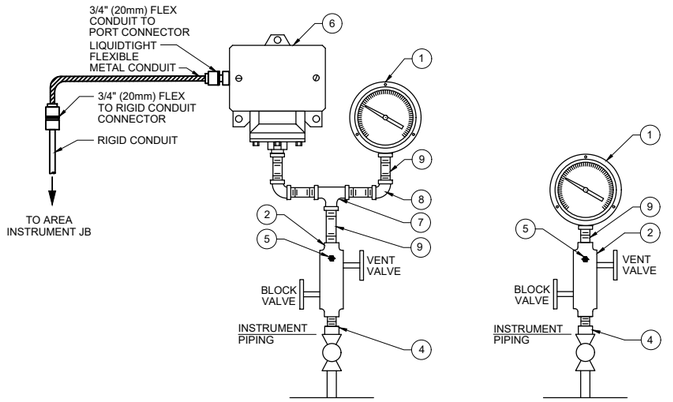
D. MOUNT DISPLAY ON STANDARD INSTRUMENT STAND PER DETAIL I-701 / 702. SUNSHIELD REQUIRED FOR OUTDOOR INSTALLATION.

E. IN THE CASE OF MEDIA WITH LOW DIELECTRIC CONSTANT (WHERE THE TANK BOTTOM IS VISIBLE THROUGH THE MEDIA AT LOW LEVELS) A MANUFACTURER RECOMMENDED REPOSITIONING OF ZERO LEVEL MUST BE OBSERVED.

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	SUPPLY	MATERIAL/RATING (WATER)	MATERIAL/RATING (CHEMICAL)
1	1	TRANSMITTER ELECTRONIC HOUSING	MANF	EPOXY COATED ALUMINUM	EPOXY COATED ALUMINUM
2	1	6" (DN150) DIA FLANGE (TAPPED TO ACCOMMODATE INSTRUMENT FITTING) AND MOUNTING HARDWARE	MANF	316 SS	316 SS
3	1	3" (DN80) OR 4" (DN100) ANTENNA HORN (LENGTH TO ACHIEVE MAX BEAM ANGLE INDICATED)	MANF	316 SS	ALLOY-400 OR PTFE
4	AR	GASKET	CONT	VITON	VITON
5	1	REMOTE DISPLAY	MANF	EPOXY COATED ALUMINUM	EPOXY COATED ALUMINUM
6	1	6" (150mm) DIA SCH 80 FLANGED PIPE SLEEVE WITH SEEP RING	CONT	304 SS	316 SS OR PVC
7	1	IN-CONDUIT REMOTE DISPLAY CABLE LIMIT ROUTING TO 66 FEET (20M)	MANF	PER VENDOR	PER VENDOR

I-202 RADAR LEVEL TRANSMITTER
REV 010119



PRESSURE GAUGE AND SWITCH

PRESSURE GAUGE OR SWITCH

GENERAL NOTES:

1. POTENTIALLY WETTED MATERIALS SHALL BE CHEMICALLY INERT TO THE PROCESS.
2. REFER TO P&IDS AND DATA SHEETS FOR PROCESS PIPING SIZE AND MATERIAL.
3. PIPING SIDE ISOLATION VALVES FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR.
4. REFER TO DIVISION 26 SPECIFICATIONS FOR FLEX AND RIGID CONDUIT MATERIAL AND USAGE LIMITATIONS.

KEYNOTES:

A. FOR AMBIENT TEMPERATURE APPLICATIONS LOWER THAN -10 degC, ETHYLENE GLYCOL FILL FLUID REQUIRED IN LIEU OF STANDARD SILICONE OIL.

B. FURNISH 1/4" (8mm) OD MALE CONNECTOR AND 1/4" OD (1.5mm WALL THICKNESS) 316SS DOWN TURNED DRAIN TUBING FOR FIELD INSTALLATION. ENSURE VENT / DRAIN IS DIRECTED TO SAFE LOCATION.

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	SUPPLY	MATERIAL/ RATING (WATER / AIR)	MATERIAL/ RATING (CHEMICAL)
1	1	LIQUID-FILLED PRESSURE GAUGE	MANF	PHENOLIC ENCASED	PHENOLIC ENCASED
2	1	1/2" (15mm) 2 VALVE MANIFOLD WITH INTEGRAL BLEED	MANF	316 SS	316 SS OR PVC
4	1	HEX REDUCING BUSHING 1"x1/2" (25mmx15mm)	CONT	316 SS	316 SS OR PVC
5	1	1/4" NPT VENT PIPE PLUG (B)	MANF	316 SS	316 SS OR PVC
6	1	PRESSURE SWITCH	MANF	316 SS	316 SS OR PVC
7	1	TEE 1/2" (15mm)	CONT	316 SS	316 SS OR PVC
8	2	ELBOW 1/2" (15mm)	CONT	316 SS	316 SS OR PVC
9	AR	1/2" MALE TO MALE NIPPLE	CONT	316 SS	316 SS OR PVC

I-301 PRESSURE GAUGE / SWITCH
REV 010119

Stantec

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER No.11965314 BARBARA HERRERA 12/13/22 STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

NO SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

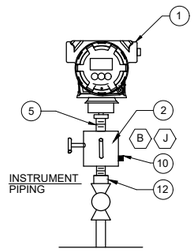
DESIGN S. KEEN
DRAWN P. CHOPADE
CHECKED D. STEFFES
APPROVED B. HERRERA
REVIEW

INSTRUMENTATION AND CONTROL
INSTALLATION DETAILS - II

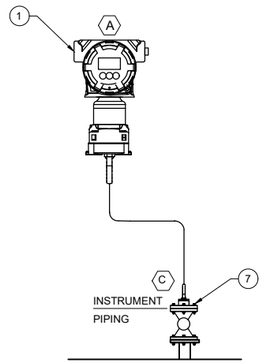
DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
GI-02
SHEET 123 OF 126

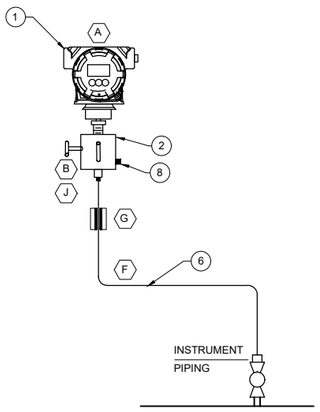
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PRESSURE TRANSMITTER



PRESSURE TRANSMITTER WITH CAPILLARY SENSING TUBE



PRESSURE TRANSMITTER- REMOTE MOUNT

GENERAL NOTES:

1. POTENTIALLY WETTED MATERIALS SHALL BE CHEMICALLY INERT TO THE PROCESS.
2. REFER TO P&IDS AND DATA SHEETS FOR PROCESS PIPING SIZE AND MATERIAL.
3. PIPING SIDE ISOLATION VALVES FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR.
4. REFER TO DIVISION 26 SPECIFICATIONS FOR FLEX AND RIGID CONDUIT MATERIAL AND USAGE LIMITATIONS.

KEYNOTES:

A. WALL OR INSTRUMENT-STAND MOUNT.

B. FURNISH 1/4" (8mm) OD MALE CONNECTOR AND 1/4" OD (1.5mm WALL THICKNESS) 316SS DOWN-TURNED DRAIN TUBING FOR FIELD INSTALLATION. ENSURE VENT / DRAIN IS DIRECTED TO SAFE LOCATION.

C. CAPILLARY DIAPHRAGM SEAL SYSTEM

D. ARMORED CAPILLARIES: 316 SS.
FLANGE: 316 SS OR HASTELLOY C PREFERRED. HOWEVER ENGINEER APPROVED FINAL SELECTION BASED ON MATERIAL CHEMICAL COMPATIBILITY.

E. FOR AMBIENT TEMPERATURE APPLICATIONS LOWER THAN -10 degC, ETHYLENE GLYCOL FILL FLUID REQUIRED IN LIEU OF STANDARD SILICONE OIL.

F. IN GENERAL, FOR GAS APPLICATIONS IMPULSE TUBING SHALL BE SLOPED UP TO THE SWITCH OR GAUGE. FOR LIQUID APPLICATIONS, IMPULSE TUBING SHALL BE SLOPED DOWN TO THE SWITCH OR GAUGE. MINIMUM APPLIED SLOPE SHALL BE 1:12 TUBING LENGTHS SHALL BE APPROXIMATELY EQUALIZED AND KEPT AS SHORT AS POSSIBLE.

G. 1/2" TUBING SHALL BE SUPPORTED / BRACED EVERY 3-FT. THERMALLY INSULATING SPACER MATERIAL SHALL BE APPLIED TO SEPARATE THE TUBING FROM THE SUPPORTS. PIGTAIL LOOP REQUIRED FOR HIGH VIBRATION INSTALLATIONS ONLY.

H. 316 SS OR HASTELLOY C PREFERRED. HOWEVER ENGINEER APPROVED FINAL SELECTION BASED ON MATERIAL CHEMICAL COMPATIBILITY.

J. VENT / DRAIN TO SAFE LOCATION (GRADE / DRAIN)

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	SUPPLY	MATERIAL/ RATING (WATER)	MATERIAL/ RATING (CHEMICAL)
1	1	PRESSURE TRANSMITTER ELECTRONIC HOUSING	MANF	EPOXY COATED ALUMINUM	
2	1	2 VALVE MANIFOLD WITH INTEGRAL BLEED	MANF	316 SS	316 SS OR PVC
3	AR	ISOLATION DIAPHRAGM SEAL; SILICONE OIL FILL FLUID (E)	MANF	316 SS	HASTELLOY C OR PVC
4	1	HEX REDUCING BUSHING 1"x1/2" (25mmx15mm)	CONT	316 SS	316 SS OR PVC
5	AR	1/2" MALE TO MALE NIPPLE	CONT	316 SS	316 SS OR PVC
6	AR	IMPULSE TUBING (1/2" (15mm) OD AND 1.5mm WALL THICKNESS) AND COMPRESSION FITTINGS (F)(G)	CONT	316 SS	(H)
7	AR	CAPILLARY DIAPHRAGM SEAL SYSTEM FLANGE (SIZED AND RATED TO MATCH ISOLATION VALVE FLANGE AND PROCESS REQUIREMENTS) WITH INTEGRAL 1/4" (8mm) ARMORED CAPILLARY TUBE (LENGTH AS REQUIRED); SILICONE OIL FILL FLUID.	MANF	316 SS (FLANGES AND CAPILLARIES)	(D)(E)
8	1	1/4" NPT VENT PIPE PLUG	MANF	316 SS	316 SS OR PVC
9	1	INSTRUMENT REMOVAL DEVICE AND 1/2" STEM	MANF	316 SS	316 SS OR PVC

I-303 PRESSURE TRANSMITTER
REV 010119

Stantec

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
No.11965314
BARBARA HERRERA
12/13/22
STATE OF UTAH

REVISIONS

NO.	DATE	REV. BY	DESCRIPTION

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

NO SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW
CHECKED D. STEFFES
APPROVED B. HERRERA

DESIGN
DESIGN S. KEEN
DRAWN P. CHOPADE

INSTRUMENTATION AND CONTROL
INSTALLATION DETAILS – III

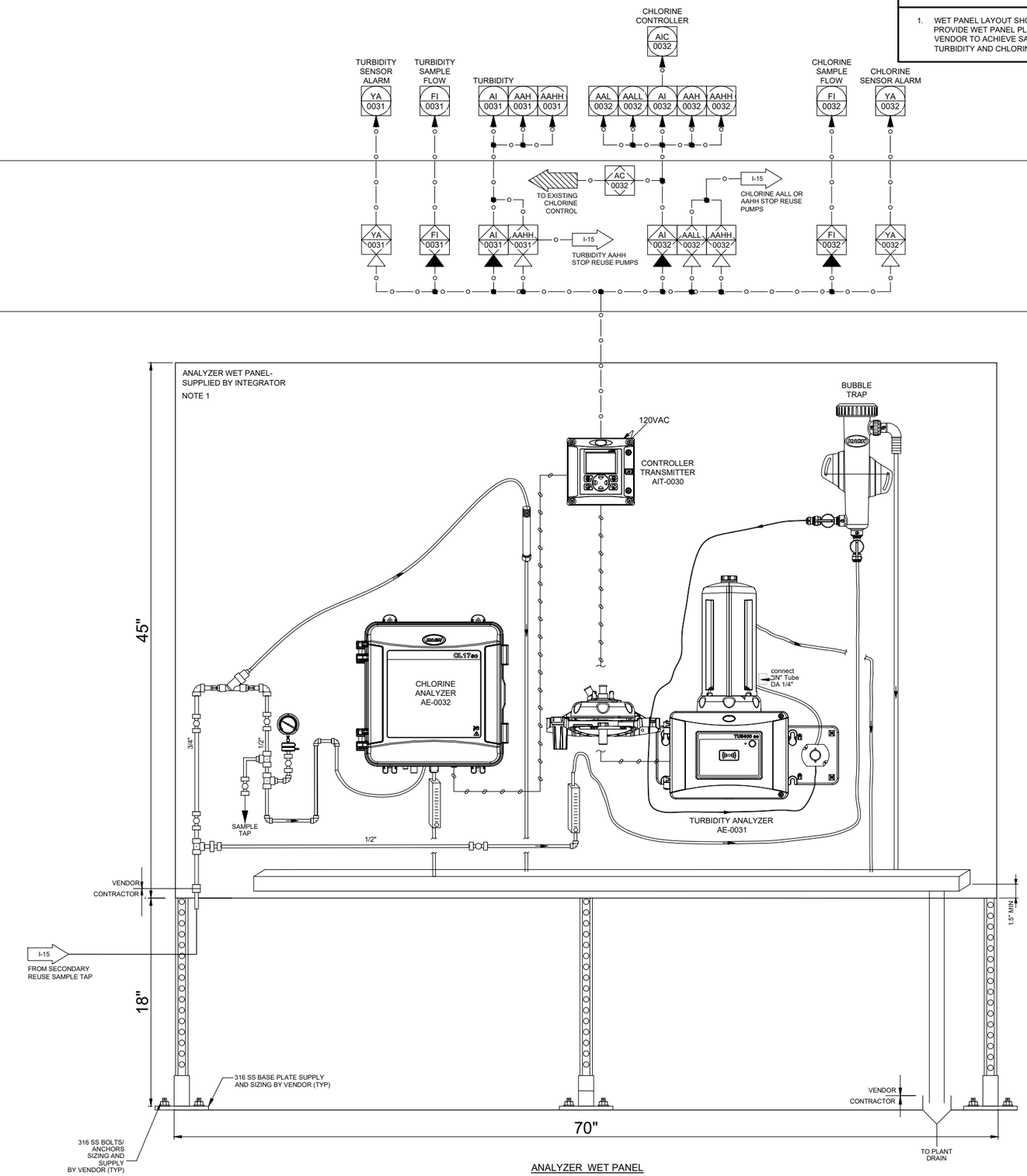
DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
GI-03

SHEET 124 OF 126

GENERAL SHEET NOTES

1. WET PANEL LAYOUT SHOWN AS A GENERAL ARRANGEMENT. CONTRACTOR SHALL DESIGN AND PROVIDE WET PANEL PLUMBING AND EQUIPMENT LAYOUT IN COORDINATION WITH THE ANALYZER VENDOR TO ACHIEVE SAMPLE PRESSURE AND FLOW CONTROL REQUIRED FOR ACCURATE TURBIDITY AND CHLORINE MEASUREMENTS.



ANALYZER WET PANEL

Stantec

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER
No. 11965314
BARBARA CHEROPUS
12/13/22
STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
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MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

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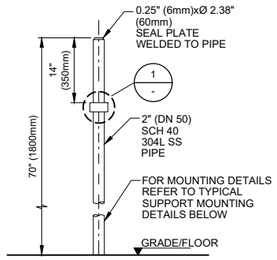
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REVIEW
CHECKED D. STEFFES
APPROVED B. HERRERA

INSTRUMENTATION AND CONTROL
ANALYZER WET PANEL

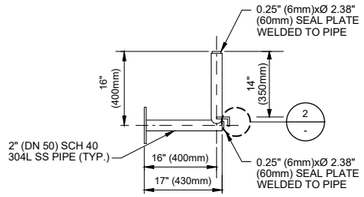
DATE: DECEMBER 2022
PROJECT NUMBER 483-20-02

DRAWING NO.
GI-04
SHEET 125 OF 126

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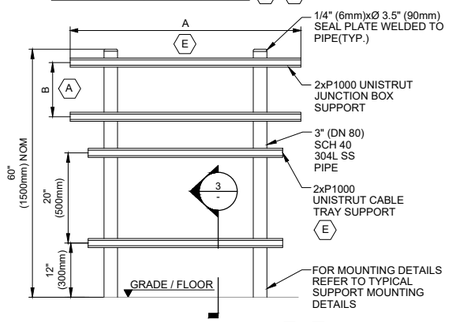


GRADE / FLOOR MOUNTED

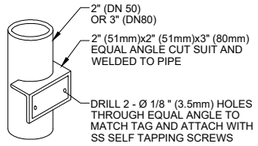


WALL / COLUMN MOUNTED

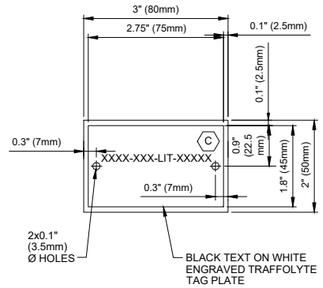
SINGLE INSTRUMENT SUPPORT (B) (F)



PANEL / JUNCTION BOX SUPPORT (B) (F)

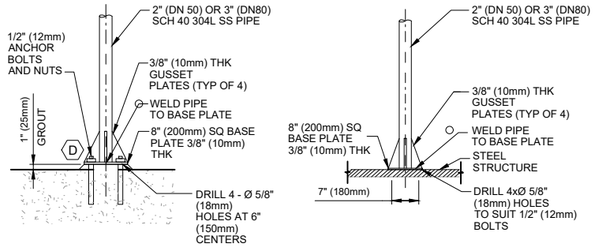


1 - DETAIL



INSTRUMENT TAG AND MOUNTING PLATE (B) (F)

2 - DETAIL



CONCRETE SLAB MOUNTING

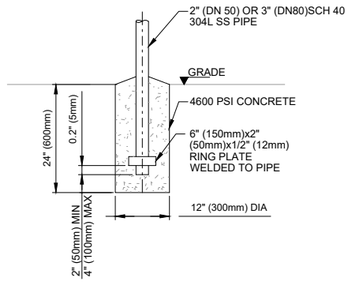
STEEL STRUCTURE MOUNTING

GENERAL NOTES:

1. INSTRUMENT DISPLAY SHALL BE SITUATED 48" (1220mm) ABOVE GRADE. REQUEST FOR DEVIATION SHALL BE SUBMITTED IN WRITING TO THE ENGINEER FOR APPROVAL.
2. REFER TO WEATHER SHIELD INSTALLATION DETAILS I-702 FOR WEATHER SHIELD SPECIFICS AND ADDITIONAL INSTALLATION REQUIREMENTS.
3. AFTER FABRICATION REMOVE ALL SHARP EDGES, BURRS ETC.
4. ALL WELDS SHALL BE 0.2" (6mm) CONTINUOUS FILLET WELDS FULL PERIMETER UNLESS NOTED OTHERWISE.
5. STANDS ARE TYPICAL; SITE MODIFICATION MAY BE NECESSARY TO ACCOMMODATE INSTALLATION.

KEYNOTES:

A. DIMENSION "B" TO SUIT JUNCTION BOX MOUNTING BRACKETS.
B. ALL HEAT AFFECTED WELD AREAS TO BE PAINTED WITH ZINC CHROMATE.
C. REFER TO PROJECT INSTRUMENT SCHEDULE FOR TAG NUMBERING DETAILS.
D. BASEPLATES TO BE FIXED TO CONCRETE USING 1/2" (12mm) 316 SS ANCHOR BOLTS (QTY=4) USING MULTI EPOXY ADHESIVE ANCHORS. IF CONCRETE THICKNESS IS INSUFFICIENT FOR MOUNTING VERTICAL BASE PLATES, EMPLOY A THROUGH BOLTED CONNECTION.
E. DIMENSION "A" LENGTH AND CABLE TRAY SUPPORT LENGTH AS REQUIRED TO SUIT NUMBER OF JUNCTION BOXES OR CONTROL PANELS.
F. SUPPORT ASSEMBLY SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.



YARD MOUNTING

TYPICAL SUPPORT MOUNTING DETAILS

3 - SECTION

I-701 INSTRUMENT STAND

REV 010119

Stantec

BOWEN COLLINS & ASSOCIATES

PROFESSIONAL ENGINEER No.11965314 BARBARA HERRERA 12/13/22 STATE OF UTAH

NO.	DATE	REV. BY	DESCRIPTION
			REVISIONS

MAGNA WATER DISTRICT
MAGNA WRF REUSE PROJECT
MAGNA, UTAH

NO SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

REVIEW CHECKED D. STEFFES APPROVED B. HERRERA

DESIGN DESIGN S. KEEN DRAWN P. CHOPADE

INSTRUMENTATION AND CONTROL
INSTALLATION DETAILS – IV

DATE: DECEMBER 2022 PROJECT NUMBER 483-20-02

DRAWING NO.
GI-05
SHEET 126 OF 126

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