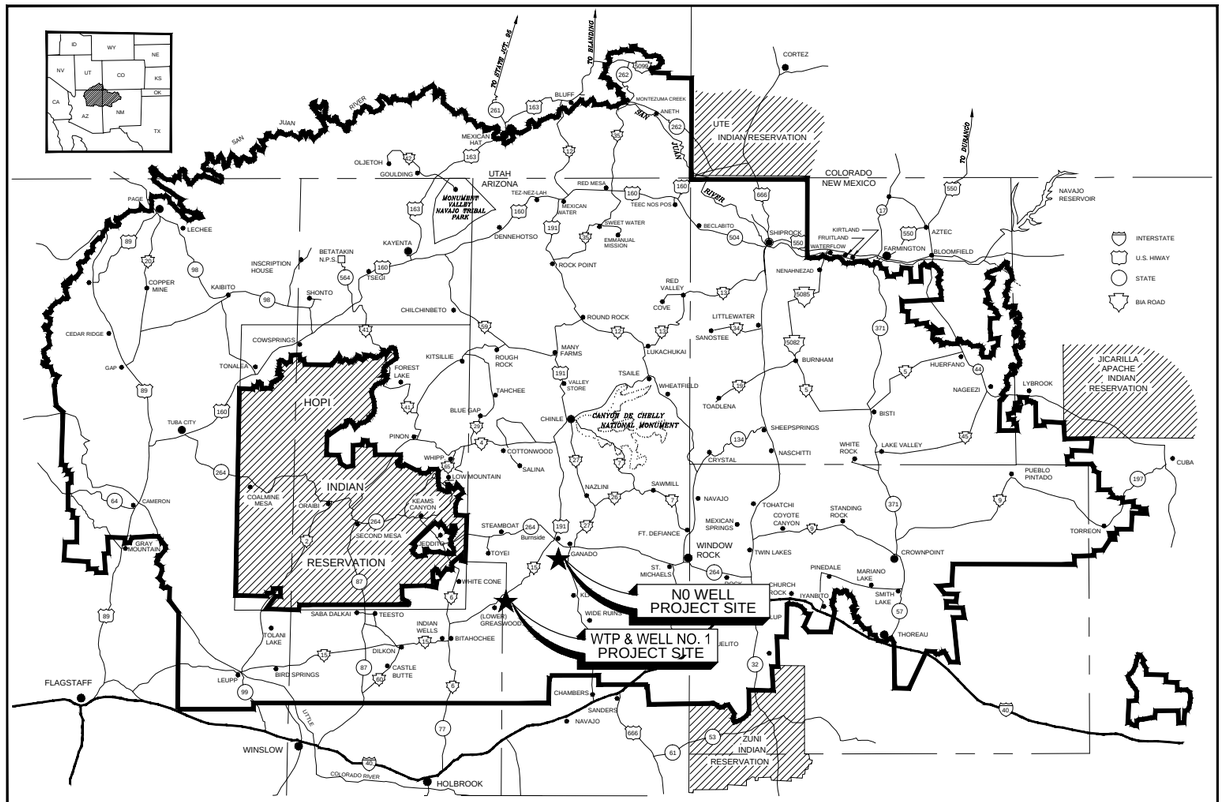
NAVAJO NATION

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LOWER GREASEWOOD WATER TREATMENT PLANT, LOWER GREASEWOOD WELL 1 PUMP HOUSE, AND GANADO N0 WELL PUMP HOUSE
JUNE 2017



NAVAJO INDIAN RESERVATION PLAN

LOCATION MAP
NOT TO SCALE

Call at least two full working days before you begin excavation.
ARIZONA 811
Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County: (602) 263-1100

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ PROJECT MANAGER DATE: 6/2/17
APPROVED: _____ BROWN AND CALDWELL DATE: 6/2/17

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CHECKED: MAF
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

5468 MICHAEL P. KOBE — Date Signed 6/2/2017 — ARIZONA, U.S.A. — Expires 12/31/18

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
GENERAL

COVER SHEET

FILENAME: 143956-G-001.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: G-001
SHEET NUMBER: 1 OF 78

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Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CADcontract No. 3 - Lower Greasewood Water Treatment Plant_Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\General Filename: 143956-G-001.dwg Plot Date: June 13, 2017 - 7:32 AM CADD User: David Davidse

DRAWING INDEX

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1 OF 6	AC TANK PANEL COVER SHEET
2 OF 6	AC TANK CONTROL PANEL DISCRETE I/O
3 OF 6	AC TANK CONTROL PANEL ANALOG I/O
4 OF 6	AC TANK CONTROL PANEL POWER DISTRIBUTION
5 OF 6	AC TANK CONTROL PANEL BACKPLANE
6 OF 6	AC TANK CONTROL PANEL CABLE PINOUT
1 OF 6	PLC CONTROL PANEL COVER SHEET
2 OF 6	PLC CONTROL PANEL DISCRETE I/O (SIMPLEX WELL WITH SOFT STARTER)
3 OF 6	PLC CONTROL PANEL ANALOG I/O (SIMPLEX WELL WITH SOFT STARTER)
4 OF 6	PLC CONTROL PANEL POWER DISTRIBUTION
5 OF 6	PLC CONTROL PANEL BACKPLANE
5A OF 6	PLC CONTROL PANEL WITH SWING OUT PANEL BACKPLANE
6 OF 6	PLC CONTROL PANEL CABLE PINOUT
1 OF 3	3 PHASE - SOFT START PUMP PANEL COVER SHEET
2 OF 3	3 PHASE - SOFT START PUMP PANEL LOGIC WIRING
3 OF 3	3 PHASE - SOFT START PUMP PANEL 7.5 TO 50 HP APPLICATIONS BACKPLANE
3 OF 3	3 PHASE - SOFT START PUMP PANEL 60,75,100 HP APPLICATIONS BACKPLANE
1 OF 2	PUMP HOUSE LAYOUT
2 OF 2	PUMP HOUSE LAYOUT

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REGISTERED PROFESSIONAL ENGINEER 54088 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

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LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
GENERAL

INDEX OF DRAWINGS

FILENAME 143956-G-002.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER G-002
SHEET NUMBER 2 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

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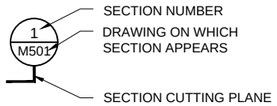
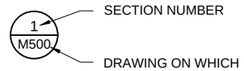
SECTION AND DETAIL DESIGNATION

(1) SECTION CUT ON DWG M500



(2) ON DWG M501 THIS SECTION IS IDENTIFIED



(3) DETAILS ARE CROSS-REFERENCED IN A SIMILAR MANNER. EXCEPT THAT DETAILS ARE IDENTIFIED BY LETTER RATHER THAN BY NUMBER.

PIPE SYSTEM DESIGNATIONS

BW	BACKWASH WATER	V	VENT
BWW	BACKWASH WASTE WASHWATER	WW	WELL WATER
CD	CHEMICAL DRAIN	1W	POTABLE WATER
CLG	CHLORINE GAS		
CLS	CHLORINE SOLUTION	2W	POTABLE WATER (DOWNSTREAM OF AIR GAP OR BACK FLOW PREVENTER)
CLV	CHLORINE VACUUM		
D	DRAIN		
OF	OVERFLOW		
PD	PUMPED DRAINAGE		
RWR	RECLAIMED WATER		
S	SLUDGE		
STD	STORM DRAIN		
TD	TANK DRAIN		

DRAWING NUMBERING SYSTEM

1. THE DRAWINGS ARE SUBDIVIDED BY DISCIPLINE AS FOLLOWS:

G	GENERAL
C	CIVIL
A	ARCHITECTURAL
S	STRUCTURAL
M	MECHANICAL
H	HVAC
E	ELECTRICAL
I	INSTRUMENTATION
P	PROCESS
U	PLUMBING

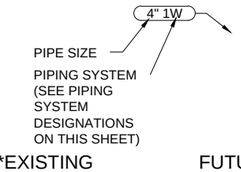
GENERAL SYMBOLS

- EXISTING EQUIPMENT OR MATERIALS TO BE REMOVED
- NEW FACILITIES
- EXISTING
- PROPERTY LINE
- RIGHT OF WAY (EASEMENT)
- EDGE OF PAVEMENT
- CENTERLINE
- HIDDEN LINE
- FUTURE
- FENCE
- HANDRAIL
- WATER SURFACE
- @ AT
- & AND
- Ø DIAMETER
- ℄ CENTER LINE
- ' FEET
- " INCHES
- NATURAL GROUND OR GRADE
- COMPACTED DECOMPOSED GRANITE DRIVING SURFACE
- COMPACTED GRADE OR FILL
- GRANULAR MATERIAL/ AGGREGATE BASE
- AC PAVEMENT IN PLAN OR SECTION

1. ADDITIONAL DISCIPLINE SPECIFIC SYMBOLS, ARE INCLUDED IN THE DISCIPLINE DRAWINGS

PIPING DESIGNATIONS

PIPING IS CALLED OUT BY SIZE FOLLOWED BY PIPING SYSTEM DESIGNATION, ENCLOSED AS SHOWN:



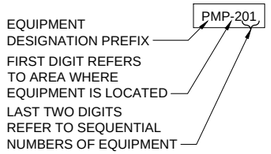
*EXISTING 4" 1W

FUTURE 4" 1W

* PIPING SYSTEM DESIGNATIONS FOR EXISTING PIPE INDICATE TYPE OF SERVICE ONLY AND DO NOT IMPLY PIPE MATERIALS USED.

EQUIPMENT DESIGNATIONS:

EQUIPMENT IS CALLED OUT BY ITS PREFIX FOLLOWED BY A 3 DIGIT NUMBER, ENCLOSED AS SHOWN:



A FACILITY DESIGNATION PRECEDES EACH EQUIPMENT DESIGNATION PREFIX - SEE P & ID'S FOR DETAILS

EXISTING PMP-201

FUTURE PMP-201

VALVE SYMBOLS

- GATE VALVE (NORMALLY OPEN)
- GATE VALVE (NORMALLY CLOSED)
- PLUG VALVE (NORMALLY OPEN)
- PLUG VALVE (NORMALLY CLOSED)
- BALL VALVE (NORMALLY OPEN)
- BALL VALVE (NORMALLY CLOSED)
- BUTTERFLY VALVE
- N.C. BUTTERFLY VALVE (NORMALLY CLOSED)
- (M) MOTOR OPERATOR
- GLOBE VALVE
- DIAPHRAGM VALVE
- KNIFE GATE VALVE
- CHECK VALVE
- PRESSURE CONTROL VALVE
- BALL CHECK VALVE
- PRESSURE RELIEF VALVE
- M FLOW METER

PIPE AND FITTINGS SYMBOLS (MECHANICAL)

SIGNAL LINE / DOUBLE LINE

- FLANGED JOINT
- MECHANICAL JOINT
- CONCENTRIC REDUCER
- 90° BEND DOWN
- 90° BEND UP
- TEE UP
- TEE DOWN
- MECHANICAL COUPLING
- DISMANTLING JOINT

EQUIPMENT AND GENERAL ABBREVIATIONS

ACU	AIR CONDITIONING UNIT	MOV	MOTOR OPERATED VALVE
ARV	AIR RELEASE VALVE	PI	PRESSURE GAUGE
ATP	VERTICAL TURBINE PUMP AIR RELEASE VALVE	PIT	PRESSURE INDICATING TRANSMITTER
ATS	AUTOMATIC TRANSFER SWITCH	PLV	PLUG VALVE
BFP	BACK FLOW PREVENTER	PMP	PUMP
BFV	BUTTERFLY VALVE	PNL	PANEL
BAV	BALL VALVE	PRV	PRESSURE REDUCING VALVE
CP	COMPRESSOR	PS	PUMP STATION
CT	CURRENT TRANSFORMER	PVL	PRESSURE VESSEL
CV	CHECK VALVE	RECPT	RECEPTACLE
DU	DRIVE UNIT	RW	RECLAIMED WATER
ENCL	ENCLOSURE	RWCD	ROOSEVELT WATER CONSERVATION DISTRICT
ECU	EVAPORATIVE COOLING UNIT	SBD	SWITCHBOARD
EF	EXHAUST FAN	SG	SLUICE GATE
F	FAN	SLR	SILENCER
FM	FLOW METER	SR.	SALT RIVER PROJECT
FIT	FLOW INDICATING TRANSMITTER	SUP	SUMP PUMP
GAC	GRANULAR ACTIVATED CARBON	SV	SOLENOID VALVE
GEN	GENERATOR	SWGR	SWITCHGEAR
GT	GATE	TB	TERMINAL BOX
GV	GATE VALVE	TFR	TRANSFORMER
HVAC	HEATING, VENTILATION AND AIR CONDITIONING	TNK	TANK
LCP	LOCAL CONTROL PANEL	UG	UNDER GROUND
LE	LEVEL METER	US	UTILITY STATION
LIT	LEVEL INDICATING TRANSMITTER	VFD	VARIABLE FREQUENCY DRIVE
LVR	LOUVER	VEN	VENTILATOR
M	MOTOR	WM	WATER METER
MCC	MOTOR CONTROL CENTER	WV	WATER VALVE

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REGISTERED ARIZONA 54086 MICHAEL P. KOBE Date Signed 6/2/2017 Expires 12/31/18

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LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
GENERAL

STANDARD SYMBOLS

FILENAME 143956-G-003.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER G-003
SHEET NUMBER 3 OF 78

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A	AMPERE
AC	ASPHALTIC CONCRETE
A/C	AIR CONDITIONING
ACC	AREA CONTROL CENTER
ACP	ASBESTOS CEMENT PIPE
ACST	ACOUSTIC
AF	AIR FILTER
AHU	AIR HANDLING UNIT
AMD	AIR MONITORING DEVICE
ANC	ANCHOR
AR	AIR RETURN
AS	AIR SUPPLY
AV	ANGLE VALVE
BAC	BACTERIOLOGICAL
BC	BEGINNING OF CURVE
BCR	BEGINNING OF CURVE RETURN
BCOP	BARE COPPER
BGAT	BOOLEAN GATE
BF	BLIND FLANGE
BHP	BRAKE HORSEPOWER
BSN	BAR SCREEN
BUV	BUTTERFLY VALVE
BV	BALL VALVE
CAB	DIRECT BURIAL CABLE
CAF	COMBUSTION AIR FAN
CC	COOLING COIL
C-C	CENTER TO CENTER
CCP	CONCRETE CYLINDER PIPE
CCSP	CONCRETE LINED AND COATED STEEL PIPE
CD	CEILING DIFFUSER
CDR	CONDUCTOR
CDU	CONDENSING UNIT
CED	CEILING EXHAUST DIFFUSER
CER	CEILING EXHAUST REGISTER
CF	CUBIC FEET
CFH	CUBIC FEET PER HOUR
CFR	CODE OF FEDERAL REGULATIONS
CHR	CHILLER
CIRC	CIRCUMFERENCE
CK	CHECKER(ED)
CKPL	CHECKER PLATE
℄	CENTERLINE
CL	CLEARANCE
CL2	CHLORINE
CM	MANUAL CONTROL STATION
CMA	MANUAL-AUTO CONTROL STATION
CMC	CEMENT MORTAR COATED
CML	CEMENT MORTAR LINED
CMPA	ASBESTOS PROTECTED CORRUGATED METAL PIPE
CNTL	CONTROL
CO2	CARBON DIOXIDE
COD	CHEMICAL OXYGEN DEMAND
COF	COOLING AIR FAN
COM	COMMINUTOR
CON	CONVEYOR
COND	CONDUCTIVITY
CONN	CONNECTION
CJ	CONSTRUCTION JOINT
CONT	CONTINUED
CP	COMPRESSOR
CPVC	CHLORINATED POLYVINYL CHLORIDE
CR	CONDUIT RACK
CRF	CHEMICAL FEEDER
CRN	CRANE
CREJ	CORRUGATED RUBBER EXPANSION JOINT
CSD	CEILING SUPPLY DIFFUSER
CTF	CENTRIFUGE
CTR	CONTRACTOR, CONTROL UNIT
CV	CONTROL VALVE
DB	DUCT BANK
DE	DENSITY METER
DF	DRINKING FOUNTAIN
DFD	DUCT FIRE DAMPER
DG	DOOR GRILLE
DI	DUCTILE IRON
DM	DAMPER MOTOR
DR	DRAIN ROCK
DT	DRAIN TRAP
DWF	DRY WEATHER FLOW
EA	EXHAUST AIR / ENVIRONMENTAL ASSESSMENT
EAT	ENTERING AIR TEMPERATURE
EAU	ENGINE ALTERNATOR UNIT
EC	END OF CURVE
ED	EXTRACTOR DAMPER, EQUIPMENT DRAIN
EE	EACH END
EFF	EFFLUENT
EG	EXHAUST GRILLE
EJ	EXPANSION JOINT
EL	ELEVATION

ELL	ELBOW
EMBD	EMBEDDED
E/P	ELECTRIC/PNEUMATIC
EPR	EVAPORATOR
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EXISTING SURFACE
EWEF	EACH WAY EACH FACE
EWT	ENTERING WATER TEMPERATURE
EXG	EXHAUST GRILLE
EXIST	EXISTING
F	FAHRENHEIT, FACE, FUSE(D)
FAI	FRESH AIR INTAKE
FB	FLAT BAR, FLOOR BEAM
FC	FAIL CLOSED
FCL	FREE CHLORINE
FCR	FINE CRUSHED ROCK
FE	FLOWMETER
FF	FAR FACE / FINISHED FLOOR
F-F	FACE TO FACE
FH	FIRE HYDRANT, FLATHEAD
FIN	FINISHED
FL	FLOW LINE
FLC	FLOCCULATOR
FLP	FLUID POWER UNIT
FLR	FLOOR
FLT	FILTER
FM	FORCE MAIN
FMH	FLEXIBLE METAL HOSE
FMX	FLASH MIXER
FO	FAIL OPEN
FP	FILTER PRESS
FPC	FLEXIBLE PIPE COUPLING
FPC-T	FPC TO TAKE TENSION
FRS	FREEZESTAT
FS	FLOW SWITCH, FIRESTAT
FT	FLASH TANK
G	POWER ACTUATED GATE
GB	GRADE BREAK
GBV	GLOBE VALVE
GDR	GRINDER
GFI	GROUND FAULT INTERRUPTOR
GPD	GALLONS PER DAY
GRDR	GRINDER
GRT	GROUT
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
H/A	HAND AUTO
HC	HEATING COIL
HEX	HEAT EXCHANGER
HDOT	HEAVY DUTY OILTIGHT
HG	MERCURY, HAND GRADE
HHV	HEAT HOSE VALVE
HOA	HAND-OFF-AUTO
HOR	HORIZONTAL
HP	HIGH PRESSURE, HIGH POINT, HORSEPOWER
HR	HANDRAIL, HEAT RESERVOIR
HSS	HIGH SIGNAL SELECT
HTV	HIGH TEMPERATURE VENT
HV	HOSE VALVE
H/V	HEATING AND VENTILATING
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HWTR	HIGH WATER
HYDT	HYDRANT
ICN	INCINERATOR
IF	INSIDE FACE
IL	INDICATING LAMP
INF	INFLUENT
INS	INSULATE(D)(ION)
INTER	INTERMEDIATE
INT	INTERIOR
INV	INVERT
IT	INSTRUMENT TAP
JST	JOIST
K	KIP (1000 POUNDS)
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAR	KILOVAR
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE, LATERAL, LATITUDE
LEL	LOWER EXPLOSIVE LIMIT
LGW	LOWER GREASEWOOD
LOD	LIMITS OF DISTURBMENTS
LOS	LOCKOUT STOP
LS	LIMIT SWITCH
MBH	THOUSAND BTU'S PER HOUR

MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILLS
MCU	MASTER CONTROL UNIT
MD	MOTORIZED DAMPER
MEE	MISCELLANEOUS ELECTRICAL EQUIPMENT
MGD	MILLION GALLONS PER DAY
MG/I	MILLIGRAMS PER LITER
MIE	MISCELLANEOUS INSTRUMENTATION EQUIPMENT
MILSPEC	MILITARY SPECIFICATION
MIN	MINIMUM, MINUTE
MJ	MECHANICAL JOINT
ML	MILLILITER
MME	MISCELLANEOUS MECHANICAL EQUIPMENT
MOP	MOTOR OPERATOR
MUL/DIV	MULTIPLY/DIVIDE
MV	MUD VALVE, MILLIVOLT
MX	MIXER
N	NEUTRAL
NA	NONAUTOMATIC
NAOH	SODIUM HYDROXIDE
NEG	NEGATIVE
NF	NONFUSED
NOX	NITRATES AND NITRITES
NPSH	NET POSITIVE SUCTION HEAD
NRS	NONRISING STEM
OA	OUTSIDE AIR, OVERALL
OAI	OUTSIDE AIR INTAKE
OB	OPPOSED BLADE
OL	OVERLOAD
O-O	OUT TO OUT
ORF	ODOR REMOVAL FILTER
ORP	OXIDATION REDUCTION POTENTIAL
ORT	ODOR REMOVAL TOWER
OSA	OUTSIDE AIR
OSC	ODOR SCRUBBER
P	PUMP
PAR	PARALLEL
PC	PLAIN CONCRETE, PIPE COUPLING
PCC	PLANT CONTROL CENTER
PCHV	PINCH VALVE
PCP	PLAIN CONCRETE PIPE
PC-T	PIPE COUPLING TO TAKE TENSION
PCU	PHOTOELECTRIC CONTROL UNIT
P/E	PNEUMATIC/ELECTRIC
PF	POWER FACTOR
PI	PROPORTIONAL PLUS INTEGRAL CONTROL
PID	PROPORTIONAL PLUS INTEGRAL PLUS DERIVATIVE CONTROL
PIVC	POINT OF INTERSECTION ON VERTICAL CURVE
PL	PROPERTY LINE, PIPELINE, PLATE
PLYWD	PLYWOOD
PNL	PANEL, PANELBOARD
PO4	PHOSPHATE
POP	PNEUMATIC OPERATOR
PP	POWER POLE
PRES	PRESSURE
PRD	PRESSURE RELIEF DAMPER
PRV	PRESSURE REGULATING (REDUCING) (RELIEF) VALVE
PRS	PRESSURE REDUCING STATION
PS	PRESSURE SWITCH, PRESSURE SENSOR
PSIA	POUND PER SQUARE INCH ABSOLUTE
PSIG	POUNDS PER SQUARE INCH GAGE
PV	PLUG VALVE, PROCESS VARIABLE
PVL	PRESSURE VESSEL
PVT	PAVEMENT
Q	RATE OF FLOW
QCPLG	QUICK COUPLING
R	RADIUS
RA	RETURN AIR
RAF	ROLL TYPE AIR FILTER
RCR	RECORDER
REC	RECEIVER
RECD	RECEIVED
RECP	RECEPTACLE
RED	REDUCE(R)
REG	REGULATOR
REL	RELAY
RT	RIGHT
RTP	REINFORCED THERMOSET PLASTIC
RTU	REMOTE TERMINAL UNIT
RGS	RIGID GALVANIZED STEEL
RL	REDUCED LEVEL
RWL	RAINWATER LEADER
S	SOUTH, SILENCER
SB	SIGNAL BOX
SCR	SCRUBBER

SD	SPLITTER DAMPER, SMOKE DETECTOR
SEP	SEPARATOR
SG	SUPPLY GRILLE, SLUICE GATE
SI	SPEED INCREASER
SIM	SIMILAR
SL	SLOPE
SLG	SLIDE GATE
SN	SCREEN
SP	SPACE, SET POINT, STATIC PRESSURE
SPG	SPACING
SPT	SOUND POWERED TELEPHONE
SO2	SULFUR DIOXIDE
SPL	SPLICE
SR	SPEED REDUCER
SRV	SAFETY RELIEF VALVE
SRG	SPLIT-RANGING
SS	STAINLESS STEEL, SANITARY SEWER, SPEED SELECTOR
SSC	SOLID STATE CONTROLLER
SSFH	STAINLESS STEEL FLAT HEAD
SSK	SERVICE SINK
ST	START
STD	STANDARD
STGA	STARTING AIR
SUB	SUBSTITUTE
SWB	SWITCHBOARD
SYM	SYMMETRICAL
TP	TANGENT POINT
TB	TERMINAL BOX
T/B	TOP OF BANK
TBN	TURBINE
T/C	TOP OF CURB
TCL	TOTALLY CLOSED
TCP	TEMPERATURE CONTROL PANEL
TD	TIME DELAY RELAY
TFR	TRANSFORMER
TOA	TEST-OFF-AUTO
TOC	TOTAL ORGANIC CARBON
TPG	TOPPING
TPLX	TRIPLEXED
TR	TIMING RELAY, STAIR TREAD
TRM	TRANSMITTER
TRN	TRANSDUCER
TRS	TRANSFER SWITCH
TS	TEMPERATURE SWITCH
TV	THERMOSTATIC VALVE
UL	ULTIMATE LOAD
UN	UNION
UP	UTILITY POLE
UPS	UNINTERRUPTIBLE POWER SUPPLY
US	UTILITY STATION
USS	UNIT SUBSTATION
V	VALVE, VOLTS
VAC	VOLTS ALTERNATING CURRENT
VAR	VARIES, VARIABLE
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VD	VOLUME DAMPER
VDC	VOLTS DIRECT CURRENT
VFT	VACUUM FILTER
VP	VAPOR PRESSURE, VACUUM PUMP
VSC	VARIABLE SPEED COUPLING
VTR	VENT THROUGH ROOF
VV	VARIABLE VOLUME BOX
WC	WATER CLOSET, WATER COLUMN
WCO	WALL CLEANOUT
WEG	WALL EXHAUST GRILLE
WER	WALL EXHAUST REGISTER
WF	WIDE FLANGE
WG	WASTE GAS
WSR	WALL SUPPLY REGISTER, WASHER
WSTP	WATERSTOP
WT	WATERTIGHT
WTP	WATER TREATMENT PLANT
WWF	WELDED WIRE FABRIC, WET WEATHER FLOW
X	SPARE CONDUIT
XLP	CROSS LINKED POLYETHYLENE
XP	EXPLOSIONPROOF
YCO	YARD CLEANOUT
ZS	POSITION SWITCH

NOTES:
1. ADDITIONAL ABBREVIATIONS ARE DEFINED IN ANSI Y1.1-1972.
2. ABBREVIATIONS FOR PIPING SYSTEMS ARE SPECIFIED IN SECTION 15050.

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ (PROJECT MANAGER) DATE: 6/2/17
APPROVED: _____ (BROWN AND CALDWELL) DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: NONE
DESIGNED: MK
DRAWN: DD
CHECKED: MAF
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED 54068 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.

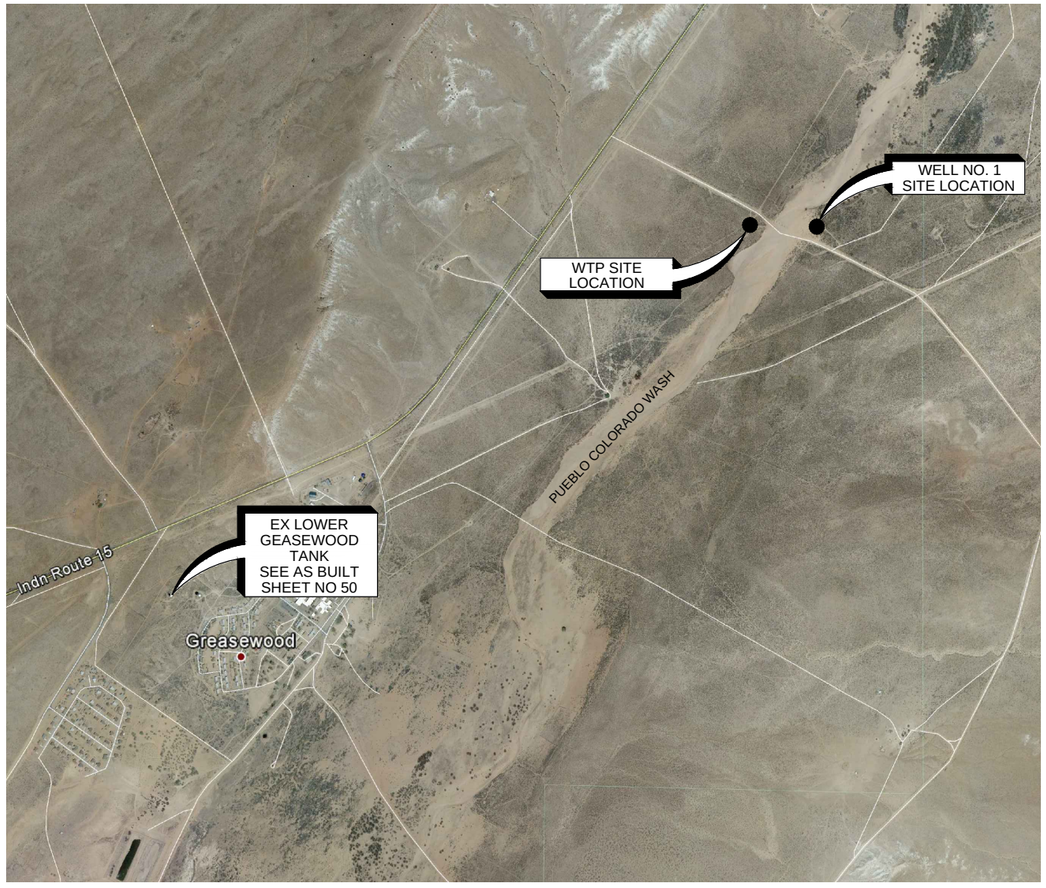
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
GENERAL

STANDARD ABBREVIATIONS

FILENAME 143956-G-004.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER G-004
SHEET NUMBER 4 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\General Filename: 143956-G-004.dwg Plot Date: June 13, 2017 - 7:35 AM CADD User: David Davidse



VICINITY MAP

0 1000 2000

SCALE IN FEET

VICINITY MAP

0 1000 2000

SCALE IN FEET

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17
(PROJECT MANAGER)

APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES
AT FULL SIZE
(IF NOT 2" - SCALE ACCORDINGLY)

SCALE: NONE

DESIGNED: MK
DRAWN: DD
CHECKED: MAF
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED
54088
MICHAEL P. KOBE
Date Signed 6/2/2017
ARIZONA, U.S.A.
Expires 12/31/18

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.

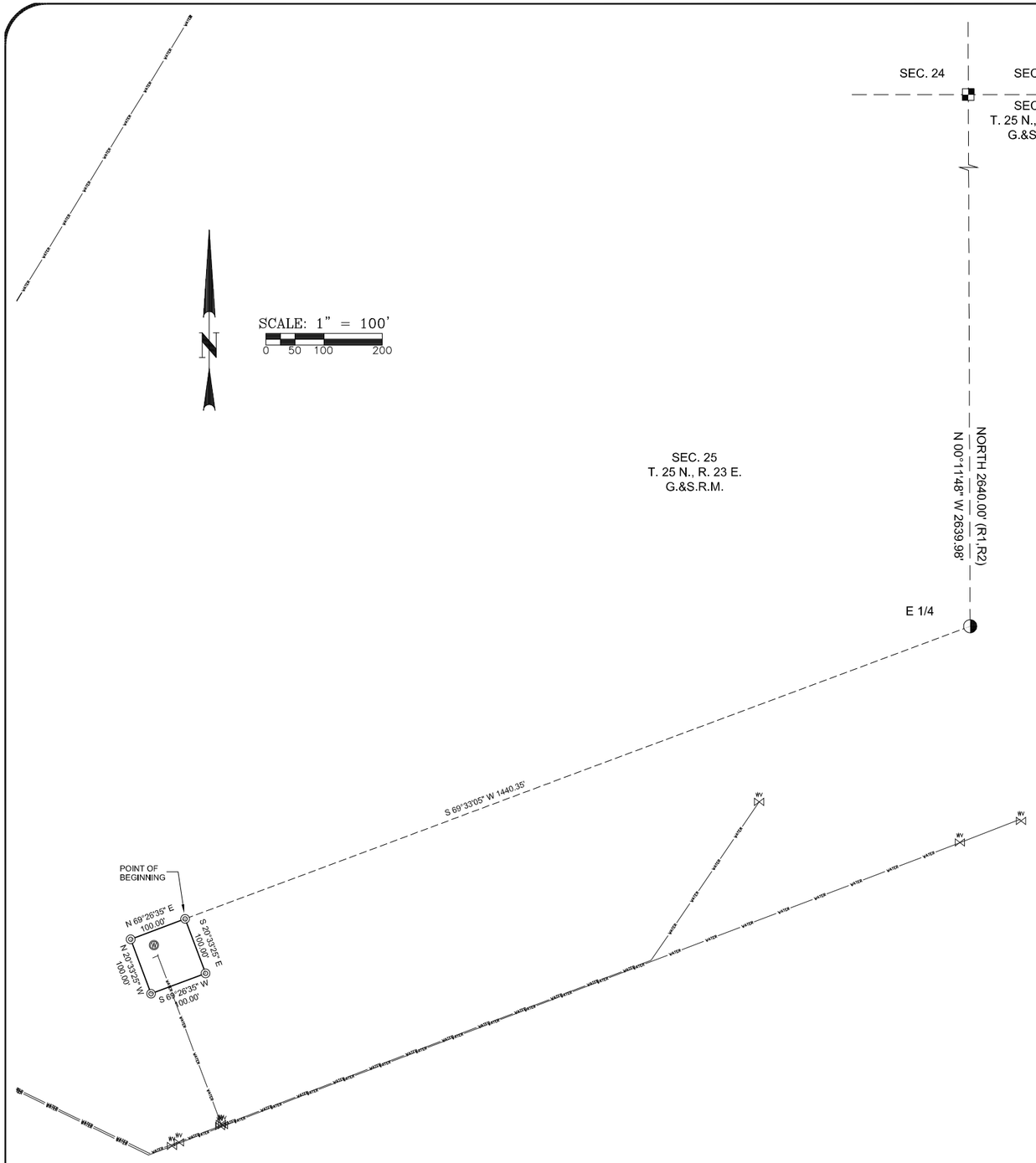
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
GENERAL

VICINITY MAP

FILENAME
143956-G-005.dwg
BC PROJECT NUMBER
143956
DRAWING NUMBER
G-005
SHEET NUMBER
5 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewood\design\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\General Filename: 143956-G-005.dwg Plot Date: June 13, 2017 - 7:35 AM CADD User: David Davidse



RESULTS OF SURVEY

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENT
WELL N01
0.23 ± ACRE
LOCATED IN SECTION 25, T. 25 N., R. 23 E., G.&S.R.M.
DISTRICT 17, NAVAJO NATION
GREASEWOOD, NAVAJO COUNTY, ARIZONA

LEGAL DESCRIPTION:
A PARCEL OF LAND SITUATED WITHIN SECTION 25, TOWNSHIP 25 NORTH, RANGE 23 EAST, GILA & SALT RIVER MERIDIAN, DISTRICT 17, NAVAJO NATION, IN GREASEWOOD, NAVAJO COUNTY, STATE OF ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE EAST QUARTER CORNER OF SECTION 25 MARKED BY B.L.M. BRASS CAP, FROM WHICH THE NORTHEAST CORNER OF SAID SECTION 25 LIES N 00°11'48" W, A DISTANCE OF 2639.98 FEET (BASIS OF BEARINGS, ARIZONA STATE PLANE EAST ZONE GRID BEARING)(NORTH, 2640.00 FEET PER B.L.M. SURVEY PLAT 1114-1, DATED MARCH 30, 2004, R1); THENCE S 69°33'05" W, A DISTANCE OF 1440.35 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048"; SAID POINT BEING THE POINT OF BEGINNING OF THE HEREIN DESCRIBED PARCEL OF LAND;
THENCE S 20°33'25" E, A DISTANCE OF 100.00 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE S 69°26'35" W, A DISTANCE OF 100.00 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE N 20°33'25" W, A DISTANCE OF 100.00 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE N 69°26'35" E, A DISTANCE OF 100.00 FEET TO THE POINT OF BEGINNING.

SAID PARCEL BEING 0.23 ACRES MORE OR LESS AND BEING SUBJECT TO ANY AND ALL EXISTING EASEMENTS FOR UTILITIES LOCATED THEREIN.

EXHIBIT "A"

LEGEND:
- ◪ - FOUND 3" BRASS CAP, B.L.M. SECTION CORNER
- ◑ - FOUND 3" BRASS CAP, B.L.M. 1/4 CORNER
- ◬ - FOUND 3" BRASS CAP, B.L.M. REFERENCE MARKER
- ⊕ - FOUND 3" BRASS CAP, B.I.A RIGHT-OF-WAY
- ◎ - SET 5/8" REBAR W/ PLASTIC CAP "GPS RLS 42048"

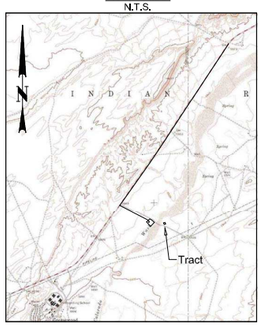
REFERENCES:
(R1) BUREAU OF LAND MANAGEMENT SURVEY PLAT 1114-1, DATED MARCH 30, 2004.
(R2) BUREAU OF LAND MANAGEMENT SURVEY PLAT 1114-2, DATED NOVEMBER 12, 2004.
(R3) CONSTRUCTION PLANS, N15(3)2&4 SUNRISE SPRINGS TO GREASEWOOD, BUREAU OF INDIAN AFFAIRS, DIVISION OF TRANSPORTATION, DATED SEPTEMBER 22, 1964.
(R4) STATE PLANE COORDINATES PER NATIONAL GEODETIC SURVEY, O.P.U.S. PROCESSED GPS DATA.

BASIS OF BEARINGS:
THE EAST SECTION LINE OF SECTION 25, T. 25 N., R. 23 E., WITH ARIZONA STATE PLANE COORDINATE EAST ZONE GRID BEARING OF N 00°11'48" W AND A B.L.M. BEARING OF NORTH PER B.L.M. PLAT 1114-1.

CERTIFICATION:
THIS IS TO CERTIFY THAT THE SURVEY DESCRIBED AND PLATTED HEREON WAS MADE UNDER MY DIRECTION DURING THE MONTHS OF MARCH & APRIL OF 2013 AND JANUARY OF 2014; THAT THE SURVEY IS TRUE AND COMPLETE AS SHOWN; THAT MONUMENTS SHOWN ACTUALLY EXIST OR WILL BE SET AS SHOWN; THAT THEIR POSITIONS ARE CORRECTLY SHOW; AND THAT SAID MONUMENTS ARE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED.

HALBERT O. GOLDTOOTH, AZ RLS 42048

VICINITY MAP
N.T.S.



DRAWING NUMBER
V-001

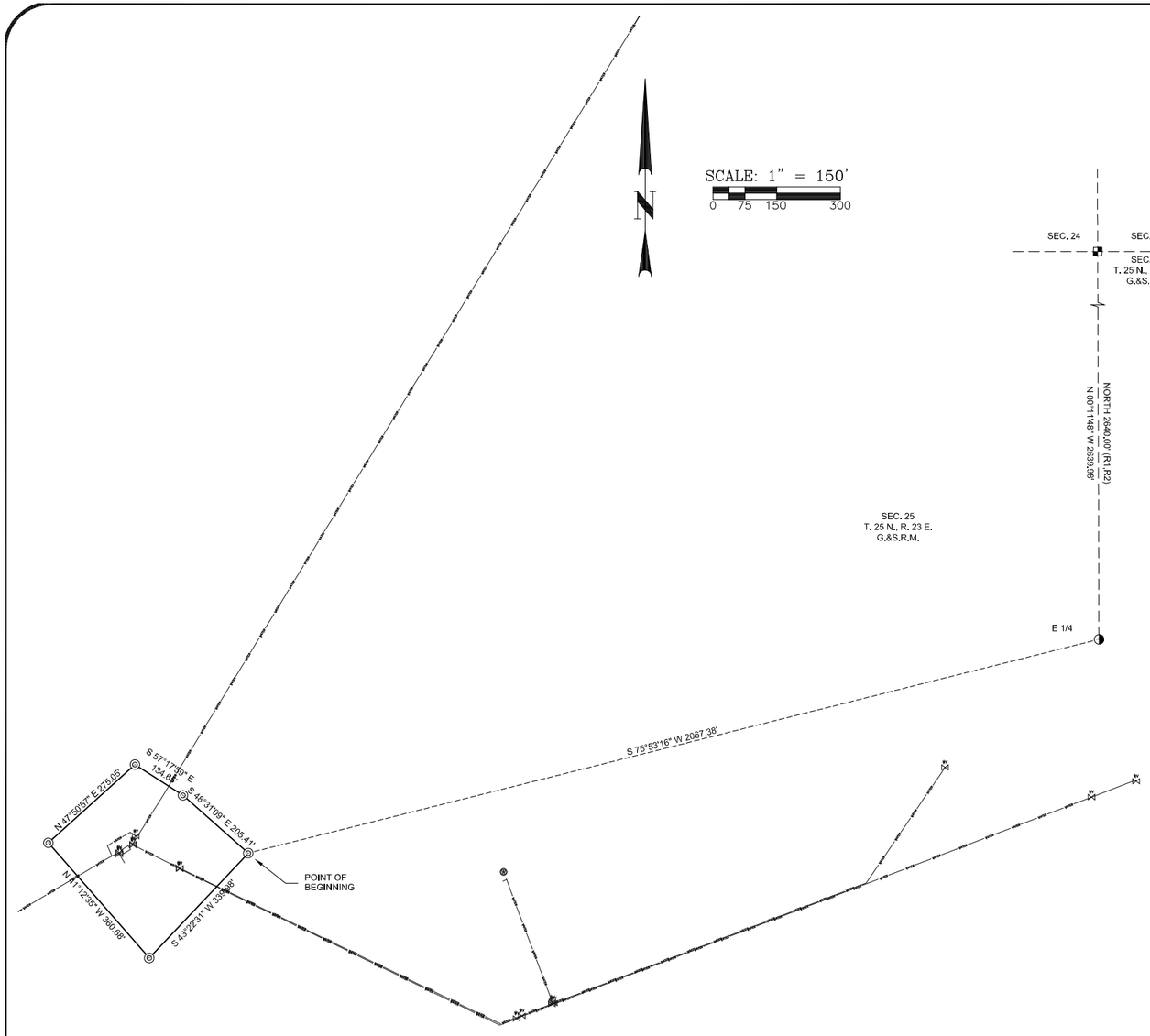
GOLDTOOTH PRECISION SOLUTIONS, INC.
P.O. BOX 640 TUBA CITY, AZ 86045 Ph: (928)283-4652 Fax: (928)283-5073

Job No.: 1311
Surveyed: March & April 2013 and January 1, 2014
File: 1311 Lower Greasewood Wells.dwg
Drawn by: H.Goldtooth
Checked by: H.Goldtooth
Revised: n/a
Scale: 1" = 100'
Sheet: 1 of 1

REGISTERED LAND SURVEYOR CERTIFICATE NO. 42048 HALBERT O. GOLDTOOTH ARIZONA U.S.A.

EXPIRES 3-31-2015

Halbert O. Goldtooth, AZ R.L.S. 42048



RESULTS OF SURVEY

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENT
TREATMENT BUILDING
2.50 ± ACRE
LOCATED IN SECTION 25, T. 25 N., R. 23 E., G.&S.R.M.
DISTRICT 17, NAVAJO NATION
GREASEWOOD, NAVAJO COUNTY, ARIZONA

LEGAL DESCRIPTION:
A PARCEL OF LAND SITUATED WITHIN SECTION 25, TOWNSHIP 25 NORTH, RANGE 23 EAST, GILA & SALT RIVER MERIDIAN, DISTRICT 17, NAVAJO NATION, IN GREASEWOOD, NAVAJO COUNTY, STATE OF ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE EAST QUARTER CORNER OF SECTION 25 MARKED BY B.L.M. BRASS CAP, FROM WHICH THE NORTHEAST CORNER OF SAID SECTION 25 LIES N 00°11'48" W, A DISTANCE OF 2639.98 FEET (BASIS OF BEARINGS, ARIZONA STATE PLANE EAST ZONE GRID BEARING)(NORTH, 2640.00 FEET PER B.L.M. SURVEY PLAT 1114-1, DATED MARCH 30, 2004, R1); THENCE S 75°53'16" W, A DISTANCE OF 2067.38 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048"; SAID POINT BEING THE POINT OF BEGINNING OF THE HEREIN DESCRIBED PARCEL OF LAND;
THENCE S 43°22'31" W, A DISTANCE OF 339.98 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE N 41°12'35" W, A DISTANCE OF 360.68 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE N 47°50'57" E, A DISTANCE OF 275.05 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE S 57°17'59" E, A DISTANCE OF 134.65 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE S 48°31'09" E, A DISTANCE OF 205.41 FEET TO THE POINT OF BEGINNING.

SAID PARCEL BEING 2.50 ACRES MORE OR LESS AND BEING SUBJECT TO ANY AND ALL EXISTING EASEMENTS FOR UTILITIES LOCATED THEREIN.

EXHIBIT "A"

LEGEND:
- ■ - FOUND 3" BRASS CAP, B.L.M. SECTION CORNER
- ◑ - FOUND 3" BRASS CAP, B.L.M. 1/4 CORNER
- ◬ - FOUND 3" BRASS CAP, B.L.M. REFERENCE MARKER
- ⊕ - FOUND 3" BRASS CAP, B.I.A RIGHT-OF-WAY
- ◎ - SET 5/8" REBAR W/ PLASTIC CAP "GPS RLS 42048"

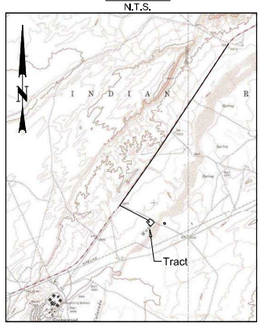
REFERENCES:
(R1) BUREAU OF LAND MANAGEMENT SURVEY PLAT 1114-1, DATED MARCH 30, 2004.
(R2) BUREAU OF LAND MANAGEMENT SURVEY PLAT 1114-2, DATED NOVEMBER 12, 2004.
(R3) CONSTRUCTION PLANS, N15(3)2&4 SUNRISE SPRINGS TO GREASEWOOD, BUREAU OF INDIAN AFFAIRS, DIVISION OF TRANSPORTATION, DATED SEPTEMBER 22, 1964.
(R4) STATE PLANE COORDINATES PER NATIONAL GEODETIC SURVEY, O.P.U.S. PROCESSED GPS DATA.

BASIS OF BEARINGS:
THE EAST SECTION LINE OF SECTION 25, T. 25 N., R. 23 E., WITH ARIZONA STATE PLANE COORDINATE EAST ZONE GRID BEARING OF N 00°11'48" W AND A B.L.M. BEARING OF "NORTH" PER B.L.M. PLAT 1114-1.

CERTIFICATION:
THIS IS TO CERTIFY THAT THE SURVEY DESCRIBED AND PLATTED HEREON WAS MADE UNDER MY DIRECTION DURING THE MONTHS OF MARCH & APRIL OF 2013 AND JANUARY OF 2014; THAT THE SURVEY IS TRUE AND COMPLETE AS SHOWN; THAT MONUMENTS SHOWN ACTUALLY EXIST OR WILL BE SET AS SHOWN; THAT THEIR POSITIONS ARE CORRECTLY SHOWN; AND THAT SAID MONUMENTS ARE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED.

HALBERT O. GOLDTOOTH, AZ RLS 42048

VICINITY MAP
N.T.S.



DRAWING NUMBER
V-002

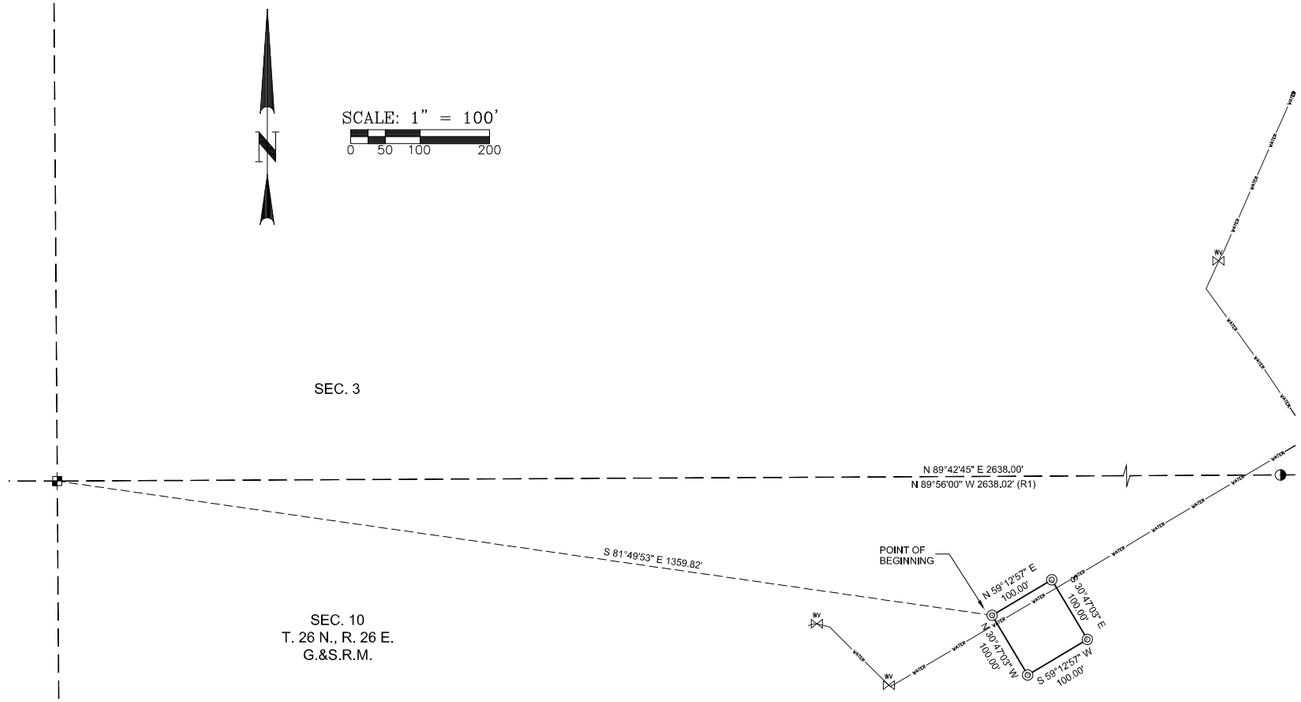
GOLDTOOTH PRECISION SOLUTIONS, INC.
P.O. BOX 640 TUBA CITY, AZ 86045 Ph: (928)283-4652 Fax: (928)283-5073

Job No.: 1311
Surveyed: March & April 2013 and January 1, 2014
File: 1311 Lower Greasewood Wells.dwg
Drawn by: H.Goldtooth
Checked by: H.Goldtooth
Revised: n/a
Scale: 1" = 150'
Sheet: 1 of 1

REGISTERED LAND SURVEYOR CERTIFICATE NO. 42048 HALBERT O. GOLDTOOTH 2-19-14 ARIZONA U.S.A.
EXPIRES 3-31-2017
Halbert O. Goldtooth, A.R.L.S. 42048

RESULTS OF SURVEY

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENT
WELL N0
0.23 ± ACRE
LOCATED IN SECTION 10, T. 26 N., R. 26 E., G.&S.R.M.
DISTRICT 17, NAVAJO NATION
GANADO, APACHE COUNTY, ARIZONA



LEGAL DESCRIPTION:
A PARCEL OF LAND SITUATED WITHIN SECTION 10, TOWNSHIP 26 NORTH, RANGE 26 EAST, GILA & SALT RIVER MERIDIAN, DISTRICT 17, NAVAJO NATION, IN GANADO, APACHE COUNTY, STATE OF ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWEST CORNER OF SECTION 10 MARKED BY B.L.M. BRASS CAP, FROM WHICH THE NORTH QUARTER CORNER OF SAID SECTION 10 LIES N 89°42'45" E, A DISTANCE OF 2638.00 FEET (BASIS OF BEARINGS, ARIZONA STATE PLANE EAST ZONE GRID BEARING) (N 89°56'00" W, 2638.02 FEET PER B.L.M. SURVEY PLAT 1151-A, DATED APRIL 20, 2005, R1); THENCE S 81°49'53" E, A DISTANCE OF 1359.82 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048"; SAID POINT BEING THE POINT OF BEGINNING OF THE HEREIN DESCRIBED PARCEL OF LAND;
THENCE N 59°12'57" E, A DISTANCE OF 100.00 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048"
THENCE S 30°47'03" E, A DISTANCE OF 100.00 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048"
THENCE S 59°12'57" W, A DISTANCE OF 100.00 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048"
THENCE N 30°47'03" W, A DISTANCE OF 100.00 FEET TO THE POINT OF BEGINNING.

SAID PARCEL BEING 0.23 ACRES MORE OR LESS AND BEING SUBJECT TO ANY AND ALL EXISTING EASEMENTS FOR UTILITIES LOCATED THEREIN.

EXHIBIT "A"

LEGEND:
- ▪ - FOUND 3" BRASS CAP, B.L.M. SECTION CORNER
- ◑ - FOUND 3" BRASS CAP, B.L.M. 1/4 CORNER
- ◬ - FOUND 3" BRASS CAP, B.L.M. REFERENCE MARKER
- ⊖ - FOUND 3" BRASS CAP, B.I.A RIGHT-OF-WAY
- ◎ - SET 5/8" REBAR W/ PLASTIC CAP "GPS RLS 42048"

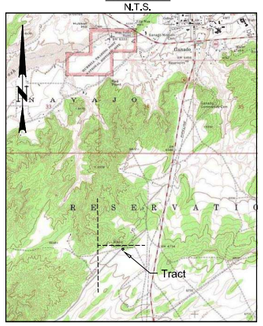
REFERENCES:
(R1) BUREAU OF LAND MANAGEMENT SURVEY PLAT 1151-A, DATED APRIL 20, 2005.
(R2) STATE PLANE COORDINATES PER NATIONAL GEODETIC SURVEY, O.P.U.S. PROCESSED GPS DATA.

BASIS OF BEARINGS:
THE NORTH SECTION LINE OF SECTION 10, T. 26 N., R. 26 E., WITH ARIZONA STATE PLANE COORDINATE EAST ZONE GRID BEARING OF N 89°42'45" E AND A B.L.M. BEARING OF N 89°56'00" W PER B.L.M. PLAT 1151-A.

CERTIFICATION:
THIS IS TO CERTIFY THAT THE SURVEY DESCRIBED AND PLATTED HEREON WAS MADE UNDER MY DIRECTION DURING THE MONTHS OF MARCH & APRIL OF 2013 AND JANUARY OF 2014; THAT THE SURVEY IS TRUE AND COMPLETE AS SHOWN; THAT MONUMENTS SHOWN ACTUALLY EXIST OR WILL BE SET AS SHOWN; THAT THEIR POSITIONS ARE CORRECTLY SHOWN; AND THAT SAID MONUMENTS ARE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED.

HALBERT O. GOLDTOOTH, AZ RLS 42048

VICINITY MAP
N.T.S.



DRAWING NUMBER
V-003

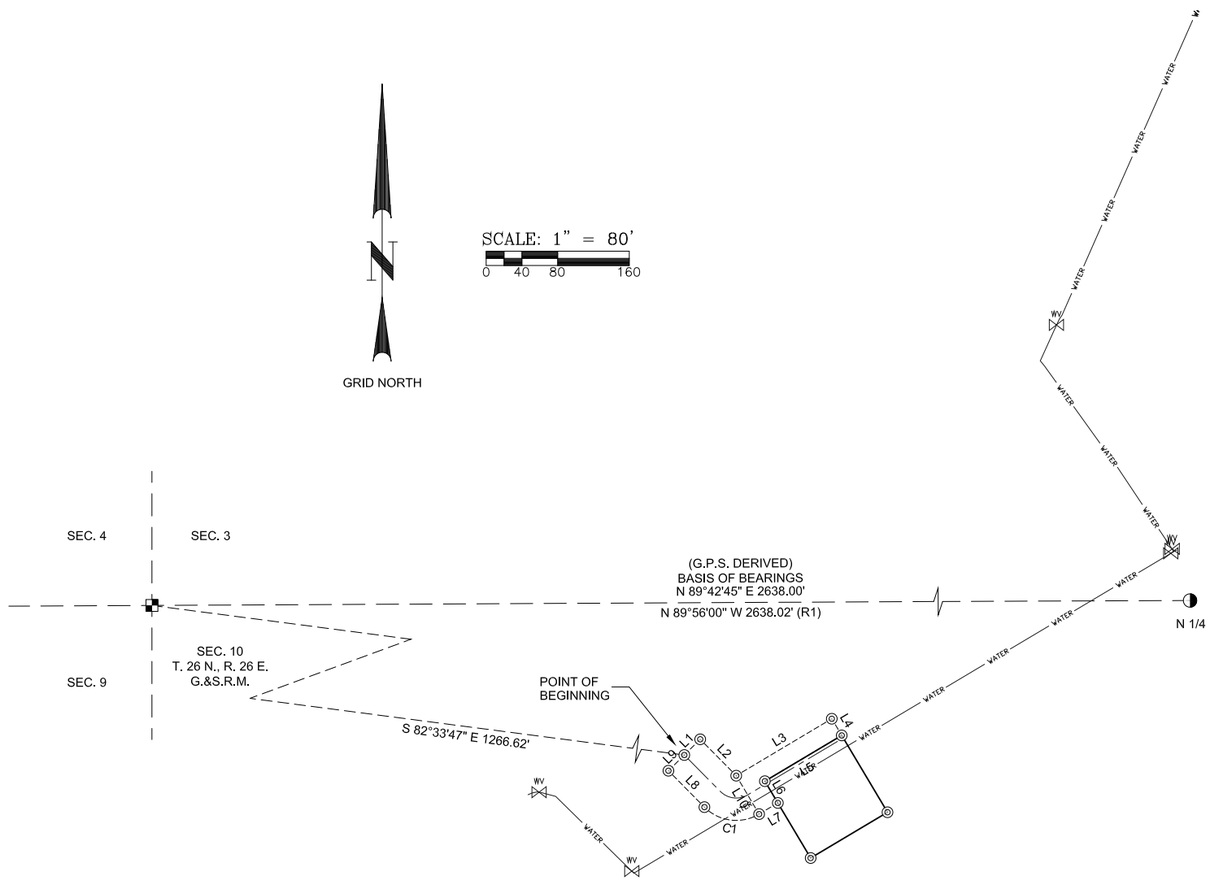
GOLDTOOTH PRECISION SOLUTIONS, INC.
P.O. BOX 640 TUBA CITY, AZ 86045 Ph: (928)283-4652 Fax: (928)283-5073

Job No.: 1311
Surveyed: March & April 2013 and January 1, 2014
File: 1311 Lower Greasewood Wells.dwg
Drawn by: H.Goldtooth
Checked by: H.Goldtooth
Revised: n/a
Scale: 1" = 100'
Sheet: 1 of 1

REGISTERED LAND SURVEYOR CERTIFICATE NO. 42048 HALBERT O. GOLDTOOTH 12-15-14 ARIZONA U.S.A.

EXPIRES 3-31-2017

Halbert O. Goldtooth, AZ R.L.S. 42048



RESULTS OF SURVEY

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENT
WELL N0 ACCESS ROAD
0.18 ± ACRE
LOCATED IN SECTION 10, T. 26 N., R. 26 E., G.&S.R.M.
DISTRICT 17, NAVAJO NATION
GANADO, APACHE COUNTY, ARIZONA

LEGAL DESCRIPTION:
A PARCEL OF LAND SITUATED WITHIN SECTION 10, TOWNSHIP 26 NORTH, RANGE 26 EAST, GILA & SALT RIVER MERIDIAN, DISTRICT 17, NAVAJO NATION, IN GANADO, APACHE COUNTY, STATE OF ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWEST CORNER OF SECTION 10 MARKED BY B.L.M. BRASS CAP, FROM WHICH THE NORTH QUARTER CORNER OF SAID SECTION 10 LIES N 89°42'45" E, A DISTANCE OF 2638.00 FEET (BASIS OF BEARINGS, ARIZONA STATE PLANE EAST ZONE GRID BEARING) (N 89°56'00" W, 2638.02 FEET PER B.L.M. SURVEY PLAT 1151-A, DATED APRIL 20, 2005, R1); THENCE S 82°33'47" E, A DISTANCE OF 1266.62 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048"; SAID POINT BEING THE POINT OF BEGINNING OF THE HEREIN DESCRIBED PARCEL OF LAND;
THENCE N 45°18'32" E, A DISTANCE OF 25.00 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE S 44°41'28" E, A DISTANCE OF 57.23 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE N 59°12'57" E, A DISTANCE OF 124.37 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE S 30°47'03" E, A DISTANCE OF 21.69 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE S 59°12'57" W, A DISTANCE OF 100.00 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE S 30°47'03" E, A DISTANCE OF 28.31 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE S 59°12'57" W, A DISTANCE OF 24.37 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048" SET AT THE BEGINNING OF A NON-TANGENT CURVE RIGHT HAVING A RADIUS OF 50.00 FEET AND A RADIAL LINE TO SAID POINT BEARS S 82°44'16" E;
THENCE NORTHERLY ALONG SAID CURVE, THROUGH A CENTRAL ANGLE OF 76°05'35", A DISTANCE OF 66.40 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048";
THENCE N 44°41'28" W, A DISTANCE OF 57.23 FEET TO A 5/8" REBAR WITH PLASTIC CAP STAMPED "GPS RLS 42048"
THENCE N 45°18'32" E, A DISTANCE OF 25.00 FEET TO THE POINT OF BEGINNING.

SAID PARCEL BEING 0.18 ACRES MORE OR LESS AND BEING SUBJECT TO ANY AND ALL EXISTING EASEMENTS FOR UTILITIES LOCATED THEREIN.

EXHIBIT "A"

LEGEND:
- ■ - FOUND 3" BRASS CAP, B.L.M. SECTION CORNER
- ◑ - FOUND 3" BRASS CAP, B.L.M. 1/4 CORNER
- ◎ - SET 5/8" REBAR W/ PLASTIC CAP "GPS RLS 42048"
- WV - WATER VALVE
- Ⓦ - WELL

REFERENCES:
(R1) BUREAU OF LAND MANAGEMENT SURVEY PLAT 1151-A, DATED APRIL 20, 2005.
(R2) STATE PLANE COORDINATES PER NATIONAL GEODETIC SURVEY, O.P.U.S. PROCESSED GPS DATA.

BASIS OF BEARINGS:
THE NORTH SECTION LINE OF SECTION 10, T. 26 N., R. 26 E., WITH ARIZONA STATE PLANE COORDINATE EAST ZONE GRID BEARING OF N 89°42'45" E AND A B.L.M. BEARING OF N 89°56'00" W PER B.L.M. PLAT 1151-A.

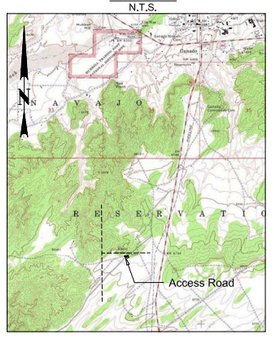
LINE TABLE		
LINE	BEARING	LENGTH
L1	N 45°18'32" E	25.00'
L2	S 44°41'28" E	57.23'
L3	N 59°12'57" E	124.37'
L4	S 30°47'03" E	21.69'
L5	S 59°12'57" W	100.00'
L6	S 30°47'03" E	28.31'
L7	S 59°12'57" W	24.37'
L8	N 44°41'28" W	57.23'
L9	N 45°18'32" E	25.00'
L10	S 30°47'03" E	50.00'

CURVE TABLE						
CURVE	ANGLE	RADIUS	LENGTH	TANGENT	CHORD	BEARING
C1	76°05'35"	50.00'	66.40'	39.13'	61.63'	S 82°44'16" E

CERTIFICATION:
THIS IS TO CERTIFY THAT THE SURVEY DESCRIBED AND PLATTED HEREON WAS MADE UNDER MY DIRECTION DURING THE MONTHS OF MARCH & APRIL OF 2013 AND JANUARY OF 2014; THAT THE SURVEY IS TRUE AND COMPLETE AS SHOWN; THAT MONUMENTS SHOWN ACTUALLY EXIST OR WILL BE SET AS SHOWN; THAT THEIR POSITIONS ARE CORRECTLY SHOWN; AND THAT SAID MONUMENTS ARE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED.

HALBERT O. GOLDTOOTH, AZ RLS 42048

VICINITY MAP
N.T.S.



DRAWING NUMBER
V-004

GOLDTOOTH PRECISION SOLUTIONS, INC.
P.O. BOX 640 TUBA CITY, AZ 86045 Ph: (928)283-4652 Fax: (928)283-5073

Job No.: 1311
Surveyed: March & April 2013 and January 2014
File: 1311 Well N0 Access Road.dwg
Drawn by: H.Goldtooth
Checked by: H.Goldtooth
Revised: n/a
Scale: 1" = 80'
Sheet: 1 of 1

REGISTERED LAND SURVEYOR CERTIFICATE NO. 42048 HALBERT O. GOLDTOOTH Date Signed 3-28-14 ARIZONA, U.S.A.

EXPIRES 3-31-2017

Halbert O. Goldtooth, AZ R.L.S. 42048

CIVIL SYMBOLS

- CENTER LINE
- PROPERTY BOUNDARY LINE
- EASEMENT LINE
- WATERLINE
- EXISTING WATERLINE
- OVERHEAD POWER LINE
- EXISTING OVERHEAD POWER LINE
- EXISTING UNDERGROUND TELEPHONE LINE
- EXISTING GAS LINE
- FENCE
- EXISTING FENCE
- CONTOUR LINE
- EXISTING CONTOUR LINE
- GATE VALVE
- EXISTING GATE VALVE
- WELL
- EXISTING WELL
- POWER POLE
- EXISTING POWER POLE
- EXISTING GUY WIRE
- REDUCER
- EXISTING REDUCER
- BLOWOFF VALVE
- AIR RELEASE VALVE

Call at least two full working days before you begin excavation.
ARIZONA 811
Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County: (602) 263-1100

GENERAL CIVIL NOTES

1. CONTRACTOR SHALL VERIFY (POTHOLE IF NECESSARY) ALL EXISTING UTILITIES (VERTICAL AND HORIZONTAL LOCATION), CONDUITS, FOUNDATIONS AND OTHER UNDERGROUND OBJECTS PRIOR TO THE START OF WORK.
2. FENCES, SIGNS, CURBS, LIGHT POLES, IRRIGATION PIPING, CONTROL WIRING, AND SPRAY HEADS, ETC. SHALL BE REMOVED AND REPLACED AS NECESSARY TO PERFORM THE WORK. UNLESS OTHERWISE INDICATED, ALL SUCH WORK SHALL BE INCIDENTAL TO CONSTRUCTION OF THE PROJECT. ALL DISTURBED AREAS INCLUDING CONCRETE STEPS, TIMBER STEPS, RETAINING WALLS, CONCRETE SIDEWALKS, PAVEMENT, LIGHT POSTS, CURBS, UNDERGROUND PIPING AND STRUCTURES SHALL BE RESTORED TO MATCH EXISTING UNLESS OTHERWISE NOTED.
3. ALL PAVEMENT DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS.
4. ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND THE LIMIT OF WORK SHALL BE RESTORED AT NO ADDITIONAL COST TO THE OWNER.
5. THE CONTRACTOR SHALL NOT STORE ANY APPARATUS, MATERIALS, SUPPLIES, AND EQUIPMENT ON DRAINAGE STRUCTURES OR WITHIN 100 FEET OF WETLANDS.
6. THE CONTRACTOR SHALL GRADE PROPOSED SLOPES TO MEET EXISTING SLOPES WHERE SHOWN ON PLANS.
7. THE CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL DEVICES.
8. THE CONTRACTOR SHALL NOTIFY THE OWNER AT LEAST 72 HOURS PRIOR TO EXCAVATING NEAR ANY UTILITIES.
9. CONTRACTOR LAYOUT AREAS SHALL BE COORDINATED AND APPROVED BY THE CONSTRUCTION MANAGER AND OWNER. LIMITED SPACE IS AVAILABLE WITHIN THE SITE. THE OWNER SHALL NOT BE RESPONSIBLE FOR PROTECTING OR SECURING CONTRACTOR LAYOUT AND STORAGE AREAS, AND OWNER SHALL NOT BE LIABLE FOR THEFT OR DAMAGE TO CONTRACTORS STORED MATERIALS OR EQUIPMENT.
10. ALL EXISTING UTILITY INFORMATION WAS OBTAINED FROM ARIZONA BLUESTAKES. THIS INFORMATION MAY NOT BE COMPLETELY ACCURATE OR INDICATE ALL OF THE UTILITIES, UNDERGROUND PIPING, OR BURIED STRUCTURES PRESENT.
11. ALL TRENCH EXCAVATIONS SHALL BE COMPLETELY CLOSED AT THE END OF EACH WORKING DAY BY BACKFILLING. COVERING WITH STEEL PLATES MAY BE ALLOWED IF APPROVED BY THE CONSTRUCTION MANAGER.

GENERAL DEMOLITION NOTES

1. REFER TO THE DEMOLITION DRAWINGS FOR ADDITIONAL INFORMATION REGARDING DEMOLITION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND DISPOSING OF ALL DEMOLISHED MATERIALS. DISPOSAL SHALL BE IN ACCORDANCE WITH ALL STATE AND LOCAL REGULATIONS AND SPECIFICATION SECTIONS 02100 AND 02200.
3. EQUIPMENT AND MATERIALS THAT ARE TO BE SALVAGED SHALL BE PROTECTED BY THE CONTRACTOR AND STORED AT A DESIGNATED LOCATION AS DETERMINED BY THE OWNER.

GENERAL SITE GRADING NOTES

1. STRIPPING OF TOPSOIL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200, EARTHWORK.
2. ALL ROAD AND PARKING AREA SURFACES SHALL PITCH 2 PERCENT MINIMUM UNLESS OTHERWISE NOTED. REFER TO DRAWING FOR DETAILS.
3. CONTRACTOR SHALL NOT TRACK OR SPILL EARTH, DEBRIS OR OTHER CONSTRUCTION MATERIAL ON PUBLIC OR PRIVATE STREETS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMMEDIATE ASSOCIATED CLEAN UP.
4. ALL CATCH BASINS, MANHOLES, VALVE PITS, VALVE BOXES AND OTHER BURIED FACILITIES WITH SURFACE ACCESS SHALL BE ADJUSTED TO MATCH FINAL GRADES, UNLESS OTHERWISE INDICATED.
5. CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL DEBRIS AND EXCESS EXCAVATED MATERIAL FROM WITHIN THE CONSTRUCTION LIMIT OF WORK, TO A SUITABLE SITE IN COMPLIANCE WITH ALL STATE AND LOCAL REGULATIONS.
6. WHERE EXISTING PAVEMENT IS REMOVED AND REPLACED, MATCH EXISTING GRADES TO THE EXTENT POSSIBLE. COORDINATE FINE GRADING WITH THE CONSTRUCTION MANAGER.
7. CONTRACTOR TO STRIP, SAVE AND REPLACE TOP SOIL PER CONSTRUCTION MANAGER.
8. CONTRACTOR TO REGRADE, AND RESEED ALL DISTURBED AREAS PER CONSTRUCTION MANAGER.

GENERAL SITE PIPING NOTES

1. REFER TO SPEC. SECTION 15050 FOR PIPE SCHEDULE AND ADDITIONAL PIPING NOTES.
2. ALL PIPE LINES SHALL SLOPE UNIFORMLY BETWEEN ELEVATIONS INDICATED ON THE DRAWINGS. NO CRESTS IN PIPING WILL BE PERMITTED. ALL HORIZONTAL AND VERTICAL BENDS IN PRESSURIZED LINES SHALL BE RESTRAINED JOINTS. PROVIDE ALL BENDS (HORIZONTAL AND VERTICAL) AS REQUIRED TO MEET THE GRADES AND ALIGNMENT INDICATED ON THE DRAWINGS.
3. ALL BURIED CONNECTIONS TO STRUCTURES SHALL HAVE SLEEVE TYPE (SOLID SLEEVE) FLEXIBLE CONNECTIONS APPROXIMATELY 4 FEET FROM THE STRUCTURES. ALL SLEEVE TYPE COUPLINGS ON PRESSURE LINES SHALL BE RESTRAINED.

GENERAL SITE PIPING NOTES (CONT'D.)

4. OPENINGS FOR PIPE IN PRECAST MANHOLE BASES SHALL BE CAST IN THE REQUIRED LOCATIONS DURING MANHOLE MANUFACTURE. FIELD CUT OPENINGS WILL NOT BE PERMITTED UNLESS APPROVED BY THE CONSTRUCTION MANAGER.
5. PROVIDE CAST OR DUCTILE IRON WALL CASTINGS, OR GALVANIZED STEEL PIPE SLEEVES, FOR ALL PIPE PENETRATIONS MADE THROUGH CAST-IN-PLACE CONCRETE FOUNDATIONS, WALLS AND SLABS. ALL WALL SLEEVES AND WALL CASTINGS SHALL HAVE WATERSTOPS. SEE STRUCTURAL DRAWINGS FOR LOCATIONS OF PENETRATIONS.
6. A MINIMUM OF 42-INCHES OF COVER REQUIRED ON PIPES UNLESS NOTED OTHERWISE.
7. MANHOLES ARE 4 FEET IN DIAMETER UNLESS OTHERWISE NOTED. THE TOP OF MANHOLE FRAMES SHALL BE SET FLUSH WITH FINISH GRADE, UNLESS OTHERWISE NOTED ON DRAWINGS. PIPES WITHIN VALVE PITS SHALL BE SUPPORTED 12 INCHES ABOVE BOTTOM OF MANHOLE ON ADJUSTABLE PIPE SADDLE SUPPORTS, UNLESS OTHERWISE INDICATED.
8. REFER TO SPECIFICATION SECTION 02200 AND CIVIL DETAILS FOR PIPE AND STRUCTURE BEDDING AND BACKFILL REQUIREMENTS.
9. COMPACTION TESTS WILL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION SECTION 02200, EARTHWORK. ANY SETTLEMENT OCCURRING WITHIN ONE YEAR OF FINAL COMPLETION OF THE WORK SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
10. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
11. REFER TO THE SPECIFICATIONS FOR INFORMATION REGARDING ANY NECESSARY COORDINATION WITH OTHERS, INCLUDING RESPONSIBILITIES AND RELATED COSTS.
12. WHERE NEW PIPING IS TO BE CONNECTED TO EXISTING PIPING, THE CONTRACTOR SHALL EXCAVATE A TEST PIT TO VERIFY LOCATION, ELEVATION, ORIENTATION AND MATERIAL OF CONSTRUCTION.
13. WHERE NEW PIPING IS TO BE CONNECTED TO EXISTING PIPING, THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ADAPTERS, FITTINGS, AND ADDITIONAL PIPE AS REQUIRED TO COMPLETE THE CONNECTION.
14. POTABLE WATER LINES SHOULD BE INSTALLED OVER WASTEWATER LINES. A MINIMUM SEPARATION OF 18 INCHES BETWEEN THE BOTTOM OF THE POTABLE WATER LINE AND THE TOP OF THE WASTEWATER LINE SHALL BE MAINTAINED.

GENERAL SITE PIPING NOTES (CONT'D.)

15. ALL STRUCTURES AND PIPELINES LOCATED ADJACENT TO ANY TRENCH EXCAVATION SHALL BE PROTECTED AND FIRMLY SUPPORTED BY THE CONTRACTOR UNTIL THE TRENCH IS BACKFILLED. DAMAGE TO ANY SUCH STRUCTURES CAUSED BY OR RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE. ALL UTILITIES REQUIRING REPAIR, RELOCATION OR ADJUSTMENT AS A RESULT OF THE PROJECT SHALL BE COORDINATED THROUGH THE CONSTRUCTION MANAGER.
16. ALL EXISTING UTILITIES ENCOUNTERED DURING CONSTRUCTION ARE TO REMAIN IN SERVICE THROUGHOUT THE PROJECT, UNLESS OTHERWISE NOTED.
17. ALL EXISTING UTILITIES REPLACED OR RELOCATED SHALL BE CONSTRUCTED OF NEW MATERIALS, APPROVED BY THE CONSTRUCTION MANAGER, SIMILAR TO THOSE OF THE THE EXISTING UTILITY.
18. WHERE PIPES ARE TO BE ABANDONED, FILL WITH CONCRETE SLURRY PRIOR TO INSTALLING CAP.
19. UNLESS OTHERWISE INDICATED, CONCRETE USED FOR ENCASEMENT, ANCHOR BLOCKS, BACKING, PIPE CRADLES, ARCHES AND FILL SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.
20. SURVEY COORDINATES AND ELEVATIONS SHALL BE PROVIDED FOR ALL BURIED PIPING BENDS AND VALVES ON AS-BUILT DRAWINGS.
21. PROVIDE VALVE BOXES FOR ALL BURIED VALVES.
22. CONTRACTOR SHALL POTHOLE AND FIELD INVESTIGATE PIPING AND INTERFERENCES WITH EXISTING FACILITIES PRIOR TO BEGINNING WORK. CONTRACTOR SHALL FIELD ROUTE NEW LINES AS NECESSARY TO AVOID EXISTING FACILITIES AND SHALL COORDINATE FIELD ROUTING WITH CONSTRUCTION MANAGER.
23. UNLESS NOTED OTHERWISE ALL UNDERGROUND PIPING SHALL BE INSTALLED PER IHS STANDARD DETAIL W-27.
24. ASPHALT SURFACES DISTURBED DURING UNDERGROUND PIPING INSTALLATION, DUCT BANK INSTALLATION AND OTHER ACTIVITIES SHALL BE REPAIRED.
25. FIELD ROUTE ALL PIPING TO AVOID CONFLICTS WITH EXISTING PIPING AND FACILITIES. CONTRACTOR TO FIELD INVESTIGATE ALL PIPING ROUTES AND COORDINATE ANY NECESSARY ROUTING CHANGES WITH CONSTRUCTION MANAGER.

GENERAL SITE LAYOUT NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LAYOUT OF ALL PROPOSED WORK AS SHOWN ON THE DRAWINGS.
2. CONTROL POINTS ON SHEETV-001 THRU V-004 DEFINE THE CONSTRUCTION CONTROL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THIS PROVIDED LAYOUT INFORMATION THROUGHOUT THE COURSE OF CONSTRUCTION. REPORT ANY LAYOUT DISCREPANCIES IMMEDIATELY TO THE CONSTRUCTION MANAGER.

GENERAL SITE LAYOUT NOTES (CONT'D.)

3. IN GENERAL, THE GIVEN STRUCTURE LOCATIONS ARE TO THE OUTSIDE FACE OF THE STRUCTURE FOUNDATION WALL, NOT FOOTINGS. REFER TO THE CIVIL AND STRUCTURAL DRAWINGS FOR STRUCTURE DIMENSIONS. RADII SHOWN FOR ROADS ARE TO EDGE OF PAVEMENT.
4. THE LOCATION AND LIMITS OF ALL ON-SITE WORK AND STORAGE AREAS SHALL BE REVIEWED/COORDINATED WITH, AND ACCEPTABLE TO, THE OWNER AND CONSTRUCTION MANAGER. THE CONTRACTOR SHALL LIMIT HIS ACTIVITIES TO THESE AREAS.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RE-ESTABLISHING AND RESETTING ALL EXISTING PROPERTY MONUMENTS DISTURBED BY HIS OPERATIONS. THIS WORK SHALL BE DONE BY A LAND SURVEYOR REGISTERED IN THE STATE OF ARIZONA AT NO ADDITIONAL COST TO THE OWNER.
6. WRITTEN DIMENSIONS SHALL PREVAIL. DO NOT SCALE DISTANCES FROM THE DRAWINGS. REPORT ANY DISCREPANCIES IMMEDIATELY TO THE CONSTRUCTION MANAGER.
7. COORDINATES SHOWN ON CIVIL DRAWINGS ARE BASED ON MODIFIED STATE PLANE (LOCAL COORDINATE SYSTEM). TO CONVERT TO ARIZONA STATE PLANE COORDINATE EAST (SEE SHEETS V-001 THRU V-004), USE A COMBINED FACTOR OF 0.99962665.

PERMITS AND NOTIFICATION NOTES

1. THE CONTRACTOR SHALL OBTAIN ALL APPLICABLE PERMITS PRIOR TO BEGINNING CONSTRUCTION.
2. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER TWENTY-FOUR (24) HOURS PRIOR TO COMMENCING PERMITTED WORK, TWENTY-FOUR (24) HOURS PRIOR TO ANY REQUIRED INSPECTION, AND AFTER COMPLETING WORK COVERED BY THE PERMIT.
3. A REQUEST FOR SHUTDOWN SHALL BE REQUIRED WHENEVER CONNECTIONS ARE MADE TO ANY UTILITY LINE, INCLUDING ELECTRIC POWER AND COMMUNICATION LINES; GAS, WATER, AND SANITARY SEWERS OR STORM SEWERS. CONNECTIONS TO ANY UTILITY WITHOUT AN APPROVED REQUEST WILL MAKE THE CONTRACTOR LIABLE TO THE OWNER FOR CORRECTION OF ANY DEFICIENCIES AND/OR RESULTING PROBLEMS, INCLUDING (BUT NOT LIMITED TO) HEALTH, SAFETY, AND FINANCIAL PROBLEMS. THE CONTRACTOR SHALL REQUEST PERMISSION AT LEAST FOUR (4) WORKING DAYS PRIOR TO THE DAY PLANNED FOR ANY UTILITY SHUT-DOWN. ALL UTILITY SHUT-DOWNS ARE SUBJECT TO APPROVAL BY THE OWNER.

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17 (PROJECT MANAGER)
APPROVED: _____ DATE: 6/2/17 (BROWN AND CALDWELL)

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: NONE
DESIGNED: MK
DRAWN: DD
CHECKED: TR
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

54069 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

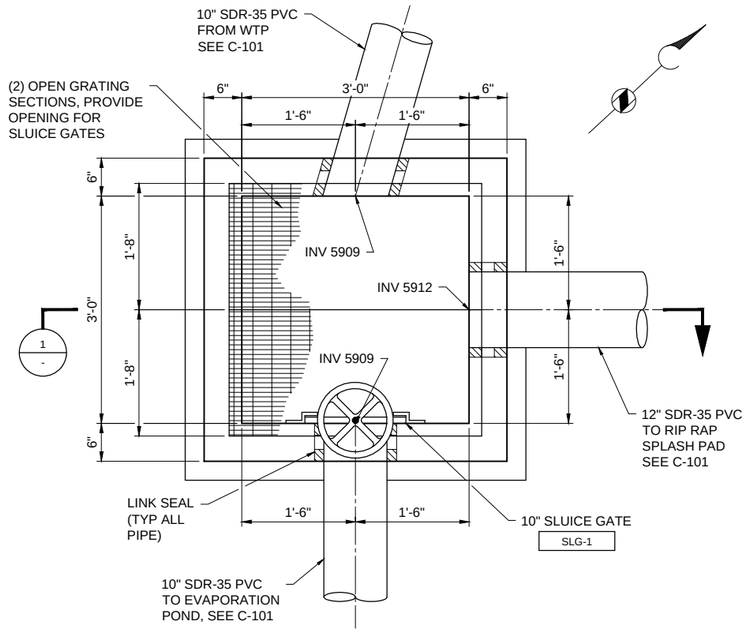
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
CIVIL

GENERAL CIVIL NOTES AND SYMBOLS

FILENAME 143956-C-001.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER C-001
SHEET NUMBER 10 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewood\design\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Civil Filename: 143956-C-001.dwg Plot Date: June 12, 2017 - 3:10 PM CADD User: David Davidse

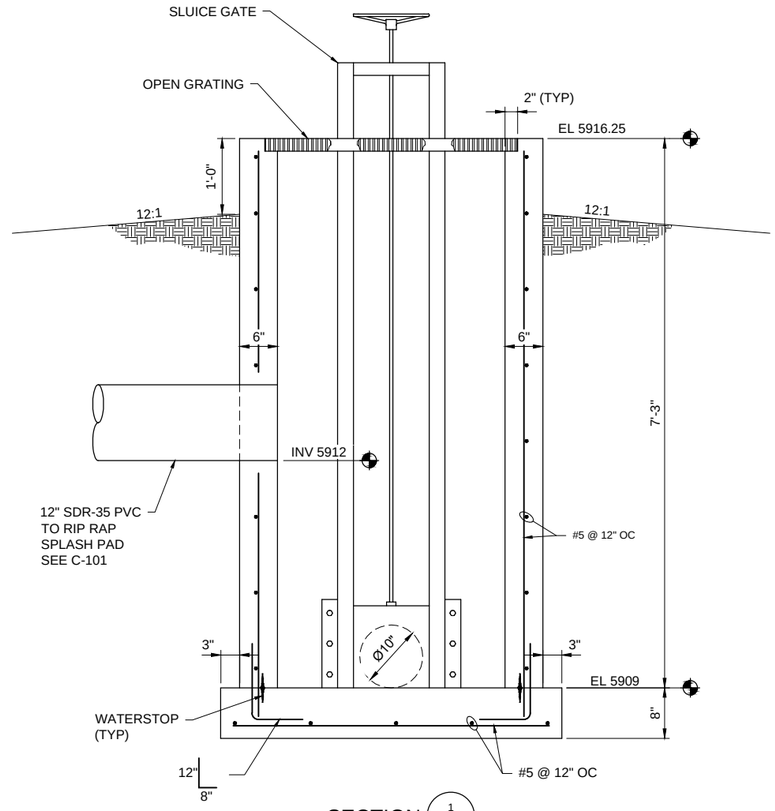


PLAN

BACKWASH
WASTEWATER
DIVERSION BOX

DETAIL A C-101

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



SECTION

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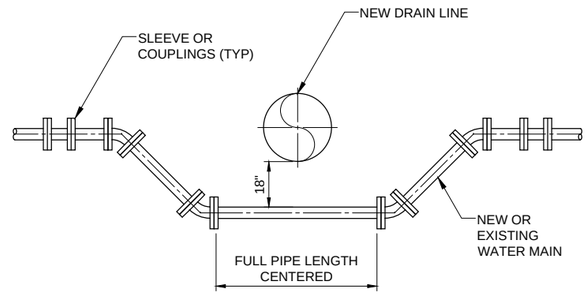


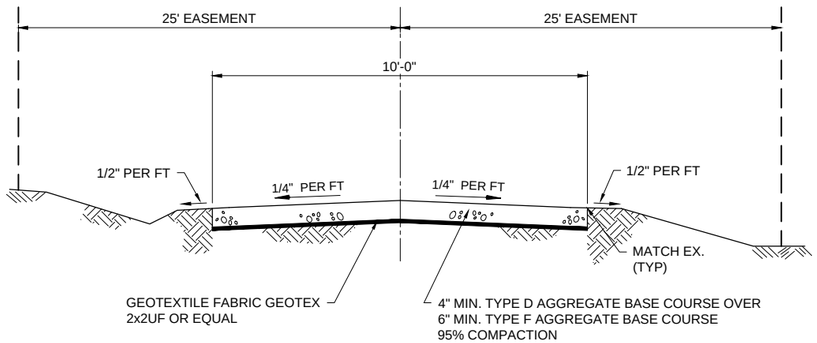
NOTES:

1. PIPE SHALL BE DUCTILE IRON AND CONFORM TO AWWA C151, THICKNESS CLASS 50.
2. MECHANICAL JOINT PIPE SHALL CONFORM TO AWWA C104, JOINTS TO CONFORM TO AWWA C111.
3. MECHANICAL JOINT FITTINGS SHALL CONFORM TO AWWA C153, JOINTS TO CONFORM TO AWWA C11.
4. MECHANICAL JOINT PIPE AND FITTINGS SHALL BE RETRAINED BE EBBA IRON MEGALUGS, OR EQUAL.

WATER MAIN LOOP

DETAIL C -

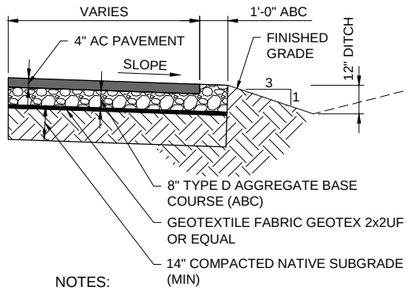
NOT TO SCALE



GANADO N0 WELL
ACCESS ROAD

DETAIL B C-103

NOT TO SCALE



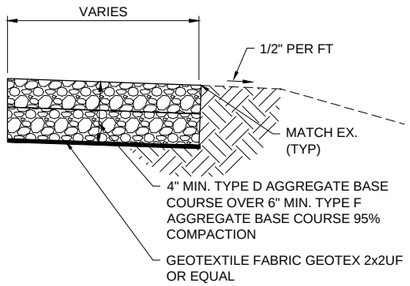
NOTES:

1. REFER TO SECTION 02743 FOR ASPHALT PAVING REQUIREMENTS.

PAVED ROAD SECTION

DETAIL E C-101

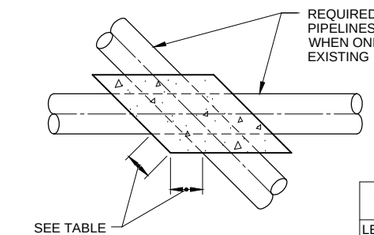
NOT TO SCALE



GRAVEL ROAD SECTION

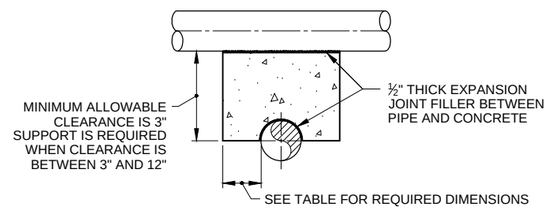
DETAIL F C-100 C-101

NOT TO SCALE



PLAN

LARGEST PIPE SIZE	REQUIRED DIMENSION
LESS THAN 2"	3"
2 ½" TO 12"	6"
MORE THAN 12"	12"



ELEVATION

CONCRETE SUPPORT
FOR PIPE CROSSINGS

DETAIL D -

NOT TO SCALE

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ PROJECT MANAGER DATE: 6/2/17

APPROVED: _____ BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: AS SHOWN
DESIGNED: MK
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EXTERNAL REFERENCE FILES

BID ISSUE

ARIZONA, U.S.A. 54969 MICHAEL P. KOBE Date Signed 6/2/2017 Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

GREAT SEAL OF THE NAVAJO NATION

NAVAJO TRIBAL UTILITY AUTHORITY — UTILITIES FOR THE NAVAJO NATION — NTUA

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
CIVIL

MISCELLANEOUS DETAILS

FILENAME 143956-C002.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER C-002
SHEET NUMBER 11 OF 78

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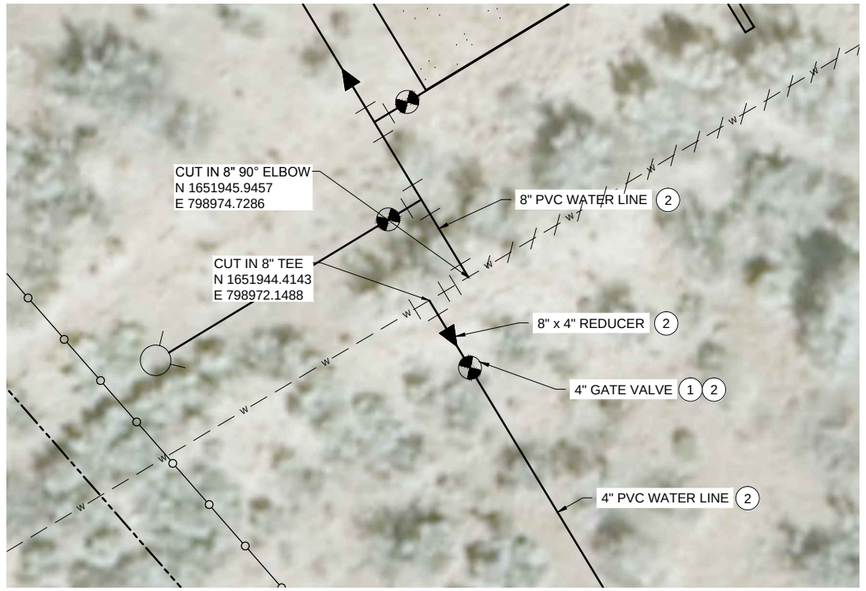
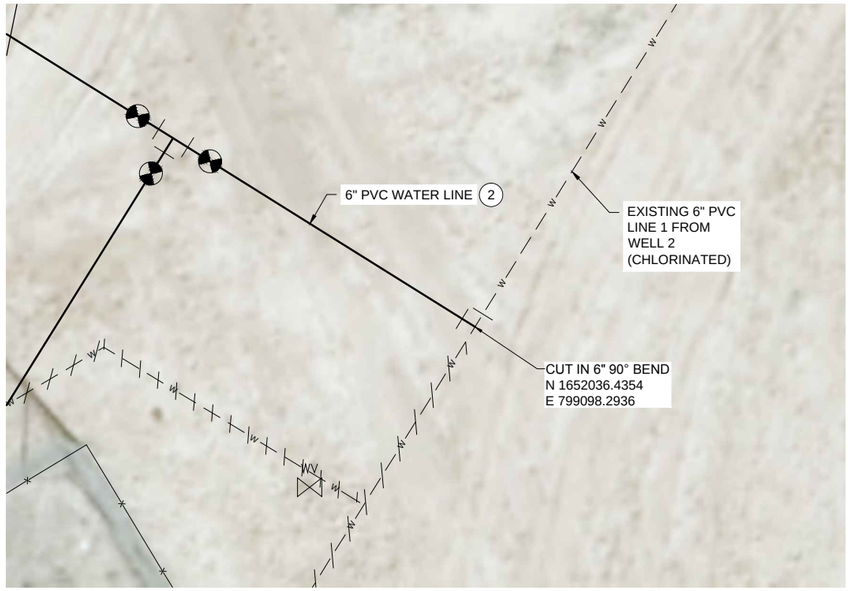
Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Civil Filename: 143956-C002.dwg Plot Date: June 12, 2017 - 3:11 PM CADD User: David Davidse



LOWER GREASEWOOD
WTP PIPE CONNECTION

DETAIL A / C-102

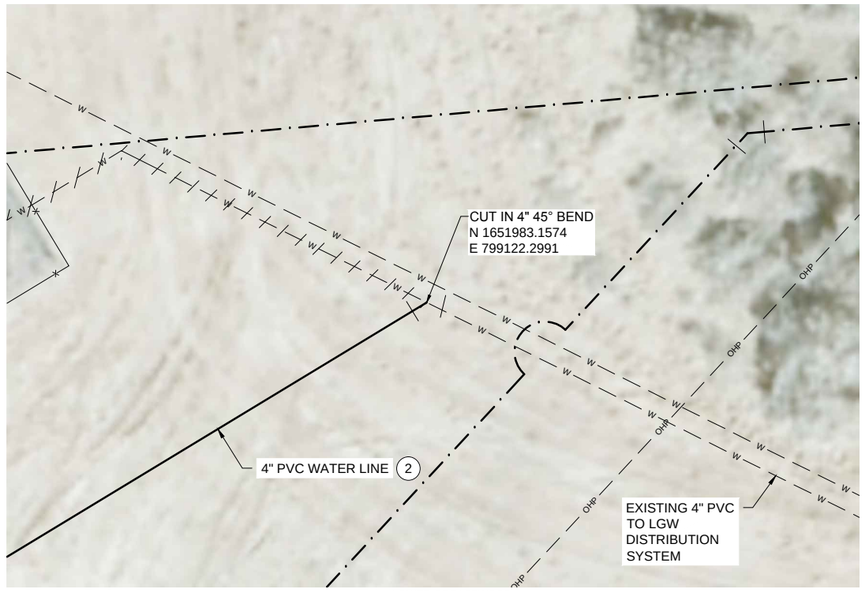
SCALE: 1" = 5'



LOWER GREASEWOOD
WTP PIPE CONNECTION

DETAIL B / C-102

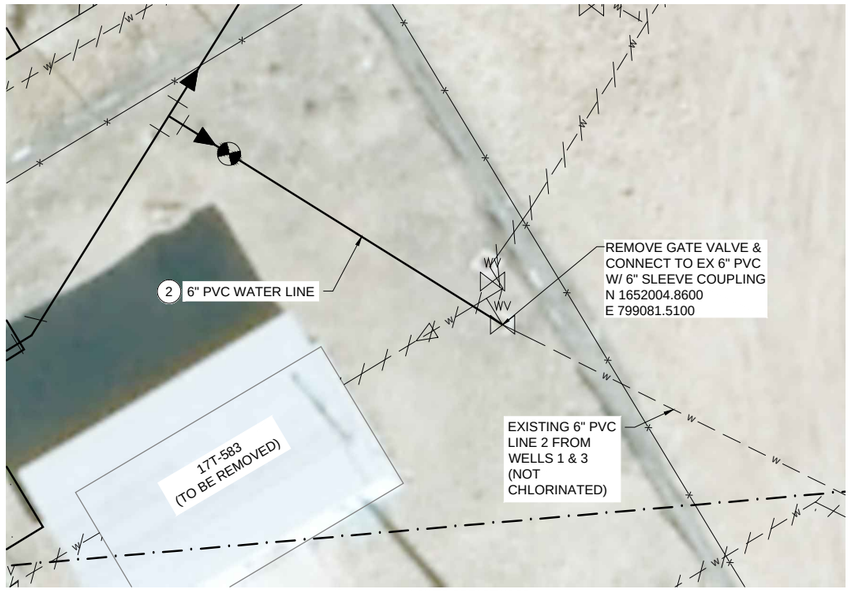
SCALE: 1" = 5'



LOWER GREASEWOOD
WTP PIPE CONNECTION

DETAIL C / C-102

SCALE: 1" = 5'



LOWER GREASEWOOD
WTP PIPE CONNECTION

DETAIL D / C-102

SCALE: 1" = 5'

GENERAL NOTES:

1. THE CONTRACTOR SHALL VERIFY THE LOCATION, ELEVATION, MATERIAL, DIMENSIONS AND CONDITION OF EXISTING WATER LINES PRIOR TO ORDERING PIPE, FITTINGS AND APPURTENANCES.

KEY NOTES:

(1) CONTRACTOR TO INSTALL GATE VALVE PER NTUA STANDARD DRAWING WS-14.

(2) CONTRACTOR TO PROVIDE THRUST RESTRAINT PER NTUA STANDARD DRAWING WS-19.

Call at least two full working days before you begin excavation.
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In Maricopa County: (602) 263-1100

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ PROJECT MANAGER DATE: 6/2/17

APPROVED: _____ BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: 1" =15'
DESIGNED: MK
DRAWN: DD
CHECKED: TR
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

54069 MICHAEL P. KOBE REGISTERED PROFESSIONAL ENGINEER Date Signed 6/2/2017 ARIZONA, U.S.A.
Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
CIVIL

PIPE CONNECTION DETAILS - 1

FILENAME 143956-C003.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER C-003
SHEET NUMBER 12 OF 78

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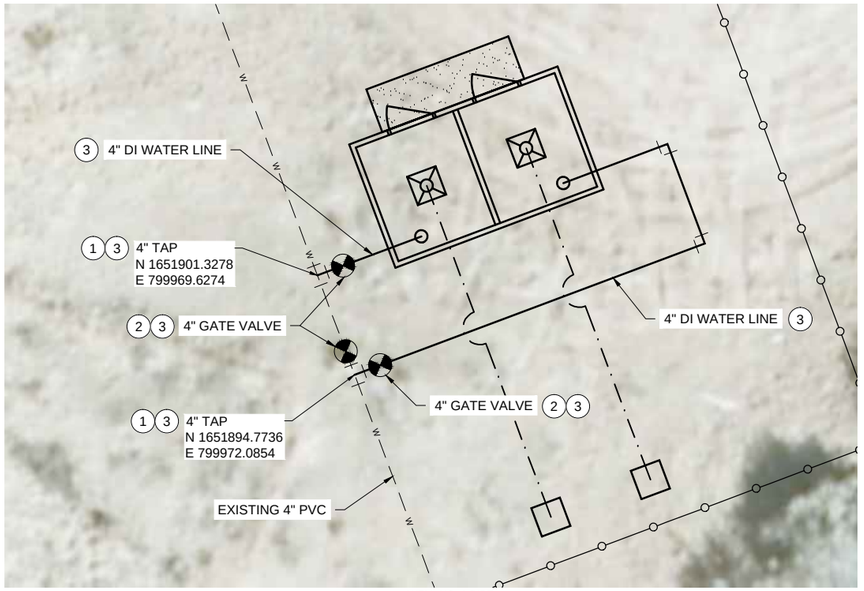
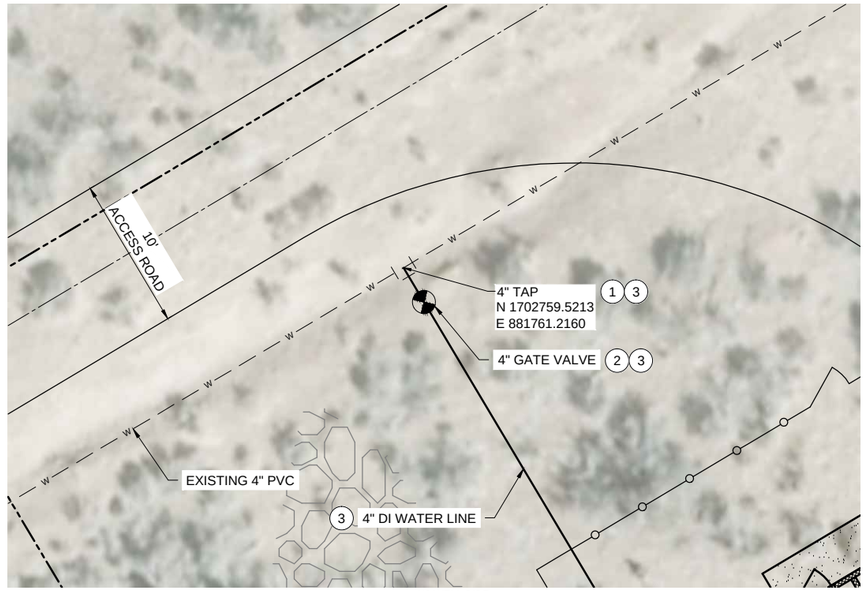


WELL NO. 1 PIPE CONNECTION

DETAIL A C-100

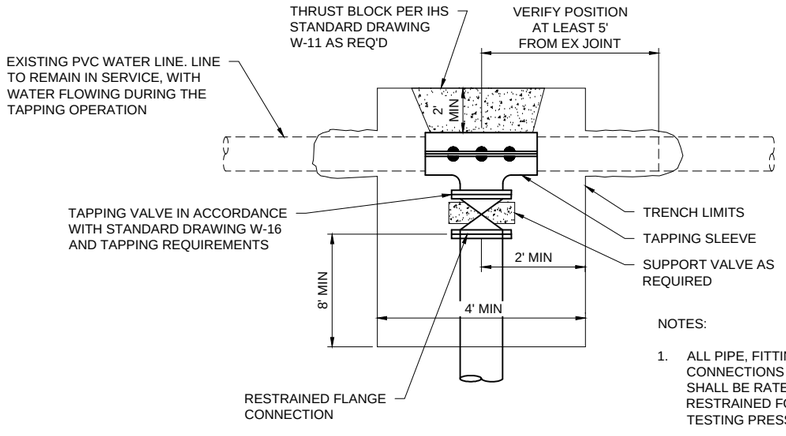
SCALE: 1" = 5'



N0 WELL PIPE CONNECTION

DETAIL B C-103

SCALE: 1" = 5'



TAP CONNECTION

DETAIL C -

SCALE: N.T.S.

NOTES:

1. ALL PIPE, FITTINGS, APPURTENANCES AND CONNECTIONS TO EXISTING PIPELINES SHALL BE RATED FOR AND FULLY RESTRAINED FOR THE OPERATING AND TESTING PRESSURES SPECIFIED.
2. TAPPING SLEEVES SHALL HAVE FULL CIRCUMFERENTIAL SEAL, ALL SST BODY AND MEET AWWA C223 REQUIREMENTS, FORD METER BOX, ROMAC OR EQUAL. PROVIDED TAPPING SLEEVE AND GASKET SHALL BE SUITABLE FOR USE WITH PVC PIPE MATERIAL AND DIMENSION BEING TAPPED (IE IPS PVC PER ASTM D2241, C900, ETC).
3. FULLY SUPPORT TAPPING MACHINE AND VALVE DURING AND AFTER TAPPING THE EXISTING PIPE.

GENERAL NOTES:

1. THE CONTRACTOR SHALL VERIFY THE LOCATION, ELEVATION, MATERIAL, DIMENSIONS AND CONDITION OF EXISTING WATER LINE PRIOR TO ORDERING PIPE, FITTINGS AND APPURTENANCES.
2. ALL SITE DI PIPING TO HAVE FULLY RESTRAINED JOINTS.

KEY NOTES:

1. CONSTRUCT CONNECTION TO EXISTING WATER LINE PER DETAIL C/C-004.
2. CONTRACTOR TO INSTALL GATE VALVE PER NTUA STANDARD DRAWING WS-14.
3. DUCTILE IRON PIPE (DI) AWWA C 151 RESTRAINED JOINT TR FLEX OR EQUAL IN A POLYETHELENE BAG. CONTRACTOR TO PROVIDE THRUST RESTRAINT PER NTUA STANDARD DRAWING WS-19.

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APPROVED: _____ BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: 1" =5'

DESIGNED: MK

DRAWN: DD

CHECKED: TR

APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

ARIZONA 54869 MICHAEL P. KOBE Date Signed 6/2/2017 REGISTERED PROFESSIONAL ENGINEER Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
CIVIL

PIPE CONNECTION DETAILS - 2

FILENAME 143956-C004.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER C-004
SHEET NUMBER 13 OF 78

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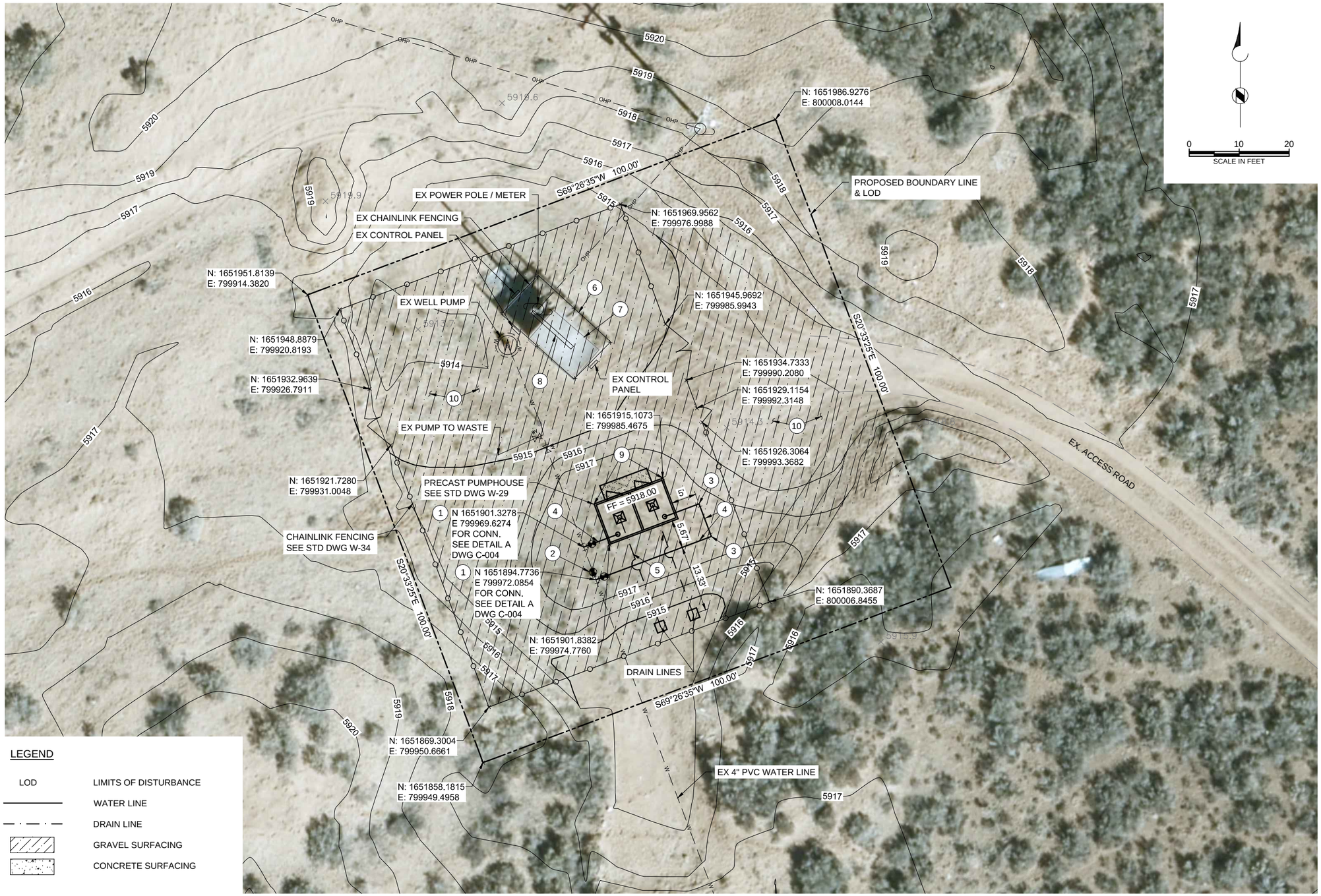

LEGEND

LOD	LIMITS OF DISTURBANCE
———	WATER LINE
— · — · —	DRAIN LINE
▨	GRAVEL SURFACING
▩	CONCRETE SURFACING

GENERAL NOTES:

1. SEE IHS STANDARD DRAWING W-23 FOR DI PIPE REQUIREMENTS.

KEY NOTES:

1. 4" TEE
2. 4 GATE VALVE
3. 4" 90° BEND
4. 4" DIA DI PIPE
5. 2" DIA PIPE, SEE IHS STD DWG W-23
6. DEMO EXISTING FENCING
7. DEMO EXISTING SHADE STRUCTURE
8. SALVAGE EXISTING TELEMETRY PLC
9. FINISHED GRADE = 5917.50, TYP AROUND PUMPHOUSE
10. GRAVEL SURFACE W/ GEOTEXILE, SEE DETAIL F/C-002

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SUBMITTED: _____ PROJECT MANAGER DATE: 6/2/17
APPROVED: _____ BROWN AND CALDWELL DATE: 6/2/17

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SCALE: 1" = 10'
DESIGNED: MK
DRAWN: DD
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APPROVED: MK

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REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
CIVIL

LOWER GREASEWOOD WELL 1 SITE PLAN

FILENAME 143956-C-100.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER C-100
SHEET NUMBER 14 OF 78

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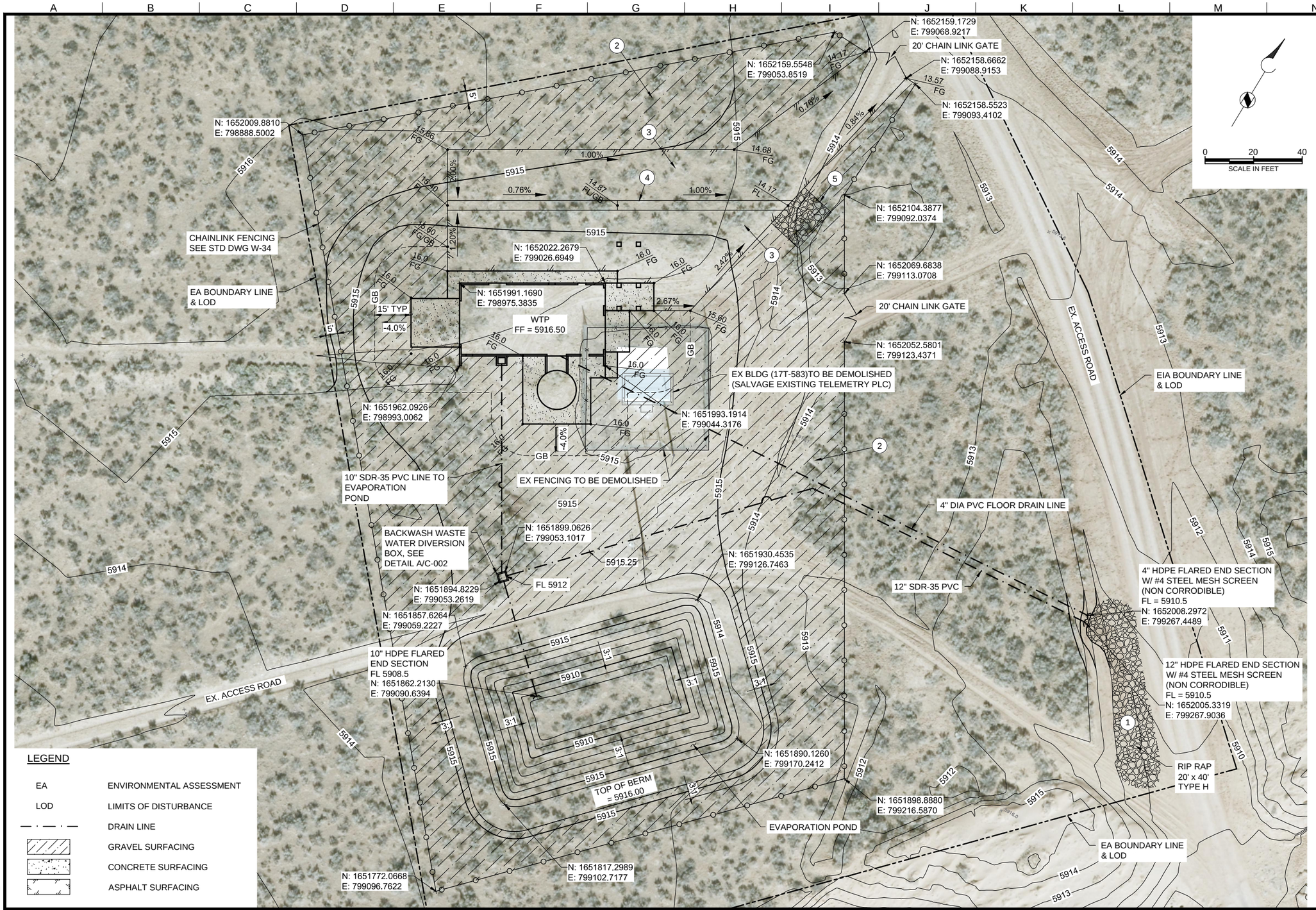


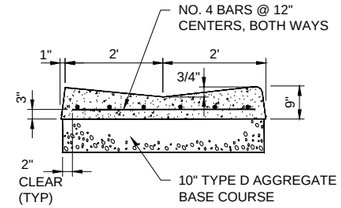
LEGEND

EA	ENVIRONMENTAL ASSESSMENT
LOD	LIMITS OF DISTURBANCE
— · — · —	DRAIN LINE
	GRAVEL SURFACING
	CONCRETE SURFACING
	ASPHALT SURFACING

GENERAL NOTES:

KEY NOTES:

1. 12" OF RIP RAP (TYPE H) WITH 6" OF ROAD BASE (TYPE A) BENEATH. SEPARATE ROAD BASE AND NATIVE SOILS WITH GEOTEXTILE.
2. GRAVEL SURFACE W/ GEOTEXILE, SEE DETAIL F/C-002.
3. ASPHALT SURFACE W/ GEOTEXILE, SEE DETAIL E/C-002.
4. 4' CONCRETE CROSS GUTTER, SEE DETAIL A THIS SHEET.
5. 15'x20' RIP RAP PAD, RIP RAP D_{50} = 8"



CROSS GUTTER

DETAIL A

NOT TO SCALE

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SUBMITTED: _____ DATE: 6/2/17 (PROJECT MANAGER)

APPROVED: _____ DATE: 6/2/17 (BROWN AND CALDWELL)

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SCALE: 1 ' =20'

DESIGNED: MK
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MICHAEL P.
KOBE
Date Signed 6/2/2017
ARIZONA, U.S.A.
Expires 12/31/18

REVISIONS

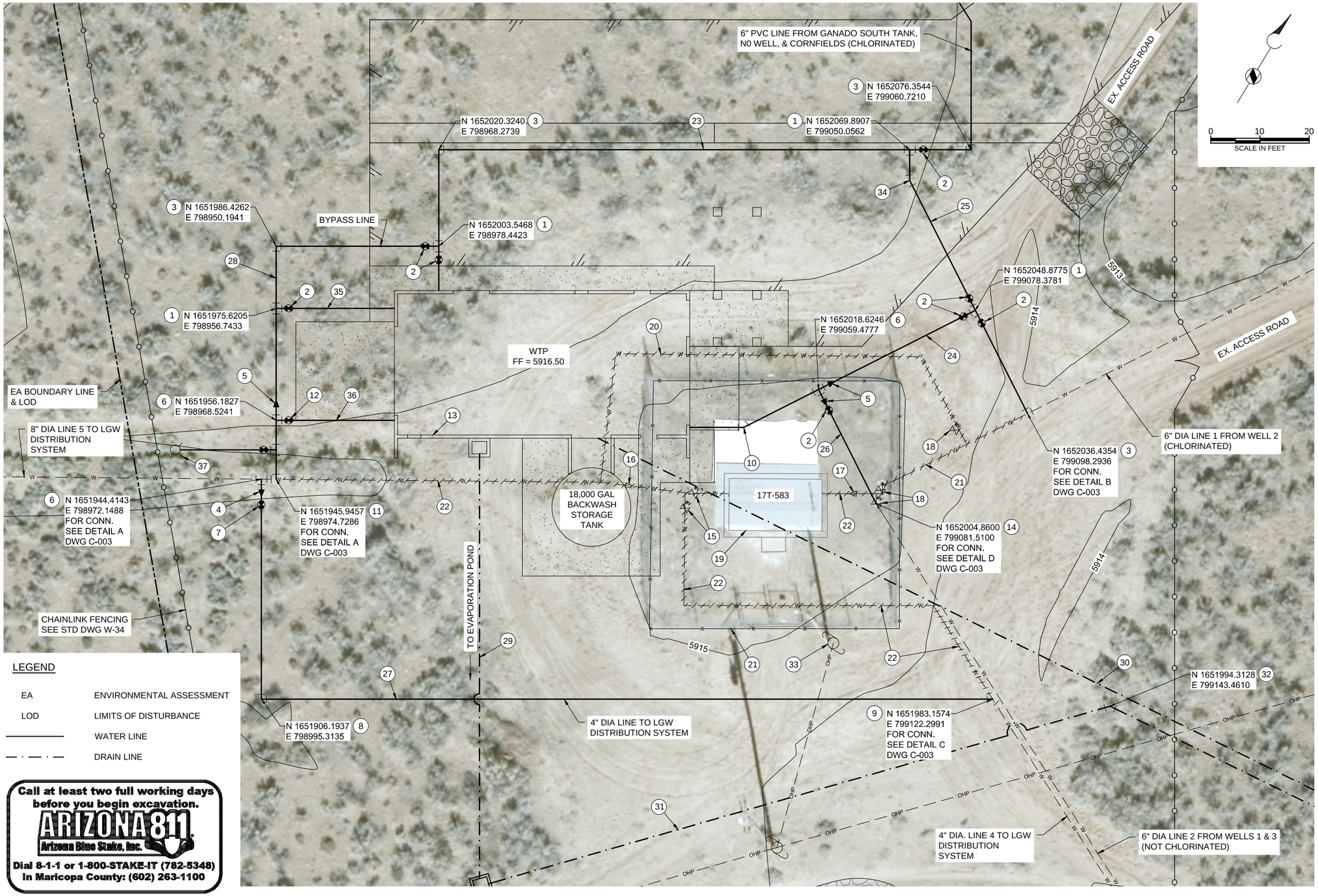
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
CIVIL

LOWER GREASEWOOD WTP GRADING PLAN

FILENAME: 143956-C-101.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: C-101
SHEET NUMBER: 15 OF 78

Path: P:\Projects\navajo Nation\143956_lowergreasewoodesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Civil Filename: 143956-C-101.dwg Plot Date: June 22, 2017 - 7:22 AM CADD User: David Davidse



LEGEND

EA	ENVIRONMENTAL ASSESSMENT
LOD	LIMITS OF DISTURBANCE
———	WATER LINE
— · — · —	DRAIN LINE

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GENERAL NOTES:

1. THE CONTRACTOR SHALL VERIFY THE LOCATION, ELEVATION, MATERIAL, DIMENSIONS AND CONDITION OF EXISTING WATER LINES PRIOR TO ORDERING PIPE, FITTINGS AND APPURTENANCES.
2. CONTRACTOR TO INSTALL GATE VALVES PER NTUA STANDARD DRAWING WS-14.
3. CONTRACTOR TO PROVIDE THRUST RESTRAINTS PER NTUA STANDARD DRAWING WS-19.

KEY NOTES:

1. 6" TEE
2. 6 GATE VALVE
3. 6" 90° BEND
4. 4" x 8" REDUCER
5. 6" x 8" REDUCER
6. 8" TEE
7. 4" GATE VALVE
8. 4" 90° BEND
9. 4" 45° BEND
10. 8" 45° BEND
11. 8" 90° BEND
12. 8" GATE VALVE
13. WTP BUILDING (30'x60' FOOTPRINT)
14. 6" MJ SLEEVE
15. DEMO EX 4" GATE VALVE
16. DEMO EX 4" x 8" REDUCER
17. DEMO EX 4" x 6" REDUCER
18. DEMO EX 6" GATE VALVE
19. DEMO EX CL FACILITY (17T-583)
20. DEMO EX 6" BYPASS LINE
21. DEMO EX PERIMETER FENCING
22. DEMO EX PIPING
23. 6" DIA PVC, SEE PROFILE 1 DWG C-104
24. 6" DIA PVC, SEE PROFILE 4 DWG C-105
25. 6" - 8" DIA PVC, SEE PROFILE 5 DWG C-105
26. 6" DIA PVC, SEE PROFILE 6 DWG C-105
27. 4" DIA PVC, SEE PROFILE 3 DWG C-104
28. 6" - 8" DIA PVC, SEE PROFILE 2 DWG C-104
29. 10" DIA SDR 35 PVC, SEE PROFILE 9 DWG C-106
30. 4" DIA PVC FLOOR DRAIN LINE, SEE PROFILE 11 DWG C-106
31. 12" DIA SDR-35 PVC, SEE PROFILE 10 DWG C-106
32. 12" 45° BEND
33. DEMO POWER POLE
34. 6" 22.5° BEND
35. 6" PVC, SEE PROFILE 7 DWG C-105
36. 8" PVC, SEE PROFILE 8 DWG C-105
37. FIRE HYDRANT, APWA PLAN 511

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APPROVED: MK

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REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
CIVIL

LOWER GREASEWOOD WTP PIPING PLAN

FILENAME 143956-C-102.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER C-102
SHEET NUMBER 16 OF 78

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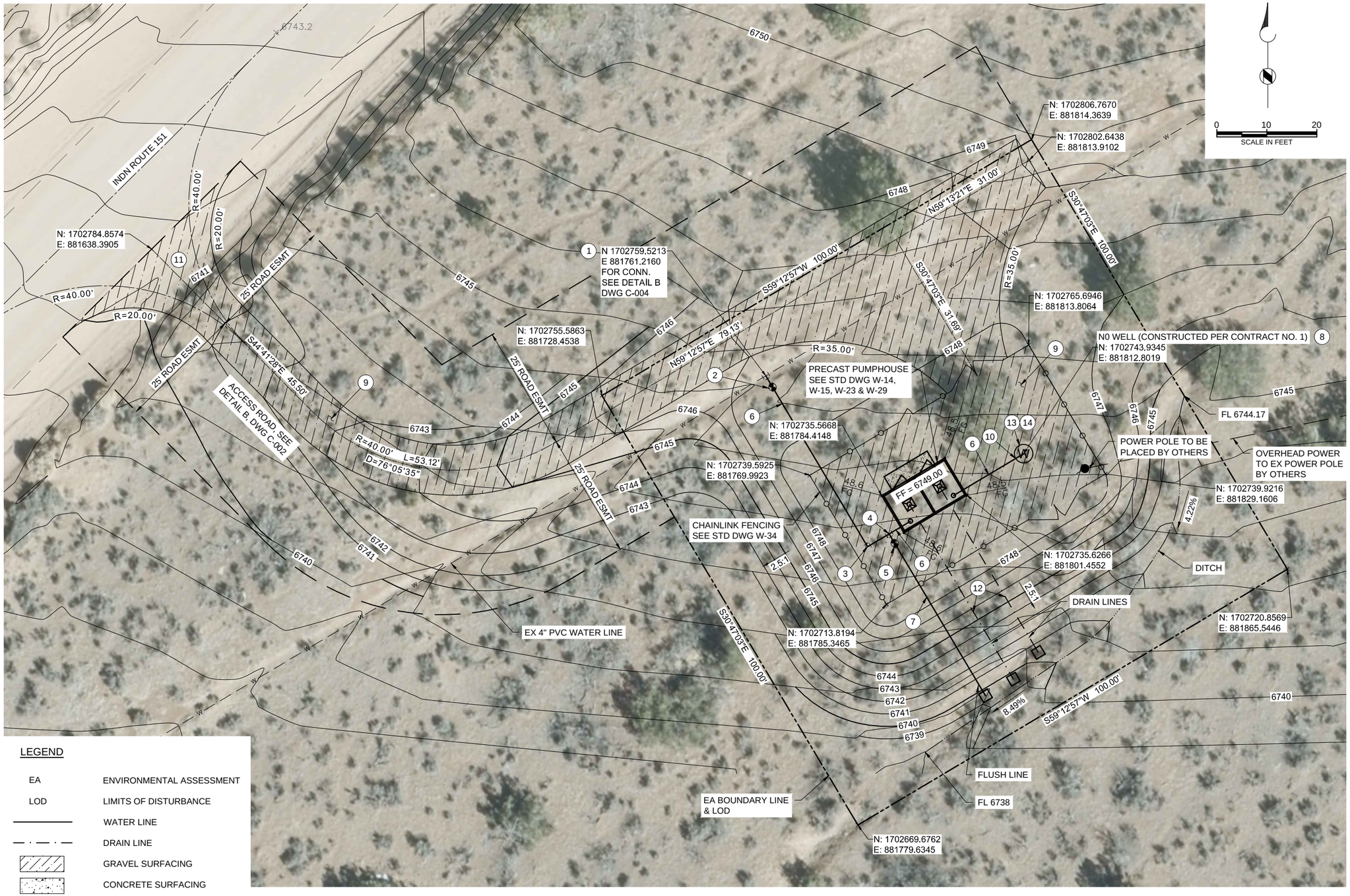

GENERAL NOTES:

1. SEE IHS STANDARD DRAWING W-23 FOR DI PIPE REQUIREMENTS.

KEY NOTES:

1. 4" TAP
2. 4 GATE VALVE
3. 4" 90° BEND
4. 4"x 2" TEE
5. 2" GATE VALVE
6. 4" DIA DI PIPE
7. 2" DIA DI PIPE
8. CONTRACTOR TO VERIFY AS-BUILT LOCATION AND COORDINATE WITH ENGINEER FOR FINAL SITE LAYOUT
9. GRAVEL SURFACE W/ GEOTEXILE, SEE DETAIL F/C-002.
10. PROVIDE FLEXIBLE SLEEVE JOINT OUTSIDE OF WELL SURFACE CASING PER GENERAL SITE PIPING NOTE 3 ON C-001.
11. SWALE TO MAINTAIN EXISTING DRAINAGE.
12. 2" DIA PIPE, SEE IHS STD DWG W-23.
13. INSTALL PITLESS ADAPTER. SEE IHS STD DWG W-30 AS MODIFIED.
14. INSTALL SUBMERSIBLE PUMP AND MOTOR.

LEGEND

EA	ENVIRONMENTAL ASSESSMENT
LOD	LIMITS OF DISTURBANCE
———	WATER LINE
— · — · —	DRAIN LINE
	GRAVEL SURFACING
	CONCRETE SURFACING

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APPROVED: MK

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STATE OF ARIZONA 54089 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
CIVIL

GANADO N0 WELL SITE PLAN

FILENAME 143956-C-103.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER C-103
SHEET NUMBER 17 OF 78

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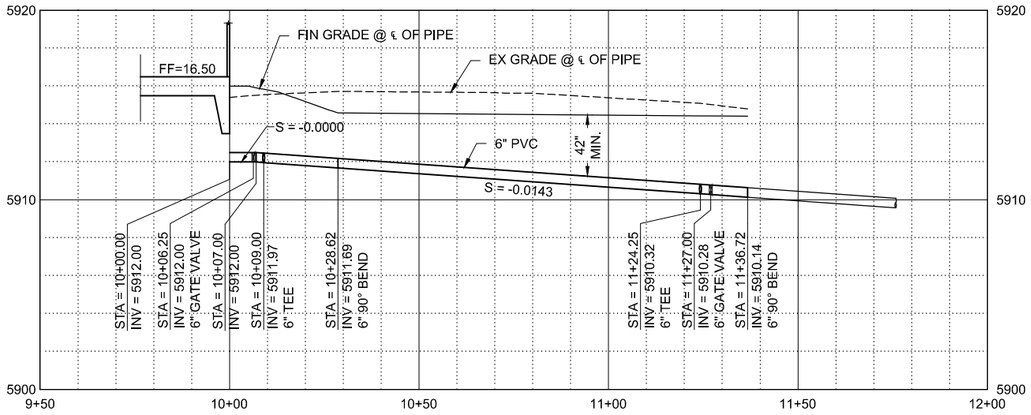
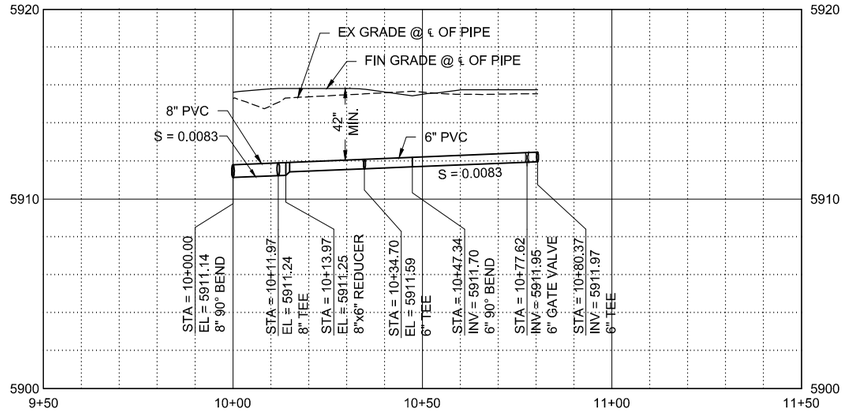
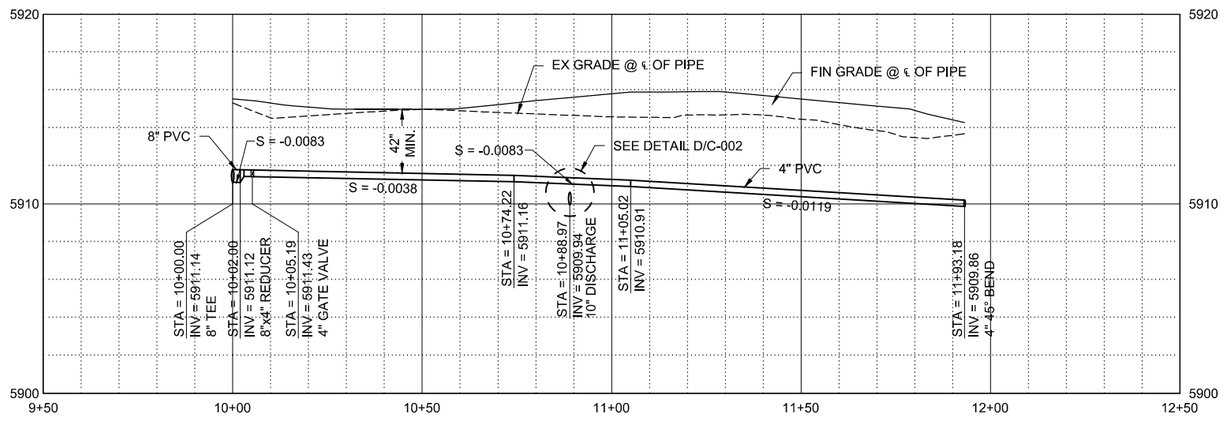


PROFILE - 1
SCALE H: 1" = 20'
V: 1" = 4'



PROFILE - 2
SCALE H: 1" = 20'
V: 1" = 4'



PROFILE - 3
SCALE H: 1" = 20'
V: 1" = 4'

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(PROJECT MANAGER)
APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: AS SHOWN
DESIGNED: MK
DRAWN: DD
CHECKED: TR
APPROVED: MK

EXTERNAL REFERENCE FILES

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MICHAEL P. KOBE
Date Signed 6/2/2017
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REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
CIVIL

LOWER GREASEWOOD WTP
PIPING PROFILES - 1

FILENAME 143956-C-104.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER C-104
SHEET NUMBER 18 OF 78

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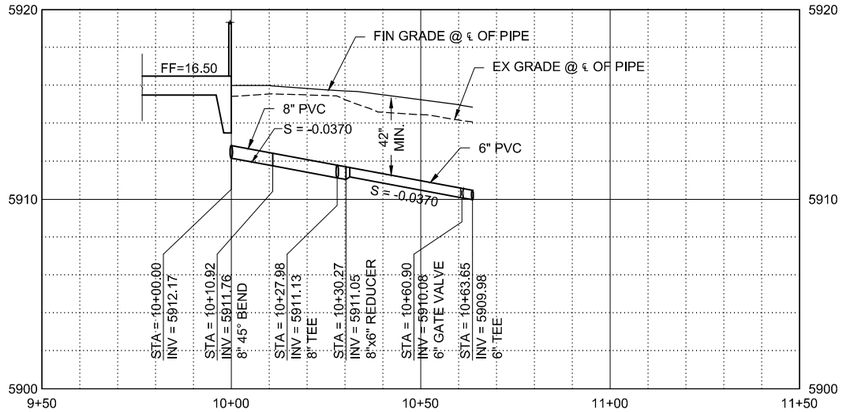
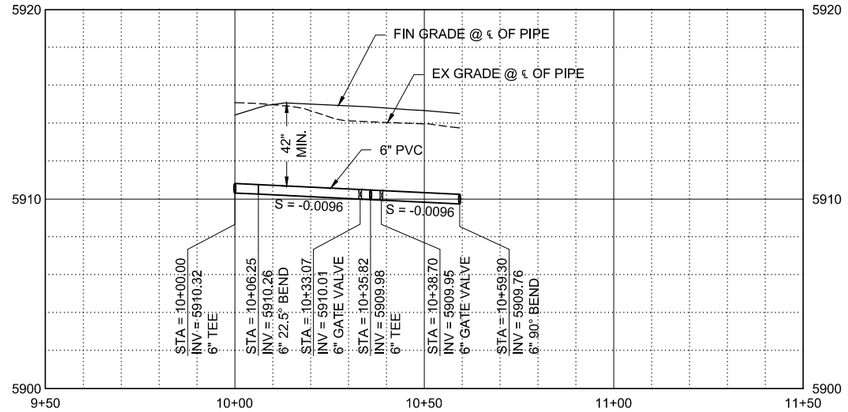
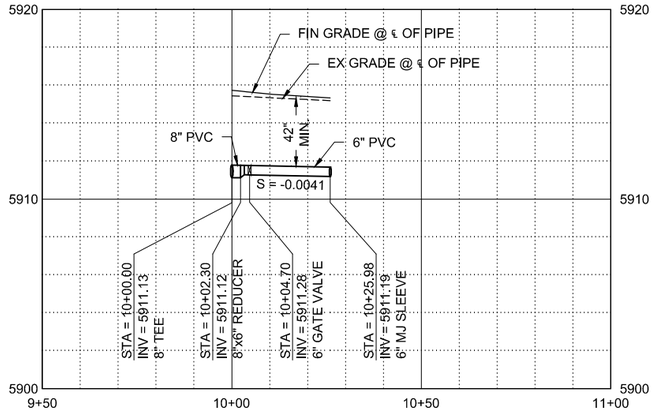


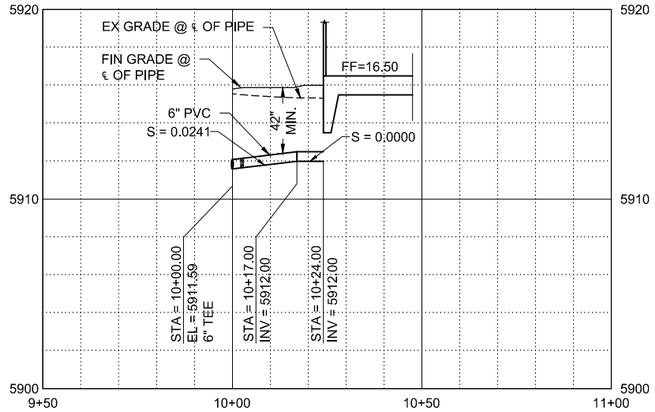
PROFILE - 4
SCALE H: 1" = 20'
V: 1" = 4'



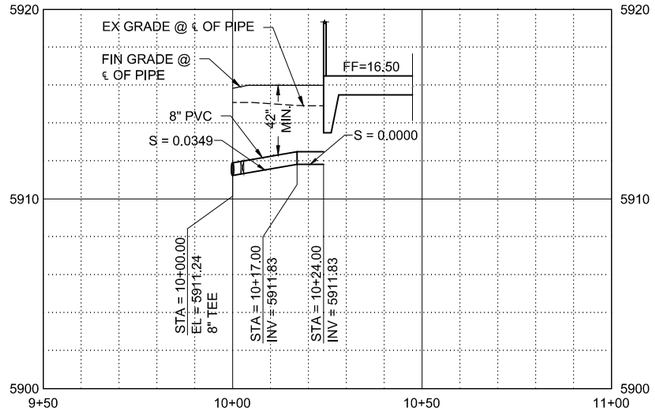
PROFILE - 5
SCALE H: 1" = 20'
V: 1" = 4'



PROFILE - 6
SCALE H: 1" = 20'
V: 1" = 4'



PROFILE - 7
SCALE H: 1" = 20'
V: 1" = 4'



PROFILE - 8
SCALE H: 1" = 20'
V: 1" = 4'

Call at least two full working days before you begin excavation.
ARIZONA 811
Arizona Blue Stake, Inc.
Dial 8-1-1 or 1-800-STAKE-IT (782-5348)
In Maricopa County: (602) 263-1100

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SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17
PROJECT MANAGER
APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: AS SHOWN
DESIGNED: MK
DRAWN: DD
CHECKED: TR
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED PROFESSIONAL ENGINEER
54069
MICHAEL P. KOBE
Date Signed 6/2/2017
ARIZONA, U.S.A.
Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

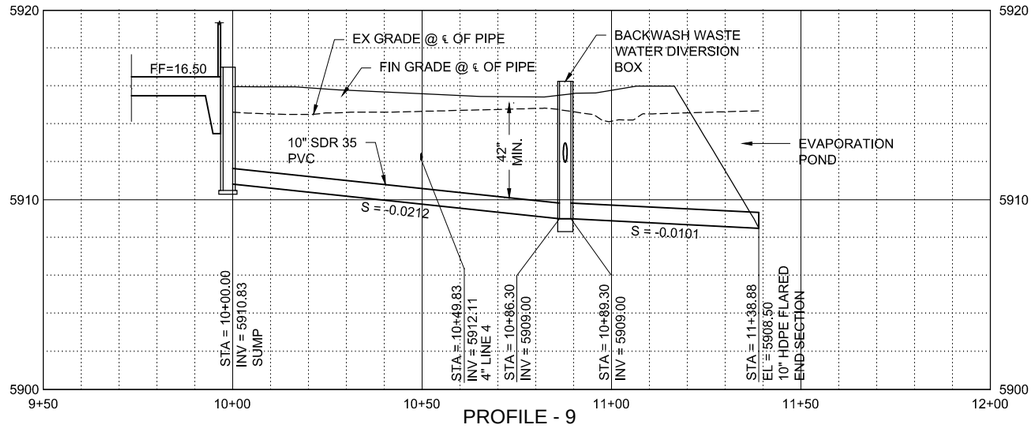
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
CIVIL

LOWER GREASEWOOD WTP
PIPING PROFILES - 2

FILENAME: 143956-C-105.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: C-105
SHEET NUMBER: 19 OF 78

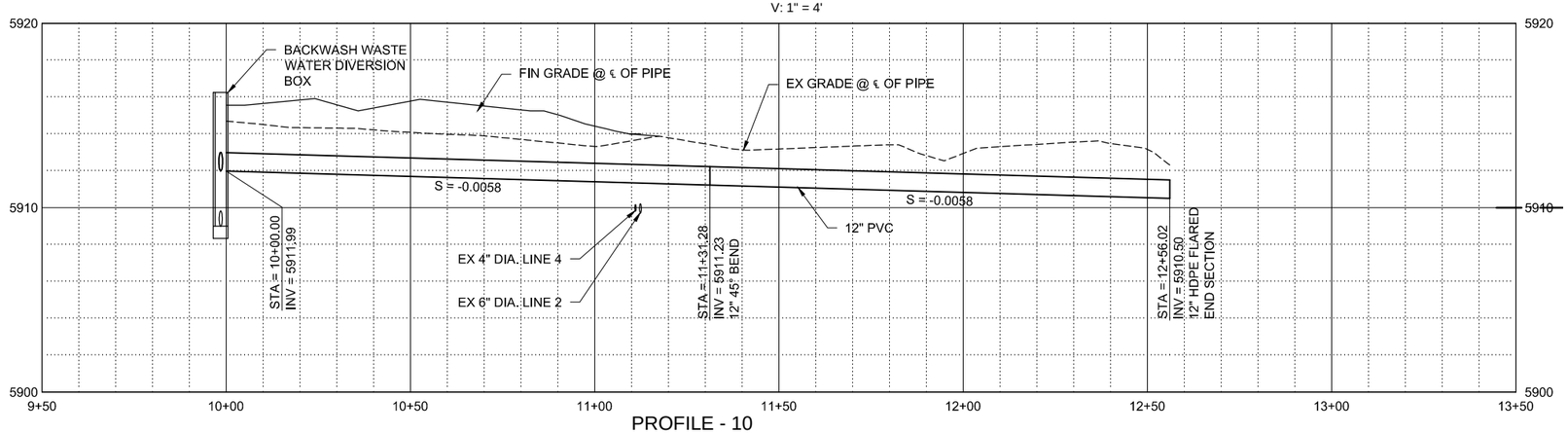
ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CADcontract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Civil Filename: 143956-C-105.dwg Plot Date: June 12, 2017 - 3:12 PM CADD User: David Davidse



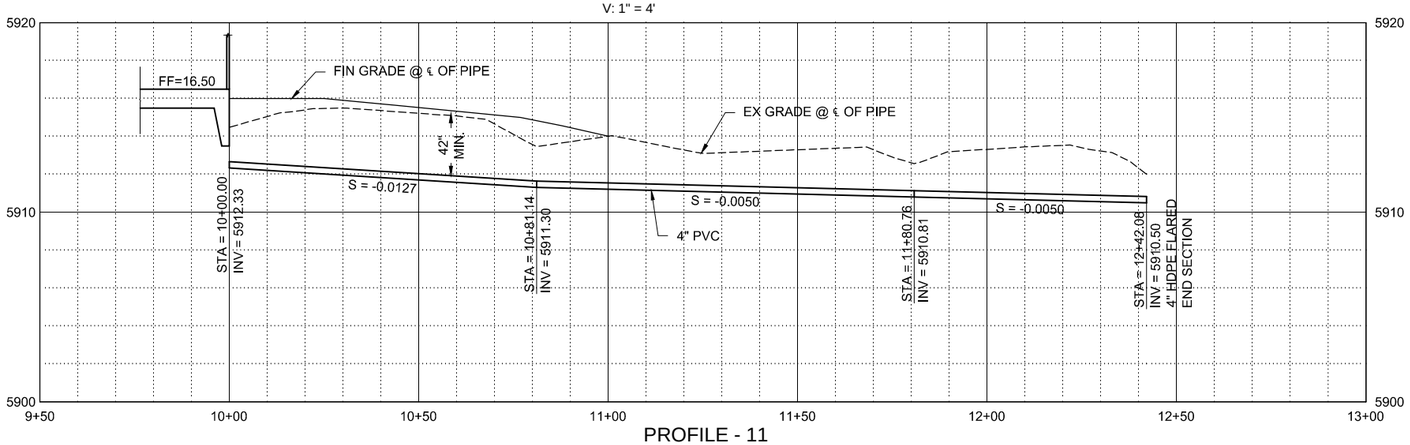
PROFILE - 9

SCALE H: 1" = 20'
V: 1" = 4'



PROFILE - 10

SCALE H: 1" = 20'
V: 1" = 4'



PROFILE - 11

SCALE H: 1" = 20'
V: 1" = 4'

Call at least two full working days before you begin excavation.
ARIZONA 811
Arizona Blue Stake, Inc.
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SALT LAKE CITY, UTAH

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APPROVED: _____ DATE: 6/2/17 (BROWN AND CALDWELL)

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: AS SHOWN
DESIGNED: MK
DRAWN: DD
CHECKED: TR
APPROVED: MK

EXTERNAL REFERENCE FILES

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54069 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
CIVIL

LOWER GREASEWOOD WTP
PIPING PROFILES - 3

FILENAME 143956-C-106.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER C-106
SHEET NUMBER 20 OF 78

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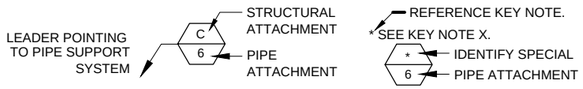
GENERAL NOTES:

1. WHERE NO REFERENCE TO PIPE SUPPORT SYSTEMS IS GIVEN ON THE DRAWINGS, THE CONTRACTOR SHALL USE AN APPROPRIATE SYSTEM AS SPECIFIED IN TABLE B, THIS DRAWING. WHERE THE COMPONENTS THAT MAKE UP THESE STANDARDS ARE NOT APPROPRIATE OR SUITABLE FOR CONDITIONS, OTHER STANDARD MANUFAC- TURED COMPONENTS OR ENGINEERED, FABRICATED COMPONENTS MAY BE SUBMITTED FOR REVIEW.

2. PIPE SUPPORT SYSTEMS WHERE SHOWN, ARE IDENTIFIED ON THE DRAWINGS AS FOLLOWS:



WHEN EITHER THE STRUCTURAL ATTACHMENT OR THE PIPE ATTACHMENT ARE NON-STANDARD OR SPECIALS, PLACE AN ASTERISK IN THE APPROPRIATE PLACE IN THE SYMBOL. EITHER ABOVE OR BELOW THE SYMBOL, PLACE A MATCHING ASTERISK AND CALLOUT REFERENCING A KEYNOTE THAT DESCRIBES THE NON-STANDARD OR SPECIAL COMPONENT. SEE EXAMPLE ABOVE.

3. FOR EXISTING CONCRETE, NEW PRECAST CONCRETE, OR NEW CONCRETE MASONRY UNITS, USE SURFACE MOUNT CHANNEL, UNISTRUT P-1000, SUPER STRUT A-1200, ELCEN 600 OR EQUAL. FOR ALL CAST-IN-PLACE CONCRETE PLACED UNDER THIS CONTRACT, USE EMBEDDED CONCRETE INSERT CHANNEL, UNISTRUT P-3200 SERIES WITH END CAPS, OR EQUAL, AND DELETE THE SURFACE MOUNT ANCHOR BOLTS.

4. HANGER BRACKETS AND SUPPORT COMPONENTS MAY BE INTERCHANGED WHERE COMPATIBLE AND APPROPRIATE.

5. UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL NOT USE EPOXY ADHESIVE AB'S OR EXPANSION ANCHORS WITHOUT THE PRIOR WRITTEN APPROVAL OF THE ENGINEER.

6. WHEN SUPPORTING PIPING THAT REQUIRES HORIZONTAL FLEXIBILITY NORMAL TO A STEEL BEAM'S AXIS, USE STRUCTURAL ATTACHMENTS C, D AND F AS SHOWN ON DRAWING M30003. TYPE F SHALL BE USED FOR PARALLEL FLEXIBILITY.

7. THE MATERIAL PRESENTED ON THIS DRAWING IS FOR REFERENCE USE. SOME OF THE DETAILS OR INFORMATION PRESENTED ON THIS DRAWING MAY NOT BE REQUIRED AS PART OF THIS CONTRACT.

8. ALL PIPING SUPPORTED BY HANGERS AND/OR VERTICAL ATTACHMENTS SHALL BE BRACED AGAINST HORIZONTAL, VERTICAL AXIAL, AND LONGITUDINAL SWAY. BRACING SHALL BE CALCULATED TO RESIST SEISMIC LOADINGS AS SPECIFIED BY SMACNA AND AS INDICATED IN THE SPECIFICATIONS.

TABLE A - SUPPORT SPACING AND ALLOWABLE ROD LOADS

NOMINAL PIPE SIZE (INCHES)	SUPPORT ROD SIZE AND MAXIMUM LOAD PER ROD - SEE NOTES 1 AND 2		MAXIMUM SUPPORT SPACING (FEET)			
	ROD SIZE (INCHES)	MAX LOAD (POUNDS)	STEEL	COPPER	PLASTIC SEE NOTE 4	CAST IRON SEE NOTE 5
3/8 TO 3/4	3/8	610	5	5	CONTINUOUS	- - -
1	3/8	610	5	5	5	- - -
1-1/4	3/8	610	5	5	5	- - -
1-1/2	3/8	610	5	5	5	- - -
2	3/8	610	10	5	5	12 FEET FOR PRESSURE PIPE 10 FEET FOR SOIL PIPE
2-1/2	3/8	610	10	10	5	
3	3/8	610	10	20	5	
4	1/2	1130	10	20	5	
6	5/8	1810	15	20	5	
8	3/4	2710	15	20	5	
10	3/4	2710	20	- - -	5	
12	1	4960	20	- - -	10	

TABLE A NOTES:

1. DESIGN WEIGHT SHALL BE TWICE THE WEIGHT OF THE PIPE FULL OF WATER PLUS THE WEIGHTS OF VALVES, FITTINGS, INSULATING MATERIALS AND SUSPENDED HANGER COMPONENTS ON THE RUN OF PIPE BEING SUPPORTED.
2. ROD SIZES SHOWN ARE FOR THE SUPPORT OF A SINGLE PIPE. WHEN SUPPORTING MORE THAN ONE PIPE, ROD SHALL BE SIZED USING DESIGN WEIGHTS (SEE NOTE 1) TO DETERMINE THE TOTAL DESIGN LOAD. THE TOTAL DESIGN LOAD SHALL NOT EXCEED THE MAXIMUM LOADS IN THE TABLE ABOVE.
3. PIPE SHALL NOT HAVE POCKETS FORMED IN THE SPAN DUE TO SAGGING OF THE PIPE BETWEEN SUPPORTS CAUSED BY THE WEIGHT OF THE PIPE, MEDIUM IN THE PIPE, INSULATION, VALVES AND FITTINGS.
4. SPAN SHOWN IS FOR SCHEDULE 80 PVC PIPE AT 100°F. SPANS FOR OTHER PLASTICS, OTHER PVC PIPE SCHEDULES AND PIPES AT HIGHER TEMPERATURES SHALL BE SHORT- ENED IN ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS. ``CONTINUOUS" MEANS PIPE SHALL BE IN UNISTRUT OR SIMILAR CHANNEL.
5. PROVIDE A MINIMUM OF ONE HANGER PER PIPE LENGTH, WITHIN 4-INCHES OF THE BELL.
6. PIPE HANGER AND SUPPORT SELECTION SHALL BE IN ACCORDANCE WITH TABLE B (M-001) AND SPECIFICATION SECTION 15096.

SUPPORT SPACING AND ROD LOADS TABLE A
DETAIL (M2301)
NO SCALE

TABLE B HANGER AND SUPPORT SELECTIONS

SYSTEM TEMP RANGE DEG F	INSULATION NOTE 1	PIPE ATTACHMENTS									BUILDING STRUCTURAL ATTACHMENTS			
		HORIZONTAL								VERTICAL	STEEL AND/OR MALL. IRON			
		STEEL STRAPS	STEEL BANDS	STEEL CLAMPS	CAST IRON HANGING ROLLS	CAST IRON SUPPORTING ROLLS	STEEL TRAPEZES AND RACKS	THERMAL HANGER SHIELDS	STEEL OR CAST IRON STANCHIONS	STEEL RISER CLAMPS	INSERTS	BEAM CLAMPS	WELDED AND BOLTED ATTACHMENTS	BRACKETS
HOT A-1 120 TO 450	COVERED	13	1, 2	3	4, 5	8	20, 21	SEE SPEC	10	11, 12	A	C, D	F, J, M	B, G, H, K, L
	BARE	6, 7 13	1, 2	3	4, 5	8	20, 21	NONE	10					
HOT A-2 451 TO 750	COVERED	13	1	3	4, 5	8	20, 21	SEE SPEC	10	11, 12	A	C, D	F, J, M	B, G, H, K, L
	BARE	NONE	NONE	3	NONE	NONE	20, 21	NONE	NONE					
HOT A-3 OVER 750	COVERED	13	1	3 (ALLOY)	4, 5	8	20, 21	SEE SPEC	10	11, 12	NONE	C, D	F, J, M	B, G, H, K, L
	BARE	13	NONE	3 (ALLOY)	NONE	NONE	20, 21	NONE	NONE					
AMBIENT B 60 TO 119	COVERED	13	1, 2	3	4, 5	8	20, 21	SEE SPEC	9,10	11, 12	A	C, D	F, J, M	B, G, H, K, L
	BARE	6, 7 13	1, 2	3	4, 5	8	20, 21	NONE	9,10					
COLD C-1 33 TO 59	COVERED	13	1, 2, 3	3	4, 5	8	20, 21	SEE SPEC	10	11, 12	A	C, D	F, J, M	B, G, H, K, L
	BARE	6, 7 13	1, 2, 3	3	4, 5	8	20, 21	NONE	10					
COLD C-2 -2 TO 32	COVERED	13	1, 2, 3	3	4, 5	8	20, 21	SEE SPEC	10	11, 12	A	C, D	F, J, M	B, G, H, K, L
	BARE	NONE	1, 2, 3	3	4, 5	8	20, 21	NONE	10					

TABLE B NOTES:

1. HANGERS ON INSULATED SYSTEMS SHALL INCORPORATE THERMAL HANGER SHIELDS.
2. HANGER AND SUPPORT SPACING SHALL BE IN ACCORDANCE WITH TABLE A (M2301).

HANGER AND SUPPORT SELECTION TABLE B
DETAIL (M2302)
NO SCALE

TABLE C
SEISMIC RESTRAINT SPACING

NOM. PIPE SIZE	MAXIMUM SPAN BETWEEN BRACES		BRACE TYPE	MAXIMUM BRACE LENGTH
	LATERAL BRACE (FEET)	LONGITUDINAL BRACE (FEET)		
2	40	80	A1	9'-4"
2-1/2	40	80	A1	9'-4"
3	40	80	A1	9'-4"
4	40	80	A1	9'-4"
6	40	80	A1	9'-4"
8	40	40	A1	9'-4"
10	40	40	A1	9'-4"
12	40	40	A2	10'-0"

(S) - STANDARD WALL

SEISMIC RESTRAINT SPACING TABLE C
DETAIL (M2303)
NO SCALE

PIPE HANGER NOTES:

1. SEE DRAWING M-001 FOR GENERAL PIPE HANGER AND SUPPORT SYSTEM NOTES.
2. FOR USE WITH COPPER PIPE (TYPES 1, 2, 6, 7, AND 12), PROVIDE PLASTIC COATED VERSION OF HANGER COMPONENT. FOR OTHER SUPPORTS USED WITH COPPER PIPE, PROVIDE A FULL 360° WRAP OF 1/16 INCH THICK NEOPRENE BONDED TO PIPE WITH A COMPATIBLE WATERPROOF ADHESIVE.
3. THE MATERIAL PRESENTED ON THIS DRAWING IS FOR REFERENCE USE. SOME OF THE DETAILS OR INFORMATION PRESENTED ON THIS DRAWING MAY NOT BE REQUIRED AS PART OF THIS CONTRACT.

TABLE D PIPE STANCHION DIAMETER (SCHEDULE 40)

PIPE SIZE (INCHES)	NOMINAL PIPE STANCHION DIA. (INCHES)	NOMINAL ELBOW OR TEE SIZE (INCHES)	NOMINAL PIPE STANCHION DIA. (INCHES)
2	1-1/2	12	6
2-1/2	1-1/2	14	6
3	2	16	6
4	3	18	8
6	3	20	8
8	4	24	8
10	4	30	10
-	-	36	12

Brown AND Caldwell
SALT LAKE CITY, UTAH

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APPROVED: _____ BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: NONE
DESIGNED: BM
DRAWN: DRP
CHECKED: BP
APPROVED: MK

EXTERNAL REFERENCE FILES

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54069 MICHAEL P. KOBE REGISTERED PROFESSIONAL ENGINEER Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.

GREAT SEAL OF THE NAVAJO NATION

NAVAJO TRIBAL UTILITY AUTHORITY — NTUA — UTILITIES FOR THE NAVAJO NATION

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
MECHANICAL

PIPE SUPPORT GENERAL NOTES AND TABLES

FILENAME 143956-M-001.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER M-001
SHEET NUMBER 21 OF 78

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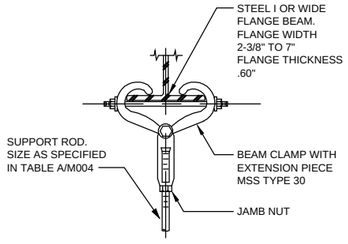
Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CADcontract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse\2-Sheets\Mechanical Filename: 143956-M-001.dwg Plot Date: June 12, 2017 - 3:13 PM CADD User: David Davidse

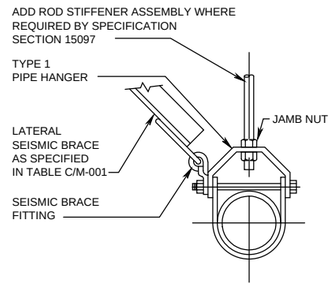


MAXIMUM ALLOWABLE LOAD:

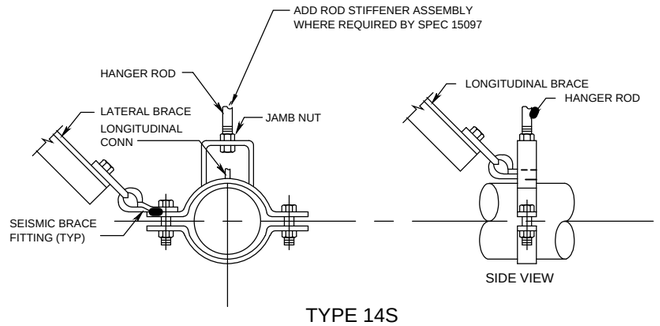
ROD SIZE	LOAD
3/8"	610 LBS
1/2"	1130 LBS
5/8" - 7/8"	1365 LBS

SPACING SHALL BE AS REQUIRED BUT SHALL NOT EXCEED THOSE SPANS SHOWN IN TABLE A/M-001

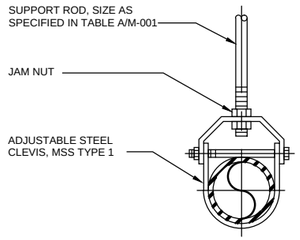
TYPE C
STRUCTURAL ATTACHMENT



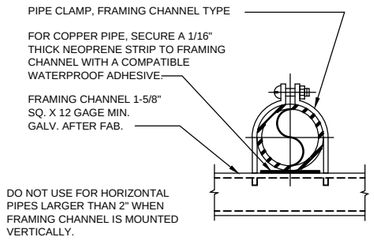
TYPE 1S
PIPE RESTRAINT ATTACHMENT



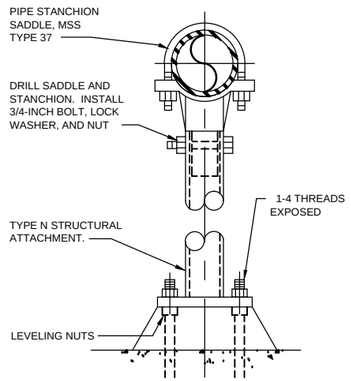
TYPE 14S
PIPE RESTRAINT ATTACHMENT
3/4" THROUGH 8"



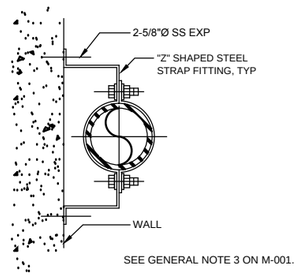
TYPE 1 PIPE HANGER
1/2" THROUGH 12" PIPE



TYPE 6 PIPE HANGER
3/8" THROUGH 8" PIPE



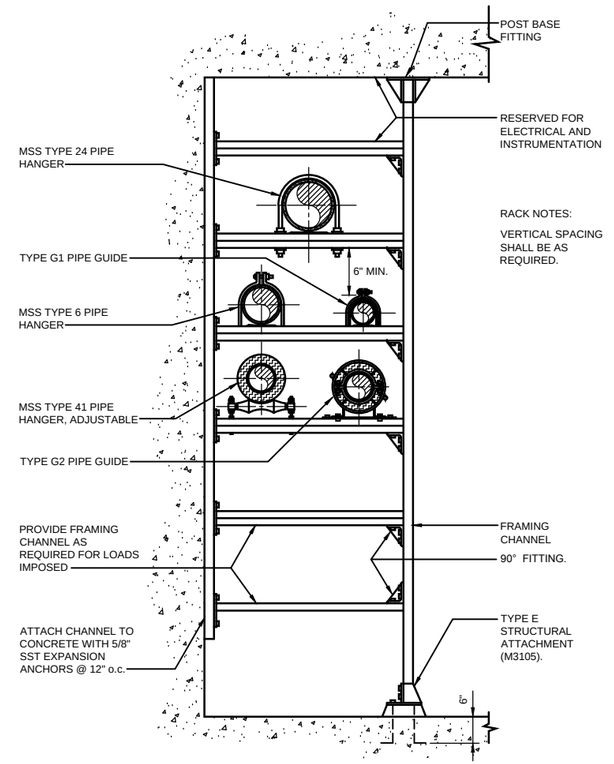
TYPE 10 PIPE HANGER
3" THROUGH 20" PIPE



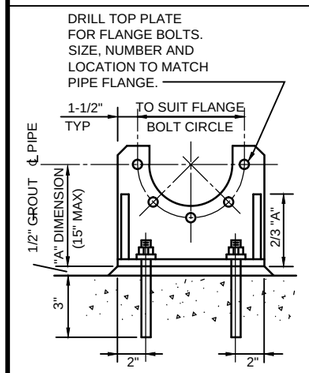
SEE GENERAL NOTE 3 ON M-001.

FOR VERTICAL PIPE ONLY

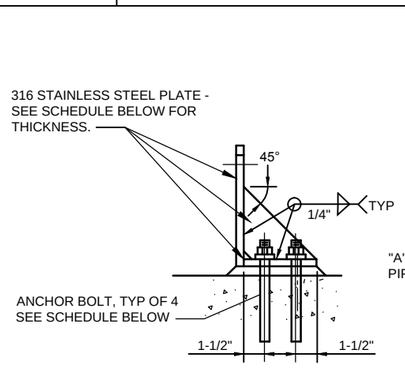
TYPE 11 PIPE HANGER
3/4" THROUGH 8" PIPE



TYPE 21 TYPICAL PIPE RACK SUPPORT
DETAIL (M2121)
NO SCALE



PLAN VIEW



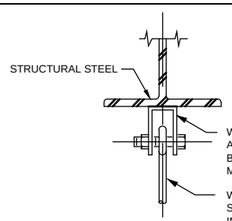
SIDE ELEVATION

COMPONENT SCHEDULE

PIPE SIZE (INCHES)	BOLT SIZE (INCHES)	PLATE THICKNESS (INCHES)
2 & 2-1/2	3/8	1/4
3 TO 6	1/2	3/8
8 TO 12	5/8	3/8
14 TO 16	3/4	1/2
18 TO 20	7/8	5/8
24 TO 30	1	3/4

"A" DIMENSION = PIPE CENTERLINE EL - (FLOOR EL + GROUT)

TYPE T
STRUCTURAL ATTACHMENT

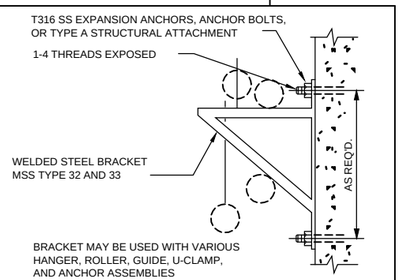


MAXIMUM ALLOWABLE LOAD:

ROD SIZE	LOAD
3/8"	610 LBS
1/2"	1130 LBS
5/8"	1810 LBS
3/4"	2710 LBS
7/8"	3770 LBS
1"	4960 LBS
1-1/4"	8000 LBS

SPACING SHALL BE AS REQUIRED BUT SHALL NOT EXCEED THOSE SPANS SHOWN IN TABLE A/M1

TYPE F
STRUCTURAL ATTACHMENT



BRACKET MAY BE USED WITH VARIOUS HANGER, ROLLER, GUIDE, U-CLAMP, AND ANCHOR ASSEMBLIES

MAXIMUM ALLOWABLE LOAD:

MSS TYPE	LOAD
32	1500 LBS
33	3000 LBS

USE DESIGN WEIGHTS SHOWN IN TABLE A/M1 TO DETERMINE TOTAL LOAD

SPACING SHALL BE AS REQUIRED, BUT SHALL NOT EXCEED THOSE SPANS SHOWN IN TABLE A/M1

TYPE G
STRUCTURAL ATTACHMENT

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SUBMITTED: _____ DATE: 6/2/17 (PROJECT MANAGER)
APPROVED: _____ DATE: 6/2/17 (BROWN AND CALDWELL)

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CERTIFICATE NO. 54069 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

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GREAT SEAL OF THE NAVAJO NATION

NAVAJO TRIBAL UTILITY AUTHORITY — UTILITIES FOR THE NAVAJO NATION

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
MECHANICAL

STANDARD DETAILS - 1

FILENAME: 143956-M-002.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: M-002
SHEET NUMBER: 22 OF 78

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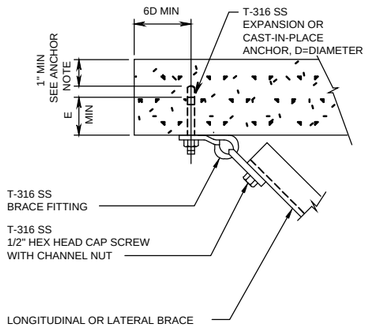
Pumphouse And N0 Well

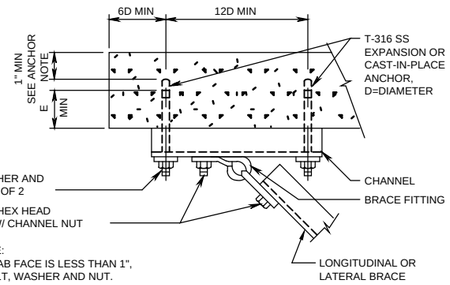


ANCHOR NOTE:
IF BOLT TO SLAB FACE IS LESS THAN 1",
USE THRU BOLT, WASHER AND NUT.

MAXIMUM ALLOWABLE LOADS:

LOAD (LBS)	EXPANSION ANCHOR		CAST-IN-PLACE ANCHOR	
	D	E	D	E
336	3/8"	3 1/2"	3/8"	3"
476	1/2"	4 1/2"	3/8"	3"
970	5/8"	5 1/2"	1/2"	4"
1400	3/4"	5"	5/8"	4"

TYPE SA-1
SEISMIC RESTRAINT ATTACHMENT

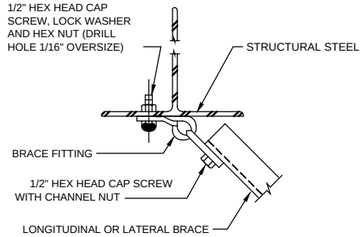


ANCHOR NOTE:
IF BOLT TO SLAB FACE IS LESS THAN 1",
USE THRU BOLT, WASHER AND NUT.

MAXIMUM ALLOWABLE LOADS:

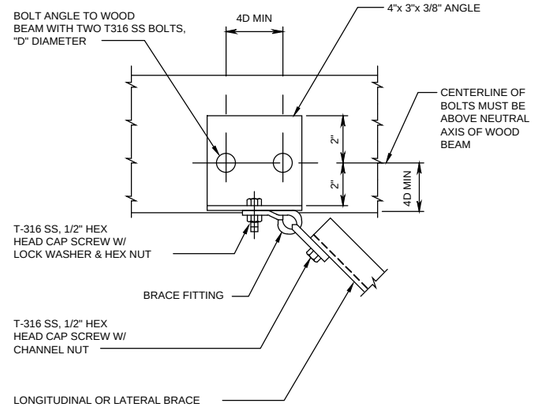
LOAD (LBS)	EXPANSION ANCHOR		CAST-IN-PLACE ANCHOR	
	D	E	D	E
336	3/8"	3 1/2"	3/8"	3"
476	3/8"	3 1/2"	3/8"	3"
970	1/2"	4 1/2"	3/8"	3"
1400	1/2"	4 1/2"	1/2"	4"

TYPE SA-2
SEISMIC RESTRAINT ATTACHMENT



MAXIMUM ALLOWABLE LOAD=1400 LBS

TYPE SA-3
SEISMIC RESTRAINT ATTACHMENT

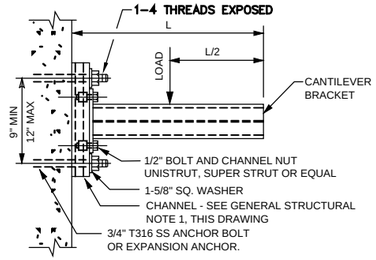


MAXIMUM ALLOWABLE LOADS:

RIGHT ANGLE TO GRAIN		PARALLEL TO GRAIN	
LOAD (LBS)	D	LOAD (LBS)	D
970	1/2"	476	1/2"
1400	1"	1400	5/8"

FOR USE WHERE BRACE RUNS PARALLEL TO WOOD SUPPORT OR WHERE DOUBLE BOLTING REQUIRED

TYPE SA-5
SEISMIC RESTRAINT ATTACHMENT



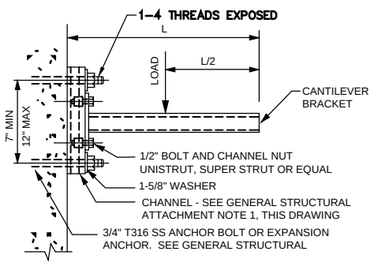
BRACKET MAY BE USED WITH VARIOUS HANGER, ROLLER,GUIDE, AND CLAMP ASSEMBLIES

CAPACITY AT MID-POINT:

L	LOAD
12"	2000 LBS
18"	1300 LBS
24"	1000 LBS
30"	800 LBS
36"	650 LBS

SPACING SHALL BE AS REQUIRED, BUT SHALL NOT EXCEED SPANS SHOWN IN TABLE A/M-001.

TYPE K
STRUCTURAL ATTACHMENT



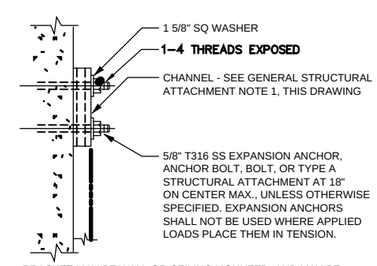
BRACKET MAY BE INSTALLED AS SHOWN OR INVERTED AND USED WITH VARIOUS HANGER, ROLLER, GUIDES, AND CLAMP ASSEMBLIES

CAPACITY AT MID-POINT:

L	LOAD
6"	1800 LBS
12"	1000 LBS
18"	700 LBS
24"	500 LBS

SPACING SHALL BE AS REQUIRED, BUT SHALL NOT EXCEED SPANS SHOWN IN TABLE A/M-001.

TYPE L
STRUCTURAL ATTACHMENT

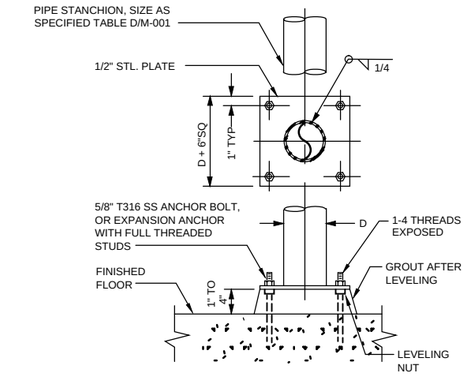


BRACKET MAY BE WALL OR CEILING MOUNTED, AND MAY BE USED WITH VARIOUS HANGER, GUIDE, RACK, OR ANCHOR, AND SWAY BRACE ASSEMBLIES.

MAXIMUM LOAD CAPACITY SHALL BE AS RECOMMENDED BY THE CHANNEL MANUFACTURER.

SPACING SHALL BE AS REQUIRED, BUT SHALL NOT EXCEED THOSE SPANS SHOWN IN TABLE A/M-001.

TYPE M
STRUCTURAL ATTACHMENT



SPACING SHALL BE AS REQUIRED, BUT SHALL NOT EXCEED THOSE SPANS SHOWN IN TABLE A/M-001.

TYPE N
STRUCTURAL ATTACHMENT

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17
PROJECT MANAGER

APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: AS SHOWN
DESIGNED: BM
DRAWN: DRP
CHECKED: BP
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED ARIZONA U.S.A. 54369 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

GREAT SEAL OF THE NAVAJO NATION

NAVAJO TRIBAL UTILITY AUTHORITY — UTILITIES FOR THE NAVAJO NATION

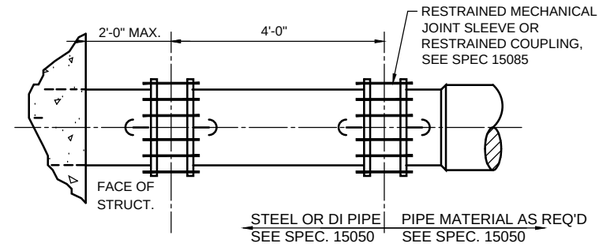
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
MECHANICAL

STANDARD DETAILS - 2

FILENAME 143956-M-003.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER M-003
SHEET NUMBER 23 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Mechanical Filename: 143956-M-003.dwg Plot Date: June 12, 2017 - 3:13 PM CADD User: David Davidse

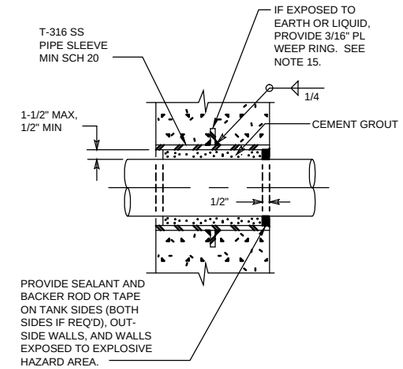


NOTE:
RESTRAINTS SHALL BE PROVIDED AS SPECIFIED. ASSURE RESTRAINTS ARE INSTALLED SUCH THAT DISMANTLING OF PIPE SYSTEM IS NOT IMPEDED.

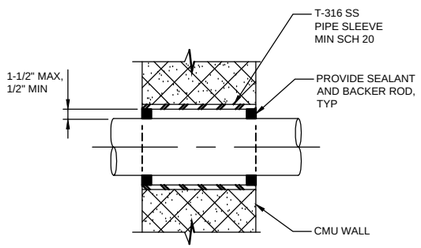
BURIED PIPE AT STRUCTURE

DETAIL A VAR

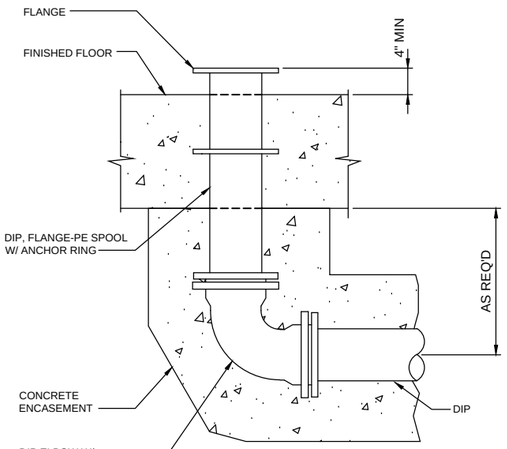
SCALE: NTS



FOR WALLS
TYPE E
PIPE PENETRATION



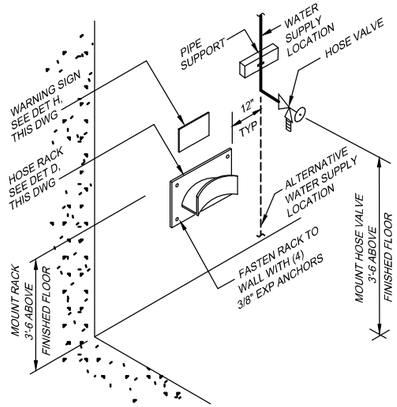
FOR WALLS
TYPE B
PIPE PENETRATION



FLOOR PENETRATION DETAIL

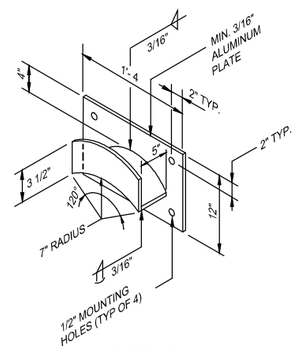
DETAIL B VAR

SCALE: NTS



TYPE A UTILITY STATION
WALL MOUNTED

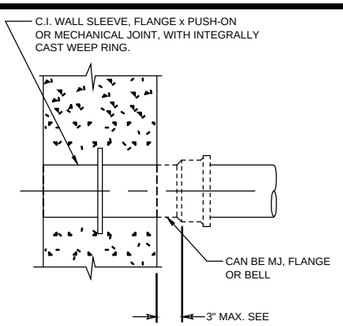
C VAR



HOSE RACK

DETAIL D VAR

NO SCALE



NOTE:
IF CONNECTION IS PUSH-ON JOINT, BELL FACE MAY BE FLUSH WITH WALL. IF CONNECTION IS MECHANICAL JOINT, BELL MUST BE PROJECT FAR ENOUGH TO ALLOW BOLTS TO BE REMOVED.

FOR WALLS
TYPE G
PIPE PENETRATION

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17
PROJECT MANAGER
APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE:	AS SHOWN
DESIGNED:	BM
DRAWN:	DRP
CHECKED:	BP
APPROVED:	MK

EXTERNAL REFERENCE FILES

BID ISSUE

54069 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

ZONE	REV.	DESCRIPTION	BY	DATE	APP.

REVISIONS

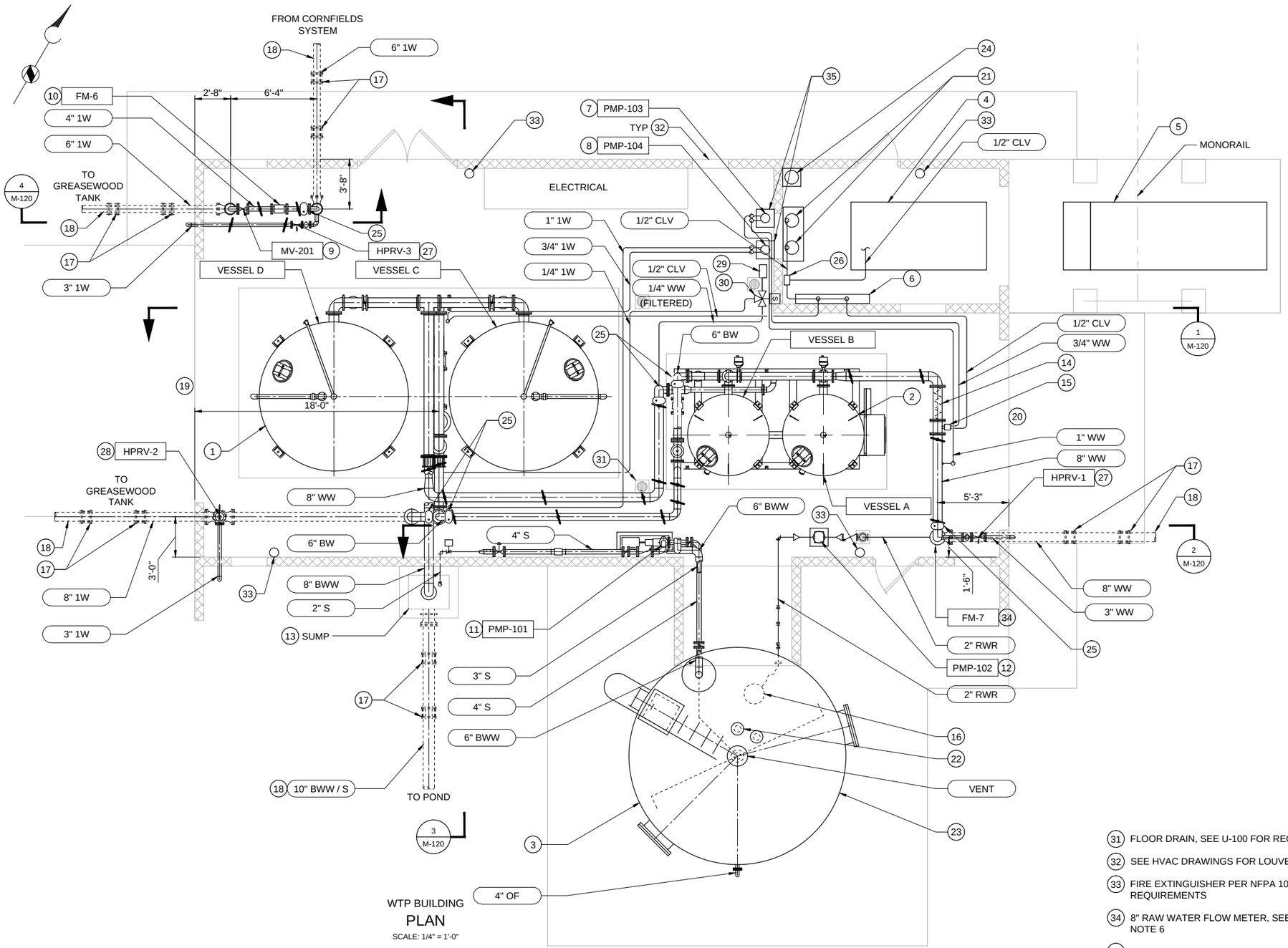
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
MECHANICAL

STANDARD DETAILS - 3

FILENAME 143956-M-004.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER M-004
SHEET NUMBER 24 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Mechanical Filename: 143956-M-004.dwg Plot Date: October 24, 2017 - 8:00 AM CADD User: David Davidse



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

GENERAL NOTES:

1. IRON-MANGANESE UNITS = VESSELS A AND B.
2. GAC UNITS = VESSELS C AND D.
3. CONCRETE ENCASE ALL PIPES UNDER STRUCTURE PER STRUCTURAL DETAIL S3061.
4. SEE DRAWING G-003 FOR PIPE DESIGNATIONS.
5. FACE PIPING FOR VESSELS A, B, C, AND D SHALL HAVE MOTORIZED VALVES TO ALLOW AUTOMATION OF EQUIPMENT CONTROLS (BACKWASH, PURGE, ETC.). SEE P-101 AND P-102. ACTUATORS ON GAC VESSEL FACE PIPING ARE NOT SHOWN ON THIS DRAWING, BUT ARE REQUIRED.
6. SEE SPECIFICATION 11830 2.03 F AND G FOR SYSTEM INTERCONNECTION FLOW METER, RAW WATER FLOW METER, AND FLOW CONTROL VALVE REQUIREMENTS. PROVIDE TO MATCH PER MANUFACTURER UTILIZED BY FILTRATION EQUIPMENT SUPPLIER.

PIPE SUPPORT LOCATION, SEE M-140.

KEY NOTES:

1. GAC SYSTEM.
2. IRON AND MANGANESE SYSTEM.
3. BACKWASH TANK, SEE DWG M-130.
4. CHLORTAINER OR EQUAL WITH SCALE FOR 1 TON CYLINDER, SEE SPECIFICATION 11700.
5. CHLORTAINER LOADING RACK.
6. ROTAMETER PANELS.
7. CHLORINE BOOSTER PUMP FOR TREATMENT.
8. CHLORINE BOOSTER PUMP FOR RESIDUAL.
9. 4" SYSTEM INTERCONNECTION VALVE. SEE GENERAL NOTE 6.
10. 4" SYSTEM INTERCONNECTION FLOW METER. SEE GENERAL NOTE 6.
11. SLUDGE MIXING AND TRANSFER PUMP.
12. RECLAIM PUMP.
13. BACKWASH WASTEWATER SUMP.
14. STATIC MIXER.
15. EDUCTOR.
16. 3" FLOATER.
17. RESTRAINED SLEEVE COUPLING, DETAIL A/M-004.
18. FOR PIPING CONTINUATION SEE DWG C-102.
19. 18' SQ COILING DOOR.
20. 16' SQ COILING DOOR.
21. CHLORINE CYLINDERS AND SCALE, SEE NTUA STANDARD DETAIL W-15.
22. LEVEL TRANSMITTER, SEE DETAIL A/M-130.
23. BACKWASH STORAGE TANK, SEE DWG. M-130.
24. NITROGEN CYLINDER.
25. COMBINATION AIR VALVE, SEE SPECIFICATION 15150.
26. AUTO SWITCH-OVER MODULE.
27. PRESSURE RELIEF VALVE - STRAIGHT.
28. PRESSURE RELIEF VALVE - ANGLED.
29. CHLORINE RESIDUAL ANALYZER.
30. 3-WAY SOLENOID VALVE.
31. FLOOR DRAIN, SEE U-100 FOR REQUIREMENTS.
32. SEE HVAC DRAWINGS FOR LOUVER DETAILS.
33. FIRE EXTINGUISHER PER NFPA 10 (2013) REQUIREMENTS
34. 8" RAW WATER FLOW METER, SEE GENERAL NOTE 6
35. EQUIPMENT BASE, SEE TYPE A ON S-008

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17 (PROJECT MANAGER)
APPROVED: _____ DATE: 6/2/17 (BROWN AND CALDWELL)

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: 1/4" = 1'-0"
DESIGNED: BM
DRAWN: DRP
CHECKED: BP
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

54369 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

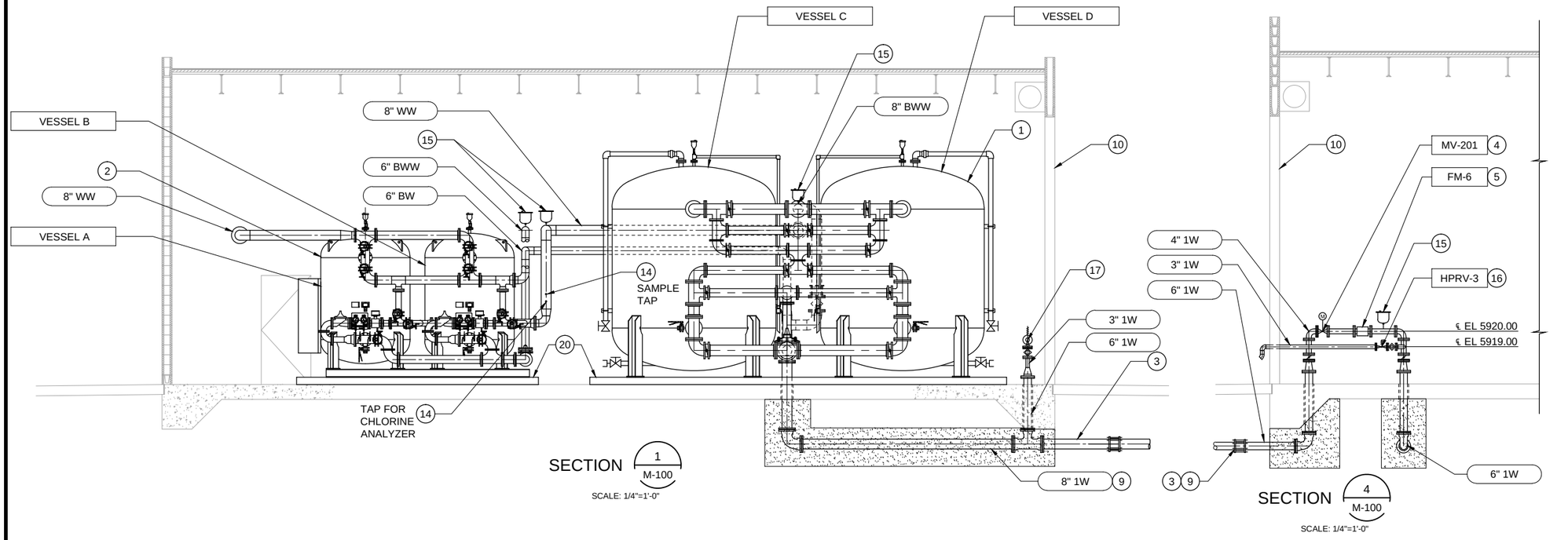
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
MECHANICAL

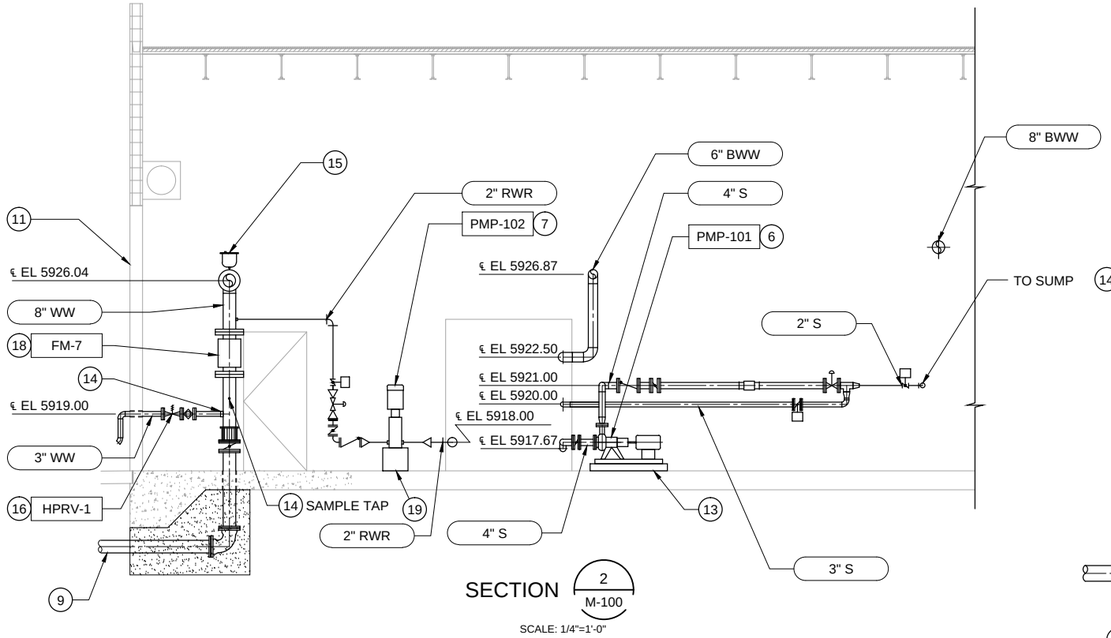
WTP BUILDING - PLAN

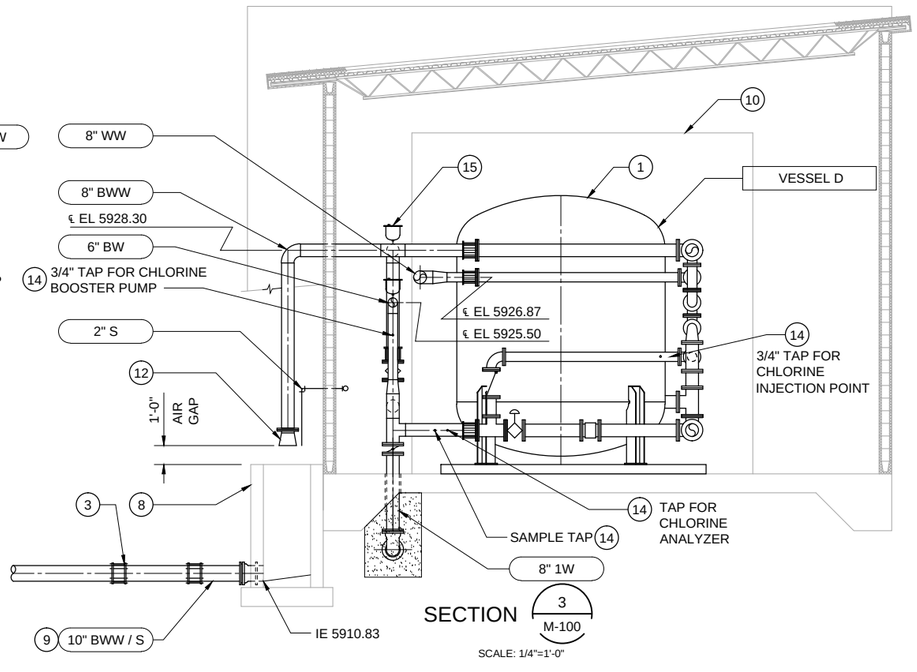
FILENAME 143956-M-100.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER M-100
SHEET NUMBER 25 OF 78

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Mechanical Filename: 143956-M-100.dwg Plot Date: October 24, 2017 - 8:01 AM CADD User: David Davidse

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH







GENERAL NOTES:

1. CONCRETE ENCASE ALL PIPES UNDER STRUCTURE PER STRUCTURAL DETAIL S3061.
2. NOT ALL PIPE SUPPORTS ARE SHOWN. ADDITIONAL SUPPORTS MAY BE REQUIRED. SEE SPECIFICATIONS.
3. FACE PIPING FOR VESSELS A, B, C, AND D SHALL HAVE MOTORIZED VALVES TO ALLOW AUTOMATION OF EQUIPMENT CONTROLS (BACKWASH, PURGE, ETC.). SEE P-101 AND P-102. ACTUATORS ON GAC VESSEL FACE PIPING ARE NOT SHOWN ON THIS DRAWING, BUT ARE REQUIRED.
4. FACE PIPING FOR VESSELS A, B, C, AND D SHALL HAVE MOTORIZED VALVES TO ALLOW AUTOMATION OF EQUIPMENT CONTROLS (BACKWASH, PURGE, ETC.). SEE P-101 AND P-102. ACTUATORS ON GAC VESSEL FACE PIPING ARE NOT SHOWN ON THIS DRAWING, BUT ARE REQUIRED.
5. SEE SPECIFICATION 11830 2.03 F AND G FOR SYSTEM INTERCONNECTION FLOW METER, RAW WATER METER, AND FLOW CONTROL VALVE REQUIREMENTS. PROVIDE TO MATCH PER MANUFACTURER UTILIZED BY FILTRATION EQUIPMENT SUPPLIER.

KEY NOTES:

1. GAC SKID.
2. IRON AND MANGANESE SKID.
3. RESTRAINED SLEEVE COUPLING, DETAIL A/M-004.
4. 4" SYSTEM INTERCONNECTION VALVE. SEE GENERAL NOTE 5.
5. 4" SYSTEM INTERCONNECTION FLOW METER. SEE GENERAL NOTE 5.
6. SLUDGE MIXING AND TRANSFER PUMP.
7. RECLAIM PUMP.
8. BACKWASH WASTEWATER SUMP.
9. FOR PIPING CONTINUATION SEE DWG C-102.
10. 18' SQ COILING DOOR.
11. 16' SQ COILING DOOR.
12. 8" FLANGED TIDEFLEX VALVE OR EQUAL.
13. EQUIPMENT PAD, SEE TYPE E ON S-008.
14. SADDLE TAP.
15. COMBINATION AIR VALVE, SEE SPECIFICATION 15150.
16. PRESSURE RELIEF VALVE - STRAIGHT.
17. PRESSURE RELIEF VALVE - ANGLED.
18. 8" RAW WATER FLOW METER, SEE GENERAL NOTE 5.
19. EQUIPMENT PAD, SEE TYPE A ON S-008.
20. SEE NOTE 2 ON S-101.

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17
PROJECT MANAGER
APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE:	1/4" = 1'-0"
DESIGNED:	BM
DRAWN:	DRP
CHECKED:	BP
APPROVED:	MK

EXTERNAL REFERENCE FILES

BID ISSUE

54869 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

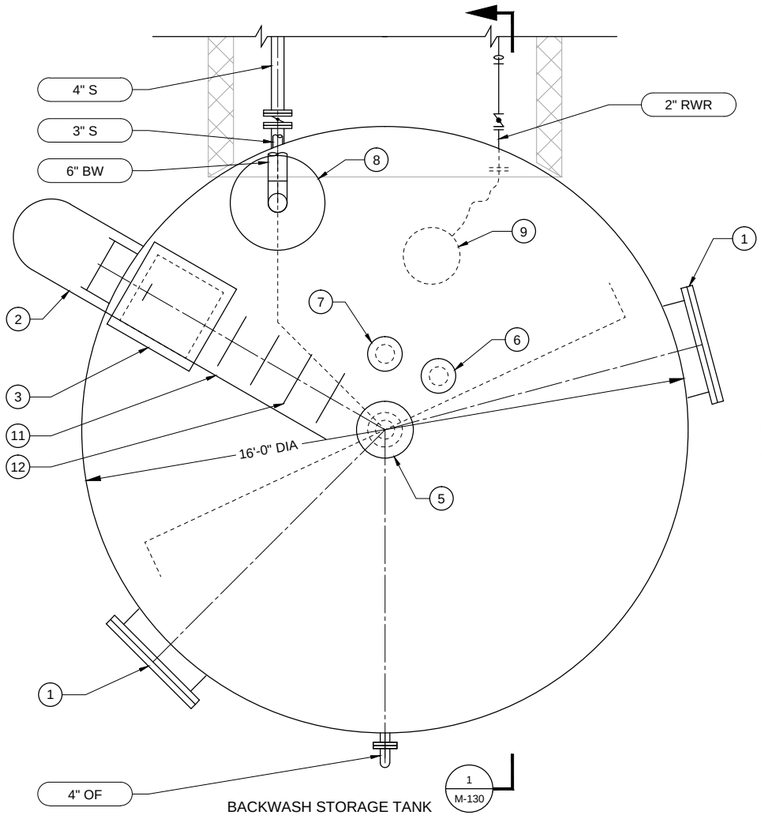
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
MECHANICAL

WTP BUILDING - SECTIONS

FILENAME 143956-M-120.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER M-120
SHEET NUMBER 26 OF 78

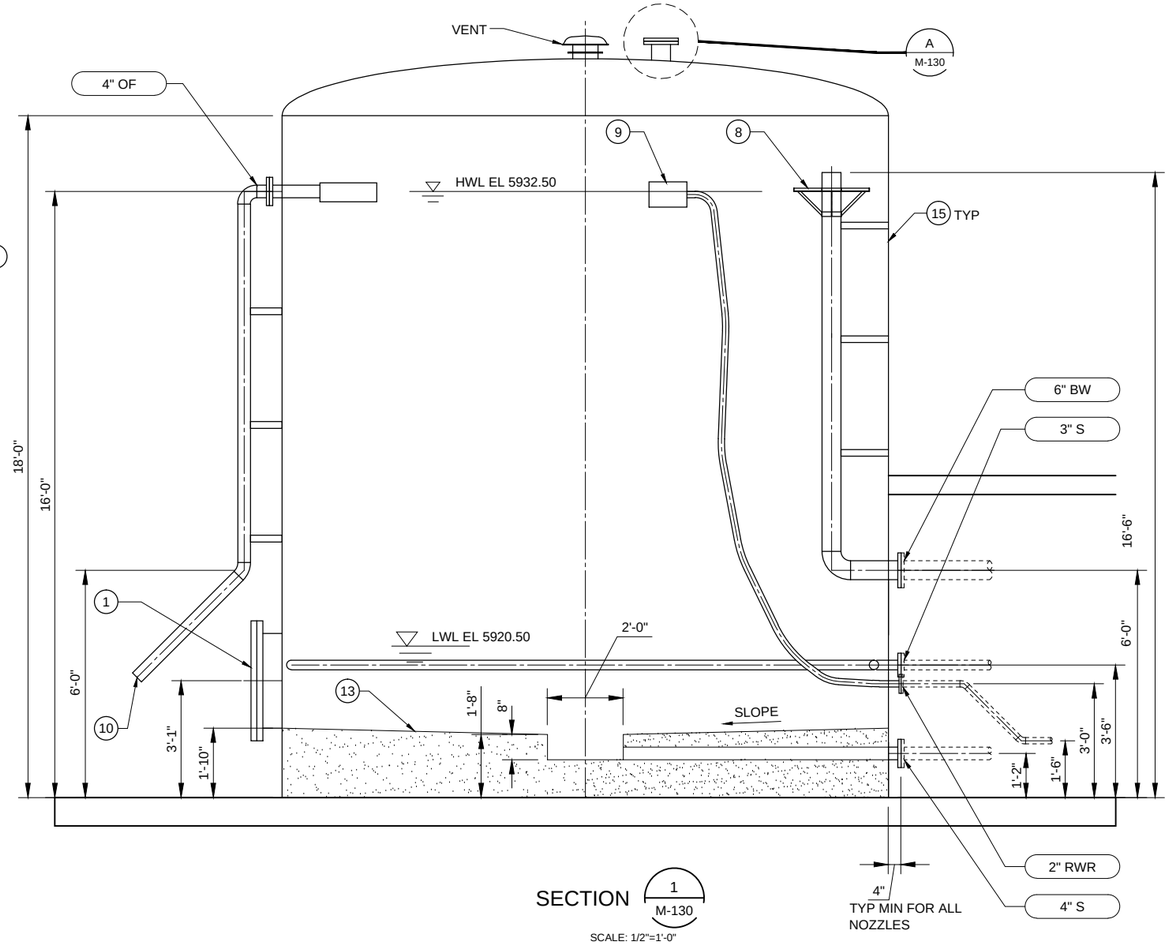
Path: P:\Projects\navajo Nation\143956_lowergreasewoddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Mechanical Filename: 143956-M-120.dwg Plot Date: October 24, 2017 - 8:01 AM CADD User: David Davidse



BACKWASH STORAGE TANK
PLAN

1 M-130

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



SECTION 1 M-130

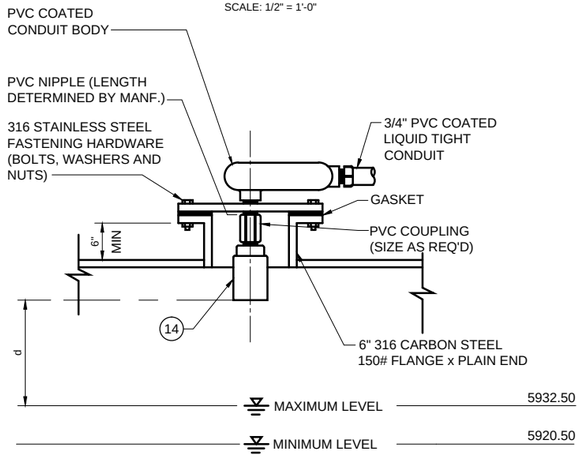
SCALE: 1/2"=1'-0"

GENERAL NOTES:

1. TANK ACCESSORIES SHOWN ARE FOR GENERAL ARRANGEMENT ONLY. SEE SECTON 13201 FOR ADDITIONAL REQUIREMENTS.
2. ALL INTERNAL PIPE, PIPE SUPPORTS AND OVERFLOW PIPE/SUPPORTS BY TANK SUPPLIER.

KEY NOTES:

1. 30" SHELL MANWAY, NTUA STANDARD DETAIL NO W-20, DRAWING 2 OF 3.
2. EXTERIOR LADDER WITH CAGE, NTUA STANDARD DETAIL NO. W-20, DRAWING 2 OF 3.
3. 24" SQ. ROOF HATCH, NTUA STANDARD DETAIL NO. W-20, DRAWING 1 OF 3.
4. OVERFLOW / WEIR BOX, NTUA STANDARD DETAIL NO. W-20, DRAWING 1 OF 3.
5. VERTICAL ROOF VENT PER TANK SUPPLIER, NTUA STANDARD DETAIL NO. W-20, DRAWING 1 OF 3.
6. 6" FLANGE FOR LEVEL TRANSDUCER, SEE DETAIL A / M-130.
7. SPARE 6" WELDED FLANGE WITH BLIND FLANGE.
8. SPLASH PLATE, SEE DETAIL B / M-130.
9. FLOATING SUCTION HEADER AND FLEXIBLE HOSE BY TREATMENT SKID SUPPLIER.
10. 304 SST SCREEN.
11. HANDRAIL.
12. LADDER BARS.
13. CONCRETE TANK FLOOR.
14. LEVEL INDICATING TRANSMITTER, SEE SECTION 11830.
15. INSULATE TANK EXTERIOR AS SPECIFIED.



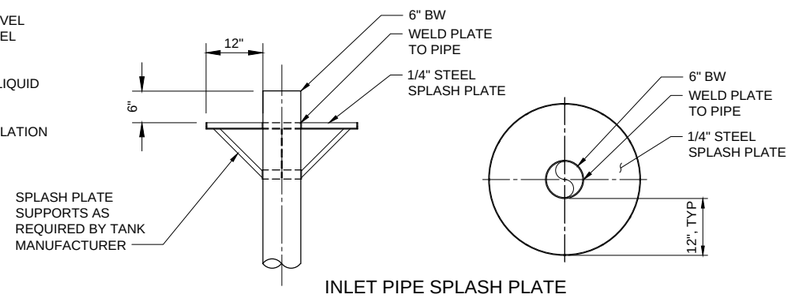
LEVEL TRANSMITTER
ULTRASONIC - FLANGED

DETAIL A M-009

SCALE: NONE

NOTES:

1. DISTANCE FROM TRANSDUCER SENSOR HEAD TO MAXIMUM LIQUID LEVEL (d) AS REQUIRED BY TRANSDUCER MANUFACTURER FOR PROPER LEVEL MEASUREMENT, MINIMUM 10 INCHES.
2. PROVIDE AN UNOBSTRUCTED SOUND PATH PERPENDICULAR TO THE LIQUID SURFACE, PER TRANSDUCER MANUFACTURER INSTRUCTIONS.
3. COORDINATE FLANGE UNIT AND STAND PIPE WITH CONCRETE INSTALLATION WORK.



INLET PIPE SPLASH PLATE

DETAIL B M-009

SCALE: NONE

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17 (PROJECT MANAGER)

APPROVED: _____ DATE: 6/2/17 (BROWN AND CALDWELL)

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

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

DESIGNED: BM
DRAWN: DRP
CHECKED: BP
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED ARIZONA U.S.A. 54069 MICHAEL P. KOBE Date Signed 6/2/2017 Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

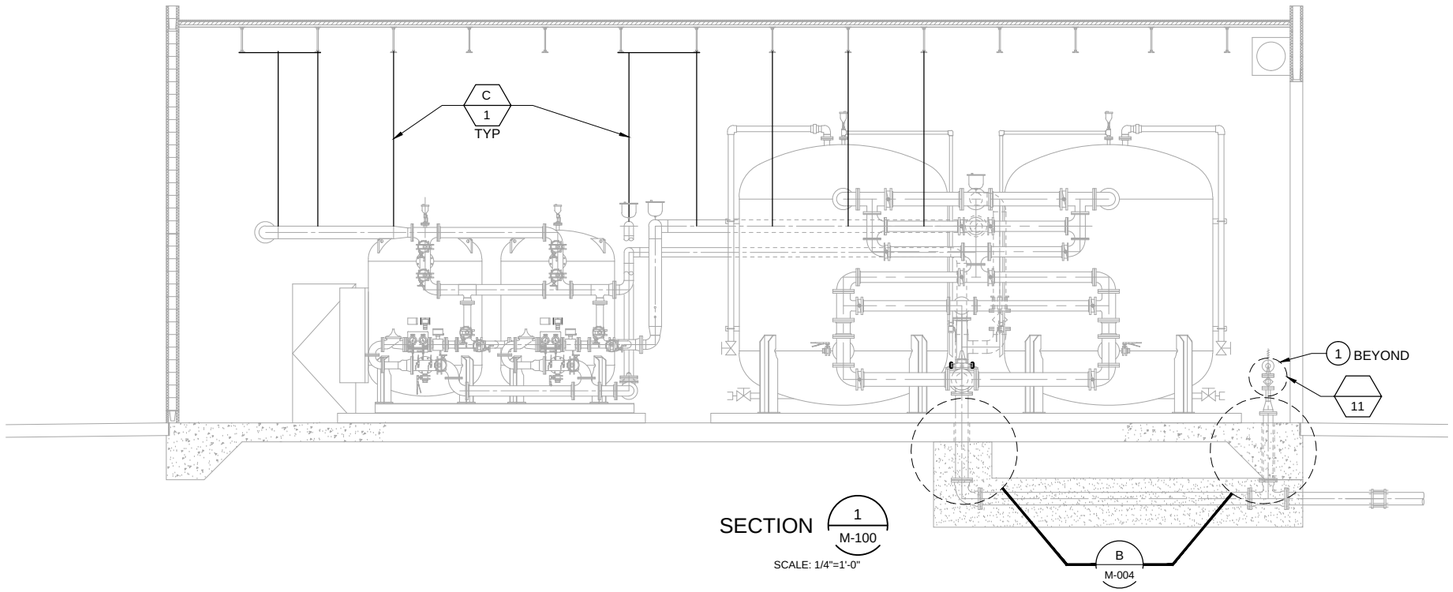
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
MECHANICAL

BACKWASH TANK - PLAN AND SECTION

FILENAME 143956-M-130.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER M-130
SHEET NUMBER 27 OF 78

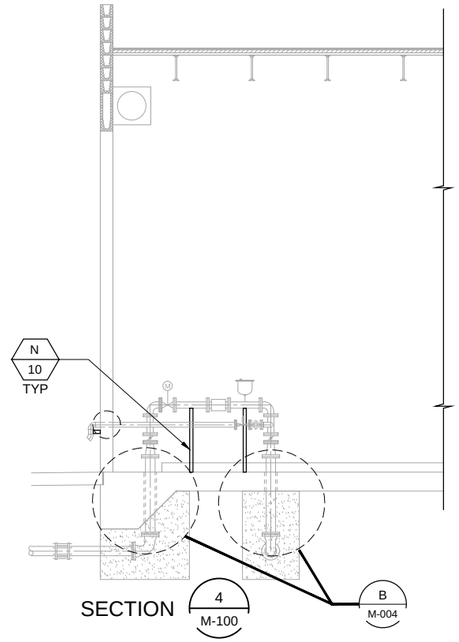
ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Mechanical Filename: 143956-M-130.dwg Plot Date: June 12, 2017 - 3:14 PM CADD User: David Davidse



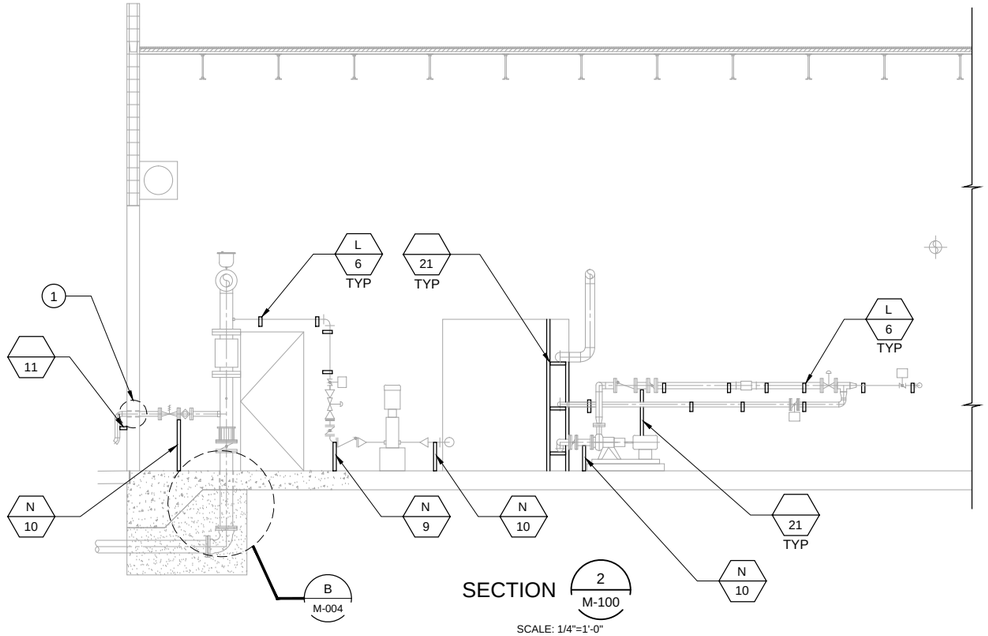
SECTION 1 M-100

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



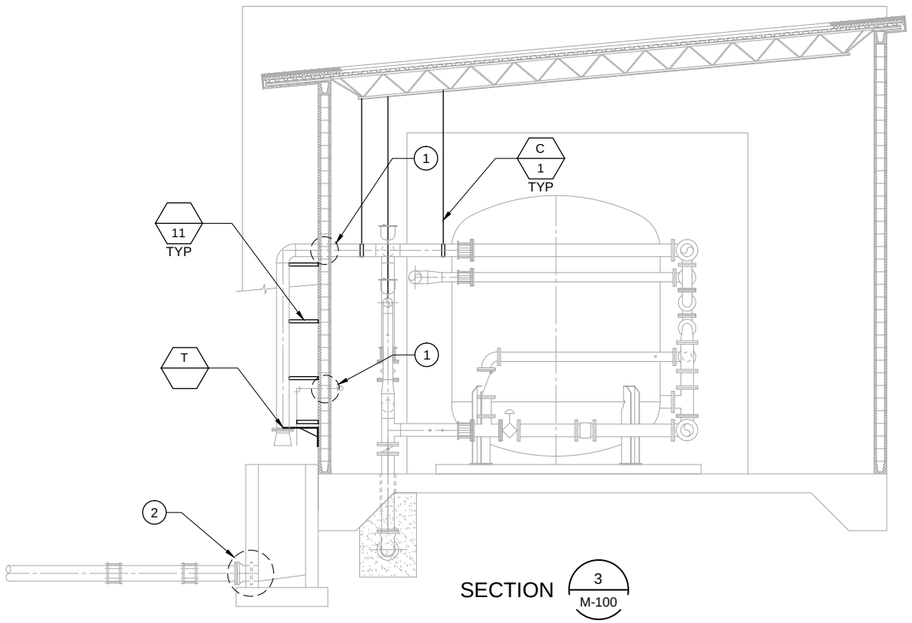
SECTION 4 M-100

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



SECTION 2 M-100

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



SECTION 3 M-100

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

GENERAL NOTES:

1. SEE DRAWING M-100 AND M-120 FOR PIPE SIZES, ELEVATIONS AND EQUIPMENT IDENTIFICATIONS.
2. SEE DRAWINGS M-001 THROUGH M-004 FOR PIPE SUPPORTS, ATTACHMENTS AND OTHER DETAILS.
3. NOT ALL PIPE SUPPORTS SHOWN. ADDITIONAL SUPPORTS MAY BE REQUIRED. SEE SPECIFICATIONS.
4. SUPPORTS FOR FACE PIPING FOR VESSELS A, B, C, AND D SHALL BE DESIGNED AND SUPPLIED BY VESSEL MANUFACTURER. FACE PIPING SHALL BE SUPPORTED FROM FLOOR.
5. SUGGESTED PIPE SUPPORT LOCATIONS, ONLY. CONTRACTOR TO DETERMINE FINAL LOCATIONS AND TYPE.

KEY NOTES:

(1) TYPE B PIPE PENETRATION, SEE M-004.

(2) TYPE G PIPE PENETRATION, SEE M-004.

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ PROJECT MANAGER DATE: 6/2/17

APPROVED: _____ BROWN AND CALDWELL DATE: 6/2/17

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54369 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

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LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
MECHANICAL

PIPE SUPPORTS, HANGERS AND PENETRATIONS

FILENAME 143956-M-140.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER M-140
SHEET NUMBER 28 OF 78

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Path: P:\Projects\navajo Nation\143956_lowergreasewoddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Mechanical Filename: 143956-M-140.dwg Plot Date: June 12, 2017 - 3:15 PM CADD User: David Davidse

GENERAL

G 1 SCOPE
THE GENERAL NOTES AND STANDARD DETAILS ARE GENERAL AND APPLY TO THE ENTIRE PROJECT EXCEPT WHERE THERE ARE SPECIFIC INDICATIONS TO THE CONTRARY.

G 2 PRECEDENCE
IF THERE IS A CONFLICT BETWEEN PROJECT SPECIFICATIONS AND STRUCTURAL DRAWINGS, INCLUDING STRUCTURAL NOTES, CONTACT THE STRUCTURAL ENGINEER OF RECORD FOR CLARIFICATION. SPECIFIC NOTES AND DETAILS ON DRAWINGS TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.

G 3 DIMENSIONS
STRUCTURAL DIMENSIONS CONTROLLED BY OR RELATED TO THE MECHANICAL OR ELECTRICAL EQUIPMENT SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL CONSTRUCTION DIMENSIONS AND NOTIFYING CONSTRUCTION MANAGER OF DISCREPANCIES IN A TIMELY FASHION.

G 4 PROVISIONS FOR EQUIPMENT
MECHANICAL AND ELECTRICAL EQUIPMENT SUPPORTS, ANCHORAGES, OPENINGS, RECESSES AND EMBEDMENTS NOT SPECIFIED ON THE STRUCTURAL DRAWINGS, BUT SPECIFIED ON OTHER CONTRACT DRAWINGS, SHALL BE PROVIDED PRIOR TO CASTING CONCRETE.

G 5 MEANS, METHODS & CONSTRUCTION LOADS
CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. CONTRACTOR IS RESPONSIBLE FOR MEANS, METHODS AND SEQUENCE OF CONSTRUCTION, AND SHALL MAKE ADEQUATE PROVISION TO MAINTAIN THE INTEGRITY OF ALL STRUCTURES AT ALL STAGES OF CONSTRUCTION. DETERMINATION OF AND PROVISIONS FOR CONSTRUCTION LOADING SHALL BE PROVIDED BY THE CONTRACTOR.

G 6 SAFETY
CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS TO ENSURE THE SAFETY OF WORKERS AND VISITORS TO THE SITE, INCLUDING BUT NOT LIMITED TO SHORING, BRACING AND ACCESS RESTRICTION. COMPLY WITH ALL FEDERAL, STATE AND LOCAL SAFETY CODES AND STANDARDS.

G 7 DRAINAGE SURFACES
SLOPE DRAINAGE SURFACES UNIFORMLY TO DRAIN. SLOPE SHALL BE 1/8" TO 1/4" PER FOOT EXCEPT WHERE NOTED OTHERWISE ON THE PLANS.

G 8 OPENINGS
OPENINGS THROUGH NEW AND EXISTING WALLS AND SLABS FOR PIPES, DUCTS, CONDUITS, ETC., ARE NOT ALL SHOWN ON THE STRUCTURAL DRAWINGS. THE CONTRACTOR SHALL COORDINATE WITH OTHER DISCIPLINES AND PROVIDE THESE OPENINGS IN ACCORDANCE WITH THE OTHER CONTRACT DOCUMENTS.

DESIGN CRITERIA

D 1 GOVERNING BUILDING CODE
CONSTRUCTION SHALL BE IN ACCORDANCE WITH 2006 INTERNATIONAL BUILDING CODE. THIS CODE SHALL GOVERN EXCEPT WHERE OTHER APPLICABLE CODES OR CONTRACT PROVISIONS ARE MORE RESTRICTIVE.

D 2 LIVE LOADS
1. EQUIPMENT SLAB ON GRADE ..... 250 PSF OR LOAD FROM EQUIPMENT, WHICHEVER IS GREATER
2. BUILDING FLOOR SLAB ..... 250 PSF
3. CHLORINE RACK SLAB ..... 250 PSF
4. STAIRS, LANDINGS AND ENTRY AREAS ..... 100 PSF
5. GRATING, CHECKERED PLATES, AND HATCHES ..... SAME AS ADJACENT FLOOR AREAS, UNO
6. STORAGE AREAS..... 100 PSF
7. ROOF LIVE LOAD MINIMUM..... 20 PSF

D 3 MAJOR EQUIPMENT LOADS
1. FILTER SKID..... DL = 78,000 LBS
2. GAC SYSTEM..... DL = 228,000 LBS
3. BACKWASH TANK..... DL = 1,000 PSF

D 4 GROUND SNOW LOAD, PG ..... 25 PSF
DRIFTING LOADS IN ACCORDANCE WITH ASCE 7

D 5 WIND
BASIC WIND SPEED ..... 90 MPH
EXPOSURE CATEGORY C
IMPORTANCE FACTOR ..... I = 1.15
TOPOGRAPHIC FACTOR ..... K_{ZT} = 1.0

DESIGN CRITERIA (continued)

D 6 SEISMIC
SITE CLASS ..... D
DESIGN ACCEL, SHORT PERIOD ..... S_{DS} = .194 g
DESIGN ACCEL, 1-SEC PERIOD ..... S_{D1} = .079 g
STRUCTURAL OCCUPANCY CATEGORY III
SEISMIC IMPORTANCE FACTOR ..... I = 1.25 I_P = 1.00,
EXCEPT FOR FIRE PROTECTION SYSTEM, EGRESS STAIRWAYS, AND COMPONENTS CONTAINING HAZARDOUS MATERIALS ..... I_P = 1.50
SEISMIC DESIGN CATEGORY ..... B
ORDINARY REINFORCED MASONRY
SHEAR WALLS ..... R = 4 Ω_o = 2.5 Cd = 4
ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE

FOUNDATION

F 1 DESIGN BASIS
FOUNDATION DESIGN IS BASED ON RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT, GEOTECHNICAL REPORT FOR THE LOWER GREASEWOOD WATER SUPPLY IMPROVEMENTS PROJECT, ARIZONA, BY AMEC, PROJECT NO. 135170009, DATED OCTOBER 11, 2013.

F 2 ALLOWABLE BEARING PRESSURE
SHALLOW FOUNDATIONS SHALL BEAR ON AT LEAST 5 FEET OF STRUCTURAL FILL AND HAVE BEEN DESIGNED FOR AN ALLOWABLE BEARING PRESSURE OF 2,000 PSF.

F 3 MINIMUM FOUNDATION PREPARATION
SPECIFICATIONS AND DRAWINGS DESCRIBE SPECIFIC FOUNDATION PREPARATION AND REQUIREMENTS. FOR SITUATIONS NOT SPECIFICALLY NOTED, SUBMIT REQUEST FOR CLARIFICATION TO CONSTRUCTION MANAGER PRIOR TO PROCEEDING.

F 4 DIFFERING CONDITIONS
FOUNDATION CONDITIONS NOTED DURING CONSTRUCTION WHICH DIFFER FROM THOSE INDICATED IN THE REPORT SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER. CONTRACTOR IS RESPONSIBLE FOR REPLACING WORK CONDUCTED AFTER SUCH NOTIFICATION BUT BEFORE CONSTRUCTION MANAGER PROVIDES ADDITIONAL DIRECTIONS.

F 5 EXCAVATION, DE-WATERING & SAFETY
CONTRACTOR SHALL PROVIDE FOR ALL DE-WATERING OF EXCAVATIONS, AND DESIGN / PROVIDE ALL CRIBBING, SHORING AND BRACING REQUIRED FOR SAFETY AND TO ALLOW CONSTRUCTION OF THE WORK PRESENTED HEREIN.

F6 STRUCTURAL BACKFILL
UNLESS NOTED OTHERWISE, STRUCTURAL BACKFILL SHALL BE PLACED IN UNIFORM LAYERS AND SHALL BE BROUGHT UP UNIFORMLY AROUND THE STRUCTURE. ADDITIONALLY, BACKFILL SHALL BE BROUGHT UP UNIFORMLY ON BOTH SIDES OF FOUNDATION WALLS. SEE SPECIFICATION 02200 FOR ADDITIONAL INFORMATION.

CONCRETE

C 1 APPLICABLE CODES
CONCRETE CONSTRUCTION SHALL CONFORM TO ACI 301-10 "SPECIFICATIONS FOR STRUCTURAL CONCRETE", AND THE FOLLOWING CODES:
ACI 318-08 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE"
ACI 350-06 (FOR LIQUID CONTAINING STRUCTURES) - "CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES"

C 2 REINFORCING STEEL DETAILS
ALL DETAILING, FABRICATION AND ERECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH ACI DETAILING MANUAL (ACI SP-66), LATEST EDITION.

C 3 DESIGN STRENGTH
1. STRUCTURAL CAST-IN-PLACE CONCRETE EXCEPT AS NOTED IN ITEM 2 BELOW ..... f'c = 4,500 PSI
2. REFERENCE CIP CONCRETE SPECIFICATION 03300 FOR OTHER CLASSES OF CONCRETE AND THEIR USES
3. REINFORCED STEEL ..... ASTM A615, GRADE 60 DEFORMED BARS UNLESS OTHERWISE NOTED

CONCRETE (continued)

C 4 CONCRETE COVER
CONCRETE COVER FOR REINFORCING BARS SHALL CONFORM TO ACI 350 AND AS FOLLOWS WITH MINIMUM COVER OF ONE BAR DIAMETER:
1. CONCRETE CAST AGAINST EARTH ..... 3"
2. CONCRETE EXPOSED TO EARTH, WASTEWATER, CHEMICALS OR WEATHER ..... 2"
3. CONCRETE NOT EXPOSED TO EARTH, WASTEWATER, CHEMICALS OR WEATHER .....1-1/2"

C 5 BAR DEVELOPMENT AND LAP SPLICE LENGTH
SEE TABLE AT THE END OF THESE STRUCTURAL NOTES. IN SLABS, BEAMS, GIRDERS AND HORIZONTAL REINFORCING AT WALLS, SPLICES OF ADJACENT REINFORCING STEEL BARS SHALL BE STAGGERED AT LEAST ONE SPLICE LENGTH, UNLESS OTHERWISE SPECIFIED.

C 6 WELDING REINFORCING BARS
ALL REINFORCING TO BE WELDED SHALL CONFORM TO ASTM A706. REBAR WELDING SHALL BE IN ACCORDANCE WITH AWS D1.4.

C 7 STANDARD HOOKS
BARS ENDING IN RIGHT ANGLE BENDS OR HOOKS SHALL CONFORM TO THE REQUIREMENTS OF PARAGRAPH 7.1 ACI-318. PROVIDE STANDARD HOOK IN BARS WHICH TERMINATE AT WALL OR SLAB INTERSECTIONS THAT PROVIDE LESS THAN THE SPECIFIED DEVELOPMENT LENGTH.

C 8 CHAMFERS
EXCEPT AS OTHERWISE REQUIRED, EXPOSED CONCRETE CORNERS AND EDGES SHALL HAVE 3/4" CHAMFERS. RE-ENTRANT CORNERS SHALL NOT HAVE FILLETS.

C 9 ANCHOR BOLTS
ANCHOR BOLTS SHALL BE STAINLESS STEEL TYPE 316 MATERIAL UNLESS OTHERWISE NOTED (SEE SPECIFICATIONS).

C 10 INSERTS
PROVIDE ANCHORAGE INSERTS ON CONCRETE WALLS AND CONCRETE CEILINGS IN GALLERIES, PIPE CHASES, TUNNELS AS REQUIRED BY MECHANICAL AND ELECTRICAL INSTALLATIONS. USE UNISTRUT P3200 SERIES HOT DIP GALVANIZED OR EQUAL UNLESS OTHERWISE SPECIFIED.

C 11 COMPATIBLE FINISHES
CURING COMPOUNDS AND OTHER SURFACE TREATMENTS, CONCRETE ADMIXTURES AND SUB-SLAB DRAINAGE SHALL BE REVIEWED BY CONTRACTOR AND CERTIFIED COMPATIBLE WITH FINISHES TO BE APPLIED LATER IN THE CONSTRUCTION SEQUENCE.

C12 VAPOR BARRIER BELOW SLAB ON GRADE
VAPOR BARRIER, WHERE NOTED ON THE DRAWINGS, SHALL BE 10 MIL MINIMUM CLASS A OR B PLASTIC WATER VAPOR RETARDER PER ASTM E1745. INSTALL PER ASTM E1643. LAP JOINTS 6" AND SEAL WITH MANUFACTURER'S RECOMMENDED TAPE OR ADHESIVE.

GROUT

GR 1 PRECISION NON-SHRINK CEMENT GROUT FOR STRUCTURAL STEEL COLUMNS AND TRUSS BEARING BASE PLATES: SEE SPECIFICATION 03600.

GR 2 EQUIPMENT GROUTING
SEE MECHANICAL SPECIFICATIONS AND SPECIFICATION SECTION 03600, GROUT.

REINFORCED CONCRETE MASONRY

MA 1 CONCRETE MASONRY UNITS (CMU) SHALL BE HOLLOW LOAD BEARING UNITS CONFORMING TO ASTM C90, 135 PCF NORMAL WEIGHT, PRISM STRENGTH (f'm) = 2000 PSI.

MA 3 MORTAR SHALL BE TYPE S CONFORMING TO ASTM C270, MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS = 2800 PSI.

MA 5 GROUT SHALL BE f'c = 2000 PSI CONFORMING TO ASTM C476.

MA 6 REINFORCING STEEL SHALL BE ASTM A615, GRADE 60 DEFORMED BARS.

MA 7 RUNNING BOND SHALL BE USED THROUGHOUT.

MA 8 USE 3/8" FLUSH MORTAR JOINTS THROUGHOUT, TOOLED CONCAVE.

STEEL

ST 1 ALL STRUCTURAL STEEL WORK SHALL BE IN ACCORDANCE WITH THE AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" (AISC 360-05) AND AISC "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (AISC 303-05). IN SEISMIC DESIGN CATEGORIES D, E AND F, THE PROVISIONS OF AISC 341-05, "SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS, INCLUDING SUPPLEMENT No. 1", SHALL ALSO APPLY.

ST 2 MATERIALS
1. STEEL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992. OTHER STEEL SHAPES AND PLATES SHALL CONFORM TO ASTM A36.
2. STRUCTURAL STEEL PIPE SHALL CONFORM TO ASTM A53 TYPES E OR S, GRADE B. STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A500 GRADE B (Fy = 46 KSI).
3. ALL STAINLESS STEEL SHALL BE TYPE 316 MEETING ASTM A276 FOR BARS AND SHAPES, AND ASTM A240 FOR PLATES, UNLESS OTHERWISE SPECIFIED. ALL STAINLESS STEEL SHALL BE PASSIVATED PER ASTM A380.

ST 3 WELDING
1. WELDING SHALL CONFORM TO AWS D1.1-1 AND AISC 341-05.
2. ELECTRODES FOR SHOP AND FIELD WELDS SHALL CONFORM TO AWS A5.1 OR A5.5, CLASS E70XX.
3. STAINLESS STEEL WELDING SHALL CONFORM TO AWS D1.6 WITH A5.4 OR A5.9 ELECTRODES.

ST 4 BOLTS
STRUCTURAL BOLTS AT STEEL FRAMING SHALL BE GALVANIZED AND CONFORM TO ASTM A325N (TYPE 1) FOR CONNECTION OF GALVANIZED OR PAINTED FRAMING. HIGH STRENGTH BOLTS SHALL BE FULLY TENSIONED UNLESS CONNECTING HSS SHAPES OR OTHERWISE NOTED. STAINLESS STEEL TYPE 316 BOLTS SHALL BE USED FOR CONNECTION OF STAINLESS STEEL AND ALUMINUM FRAMING.

ST 5 ENCASED STEEL
STEEL COMPLETELY ENCASED IN CONCRETE SHALL NOT BE GALVANIZED OR PAINTED AND SHALL HAVE A CLEAN SURFACE FOR BONDING TO CONCRETE UNLESS OTHERWISE NOTED ON THE DRAWINGS.

ST 6 PAINTING
STRUCTURAL STEEL SHALL BE PAINTED IN ACCORDANCE WITH SPECIFICATION. SHOP PRIMER SHALL BE COMPATIBLE WITH FINISH COATINGS. MONORAIL CAPACITIES SHALL BE PAINTED ON THE SIDE OF MONORAIL BEAMS.

Brown AND Caldwell
SALT LAKE CITY, UTAH
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APPROVED: MK

EXTERNAL REFERENCE FILES

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CERTIFICATE NO. 44977 SCOTT W. HARPER Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 9/30/18

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LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL
LOWER GREASEWOOD WTP
GENERAL NOTES - 1

FILENAME 143956-S-001.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER S-001
SHEET NUMBER 29 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewood\design\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Structural Filename: 143956-S-001.dwg Plot Date: June 1, 2018 - 1:54 PM CADD User: David Davidse

ALUMINUM

A 1 APPLICABLE CODE
ALUMINUM CONSTRUCTION SHALL CONFORM TO THE 2005 EDITION OF THE ALUMINUM DESIGN MANUAL OF THE ALUMINUM ASSOCIATION.

A 2 MATERIAL
1. ALUMINUM STRUCTURAL SHAPES SHALL BE ALLOY 6061-T6 PER ASTM B308.
2. ALUMINUM PIPE AND TUBING SHALL BE ALLOY 6061-T6 PER ASTM B241.
3. ALUMINUM PLATE SHALL BE ALLOY 6061-T6 PER ASTM B209.
4. ALUMINUM RAISED PATTERN (CHECKERED PLATE) PLATE SHALL BE ALLOY 6061-T6 TREAD PLATE PER ASTM B632.

A 3 DISSIMILAR MATERIALS
WHERE ALUMINUM IS IN CONTACT WITH CONCRETE OR MASONRY SURFACES, CONTACT SURFACE SHALL BE COATED WITH A HEAVY COAT OF ALKALI-RESISTANT BITUMINOUS PAINT.

ALUMINUM GRATING

AG 1 UNLESS OTHERWISE NOTED, ALL GRATING AND GRATING STAIR TREADS SHALL BE ALUMINUM.

AG 2 ALUMINUM GRATING AND TREADS SHALL BE OF ALLOY 6061-T6 CONFORMING TO ASTM B221. SEE STANDARD DETAIL FOR GRATING THICKNESS UNLESS NOTED OTHERWISE ON THE DRAWINGS. THE MINIMUM BEARING BAR WIDTH SHALL BE 3/16".

AG 3 ALUMINUM GRATING SHALL BE ANCHORED TO SUPPORT FRAMING WITH 1/4" DIAMETER SELF TAPPING STAINLESS STEEL SCREWS PLACED THROUGH STAINLESS STEEL U-CLIPS ENGAGING TWO MAIN BEARING BARS. MINIMUM FOUR CLIPS PER GRATING PANEL. MAXIMUM DISTANCE BETWEEN CLIPS SHALL BE THREE FEET.

SPECIAL INSPECTIONS

SI 1 AN INDEPENDENT TESTING COMPANY RETAINED BY THE OWNER AND APPROVED BY THE BUILDING OFFICIAL SHALL INSPECT THE FOLLOWING (SEE EXPANDED LIST ON DRAWINGS S-003 AND S-004, SPECIFICATIONS AND GOVERNING CODE):

SI 2 CONTRACTOR SHALL NOTIFY THE TESTING COMPANY FOR ALL INSPECTIONS.

STEEL JOISTS

SJ 1 STEEL JOISTS AND STEEL JOIST BRIDGING SHALL BE DESIGNED IN ACCORDANCE WITH STEEL JOIST INSTITUTE STANDARD SPECIFICATIONS FOR OPEN WEB STEEL JOISTS (K-SERIES) WITH A MAXIMUM DEPTH OF 16". DEFLECTION SHALL NOT EXCEED SPAN/240. IN ADDITION, BRIDGING SHALL BE DESIGNED FOR LATERAL LOADING FROM WIND LOAD, AND SEISMIC LOAD AS APPLICABLE.

SJ 2 LOADS

DEAD LOADS
1. MEMBER WEIGHT..... ACTUAL WEIGHT
2. ROOF COVER WEIGHT..... 10 PSF
3. INCIDENTAL EQUIPMENT.....10 PSF
4. POINT LOAD FROM PIPE SUPPORTS..... SEE MECHANICAL DRAWINGS

LOADS FROM SNOW, ROOF LIVE, WIND, AND SEISMIC AS DETERMINED FROM DESIGN CRITERIA ON S-001.

SJ 3 STEEL JOIST AND JOIST BRIDGING SHALL BE HOT DIP GALVANIZED.

SJ 4 STEEL JOIST SHALL BE FABRICATED OF STEEL THAT COMPLIES WITH THE REQUIREMENTS OF THE SJI SPECIFICATIONS.

STEEL ROOF DECK

RD 1 ALL WORK SHALL CONFORM TO THE STEEL DECK INSTITUTE SPECIFICATIONS AND RECOMMENDATIONS.

RD 2 UNLESS INDICATED OTHERWISE, STEEL ROOF DECK SHALL BE GALVANIZED, G60, STEEL DECK CONFORMING TO STEEL DECK INSTITUTE (SDI) DESIGNATION 1 1/2-INCH WR 22.

RD3 DECK SHALL BE CONTINUOUS OVER THREE SPANS MINIMUM.

RD 4 UNLESS INDICATED OTHERWISE, ATTACHMENT OF STEEL ROOF DECK TO STEEL ROOF JOIST AND DECK LEDGE SHALL BE AS FOLLOWS:
1. THREE #12 TEK SCREWS PER 36-INCH (36/3) WIDTH SHEET AT EACH TRANSVERSE SUPPORT AND DECK LEDGE ANGLE ALONG EDGES PERPENDICULAR TO DECK SPAN.
2. FOUR EQUALLY SPACED #10 TEK SCREWS AT DECK LEDGE ANGLE ALONG EDGES PARALLEL TO DECK SPAN.

RD 5 UNLESS INDICATED OTHERWISE, STEEL ROOF DECK TO STEEL ROOF DECK SIDE LAP CONNECTION SHALL BE FOUR #10 TEK SCREWS AT EQUALLY SPACED BETWEEN EACH STEEL ROOF JOIST.

STRUCTURAL DEFERRED SUBMITTALS (IBC 2006, SECTION 107.3.4.2)

SDS 1 THE CONTRACTOR SHALL SUBMIT DRAWINGS AND CALCULATIONS BEARING THE SEAL OF A PROFESSIONAL ENGINEER LICENSED IN ARIZONA TO THE ENGINEER FOR REVIEW. STRUCTURAL DEFERRED SUBMITTALS INCLUDE:
1. ANCHOR BOLTS FOR ALL EQUIPMENT ANCHORAGE.
2. STEEL ROOF JOIST

STRUCTURAL OBSERVATIONS

SO 1 THE OWNER SHALL RETAIN A REGISTERED DESIGN PROFESSIONAL TO PERFORM STRUCTURAL OBSERVATIONS. THE CONSTRUCTION MANAGER SHALL NOTIFY THE OWNER AT LEAST 48 HOURS BEFORE A DESIGNATED WORK IS TO BE COVERED. REFER TO SPECIFICATION 01400 FOR ADDITIONAL REQUIREMENTS.

SO 2 REQUIRED STRUCTURAL OBSERVATIONS INCLUDE:
1. STRUCTURAL FILL.
2. FOUNDATIONS PREPARED FOR CONCRETE PLACEMENT
3. PREPARATION OF MASONRY WALLS WITH REINFORCING IN PLACE PRIOR TO PLACEMENT OF GROUT.
4. COMPLETION OF CMU BEARING WALLS.
5. STEEL ROOF FRAMING, PRIOR TO COVER-UP WITH NON STRUCTURAL ELEMENTS.
6. COMPLETION OF LATERAL FORCE RESISTING ELEMENTS INCLUDING DIAPHRAGMS, SHEAR WALLS, AND OTHER ELEMENTS.
7. COMPLETION OF STRUCTURAL SYSTEM AFTER ALL SIGNIFICANT ARCHITECTURAL, MECHANICAL, PLUMBING, HEATING / VENTILATION EQUIPMENT, ELECTRICAL AND FINISH ELEMENTS ARE INSTALLED.

TENSION DEVELOPMENT AND LAP SPLICE LENGTHS (IN INCHES) FOR UNCOATED BARS IN NORMAL-WEIGHT CONCRETE WITH f_c' = 4,000 PSI OR HIGHER

THIS TABLE IS GOOD ONLY FOR CENTER/CENTER SPACING OF REINFORCING BARS EQUAL TO THE MINIMUM SHOWN OR GREATER. NO TRANSVERSE REINFORCING ASSUMED.

BAR SIZE	APPLICATION	CONCRETE COVER = 0.75 IN.			CONCRETE COVER = 1.00 IN.			CONCRETE COVER = 1.50 IN.			CONCRETE COVER = 2.00 IN.			CONCRETE COVER = 3.00 IN.		
		TOP	OTHER	MIN C/C SPACING	TOP	OTHER	MIN C/C SPACING	TOP	OTHER	MIN C/C SPACING	TOP	OTHER	MIN C/C SPACING	TOP	OTHER	MIN C/C SPACING
#3	DEVELOPMENT	12	12	2.00	12	12	2.50	12	12	3.50	12	12	4.50	12	12	6.50
	LAP SPLICE	16	16	2.25	16	16	2.75	16	16	3.75	16	16	4.75	16	16	6.75
#4	DEVELOPMENT	19	15	2.00	15	12	2.50	15	12	3.50	15	12	4.50	15	12	6.50
	LAP SPLICE	24	19	2.50	20	16	3.00	20	16	4.00	20	16	5.00	20	16	7.00
#5	DEVELOPMENT	28	21	2.25	22	17	2.75	19	15	3.75	19	15	4.75	19	15	6.75
	LAP SPLICE	37	28	2.75	29	22	3.25	24	19	4.25	24	19	5.25	24	19	7.25
#6	DEVELOPMENT	37	29	2.25	31	24	2.75	22	17	3.75	22	17	4.75	22	17	6.75
	LAP SPLICE	48	37	3.00	40	31	3.50	29	22	4.50	29	22	5.50	29	22	7.50
#7	DEVELOPMENT	60	46	2.50	50	38	3.00	37	28	4.00	33	25	5.00	33	25	7.00
	LAP SPLICE	78	60	3.25	64	50	3.75	48	37	4.75	42	33	5.75	42	33	7.75
#8	DEVELOPMENT	74	57	2.50	62	48	3.00	47	36	4.00	37	29	5.00	37	29	7.00
	LAP SPLICE	96	74	3.50	80	62	4.00	60	47	5.00	48	37	6.00	48	37	8.00
#9	DEVELOPMENT	90	69	2.75	76	58	3.25	57	44	4.25	46	36	5.25	42	32	7.25
	LAP SPLICE	117	90	3.75	98	76	4.25	74	57	5.25	60	46	6.25	55	42	8.25
#10	DEVELOPMENT	108	83	2.75	92	70	3.25	70	54	4.25	57	44	5.25	47	36	7.25
	LAP SPLICE	142	109	4.00	120	92	4.50	91	70	5.50	74	57	6.50	61	47	8.50
#11	DEVELOPMENT	127	98	3.00	108	83	3.50	84	64	4.50	68	53	5.50	52	40	7.50
	LAP SPLICE	168	130	4.25	144	111	4.75	110	85	5.75	90	69	6.75	68	52	8.75

NOTES:

1. TABULATED VALUES ARE BASED ON GRADE 60 REINFORCING BARS AND NORMAL-WEIGHT CONCRETE.
2. TENSION DEVELOPMENT LENGTHS AND TENSION LAP SPLICE LENGTHS ARE CALCULATED PER ACI 318-08, SECTIONS 12.2.3 AND 12.15, RESPECTIVELY.
3. LAP SPLICE LENGTHS ARE LAP CLASS B = 1.3 l_d (ACI 318-08, SECTION 12.15.1).
4. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 IN. OF FRESH CONCRETE CAST BELOW THE BARS.

TABLE 1

REQUIRED SPECIAL INSPECTIONS - STRUCTURAL SYSTEMS

SYSTEM OR MATERIAL	REQUIRED INSPECTION	FREQUENCY OF INSPECTION		REMARKS
		CONTINUOUS	PERIODIC	
SOILS	VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL		X	
	VERIFY SOIL MATERIALS BELOW FOOTINGS ARE ADEQUATE TO ACHIEVE DESIGN BEARING CAPACITY		X	
	PRIOR TO PLACEMENT OF CONTROLLED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY		X	
	PERFORM CLASSIFICATION AND TESTING OF CONTROLLED FILL MATERIALS		X	SEE TABLE 3
	VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF CONTROLLED FILL	X		SEE TABLE 3
CONCRETE	INSPECT FORMWORK FOR LOCATION AND DIMENSIONS OF MEMBER BEING FORMED		X	
	VERIFY MATERIAL FOR REINFORCEMENT		X	CONTRACTOR TO SUBMIT CERTIFIED MILL TEST REPORTS
	REINFORCING STEEL PLACEMENT		X	
	INSPECT ANCHORS TO BE CAST IN CONCRETE		X	PRIOR TO AND DURING CONCRETE PLACEMENT
	INSPECT POST-INSTALLED CONCRETE ANCHORS: - HORIZONTAL AND UPWARDLY INCLINED ADHESIVE ANCHORS - OTHER ANCHORS UNLESS ICC REPORT REQUIRED CONTINUOUS INSPECTION	X	X	INSPECTION TO CONFORM TO IBC AND TO ANCHOR MANUFACTURER'S RECOMMENDATIONS AND ICC REPORTS
	VERIFY USE OF REQUIRED CONCRETE MIX DESIGN(S)		X	
	AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND TEMPERATURE OF CONCRETE	X		CONTINUOUS DURING PREPARATION OF SAMPLES
	CONCRETE PLACEMENT	X		
	INSPECTION FOR MAINTENANCE OF CURING PROCEDURES AND TEMPERATURE		X	VERIFY APPROPRIATE CURING METHOD HAS BEEN IMPLEMENTED AFTER EACH POUR
	VERIFY IN-SITU CONCRETE STRENGTH PRIOR TO REMOVAL OF SHORES AND FORMS FROM STRUCTURAL SLABS AND BEAMS		X	
	CEMENTITIOUS GROUTING OF BASE PLATES AND EPOXY GROUTING FOR EQUIPMENT MOUNTING	X		
MASONRY	VERIFY PROPORTIONS OF SITE -PREPARED MORTAR AND GROUT		X	AT START OF MASONRY CONSTRUCTION
	VERIFY SPECIFIED TYPE, GRADE AND SIZE OF REINFORCEMENT		X	CONTRACTOR TO SUBMIT CERTIFIED MILL TEST REPORTS
	VERIFY MATERIALS FOR MASONRY UNITS, MORTAR, GROUT, ANCHORS, TIES AND ACCESSORIES		X	CONTRACTOR TO SUBMIT MANUFACTURER'S CERTIFIED COMPLIANCE REPORTS
	VERIFY TYPE, SIZE, LOCATION AND INSTALLATION OF EMBEDDED CONNECTORS AND ANCHORS		X	
	VERIFY SIZE AND LOCATION OF STRUCTURAL ELEMENTS		X	
	VERIFY TYPE, SIZE AND LOCATION OF ANCHORAGE OF MASONRY TO OTHER CONSTRUCTION		X	
	VERIFY PROTECTION PROVISIONS FOR COLD AND HOT WEATHER MASONRY CONSTRUCTION		X	
	PLACEMENT OF MASONRY UNITS AND CONSTRUCTION OF MORTAR JOINTS		X	
	REINFORCING STEEL PLACEMENT		X	
	VERIFY GROUT SPACE IS CLEAN		X	
	VERIFY PROPORTIONS OF GROUT; USE OF REQUIRED GROUT MIX DESIGN		X	
	OBSERVE GROUT PLACEMENT	X		
	OBSERVE PREPARATION OF ANY GROUT OR MORTAR SPECIMENS AND/OR PRISMS	X		CONTINUOUS DURING PREPARATION OF SAMPLES

TABLE 1

REQUIRED SPECIAL INSPECTIONS - STRUCTURAL SYSTEMS

SYSTEM OR MATERIAL	REQUIRED INSPECTION	FREQUENCY OF INSPECTION		REMARKS
		CONTINUOUS	PERIODIC	
STRUCTURAL STEEL AND ALUMINUM	FABRICATION OF STRUCTURAL ELEMENTS			FABRICATOR SHALL BE APPROVED IN ACCORDANCE WITH IBC, CHAPTER 17 TO PERFORM WORK WITHOUT SPECIAL INSPECTION
	VERIFY MATERIAL OF ANCHOR BOLTS AND THREADED RODS		X	CONTRACTOR TO SUBMIT MANUFACTURER'S CERTIFIED TEST REPORTS
	VERIFY MATERIAL OF HIGH-STRENGTH BOLTS, NUTS AND WASHERS		X	CONTRACTOR TO SUBMIT MANUFACTURER'S CERTIFIED TEST REPORTS
	VERIFY MATERIAL FOR STRUCTURAL STEEL AND ALUMINUM SHAPES, PLATES, BARS, ETC.		X	CONTRACTOR TO SUBMIT CERTIFIED MILL TEST REPORTS
	VERIFY MATERIALS FOR WELD FILLER MATERIALS		X	
	VERIFY WELDER QUALIFICATIONS		X	CONTRACTOR TO SUBMIT WELDERS CERTIFICATES
	VERIFY USE OF PROPER WELDING PROCEDURES		X	
	INSPECT SINGLE-PASS FILLET WELDS LESS THAN OR EQUAL TO 5/16"		X	VISUALLY INSPECT ALL WELDS
	INSPECT HIGH-STRENGTH BEARING-TYPE BOLTED CONNECTIONS		X	
	VERIFY TYPE, DEPTH AND GAGE OF DECKING AND GRATING		X	
	INSPECT INSTALLATION (ATTACHMENT) OF DECKING AND GRATING		X	
	INSPECT WELDING OF HEADED STUDS IN COMPOSITE STRUCTURAL SLABS		X	
	INSPECT STEEL JOIST FRAMING TO VERIFY THAT BRIDGING, JOIST, CONNECTIONS AND PIPE SUPPORTS COMPLY WITH APPROVED CONSTRUCTION DRAWINGS	X		
	INSPECT FIELD WELDING PER AWS D1.1	X		

QUALITY ASSURANCE NOTES

1. THE QUALITY OF THE WORKMANSHIP AND THE QUALITY OF THE MATERIALS OF CONSTRUCTION ARE GOVERNED BY THE INTERNATIONAL BUILDING CODE, 2006 EDITION (IBC).
2. TO ASSURE THE QUALITY OF THE CONSTRUCTION OF THIS PROJECT, STRUCTURAL TESTS, SPECIAL INSPECTION AND STRUCTURAL OBSERVATION WILL BE PERFORMED IN ACCORDANCE WITH IBC, CHAPTER 17.
3. WHERE FREQUENCY OF INSPECTION IS SPECIFIED TO BE CONTINUOUS, THE SPECIAL INSPECTOR IS EXPECTED TO BE PRESENT IN THE AREA WHERE THE WORK IS BEING PERFORMED AND PROVIDING FULL-TIME OBSERVATION OF THE WORK REQUIRING SPECIAL INSPECTION.
4. WHERE FREQUENCY OF INSPECTION IS SPECIFIED TO BE PERIODIC, THE SPECIAL INSPECTOR IS EXPECTED TO BE PRESENT IN THE AREA WHERE THE WORK HAS BEEN OR IS BEING PERFORMED AND AT THE COMPLETION OF THE WORK (PRIOR TO THE NEXT CONSTRUCTION TASK).
5. SPECIAL INSPECTIONS ARE IN ADDITION TO INSPECTIONS BY THE BUILDING OFFICIALS. CONSTRUCTION IS SUBJECT TO INSPECTION BY THE BUILDING OFFICIAL. COORDINATE WITH BUILDING DEPARTMENT TO DETERMINE REQUIRED INSPECTIONS.
6. CONTRACTOR SHALL PROVIDE ACCESS TO THE WORK FOR REQUIRED INSPECTIONS. CONTRACTOR SHALL PROVIDE NOTIFICATION IN ADVANCE OF REQUIRED INSPECTIONS, TESTING AND STRUCTURAL OBSERVATIONS.

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LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: NONE
DESIGNED: KW
DRAWN: RBB
CHECKED: SH
APPROVED: MK

EXTERNAL REFERENCE FILES

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REGISTERED 44977 SCOTT W. HARPER Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 9/30/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

LOWER GREASEWOOD WTP
SPECIAL INSPECTION NOTES - 1

FILENAME 143956-S-003.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER S-003
SHEET NUMBER 31 OF 78

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Path: P:\Projects\navajo Nation\143956_lowergreasewooddesignCAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Structural Filename: 143956-S-003.dwg Plot Date: June 1, 2018 - 1:55 PM CADD User: David Davidse

TABLE 2
REQUIRED SPECIAL INSPECTIONS - NONSTRUCTURAL SYSTEMS

SYSTEM OR MATERIAL	REQUIRED INSPECTION	FREQUENCY OF INSPECTION		REMARKS
		CONTINUOUS	PERIODIC	
MECHANICAL	INSPECT ANCHORAGE OF FIRE SPRINKLER SYSTEM		X	
	INSPECT ANCHORAGE OF ALL MECHANICAL SYSTEMS (INCLUDING EQUIPMENT PIPING, DUCT WORK, ETC.) REQUIRING STANDBY POWER		X	
	CERTIFICATE OF COMPLIANCE FOR ALL MECHANICAL EQUIPMENT REQUIRING STANDBY POWER			EQUIPMENT MANUFACTURER SHALL PROVIDE CERTIFICATE OF COMPLIANCE
ELECTRICAL	INSPECT ANCHORAGE OF ELECTRICAL EQUIPMENT FOR STANDBY POWER		X	
	INSPECT ANCHORAGE OF ALL OTHER ELECTRICAL EQUIPMENT REQUIRING STANDBY POWER		X	
	CERTIFICATE OF COMPLIANCE FOR ALL ELECTRICAL EQUIPMENT FOR STANDBY POWER AND ALL ELECTRICAL EQUIPMENT REQUIRING STANDBY POWER			EQUIPMENT MANUFACTURER SHALL PROVIDE CERTIFICATE OF COMPLIANCE
	EMERGENCY LIGHTING		X	

TABLE 3
REQUIRED TESTING FOR SPECIAL INSPECTIONS

SYSTEM OR MATERIAL	TESTING		REMARKS
	CODE OR STANDARD REFERENCE	FREQUENCY	
GEOTECHNICAL			
PREPARED SUBGRADE DENSITY	ASTM D6938	EACH 300 SF OF PREPARED SUBGRADE	PER GEOTECHNICAL REPORT
FILL IN-PLACE DENSITY	ASTM D6938	EACH 300 SF OF EACH LIFT PLACED EACH DAY	PER GEOTECHNICAL REPORT
CONCRETE			
CONCRETE COMPRESSIVE STRENGTH	ASTM C31,ASTM C39,ASTM C172	SEE SPECIFICATION 03300	
CONCRETE SLUMP	ASTM C143	WHENEVER CYLINDERS ARE CAST	
CONCRETE AIR CONTENT	ASTM C231	WHENEVER CYLINDERS ARE CAST	
CONCRETE TEMPERATURE	ASTM C1064	WHENEVER CYLINDERS ARE CAST	
CEMETITIOUS AND EPOXY GROUT COMPRESSIVE STRENGTH	ASTM C942 (CEMENTITIOUS) ASTM C579 (EPOXY)		TEST 2" CUBES FOR EACH GROUT SHIPMENT TO THE FIELD
MASONRY			
COMPRESSIVE STRENGTH, f'm, OF MASONRY ASSEMBLIES	PRIOR TO START OF MASONRY CONSTRUCTION, CONTRACTOR SHALL SUBMIT VERIFICATION OF COMPRESSIVE STRENGTH FOR EACH TYPE OF MASONRY ASSEMBLY. PRISM TEST METHOD SHALL BE USED.		
MASONRY UNIT STRENGTH	ASTM C140	(12) UNITS PER EACH 50000 UNITS	CONTRACTOR TO SUBMIT MANUFACTURER'S CERTIFIED TEST REPORTS FOR EACH TYPE OF MASONRY UNIT
GROUT STRENGTH	ASTM C1019	EACH 5000 SF OF WALL	COMPRESSIVE STRENGTH, AIR CONTENT, SLUMP, TEMPERATURE OF FILL FOR MASONRY ASSEMBLIES SHALL BE TESTED PER CONCRETE REQUIREMENTS ABOVE.
PRISM STRENGTH OF MASONRY ASSEMBLY	ASTM C1314	(3) PRISMS FOR EACH 5000 SF OF WALL	A SET OF TESTS IS REQUIRED FOR EACH TYPE OF MASONRY ASSEMBLY
STEEL			
MAGNETIC PARTICLE (MT) AND ULTRASONIC (UT) TESTING OF WELDS	MT - AWS D1.1 6.14.4 UT - AWS D1.1 6.13 & 6.14.3	AT ALL PARTIAL AND FULL PENETRATION FIELD WELDS	
PRE-CONSTRUCTION TESTING OF WELDING STUDS	AWS D1.1 7.7.1	EACH SIZE AND TYPE OF STUD EACH SHIFT	
PRE-INSTALLATION VERIFICATION OF PRETENSIONED HIGH STRENGTH BOLTS	RCSC SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS SECTION 7	EACH COMBINATION OF DIAMETER, LENGTH, GRADE, AND LOT TO BE USED IN THE WORK	

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AT FULL SIZE
(IF NOT 2" - SCALE ACCORDINGLY)
SCALE: NONE
DESIGNED: KW
DRAWN: RBB
CHECKED: SH
APPROVED: MK

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44977
SCOTT W. HARPER
Date Signed 6/2/2017
ARIZONA, U.S.A.
Expires 9/30/18

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

LOWER GREASEWOOD WTP
SPECIAL INSPECTION NOTES - 2

FILENAME 143956-S-004.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER S-004
SHEET NUMBER 32 OF 78

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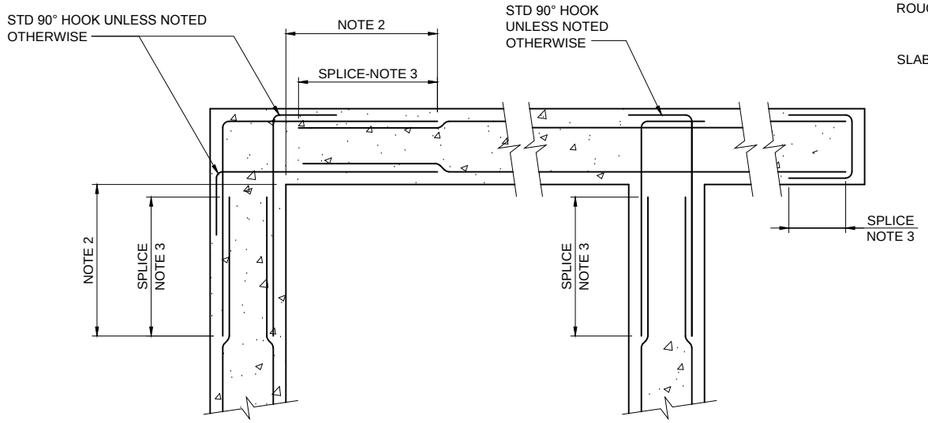
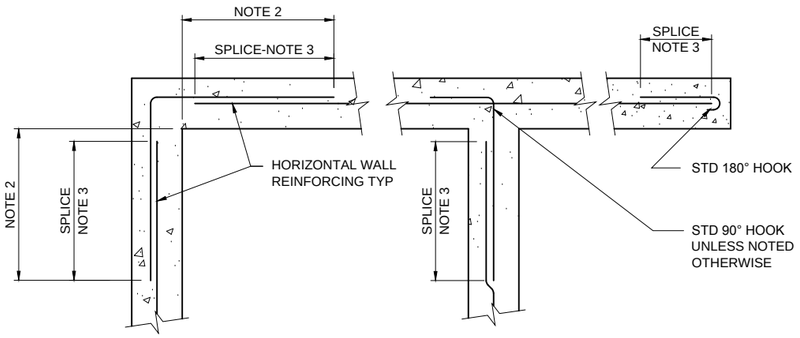
Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Structural Filename: 143956-S-004.dwg Plot Date: June 1, 2018 - 1:56 PM CADD User: David Davidse



DOUBLE MAT REINFORCING



SINGLE MAT REINFORCING

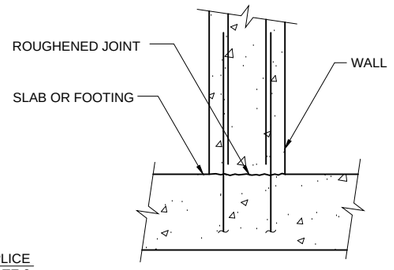
NOTES:

1. UNLESS NOTED OTHERWISE, SIZE AND SPACING OF CORNER OR INTERSECTION REINFORCING SHALL MATCH HORIZONTAL REINFORCING SHOWN IN SPECIFIC SECTIONS OR DETAILS. VERTICAL REINFORCING NOT SHOWN FOR CLARITY.
2. UNLESS NOTED OTHERWISE, BAR SPLICE SHALL BE LOCATED OUTSIDE OF CORNER OR INTERSECTION AREA TO AVOID CONGESTION. CONTRACTORS OPTION TO PROVIDE SINGLE BENT BAR IN LIEU OF SPLICE CONFIGURATION AT ONE END ONLY.
3. SEE GENERAL STRUCTURAL NOTES FOR SPLICE LENGTH. HORIZONTAL WALL BARS SHALL BE CONSIDERED TOP BARS FOR DEVELOPMENT AND SPLICE LENGTHS.

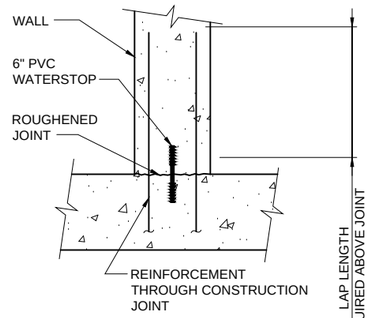
TYPICAL HORIZONTAL WALL REINFORCING

DETAIL A / VAR

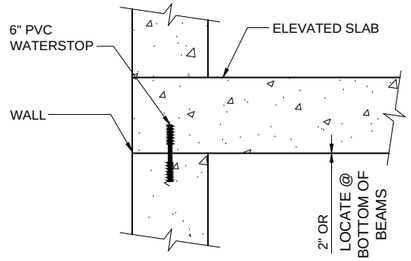
SCALE: NONE



TYPICAL JOINT WITHOUT WATERSTOP



JOINT WITH PVC WATERSTOP



NOTES:

1. SEE SECTIONS AND DETAILS FOR TYPE OF JOINT REQUIRED.
2. ALL REINFORCING TO CONTINUE THROUGH JOINT.

WALL/ELEVATED SLAB JOINT WITH PVC WATERSTOP

TYPICAL HORIZONTAL CONSTRUCTION JOINT

DETAIL B / VAR

SCALE: NONE

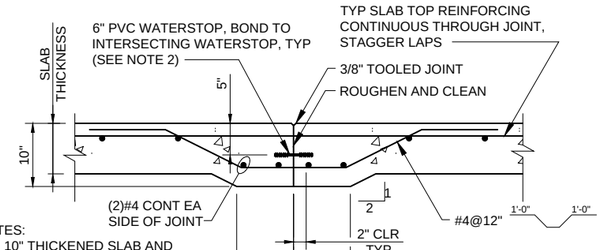
NOTES:

1. ALL REINFORCING SHALL BE CONTINUOUS THROUGH JOINT.
2. WATERSTOP REQUIRED AT LIQUID HOLDING BASINS AND TANKS, AND BELOW GRADE WALLS.

TYPICAL VERTICAL WALL CONSTRUCTION JOINT

DETAIL D / VAR

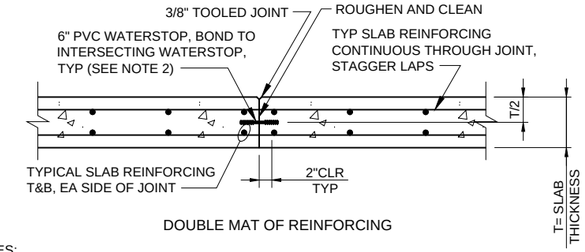
SCALE: NONE



NOTES:

1. 10" THICKENED SLAB AND ADDITIONAL #4 ONLY AT JOINTS WITH WATERSTOPS. REQ'D
2. FOR SLABS 10" THICK OR GREATER, NO THICKENING REQ'D.

ONE LAYER OF REINFORCING



DOUBLE MAT OF REINFORCING

NOTES:

1. ALL REINFORCING SHALL BE CONTINUOUS THROUGH JOINT.
2. WATERSTOP REQUIRED AT LIQUID HOLDING BASINS AND TANKS, AND BELOW GRADE SLABS.

TYPICAL SLAB CONSTRUCTION JOINT

DETAIL C / VAR

SCALE: NONE

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SCALE:	AS SHOWN
DESIGNED:	KW
DRAWN:	RBB
CHECKED:	SH
APPROVED:	MK

EXTERNAL REFERENCE FILES

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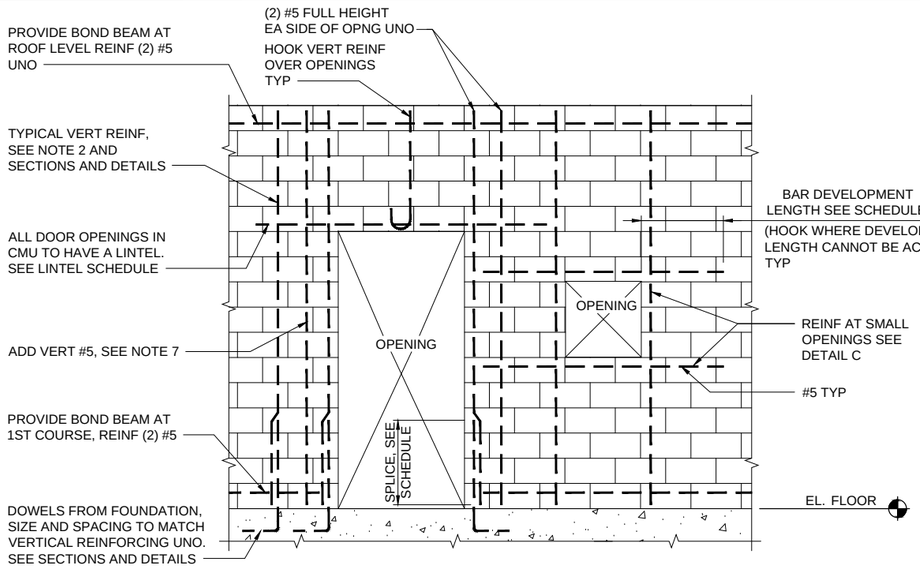
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

LOWER GREASEWOOD WTP
STANDARD DETAILS - 1

FILENAME	143956-S-005.dwg
BC PROJECT NUMBER	143956
DRAWING NUMBER	S-005
SHEET NUMBER	33 OF 78



NOTES:

1. GROUT ALL CELLS SOLID.
2. UNLESS NOTED OTHERWISE, 8" CMU WALLS SHALL BE REINFORCED WITH #5 @ 16" VERTICAL (CENTERED IN WALL).
3. PROVIDE ADDITIONAL BOND BEAMS AS DEFINED ON DRAWING SECTIONS.
4. FOR ADDITIONAL REINFORCEMENT AT WALL INTERSECTIONS AND CORNERS, SEE DETAIL D/S-006.
5. HORIZONTAL JOINT REINFORCEMENT (HJR) AT 16-INCHES ON CENTER MAXIMUM. PROVIDE PRE-FABRICATED CORNER AND INTERSECTION PIECES AS SPECIFIED.
   1) HJR IS 2-W1.7 (9 GAGE) PER COURSE SPACING, ONE WIRE IN EACH FACE SHELL.
   2) LAP = 1'-4" FOR HJR.
6. CMU FOR BOND BEAMS TO BE SPECIAL BOND BEAM UNITS.
7. AT ROLL UP DOORS WIDER >10' ADD FULL HEIGHT VERT #5 (3) CELLS OVER FROM OPENING EACH SIDE.
8. REBAR POSITIONER, SEE DETAIL B/S-007.

BAR DEVELOPMENT OR SPLICE LENGTH SCHEDULE	
BAR SIZE	8" CMU
	SINGLE CURTAIN REINF
4	3'-0"
5	3'-9"
6	4'-6"

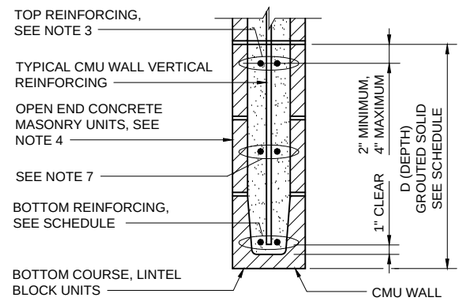
NOTE:

1. UNLESS NOTED OTHERWISE IN THE DRAWINGS, ALL DEVELOPMENT AND SPLICE LENGTHS SHALL CONFORM TO THE TABLE ABOVE.

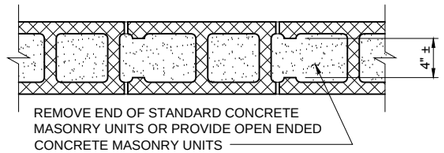
TYPICAL MASONRY WALL ELEVATION

DETAIL A / S-006

SCALE: NONE



SECTION



PLAN--CONCRETE MASONRY UNITS ABOVE BOTTOM LINTEL UNIT (SEE NOTE 4)

LINTEL SCHEDULE			
MAXIMUM OPENING WIDTH	D	REINFORCING SEE NOTE 3 & 7	END BEARING, SEE NOTE 6
2'-8"	8"	2 #5	2'-0"
4'-0"	16"	2 #5	2'-0"
10'-0"	24"	2 #5	2'-0"
18'-0"	24"	2 #5	2'-0"

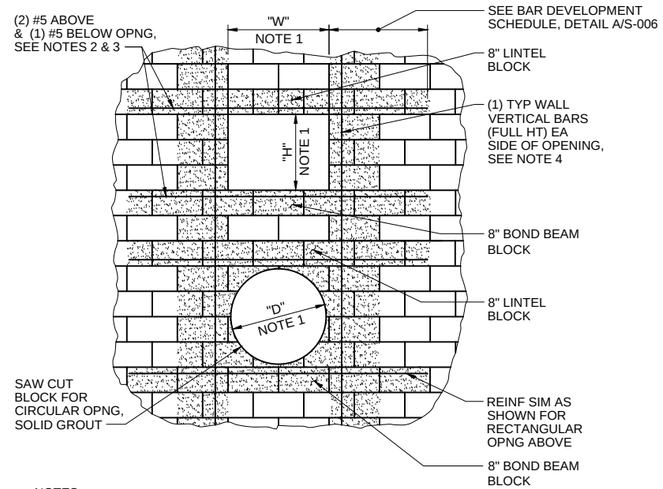
NOTES:

1. REINFORCING TO EXTEND FULL LENGTH OF LINTEL.
2. ALL MASONRY OPENINGS TO HAVE A LINTEL.
3. LINTELS OVER OPENINGS THAT ARE 4'-0" OR LARGER SHALL HAVE TOP REINFORCING IDENTICAL TO BOTTOM REINFORCING.
4. PROVIDE OPEN END CONCRETE MASONRY UNITS FOR ALL CONCRETE MASONRY UNITS ABOVE BOTTOM COURSE OF CONCRETE MASONRY LINTEL UNITS. OPEN END UNITS SHOULD EXTEND FULL WIDTH LINTEL INCLUDING BEARING AT BOTH ENDS. OPEN END UNITS MAY BE MADE FROM STANDARD UNITS BY REMOVING WEB AT ONE END.
5. DETAIL APPLICABLE FOR ALL MASONRY WALL LINTELS EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE.
6. END BEARING SHALL BE 2'-0" UNLESS END OF WALL PREVENTS WALL FROM EXTENDING 2'-0", WHEREAS END BEARING SHALL BE DISTANCE FROM EDGE OF OPENING TO END OF WALL, 8" MINIMUM.
7. FOR OPENING WIDTH GREATER THAN 10'-0", 2 ADDITIONAL #5 ARE REQUIRED IN THE MIDDLE OF THE LINTEL.

CMU LINTEL

DETAIL B / S-006

SCALE: NONE



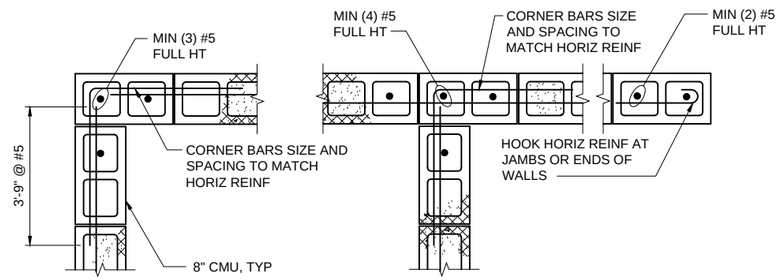
NOTES:

1. TYPICAL FOR ALL OPENINGS WITH (W, H, OR D) 2'-0" OR GREATER AND 4'-0" OR LESS, UNLESS NOTED OTHERWISE. SEE PLANS FOR LARGER OPENINGS.
2. AT ADJACENT OPENINGS WITH LESS THAN 8'-0" WALL BETWEEN, CONTINUE HORIZONTAL REINFORCING TO 3'-9" BEYOND FURTHEST OPENING.
3. AT OPENINGS LOCATED WITHIN 3'-9" OF CORNER, CONTINUE HORIZONTAL REINFORCING AROUND CORNER PER DETAIL D/S-006.
4. LOCATE VERTICAL BARS CENTERED IN 1 ADJACENT CELL IN 8" WALLS, LAP WITH MATCHING FOUNDATION DOWELS. SEE DETAIL A/S-006 FOR LAP LENGTH.

CMU OPENING REINFORCING

DETAIL C / S-006

SCALE: NONE



NOTE:

1. ALL CELLS TO BE SOLID GROUTED.

TYPICAL CMU WALL REINFORCING AT CORNERS AND INTERSECTIONS

DETAIL D / S-006

SCALE: NONE

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesignCAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse\2-Sheets\Structural Filename: 143956-S-006.dwg Plot Date: June 1, 2018 - 1:57 PM CADD User: David Davidse

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17 (PROJECT MANAGER)

APPROVED: _____ DATE: 6/2/17 BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: AS SHOWN

DESIGNED: KW

DRAWN: RBB

CHECKED: SH

APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED ARCHITECT 44977 SCOTT W. HARPER Date Signed 6/30/2017 ARIZONA, U.S.A. Expires 9/30/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

GREAT SEAL OF THE NAVAJO NATION

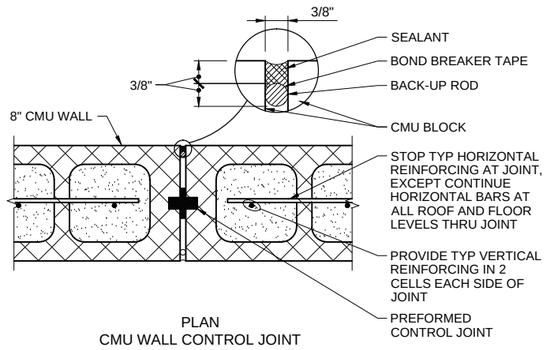
NTUA NAVAJO TRIBAL UTILITY AUTHORITY UTILITIES FOR THE NAVAJO NATION

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

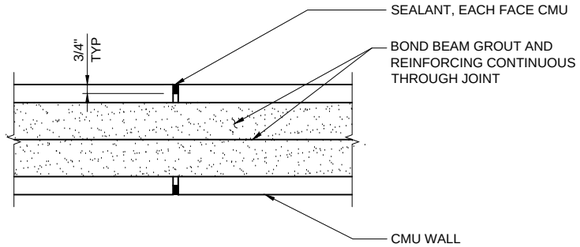
LOWER GREASEWOOD WTP
STANDARD DETAILS - 2

FILENAME: 143956-S-006.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: S-006
SHEET NUMBER: 34 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH



PLAN
CMU WALL CONTROL JOINT



PLAN
AT ROOF AND FLOOR LEVEL BOND BEAMS

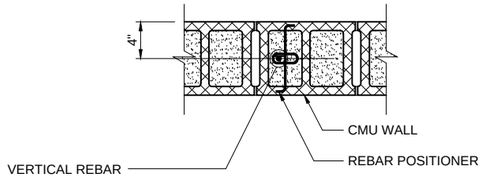
NOTE:

1. ALL HORIZONTAL REINFORCING INCLUDING JOINT REINFORCEMENT SHALL BE DISCONTINUOUS AT CONTROL JOINTS EXCEPT BOND BEAM REINFORCING AT ROOF LEVEL, FLOOR LEVEL(S), AND PARAPET LEVEL (IF APPLICABLE).

TYPICAL CMU WALL CONTROL JOINT (MWCJ)

DETAIL A / S-007

SCALE: NONE



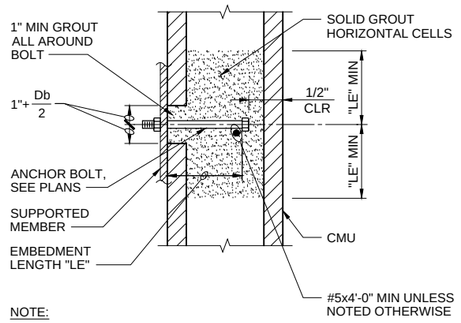
NOTES:

1. REBAR POSITIONER ARE REQUIRED AT ALL VERTICAL REBAR IN CMU WALLS.
2. REBAR POSITIONERS SHALL BE 9 GAGE WIRE, HOT DIP GALVANIZED.
3. REBAR POSITIONER SHALL BE LOCATED AT TOP OF FIRST COURSE, ONE COURSE BELOW TOP OF WALL, AND AT MAXIMUM SPACING OF 4'-0".

REBAR POSITIONER

DETAIL B / S-007

SCALE: NONE



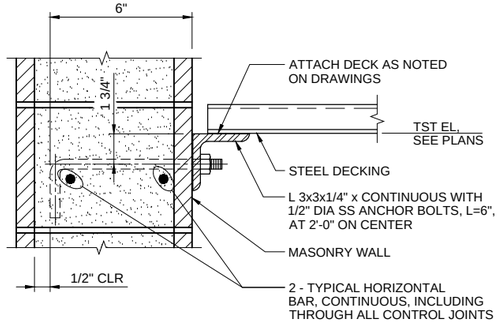
NOTE:

Db = DIAMETER OF BOLT

MASONRY ANCHOR BOLT

DETAIL C / S-007

SCALE: NONE



DECKING NORMAL TO WALL SHOWN

NOTE:

1. DECKING LEDGER SUPPORT ANGLE TO CMU WALL CONNECTION SIMILAR AT WALL PARALLEL TO DECK SPAN. SEE DETAIL A/S-009.

DECKING LEDGER SUPPORT ANGLE

DETAIL D / S-007

SCALE: NONE

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Structural Filename: 143956-S-007.dwg Plot Date: June 1, 2018 - 1:57 PM CADD User: David Davidse

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17 (PROJECT MANAGER)
APPROVED: _____ DATE: 6/2/17 (BROWN AND CALDWELL)

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: AS SHOWN
DESIGNED: KW
DRAWN: RBB
CHECKED: SH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

SCOTT W. HARPER 44977 REGISTERED PROFESSIONAL ENGINEER ARIZONA, U.S.A. Date Signed 6/2/2017 Expires 9/30/18

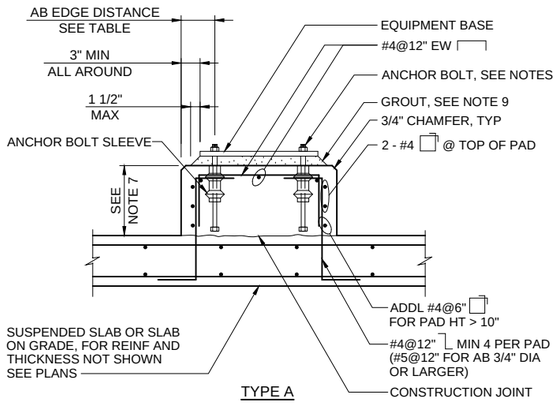
REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

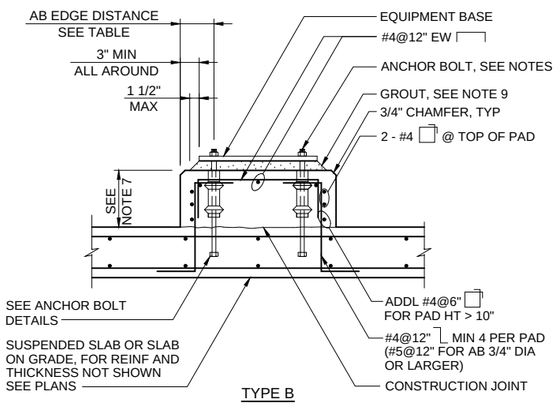
LOWER GREASEWOOD WTP
STANDARD DETAILS - 3

FILENAME: 143956-S-007.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: S-007
SHEET NUMBER: 35 OF 78

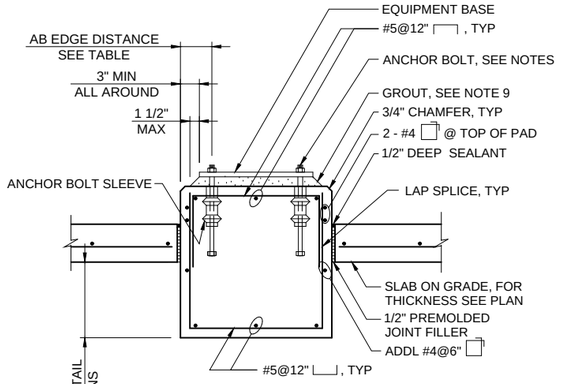
ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH



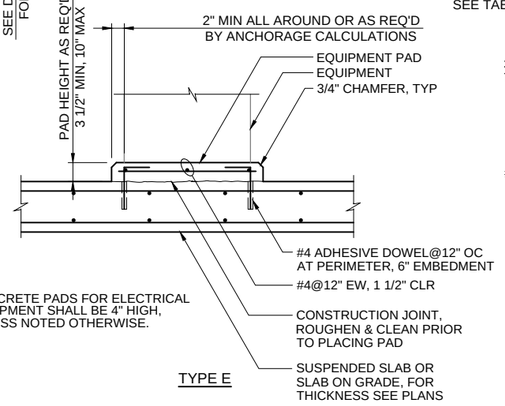
TYPE A



TYPE B



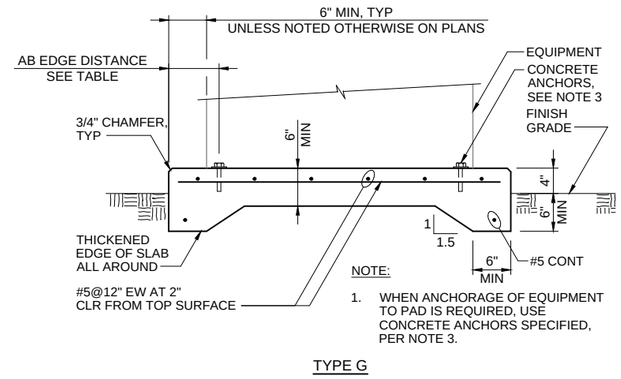
TYPE D



NOTES:

1. CONCRETE PADS FOR ELECTRICAL EQUIPMENT SHALL BE 4" HIGH, UNLESS NOTED OTHERWISE.

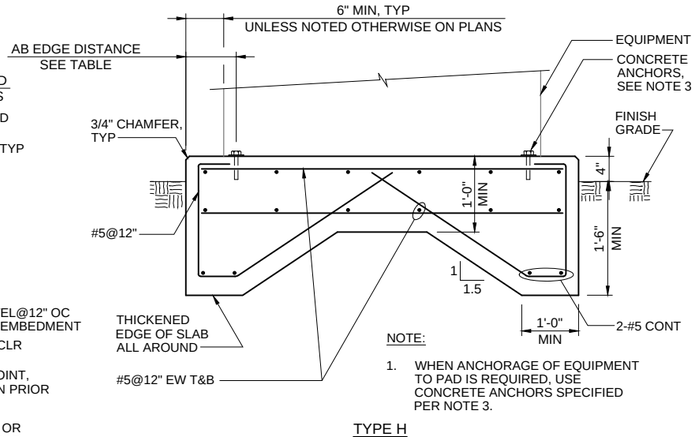
TYPE E



NOTE:

1. WHEN ANCHORAGE OF EQUIPMENT TO PAD IS REQUIRED, USE CONCRETE ANCHORS SPECIFIED, PER NOTE 3.

TYPE G



NOTE:

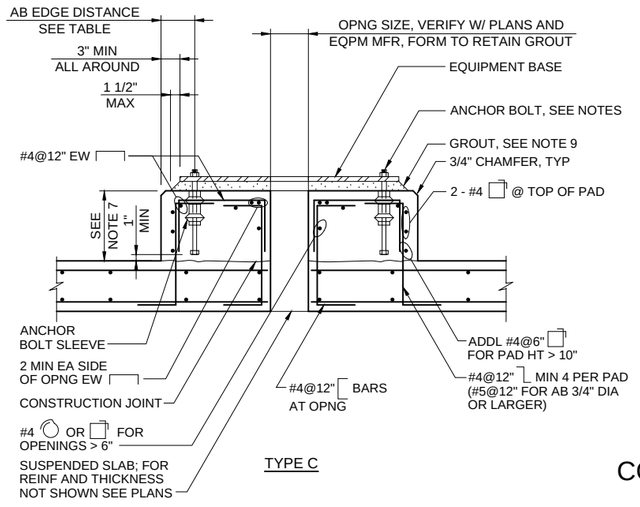
1. WHEN ANCHORAGE OF EQUIPMENT TO PAD IS REQUIRED, USE CONCRETE ANCHORS SPECIFIED PER NOTE 3.

TYPE H

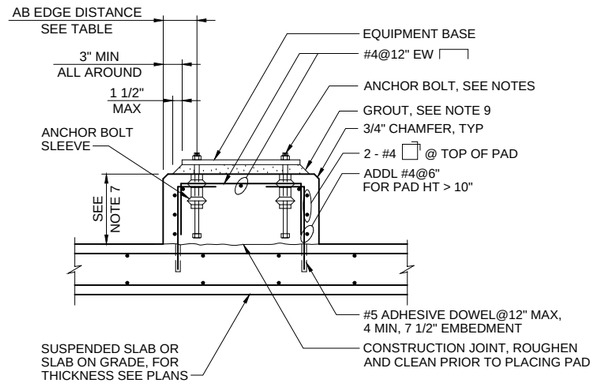
NOTES:

1. PAD SIZE SHALL BE MINIMUM INDICATED OR AS SHOWN ON THE PLANS OR AS INDICATED BY THE MANUFACTURER AND APPROVED BY THE PROJECT REPRESENTATIVE.
2. COORDINATE LOCATION OF ELECTRICAL CONDUIT AND DRAINAGE PIPING PENETRATIONS WITHIN THE EQUIPMENT PAD. STUB UP PENETRATIONS ON THE SAME SIDE OF THE EQUIPMENT AS REQUIRED FOR CONNECTION TO EQUIPMENT. EQUIPMENT DRAINS SHALL BE LOCATED AS REQUIRED FOR DRAINAGE FROM EQUIPMENT. EQUIPMENT PAD SHALL BE CONFIGURED ACCORDINGLY.
3. THE SIZE, NUMBER, TYPE, LOCATION, AND THREAD PROJECTION OF THE ANCHOR BOLTS SHALL BE DETERMINED BY THE EQUIPMENT MANUFACTURER AND AS APPROVED BY THE PROJECT REPRESENTATIVE. ANCHOR BOLTS SHALL BE HELD IN POSITION WITH A TEMPLATE OR OTHER ACCEPTABLE MEANS, MATCHING THE BASE PLATE, WHILE PAD IS BEING PLACED.
4. ANCHOR BOLT SLEEVES SHALL HAVE A MINIMUM INTERNAL DIAMETER 1" GREATER THAN BOLT DIAMETER AND A MAXIMUM INTERNAL DIAMETER 3" GREATER THAN ANCHOR BOLT DIAMETER. THE MINIMUM SLEEVE LENGTH SHALL BE 8 TIMES THE BOLT DIAMETER. SLEEVES SHALL BE FILLED WITH NON-SHRINK GROUT AFTER BOLTS ARE ALIGNED. SEE ANCHOR BOLT DETAILS DRAWING.
5. EQUIPMENT BASES SHALL BE INSTALLED LEVEL, SEE SPECIFICATION SECTION 11002 FOR LEVELING REQUIREMENT.
6. WEDGES OR SHIMS SHALL BE USED TO SUPPORT THE BASE WHILE THE GROUT IS PLACED. ANCHOR BOLTS MAY BE USED FOR LEVELING WITH DOUBLE NUTS. HOWEVER, PRIOR TO TIGHTENING, THE BASE PLATE MUST BE HARD-SHIMMED AND THE LEVELING NUTS BACKED OFF. EACH ANCHOR BOLT MUST HAVE IT'S OWN SHIM PACK AND THE NUT FULLY TIGHTENED PRIOR TO GROUTING. WEDGES OR SHIMS THAT ARE LEFT IN PLACE SHALL NOT BE EXPOSED TO VIEW.
7. HEIGHT OF PADS SHALL BE MINIMUM REQUIRED FOR ANCHOR BOLT CLEARANCE TO KEEP ANCHOR BOLT ABOVE SUPPORTING SLAB (SEE TABLE BELOW). WHERE EQUIPMENT OR PIPING ELEVATION REQUIRE A PAD HEIGHT LESS THAN THE MINIMUM SHOWN, USE TYPE "B" EQUIPMENT PAD WITH ANCHOR BOLT EMBEDDED INTO BASE SLAB.
8. TYPE "D" PAD SHALL BE USED ONLY WHERE SPECIFICALLY INDICATED. PLACE THE SURROUNDING FLOOR SLAB AFTER THE EQUIPMENT PAD.
9. FOR GROUT APPLICATION, SEE SPECIFICATION SECTION 11002.
10. AT CONTRACTOR'S OPTION, ADHESIVE ANCHORS MAY BE USED IN LIEU OF CAST-IN-PLACE ANCHOR BOLTS FOR EQUIPMENT ANCHOR BOLTS LESS THAN 5/8" DIAMETER WHEN APPROVED BY THE EQUIPMENT MANUFACTURER AND APPROVED BY THE PROJECT REPRESENTATIVE. ANCHORS SHALL BE INSTALLED WITH 4 1/2" MINIMUM EDGE DISTANCE IN EACH DIRECTION.
11. ANCHOR BOLTS AND EQUIPMENT PADS FOR RIGID EQUIPMENT MOUNTS SHALL COMPLY WITH SPECIFICATION SECTION 11002. REQUIREMENTS IN SECTION 11002 SHALL CONTROL OVER THE STANDARD DETAILS SHOWN ON THIS DRAWING.

EQUIPMENT PAD DIMENSIONS										
AB DIA (IN.)	1/2	5/8	3/4	7/8	1	1 1/4	1 3/8	1 1/2	1 3/4	2
MIN PAD HT (IN.)	7 1/2	9 1/2	11	12 1/2	14	17 1/2	19	20 1/2	24	27
MIN AB EDGE DISTANCE	4 1/2	4 1/2	4 1/2	5 1/4	6	7 1/2	8 1/4	9	10 1/2	12



TYPE C



TYPE F

CONCRETE EQUIPMENT PAD DETAILS

SCALE: NONE

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17
PROJECT MANAGER

APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: AS SHOWN
DESIGNED: KW
DRAWN: MGG
CHECKED: SH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED ARIZONA U.S.A. 44977 SCOTT W. HARPER Date Signed 6/2/2017 Expires 9/30/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

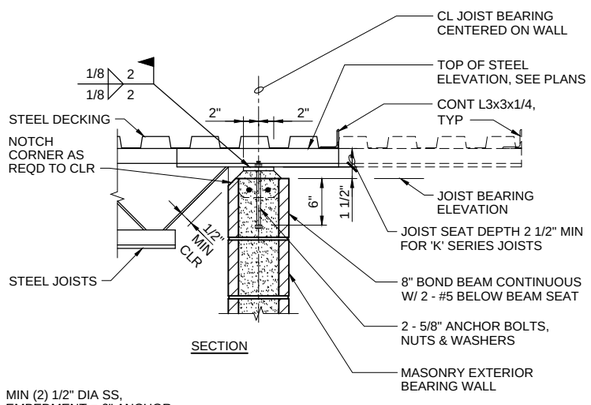
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

LOWER GREASEWOOD WTP
STANDARD DETAILS - 4

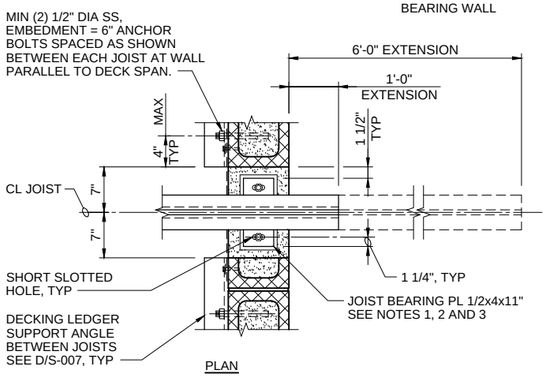
FILENAME 143956-S-008.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER S-008
SHEET NUMBER 36 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Structural Filename: 143956-S-008.dwg Plot Date: June 1, 2018 - 1:59 PM CADD User: David Davidse



SECTION



PLAN

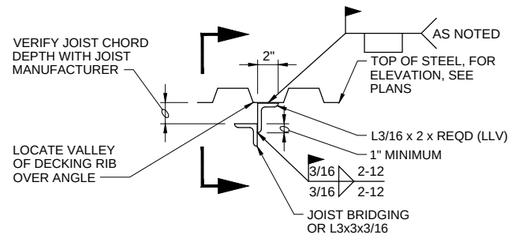
NOTES:

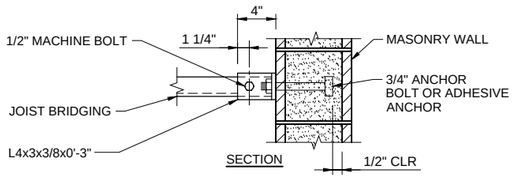
1. MINIMUM SEAT CONNECTION SHOWN. COORDINATE WITH JOIST MANUFACTURER DESIGN.
2. JOIST SHOWN WITHOUT SLOPE. SEE SECTIONS FOR CORRECT SLOPE.
3. JOIST MANUFACTURER SHALL PROVIDE SLOPED BEARING SEATS WITH GROUT PACK PER DESIGN.

STEEL JOIST SEAT/EXTERIOR WALL

DETAIL A / S-009

SCALE: NONE





BOTTOM BRIDGING CONNECTION

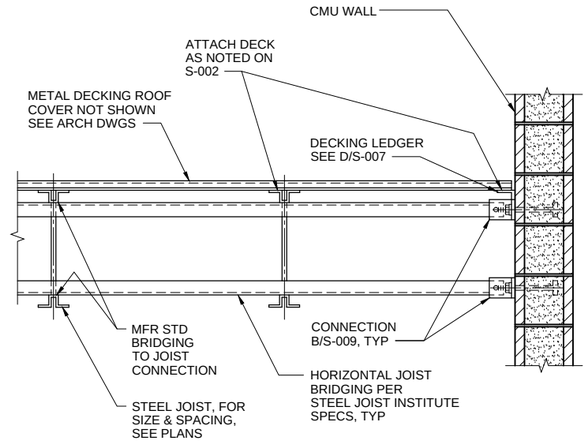
NOTES:

1. MINIMUM BRIDGING CONNECTION SHOWN. COORDINATE WITH JOIST MANUFACTURER DESIGN.

JOIST BRIDGING/WALL CONNECTION

DETAIL B / S-009

SCALE: NONE



TYPICAL K JOIST BRIDGING

DETAIL C / S-009

SCALE: NONE

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse\2-Sheets\Structural Filename: 143956-S-009.dwg Plot Date: June 1, 2018 - 2:00 PM CADD User: David Davidse

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17
(PROJECT MANAGER)
APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: AS SHOWN
DESIGNED: KW
DRAWN: RBB
CHECKED: SH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

CERTIFICATE NO. 44977 SCOTT W. HARPER Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 9/30/18

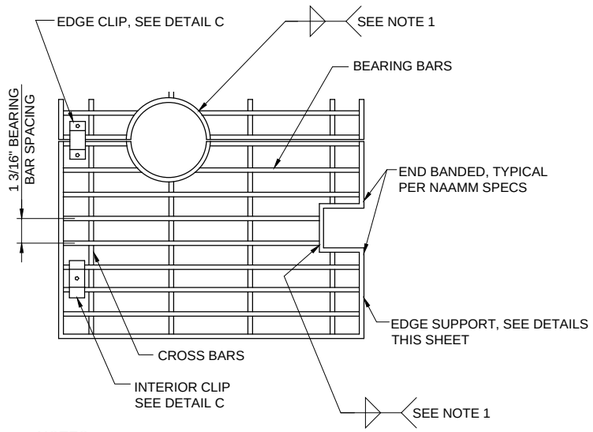
REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

LOWER GREASEWOOD WTP
STANDARD DETAILS - 5

FILENAME: 143956-S-009.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: S-009
SHEET NUMBER: 37 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH



NOTES:
1. TYPICAL ALL BEARING AND CROSS BARS TO INTERIOR END BANDS.
2. FOR ADDITIONAL INFORMATION, SEE DETAIL B.

ALUMINUM GRATING PLAN

DETAIL A / VAR

SCALE: NONE

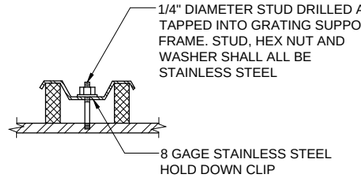
GRATING SCHEDULE		
BEARING BAR SIZE (SEE NOTE 7)	CLEAR SPAN	MINIMUM END BEARING
1 1/4 x 3/16	UP TO 4'-0"	1"
1 1/2 x 3/16	4'-6"	1"
1 3/4 x 3/16	5'-0"	1"
2 x 3/16	6'-0"	1"
2 1/4 x 3/16	6'-6"	1"
2 1/2 x 3/16	7'-0"	2"

GRATING NOTES:
1. NAAMM REFERS TO "NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS," LATEST EDITION.
2. GRATING SHALL CONFORM TO THE METAL BAR GRATING MANUAL OF NAAMM. UNLESS OTHERWISE SPECIFIED, GRATING SUPPORT BEAMS SHALL BE ALUMINUM AND GRATING SUPPORT ANGLES AND EMBEDS SHALL BE STAINLESS STEEL.
3. GRATING SHALL BE SWAGED.
4. UNLESS OTHERWISE SPECIFIED, PROVIDE 4 GRATING CLIPS APPROXIMATELY 4 INCHES FROM THE CORNERS OF EACH PIECE. ADJACENT PIECES MAY BE ANCHORED WITH ONE CLIP AND TWO STUDS, THE HOLD DOWN CLIPS SHALL BE STAINLESS STEEL.
5. GRATING SHALL BE REMOVABLE.
6. CLEAR SPAN SHALL BE PLAN DIMENSION, FACE TO FACE OF OPENING.
7. BEARING BAR SIZE SHALL BE AS SHOWN IN TABLE UNLESS SPECIFIED OTHERWISE ON DESIGN DRAWINGS.

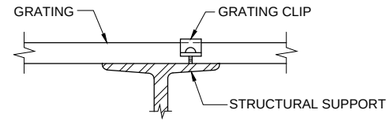
ALUMINUM GRATING SCHEDULE AND NOTES

DETAIL B / VAR

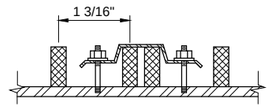
SCALE: NONE



INTERIOR CLIP



CLIPS ON FRAMING

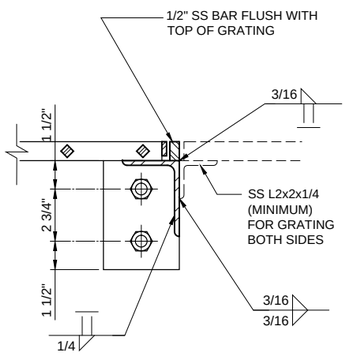


CLIP AT EDGES

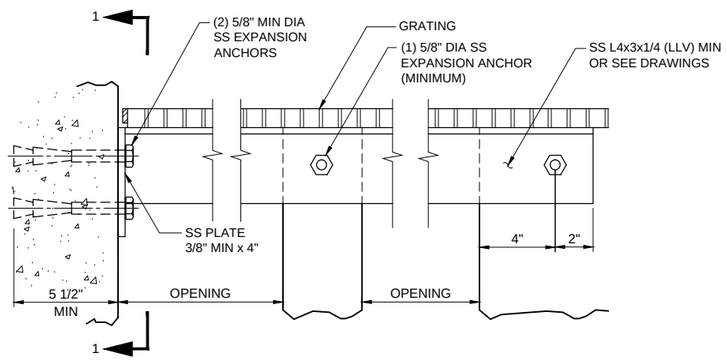
GRATING CLIPS

DETAIL C / VAR

SCALE: NONE



SECTION 1-1

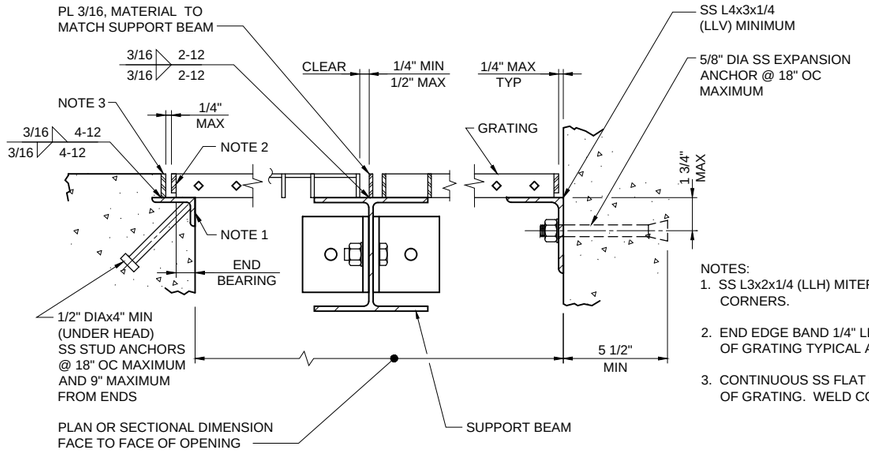


END RETURN WALL | INTERMEDIATE WALL | END FLUSH WALL

GRATING SUPPORT AT OPENINGS

DETAIL E / VAR

SCALE: NONE



NOTES:
1. SS L3x2x1/4 (LLH) MITER AND WELD CORNERS.
2. END EDGE BAND 1/4" LESS THAN DEPTH OF GRATING TYPICAL AT BEARING SEATS.
3. CONTINUOUS SS FLAT BAR 1/4" x DEPTH OF GRATING. WELD CORNERS.

GRATING SUPPORT AT CONCRETE

DETAIL F / VAR

SCALE: NONE

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ (PROJECT MANAGER) DATE: 6/2/17

APPROVED: _____ (BROWN AND CALDWELL) DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE:	AS SHOWN
DESIGNED:	KW
DRAWN:	MGG
CHECKED:	SH
APPROVED:	MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED ARCHITECT 44977 SCOTT W. HARPER Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 9/30/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

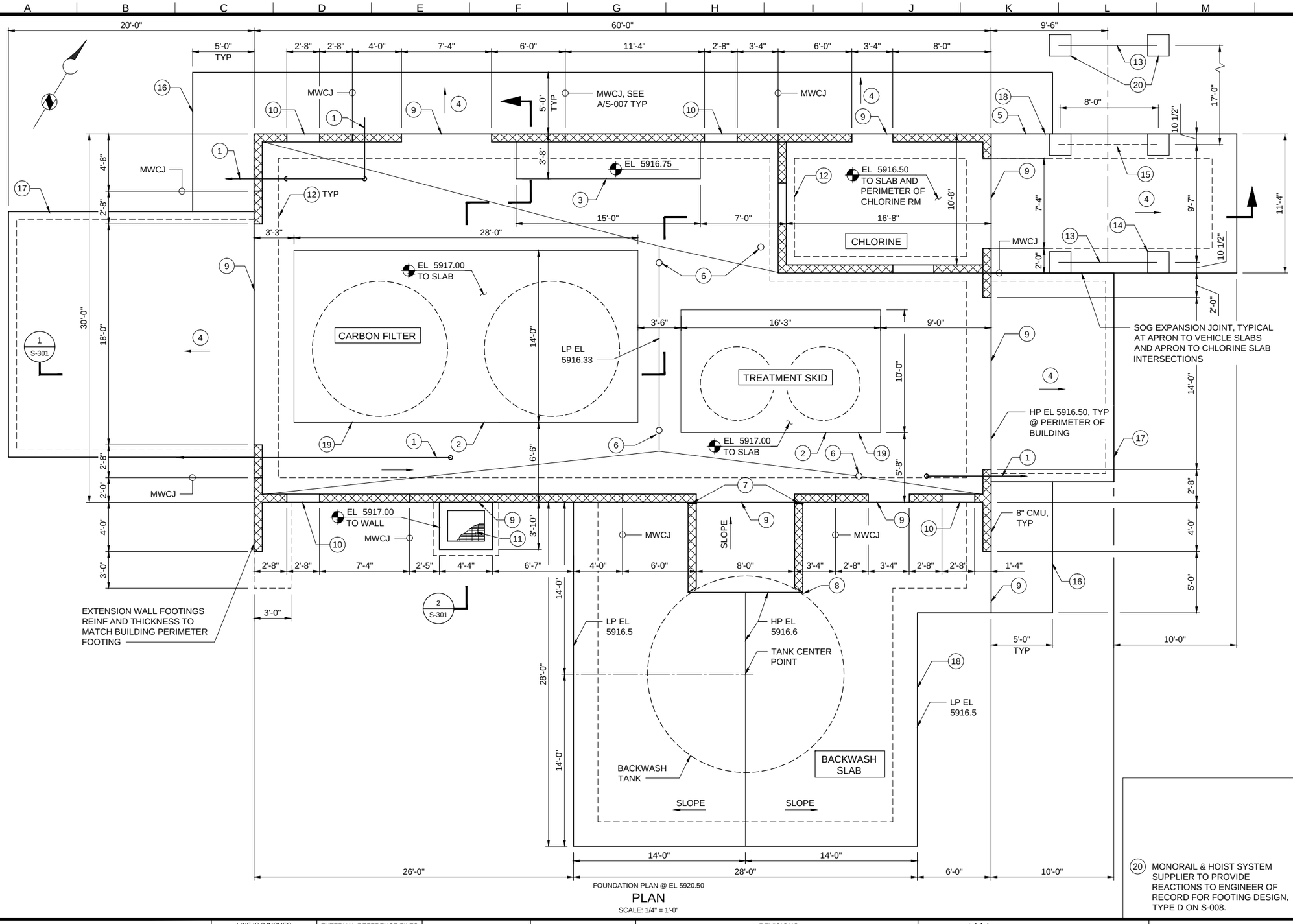
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

LOWER GREASEWOOD WTP
STANDARD DETAILS - 6

FILENAME 143956-S-010.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER S-010
SHEET NUMBER 38 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Structural Filename: 143956-S-010.dwg Plot Date: June 1, 2018 - 2:00 PM CADD User: David Davidse



FOUNDATION PLAN @ EL 5920.50

PLAN

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

GENERAL NOTES:

1. REFER TO STRUCTURAL GENERAL NOTES AND STANDARD DETAILS FOR ADDITIONAL INFORMATION.
2. NOT ALL REQUIRED OPENINGS IN THE SLAB AND WALLS ARE SHOWN ON THE STRUCTURAL DRAWINGS. SEE THE ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS.

KEY NOTES:

1. SEE MECHANICAL AND CIVIL DRAWINGS FOR PIPE INFO AND LOCATION OF PIPE PENETRATIONS THRU THE FLOOR SLAB.
2. MECHANICAL HOUSE KEEPING PAD, VERIFY SIZE WITH EQUIPMENT SUPPLIER. EQUIPMENT SUPPLIER TO DESIGN AND PROVIDE ANCHORS TO CONCRETE SLAB BELOW HOUSE KEEPING PAD. SEE SPECIFICATION 01900 FOR DESIGN CRITERIA. SIZE EQUIPMENT BASE / SKIDS TO LIMIT BEARING PRESSURES TO THOSE SHOWN IN THE DESIGN CRITERIA ON S-001.
3. ELECTRICAL HOUSE KEEPING PAD, VERIFY SIZE WITH EQUIPMENT SUPPLIER, TYPE A ON S-008.
4. SLOPE EXTERIOR SLABS AT 1/8"/FT.
5. SEE MECHANICAL DRAWINGS FOR LOCATION OF CHLORINE LOADING RACK AND CHLORTAINER.
6. FLOOR DRAIN, SEE MECHANICAL DRAWING FOR TYPE AND SIZE. VERIFY SIZE WITH SUPPLIER.
7. MWCJ SIMILAR TO SECTION A/S-007, EXCEPT NO PRE-FORMED CJ.
8. CONTRACTOR TO COORDINATE CONNECTION OF TANK TO CMU WITH TANK SUPPLIER.
9. 1/2" EXPANSION JOINT WITH JOINT FILLER AND SEALANT PER SPECIFICATION.
10. LOUVER. NOT ALL LOUVERS ARE SHOWN HERE. SEE ARCHITECTAL DRAWINGS FOR SIZE AND LOCATION.
11. ALUMINUM GRATING PER DETAIL A/S-010.
12. THICKENED SLAB EDGE. SEE SECTIONS FOR WIDTH AND DEPTH.
13. MONORAIL AND HOIST SYSTEM. SEE SPECIFICATION 14611. WIDTH OF SUPPORTING FRAME TO BE DETERMINED BY SYSTEM SUPPLIER.
14. MONORAIL AND HOIST SUPPORT FRAME TO USE CHLORINE RACK SLAB FOR FOOTING. MONORAIL AND HOIST SYSTEM SUPPLIER TO PROVIDE REACTIONS TO ENGINEER OF RECORD (EOR) FOR SLAB DESIGN. CONTRACTOR SHALL NOT CONSTRUCT SLAB BEFORE EOR HAS CHECKED SLAB DESIGN.
15. OPTIONAL CENTER SUPPORT, COORDINATE CLEARANCE THRU SUPPORTS WITH LENGTH OF CYLINDER.
16. 6" APRON SLAB. REINFORCE WITH #4@12" OC, EW CENTERED. PROVIDE CONTROL JOINTS AT 10'-0" MAX SPACING. AT EACH CONTROL JOINT TERMINATE EVERY OTHER REINFORCEMENT BAR.
17. 8" VEHICLE SLAB. SEE 1/S-302 FOR REINFORCEMENT.
18. SLAB REINFORCEMENT, CONCRETE THICKNESS AND SLAB EDGE TO MATCH BUILDING SLAB.
19. CONTRACTOR TO PROVIDE AND INSTALL CONCRETE IN BOTTOM OF ALL FOUR TREATMENT VESSELS TO SUPPORT UNDERDRAIN PIPING. CONCRETE TO FILL VESSEL BOTTOM UP TO UNDERDRAIN PIPING. INSTALLATION SHALL BE COORDINATED WITH EQUIPMENT VENDOR.
20. MONORAIL & HOIST SYSTEM SUPPLIER TO PROVIDE REACTIONS TO ENGINEER OF RECORD FOR FOOTING DESIGN, TYPE D ON S-008.

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APPROVED: _____ DATE: 6/2/17 (BROWN AND CALDWELL)

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

DESIGNED: KW
DRAWN: RBB
CHECKED: SH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

CERTIFICATE NO. 44977 SCOTT W. HARPER Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 9/30/18

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.

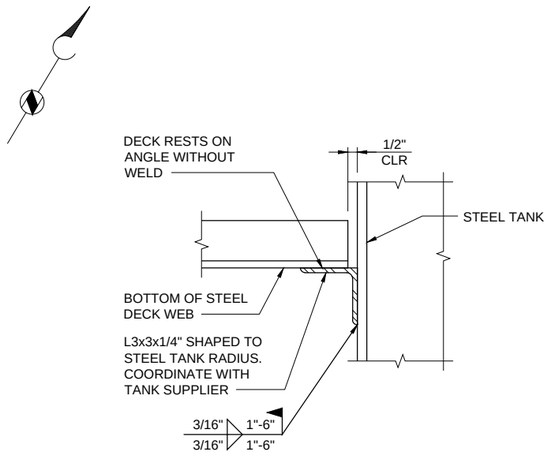
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

LOWER GREASEWOOD WTP
BUILDING FOUNDATION PLAN

FILENAME 143956-S-101.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER S-101
SHEET NUMBER 39 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewood\design\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse\2-Sheets\Structural Filename: 143956-S-101.dwg Plot Date: June 1, 2018 - 2:01 PM CADD User: David Davidse



SECTION 2/-

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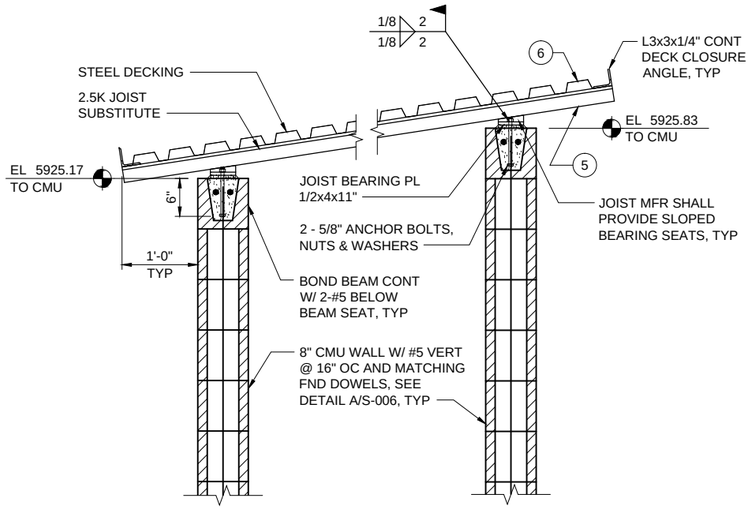
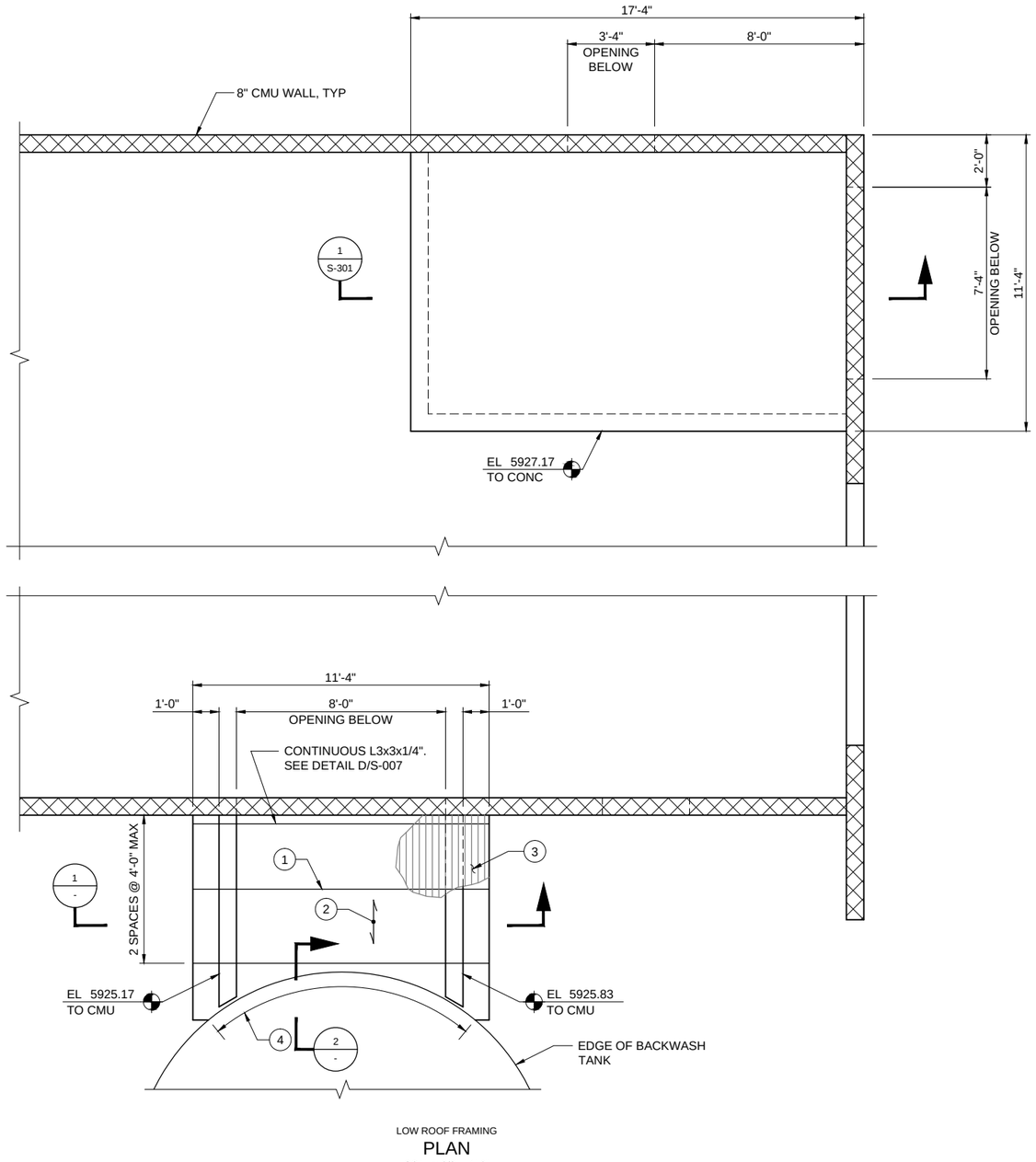


NOTE:

1. MINIMUM SEAT CONNECTION SHOWN. COORDINATE WITH JOIST MANUFACTURER DESIGN.

SECTION 1/-

SCALE: 1"=1'-0"



LOW ROOF FRAMING

PLAN

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

GENERAL NOTES:

1. SEE GENERAL NOTES ON SHEET S-101.

KEY NOTES:

1. 2.5K STEEL BAR JOIST SUBSTITUTE. CONTRACTOR TO DESIGN AND PROVIDE JOIST SUBSTITUTE, MAXIMUM DEPTH 2.5". FOR JOIST SUBSTITUTE, SEE STRUCTURAL NOTES AND SPECIFICATION 05210. SEE KEYNOTE 7 ON S-301.
2. STEEL ROOF DECK SPAN.
3. STEEL ROOF DECK. FOR STEEL ROOF DECK REQUIREMENTS, SEE STRUCTURAL NOTES AND SPECIFICATION 05311.
4. FIELD TRIM METAL DECKING AROUND TANK. SEE A-105 FOR MORE INFORMATION. SUPPORT DECK WITH CONTINUOUS ANGLE.
5. FOR ROOF COVERING, FLASHING AND SOFFIT COVERING, SEE ARCHITECTURAL DRAWINGS.
6. ROOF IS STANDING SEAM METAL ROOF, MEMBRANE AND INSULATION ON TOP OF METAL DECK, SEE ARCHITECTURAL DRAWINGS.

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

DESIGNED: KW
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REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

LOWER GREASEWOOD WTP
BUILDING LOW ROOF FRAMING PLAN

FILENAME: 143956-S-102.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: S-102
SHEET NUMBER: 40 OF 78

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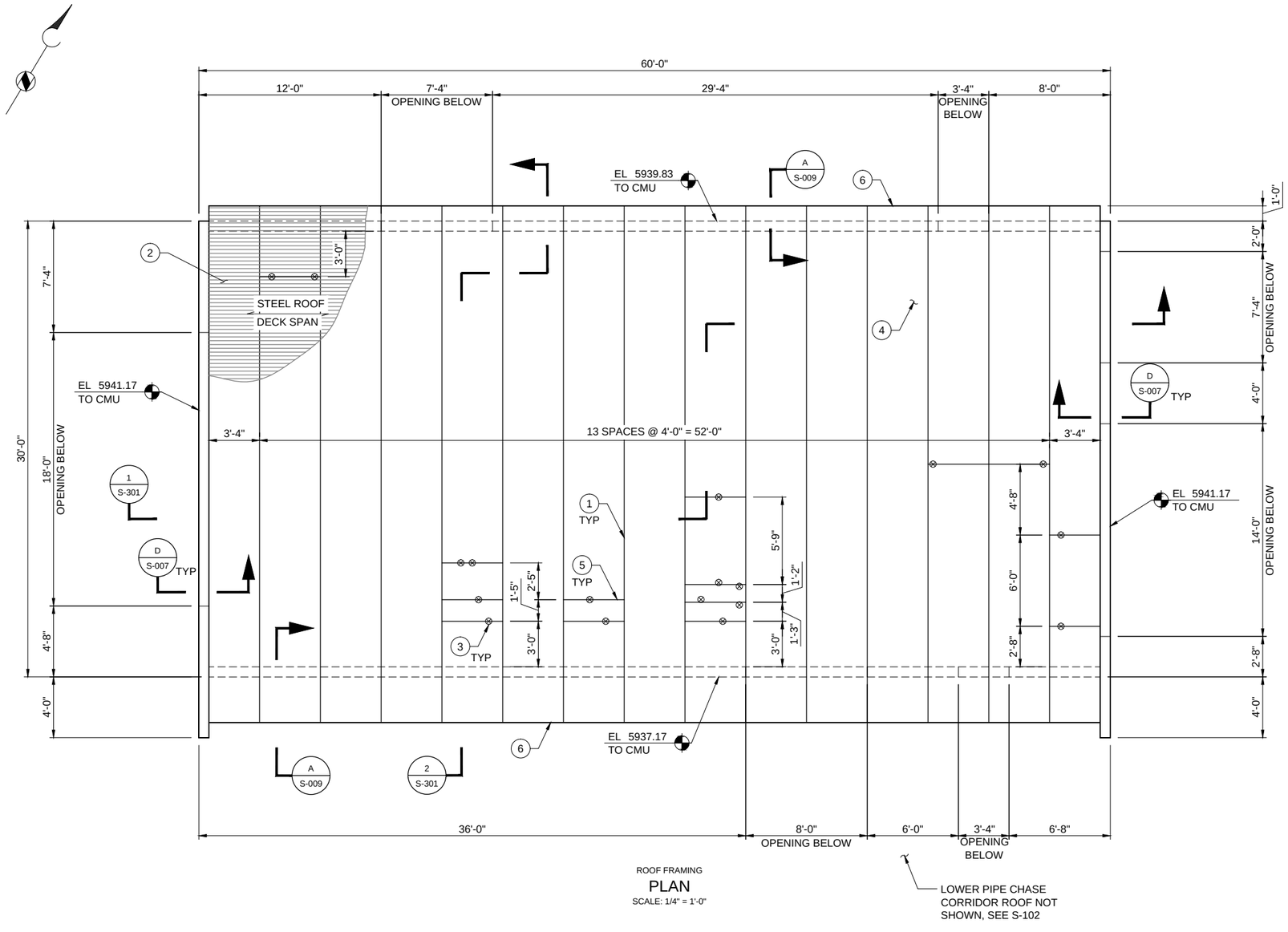

GENERAL NOTES:

1. SEE GENERAL NOTES ON SHEET S-101.

KEY NOTES:

(1) STEEL BAR JOIST, K SERIES. BRIDGING NOT SHOWN. CONTRACTOR TO DESIGN AND PROVIDE STEEL BAR JOIST, MAX DEPTH 16". LAYOUT OF JOIST MAY BE ADJUSTED TO ACCOMODATE POINT LOADS. SEE KEY NOTE 3. FOR STEEL JOIST REQUIREMENTS, SEE STRUCTURAL NOTES AND SPECIFICATION 05210. SEE KEY NOTE 7 ON S-301.

(2) STEEL ROOF DECK. FOR STEEL ROOF DECK REQUIREMENTS, SEE STRUCTURAL NOTES AND SPECIFICATION 05311.

(3) ⊗ REPRESENTS LOCATION OF MAX 1130 lb PIPE SUPPORT LOADS. BAR JOIST DESIGNER SHALL:
- A) DESIGN JOIST FOR THESE ADDITIONAL CONCENTRATED LOADS. WHERE LOADS FALL BETWEEN JOIST, DESIGN JOIST ON EACH SIDE TO CARRY FULL LOAD.
- B) PROVIDE AND DESIGN ADDITIONAL STEEL PIPE SUPPORT MEMBERS WHERE LOADS ARE BETWEEN JOISTS. DESIGN ADDITIONAL MEMBERS WITH LOAD AT CENTER.
- C) VERIFY LOCATIONS OF LOADS WITH MECHANICAL DRAWINGS.
- D) DESIGN JOIST WITH PIPE SUPPORT CONCENTRATED LOADS LOCATED ±6" FROM LOCATION SHOWN.

(4) INTERIOR CEILING OF CHLORINE ROOM BELOW NOT SHOWN, SEE S-102.

(5) FIELD INSTALL ALL PIPE SUPPORT MEMBERS ONLY AFTER FINAL LOCATION OF PIPE SUPPORTS HAVE BEEN FIELD VERIFIED. IF LOCATION OF PIPE SUPPORT MEMBERS VARY MORE THAN 6" FROM THAT SHOWN CONTACT ENGINEER.

(6) CONT L3x3x1/4 NOT SHOWN, SEE DETAIL A/S-008.

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SCALE: 1/4"=1'-0"
DESIGNED: KW
DRAWN: RBB
CHECKED: SH
APPROVED: MK

EXTERNAL REFERENCE FILES

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REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

LOWER GREASEWOOD WTP
BUILDING ROOF FRAMING PLAN

FILENAME 143956-S-103.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER S-103
SHEET NUMBER 41 OF 78

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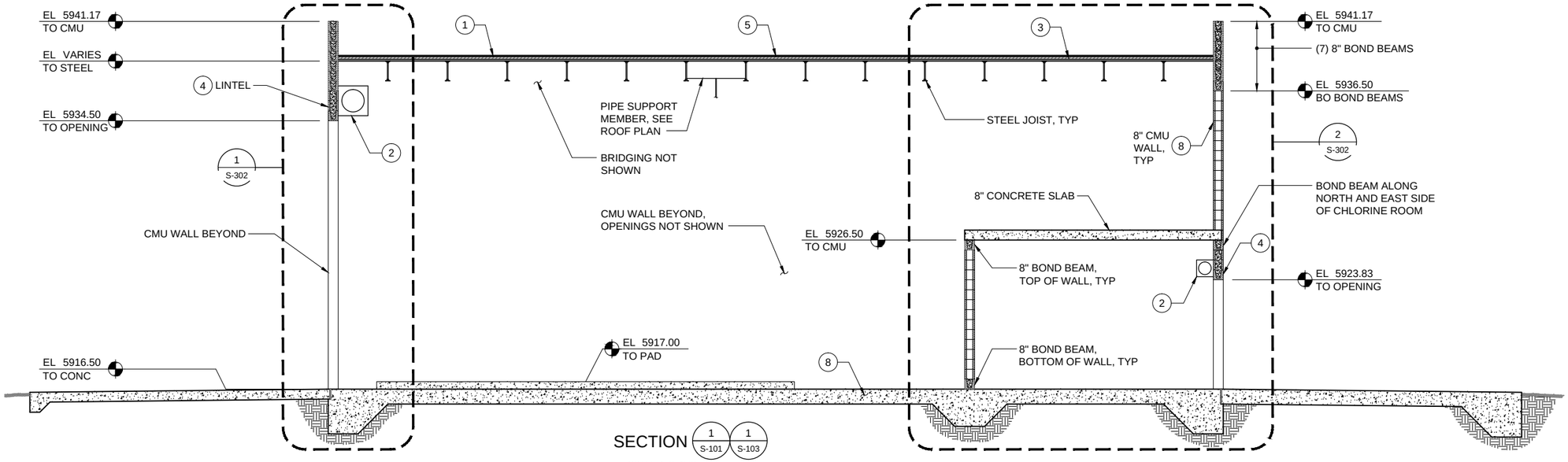
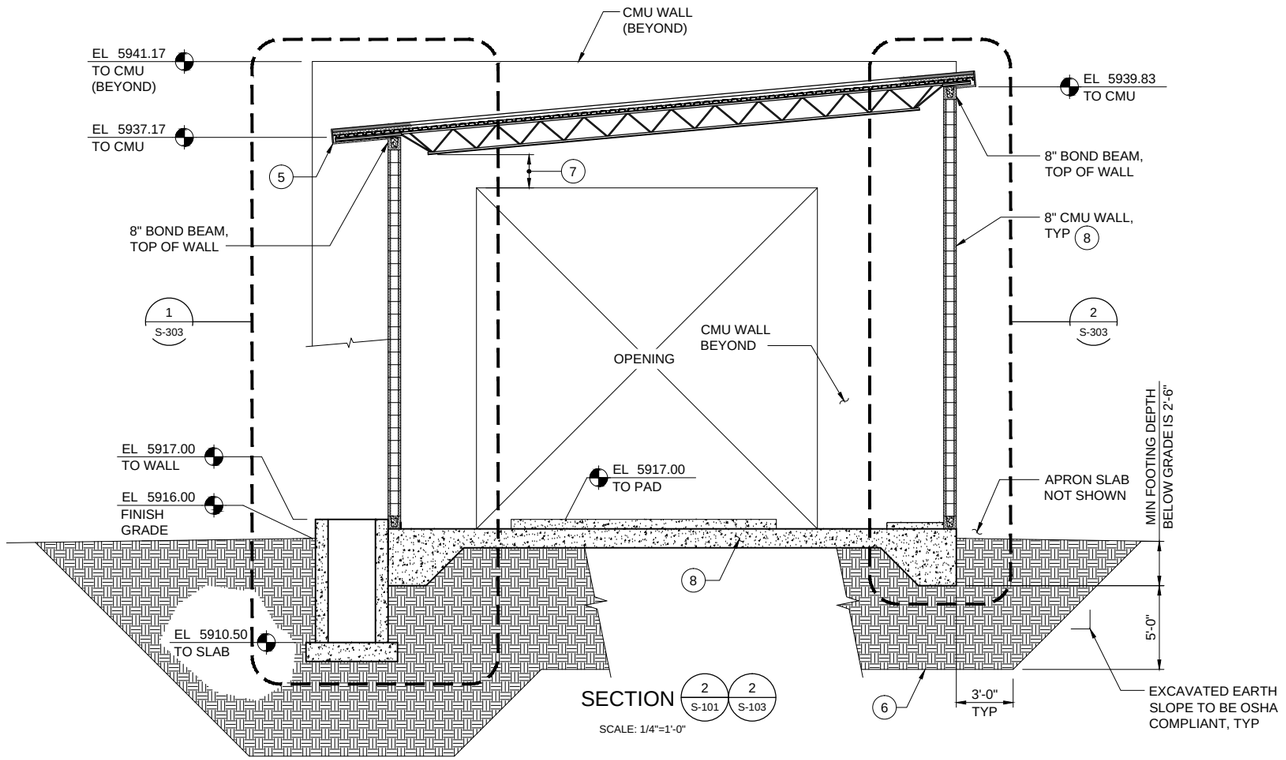


SECTION 1 S-101 / 1 S-103

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



SECTION 2 S-101 / 2 S-103

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

GENERAL NOTES:

1. SEE GENERAL NOTES ON SHEET S-101.

KEY NOTES:

(1) ROOF IS STANDING SEAM METAL ROOF, MEMBRANE AND INSULATION ON TOP OF METAL DECK, SEE ARCHITECTURAL DRAWINGS.

(2) AREA REQUIRED FOR COILING DOOR HOOD, TYPICAL OF 3. CONTRACTOR TO VERIFY WITH ROLL UP DOOR MANUFACTURER THAT THERE IS SUFFICIENT SPACE ABOVE OPENING TO INSTALL DOOR HOOD.

(3) STRUCTURAL ROOF SYSTEM PER ROOF FRAMING PLAN AND SPECIFICATION.

(4) PROVIDE LINTELS OVER ALL OPENINGS, SEE DETAIL B/S-006.

(5) FOR ROOF COVERING, FLASHING AND SOFFIT COVERING, SEE ARCHITECTURAL DRAWINGS.

(6) SEE TABLE A, THIS SHEET FOR BACKFILL DEPTHS. COMPACT SUBGRADE SOIL TO 95% MIN OF ASTM D1557. MOISTURE ±2% OF OPTIMUM MOISTURE CONTENT. SEE SPECIFICATION 2200 FOR MORE INFORMATION.

TABLE A

MINIMUM BACKFILL DEPTHS (INCHES)

UNDER FOOTING	BEYOND EDGES OF FOOTING	UNDER BUILDING SLAB
60	36	60

BACKFILL DEFINED BY SPECIFICATION 02200 AS MATERIAL CLASS B1.

(7) STEEL JOIST DESIGNER TO BE AWARE OF TIGHT CLEARANCE BETWEEN ROLL-UP DOOR AND BOTTOM OF STEEL JOIST BRIDGING. PROVIDE 1'-0" CLEAR BETWEEN BOTTOM OF JOIST AND TOP OF DOOR OPENINGS. TYP AT BOTH EAST AND WEST ROLL UP DOORS.

(8) WALL AND SLAB REINFORCING NOT SHOWN. SEE SECTIONS ON S-302 AND S-303, TYP.

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REVISIONS

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LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

LOWER GREASEWOOD WTP
BUILDING SECITONS

FILENAME 143956-S-301.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER S-301
SHEET NUMBER 42 OF 78

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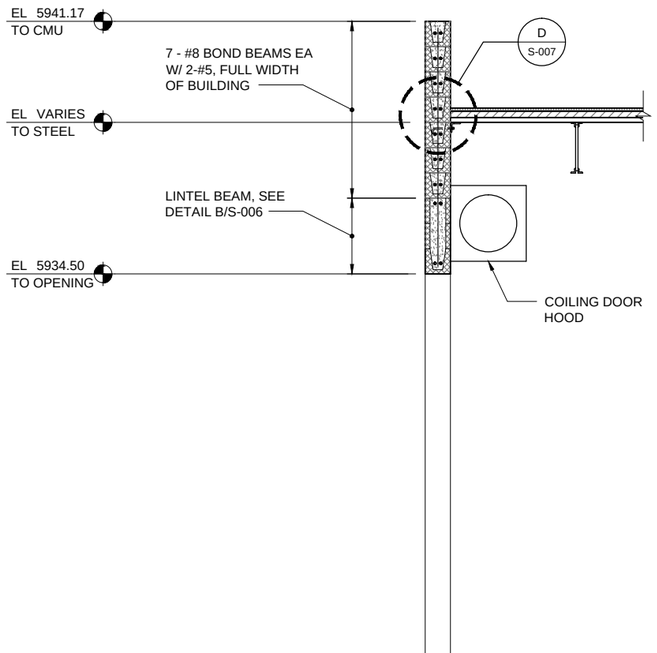
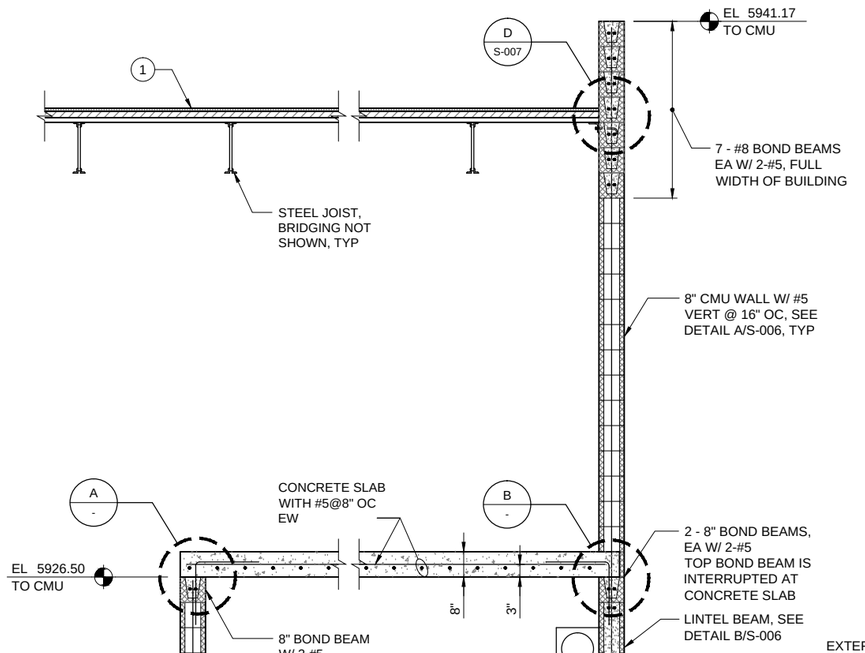
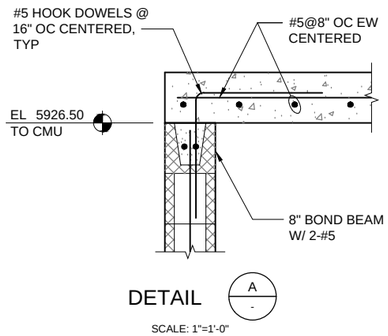
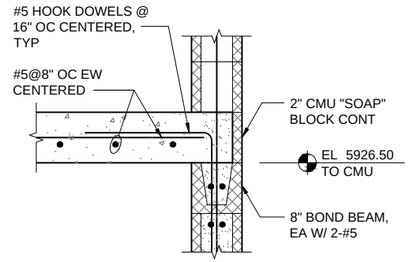


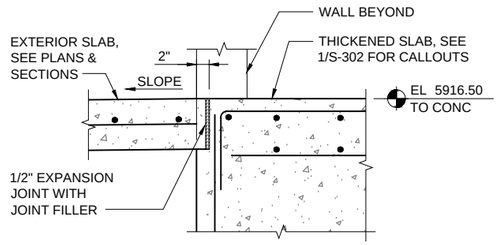




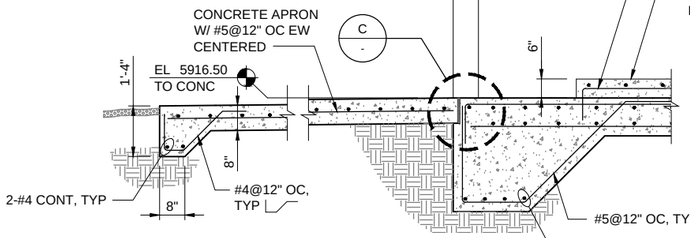
DETAIL A
-
SCALE: 1"=1'-0"



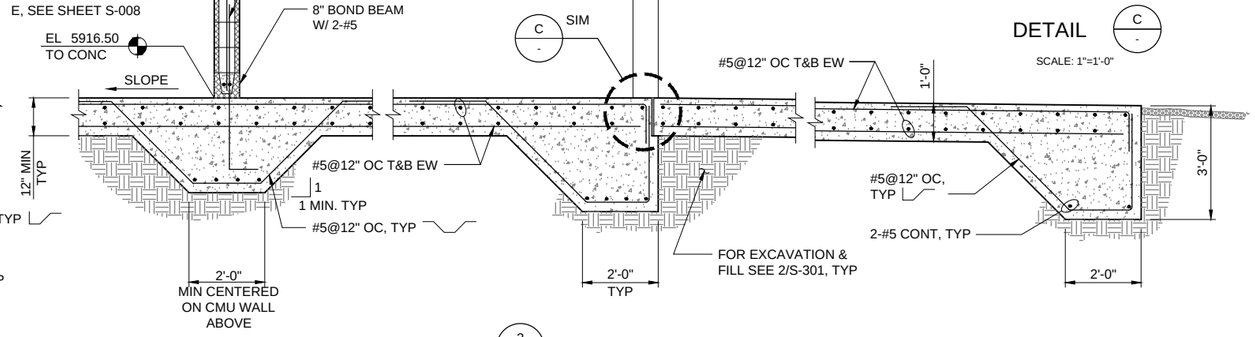
DETAIL B
-
SCALE: 1"=1'-0"



DETAIL C
-
SCALE: 1"=1'-0"



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



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

GENERAL NOTES:

1. SEE GENERAL NOTES ON SHEET S-101.

KEY NOTES:

(1) FOR ROOF COVERING, FLASHING AND SOFFIT COVERING, SEE ARCHITECTURAL DRAWINGS.

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DRAWN: RBB
CHECKED: SH
APPROVED: MK

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REGISTERED PROFESSIONAL ENGINEER
44977
SCOTT W. HARPER
Date Signed 6/2/2017
ARIZONA, U.S.A.
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ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

LOWER GREASEWOOD WTP
BUILDING SECTIONS AND DETAILS - 1

FILENAME 143956-S-302.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER S-302
SHEET NUMBER 43 OF 78

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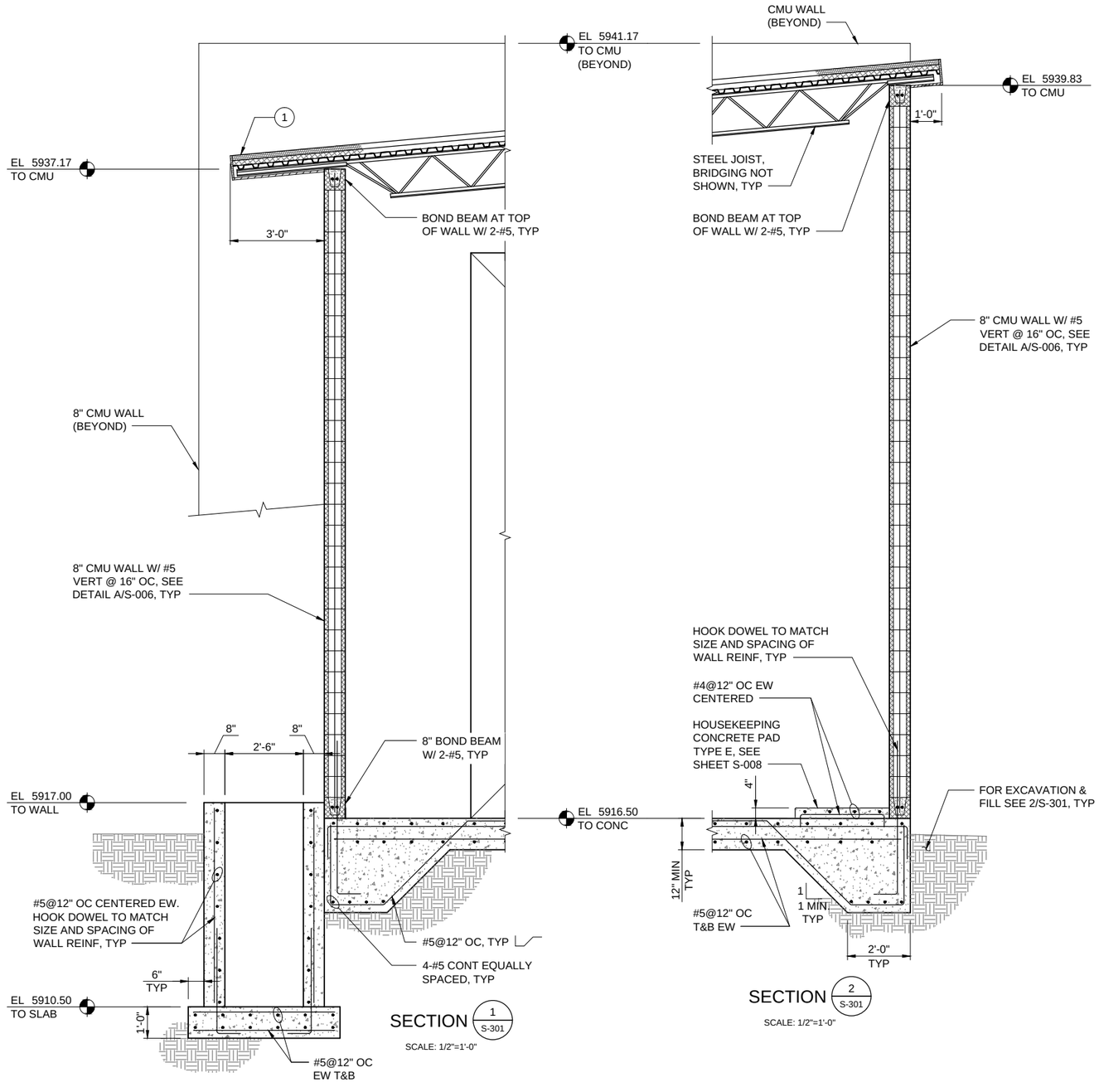

GENERAL NOTES:

1. SEE GENERAL NOTES ON SHEET S-101.

KEY NOTES:

(1) FOR ROOF COVERING, FLASHING AND SOFFIT COVERING, SEE ARCHITECTURAL DRAWINGS.

Path: P:\Projects\navajo Nation\143956_lowergreasewoddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Structural Filename: 143956-S-303.dwg Plot Date: June 1, 2018 - 2:03 PM CADD User: David Davidse

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SALT LAKE CITY, UTAH

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PROJECT MANAGER

APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

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REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
STRUCTURAL

LOWER GREASEWOOD WTP
BUILDING SECTIONS AND DETAILS - 2

FILENAME	143956-S-303.dwg
BC PROJECT NUMBER	143956
DRAWING NUMBER	S-303
SHEET NUMBER	44 OF 78

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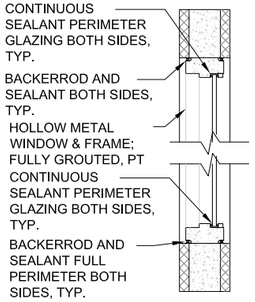
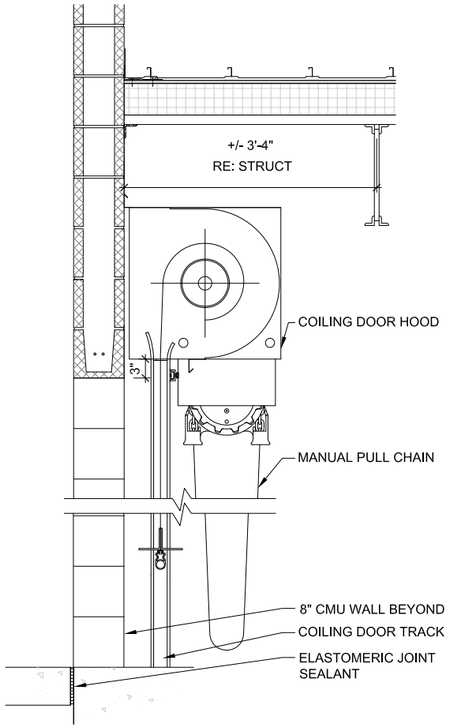
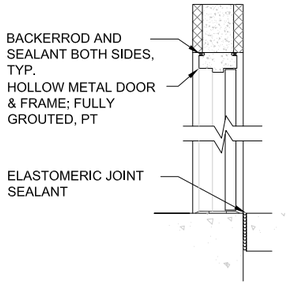


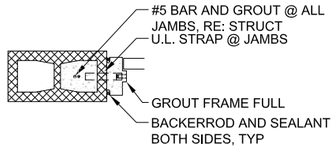
5 A-001 TYP. HM WINDOW HEAD/SILL
SCALE: 1"=1'-0" LOUVER SIM



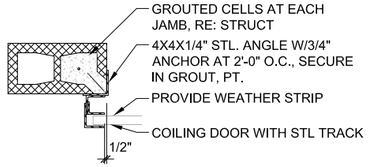
4 A-001 TYP. COILING DOOR HEAD/SILL
SCALE: 1"=1'-0"



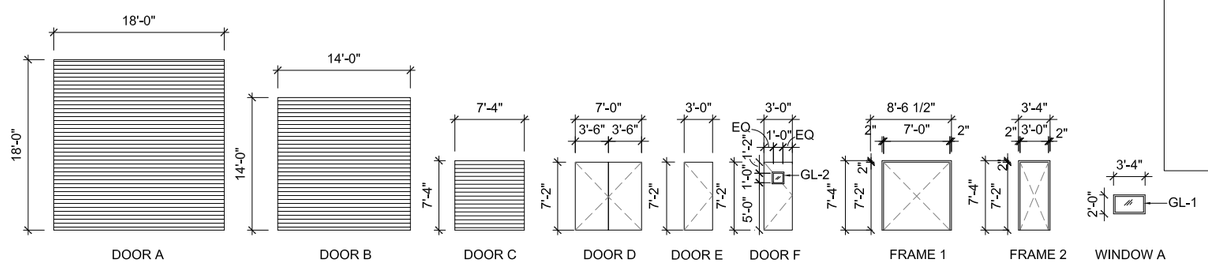
3 A-001 TYP. HM DOOR HEAD/SILL
SCALE: 1"=1'-0"



2 A-001 TYP. HM DOOR JAMB
SCALE: 1"=1'-0"



1 A-001 TYP. COILING DOOR JAMB
SCALE: 1"=1'-0"



DOOR FRAME AND WINDOW ELEVATIONS
SCALE: 1/8"=1'-0"

DOOR SCHEDULE — D/# DOOR TAG / DOOR NUMBER

DOORS							GENERAL	FRAMES						REMARKS
DOOR NO.	TYPE	DIMENSIONS W	H	TH	MATERIAL	FINISH	HARDWARE	TYPE	DETAILS SILL	HEAD	JAMB	MATERIAL	FINISH	
1	A	18'-0"	18'-0"	-	STL	FACTORY FINISH	3	-	4/A-001	4/A-001	1/A-001	STL	FACTORY FINISH	-
2	D	(2) 3'-6"	7'-2"	1 3/4"	HM	PAINT	2	1	3/A-001	3/A-001	2/A-001	HM	PAINT	-
3	F	3'-0"	7'-2"	1 3/4"	HM	PAINT	1	2	3/A-001	3/A-001	2/A-001	HM	PAINT	PROVIDE PANIC HARDWARE
4	B	7-4"	7'-4"	-	STL	FACTORY FINISH	3	-	4/A-001(SIM)	4/A-001(SIM)	1/A-001	STL	FACTORY FINISH	-
5	C	14'-0"	14'-0"	-	STL	FACTORY FINISH	3	-	4/A-001(SIM)	2/A-001(SIM)	1/A-001	STL	FACTORY FINISH	-
6	E	3'-0"	7'-2"	1 3/4"	HM	PAINT	1	2	3/A-001	3/A-001	2/A-001	HM	PAINT	-

BUILDING CODE ANALYSIS

BUILDING CODES:
2006 INTERNATIONAL BUILDING CODE
2006 INTERNATIONAL MECHANICAL CODE
2006 INTERNATIONAL PLUMBING CODE
2006 INTERNATIONAL ELECTRICAL CODE
2009 NAVAJO COUNTY ADDENDA AND ADDITIONS TO THE IBC

OCCUPANCY GROUP: F-1

CONSTRUCTION TYPE VB

ALLOWABLE FLOOR AREA: (TABLE 503)

ALLOWABLE AREA:
F-1 8,500 SF, 1 STORIES

ACTUAL FLOOR AREA:
F-1 1,800 SF, 1 STORY

REQUIRED EXITS:
F-1 1,682/500=13, 1 EXIT REQUIRED, 2 PROVIDED
F-1 (CHLORINE) 190/500=.38, 1 EXIT REQUIRED, 1 PROVIDED

DISTANCE TO EXITS: (TABLE 1016.1)
F-1 200 FT MAXIMUM, WITHOUT SPRINKLERS

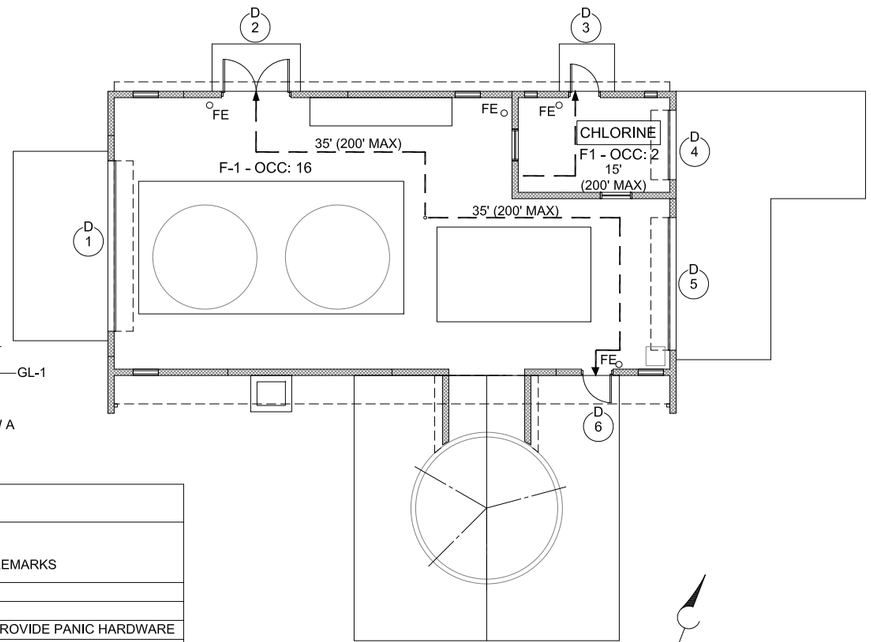
COMMON PATH OF EGRESS TRAVEL - 75' MAX

OCCUPANCY LOADS (TABLE 1004.1.1)
F-1 1,600/100 = 16 TOTAL OCCUPANTS
F-1 (CHLORINE) 200/100 = 2 TOTAL OCCUPANTS

CHEMICAL CLASSIFICATION TABLE - OCCUPANCY GROUP DETERMINATION
April 2014

CHEMICAL Name / CAS No.	Other Name	HAZARD Type	Classification	STATE	CONCENTRATION	ACTUAL AMOUNT	CONTAINER	EXEMPT AMOUNT Basic	Sprinkled Bldg or Cabinets	Sprinkled Bldg & Cabinets	OCCUPANCY (if over exempt amount per IBC)	NFPA 704 IDENTIFICATION Health	Fire	Reactivity	Specific
Chlorine Room															
Chlorine 7782-50-5		Physical & Health	Oxidizing Gas-Liquefied, Corrosive, Toxic	Gas	100%	300 lbs.	Cylinders	810 lbs.	1,620 lbs.	N.A.	F-1	3	0	0	OX
						2,000 lbs.	Cylinder (Housed in "ChlorTainer")				F-1				

ABBREVIATIONS
N.L. No Limit
gal. Gallons
lbs. Pounds
OX Oxidizer
W Water Reactive



CODE & DOOR PLAN
SCALE: 1/8"=1'-0"

GENERAL NOTES:

1. REPETITIVE FEATURES ARE NOT DRAWN IN THEIR ENTIRETY AND SHALL BE COMPLETELY PROVIDED AS IF DRAWN IN FULL.
2. VERIFY SIZES OF ALL EQUIPMENT TO BE PROVIDED IN THIS CONTRACT OR BY OTHERS & COORD ALL ROUGH-IN & SUBSTRATE DIMENSIONS TO DETERMINE ACTUAL REQUIRED SIZES OF PADS, CURBS, TANKS, ETC
3. REFER TO STRUCTURAL, MECHANICAL, ELECTRICAL AND OTHER CATEGORIES OF DRAWINGS FOR ADDITIONAL NOTES.
4. VERIFY AND COORD SIZE AND LOCATION OF, AND PROVIDE ALL OPENINGS THROUGH FLOOR AND WALLS, FURRING, CURBS, ANCHORS, AND INSERTS. PROVIDE ALL BASES & BLOCKING REQUIRED FOR ACCESSORIES, MECHANICAL, ELECTRICAL AND OTHER EQUIPMENT.
5. DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS SHALL ESTABLISH LOCATION OF ALL PARTITIONS, OPENINGS, EQUIPMENT, ETC.
6. LARGER SCALE DRAWINGS AND DETAILS HAVE PRIORITY OVER SMALLER SCALE DRAWINGS.
7. CONTRACTOR SHALL VERIFY FIELD CONDITIONS BEFORE PROCEEDING WITH CONSTRUCTION.

KEY NOTES:

SHORT AND BRENNAN ARCHITECTS

Brown AND Caldwell
SALT LAKE CITY, UTAH
SUBMITTED: PROJECT MANAGER DATE: 6/2/17
APPROVED: BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: #####
DESIGNED: SBA
DRAWN: BU
CHECKED: GS
APPROVED: #####

EXTERNAL REFERENCE FILES

BID ISSUE

REVISIONS ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
CONTRACT NO. 3 - LGW WTP, WELL 1 PH & GANADO N0 WELL PH
ARCHITECTURAL

CODE ANALYSIS, GENERAL NOTES AND SCHEDULES

FILENAME: LGW Sheetset.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: A-001
SHEET NUMBER: 45 OF 78

189.1

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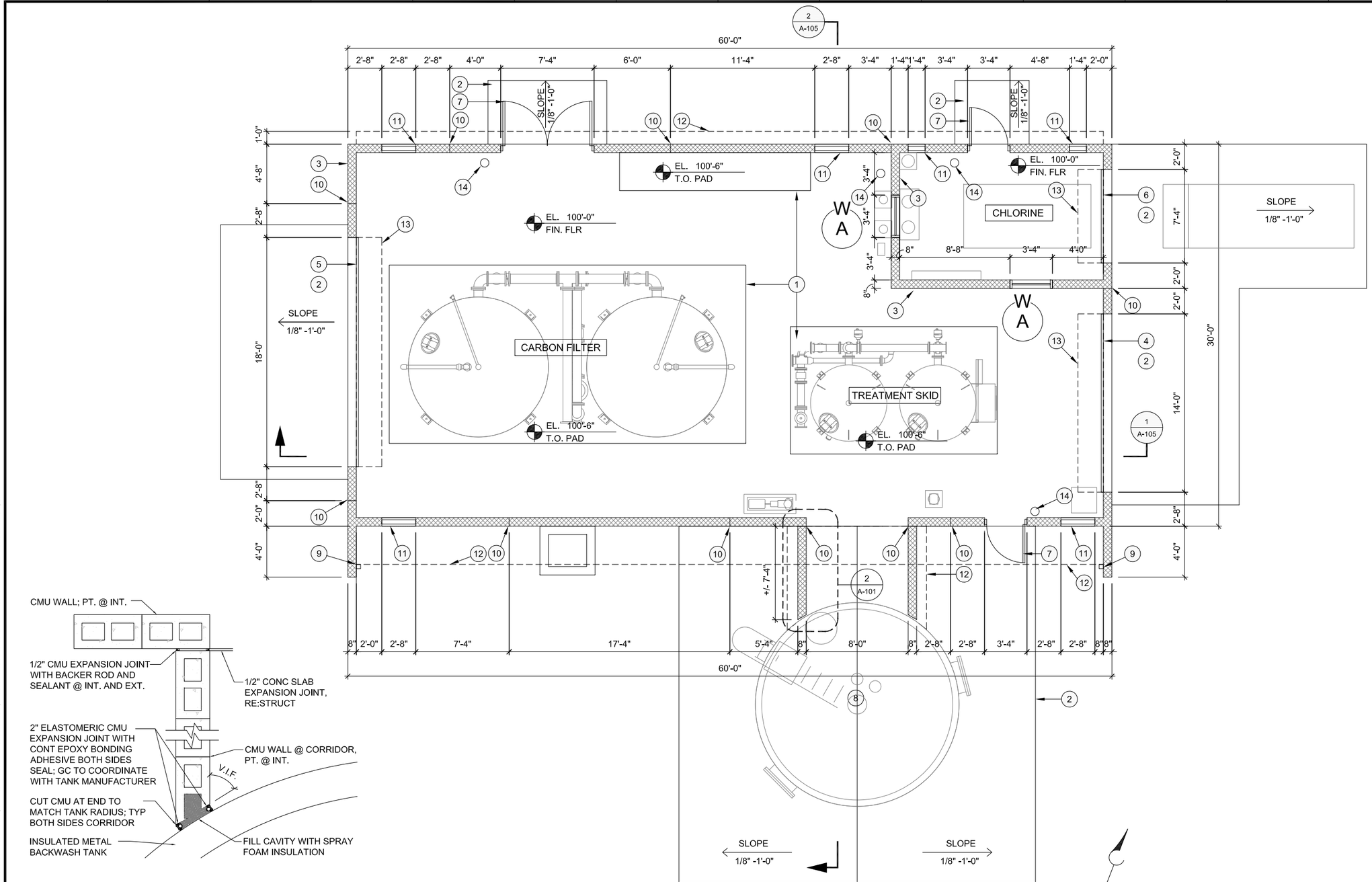

1 A-101 PLAN DETAILS @ CORRIDOR
SCALE: 1"=1'-0"

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

GENERAL NOTES:

1. FINISH FLOOR ELEVATION OF 100'-0" = EL 5916.50

KEY NOTES:

1. CONCRETE EQUIPMENT PAD; RE STRUCT
2. CONCRETE APRON, SLOPE 1/8" PER FOOT, RE: STRUCT
3. CMU WALL, PT INTERIOR
4. 14'X14' COILING DOOR
5. 18'X18' COILING DOOR
6. 7'- 4" X 7'- 4" COILING DOOR
7. HOLLOW METAL DOOR AND FRAME, PT
8. BACKWASH TANK
9. PREFINISHED GUTTER, DOWNSPOUT, AND 5'-0" LONG CONCRETE SPLASH-BLOCK
10. CMU JOINT, RE: STRUCT
11. LOUVER, RE: MECH
12. LINE OF ROOF ABOVE
13. LINE OF COILING DOOR HOOD ABOVE
14. WALL MOUNTED FIRE EXTINGUISHER AND BRACKET

SHORT AND BRENNAN ARCHITECTS

Brown AND Caldwell
SALT LAKE CITY, UTAH
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EXTERNAL REFERENCE FILES

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REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
CONTRACT NO. 3 - LGW WTP, WELL 1 PH & GANADO N0 WELL PH
ARCHITECTURAL

FLOOR PLAN

FILENAME: LGW Sheetset.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: A-101
SHEET NUMBER: 46 OF 78

189.1

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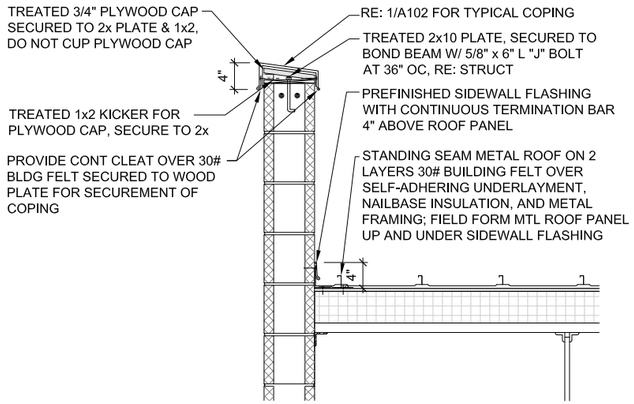
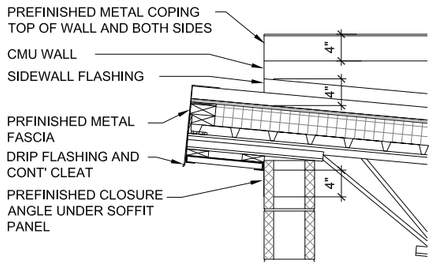
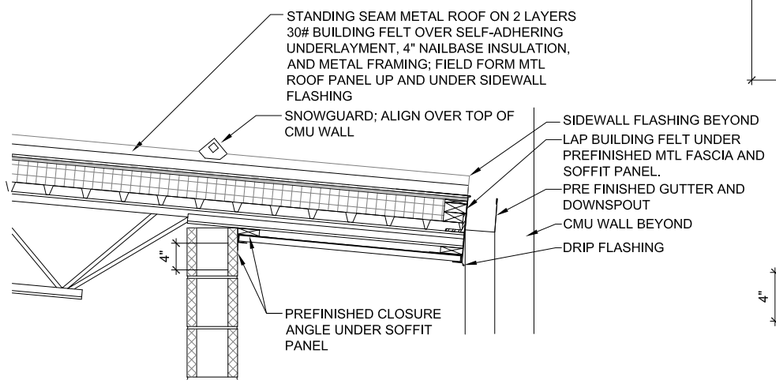


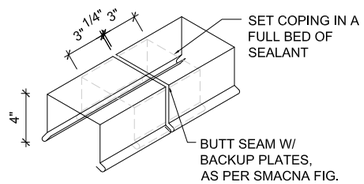
4 A-102 TYPICAL PARAPET & SIDEWALL FLASHING
SCALE: 1"=1'-0"



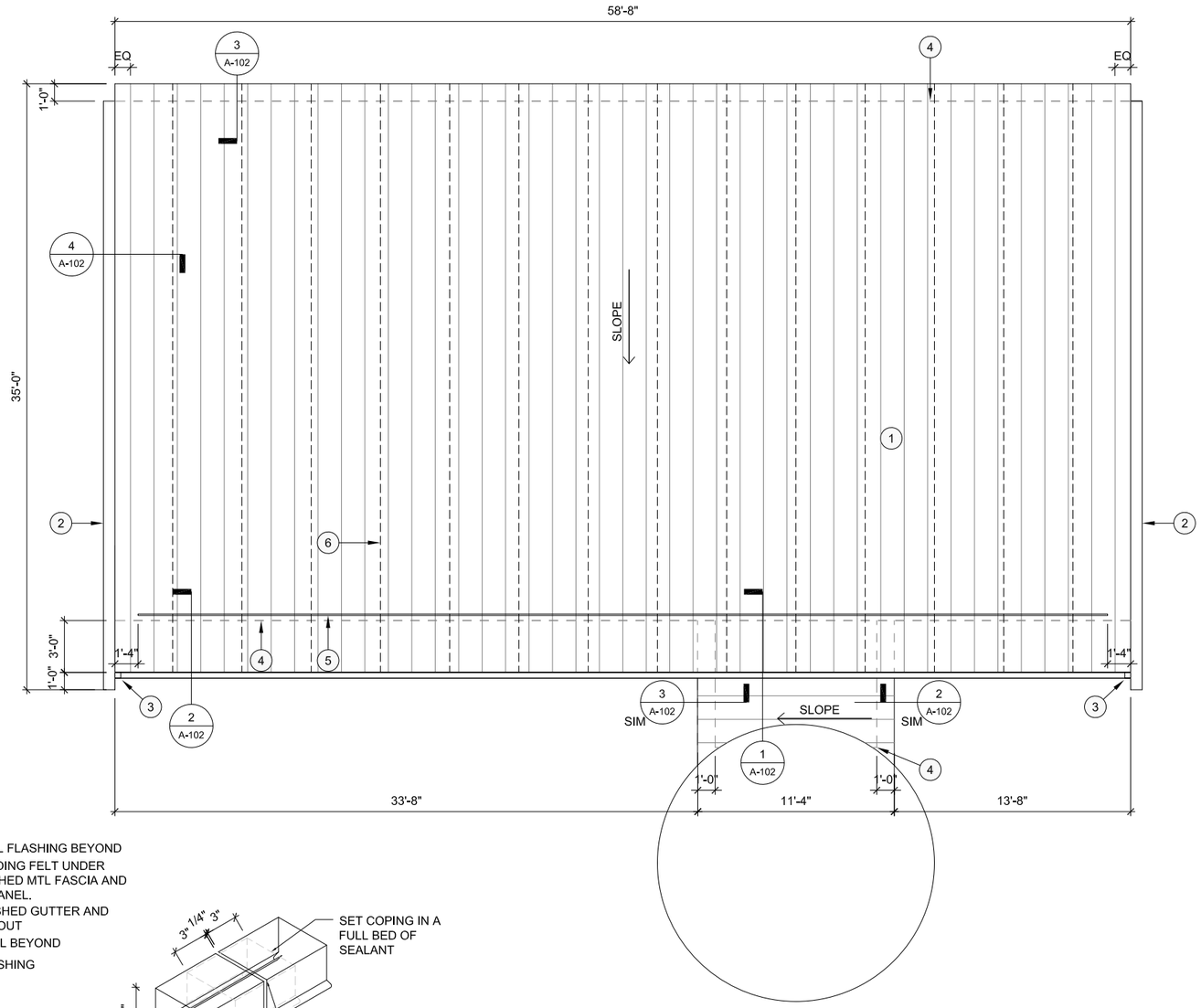
3 A-102 TYPICAL HIGH EAVE
SCALE: 1"=1'-0"



2 A-102 TYPICAL LOW EAVE
SCALE: 1"=1'-0"



1 A-102 TYPICAL COPING DETAIL
N.T.S.



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

GENERAL NOTES:

1. FINISH FLOOR ELEVATION OF 100'-0" = EL 5916.50

KEY NOTES:

1. STANDING SEAM METAL ROOF
2. PREFINISHED METAL COPING
3. PREFINISHED GUTTER AND DOWNSPOUT
4. LINE OF WALL BELOW
5. SNOW GUARD
6. LINE OF STRUCTURAL JOIST BELOW, RE: STRUCT

SHORT AND BRENNAN ARCHITECTS

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17 (PROJECT MANAGER)
APPROVED: _____ DATE: 6/2/17 (BROWN AND CALDWELL)

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: #####
DESIGNED: SBA
DRAWN: BU
CHECKED: GS
APPROVED: #####

EXTERNAL REFERENCE FILES

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REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
CONTRACT NO. 3 - LGW WTP, WELL 1 PH & GANADO N0 WELL PH
ARCHITECTURAL

ROOF PLAN
AND ROOF DETAILS

FILENAME: LGW Sheetset.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: A-102
SHEET NUMBER: 47 OF 78

189,1

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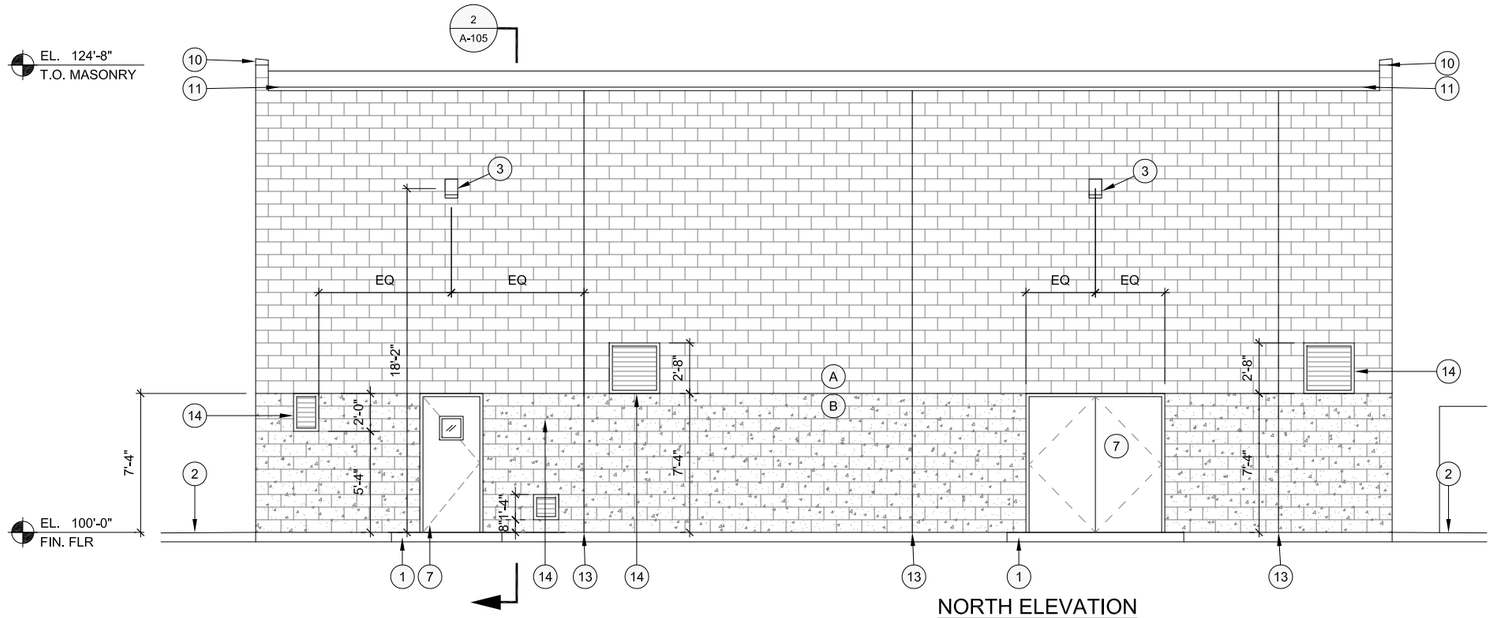
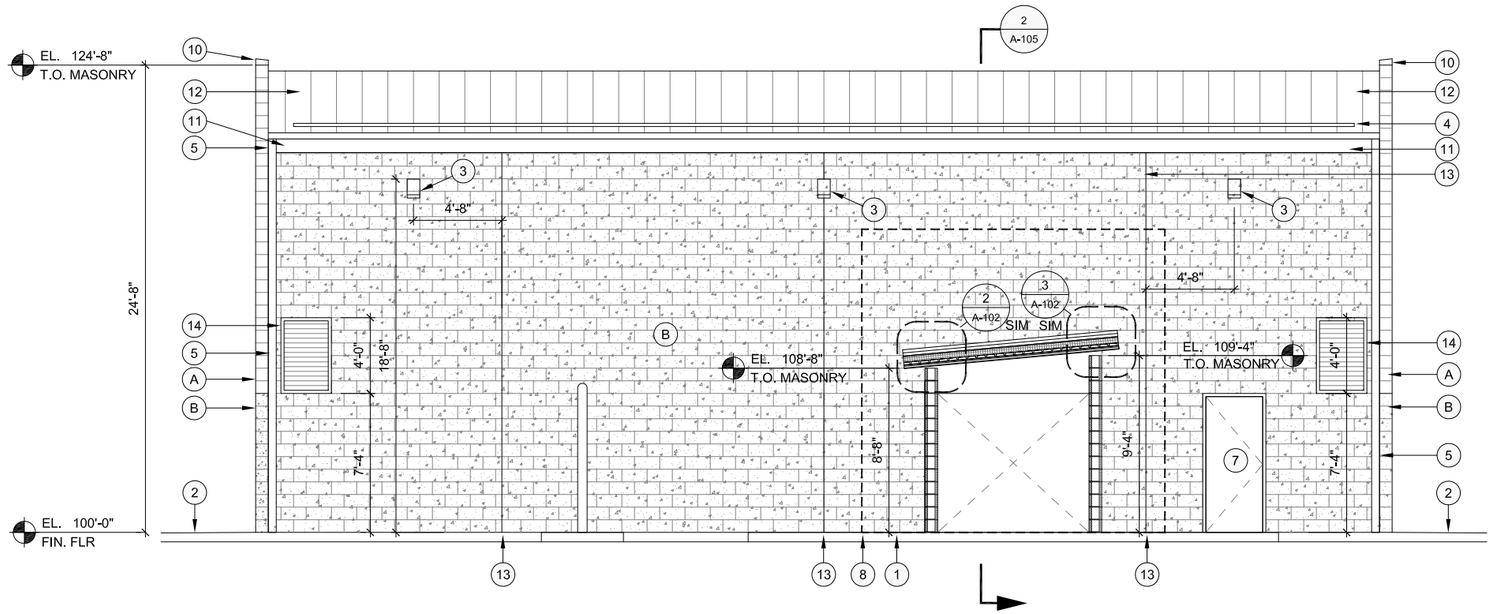


NORTH ELEVATION

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



SOUTH ELEVATION

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

GENERAL NOTES:

KEY NOTES:

1. CONCRETE EQUIPMENT PAD/LANDING, RE: STRUCT
2. CONCRETE APRON, RE: STRUCT
3. EXTERIOR LIGHT FIXTURE, RE: ELEC, TYP
4. SNOWGUARD
5. PREFINISHED GUTTER, DOWNSPOUT AND 5'-0" CONC SPLASH-BLOCK
6. -
7. HOLLOW METAL DOOR AND FRAME
8. BACKWASH TANK
9. -
10. PREFINISHED METAL COPING
11. PREFINISHED METAL FASCIA
12. STANDING SEAM METAL ROOF
13. CMU CONTROL JOINT, RE: 1/A-101
14. LOUVER, RE: MECH

A. CMU TYPE 1, SMOOTH FACE BLOCK

B. CMU TYPE 2, SPLIT FACE BLOCK

SHORT AND BRENNAN ARCHITECTS

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ PROJECT MANAGER DATE: 6/2/17

APPROVED: _____ BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: #####

DESIGNED: SBA

DRAWN: BU

CHECKED: GS

APPROVED: #####

EXTERNAL REFERENCE FILES

BID ISSUE

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
CONTRACT NO. 3 - LGW WTP, WELL 1 PH & GANADO N0 WELL PH
ARCHITECTURAL

ELEVATIONS

FILENAME: LGW Sheetset.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: A-103
SHEET NUMBER: 48 OF 78

189.2

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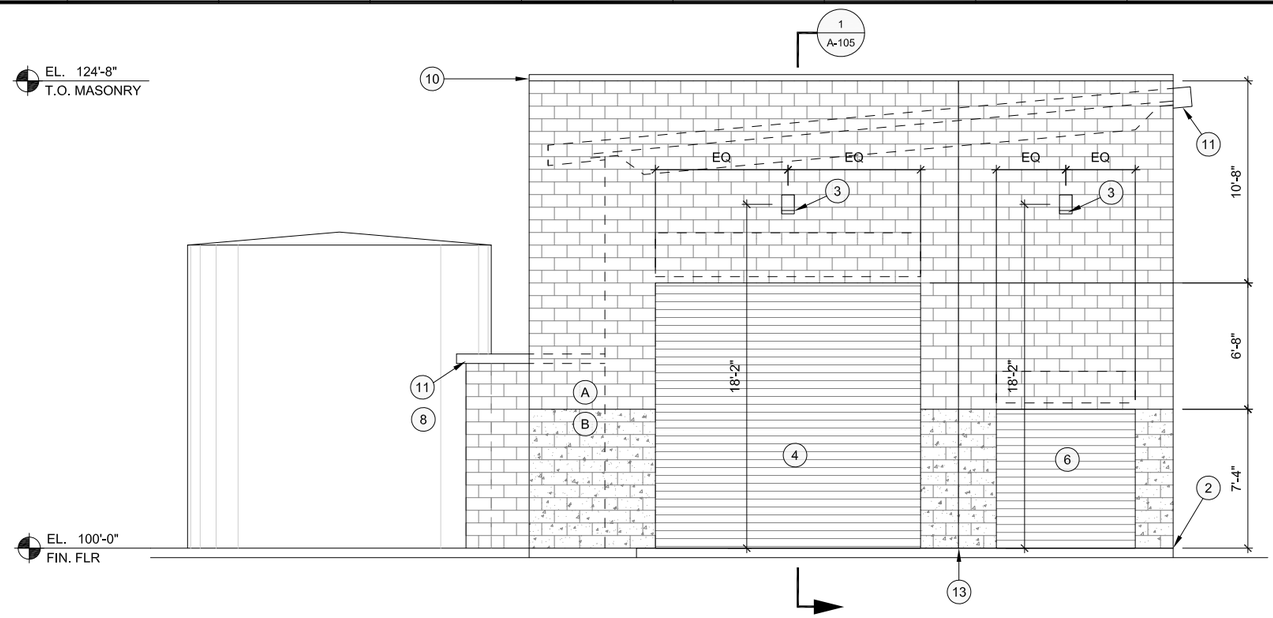
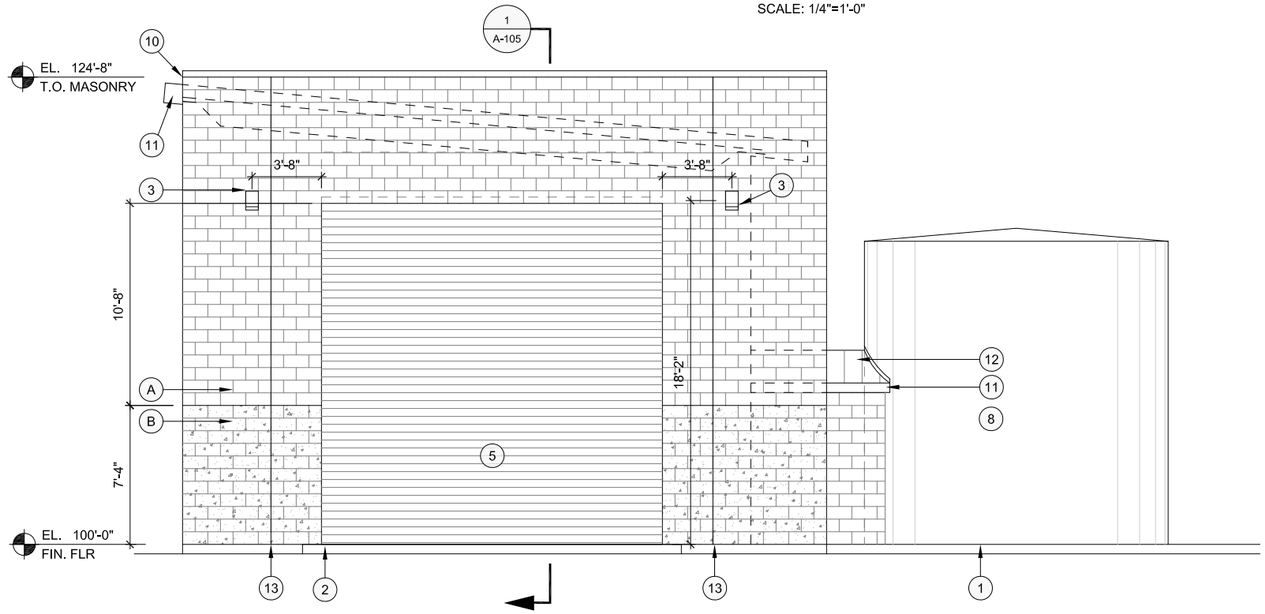


EAST ELEVATION
SCALE: 1/4"=1'-0"



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

GENERAL NOTES:

1. FINISH FLOOR ELEVATION OF 100'-0" = EL 5916.50

KEY NOTES:

1. CONCRETE EQUIPMENT PAD/LANDING, RE: STRUCT
2. CONCRETE APRON, RE: STRUCT
3. CMU WALL
4. 14'X14' COILING DOOR
5. 18'X18' COILING DOOR
6. 7'- 4" X 7'- 4" COILING DOOR
7. -
8. BACKWASH TANK
9. -
10. PREFINISHED METAL COPING
11. PREFINISHED METAL FASCIA
12. STANDING SEAM METAL ROOF
13. CMU CONTROL JOINT, RE: 1/A-101
14. -

A. CMU TYPE 1, SMOOTH FACE BLOCK
B. CMU TYPE 2, SPLIT FACE BLOCK

SHORT AND BRENNAN ARCHITECTS

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ PROJECT MANAGER DATE: 6/2/17
APPROVED: _____ BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: #####
DESIGNED: SBA
DRAWN: BU
CHECKED: GS
APPROVED: #####

EXTERNAL REFERENCE FILES

BID ISSUE

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
CONTRACT NO. 3 - LGW WTP, WELL 1 PH & GANADO N0 WELL PH
ARCHITECTURAL

ELEVATIONS

FILENAME: LGW Sheetset.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: A-104
SHEET NUMBER: 49 OF 78

189.2

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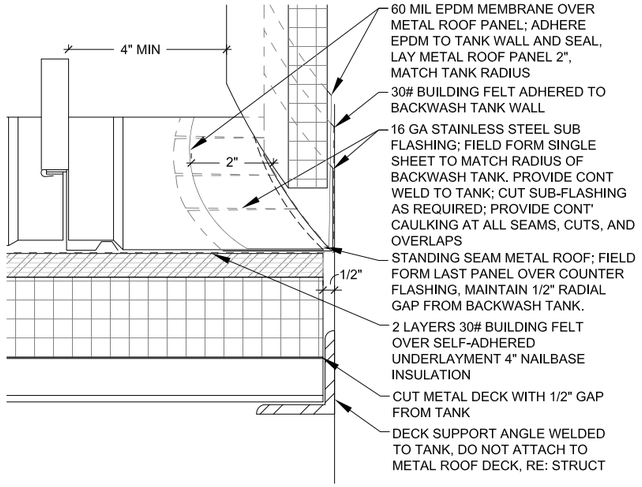
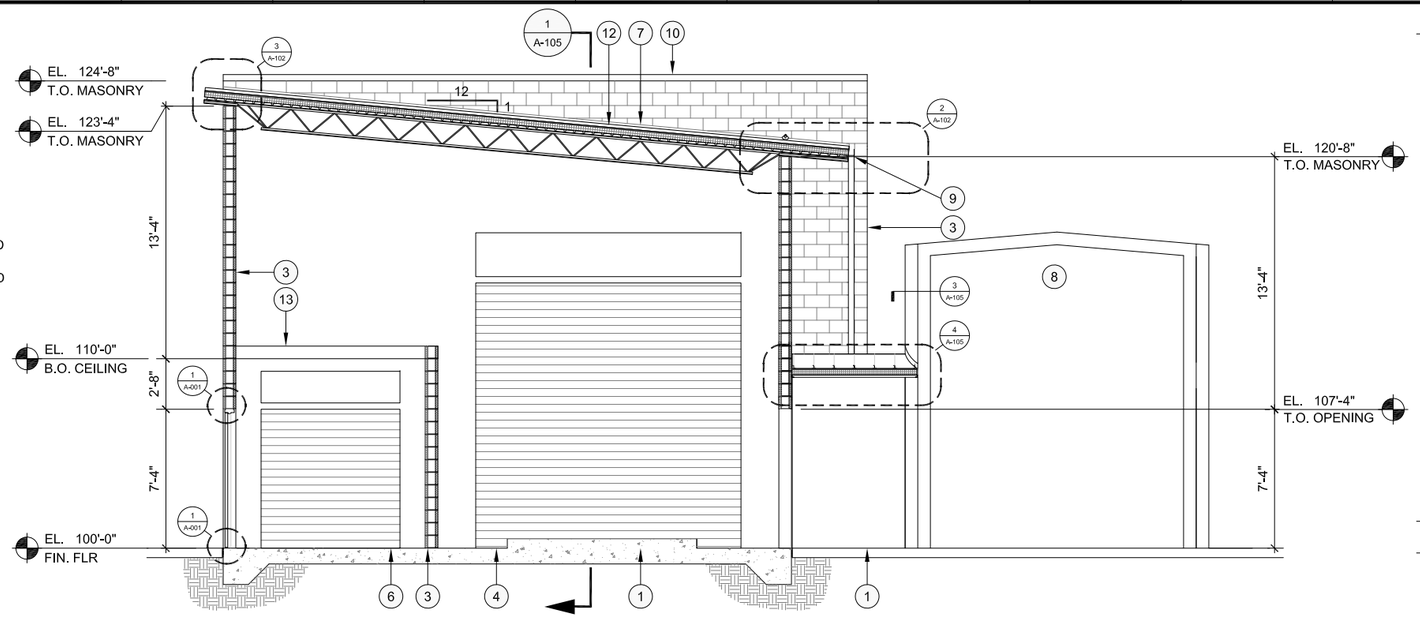
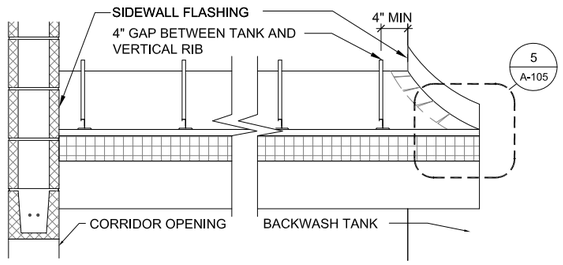


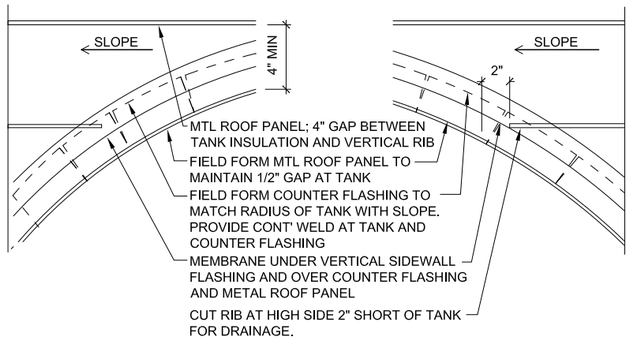
5 A-105 BACKWASH TANK FLASHING DETAIL
SCALE: 6"=1'-0"



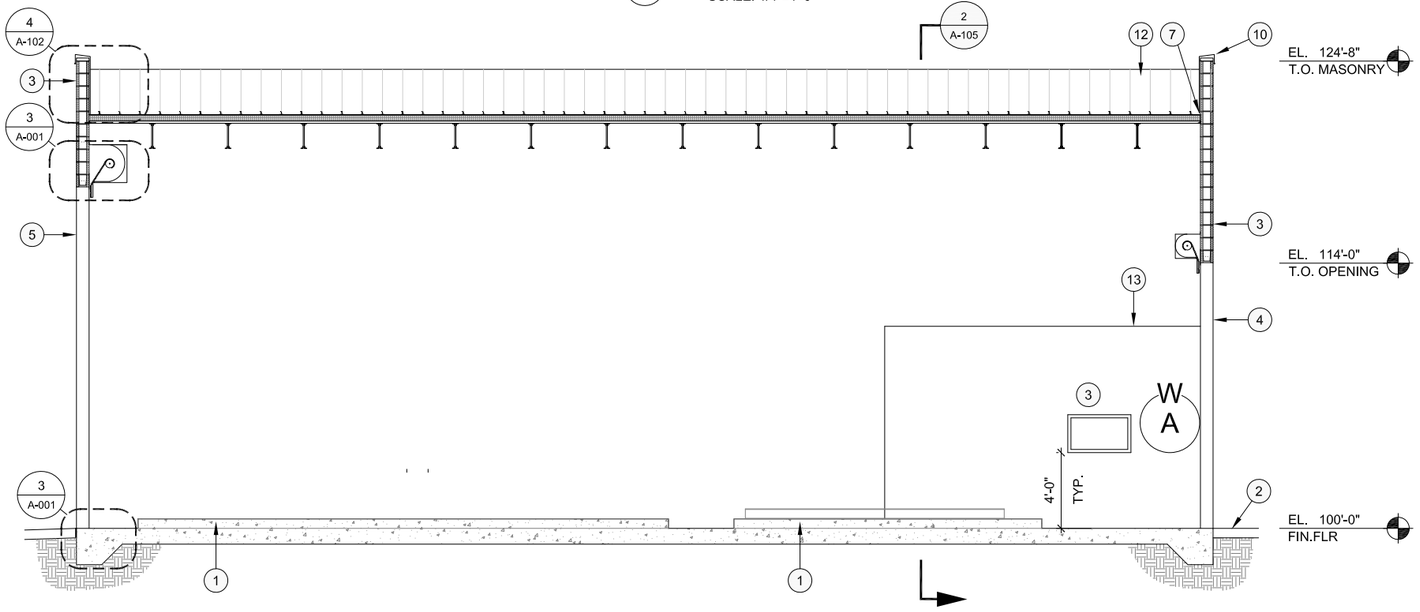
2 A-105 BUILDING SECTION
SCALE: 1/4"=1'-0"



4 A-105 DETAIL @ CORRIDOR ROOF
SCALE: 1"=1'-0"



3 A-105 PLAN DETAIL AT CORRIDOR/BACKWASH
SCALE: 1"=1'-0"



1 A-105 BUILDING SECTION
SCALE: 1/4"=1'-0"

GENERAL NOTES:

KEY NOTES:

1. CONCRETE EQUIPMENT PAD/LANDING
2. CONCRETE APRON
3. CMU WALL
4. 14'X14' COILING DOOR
5. 18'X18' COILING DOOR
6. 7'- 4" X 7'- 4" COILING DOOR
7. SIDEWALL FLASHING
8. BACKWASH TANK
9. PREFINISHED GUTTER, DOWNSPOUT AND CONCRETE 5'-0" SPLASH-BLOCK
10. PREFINISHED METAL COPING
11. PREFINISHED METAL FASCIA AND SOFFIT PANEL
12. STANDING SEAM METAL ROOF
13. CONCRETE CEILING, RE: STRUCT

SHORT AND BRENNAN ARCHITECTS

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: PROJECT MANAGER DATE: 6/2/17
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LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
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DESIGNED: SBA
DRAWN: BU
CHECKED: GS
APPROVED: #####

EXTERNAL REFERENCE FILES

BID ISSUE

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
CONTRACT NO. 3 - LGW WTP, WELL 1 PH & GANADO N0 WELL PH
ARCHITECTURAL

BUILDING SECTIONS AND DETAILS

FILENAME: LGW Sheetset.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: A-105
SHEET NUMBER: 50 OF 78

189.2

Path: Y:\Inactive Projs\Lower Greasewood WTP - 21402.00\100%\Drawings Filename: LGW Sheetset.dwg Plot Date: June 16, 2017 - 1:58 PM CADD User: Brian Unger

SYMBOLS:

CIRCUIT AND RACEWAYS:

- RACEWAY OR WIRING SYSTEM ABOVE FLOOR LEVEL BELOW CEILING, EXPOSED, UON.
- RACEWAY OR WIRING SYSTEM ABOVE FLOOR LEVEL. CONCEALED IN WALL OR ABOVE CEILING, UON.
- RACEWAY OR WIRING SYSTEM IN OR UNDER FLOOR, OR CONCEALED IN OR BEHIND STRUCTURE OR EQUIPMENT, OR CONDUIT ROUTED BELOW GRADE IN CONCRETE ENCASEMENT.
- ELECTRICAL DUCTBANK
- EMH — ELECTRICAL MANHOLE
- EPB, IPB — ELECTRICAL PULLBOX, INSTRUMENT PULLBOX.
- PNL-A-1,3,5 — HOME RUN: DESIGNATIONS INDICATE A ONE-LINE DIAGRAM OR PANELBOARD SCHEDULE REFERENCE. EXAMPLE: TO PANELBOARD PNL-A, CIRCUITS 1, 3, AND 5.
- RACEWAY OR WIRING SYSTEM: UP ON PLAN DRAWINGS
- RACEWAY OR WIRING SYSTEM: DOWN ON PLAN DRAWINGS
- RACEWAY OR WIRING SYSTEM CHANGE IN ELEVATION
- EMPTY CONDUIT STUB AND CAP
- SHH23 — SIGNAL (S), LOW VOLTAGE (L), OR MEDIUM VOLTAGE (M), HANDHOLE (HH) OR MANHOLE (MH) WITH DESIGNATION. EXAMPLE: SIGNAL HANDHOLE NUMBER 23.
- JB 2700A — JUNCTION BOX WITH OPTIONAL IDENTIFIER.
- JUNCTION BOX, WALL MOUNTED.
- TB 1035 — TERMINAL BOX WITH OPTIONAL IDENTIFIER EXAMPLE: TERMINAL BOX #1035

GROUNDING:

- GROUND ROD, 3/4" x 10'-0", COPPERCLAD
- GROUND ROD AND TEST WELL
- LIGHTNING ROD
- GROUND CONNECTION
- —G—G— GROUNDING SYSTEM CONDUCTOR
- —L—L— LIGHTNING SYSTEM CONDUCTOR
- G — EQUIPMENT GROUND PLATE
- —OHE—OHE— OVERHEAD POWER LINE

METERING (ANSI/IEEE FUNCTIONS AS SPECIFIED):

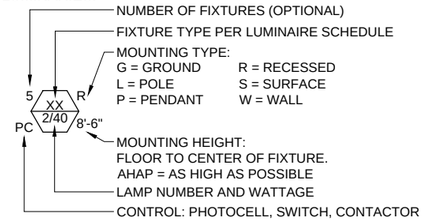
- ID# — POWER MONITOR (PM), POWER QUALITY MONITOR (HARMONIC ANALYSIS) (PQM), MOTOR MONITOR AND PROTECTION RELAY (MPR), FEEDER PROTECTION RELAY (FPR)

POWER DISTRIBUTION EQUIPMENT:

APPROXIMATE SHAPE AND SCALE WITH ESTIMATED SIZE AND NUMBER OF SECTIONS

- FLOOR MOUNTED SWITCHBOARD OR MOTOR CONTROL CENTER
- MCC 1100 OR MCC-M — EQUIPMENT NUMBER
- WALL MOUNTED PANELBOARD OR CABINET
- PBD 1200 — EQUIPMENT NUMBER

LUMINARIES:



- RECESSED MOUNTED FIXTURE
- SUSPENDED PENDANT MOUNTED FIXTURE
- SURFACE MOUNTED FIXTURE
- RECESSED, SURFACE OR PENDANT
- WALL MOUNTED
- DIRECTIONAL LIGHT
- POLE-MOUNTED AREA LIGHT: ONE POLE AND TWO FIXTURES SHOWN
- EMERGENCY LIGHTING UNIT WITH BATTERY CHARGER

EXIT LIGHTS WITH DARK QUADRANTS INDICATE ILLUMINATED FACES:

- SURFACE ON CEILING
- WALL MOUNTED
- EXIT DIRECTIONAL ARROWS

LIGHTING CONTROL AND CIRCUITING:

- 3a — LIGHTING CIRCUIT IDENTIFIER: 3a INDICATES FIXTURE POWERED FROM CIRCUIT 3 AND CONTROLLED BY SWITCH a
- NL — EMERGENCY LIGHTING FIXTURES WITH EMERGENCY BALLAST. NL = UNSWITCHED POWER SOURCE
- PCU — PHOTOELECTRIC CONTROL UNIT

CIRCUIT IDENTIFICATION:

P101-1: 3-1/0, 6G, 2"C	CIRCUIT P101-1: THREE 1/0 CONDUCTORS, ONE NO. 6 AWG GROUND WIRE IN 2" CONDUIT
P101-2: 2 [3-1/0, 6G, 2"C]	P101-2: TWO PARALLEL SETS OF THREE 1/0 CONDUCTORS, ONE NO. 6 AWG GROUND EACH IN 2" CONDUIT
C113: 12/C #14, 2"C	CONTROL CIRCUIT C113: ONE-TWELVE CONDUCTOR #14 AWG CONTROL CABLE
S111: 2-1 PR #16S, 1"C	SIGNAL CIRCUIT S111: TWO SIGNAL CABLES OF ONE PAIR 16 AWG TWISTED SHIELDED CABLES IN 1" CONDUIT
S112: 1-4 PR #16S, 1"C	SIGNAL CIRCUIT S112: ONE - FOUR PAIR 16 AWG SHIELDED IN 1" CONDUIT

TELEPHONE SYSTEMS:

- EXTERNAL LINE OR PLANT PHONE SYSTEM OUTLET

WIRING DEVICES:

SWITCHES:

- $ — SINGLE POLE SWITCH.
- $$ — GANGED SWITCHES IN COMMON BOX WITH COMMON WALL PLATE
- $a3 — SWITCH SUPERSCRIPT MODIFIER: LOWER CASE LETTER INDICATES LUMINAIRE CONTROLLED (I.E. a, b, c, ect). MAY BE COMBINED WITH CIRCUIT NUMBER (I.E. 1a, 4b, ect.)
  SWITCH SUBSCRIPT MODIFIER: UPPER CASE LETTER OR NUMBER
  2 = DOUBLE POLE
  3 = THREE WAY
  4 = FOUR WAY
  K = KEY OPERATED
  M = HORSEPOWER RATED MANUAL STARTER
  MC = MOMENTARY CONTACT, THREE POSITION
  MS = MANUAL (MOTOR) STARTER OR SWITCH
  R = RHEOSTAT (DIMMER OR SPEED CONTROL)
  F = FLUSH MOUNTED
  WP = WEATHERPROOF

RECEPTACLES:

- φ3, φGF — SINGLE STROKE - SINGLE OUTLET; DOUBLE STROKE - DUPLEX OUTLET

  RECEPTACLE MODIFIERS:
  3 = BRANCH CIRCUIT NUMBER
  C = CLOCK HANGER
  GF = GROUND FAULT CIRCUIT INTERRUPTER
  WP = WEATHERPROOF
- 480V RECEPTACLE
- 10-50R — SPECIAL RECEPTACLE. RATING OR NEMA CONFIGURATION. EXAMPLE: NEMA 10-50R, 125/250V, 3 POLE, 3 WIRE, 50 AMP, NON-GROUNDING TYPE
- RECESSED FLOOR RECEPTACLE
- SURFACE FLOOR RECEPTACLE
- GANGED RECEPTACLES: IN COMMON BOX WITH COMMON WALL PLATE

EQUIPMENT AND AREA CLASSIFICATIONS:

- M — MOTOR
- INDIVIDUAL MOTOR STARTER
- COMBINATION MOTOR STARTER
- 100A — NON-FUSED DISCONNECT: 100A, 3POLE
- F, 60A — FUSED DISCONNECT
- FIELD INSTRUMENT
- FIELD INSTRUMENT MOUNTED ON CONTROL STATION MOUNTING STAND. TYPICAL FOR ALL EQUIPMENT.
- CS — CONTROL STATION. CONFIGURATION ACCORDING TO CONTROL DIAGRAMS. REFER TO P&ID FOR HAND STATION EQUIVALENT DEVICES.
- HS 1311 — HAND STATION EQUIPMENT DESIGNATOR
- CI-D1, CI-D2 — HAZARDOUS AREA CLASSIFICATION
- UNCLASSIFIED — UNCLASSIFIED AREA
- CORROSIVE — CORROSIVE AREA
- ANTENNA

ABBREVIATIONS:

NOTES:
1. ABBREVIATIONS SHOWN ON ELECTRICAL DRAWINGS ARE IN ACCORDANCE WITH ASME STANDARD Y14.38A
2. ABBREVIATIONS ON THIS SHEET ARE IN ADDITION TO THE ABBREVIATIONS DEFINED ON OTHER DRAWINGS.
3. ABBREVIATIONS HERE IN SHALL TAKE PRECEDENCE IN CASE OF CONFLICT.
4. ABBREVIATIONS ARE NOT EQUIPMENT NUMBERING PREFIXES LISTED ON OTHER DRAWINGS.

A, AMP	AMP(S), AMPERE(S)	GND, G	GROUND	NO.	NUMBER	VAR	VOLT-AMPERE REACTIVE
AC	ALTERNATING CURRENT	GRS	GALVANIZED RIGID STEEL	NOM	NOMINAL	VC	VACUUM CONTACTOR
AFF	ABOVE FINISHED FLOOR	H	HIGH	NP	NAMEPLATE	W	WATT, WIRE, WIDE
AHAP	AS HIGH AS POSSIBLE	HGT	HEIGHT	NTS	NOT TO SCALE	W/	WITH
AIC	AMPS INTERRUPTING CAPACITY, SYMM.	HH	HANDHOLE	OC	ON CENTER	W/O	WITHOUT
AL	ALUMINUM	HID	HIGH INTENSITY DISCHARGE	OD	OUTSIDE DIAMETER	WG	WITH GROUND
ARCH	ARCHITECT(URAL)	HP	HORSEPOWER	OH	OVERHEAD	WP	WEATHERPROOF
ASYM	ASYMMETRICAL	HPS	HIGH PRESSURE SODIUM	OIS	OPERATOR INTERFACE STATION	WW	WIREWAY
AUTO	AUTOMATIC	HTR	HEATER	OT	OIL TIGHT	XMTR	TRANSMITTER
AUX	AUXILIARY	HV	HIGH VOLTAGE	OWS	OPERATOR WORKSTATION	Z	IMPEDANCE
AWG	AMERICAN WIRE GAUGE	HVAC	HEATING, VENTILATION, & AIR CONDITIONING	P	POLE, PHASE		
BC	BARE COPPER	HZ	HERTZ (CYCLES PER SECOND)	PB	PUSH-BUTTON, PULLBOX		
BLDG	BUILDING	I/O	INPUT / OUTPUT	PCP	PROCESS CONTROL PANEL		
BOT	BOTTOM	ICOM	INTERCOM	PF	POWER FACTOR		
C	CONDUCTOR, CONDUIT	ID	INSIDE DIAMETER	PH	PHASE		
CB	CIRCUIT BREAKER	IMC	INDIVIDUAL MOTOR CONTROLLER	PLC	PROGRAMMABLE LOGIC CONTROLLER		
CKT	CIRCUIT	INCAND	INCANDESCENT	PMM	POWER MONITORING MODULE		
CLG	CEILING	INST	INSTANTANEOUS, INSTRUMENT	PNL	PANEL		
CM	CENTIMETERS	INTLK	INTERLOCK	PP	POWER PANEL		
CNTL	CONTROL	IPB	INSTRUMENT PULLBOX	PRI	PRIMARY		
CONC	CONCRETE	JB	JUNCTION BOX	PT	POTENTIAL TRANSFORMER		
CPT	CONTROL POWER TRANSFORMER	KCMIL	1000 CIRCULAR MIL	PVC	POLYVINYL CHLORIDE		
CT	CURRENT TRANSFORMER	kV	KILOVOLT	PWR	POWER		
CU	COPPER	kVA	KILOVOLT-AMPERE	RCPT	RECEPTACLE		
DB	DIRECT BURIAL	KVAR	KILOVOLT-AMPERE REACTIVE	RE STL	REINFORCED STEEL		
DC	DIRECT CURRENT, DATA CABLE	KW	KILOWATT	REF	REFERENCE		
DET	DETAIL	KWH	KILOWATT HOUR	REQD	REQUIRED		
DIAG	DIAGRAM	L	LONG	RMS	ROOT MEAN SQUARE		
DISC	DISCONNECT	LA	LIGHTNING ARRESTOR	RTD	RESISTANCE TEMPERATURE DETECTOR		
DWG	DRAWING	LCP	LOCAL CONTROL PANEL	RTU	REMOTE TERMINAL UNIT		
EA	EACH	LT	LONG TIME	SA	SURGE ARRESTOR		
EC	EMPTY CONDUIT	LTG	LIGHTING	SCR	SILICON CONTROLLED RECTIFIER		
ECP	EQUIPMENT CONTROL PANEL	LV	LOW VOLTAGE	SD	SMOKE DETECTOR		
EDB	ELECTRICAL DUCTBANK	M	METER	SEC	SECONDARY		
EG	ENGINE GENERATOR SET	MA	MILLIAMPERE	SEL	SELECTOR		
EL	ELEVATION	MBS	MANUAL BYPASS SWITCH	SPD	SURGE PROTECTIVE DEVICE		
ELEC	ELECTRIC(AL)	MCC	MOTOR CONTROL CENTER	SPEC	SPECIFICATION		
EMER	EMERGENCY	MCP	MOTOR CIRCUIT PROTECTOR	SPKR	SPEAKER		
EMH	ELECTRICAL MANHOLE	MECH	MECHANICAL	ST	SHORT TIME		
ENCL	ENCLOSURE / ENCLOSED	MFR	MANUFACTURE	SUB	SUBSTATION		
EP	EXPLOSION PROOF	MH	MANHOLE, METAL HALIDE	SW	SWITCH		
EPB	ELECTRICAL PULLBOX	MIC	MICROPHONE	SWBD	SWITCHBOARD		
EQUIP	EQUIPMENT	MISC	MISCELLANEOUS	SWGR	SWITCHGEAR		
EX	EXISTING	MM	MILLIMETER	SYMM	SYMMETRICAL		
F.O.	FAIL OPENED	MOV	MOTOR OPERATED VALVE	SYS	SYSTEM		
FDR	FEEDER	MPC	MINI POWER CENTER	TB	TERMINAL BOX		
FL	FLUORESCENT	MTS	MANUAL TRANSFER SWITCH	TEL	TELEPHONE		
FLA	FULL LOAD AMPS	MV	MILLIVOLT, MEDIUM VOLTAGE	TEMP	TEMPERATURE		
FLEX	FLEXIBLE CONDUIT	MVMC	MEDIUM VOLTAGE MOTOR CONTROL	TFR	TRANSFORMER		
FM	FLOW METER	N.C.	NORMALLY CLOSED	TRI	TRIAD		
FO	FIBER OPTIC	N.O.	NORMALLY OPENED	TV	TELEVISION		
FUT	FUTURE	N/A	NOT APPLICABLE	TYP	TYPICAL		
GDR	GROUNDING RESISTOR	NEUT,N	NEUTRAL	U/G	UNDERGROUND		
GEC	GROUND ELECTRODE CONDUCTOR	NF	NON-FUSED	UON	UNLESS OTHERWISE NOTED		
GF	GROUND FAULT	NIC	NOT IN CONTRACT	UPS	UNINTERRUPTIBLE POWER SUPPLY		
GFI	GROUND FAULT INTERRUPTER			V	VOLT		
				VA	VOLT-AMPERE		

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ (PROJECT MANAGER) DATE: 6/2/17
APPROVED: _____ (BROWN AND CALDWELL) DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: NONE
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED PROFESSIONAL ENGINEER CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 6/17/2017 ARIZONA, U.S.A. Expires 9/30/19

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

SYMBOLS, ABBREVIATIONS AND NOTES

FILENAME	143956-E-001.dwg
BC PROJECT NUMBER	143956
DRAWING NUMBER	E-001
SHEET NUMBER	51 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: \\bcslcfp01\projects\Projects\Navajo Nation\143956_LowerGreasewoodDesign\CAD\Contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Electrical Filename: 143956-E-001.dwg Plot Date: June 7, 2017 - 12:00 PM CADD User: Christopher Resop

CONTROL DIAGRAMS:

LINEWORK:

- CONDUCTORS CONNECTED
- CONDUCTORS NOT CONNECTED

MISCELLANEOUS:

- MCP, 15 AMP — MOTOR CIRCUIT PROTECTOR (MCP) MAGNETIC-ONLY CIRCUIT BREAKER
- 15 AMP — THERMAL-MAGNETIC CIRCUIT BREAKER
- FU 2B, 15 AMP — FUSE WITH SIZE AND OPTIONAL IDENTIFICATION
- FU 2B, 15 AMP — FUSE WITH BLOWN FUSE INDICATOR
- SIZE — DISCONNECT SWITCH
- MTR — MOTOR (PHASES AS REQUIRED)
- SOLENOID VALVE OR OVERLOAD TRIP UNIT
- 250W — SPACE HEATER AND WATTAGE
- 480V / 120V, 250VA — CONTROL TRANSFORMER. PRIMARY & SECONDARY VOLTAGE SHOWN, SIZE OPTIONAL
- 50/3, CT (3) — CURRENT TRANSFORMER WITH PRIMARY / SECONDARY TURNS RATIO
- HORN / SIREN
- KVAR — POWER FACTOR CORRECTION CAPACITOR
- XX — MOTOR STARTER TERMINATION POINT
- XX — PLC I/O POINTS:
  - DO = DIGITAL OUT SIGNAL
  - DI = DIGITAL IN SIGNAL
  - AO = ANALOG OUT SIGNAL
  - AI = ANALOG IN SIGNAL

STATUS INDICATORS: SHOWN WITH DESCRIPTION AND COLOR (X):

A = AMBER, B = BLUE, G = GREEN, R = RED, W = WHITE

INDICATORS:

- STATUS (X = COLOR)
- X1 — PUSH TO TEST
- TEST — REMOTE TEST
- BACK-LIT PUSH-BUTTON

DESCRIPTION (TYP)

COILS:

- C — LTG CTK #1
- CR 10 — AUTO ENABLE
- TR 9 — ON or OFF DELAY RANGE x to xx SEC/MIN SET AT x SEC/MIN
- L, U, LR 8
- OL (SSOL) — THERMAL OVERLOAD RELAY OR SOLID STATE OVERLOAD RELAY
- A — METER WITH ALPHA IDENTIFIERS
  - ETM= ELAPSED TIME
  - A = AMMETER
  - V = VOLTMETER

A) RELAYS OR CONTACTOR COILS WITH DESCRIPTION OR REFERENCE
- C = CONTACTOR, LIGHTING OR GENERAL USE
- F = FAST OR FORWARD
- IC = ISOLATION CONTACTOR
- M = MAIN OR LINE
- MO = MOTOR OPERATED
- R = RUN OR REVERSE
- S = SLOW OR START
- T = TRIP COIL
- 1M = FIRST MAIN OR WYE
- 2M = SECOND OR DELTA

B) RELAY COILS WITH NUMERIC PREFIX OR SUFFIX
- CR = CONTROL RELAY
- MR = MACHINE TOOL RELAY
- TR = TIMING RELAY

C) TIME DELAY COIL WITH NUMERIC PREFIX OR SUFFIX, DELAY ACTION, TIMING RANGE AND SETTING

D) MECHANICALLY LATCHED RELAY WITH UNLATCH COIL

POWER CONTACTORS:

- M, SIZE 3 — AIR-BREAK CONTACTOR WITH NEMA SIZE
- M, SIZE 6 — VACUUM CONTACTOR WITH NEMA SIZE
- M, SIZE 2 — REDUCED VOLTAGE SOLID STATE STARTER

SWITCH OR INTERLOCK CONTACTS:

NORMALLY OPEN (NO)	NORMALLY CLOSED (NC)	
CR12, LINE 12	CR9, LINE 25	CONTROL RELAY CONTACTS
TR3, TC, LINE 43	TR4, TO, LINE 44	ON DELAY (DELAY ON COIL ENERGIZATION) RELAY CONTACTS TC = NORMALLY OPEN, TIME CLOSED TO = NORMALLY CLOSED, TIME OPENED
TR5, TO, LINE 45	TR6, TC, LINE 46	OFF DELAY (DELAY ON COIL DE-ENERGIZATION) RELAY CONTACTS TO = NORMALLY OPEN, TIME OPENED TC = NORMALLY CLOSED, TIME CLOSED
TR5, INST, LINE 45	TR6, INST, LINE 46	TIME DELAY RELAY INSTANTANEOUS CONTACTS

SWITCHES: (SHOWN WITH OPTIONAL LOCATION REFERENCE)

NORMALLY OPEN (NO)	NORMALLY CLOSED (NC)	
5ZS, VALVE FV010	1ZS, VALVE FV0101	LIMIT: FREE
3ZS, VALVE FV0101	7ZS, VALVE FV0101	LIMIT: HELD
FS3	FS3	FLOW
TS1	TS1	TEMPERATURE
PS1	PS1	PRESSURE
LS5	LS5	LEVEL
WS2	WS2	FORCE OR TORQUE
SS1	SS1	SPEED
HSxxx, AT PNLxxx	HSxxx, AT PNLxxx	MOMENTARY PUSH-BUTTON
STOP, AT DRIVE		MUSHROOM HEAD MOMENTARY PUSH-BUTTON
OFF, ON, DESCRIPTION		MAINTAINED PUSH-BUTTON OR ROCKER SWITCH
1, 2, OX, AT PNLxxx		SELECTOR SWITCH: 2 POSITION MAINTAINED SWITCH POSITION X = CLOSED CONTACT O = OPEN CONTACT
1, 2, XO, OX, AT PNLxxx		SELECTOR SWITCH: 2 POSITION SPRING RETURN X = CLOSED CONTACT O = OPEN CONTACT
1, 2, 3, XOO, OOX, AT PNLxxx		SELECTOR SWITCH: 3 POSITION X = CLOSED CONTACT O = OPEN CONTACT

ONE LINE DIAGRAMS:

- CIRCUIT ROUTED IN UNDERGROUND DUCTBANK
- 12kV — INCOMING POWER SUPPLY
- CABLE TERMINATION: STRESS CONE FOR SHIELDED CABLES.
- LIGHTNING ARRESTOR
- SURGE ARRESTOR
- BUS DUCT OR BUSWAY
- STAB OR PULL-APART CONNECTION.
- 52A, 200A — AIR CIRCUIT BREAKER: TRIP RATING AND I.D.
- 3P, 400AT, 400AF, LSIG — AIR CIRCUIT BREAKER: BREAKER FRAME RATING / TRIP SETTING. SOLID STATE TRIP FEATURES SHOWN:
  - L = LONG DELAY
  - S = SHORT DELAY
  - I = INSTANTANEOUS
  - G = GROUND FAULT
- 52-G1, E, 1000AT, 1200AF — POWER CIRCUIT BREAKER FRAME AND TRIP SETTING AND I.D. SHOWN
- 100A — POWER DISCONNECT OR ISOLATION SWITCH: CONTINUOUS RATING SHOWN. 30A, 3P
- F, OR, 100E, 200A — FUSED SWITCH: WITH TYPE AND RATINGS
- 1500 KVA, 13.2 KV - 480V, 3Ø, 4W — POWER TRANSFORMER: DESIGNATION, SIZE, PRIMARY AND SECONDARY VOLTAGES, AND WINDING CONFIGURATION
- WINDING CONFIGURATION: DELTA
- WYE (GROUNDED)
- 4160V - 120V — POTENTIAL TRANSFORMER WITH PRIMARY AND SECONDARY VOLTAGES AND WINDINGS QUANTITIES
- 250/5 — CURRENT TRANSFORMER: RATIO, QUANTITIES
- xS — METER SWITCH:
  - AS = AMMETER SWITCH
  - VS = VOLTMETER SWITCH
- A, 0 - 1000 AMPS — METER WITH RANGE:
  - A = AMMETER
  - W = WATTMETER
  - KWH = KILOWATT-HOUR METER
  - F = FREQUENCY METER
  - VAR = VAR METER
  - V = VOLTMETER
- 64 N, 3 — ANSI C37.2 DEVICE WITH QUANTITIES
- 600kW, 60 HZ, 480V, 3P,4W, OR, G — GENERATOR WITH RATING
- GDR, 50 AMP, 10 SEC — NEUTRAL GROUNDING RESISTOR: CURRENT / TIME RATING SHOWN
- K — KEY INTERLOCK
- 5 — MOTOR WITH HORSEPOWER
- NORMAL, EMERGENCY, MTS10, 60A, 3P, LOAD — POWER TRANSFER SWITCH WITH DESIGNATIONS, RATING AND CONFIGURATION
  - MTS = MANUAL TRANSFER SWITCH
  - ATS = AUTOMATIC TRANSFER SWITCH
- FVNR, 31 — MOTOR CONTACTOR (SIZE 1)
  - FVR = FULL VOLTAGE, REVERSING STARTER
  - FVNR = FULL VOLTAGE NON-REVERSING
  - RVSS = REDUCED VOLTAGE SOLID-STATE
  - 2S2W = TWO SPEED, TWO WINDING STARTER
- GROUND ROD ELECTRODE
- CONTROL STATION PER CONTROL DIAGRAMS
- FIELD INSTRUMENT OR DEVICE
- 55 KVAR — POWER FACTOR CORRECTION CAPACITOR: KVAR RATING

GENERAL NOTES:

1. SYMBOLS AND ABBREVIATION DRAWINGS ARE GENERAL IN NATURE
2. NOT ALL SYMBOLS OR ABBREVIATIONS SHOWN ON DRAWINGS E-001 AND E-002 ARE USED IN SUBSEQUENT DRAWINGS.

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: PROJECT MANAGER DATE: 6/2/17
APPROVED: BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: NONE
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

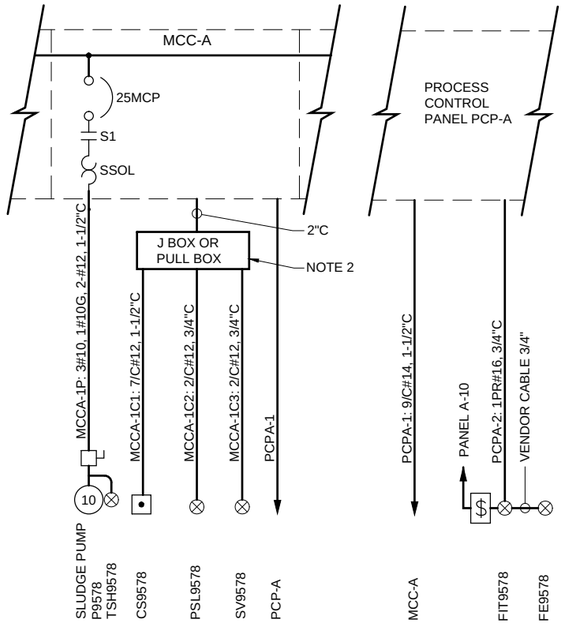
REGISTERED PROFESSIONAL ENGINEER — CERTIFICATE NO. 36697 — KENNETH W. CHANDLER — Date Signed 6/7/2017 — ARIZONA, U.S.A. — Expires 9/30/19

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

STANDARD CONTROL AND ONE-LINE DIAGRAM LEGENDS AND SYMBOLS

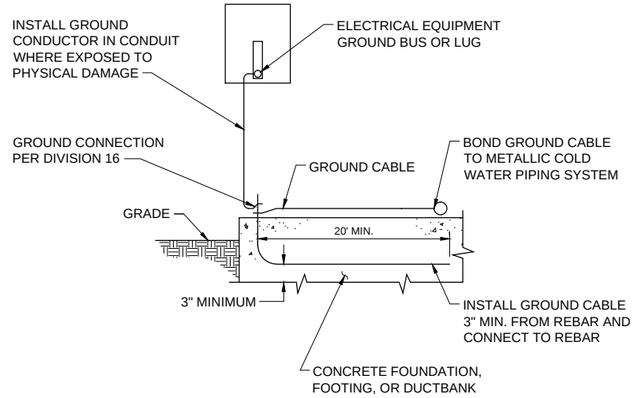
FILENAME: 143956-E-002.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: E-002
SHEET NUMBER: 52 OF 78



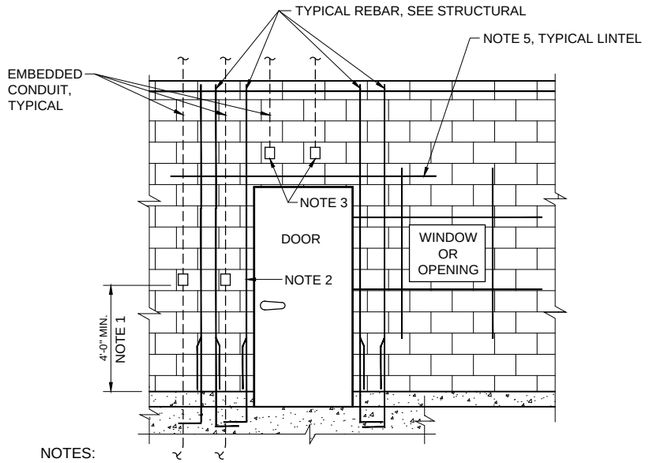
NOTES:

1. MOTOR CONTROL CENTER AND PROCESS CONTROL PANEL HOMERUN CIRCUIT DESIGNATIONS: REFER TO PLAN DRAWINGS.
2. PROVIDE TERMINATION BOX, PULL BOX FITTINGS, OR DUCTBANK TRANSITION, AS REQUIRED.

SINGLE-LINE DIAGRAM
TYPICAL
DETAIL E1001
NO SCALE



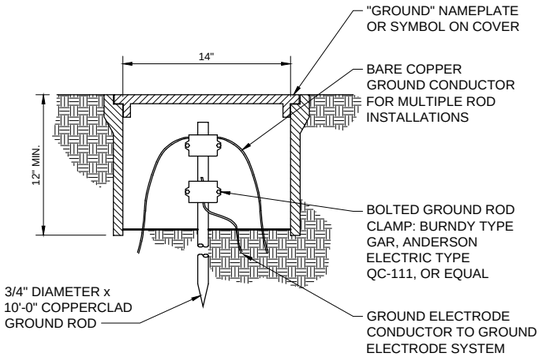
GROUND ELECTRODE
CONCRETE ENCASED
DETAIL E3001
NO SCALE



NOTES:

1. ALL EMBEDDED BOXES ABOVE GROUT LIFTS, AND BOND BEAMS.
2. EMBEDDED BOXES ARE NOT ALLOWED IN WALL BLOCK CELLS WITH VERTICAL REBAR.
3. EMBEDDED BOXES FOR EXIT LIGHTS, FIRE ALARMS, INTRUSION SWITCHES, ETC. ABOVE HORIZONTAL LINTEL. SEE STRUCTURAL FOR LINTEL HEIGHTS.
4. CUT OPENINGS IN CMU FOR EMBEDDED BOXES.
5. HORIZONTAL CONDUIT RUNS ARE NOT ALLOWED IN BOND BEAM OR LINTEL.
6. ELECTRICAL EQUIPMENT WEIGHING OVER 200 POUNDS MAY NOT BE ATTACHED TO WALLS. PROVIDE EQUIPMENT RACK PER DETAIL E4001.

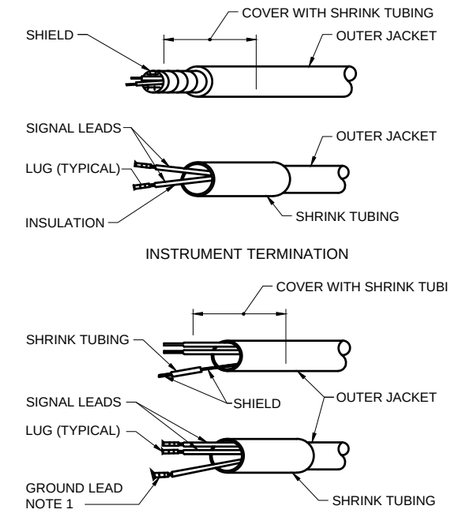
EMBEDDED RACEWAYS
CMU WALLS
DETAIL E2211
NO SCALE



NOTES:

1. TEST WELL OF CONCRETE, PVC, OR FRP MATERIAL.
2. H-20 LOAD RATED COVER FOR TEST WELL IN TRAFFIC AREA.

GROUND ELECTRODE
TEST WELL
DETAIL E3002
NO SCALE



NOTE:

1. GROUND SHIELD AT PANEL NOT AT INSTRUMENT.

SHIELDED CABLE TERMINATION
DETAIL I0501
NO SCALE

Path: \\bcsldfp01\projects\Projects\Navajo Nation\143956_LowerGreasewoodDesign\CAD\Contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Electrical Filename: 143956-E-003.dwg Plot Date: June 7, 2017 - 12:01 PM CADD User: Christopher Resop

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17 (PROJECT MANAGER)
APPROVED: _____ DATE: 6/2/17 (BROWN AND CALDWELL)

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: NONE
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED CERTIFICATE NO. EXPIRATION 36697 KENNETH W. CHANDLER Date Signed 6/7/2017 ARIZONA, U.S.A. Expires 9/30/19

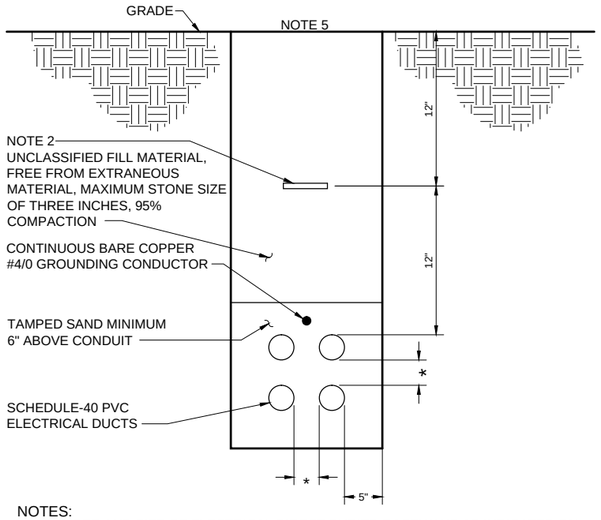
REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

STANDARD DETAILS - 1

FILENAME 143956-E-003.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER E-003
SHEET NUMBER 53 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

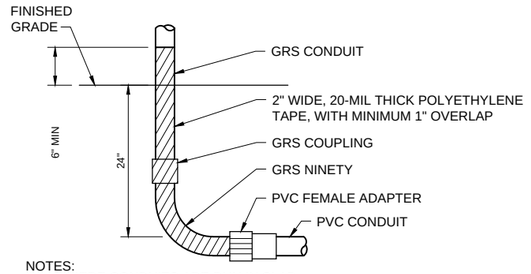


NOTES:
1. NUMBER AND SIZE OF ELECTRICAL DIRECT BURIED RACEWAYS AS INDICATED ON DRAWINGS OR SCHEDULES.
2. OSHA APPROVED 6" WIDE RED WARNING TAPE (IDEAL DU-601 OR EQUAL).
3. DIMENSIONS ARE MINIMUM.
4. BOND GROUNDING CONDUCTOR TO BUILDING GROUNDING ELECTRODES, POWER SOURCE AND LOAD ENCLOSURES.
5. REPLACE GRADING, PAVING AND CONCRETE TO MATCH EXISTING.

UNDERGROUND RACEWAYS
DIRECT BURIED

DETAIL A / TYP

SCALE: NONE

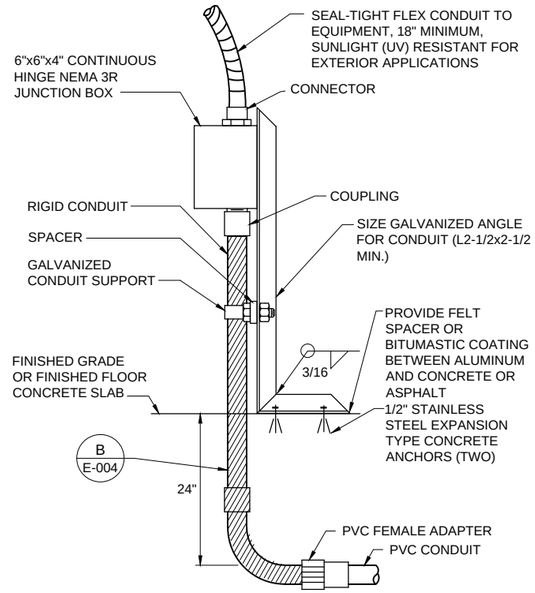


NOTES:
1. WHERE CONDUITS ARE RUN IN SLAB, THE 24" DIMENSION DOES NOT APPLY.

GRS STUB UP - WELLS

DETAIL B / TYP

SCALE: NONE

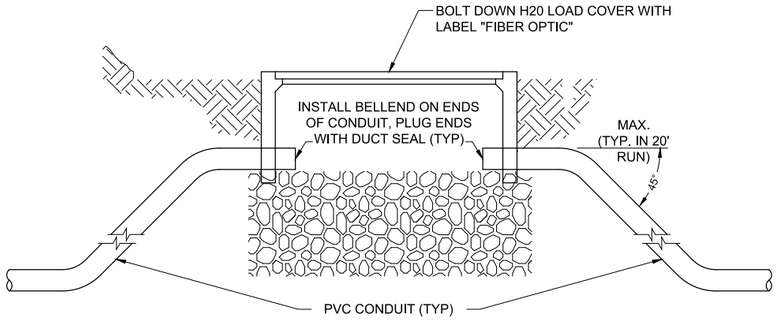


NOTES:
1. WHERE CONDUITS ARE RUN IN SLAB, THE 24" DIMENSION DOES NOT APPLY.

RIGID CONDUIT STUBUP & TRANSITION JB SUPPORT - WELLS

DETAIL C / TYP

SCALE: NONE

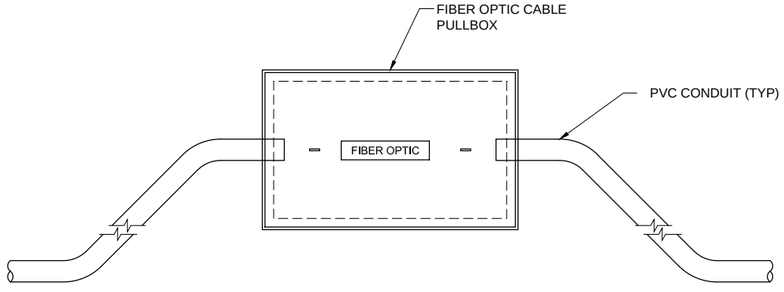


NOTES:
1. PROVIDE 2' OF PEA GRAVEL TO ALLOW WATER DRAINAGE.
2. PULLBOX SHALL BE 30"x48"x18".

FIBER OPTIC CABLE PULLBOX
SECTION VIEW

DETAIL D / TYP

NONE



FIBER OPTIC CABLE PULLBOX
PLAN VIEW

DETAIL E / TYP

NONE

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17
PROJECT MANAGER

APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE:	NONE
DESIGNED:	KWC
DRAWN:	CJR
CHECKED:	SNH
APPROVED:	MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED PROFESSIONAL ENGINEER (GENERAL) CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 9/30/19

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

REVISIONS

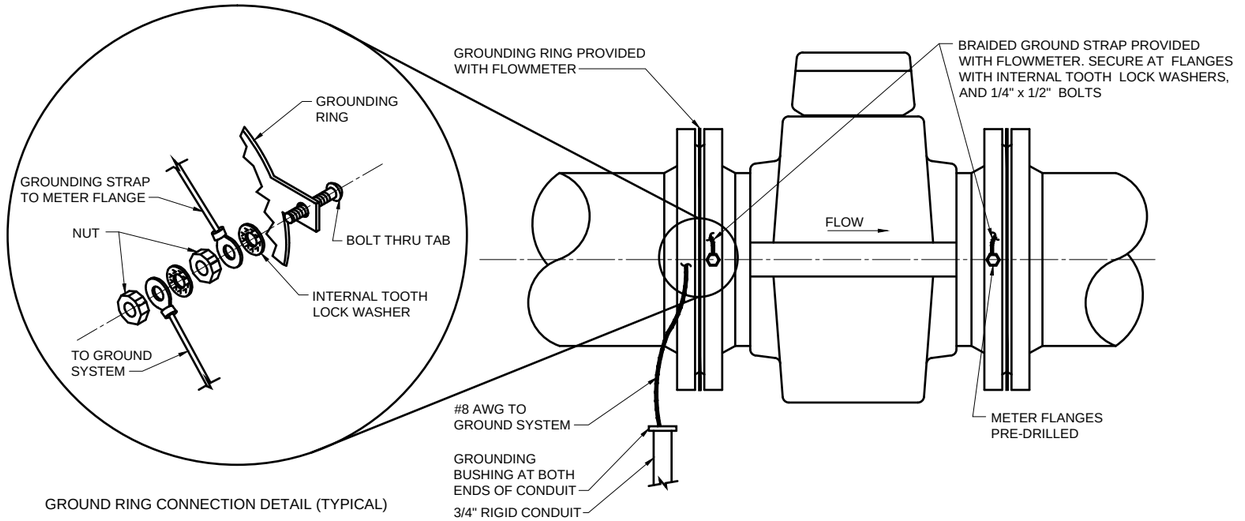
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

STANDARD DETAILS - 2

FILENAME	143956-E-004.dwg
BC PROJECT NUMBER	143956
DRAWING NUMBER	E-004
SHEET NUMBER	54 OF 78

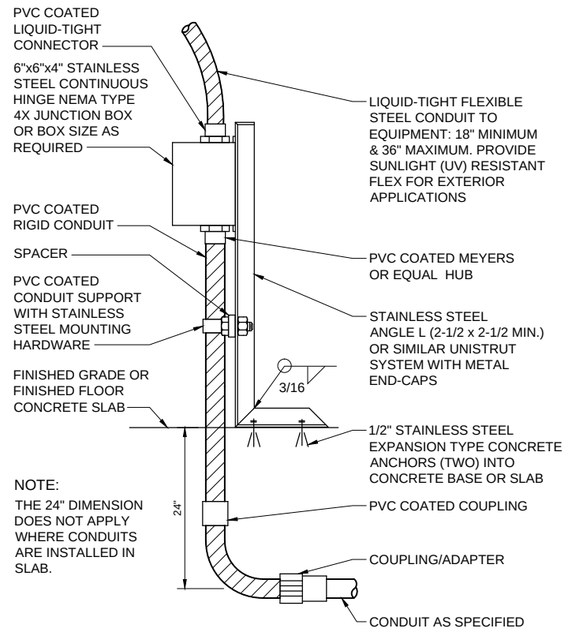
ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: \\bcslcfp01\projects\Projects\Navajo Nation\143956_LowerGreasewoodDesign\CADD\Contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Electrical Filename: 143956-E-004.dwg Plot Date: June 7, 2017 - 12:02 PM CADD User: Christopher Resop



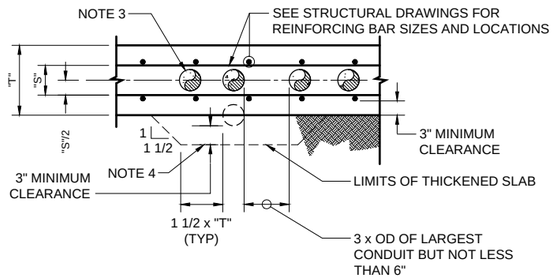
GROUND RING CONNECTION DETAIL (TYPICAL)

FLOW TRANSMITTER
MAGNETIC - GROUNDING
DETAIL I4001
SCALE: NONE

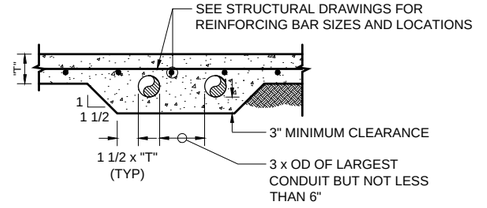


NOTE:
THE 24" DIMENSION DOES NOT APPLY WHERE CONDUITS ARE INSTALLED IN SLAB.

UNDERGROUND RACEWAYS
STUB-UP AND J-BOX
DETAIL E2112
SCALE: NONE



DOUBLE MAT REINFORCEMENT

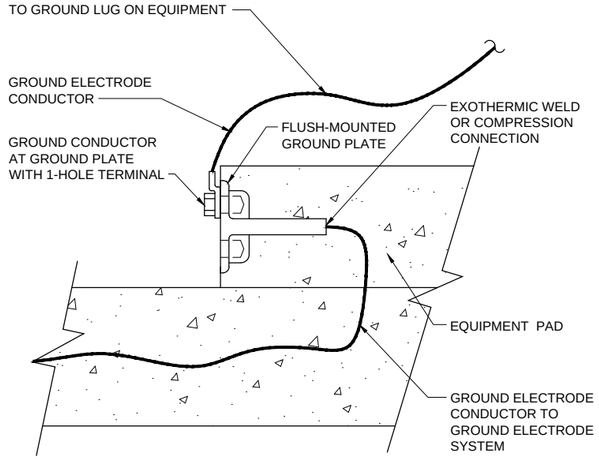


SINGLE MAT REINFORCEMENT

NOTES

1. OD = OUTSIDE DIAMETER OF CONDUIT.
2. "S" = CLEAR SPACE BETWEEN REINFORCING.
3. MAXIMUM OD = T/4 OR S - 1/2".
4. PLACE CONDUIT UNDER SLAB AND ENCASE IN CONCRETE WHERE OD GREATER THAN T/4 OR S - 1/2".
5. PROVIDE PVC OR PVC COATED CONDUITS WHERE IN CONTACT WITH REINFORCING.

EMBEDDED RACEWAYS
SLAB ON GRADE
DETAIL E2202
SCALE: NONE



NOTE:
1. REQUIRED AT ELECTRICAL EQUIPMENT

EQUIPMENT GROUNDING
GROUND PLATE IN SLAB
DETAIL E3101
SCALE: NONE

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: (PROJECT MANAGER) DATE: 6/2/17
APPROVED: BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: NONE
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED PROFESSIONAL ENGINEER CERTIFICATE NO. (ELECTRICAL) 36697 KENNETH W. CHANDLER Date Signed 6/7/2017 ARIZONA, U.S.A. Expires 9/30/19

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

STANDARD DETAILS - 3

FILENAME 143956-E-005.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER E-005
SHEET NUMBER 55 OF 78

GENERAL NOTES:

1. REPLACE EXISTING POWER UTILITY, ELECTRICAL AND TELEMETRY EQUIPMENT.
2. DISCONNECT AND RE-CONNECT EXISTING NTUA 480 VOLT 3-PHASE POWER UTILITY. EXISTING METER NUMBER APPEARS TO BE 38181922.
3. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014, 11830, AND 17900.

KEY NOTES:

(1) DISCONNECT EXISTING POWER UTILITY, REMOVE ALL EXISTING WELL ELECTRICAL AND TELEMETRY EQUIPMENT. TURN EQUIPMENT OVER TO NTUA.

(2) PROVIDE REPLACEMENT ELECTRICAL AND TELEMETRY EQUIPMENT. EXTEND AND RECONNECT POWER UTILITY.

(3) UNDERGROUND CIRCUITS PER DRAWING E-102, POWER UTILITY REQUIREMENTS TO PREVAIL.

(4) PROVIDE SERVICE ENTRANCE SECTION METER, MAIN DISCONNECT, FUSES, AND LIGHTNING ARRESTOR ON OUTSIDE OF BUILDING.

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ (PROJECT MANAGER) DATE: 6/2/17
APPROVED: _____ (BROWN AND CALDWELL) DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE:	1" = 10'
DESIGNED:	KWC
DRAWN:	CJR
CHECKED:	SNH
APPROVED:	MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED PROFESSIONAL ENGINEER CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 6/2/17 ARIZONA, U.S.A. Expires 9/30/19

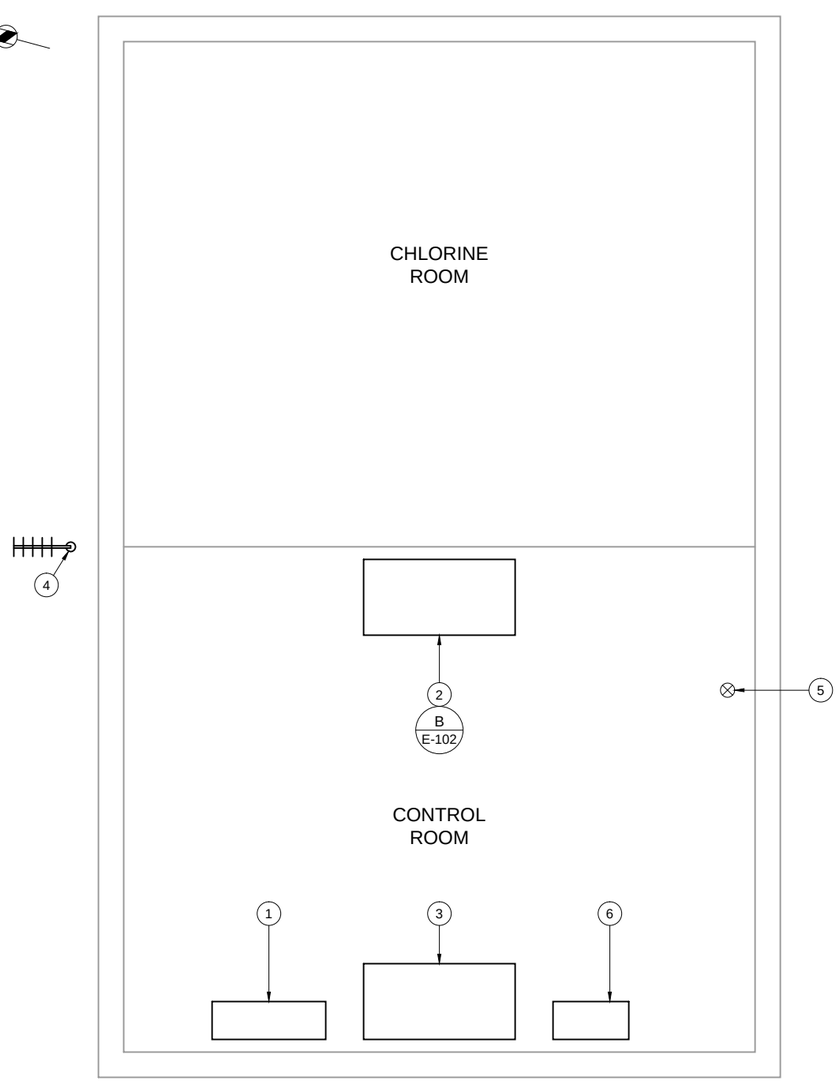
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

LOWER GREASEWOOD SITE PLAN WELL 1

FILENAME	143956-E-100.dwg
BC PROJECT NUMBER	143956
DRAWING NUMBER	E-100
SHEET NUMBER	56 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH



PUMP HOUSE
PLAN
SCALE: NONE

LOWER GREASEWOOD WELL 1

LOAD SUMMARY AT 480 VAC

LOAD DESCRIPTION	KVA	HP	480 VAC FLA
WELL PUMP RVSS CONTROLLER		25	34
TRANSFORMER FOR PANEL-A	15		31.3
SUBTOTAL:	15	25	65.3
PLUS 25%:			16
AMPERE TOTAL:			81.6

GENERAL NOTES:

1. PROVIDE EQUIPMENT, LIGHTING, VENTILATION, AND RACEWAYS PER INDIAN HEALTH SERVICE - TECHNICAL PROVISIONS FOR MOTOR CONTROL CENTER AND TANK CONTROL PANEL - PUMP HOUSE LAYOUT. PROVIDE ALL CIRCUITS IN CHLORINE ROOM REGARDLESS OF WHETHER CHLORINE OR FLUORIDE EQUIPMENT IS PROVIDED.
2. GENERAL REQUIREMENTS: SPECIFICATION 16000.
3. TESTING: SPECIFICATION 16030.
4. ARC FLASH HAZARD ANALYSIS AND LABELING: SPECIFICATION 16431.
5. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014, 11830, AND 17900.

KEY NOTES:

1. LOAD CENTER, TRANSFORMER BELOW.
2. TELEMETRY PLC.
3. MOTOR STARTER RVSS.
4. TELEMETRY ANTENNA ON 2"x20'-0" PIPE, ANCHORED TO BUILDING. ALIGN TO PLANT SITE. PROVIDE ANTENNA CABLE IN CONDUIT. PROVIDE CGB FITTING AND EXPOSE LOOP OF CABLE FOR FINAL CONNECTION TO ANTENNA. ORIENT TO TREATMENT PLANT. MAKE PENETRATION TO BUILDING WATER TIGHT.
5. WELL FLOW METER.
6. LOAD CENTER TRANSFORMER DISCONNECT.

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SALT LAKE CITY, UTAH

SUBMITTED: _____ (PROJECT MANAGER) DATE: 6/2/17
APPROVED: _____ (BROWN AND CALDWELL) DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: NONE
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

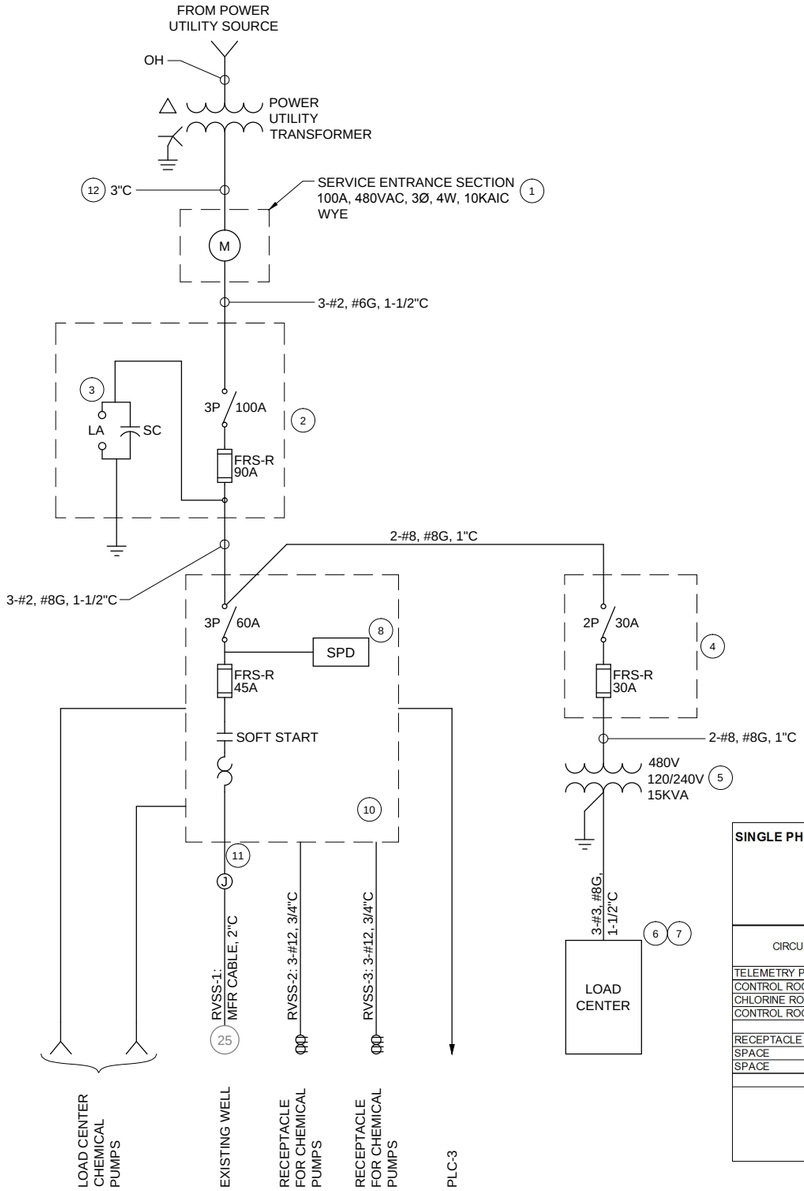
REGISTERED PROFESSIONAL ENGINEER CERTIFICATE NO. LEGEND 36697 KENNETH W. CHANDLER Date Signed 6/2/17 ARIZONA, U.S.A. Expires 9/30/19

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

LOWER GREASEWOOD WELL 1
PUMP HOUSE
PLAN

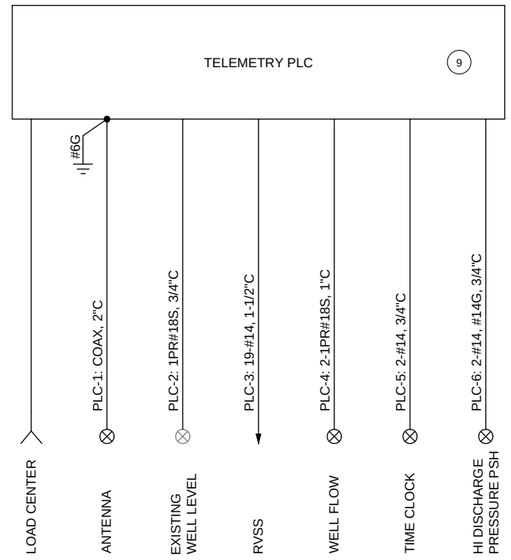
FILENAME 143956-E-101.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER E-101
SHEET NUMBER 57 OF 78



POWER ONE-LINE DIAGRAM

DETAIL A / E-102

SCALE: NONE



CONTROL ONE-LINE DIAGRAM

DETAIL B / E-102

SCALE: NONE

SINGLE PHASE PANEL: LOAD CENTER (LC)

VOLTAGE, PHASE, & WIRE:	120 / 240 VAC, 1 PHASE, 3 WIRE	LOCATION:	CONTROL ROOM
BUS SIZE:	100 AMPERE	ENCLOSURE:	NEMA-3R
MAIN SIZE:	80 AMPERE	MOUNTING:	WALL
MAIN TYPE:	CIRCUIT BREAKER	BUS BRACING:	22 K AIC
BREAKER TYPE:	PLUG-ON	FED FROM:	SES OUTDOORS

CIRCUIT TITLE / LOAD DESCRIPTION	AWG WIRE SIZE	RACE-WAY SIZE	CKT NO.	BREAKER AMP	BREAKER POLE	LOAD (VA) PHASE A	LOAD (VA) PHASE B	LOAD (VA) PHASE B	LOAD (VA) PHASE A	BREAKER POLE	BREAKER AMP	CKT NO.	AWG WIRE SIZE	RACE-WAY SIZE	CIRCUIT TITLE / LOAD DESCRIPTION
TELEMETRY PLC CONTROL PANEL	2-12, 12G	1/2	1	15	1	180			600	1	15	2	2-12, 12G	1/2	CHLORINE BOOSTER PUMP
CONTROL ROOM LIGHTS	2-12, 12G	1/2	3	15	1		200	50		1	15	4	2-12, 12G	1/2	CHLORINE PUMP
CHLORINE ROOM LIGHTS	2-12, 12G	1/2	5	15	1	200			50	1	15	6	2-12, 12G	1/2	FLUORIDE PUMP
CONTROL ROOM HEATER	2-12, 12G	1/2	7	15	2		1200	1200		2	15	8	2-12, 12G	1/2	CHLORINE ROOM HEATER
			9	-	-	1200			1200	-	-	10			
RECEPTACLE	2-12, 12G	1/2	11	15	1		180			-	-	12			SPACE
SPACE			13	-	-					-	-	14			SPACE
SPACE			15	-	-					-	-	16			SPACE
	COLUMN	TOTALS:				1580	1580	1250	1850						

PHASE-A LOAD (VA): 3430
PHASE-B LOAD (VA): 2830

TOTAL LOAD (V. 6260 I (amp) 26.1

PANEL SCHEDULE

DETAIL C / -

SCALE: NONE

GENERAL NOTES:

1. POWER UTILITY: NAVAJO TRIBAL UTILITY AUTHORITY.
2. GENERAL REQUIREMENTS: SPECIFICATION 16000.
3. TESTING: SPECIFICATION 16030.
4. ARC FLASH HAZARD ANALYSIS AND LABELING: SPECIFICATION 16431.
5. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014, 11830, AND 17900.

KEY NOTES:

1. SERVICE ENTRANCE METER SOCKET, NEMA 3R, EUSERC, TEST BLOCKS, SQUARE D.
2. MAIN DISCONNECT SWITCH, HEAVY DUTY, NEMA 3R, CLASS R FUSE REJECTION KIT, SQUARE D.
3. LIGHTNING ARRESTOR, DELTA LA603.
4. LOAD CENTER DISCONNECT SWITCH, HEAVY DUTY, NEMA 3R SQUARE D MODEL QO.
5. TRANSFORMER, TOTALLY ENCLOSED/ENCAPSULATED, 115 DEGREES C RISE, ACME T-2-53517-3S.
6. LOAD CENTER, WITH GROUND BAR, NEMA 3R, SQUARE D QOI16M100RB.
7. SURGE PROTECTIVE DEVICE, BUS CONNECTED, UL 1449 TYPE 2, 22.5KA SURGE, 1 PHASE 3-WIRE, SQUARE D QO2175SB.
8. SURGE PROTECTIVE DEVICE, UL 1449 TYPE 1, 40KA SURGE, 3 PHASE 4-WIRE, SQUARE D SDSA3650.
9. PROVIDE PER NTUA - TECHNICAL PROVISIONS 4.0 FOR MOTOR CONTROL CENTER AND TANK CONTROL PANEL - PLC CONTROL PANEL, INPUT/OUTPUT WIRING FOR SIMPLEX WELL WITH SOFT STARTER.
10. PROVIDE PER NTUA - TECHNICAL PROVISIONS 4.0 FOR MOTOR CONTROL CENTER AND TANK CONTROL PANEL - SOFT START PUMP PANEL.
11. 3-#6, #10G, 2"C
12. CONDUCTORS FROM POLE TO METER BY POWER UTILITY

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ PROJECT MANAGER DATE: 6/2/17
APPROVED: _____ BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: NONE
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED PROFESSIONAL ENGINEER CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 6/7/2017 ARIZONA, U.S.A. Expires 9/30/19

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

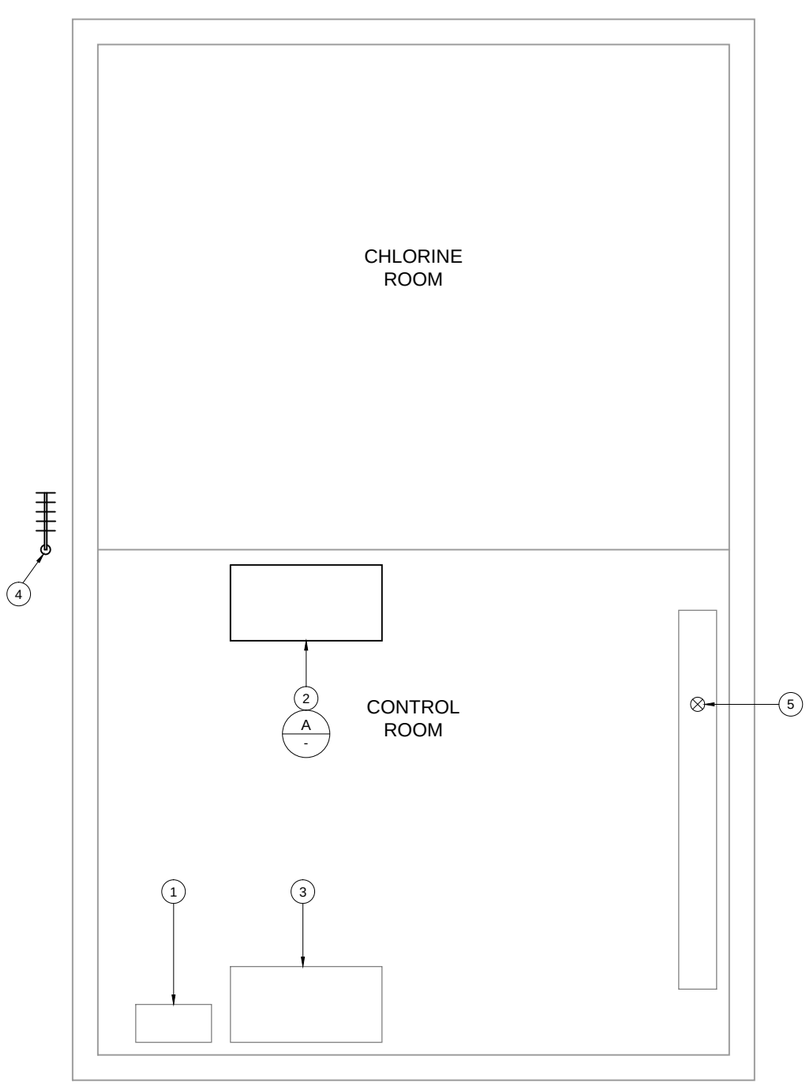
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH ELECTRICAL

LOWER GREASEWOOD WELL 1
ONE LINE DIAGRAM

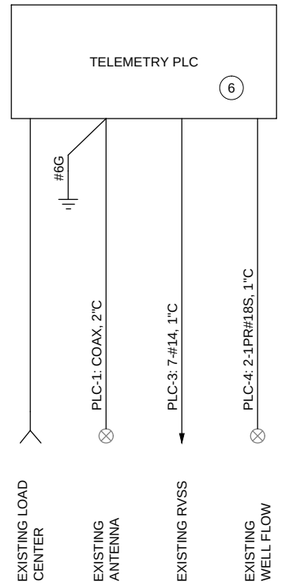
FILENAME 143956-E-102.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER E-102
SHEET NUMBER 58 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewoodsegin\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Electrical Filename: 143956-E-102.dwg Plot Date: June 15, 2017 - 3:28 PM CADD User: David Davidse



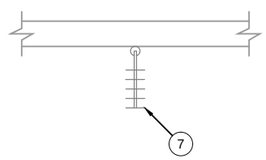
PUMP HOUSE
PLAN
SCALE: NONE



CONTROL ONE-LINE DIAGRAM

DETAIL A / -

SCALE: NONE



LOWER GREASEWOOD
WELL 3 PUMP HOUSE

DETAIL B / -

SCALE: NONE

GENERAL NOTES:

1. COORDINATE SHUTDOWN FOR WORK WITH NTUA.
2. GENERAL REQUIREMENTS: SPECIFICATION 16000.
3. TESTING: SPECIFICATION 16030.
4. ARC FLASH HAZARD ANALYSIS AND LABELING: SPECIFICATION 16431.
5. PROVIDE ADDITIONAL TRANSNET TELEMETRY RADIO FOR INSTALLATION AT WELL 3 BY NTUA.
6. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014, 11830, AND 17900.

KEY NOTES:

1. EXISTING LOAD CENTER.
2. REPLACE EXISTING TELEMETRY PLC. RECONNECT AND TEST ALL CIRCUITS.
3. EXISTING STARTER RVSS.
4. REPLACE TELEMETRY ANTENNA. RE-ALIGN TO TREATMENT PLANT AFTER PLANT TELEMETRY PLC IS OPERATIONAL.
5. EXISTING WELL FLOW METER.
6. PROVIDE PER NTUA - TECHNICAL PROVISIONS 4.0 FOR MOTOR CONTROL CENTER AND TANK CONTROL PANEL - PLC CONTROL PANEL, INPU/OUTPUT WIRING FOR SIMPLEX WELL WITH SOFT STARTER.
7. EXISTING TELEMETRY ANTENNA. RE-ALIGN TO TREATMENT PLANT AFTER PLANT TELEMETRY PLC IS OPERATIONAL.

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: PROJECT MANAGER DATE: 6/2/17

APPROVED: BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: NONE
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED PROFESSIONAL ENGINEER (Electrical) CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 9/30/19

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

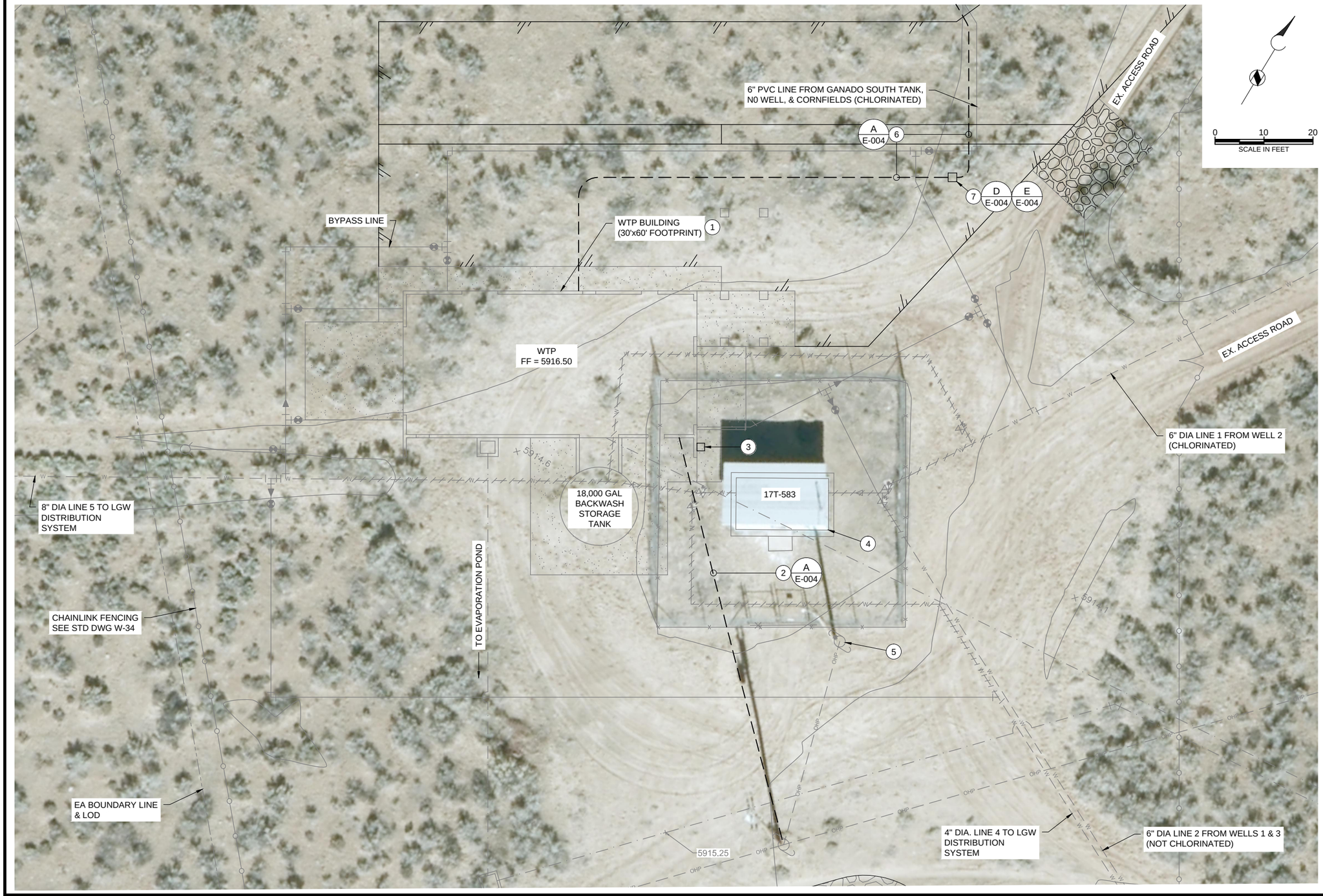
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

LOWER GREASEWOOD WELL 2
PUMP HOUSE
PLAN AND ONE LINE DIAGRAM

FILENAME: 143956-E-201.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: E-201
SHEET NUMBER: 59 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Electrical Filename: 143956-E-201.dwg Plot Date: June 15, 2017 - 3:14 PM CADD User: David Davidse



GENERAL NOTES:

1. EXISTING CHLORINATION FACILITY TO REMAIN IN OPERATION UNTIL TREATMENT PLANT IS OPERATING.
2. PROVIDE 480 VOLT 3-PHASE POWER UTILITY TO TREATMENT PLANT.
3. REMOVE 240 VOLT 1-PHASE POWER UTILITY FROM CHLORINATION FACILITY. EXISTING METER NUMBER APPEARS TO BE 19171450.
4. SALVAGE ELECTRICAL AND CONTROL EQUIPMENT FROM CHLORINATION FACILITY TO NTUA.

KEY NOTES:

1. PROVIDE ELECTRICAL AND TELEMETRY EQUIPMENT. EXTEND AND CONNECT POWER UTILITY.
2. UNDERGROUND CIRCUITS PER DRAWING E-402, POWER UTILITY REQUIREMENTS TO PREVAIL.
3. PROVIDE SERVICE ENTRANCE SECTION METER, DISCONNECT, FUSES, AND LIGHTNING ARRESTOR ON OUTSIDE OF BUILDING.
4. DEMO EXISTING CHLORINE FACILITY (17T-583)
5. DEMO EXISTING SERVICE AND REMOVE POWER UTILITY POLE.
6. FIBER OPTIC CIRCUIT SC-1. CONTINUATION ON DRAWING C-123
7. FIBER OPTIC PULLBOX

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: [signature] (PROJECT MANAGER) DATE: 6/2/17
APPROVED: [signature] (BROWN AND CALDWELL) DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: 1" = 10'
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED PROFESSIONAL ENGINEER CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 6/7/2017 ARIZONA, U.S.A. Expires 9/30/19

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

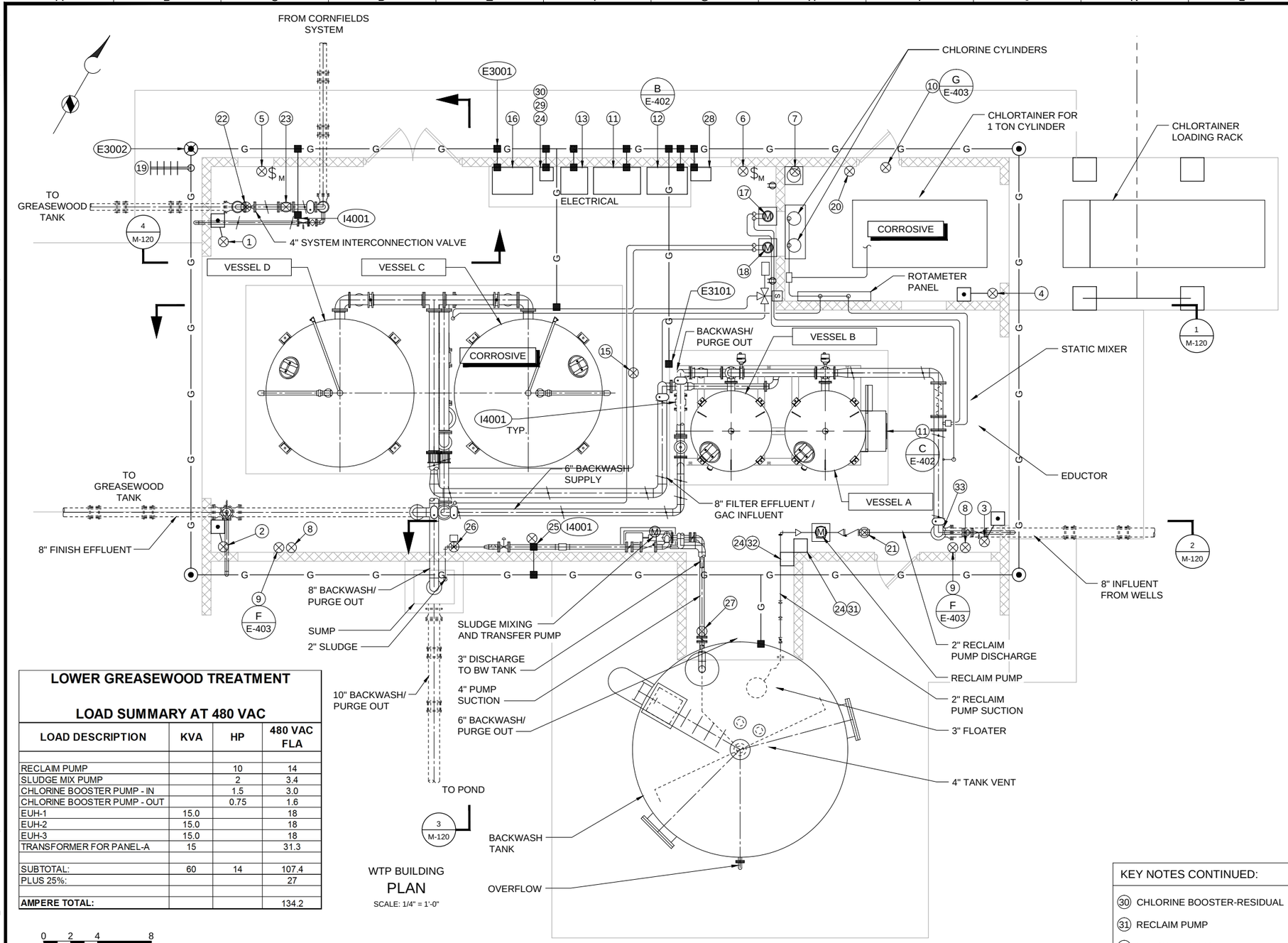
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

WATER TREATMENT PLANT
SITE PLAN

FILENAME 143956-E-400.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER E-400
SHEET NUMBER 60 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse\2-Sheets\Electrical Filename: 143956-E-400.dwg Plot Date: June 13, 2017 - 8:55 AM CADD User: David Davidse



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

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

LOWER GREASEWOOD TREATMENT

LOAD SUMMARY AT 480 VAC

LOAD DESCRIPTION	KVA	HP	480 VAC FLA
RECLAIM PUMP		10	14
SLUDGE MIX PUMP		2	3.4
CHLORINE BOOSTER PUMP - IN		1.5	3.0
CHLORINE BOOSTER PUMP - OUT		0.75	1.6
EUH-1	15.0		18
EUH-2	15.0		18
EUH-3	15.0		18
TRANSFORMER FOR PANEL-A	15		31.3
SUBTOTAL:	60	14	107.4
PLUS 25%:			27
AMPERE TOTAL:			134.2

GENERAL NOTES:

1. CORROSIVE/WASHDOWN AREA: BUILDING INTERIOR. PVC COATED STEEL RIGID CONDUIT AND STAINLESS STEEL MOUNTING.
2. GENERAL REQUIREMENTS: SPECIFICATION 16000.
3. TESTING: SPECIFICATION 16030.
4. ARC FLASH HAZARD ANALYSIS AND LABELING: SPECIFICATION 16431.
5. CIRCUITS: DRAWINGS E-402 AND E-403.
6. REFER TO MECHANICAL PLANS FOR ADDITIONAL EQUIPMENT LOCATIONS.
7. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014, 11830, AND 17900.
8. SUBMIT ELECTRICAL EQUIPMENT LAYOUT PRIOR TO CONDUIT ROUGH-IN.

KEY NOTES:

1. EUH-1 HEATER
2. EUH-2 HEATER
3. EUH-3 HEATER
4. EUH-4 HEATER
5. EXF-1 FAN
6. EXF-2 FAN
7. EXF-3 FAN
8. MOTOR OPERATED DAMPER
9. AIR TEMPERATURE SENSOR/SWITCH
10. DOOR SWITCH FOR FAN
11. FILTER CONTROL PANEL
12. TELEMETRY PLC
13. TRANSFORMER AND LOAD CENTER
14. NOT USED
15. FLOOD LEVEL SWITCH
16. PANEL BOARD
17. CHLORINE BOOSTER PUMP FOR TREATMENT
18. CHLORINE BOOSTER PUMP FOR RESIDUAL
19. OMNIDIRECTIONALTELEMETRY ANTENNA ON 2"x30'-0" PIPE, ANCHORED TO BUILDING. PROVIDE ANTENNA CABLE IN CONDUIT. PROVIDE CGB FITTING AND EXPOSE CABLE FOR FINAL CONNECTION TO ANTENNA. MAKE PENETRATION TO BUILDING WATER TIGHT.
20. CHLORINE LEAK DETECTOR. LOCATE SENSOR BELOW AT HEIGHT PER MANUFACTURER. MOUNT BEACON ABOVE.
21. RECLAIM FM-4, FCV-4 V-9
22. MV-201 VALVE
23. SYSTEM INTERCONNECTION FLOW METER FM-6
24. COMBINATION MOTOR STARTER. PROVIDE NAME PLATES, TYPICAL: "(EQUIPMENT NAME), 480VAC FROM PANELBOARD"
25. SLUDGE FM-3
26. SLUDGE V-8
27. SLUDGE V-7
28. SCADA NETWORK CABINET
29. CHLORINE BOOSTER-TREATMENT

KEY NOTES CONTINUED:

30. CHLORINE BOOSTER-RESIDUAL
31. RECLAIM PUMP
32. SLUDGE MIXING
33. RAW WATER FLOW METER FM-7

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REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

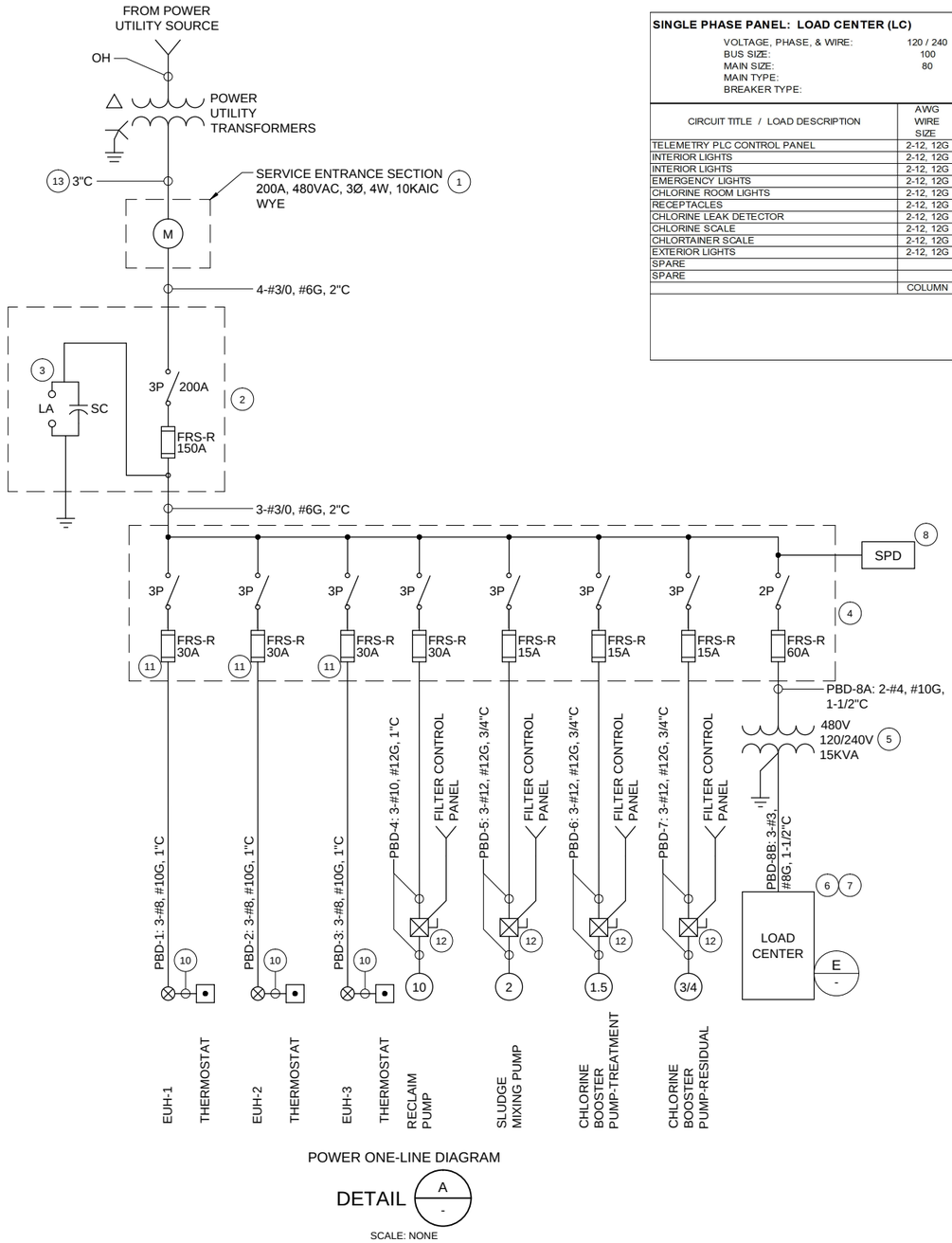
GREAT SEAL OF THE NAVAJO NATION
NTUA NAVAJO TRIBAL UTILITY AUTHORITY UTILITIES FOR THE NAVAJO NATION

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

LOWER GREASEWOOD WTP
BUILDING PLAN

FILENAME 143956-E-401.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER E-401
SHEET NUMBER 61 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH



POWER ONE-LINE DIAGRAM

DETAIL A / -

SCALE: NONE

SINGLE PHASE PANEL: LOAD CENTER (LC)

VOLTAGE, PHASE, & WIRE:	120 / 240 VAC, 1 PHASE, 3 WIRE	LOCATION:	TREATMENT ROOM
BUS SIZE:	100 AMPERE	ENCLOSURE:	NEMA-4X
MAIN SIZE:	80 AMPERE	MOUNTING:	WALL
MAIN TYPE:	CIRCUIT BREAKER	BUS BRACING:	22 K AIC
BREAKER TYPE:	PLUG-ON	FED FROM:	PANELBOARD

CIRCUIT TITLE / LOAD DESCRIPTION	AWG WIRE SIZE	RACE-WAY SIZE	BREAKER CKT NO.	BREAKER AMP	BREAKER POLE	LOAD (VA) PHASE A	LOAD (VA) PHASE B	LOAD (VA) PHASE B	LOAD (VA) PHASE A	BREAKER POLE	BREAKER AMP	BREAKER CKT NO.	AWG WIRE SIZE	RACE-WAY SIZE	CIRCUIT TITLE / LOAD DESCRIPTION
TELEMETRY PLC CONTROL PANEL	2-12, 12G	1/2	1	20	1	180			1656	1	20	2	2-12, 12G	1/2	TREATMENT ROOM FAN EXF-1
INTERIOR LIGHTS	2-12, 12G	1/2	3	20	1		768	1656		1	20	4	2-12, 12G	1/2	TREATMENT ROOM FAN EXF-2
INTERIOR LIGHTS	2-12, 12G	1/2	5	20	1	768			864	1	20	6	2-12, 12G	1/2	CHLORINE ROOM FAN EXF-3
EMERGENCY LIGHTS	2-12, 12G	1/2	7	20	1		30			1	20	8			SPARE
CHLORINE ROOM LIGHTS	2-12, 12G	1/2	9	20	1	192			2794	2	30	10	2-10, 12G	3/4	CHLORINE ROOM HEATER EUH-4
RECEPTACLES	2-12, 12G	1/2	11	20	1		1080	2794		-	-	12			
CHLORINE LEAK DETECTOR	2-12, 12G	1/2	13	20	1	50			540	1	20	14	2-12, 12G	1/2	FILTER CONTROL PANEL
CHLORINE SCALE	2-12, 12G	1/2	15	20	1		100	300		1	20	16	2-12, 12G	1/2	INTERCONNECTION SUPPLY VALVE MV-201
CHLORTAINER SCALE	2-12, 12G	1/2	17	20	1	75			20	1	20	18	2-12, 12G	1/2	INTERCONNECTION SUPPLY FLOW FM-6
EXTERIOR LIGHTS	2-12, 12G	1/2	19	20	1		1200	20		1	20	20	2-12, 12G	1/2	RAW WATER FLOW FM-7
SPARE			21	20	1				360	1	20	22	2-12, 12G	1/2	SCADA NETWORK CABINET
SPARE			23	20	1					1	20	24			SPARE
	COLUMN	TOTALS:				1265	3178	4770	6234						

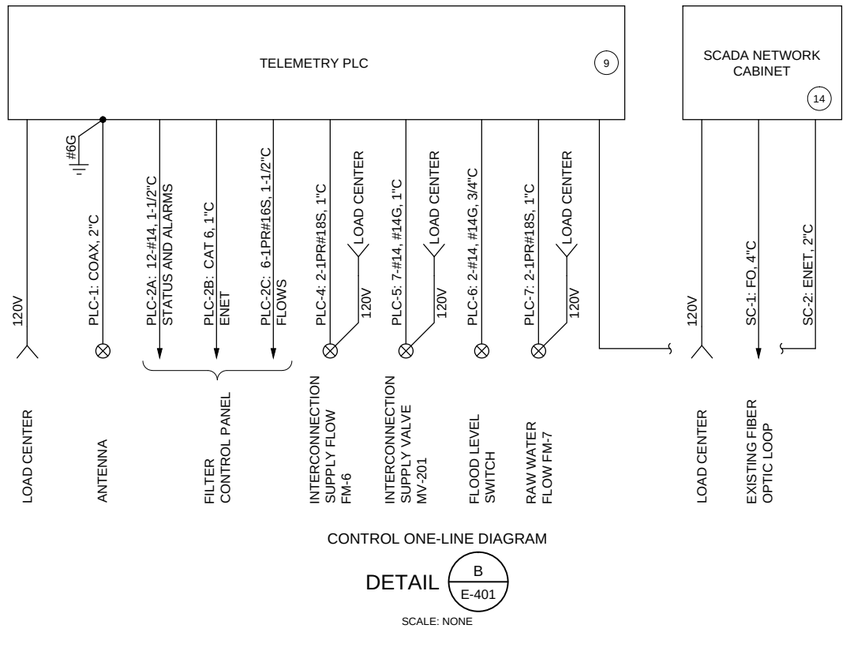
PHASE-A LOAD (VA): 7499
PHASE-B LOAD (VA): 7948

TOTAL LOAD (V. 15447 I (amp) 64.4

PANEL SCHEDULE

DETAIL E / -

SCALE: NONE



CONTROL ONE-LINE DIAGRAM

DETAIL B / E-401

SCALE: NONE

GENERAL NOTES:

1. POWER UTILITY: NAVAJO TRIBAL UTILITY AUTHORITY.
2. GENERAL REQUIREMENTS: SPECIFICATION 16000.
3. TESTING: SPECIFICATION 16030.
4. ARC FLASH HAZARD ANALYSIS AND LABELING: SPECIFICATION 16431.

KEY NOTES:

1. SERVICE ENTRANCE METER SOCKET, NEMA 3R, EUSERC, TEST BLOCKS, SQUARE D.
2. MAIN DISCONNECT SWITCH, HEAVY DUTY, NEMA 3R, CLASS R FUSE REJECTION KIT, SQUARE D.
3. LIGHTNING ARRESTOR, DELTA LA603.
4. FUSIBLE PANELBOARD, NEMA 4X SQUARE D. PROVIDE NAMEPLATE FOR EACH LOAD.
5. TRANSFORMER, TOTALLY ENCLOSED/ENCAPSULATED, 115 DEGREES C RISE, ACME T-2-53517-3S.
6. LOAD CENTER, WITH GROUND BAR, SQUARE D.
7. SURGE PROTECTIVE DEVICE, BUS CONNECTED, UL 1449 TYPE 2, 22.5KA SURGE, 1 PHASE 3-WIRE, SQUARE D QO2175SB.
8. SURGE PROTECTIVE DEVICE, UL 1449 TYPE 1, 40KA SURGE, 3 PHASE 4-WIRE, SQUARE D SDSA3650.
9. PROVIDE PER NTUA - TECHNICAL PROVISIONS 4.0 FOR MOTOR CONTROL CENTER AND TANK CONTROL PANEL - PLC CONTROL PANEL, INPUT/OUTPUT WIRING FOR SIMPLEX WELL WITH SOFT STARTER.
10. MANUFACTURER CABLE, 3/4"C
11. COORDINATE FUSE SIZES PER HEATER MANUFACTURER.
12. FUSIBLE DISCONNECT NEMA RATED COMBINATION STARTER, CLASS R FUSE CLIPS, 120VAC CONTROL, WITH OVERLOADS, HAND-OFF AUTO SELECTOR, NEMA 4X, SQUARE D 8538-SBW43/SCW44. PROVIDE FUSES BASED ON MOTORS PROVIDED.
13. CONDUCTORS FROM POLE TO METER BY POWER UTILITY.
14. PROVIDE PER SPECIFICATION 17110.

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ (PROJECT MANAGER) DATE: 6/2/17

APPROVED: _____ (BROWN AND CALDWELL) DATE: 6/2/17

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SCALE: NONE
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

Registered Professional Engineer CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 6/7/2017 ARIZONA, U. S. A. Expires 9/30/19

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

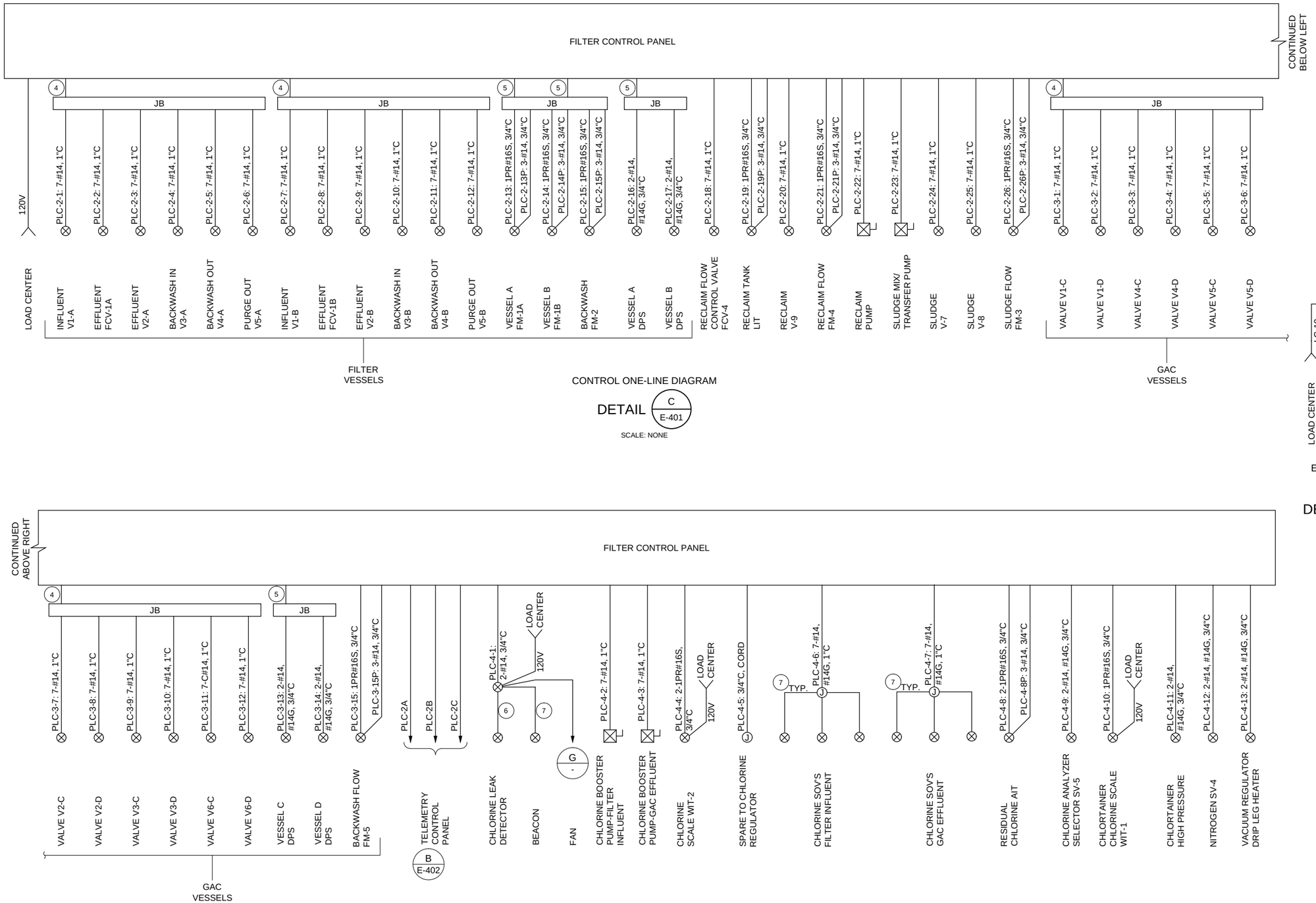
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

LOWER GREASEWOOD WTP
BUILDING
ONE LINE DIAGRAM

FILENAME 143956-E-402.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER E-402
SHEET NUMBER 62 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Electrical Filename: 143956-E-402.dwg Plot Date: June 15, 2017 - 3:26 PM CADD User: David Davidse

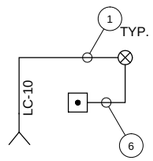


GENERAL NOTES:

1. REFER TO DRAWING E-402.
2. POWER FOR MOTOR OPERATED VALVES AND INSTRUMENTS FROM FILTER CONTROL PANEL.

KEY NOTES:

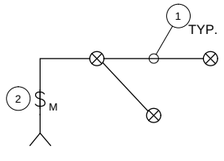
1. FAN CIRCUITS, 3-#12, #12G, 1/2"C
2. MANUAL STARTER: SPECIFICATION 16155.
3. DOOR SWITCH, ROCKER/ROLLER, NEMA 4X, 20 AMP. HONEYWELL, ALLEN-BRADLEY, OR EQUAL.
4. 3"C
5. 1-1/2"C
6. MANUFACTURER CABLE, 3/4"C
7. 2-#14, #14G, 1/2"C



EUH-4 ONE-LINE DIAGRAM

DETAIL D / -

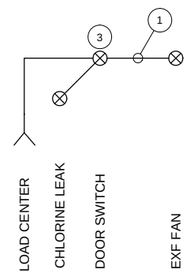
SCALE: NONE



FAN ONE-LINE DIAGRAM

DETAIL F / E-401

SCALE: NONE



CHLORINE ROOM FAN ONE-LINE DIAGRAM

DETAIL G / -

SCALE: NONE

Path: \\bcsfpr01\projects\Projects\Navajo Nation\143956_LowerGreasewoodDesign\CAD\Contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Electrical Filename: 143956-E-403.dwg Plot Date: June 7, 2017 - 12:05 PM CADD User: Christopher Resop

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ (PROJECT MANAGER) DATE: 6/2/17

APPROVED: _____ (BROWN AND CALDWELL) DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: NONE
DESIGNED: KWC
DRAWN: ACL
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

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REVISIONS

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	1	REQUESTED CHANGES	KC	5/17	

NAVAJO TRIBAL UTILITY AUTHORITY UTILITIES FOR THE NAVAJO NATION NTUA

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

LOWER GREASEWOOD WTP TREATMENT CONTROL ONE LINE DIAGRAMS

FILENAME 143956-E-403.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER E-403
SHEET NUMBER 63 OF 78

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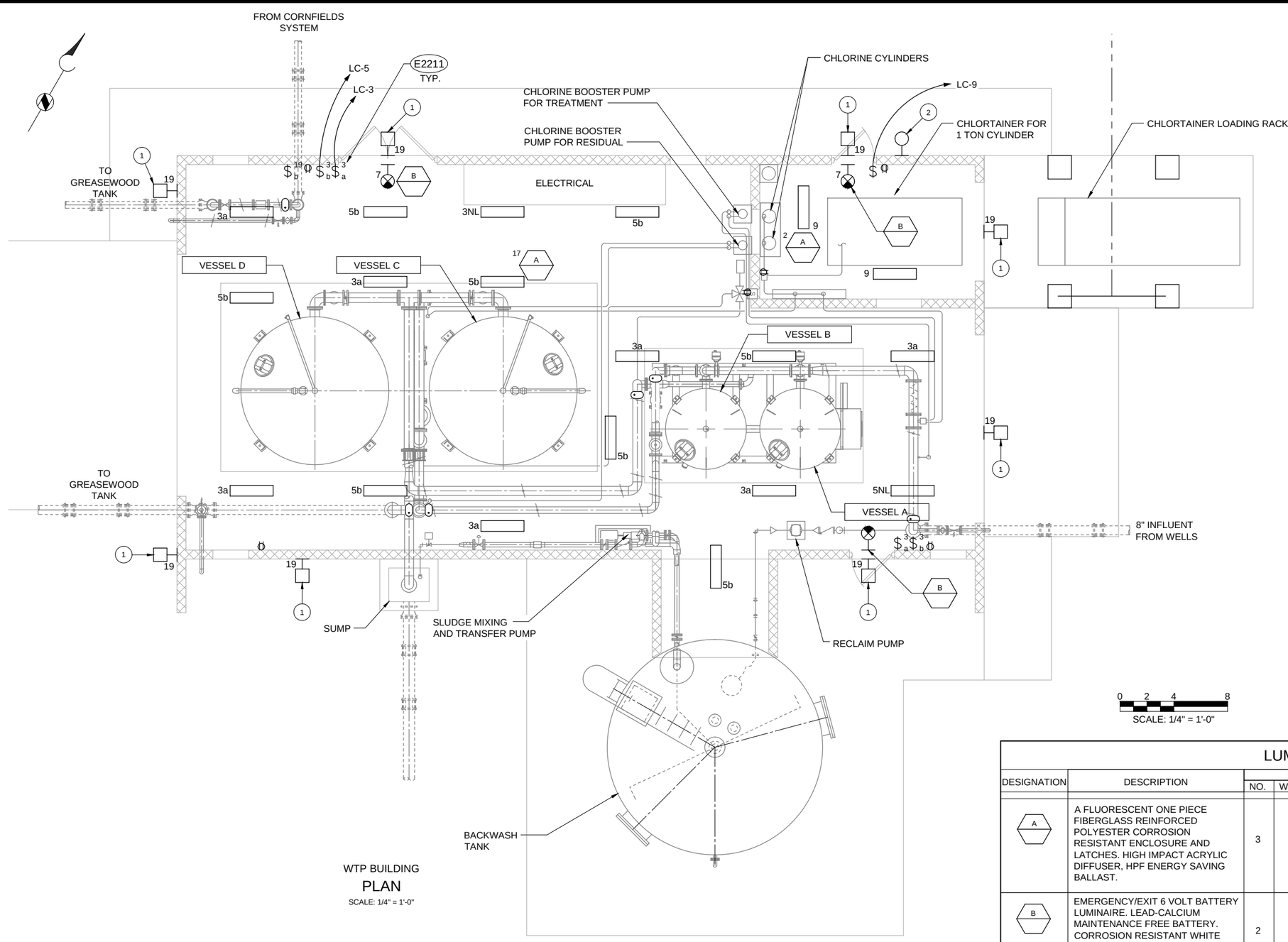

WTP BUILDING

PLAN

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

0 2 4 8

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

GENERAL NOTES:

1. RECEPTACLES SHALL BE PROVIDED AS WEATHER PROOF, CORROSION RESISTANT, GFI TYPE. CIRCUITED TO LOAD CENTER CIRCUIT (LC-11).
2. EMERGENCY/EXIT LUMINAIRES CIRCUITED TO LOAD CENTER CIRCUIT (LC-7).
3. SWITCHES SHALL BE WEATHER PROOF, CORROSION RESISTANT.

KEY NOTES:

(1) WALL-PAK, MINIMUM 150 WATTS, SEE ARCHITECTURAL. EXTERIOR LUMINAIRE HEIGHTS AND LOCATIONS PER ARCHITECTURAL DRAWINGS. MCGRAW-EDISON/EATON GWC-AF-01-LED-E1-SL4-BZ-7030-F OR EQUAL.

(2) ALARM BEACON PER SPECIFICATION 11727, AT 8' AFG. PROVIDE RED NAMEPLATE WITH 1/2" HIGH WHITE LETTERS: "CHLORINE GAS LEAK WHEN FLASHING, DO NOT ENTER. CALL NTUA TO REPORT."

LUMINAIRE SCHEDULE

DESIGNATION	DESCRIPTION	LAMP NO.	LAMP WATTS	LAMP TYPE	MOUNTING	ELEC	MANUFACTURER	REMARKS
A	A FLUORESCENT ONE PIECE FIBERGLASS REINFORCED POLYESTER CORROSION RESISTANT ENCLOSURE AND LATCHES. HIGH IMPACT ACRYLIC DIFFUSER, HPF ENERGY SAVING BALLAST.	3	32	FL F32T8/ SPX41	SUSPENDED 7'-0" AFF	120V	LITHONIA DMW332120 GEB10RSSTSLDL OR EQUAL	
B	EMERGENCY/EXIT 6 VOLT BATTERY LUMINAIRE. LEAD-CALCIUM MAINTENANCE FREE BATTERY. CORROSION RESISTANT WHITE MOLDED THERMOPLASTIC HOUSING RED LETTERS. 14 WATT 1-1/2 HOUR CAPACITY.	2	5.4	LED	WALL 8'-0" AFF	120V	LITHONIA LHQMSW3R OR EQUAL	

Brown AND Caldwell

SALT LAKE CITY, UTAH

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DESIGNED: SAM

DRAWN: CJR

CHECKED: SNH

APPROVED: MK

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LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

LOWER GREASEWOOD WTP
BUILDING LIGHTING PLAN

FILENAME 143956-E-404.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER E-404
SHEET NUMBER 64 OF 78

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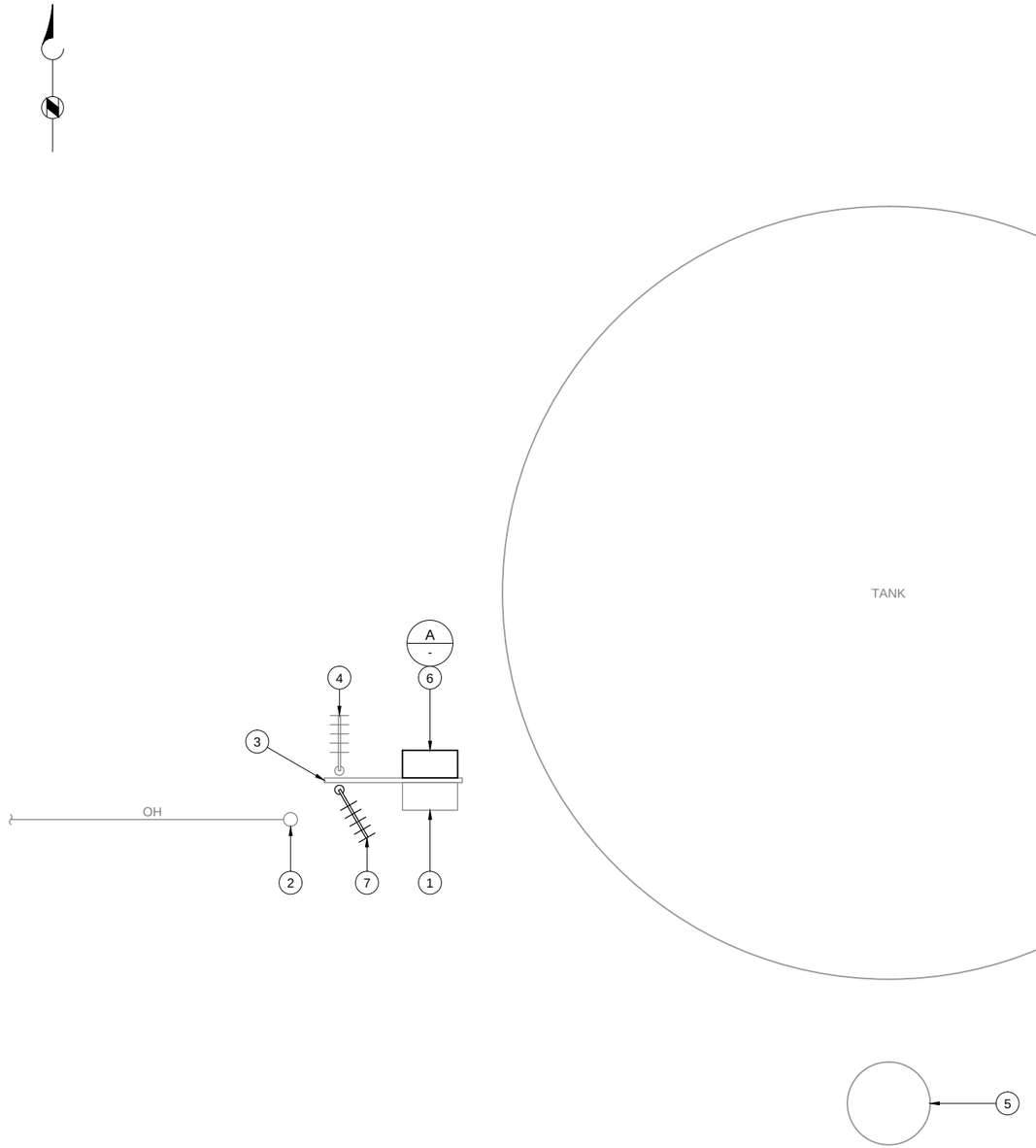
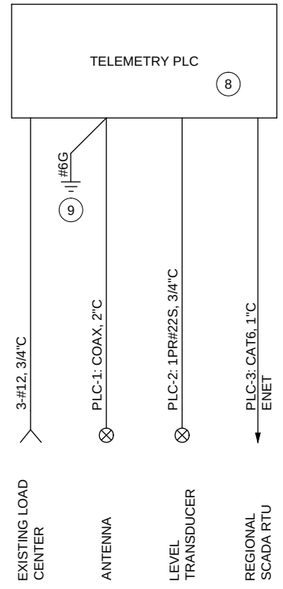


PLAN
SCALE: NONE



CONTROL ONE-LINE DIAGRAM

DETAIL A/-
SCALE: NONE

GENERAL NOTES:

1. PROVIDE TELEMETRY PLC REPLACEMENT TO CONTROL TANK LEVEL FROM LOWER GREASEWOOD WELLS OR GANADO SOUTH TANK VIA CONTROL VALVE.
2. GENERAL REQUIREMENTS: SPECIFICATION 16000.
3. TESTING: SPECIFICATION 16030.
4. ARC FLASH HAZARD ANALYSIS AND LABELING: SPECIFICATION 16431.
5. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014, 11830, AND 17900.

KEY NOTES:

1. ABANDON IN-PLACE ENCLOSURE WITH OBSOLETE TELEMETRY PLC AND REGIONAL SCADA RTU.
2. EXISTING POWER UTILITY METER ON POLE AND 120VAC LOAD CENTER.
3. EXISTING STRUT EQUIPMENT STAND.
4. EXISTING REGIONAL SCADA ANTENNA.
5. REPLACE EXISTING TANK LEVEL (PRESSURE) TRANSDUCER IN VAULT. EXTEND CONDUIT TO REPLACEMENT TELEMETRY PLC, REPLACE CABLE AND TRANSDUCER.
6. PROVIDE REPLACEMENT TELEMETRY PLC. RECONNECT AND TEST ALL CIRCUITS.
7. PROVIDE TELEMETRY ANTENNA ON 10' 2" PIPE, ORIENT TOWARDS LOWER GREASEWOOD WELLS. PROVIDE #6 GROUND AND 10' GROUND ROD FOR ANTENNA LIGHTNING ARRESTOR. PROVIDE ANTENNA CABLE IN CONDUIT. PROVIDE CGB FITTING AND EXPOSE LOOP OF CABLE FOR FINAL CONNECTION TO ANTENNA. ORIENT TO TREATMENT PLANT. MAKE PENETRATION TO BUILDING WATER TIGHT.
8. PROVIDE PER NTUA - TECHNICAL PROVISIONS 4.0 FOR MOTOR CONTROL CENTER AND TANK CONTROL PANEL - AC TANK PANEL.
9. PROVIDE 10 FOOT COPPER GROUND ROD DRIVEN IN EARTH. PROVIDE #6 BOND TO EXISTING GROUND SYSTEM.

Brown AND Caldwell
SALT LAKE CITY, UTAH

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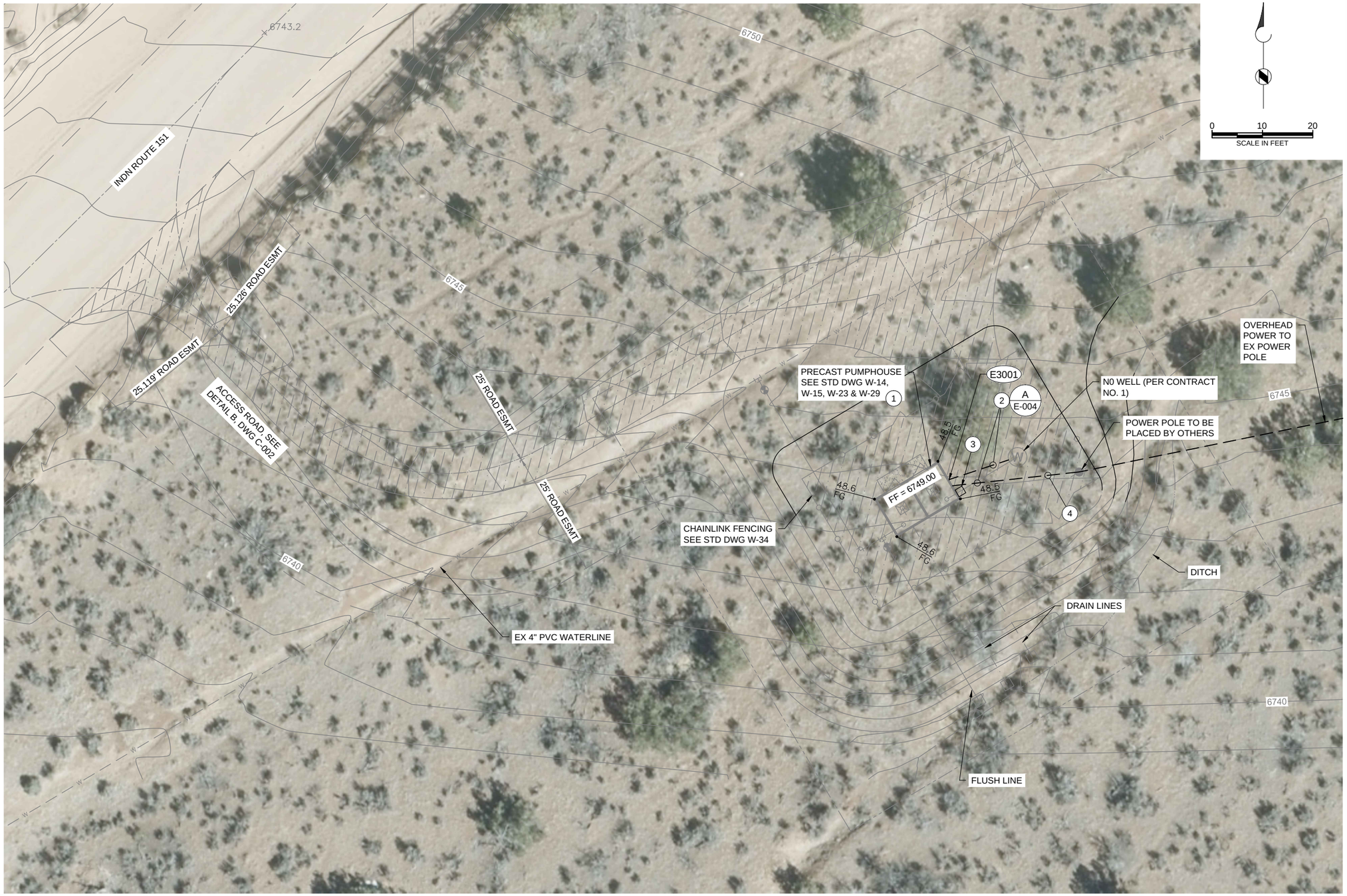
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

LOWER GREASEWOOD TANK
SITE PLAN AND ONE LINE DIAGRAM

FILENAME 143956-E-500.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER E-500
SHEET NUMBER 65 OF 78



GENERAL NOTES:

1. PROVIDE 480 VOLT 3-PHASE POWER UTILITY, ELECTRICAL AND TELEMETRY EQUIPMENT.

KEY NOTES:

1. PROVIDE ELECTRICAL AND TELEMETRY EQUIPMENT. EXTEND AND CONNECT POWER UTILITY.
2. UNDERGROUND CIRCUITS PER DRAWING E-602, POWER UTILITY REQUIREMENTS TO PREVAIL.
3. PROVIDE SERVICE ENTRANCE SECTION METER, MAIN DISCONNECT, FUSES, AND LIGHTNING ARRESTOR ON OUTSIDE OF BUILDING.
4. PROVIDE 650 FT. OF FIBER OPTIC CABLE, SUPPORT ON POWER POLES PROVIDED BY OTHERS. PROVIDE MESSENGER CABLE SUPPORT AND SLACK LOOP ENCLOSURE AT END NEAR EXISTING FIBER OPTIC LOOP. TERMINATION OF FIBERS BY NTUA.

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17
PROJECT MANAGER

APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: 1" = 10'
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED PROFESSIONAL ENGINEER CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 6/2/2017 ARIZONA, U.S.A.
Expires 9/30/19

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

GREAT SEAL OF THE NAVAJO NATION

NAVAJO TRIBAL UTILITY AUTHORITY — NTUA — UTILITIES FOR THE NAVAJO NATION

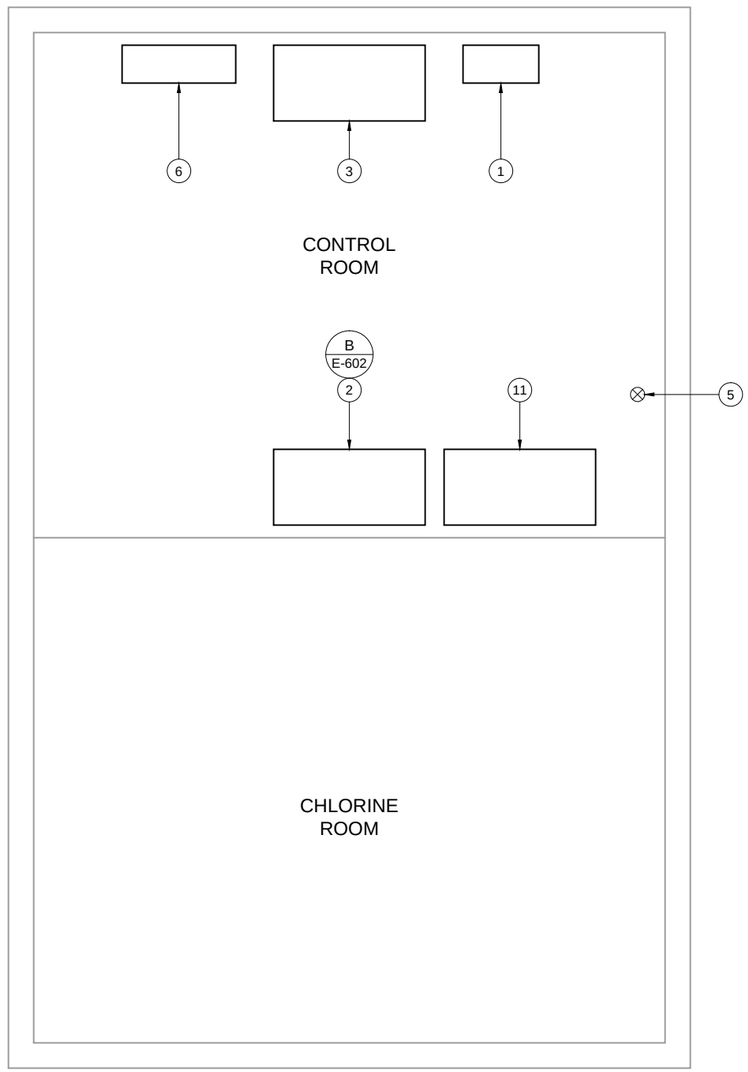
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

GANADO N0 WELL SITE PLAN

FILENAME	143956-E-600.dwg
BC PROJECT NUMBER	143956
DRAWING NUMBER	E-600
SHEET NUMBER	66 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesignCAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Electrical Filename: 143956-E-600.dwg Plot Date: June 15, 2017 - 3:20 PM CADD User: David Davidse



PUMP HOUSE
PLAN
SCALE: NONE

GANADO WELL N0

LOAD SUMMARY AT 480 VAC

LOAD DESCRIPTION	KVA	HP	480 VAC FLA
WELL PUMP RVSS CONTROLLER		125	156
TRANSFORMER FOR PANEL-A	15		31.3
SUBTOTAL:	15	125	187.3
PLUS 25%:			47
AMPERE TOTAL:			234.1

GANADO TANK TELEMETRY MODIFICATIONS

DETAIL A / E-700

SCALE: NONE

GENERAL NOTES:

1. PROVIDE EQUIPMENT, LIGHTING, VENTILATION, AND RACEWAYS PER INDIAN HEALTH SERVICE - TECHNICAL PROVISIONS FOR MOTOR CONTROL CENTER AND TANK CONTROL PANEL - PUMP HOUSE LAYOUT.
2. GENERAL REQUIREMENTS: SPECIFICATION 16000.
3. TESTING: SPECIFICATION 16030.
4. ARC FLASH HAZARD ANALYSIS AND LABELING: SPECIFICATION 16431.
5. NTUA INTENDS TO INSTALL FIBER OPTIC PRIOR TO COMMISSIONING WELL AND WILL WORK WITH CONTRACTOR ON PROVISION TO DO THIS.

KEY NOTES:

1. LOAD CENTER, TRANSFORMER BELOW.
2. TELEMETRY PLC.
3. MOTOR STARTER RVSS.
4. TELEMETRY ANTENNA ON 2"x20'-0" PIPE, ANCHORED TO BUILDING. ALIGN TO GANADO TANK SITE. PROVIDE ANTENNA CABLE IN CONDUIT. PROVIDE CGB FITTING AND EXPOSE LOOP OF CABLE FOR FINAL CONNECTION TO ANTENNA. ORIENT TO TREATMENT PLANT. MAKE PENETRATION TO BUILDING WATER TIGHT.
5. WELL FLOW METER.
6. LOAD CENTER TRANSFORMER DISCONNECT.
7. EXISTING GANADO TANK TELEMETRY PLC.
8. PROVIDE TRANSNET RADIO AND CABLING.
9. PROVIDE RADIO POWER SUPPLY AND CABLING.
10. NTUA TECHNICAL PROVISION 4.0 MOBICON PLC.
11. SCADA NETWORK CABINET

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ (PROJECT MANAGER) DATE: 6/2/17
APPROVED: _____ (BROWN AND CALDWELL) DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE:	NONE
DESIGNED:	KWC
DRAWN:	CJR
CHECKED:	SNH
APPROVED:	MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED PROFESSIONAL ENGINEER CERTIFICATE NO. LEGEND 36697 KENNETH W. CHANDLER Date Signed 6/7/2017 ARIZONA, U.S.A. Expires 9/30/19

REVISIONS

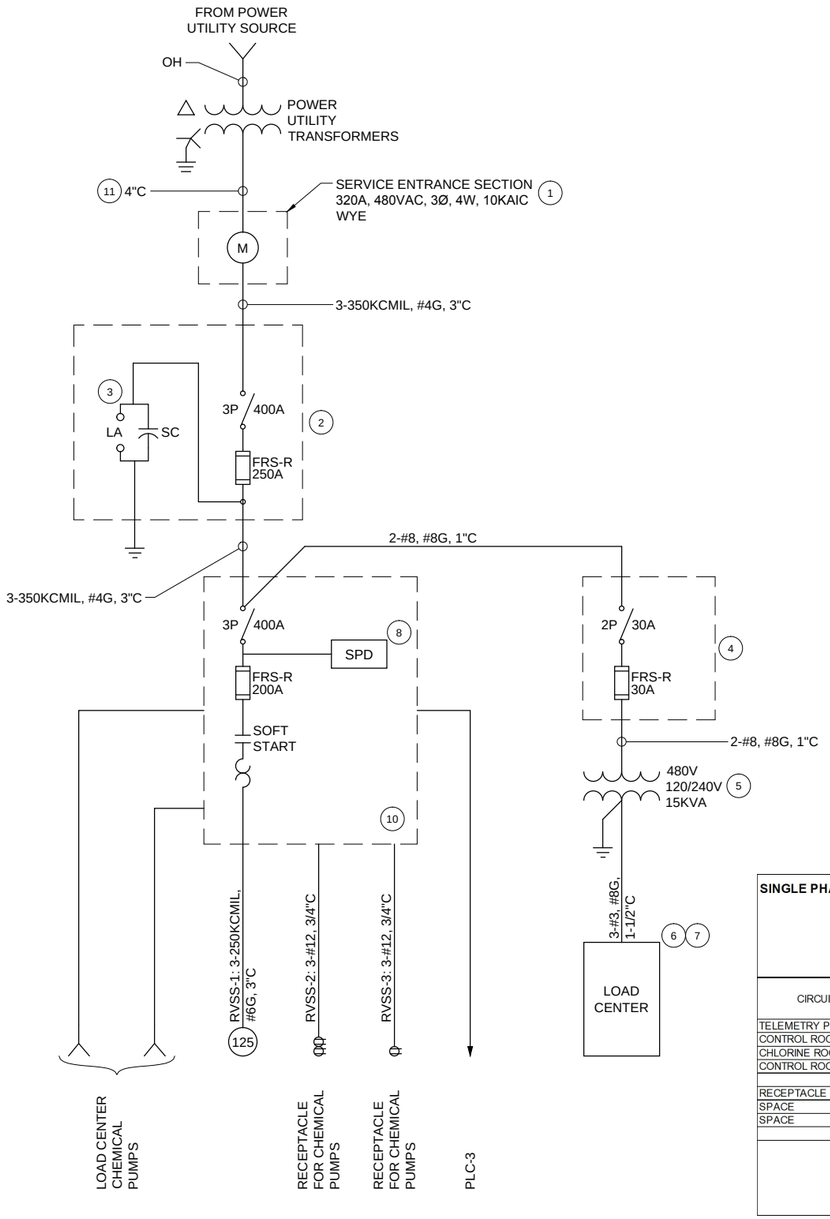
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

GANADO N0 WELL
PUMP HOUSE PLAN

FILENAME 143956-E-601.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER E-601
SHEET NUMBER 67 OF 78

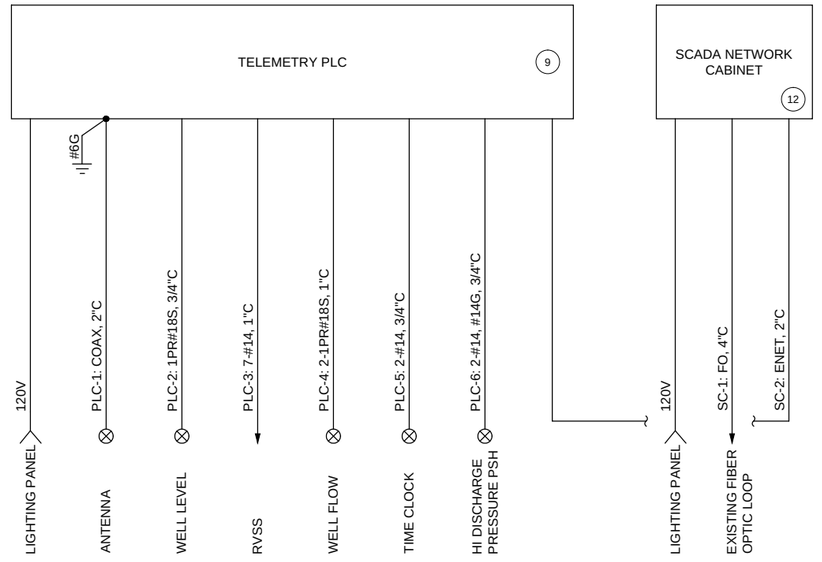
ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH



POWER ONE-LINE DIAGRAM

DETAIL A / E-602

SCALE: NONE



CONTROL ONE-LINE DIAGRAM

DETAIL B / E-602

SCALE: NONE

SINGLE PHASE PANEL: LOAD CENTER (LC)

VOLTAGE, PHASE, & WIRE:	120 / 240 VAC, 1 PHASE, 3 WIRE	LOCATION:	CONTROL ROOM
BUS SIZE:	100 AMPERE	ENCLOSURE:	NEMA-3R
MAIN SIZE:	80 AMPERE	MOUNTING:	WALL
MAIN TYPE:	CIRCUIT BREAKER	BUS BRACING:	22 K AIC
BREAKER TYPE:	PLUG-ON	FED FROM:	SES OUTDOORS

CIRCUIT TITLE / LOAD DESCRIPTION	AWG WIRE SIZE	RACE-WAY SIZE	CKT NO.	BREAKER AMP	BREAKER POLE	LOAD (VA) PHASE A	LOAD (VA) PHASE B	LOAD (VA) PHASE B	LOAD (VA) PHASE A	BREAKER POLE	BREAKER AMP	CKT NO.	AWG WIRE SIZE	RACE-WAY SIZE	CIRCUIT TITLE / LOAD DESCRIPTION
TELEMETRY PLC CONTROL PANEL	2-12, 12G	1/2	1	15	1	180			600	1	15	2	2-12, 12G	1/2	CHLORINE BOOSTER PUMP
CONTROL ROOM LIGHTS	2-12, 12G	1/2	3	15	1		200	50		1	15	4	2-12, 12G	1/2	CHLORINE PUMP
CHLORINE ROOM LIGHTS	2-12, 12G	1/2	5	15	1	200			50	1	15	6	2-12, 12G	1/2	FLUORIDE PUMP
CONTROL ROOM HEATER	2-12, 12G	1/2	7	15	2		1200	1200		2	15	8	2-12, 12G	1/2	CHLORINE ROOM HEATER
			9	-	-	1200			1200	-	-	10			
RECEPTACLE	2-12, 12G	1/2	11	15	1		180	360		-	-	12	2-12, 12G	1/2	SCADA NETWORK CABINET
SPACE			13	-	-					-	-	14			SPACE
SPACE			15	-	-					-	-	16			SPACE
	COLUMN	TOTALS:				1580	1580	1610	1850						

PHASE-A LOAD (VA): 3430
PHASE-B LOAD (VA): 3190

TOTAL LOAD (V. 6620 I (amp) 27.6

PANEL SCHEDULE

DETAIL C / -

SCALE: NONE

GENERAL NOTES:

1. POWER UTILITY: NAVAJO TRIBAL UTILITY AUTHORITY.
2. GENERAL REQUIREMENTS: SPECIFICATION 16000.
3. TESTING: SPECIFICATION 16030.
4. ARC FLASH HAZARD ANALYSIS AND LABELING: SPECIFICATION 16431.

KEY NOTES:

1. SERVICE ENTRANCE METER SOCKET, NEMA 3R, EUSERC, TEST BLOCKS, SUN VALLEY.
2. MAIN DISCONNECT SWITCH, HEAVY DUTY, NEMA 3R, CLASS R FUSE REJECTION KIT, SQUARE D.
3. LIGHTNING ARRESTOR, DELTA LA603.
4. LOAD CENTER TRANSFORMER DISCONNECT SWITCH, HEAVY DUTY, NEMA 3R SQUARE D.
5. TRANSFORMER, TOTALLY ENCLOSED/ENCAPSULATED, 115 DEGREES C RISE, ACME T-2-53517-3S.
6. LOAD CENTER, WITH GROUND BAR, NEMA 3R, SQUARE D Q016M100RB.
7. SURGE PROTECTIVE DEVICE, BUS CONNECTED, UL 1449 TYPE 2, 22.5KA SURGE, 1 PHASE 3-WIRE, SQUARE D QOI2175SB.
8. SURGE PROTECTIVE DEVICE, UL 1449 TYPE 1, 40KA SURGE, 3 PHASE 4-WIRE, SQUARE D SDSA3650.
9. PROVIDE PER NTUA - TECHNICAL PROVISIONS 4.0 FOR MOTOR CONTROL CENTER AND TANK CONTROL PANEL - PLC CONTROL PANEL, INPUT/OUTPUT WIRING FOR SIMPLEX WELL WITH SOFT STARTER.
10. PROVIDE PER NTUA - TECHNICAL PROVISIONS 4.0 FOR MOTOR CONTROL CENTER AND TANK CONTROL PANEL - SOFT START PUMP PANEL.
11. CONDUCTORS FROM POLE TO METER BY POWER UTILITY.
12. PROVIDE PER SPECIFICATION 17110.

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: (PROJECT MANAGER) DATE: 6/2/17
APPROVED: (BROWN AND CALDWELL) DATE: 6/2/17

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SCALE: NONE
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED PROFESSIONAL ENGINEER CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 6/2/17 ARIZONA, U.S.A. Expires 9/30/19

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

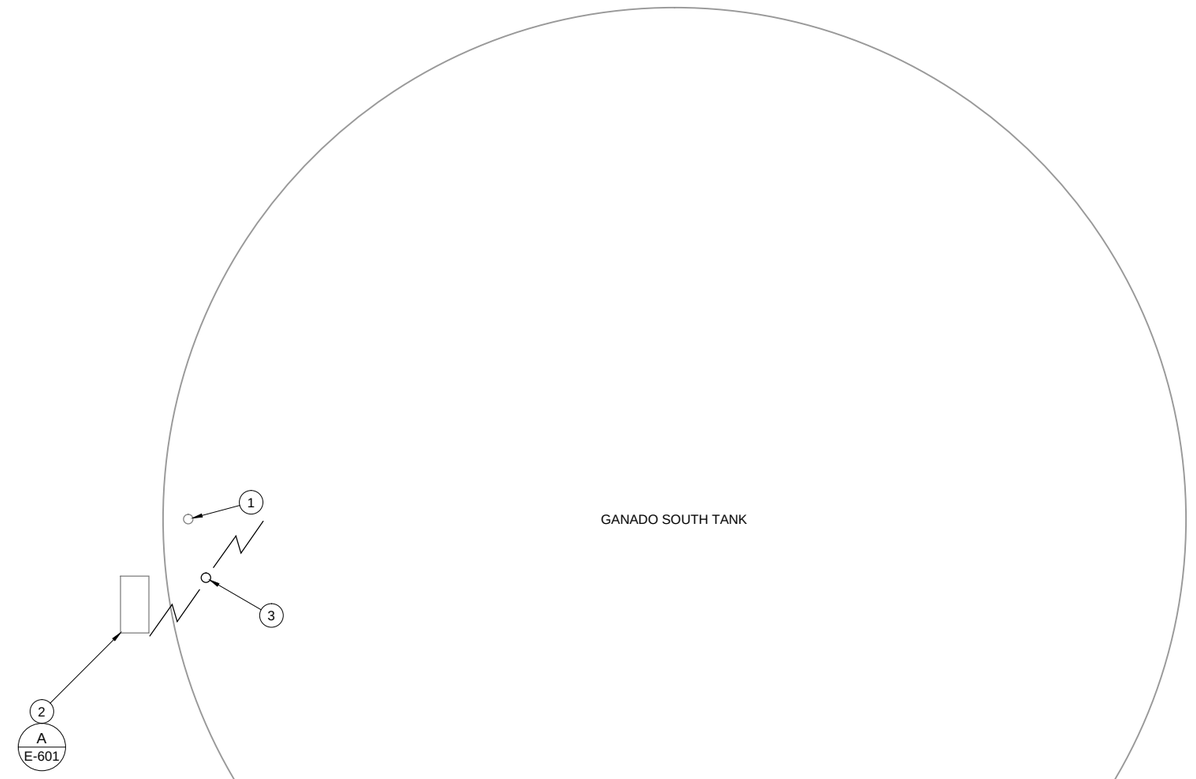
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH ELECTRICAL

GANADO WELL N0
ONE LINE DIAGRAM

FILENAME 143956-E-602.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER E-602
SHEET NUMBER 68 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewoodesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Electrical Filename: 143956-E-602.dwg Plot Date: June 15, 2017 - 3:22 PM CADD User: David Davidse



PLAN

SCALE: NONE

GENERAL NOTES:

1. MODIFY EXISTING TELEMETRY PROGRAMS TO ALLOW WELL N0 TO ALSO FILL THE GANADO SOUTH TANK IN ADDITION TO EXISTING BOOSTER PUMP STATION.
2. ADD THIRD ANTENNA SYSTEM FOR COMMUNICATIONS WITH WELL N0.
3. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014, 11830, AND 17900.

KEY NOTES:

(1) EXISTING TELEMETRY OMNI-DIRECTIONAL ANTENNA ON TOP OF TANK, APPROXIMATE HEIGHT IS 35 FEET.

(2) EXISTING TELEMETRY UNIT.

(3) PROVIDE OMNI ANTENNA ON 2"x10' PIPE ON TOP OF TANK, TRANSMISSION LINE TO TELEMETRY IN 2" CONDUIT.

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ PROJECT MANAGER DATE: 6/2/17

APPROVED: _____ BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: NONE
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 6/7/2017 ARIZONA, U.S.A. Expires 9/30/19

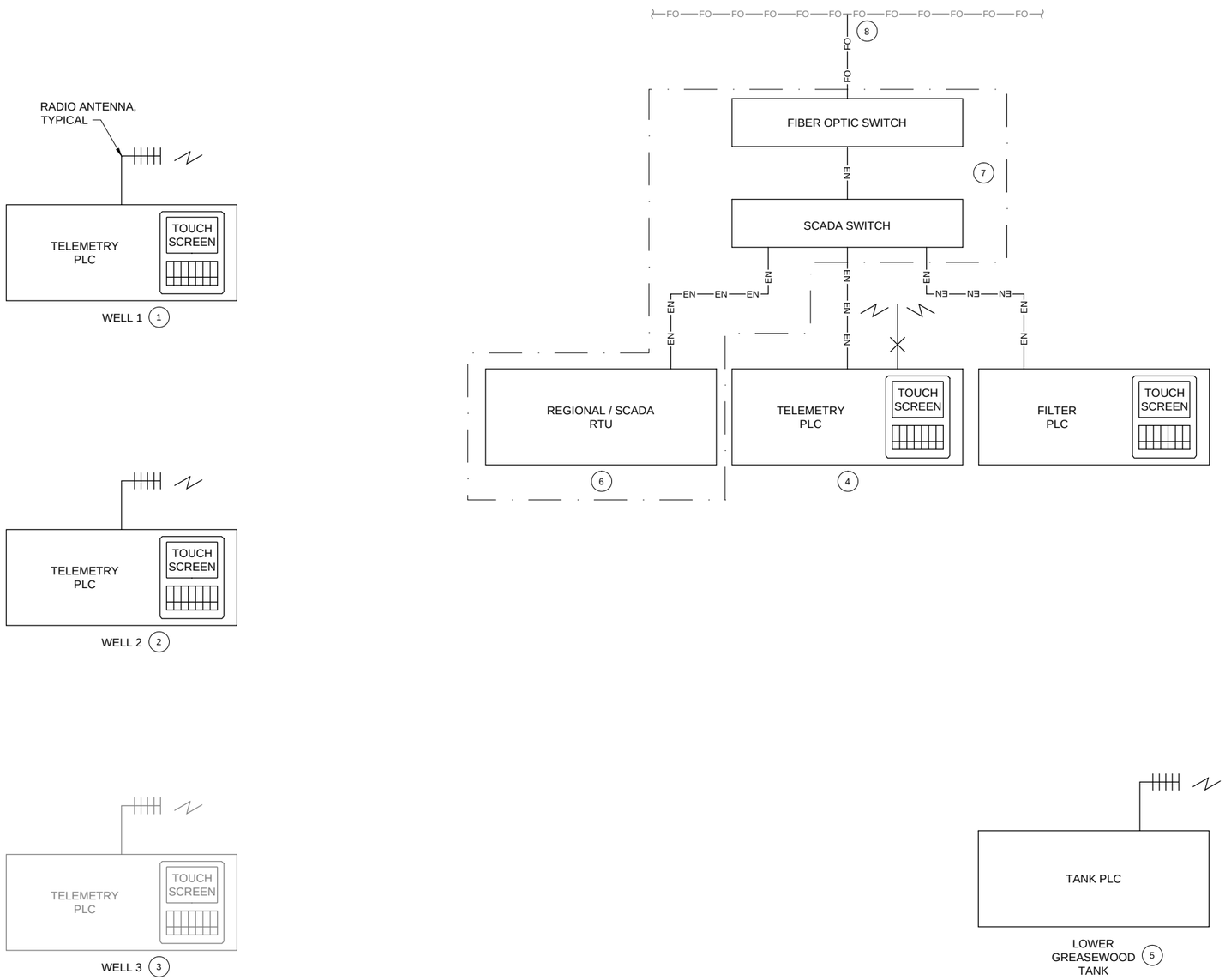
REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
ELECTRICAL

GANADO SOUTH TANK
PLAN

FILENAME: 143956-E-700.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: E-700
SHEET NUMBER: 69 OF 78



GENERAL NOTES:

1. RESTORE LOWER GREASEWOOD TANK TO SERVICE. DISCONNECT WATER SYSTEM FROM WOOD CHOP TANK.
2. EACH WELL HAS TOUCH SCREEN ENTERED TANK LEVEL SETPOINTS FOR WELL PUMP START AND STOP.
3. TANK LEVEL IS TELEMETERED TO WELLS.
4. WELL RUN STATUS AND FLOW RATE IS TELEMETERED TO TANK PLC FOR SCADA ACCESS.
5. TREATMENT PLANT FILTER AND GAC STATUS, ALARMS, AND ALL FLOW RATES ARE TELEMETERED TO TANK PLC FOR SCADA ACCESS.
6. FILTER AND GAC TREATMENT IS STARTED UPON TREATMENT PLANT WELL FLOW METER.
7. PROGRAM WELL, TREATMENT PLANT, AND TANK TELEMETRY PROGRAMS TO OPERATE AS SPECIFIED.
8. WTP TELEMETRY PLC WILL CONTROL SYSTEM INTERCONNECTION VALVE BASED ON TANK LEVEL.
9. REFER TO SPECIFICATION 17900 FOR ADDITIONAL CONTROL DESCRIPTIONS.
10. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014, 11830, AND 17900.

KEY NOTES:

1. REPLACE WELL 1 ELECTRICAL EQUIPMENT AND TELEMETRY PLC.
2. REPLACE WELL 2 ELECTRICAL EQUIPMENT AND TELEMETRY PLC.
3. WELL 3 REORIENT ANTENNA, CONFIGURE TO WORK WITH TREATMENT AND FILTER PLC INSTEAD OF TANK PLC.
4. TREATMENT FACILITIES AND TELEMETRY OF HARD-WIRED STATUS AND ALARMS. TREATMENT CONTROLLED BY WATER FLOW METER.
5. REPLACE LOWER GREASEWOOD TANK TELEMETRY SYSTEM AND ANTENNA.
6. REGIONAL SCADA RTU.
7. SCADA SWITCH AND FIBER OPTIC SWITCH.
8. CONNECTION TO EXISTING FIBER OPTIC LOOP BY NTUA

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: _____ PROJECT MANAGER DATE: 6/2/17
APPROVED: _____ BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: NONE
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

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REGISTERED PROFESSIONAL ENGINEER (ELECTRICAL) CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 6/7/2017 ARIZONA, U.S.A. Expires 9/30/19

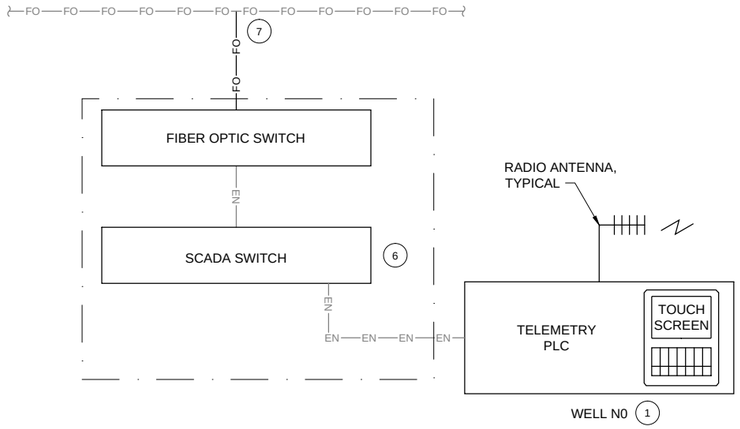
REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
INSTRUMENTATION

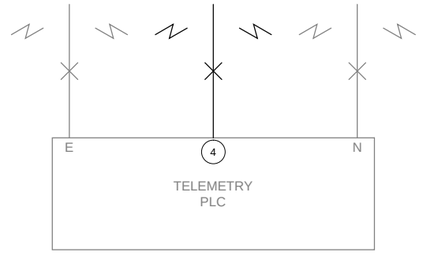
LOWER GREASEWOOD COMMUNICATIONS BLOCK DIAGRAM

FILENAME: 143956-I-001.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: I-001
SHEET NUMBER: 70 OF 78

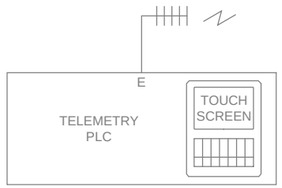
ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH



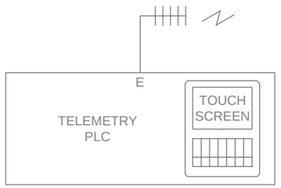
WELL N0 (1)



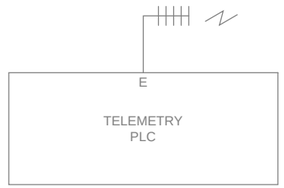
GANADO TANK (2)



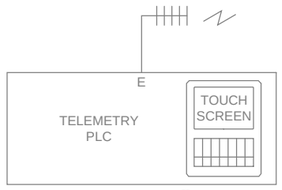
WELL 1 (3)



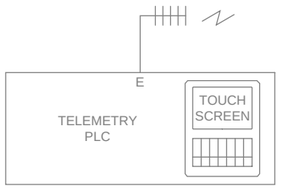
WELL 2 (3)



GANADO SOUTH TANK
AND BOOSTER (5)



WELL 3 (3)



GANADO SOUTH BOOSTER

GENERAL NOTES:

1. PROVIDE WELL N0 TO SUPPLEMENT EXISTING GANADO SOUTH TANK BOOSTER.
2. EACH WELL HAS TOUCH SCREEN ENTERED TANK LEVEL SETPOINTS FOR WELL PUMP START AND STOP.
3. TANK LEVEL IS TELEMETERED TO WELLS.
4. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014, 11830, AND 17900.

KEY NOTES:

(1) WELL N0 AND TELEMETRY.

(2) REVISE EXISTING GANADO TANK TELEMETRY PROGRAM TO RELAY SIGNALS SO WELL N0 ALSO OPERATES TO MAINTAIN GANADO SOUTH TANK LEVEL.

(3) EXISTING WELL

(4) PROVIDE OMNI ANTENNA SYSTEM, THIRD RADIO, POWER SUPPLY, AND PLC RS-232 COMMUNICATIONS MODULE AND CABLE TO ESTABLISH COMMUNICATIONS WITH WELL N0.

(5) REVISE EXISTING GANADO SOUTH TELEMETRY PROGRAM SO WELL N0 ALSO OPERATES TO MAINTAIN GANADO SOUTH TANK LEVEL IN ADDITION TO EXISTING BOOSTER PUMPS.

(6) SCADA SWITCH AND FIBER OPTIC SWITCH.

(7) CONNECTION TO EXISTING FIBER OPTIC LOOP BY NTUA.

Brown AND Caldwell
SALT LAKE CITY, UTAH

SUBMITTED: (PROJECT MANAGER) DATE: 6/2/17
APPROVED: BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)
SCALE: NONE
DESIGNED: KWC
DRAWN: CJR
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

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REGISTERED PROFESSIONAL ENGINEER CERTIFICATE NO. (ENGINEER) 36697 KENNETH W. CHANDLER Date Signed 6/7/2017 ARIZONA, U.S.A. Expires 9/30/19

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	REQUESTED CHANGES	KC	5/17	

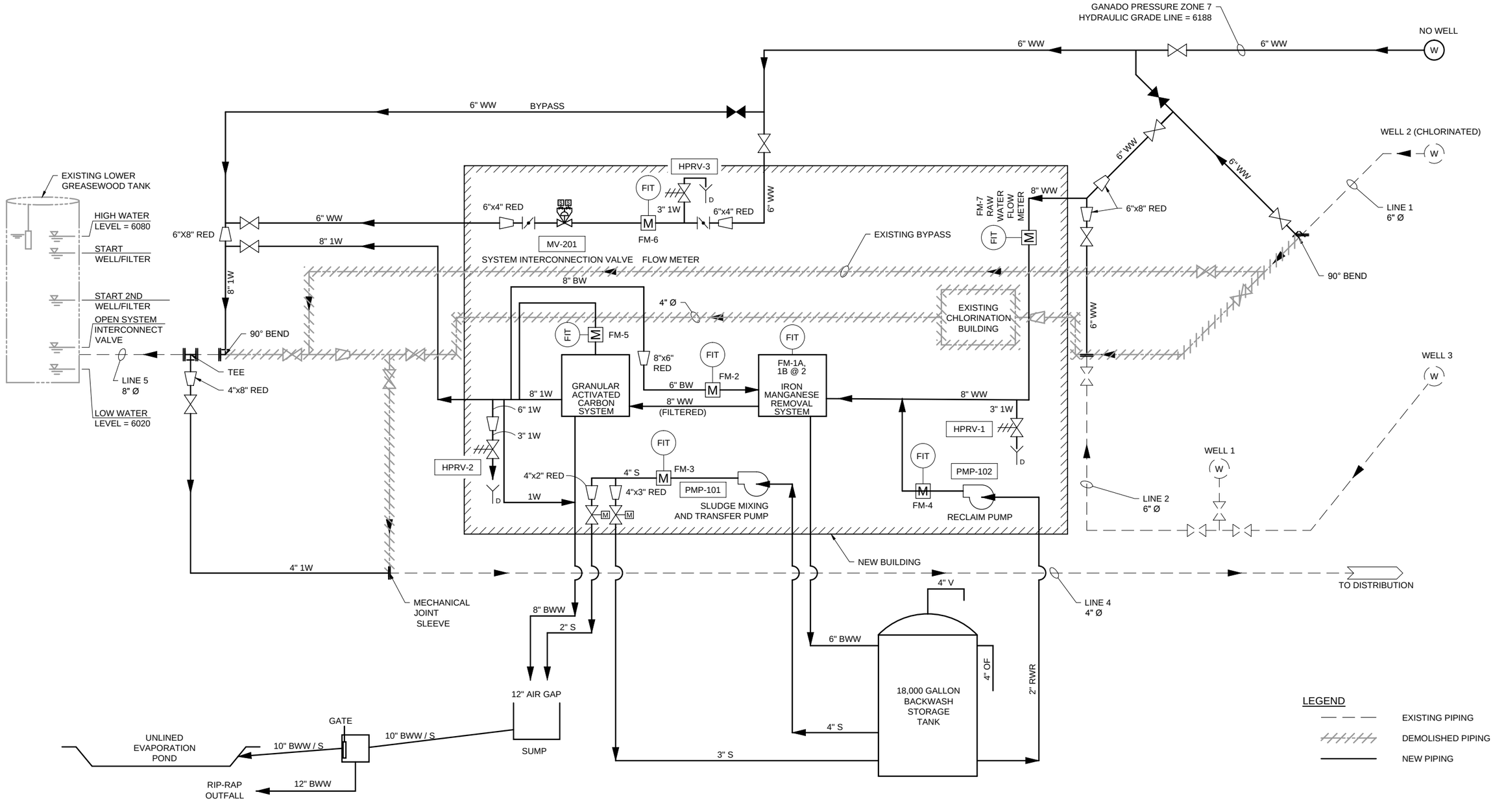
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
INSTRUMENTATION

GANADO SOUTH
COMMUNICATIONS
BLOCK DIAGRAM

FILENAME 143956-I-002.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER I-002
SHEET NUMBER 71 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: \\bcslcfp01\projects\Projects\Navajo Nation\143956_LowerGreasewoodDesign\CADContract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Instrumentation Filename: 143956-I-002.dwg Plot Date: June 7, 2017 - 12:26 PM CADD User: Christopher Resop



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Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17
PROJECT MANAGER

APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: NONE
DESIGNED: MK
DRAWN: DD
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

54869
MICHAEL P. KOBE
Date Signed 6/2/2017
ARIZONA, U.S.A.
Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

GREAT SEAL OF THE NAVAJO NATION

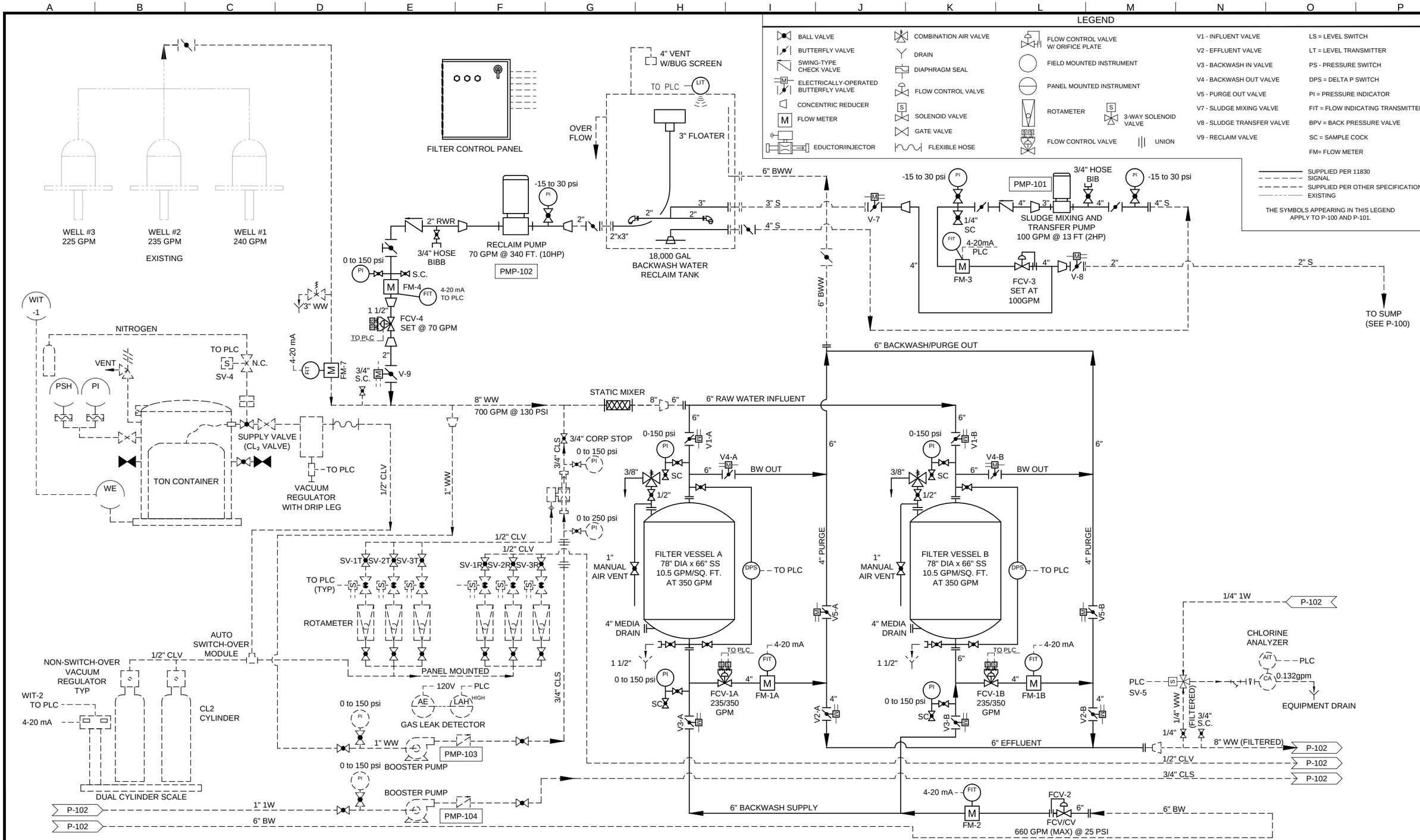
NAVAJO TRIBAL UTILITY AUTHORITY
NTUA
UTILITIES FOR THE NAVAJO NATION

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
PROCESS

LOWER GREASEWOOD WTP
PROCESS FLOW DIAGRAM

FILENAME: 143956-P-100.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: P-100
SHEET NUMBER: 72 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH



Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CADcontract No. 3 - Lower Greasewood Water Treatment Plant_Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Process Filename: 143956-P-101.dwg Plot Date: June 12, 2017 - 3:15 PM CADD User: David Davidse

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ PROJECT MANAGER DATE: 6/2/17

APPROVED: _____ BROWN AND CALDWELL DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: NONE

DESIGNED: MK

DRAWN: DD

CHECKED: SNH

APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

54069 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH PROCESS

FE MN TOC REMOVAL FILTRATION SYSTEM P&ID

FILENAME: 143956-P-101.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: P-101
SHEET NUMBER: 73 OF 78

LEGEND

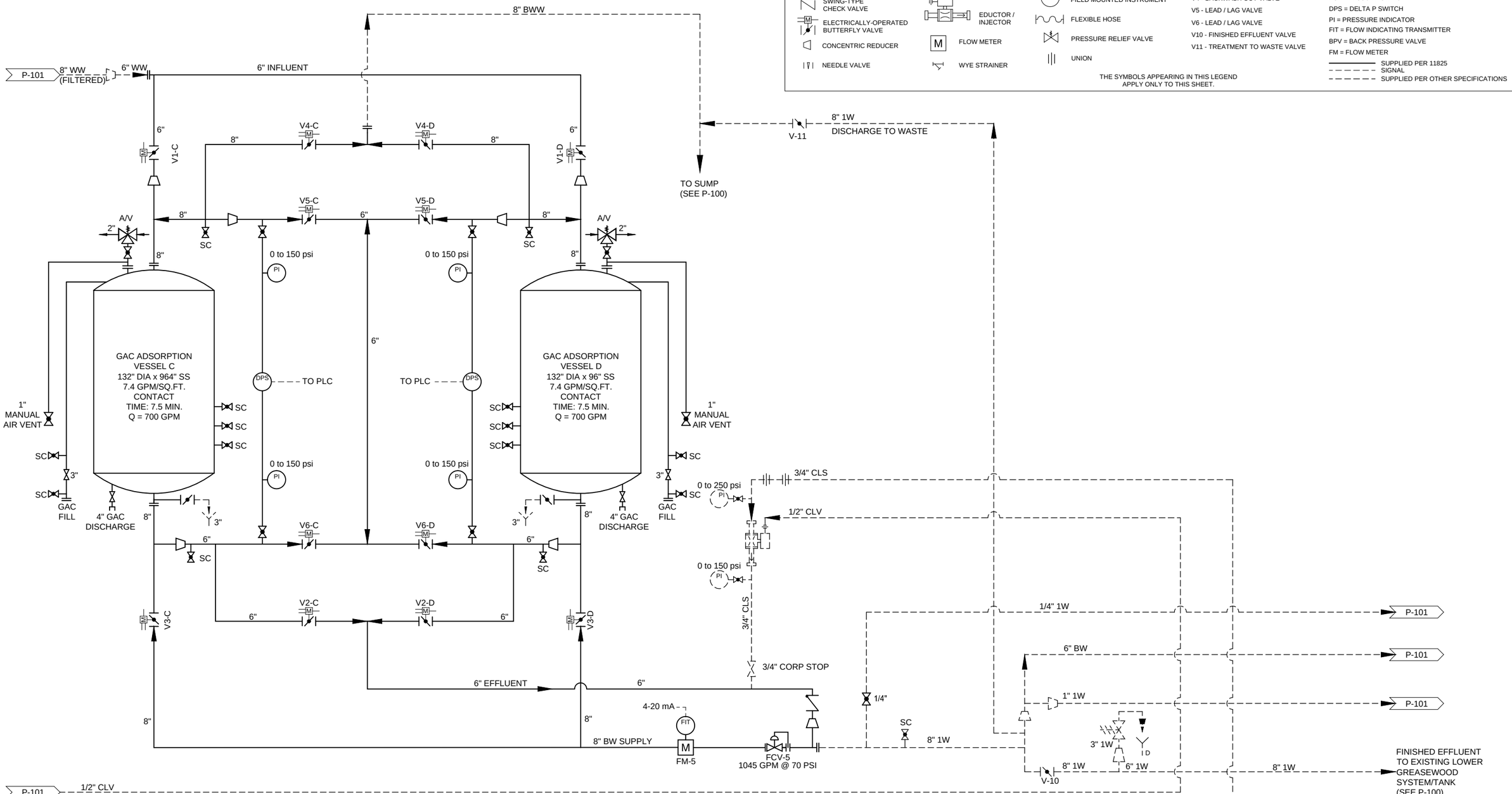
BALL VALVE
BUTTERFLY VALVE
SWING-TYPE CHECK VALVE
ELECTRICALLY-OPERATED BUTTERFLY VALVE
CONCENTRIC REDUCER
NEEDLE VALVE
COMBINATION AIR VALVE
DRAIN
EDUCTOR / INJECTOR
FLOW METER
WYE STRAINER
FLOW CONTROL VALVE W/ ORIFICE PLATE
FIELD MOUNTED INSTRUMENT
FLEXIBLE HOSE
PRESSURE RELIEF VALVE
UNION

V1 - INFLUENT VALVE
V2 - EFFLUENT VALVE
V3 - BACKWASH IN VALVE
V4 - BACKWASH OUT VALVE
V5 - LEAD / LAG VALVE
V6 - LEAD / LAG VALVE
V10 - FINISHED EFFLUENT VALVE
V11 - TREATMENT TO WASTE VALVE

SC = SAMPLE COCK
LS = LEVEL SWITCH
LT = LEVEL TRANSMITTER
PS - PRESSURE SWITCH
DPS = DELTA P SWITCH
PI = PRESSURE INDICATOR
FIT = FLOW INDICATING TRANSMITTER
BPV = BACK PRESSURE VALVE
FM = FLOW METER

SUPPLIED PER 11825
SIGNAL
SUPPLIED PER OTHER SPECIFICATIONS

THE SYMBOLS APPEARING IN THIS LEGEND APPLY ONLY TO THIS SHEET.



Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17 (PROJECT MANAGER)

APPROVED: _____ DATE: 6/2/17 BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: NONE

DESIGNED: MK
DRAWN: DD
CHECKED: SNH
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

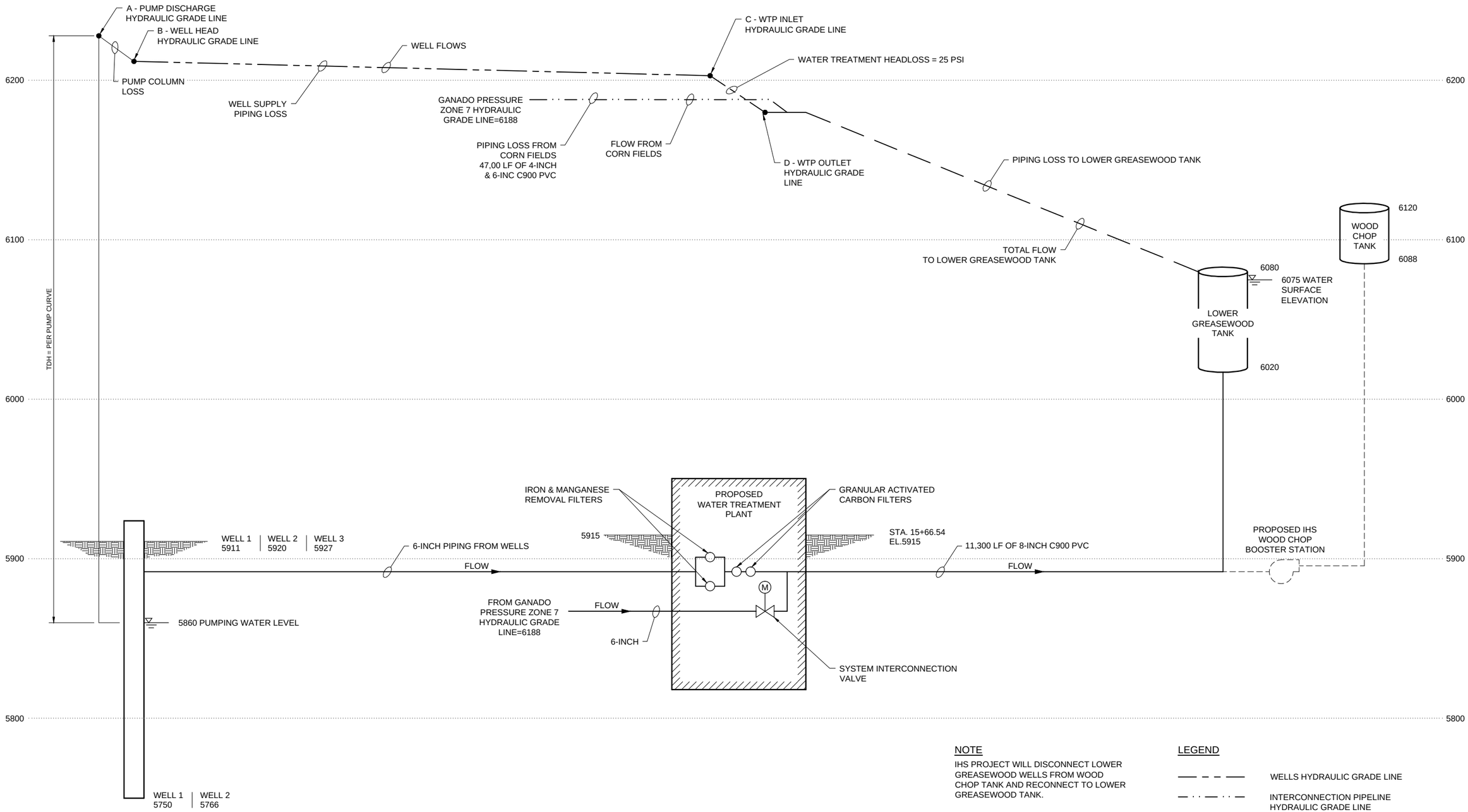
54069 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH PROCESS

FE MN TOC REMOVAL FILTRATION SYSTEM P&ID

FILENAME: 143956-P-102.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: P-102
SHEET NUMBER: 74 OF 78



NOTE

IHS PROJECT WILL DISCONNECT LOWER GREASEWOOD WELLS FROM WOOD CHOP TANK AND RECONNECT TO LOWER GREASEWOOD TANK.

LEGEND

- WELLS HYDRAULIC GRADE LINE
- INTERCONNECTION PIPELINE HYDRAULIC GRADE LINE
- HYDRAULIC GRADE LINE FROM WTP TO LGW TANK

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ (PROJECT MANAGER) DATE: 6/2/17

APPROVED: _____ (BROWN AND CALDWELL) DATE: 6/2/17

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: NONE

DESIGNED: MK

DRAWN: DD

CHECKED: SNH

APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

54069 MICHAEL P. KOBE Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

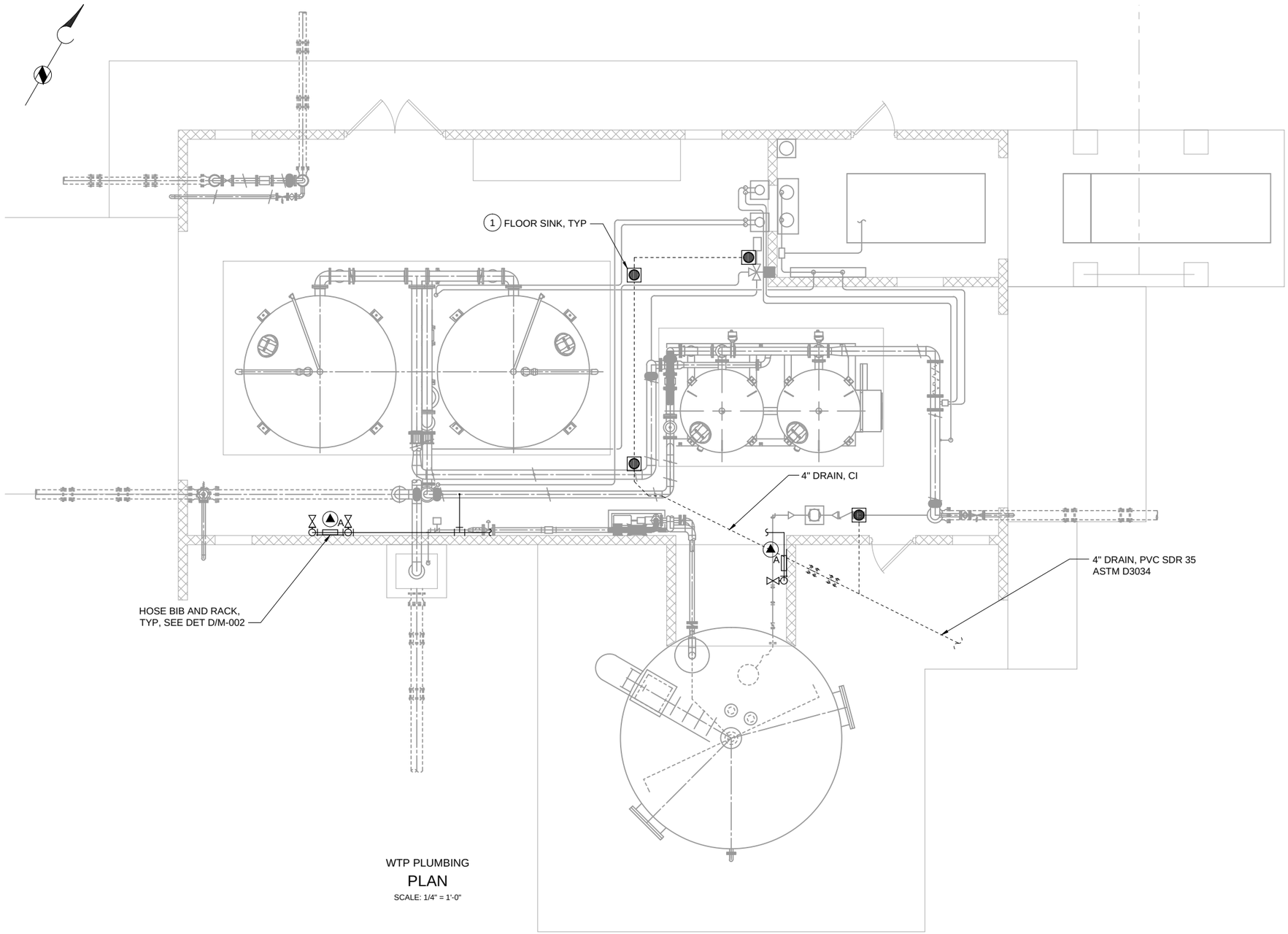
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH PROCESS

HYDRAULIC GRADE LINE DIAGRAM

FILENAME: 143956-P-103.dwg
BC PROJECT NUMBER: 143956
DRAWING NUMBER: P-103
SHEET NUMBER: 75 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CADcontract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\Process Filename: 143956-P-103.dwg Plot Date: June 12, 2017 - 3:15 PM CADD User: David Davidse



WTP PLUMBING

PLAN

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

KEY NOTES:

1. FLOOR SINKS SHALL BE JOSAM SERIES 49320A OR EQUAL FOR USE IN HIGH TRAFFIC OR HIGH WHEEL LOAD AREAS. FLOOR SINK SHALL HAVE A MINIMUM 10" SQUARE GRATE AND MEDIUM SUMP, DOME STRAINER AND DOUBLE DRAINAGE FLANGE. FLOOR SINK SHALL BE EQUIPPED WITH NIKALOY EXTRA HEAVY DUTY GRATE.
2. PROVIDE TUBING FROM ALL AIR RELEASE, VACUUM RELIEF AND COMBINATION AIR VACUUM VALVES TO FLOOR SINKS.

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17
PROJECT MANAGER

APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: Value
DESIGNED: BM
DRAWN: DRP
CHECKED: BP
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

54869
MICHAEL P. KOBE
Date Signed 6/2/2017
ARIZONA, U.S.A.
Expires 12/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
PLUMBING

PLUMBING PLAN

FILENAME 143956-U-100.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER U-100
SHEET NUMBER 76 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

HVAC DESIGNATIONS AND SYMBOLS

WALL LOUVER

AIR FLOW

DAMPER

LOUVER

T

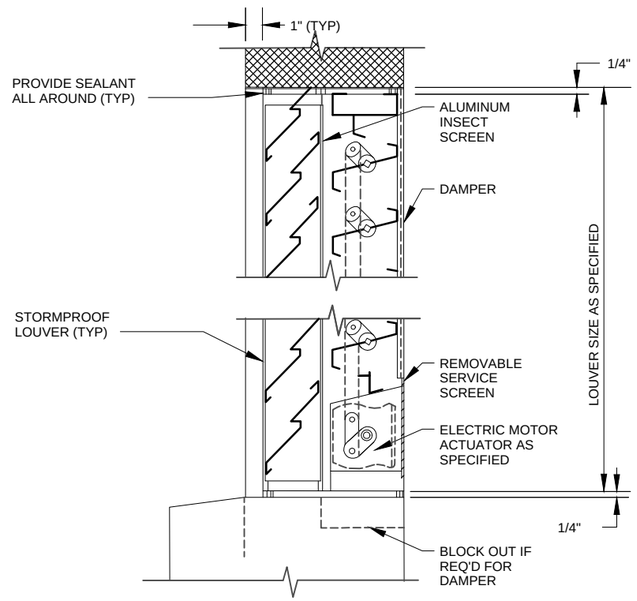
TEMPERATURE SENSOR

WALL PROPELLER FAN / BACKDRAFT DAMPER

ELECTRIC UNIT HEATER

ABBREVIATIONS

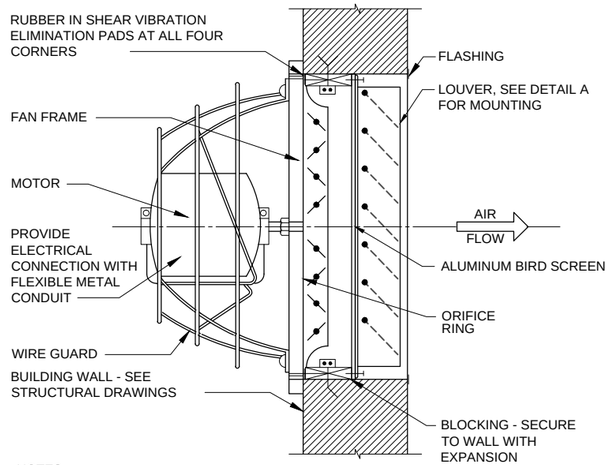
AFF	ABOVE FINISH FLOOR
CFM	CUBIC FEET PER MINUTE
DPR	DAMPER
EUH	ELECTRIC UNIT HEATER
EXF	EXHAUST FAN
OA	OUTSIDE AIR



LOUVER AND DAMPER MOUNTING

DETAIL A

NO SCALE



NOTES:

1. MOTOR SHALL BE RIGIDLY SUPPORTED FROM FAN HOUSING AND SHALL NOT BE ATTACHED TO WIRE FAN GUARD.

WALL EXHAUST FAN

DETAIL B

NO SCALE

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17
PROJECT MANAGER

APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: NONE

DESIGNED: TM
DRAWN: DRP
CHECKED: TM
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

CERTIFICATE OF REGISTRATION
43859
THERESA C. MULLER
DATE SIGNED 6/2/2017
ARIZONA, U.S.A.
Expires 3/31/18

REVISIONS

ZONE	REV.	DESCRIPTION	BY	DATE	APP.

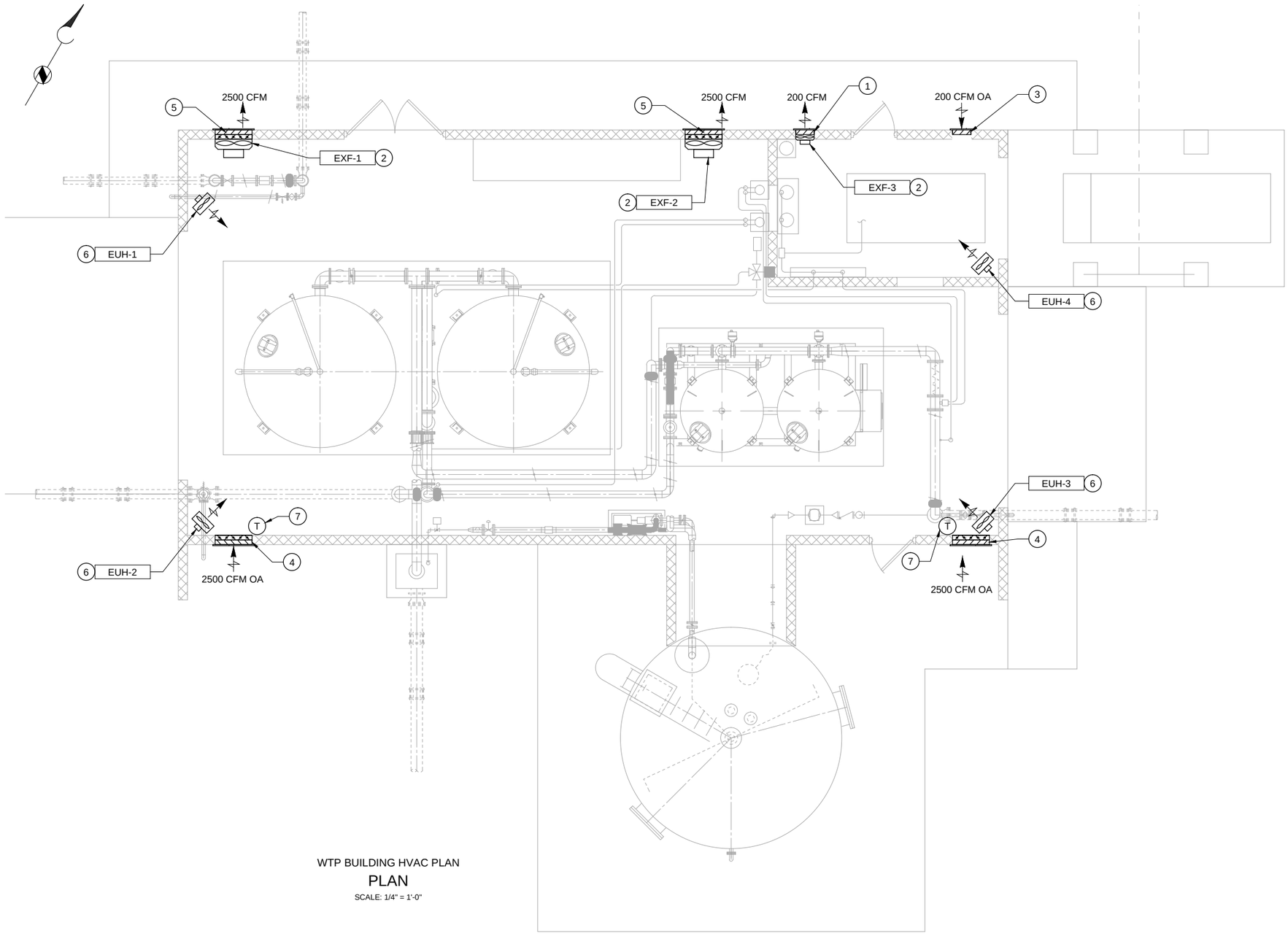
LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
HVAC

DESIGNATIONS, SYMBOLS, DETAILS AND SCHEDULES

FILENAME 143656-H-001.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER H-001
SHEET NUMBER 77 OF 78

ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\HVAC Filename: 143656-H-001.dwg Plot Date: June 14, 2017 - 1:10 PM CADD User: David Davidse



WTP BUILDING HVAC PLAN

PLAN

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

GENERAL NOTES:

1. REFER TO ELECTRICAL DRAWINGS FOR INTERLOCKS AND CONTROLS FOR THE VENTILATION SYSTEM.

KEY NOTES:

1. 16" x 16" LOUVER. INSTALL PER DETAIL B/H-001. BOTTOM OF LOUVER SHALL BE 8" ABOVE FINISHED FLOOR.
2. WALL EXHAUST FAN COUPLED TO EXHAUST LOUVER.
3. 16" x 24" INTAKE AIR LOUVER. INSTALL PER DETAIL A/H-001. BOTTOM OF LOUVER SHALL BE 5'-4" ABOVE FINISHED FLOOR.
4. 32" x 48" INTAKE AIR LOUVER WITH MOTOR OPERATED DAMPER PER SPEC 15944. INSTALL PER DETAIL A/H-001. BOTTOM OF LOUVER SHALL BE 7'-4" ABOVE FINISHED FLOOR.
5. 32" x 32" LOUVER. INSTALL PER DETAIL B/H-001. BOTTOM OF LOUVER SHALL BE 7'-4" ABOVE FINISHED FLOOR.
6. ELECTRIC UNIT HEATER
7. ADJUSTABLE ROOM AIR TEMPERATURE SENSOR (40° - 90° F). INTERLOCK FAN AND MOTORIZED DAMPER TO START WHEN ROOM AIR TEMPERATURE INCREASES ABOVE SET POINT TEMPERATURE.

Brown AND Caldwell

SALT LAKE CITY, UTAH

SUBMITTED: _____ DATE: 6/2/17
PROJECT MANAGER

APPROVED: _____ DATE: 6/2/17
BROWN AND CALDWELL

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" - SCALE ACCORDINGLY)

SCALE: 1/4" = 1'-0"
DESIGNED: TM
DRAWN: DRP
CHECKED: TM
APPROVED: MK

EXTERNAL REFERENCE FILES

BID ISSUE

CERTIFICATE 43859 THERESA C. MULLER Date Signed 6/2/2017 ARIZONA, U.S.A. Expires 3/31/18

REVISIONS					
ZONE	REV.	DESCRIPTION	BY	DATE	APP.

LOWER GREASEWOOD WATER SYSTEM IMPROVEMENTS
DRAWINGS FOR LGW WTP, LGW WELL 1 PH, & GANADO N0 WELL PH
HVAC

HVAC PLAN

FILENAME 143956-H-100.dwg
BC PROJECT NUMBER 143956
DRAWING NUMBER H-100
SHEET NUMBER 78 OF 78

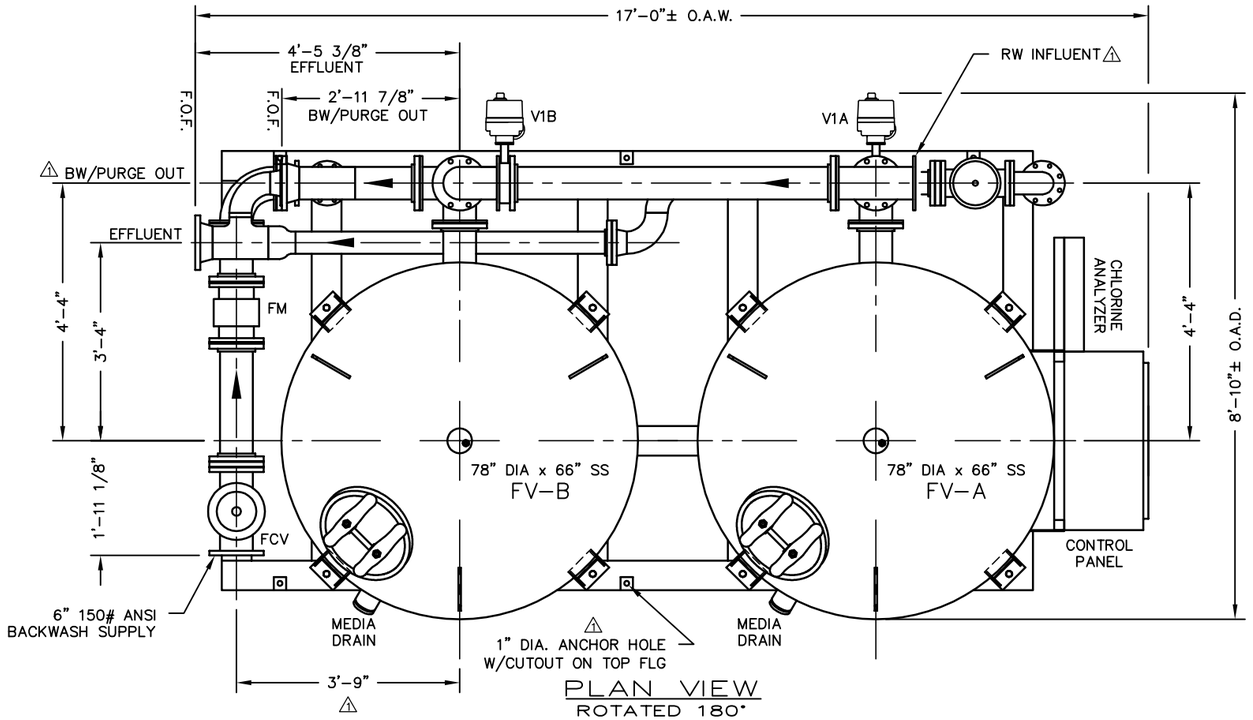
ELECTRONIC COPY OF FINAL DOCUMENT; SEALED ORIGINAL DOCUMENT ON FILE AT BROWN AND CALDWELL, MIDVALE UTAH

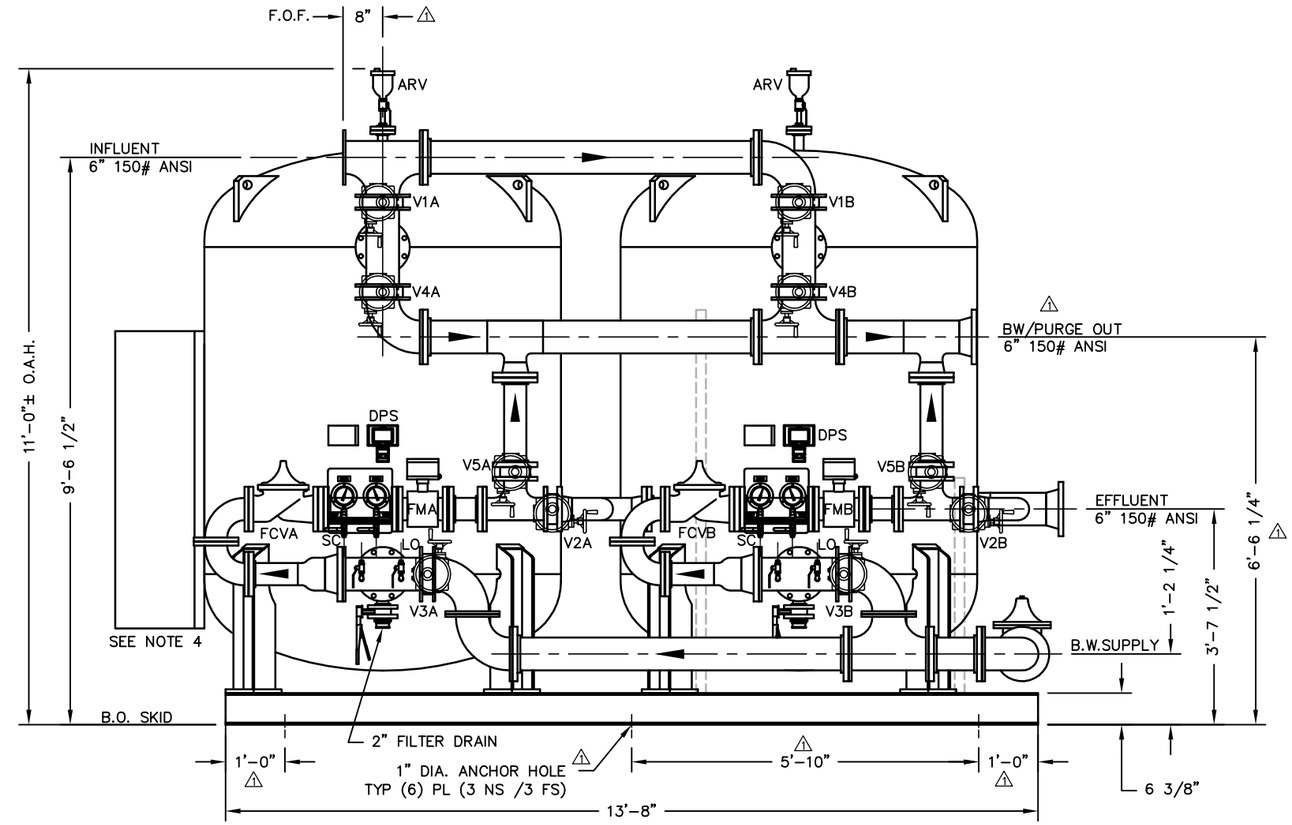
Path: P:\Projects\navajo Nation\143956_lowergreasewooddesign\CAD\contract No. 3 - Lower Greasewood Water Treatment Plant, Well #1 Pumphouse And N0 Well Pumphouse\2-Sheets\HVAC Filename: 143956-H-100.dwg Plot Date: June 14, 2017 - 1:10 PM CADD User: David Davidse

NOTES:
1. ALL DIMENSIONS ARE APPROXIMATE.
2. ALL PIPING IS SCH. 40 CARBON STEEL. FLANGES ARE 150# ANSI CARBON STEEL, WELD NECK OR SLIP ON.
3. THE ENTIRE AREA DIRECTLY IN FRONT OF THE FILTER SYSTEM FACE PIPING, APPROXIMATELY 17'–0" WIDE, SHALL BE FREE OF ANY OBSTRUCTIONS IN ORDER TO INSURE EASY ACCESS TO THE OPERATING VALVES, FLOW METERS, FCV's, FILTER DRAINS ETC.
4. THE ENTIRE AREA BENEATH THE CONTROL PANEL IS TO REMAIN CLEAR OF ANY OBSTRUCTIONS.

THIS IS A "PRELIMINARY" DRAWING SUBMITTED TO FOR REVIEW AND INFORMATION PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION.

(NOT A CONTRACT DOCUMENT - FOR REFERENCE ONLY)





PUREFLOW FILTRATION DIV.
CALIFORNIA ENVIRONMENTAL CONTROLS, INC.
6739 SOUTH WASHINGTON AVENUE
WHITTIER, CALIFORNIA 90608
(800) 926-3428 (562) 945-3425
Fax: (562) 693-5257
E-mail: pureflow@pfdiv.com

BROWN & CALDWELL
MIDVALE, UT
CONSULTANTS

CONTRACTOR

REVISIONS

	DESCRIPTION	DATE	APP
1	PER CLIENTS COMMENTS	3/5/14	

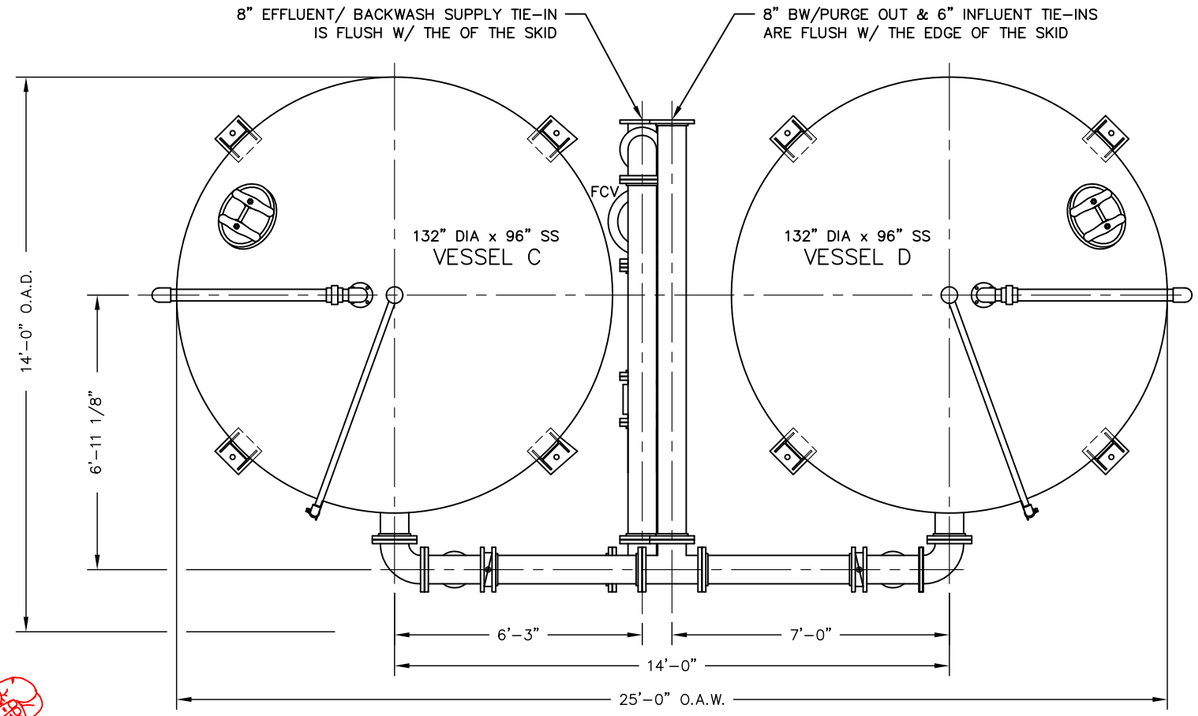
NAVAJO TRIBAL UTILITY AUTHORITY
CLIENT

LOWER GREASEWOOD FE/MN/TOC REMOVAL FILTRATION SYSTEM
PROJECT

FILTER SYSTEM PLAN & ELEVATION
TITLE

DRAWN BY	T. MORALES
CHECKED BY	A. SALAMI
APPROVED BY	A. SALAMI
DATE	2/10/14
DRAWING NO.	1137
'B' SIZE SCALE	DO NOT SCALE
JOB NO.	PROP
SHEET 1 OF 1	REVISION 1

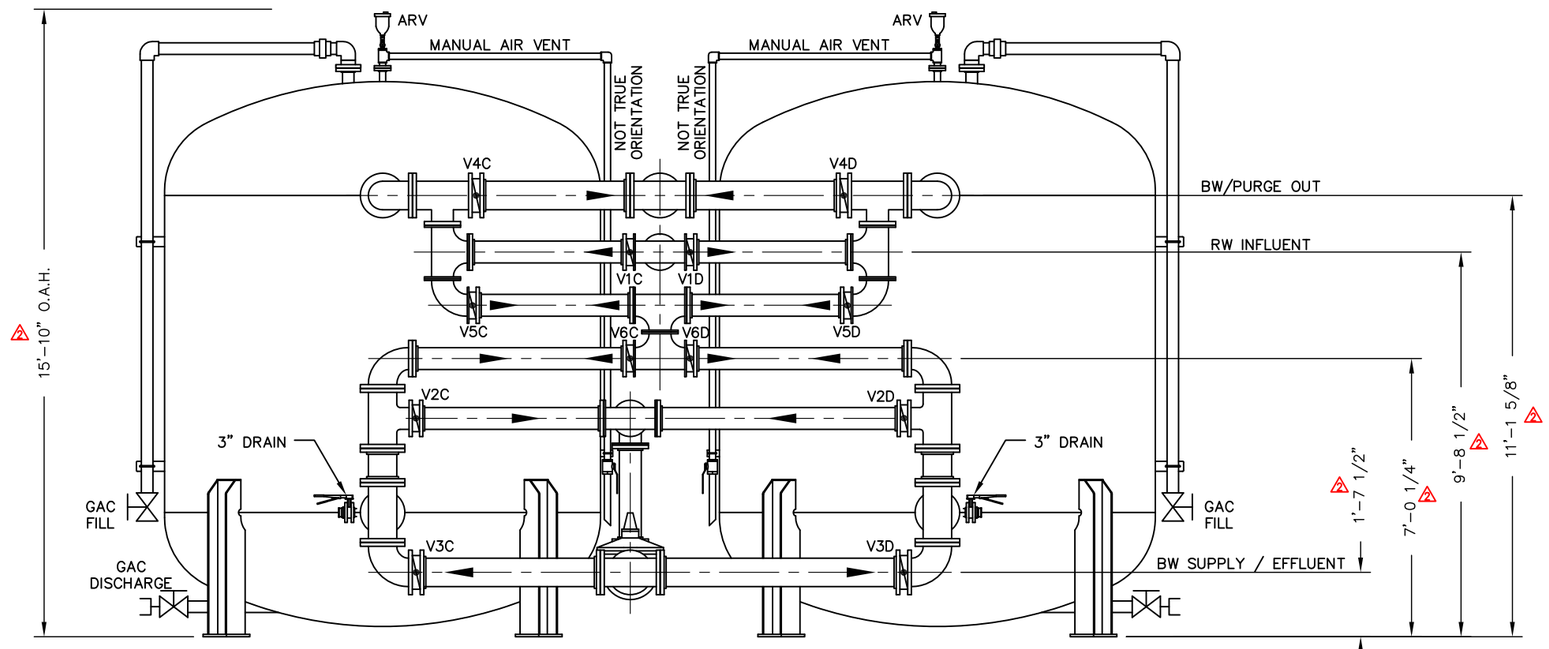
NOTES:
1. ALL DIMENSIONS ARE APPROXIMATE.
2. ALL PIPING IS SCH. 40 CARBON STEEL. FLANGES ARE 150# ANSI CARBON STEEL, WELD NECK OR SLIP ON.
3. THE ENTIRE AREA DIRECTLY IN FRONT OF THE GAC ADSORPTION SYSTEM FACE PIPING, APPROXIMATELY 14'–0" WIDE, SHALL BE FREE OF ANY OBSTRUCTIONS IN ORDER TO INSURE EASY ACCESS TO THE OPERATING VALVES ETC.
4. THE THREE (3) TIE–IN POINTS ARE 150# ANSI FLANGED CONNECTIONS.



PLAN VIEW

THIS IS A PRELIMINARY DRAWING SUBMITTED FOR REVIEW AND INFORMATION PURPOSES ONLY AND IS SUBJECT TO CHANGE WITH REGARDS TO DIMENSIONS AND ORIENTATIONS PENDING FINAL DESIGN. DRAWING IS NOT INTENDED FOR CONSTRUCTION.

(NOT A CONTRACT DOCUMENT)



FRONT ELEVATION

PUREFLOW FILTRATION DIV.
CALIFORNIA ENVIRONMENTAL CONTROLS, INC.
6739 SOUTH WASHINGTON AVENUE
WHITTIER, CALIFORNIA 90608
(800) 926–3426 (562) 945–3425
Fax: (562) 693–5257
E–mail: pureflow@pfdiv.com

BROWN & CALDWELL
MIDVALE, UT
CONSULTANTS

CONTRACTOR

REVISIONS

DESCRIPTION	DATE	APP
PER CLIENTS COMMENTS	03/26/14	A.S.
REMOVE SKID	4/8/14	

NAVAJO TRIBAL UTILITY AUTHORITY
CLIENT

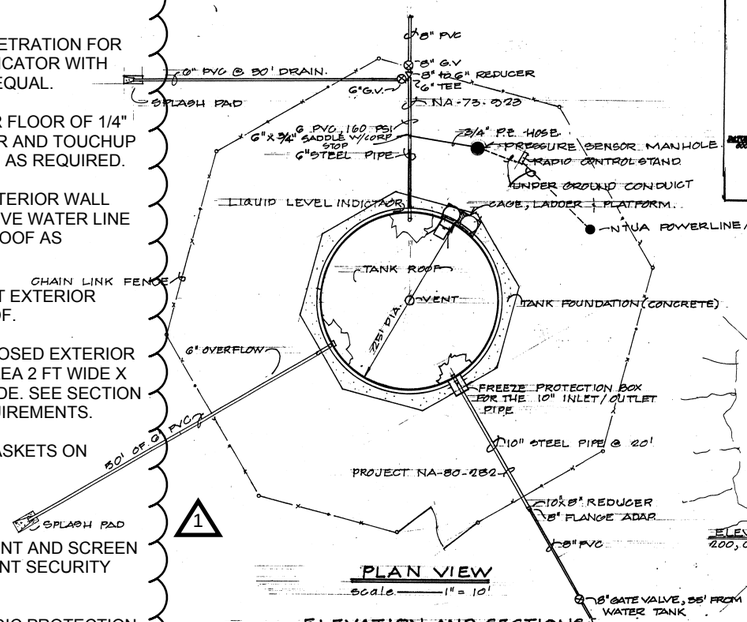
LOWER GREASEWOOD FE/MN/TOC REMOVAL FILTRATION SYSTEM
PROJECT

GAC SYSTEM PLAN & ELEVATION
TITLE

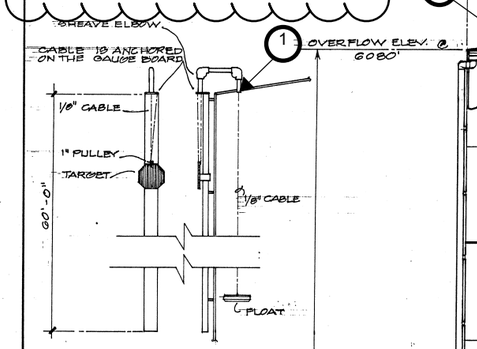
DRAWN BY	T. MORALES
CHECKED BY	A. SALAMI
APPROVED BY	A. SALAMI
DATE	3/6/14
DRAWING NO.	1338
"B" SIZE SCALE	DO NOT SCALE
JOB NO.	PROP
SHEET 1 OF 1	REVISION 2

KEY NOTES:

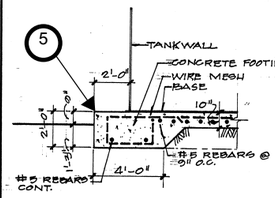
1. SEAL ROOF PENETRATION FOR FLOAT LEVE INDICATOR WITH SIKASIL DW OR EQUAL.
2. CLEAN INTERIOR FLOOR OF 1/4" SEDIMENT LAYER AND TOUCHUP FLOOR COATING AS REQUIRED.
3. SPOT REPAIR INTERIOR WALL (TOP 20 FT.) ABOVE WATER LINE AND INTERIOR ROOF AS REQUIRED.
4. BLAST & RECOAT EXTERIOR WALLS AND ROOF.
5. FILL & SEAL EXPOSED EXTERIOR FOUNDATION AREA 2 FT WIDE X 9 IN ABOVE GRADE. SEE SECTION 03300 FOR REQUIREMENTS.
6. INSTALL NEW GASKETS ON MANWAYS.
7. INSTALL NEW VENT AND SCREEN WITH OMEGA VENT SECURITY SHROUD.
8. INSTALL CATHODIC PROTECTION SYSTEM WITH SACRIFICIAL ANODE. SEE SECTION 13201 2.06.



PLAN VIEW
scale 1" = 10'

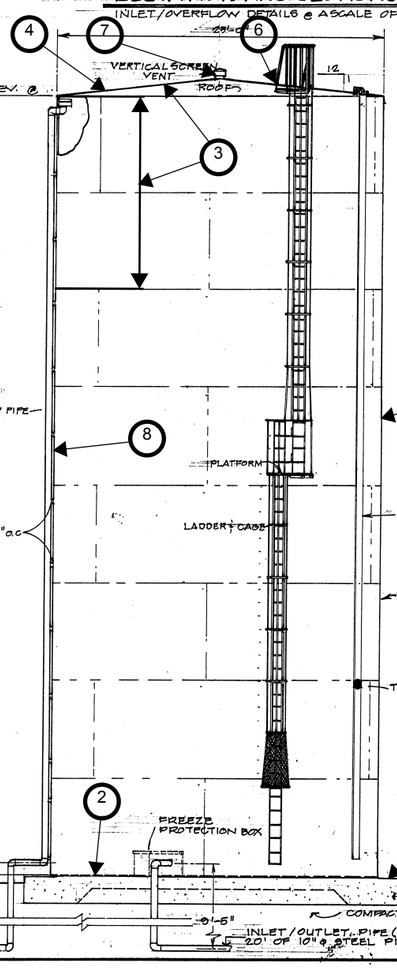


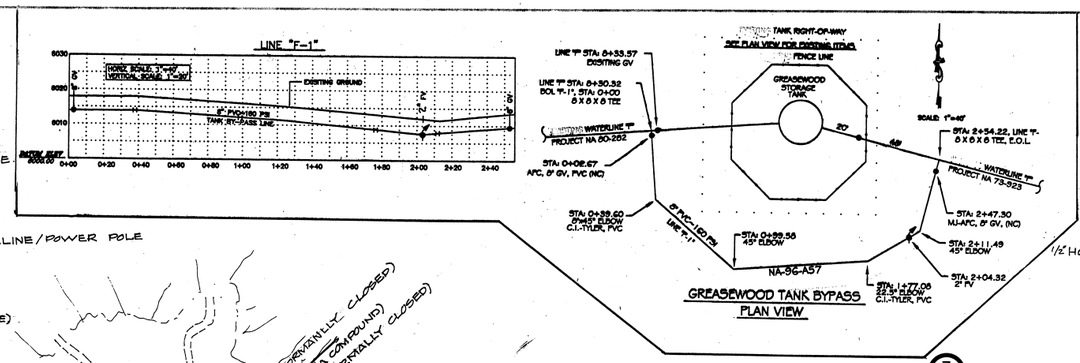
TARGET DETAIL
SCALE: 3/8" = 1'-0"



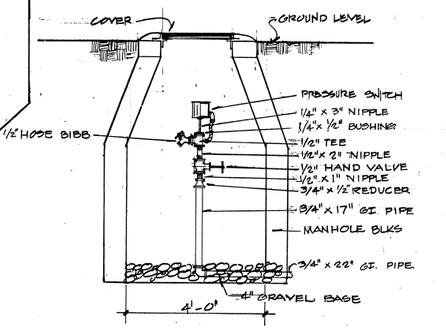
FOUNDATION DETAIL
SCALE 1"= 1/4"

ELEVATION AND SECTIONS
INLET/OVERFLOW DETAILS @ A SCALE OF 1"=3/16"

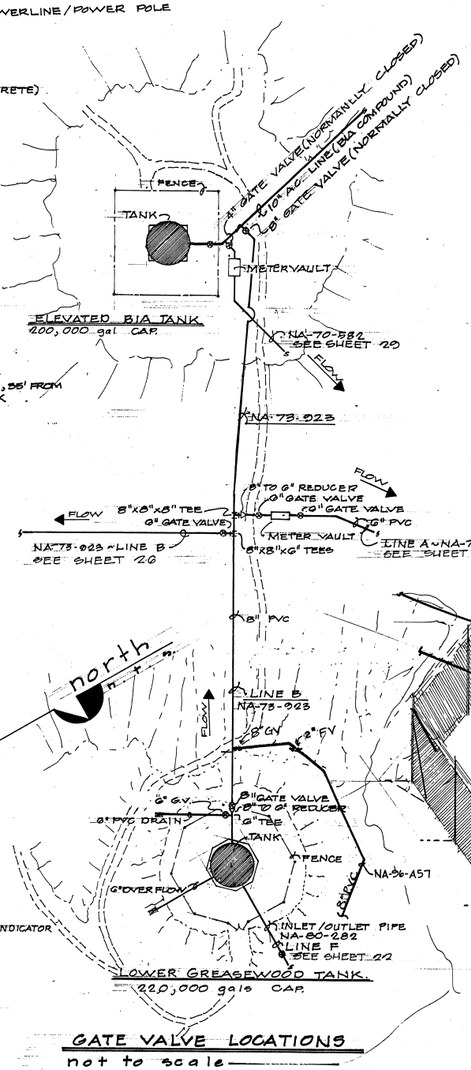




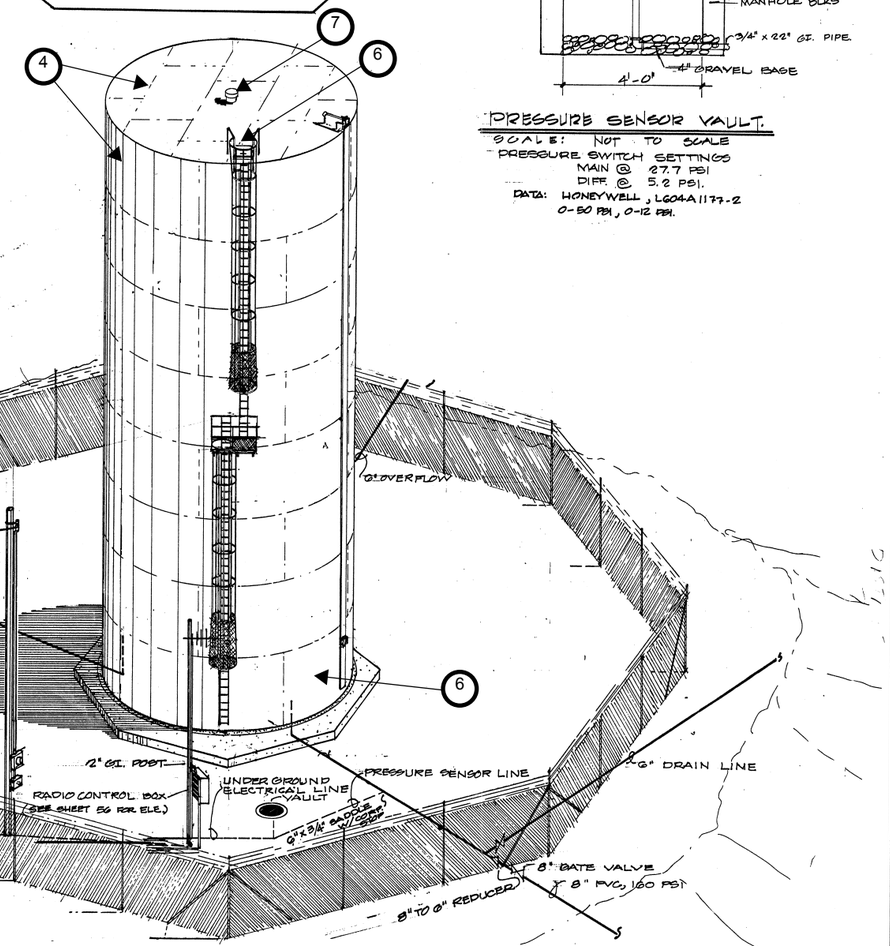
GREASEWOOD TANK BYPASS PLAN VIEW



PRESSURE SENSOR VAULT.
SCALE: NOT TO SCALE
PRESSURE SWITCH SETTINGS
MAIN @ 27.7 PSI
DIFF. @ 5.2 PSI.
DATA: HONEYWELL, LG04A1177-2
0-50 PSI, 0-12 PSI.



GATE VALVE LOCATIONS
not to scale



TANK ISOMETRIC DETAIL
not to scale
@ night.

WATER TANK INFORMATION

VOLUME: 220,000 GALLONS
HEIGHT: 60' DIAMETER: 28'
BASE ELEVATION: 6020'
OVERFLOW ELEVATION: 6080'
CONTRACTOR: EDISON METAL PRODUCTS, INC., ABQ., NEW MEX.
DATE: JULY, 1974 CONTRACT NO.: HSA-77-74-159
PAINT SYSTEM:
A. INSIDE: AWWA D-102, INSIDE PAINT #4 VP001, VP000, VP050.
B. OUTSIDE: AWWA D-102, OUTSIDE PAINT #1 MP-210 (PRIMER) N.X. ENAMEL.
STEEL THICKNESS:
A. FLOOR: 1/4" STEEL PLATES
B. WALL: 1ST 1ST RING 5/16"; 2ND 3RD RING 1/4"; 5TH, 6TH, 7TH & 8TH RINGS 1/4",
C. ROOF: 3/16" STEEL PLATES
GROUND LEVEL (SLOPED)

TANK REFURBISHMENT NOTES 1-8

1 2014 CONTRACT NO 3

OFFICE OF ENVIRONMENTAL HEALTH & ENGINEERING
AS BUILT
WINSLOW SERVICE UNIT
DATE: Jan 30, 1984 BY:

REVISION	DATE	BRIEF	BY
2	11/2004	NA 96-A57, AS BUILT	RH
1	10-99	CONSTRUCTION 96-A57	HA

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE

LOWER GREASEWOOD, NAVAJO COUNTY — NAVAJO NATION, ARIZONA

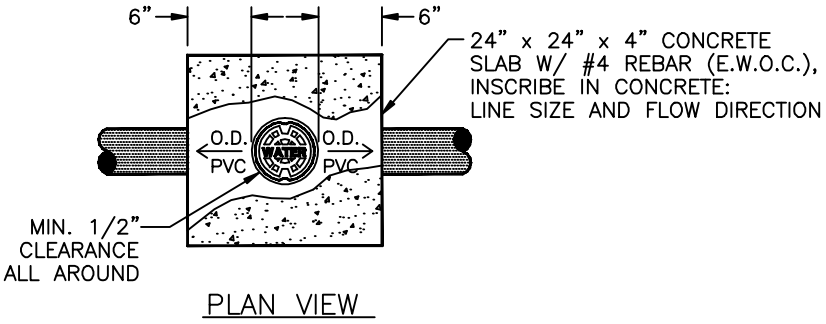
TANK DETAIL SHEET
LOWER GREASEWOOD STORAGE TANK
220,000 GALLONS.

PROJECT NO. NA-73-023, 96-A57
PUBLIC LAW 86-121

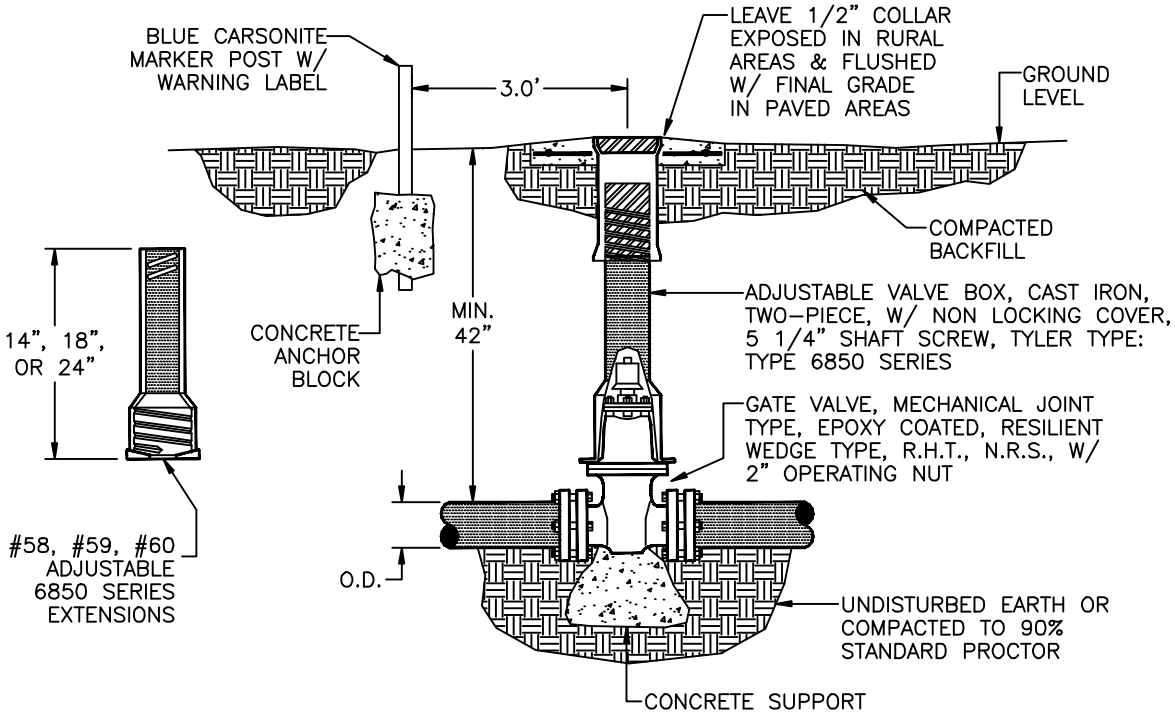
OFFICE OF ENVIRONMENTAL HEALTH & ENGINEERING
NAVAJO AREA OFFICE
WINDOW ROCK, ARIZONA

DRAWN BY: M. THOMPSON
DATE: 12-2-83

SHEET NO. 50 OF 68 TOTAL SHEETS



PLAN VIEW



NOTES:

1. IF APPROPRIATE, USE SERIES 2000 PV MEGALUG GLANDS FOR SDR-21, PVC TO SECURE GATE VALVE(S) TO OTHER FITTINGS/PIPE, USE OTHER MEGALUGS FOR DIFFERENT OUTSIDE DIAMETER PIPE/TYPE.
2. DO NOT COVER JOINTS AND BOLTS WITH CONCRETE.
3. SEE WS-13 FOR APPROPRIATE LOCATION OF MARKER POST.

DESIGNED BY:	NTUA
SURVEYED BY:	
DRAWN BY:	NTUA
APPROVED BY:	NTUA
DATE:	04/08
PROJECT NO.	
SCALE:	NTS
ACAD FILENAME:	Water Standard
DWG. NO.	WS-14.DWG

NAVAJO TRIBAL UTILITY AUTHORITY
HQ CIVIL ENGINEERING DEPARTMENT

WATER MAIN VALVE INSTALLATION

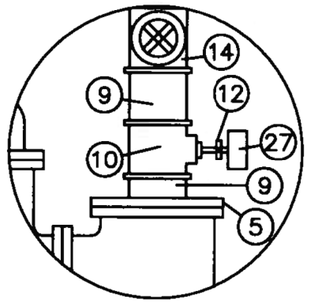
HQ-ENGINEERING FT.DEFIANCE, AZ

REVISIONS			
No.	Date	Brief	By
01	04/08	Revised	L.H.
02			
03			
04			
05			
06			

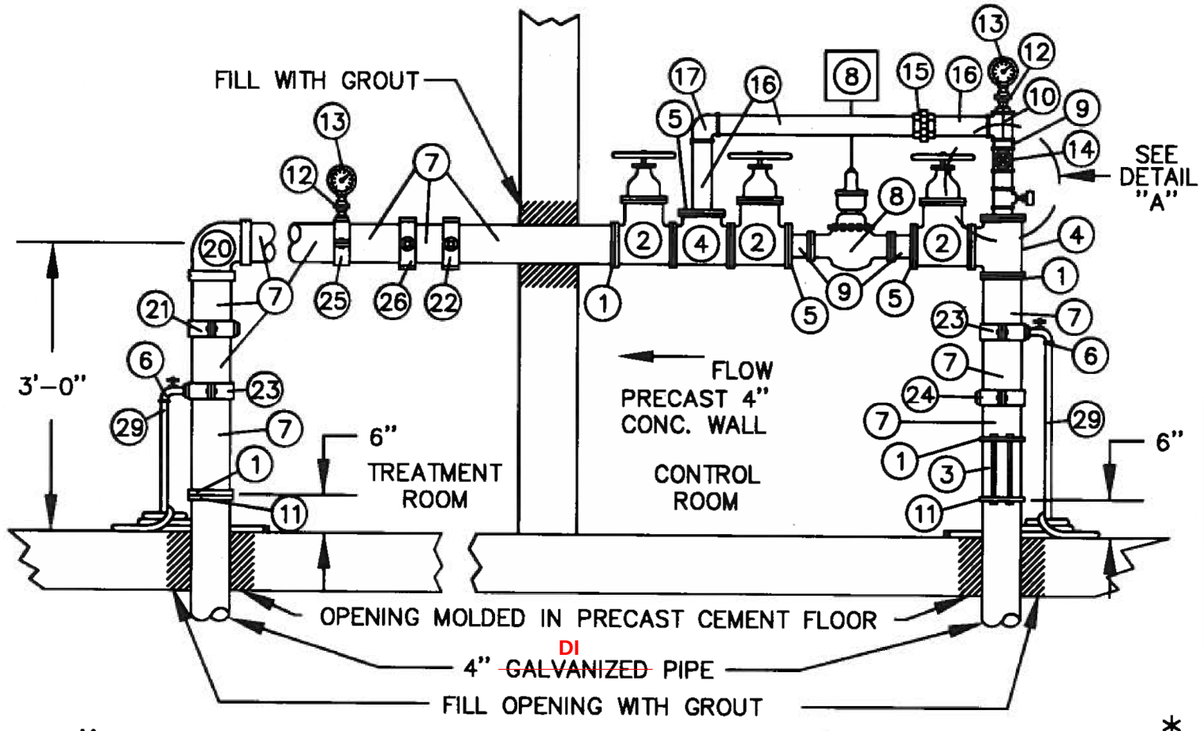
NOTES:

1. PRESSURE GAUGES AND HONEYWELL CONTROL ORDERED SEPARATELY ACCORDING TO WORKING PRESSURE
2. PIPE AND CAST IRON VALVES/FITTINGS PRIMED AND PAINTED BLUE, ORDER PAINT AND PRIMER SEPARATELY
3. HIGH PRESSURE RATED GAUGES AND VALVES ARE REQUIRED FOR PRESSURES > 150 PSI
4. WRAP EXTERIOR GALV. PIPING WITH POLYGEN TAPE

(evoQ4 ELECTROMAGNETIC



DETAIL "A"
N.T.S.



4" FLANGED PUMPHOUSE PIPING FOR FLOWS OF 50 TO 250* GPM

(125 # OR 250 # FLANGES) HEAD LOSS = 13 FT. @ 250 GPM

*DIFFERENT METER REQUIRED FOR FLOWS IN EXCESS OF 160 GPM OR PRESSURES > 150 PSI

ITEM	QUAN.	DESCRIPTION
1	4	COMPANION FLANGE, 4" FIPT X 9" FACE
2	3	GATE VALVE, 4" FLANGED, ~~C.I.~~ W/ WHEEL DI
3	1	CHECK VALVE, 4" SILENT, WAFER STYLE
		W/ BOLTS FLANGES
4	2	TEE, 4" FLANGED, ~~C.I.~~ DI
5	4	REDUCING FLANGE, 2"FIPT X 9"FACE
6	2	HOSE BIBB, 3/4" W/BACKFLOW PREVENTION
7	3	~~GALV. PIPE~~, 4" (CUT AS NEEDED) DI PIPE
8	1	2" TURBINE WATER METER W/ACT-PAK,
		~~(SENSUS W160 DR/HSP)~~ 150 PSI MAX.
		(W/COMPANION FLANGES)
9	5	NIPPLE, 2"X 3", ~~G.I.~~ (THREADED) DI
10	2	2"X 2"X 2" TEE W/2"X 3/4" & 3/4"X 1/4"
		BUSHINGS (FOR PRESSURE GAUGE & HIGH
		PRESSURE CUTOFF SWITCH)
11	2	FIELD FLANGE
12	3	VALVE, PRESSURE COCK, 1/4"
13	2	PRESSURE GAUGE
14	1	GATE VALVE, 2" BRASS (FEMALE THREADED
		ENDS)
15	1	UNION, 2" ~~G.I.~~ SS
16	3	~~G.I.~~ PIPE, 2" (CUT & THREAD IN FIELD) SS
17	1	ELBOW, 90°, 2" ~~G.I.~~ SS
18		
19		
20	1	ELBOW, 90°, 4" ~~G.I.~~ DI
21	1	SADDLE, 4"X 1" (FOR CHLORINE INTRODUCTION)
22	1	SADDLE, 4"X 1", ROTATED 90° (FOR CHLORINE
		SUPPLY)
23	2	SADDLE, 4"X 3/4", (FOR HOSE BIBB)
24	1	SADDLE, 4"X 3/4", (FOR SEQUESTERING
		TREATMENT IF NEEDED)
25	1	SADDLE, 4"X 1", W/ 1"X 1/4" BUSHING
		(FOR PRESSURE GAUGE)
26	1	SADDLE, 4"X 3/4" ROTATED 90° W/3/4"X 1/2"
		BUSHING, (FOR FLUORIDE INTRODUCTION)
27	1	HIGH PRESSURE CUT-OFF
28		
29	2	GARDEN HOSE, 10', HOSE BIBB X PLAIN END

*ALL PIPES 3-INCH OR GREATER THAT ARE NOT PVC SHALL BE DUCTILE IRON.

* ALL PIPES 2-INCH OR LESS THAT ARE NOT PVC SHALL BE STAINLESS STEEL.

REVISION	DATE	BRIEF	BY
3	1/06	ADDED METER HIGH SPEED PICK UP & ACT-PAK	D.S.
2	1/00	ADDED FIELD FLANGE TO MATERIALS LIST	R.B.M.

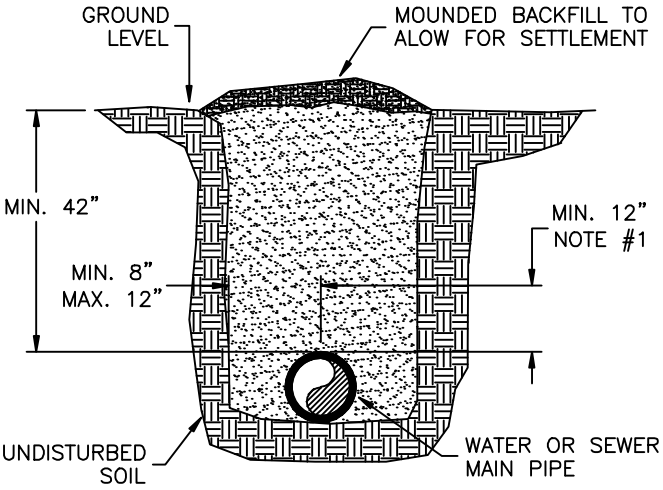
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

NAVAJO NATION,

STANDARD DRAWING NO. W-14
4" PUMPHOUSE PIPING
LIST NO. 901550

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

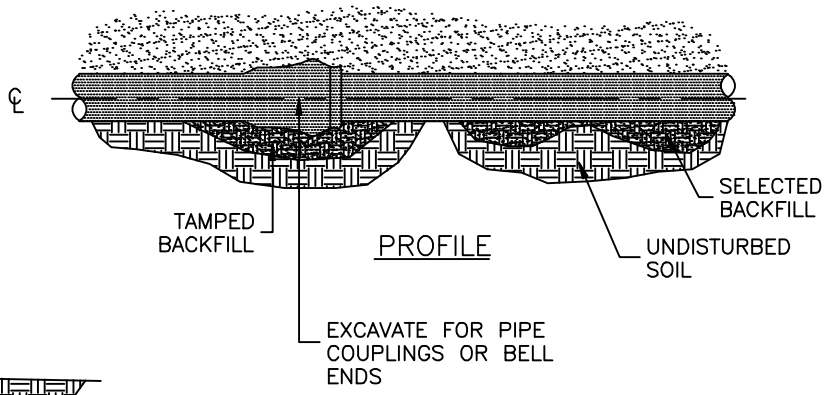
DRAWN BY: L.S. DATE: 1/93	CHECKED BY: P.S. DATE: 1/93	APPR. BY: P.S. DATE: 1/93	AUTOCAD DRAWING



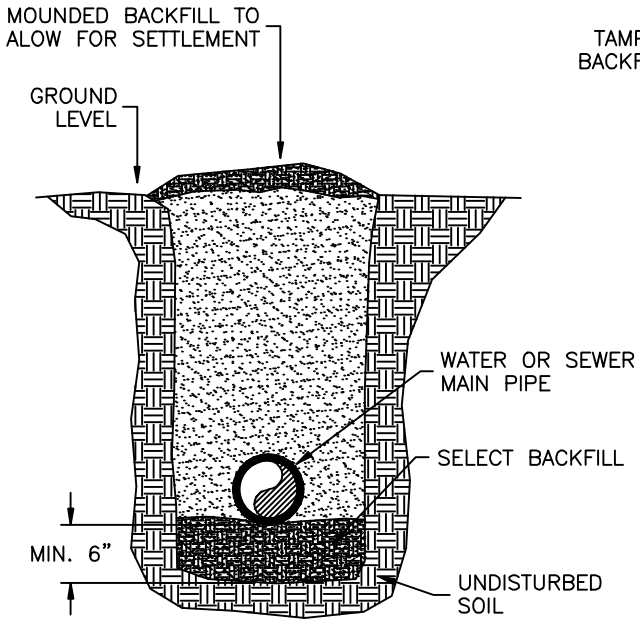
TYPICAL TRENCH DETAIL

NOTES:

1. HAND COMPACTED IN 6" LIFTS FROM BOTTOM OF TRENCH TO 12" ABOVE PIPE CROWN.
2. OPEN CUT OR PAVED OR GRAVEL ROADS (IF REQUIRED), BACK FILL MINIMUM COMPACTION 95% OPTIMUM DENSITY IN LIFTS.
3. REPAVING AND REGRAVELING WILL BE DONE TO ROAD OWNER'S REQUIREMENTS.
4. KEEP LOWER 5' OF TRENCH WALL VERTICAL IF POSSIBLE. UPPER PART OF THE TRENCH WILL VARY IN WIDTH TO COMPENSATE FOR UNSTABLE SOIL. APPLICABLE O.S.H.A. REQUIREMENTS SHALL BE MET.



PROFILE



ALTERNATE TRENCH DETAIL

DESIGNED BY:	NTUA
SURVEYED BY:	
DRAWN BY:	NTUA
APPROVED BY:	NTUA
DATE:	04/08
PROJECT NO.	
SCALE:	NTS
ACAD FILENAME:	Water Standard
DWG. NO.	WS-15.DWG

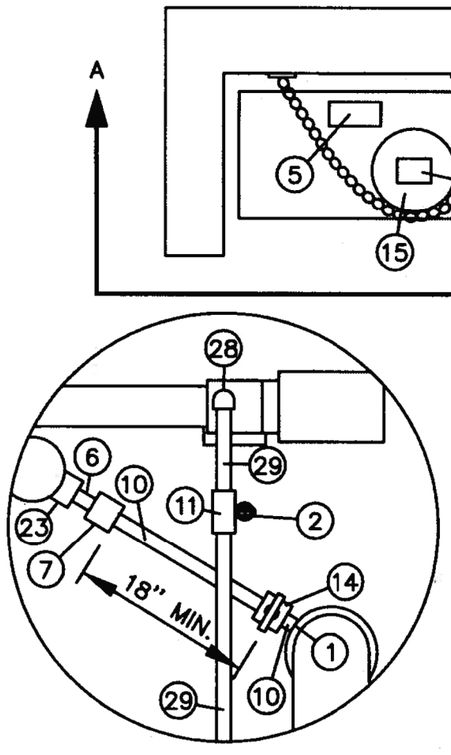
NAVAJO TRIBAL UTILITY AUTHORITY
HQ CIVIL ENGINEERING DEPARTMENT

TRENCH DETAIL

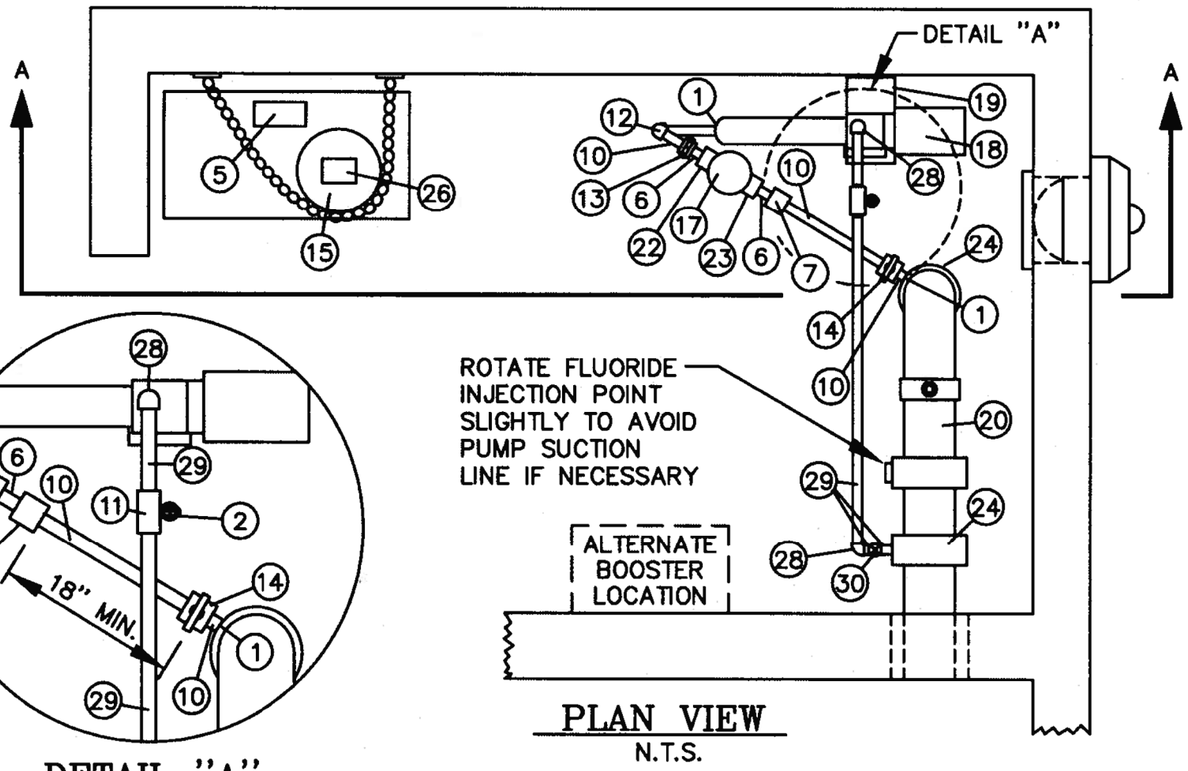
HQ-ENGINEERING FT.DEFIANCE, AZ

REVISIONS

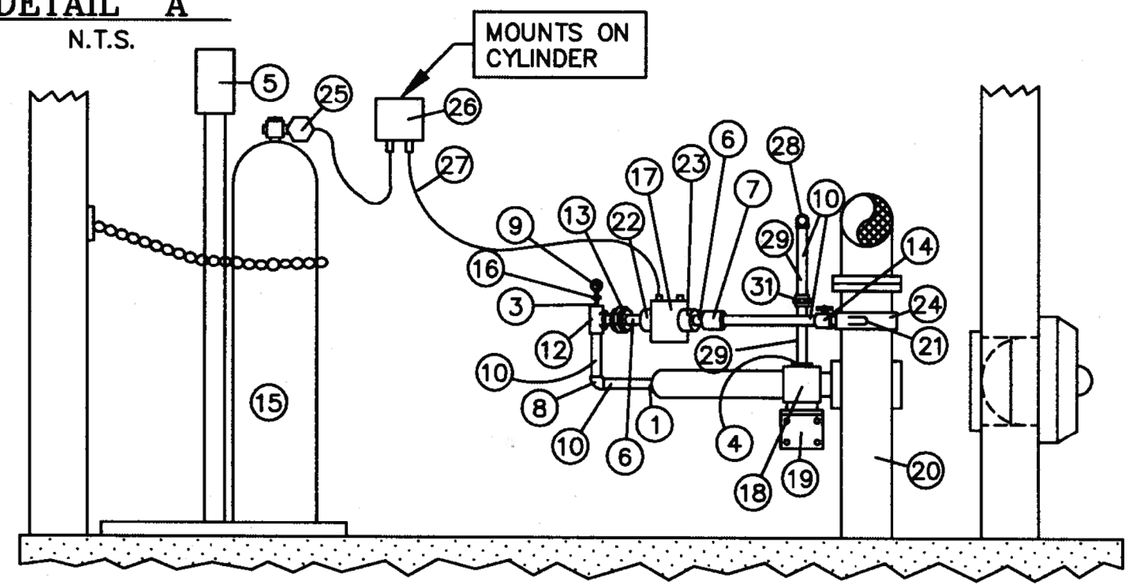
No.	Date	Brief	By
01	04/08	Revised	L.H.
02			
03			
04			
05			
06			



DETAIL "A"
N.T.S.



PLAN VIEW
N.T.S.



A–A ELEVATION VIEW
N.T.S.

ITEM	QUAN.	DESCRIPTION
1	3	ADAPTER 1" S X MIPT SCH. 80 PVC
2	1	BIBB HOSE, 3/4" MIPT BRASS
3	1	BUSHING 1" S X 1/4" FIPT SCH. 80 PVC
4	1	BUSHING 1-1/4" X 1" ~~GALV.~~ SS
*5	1	CHLORINE SCALE
6	2	BUSHING 1" S X 3/4" FIPT SCH. 80 PVC
7	1	COUPLING 1" SLIP SCH. 80 PVC
8	1	ELBOW 90° 1" SLIP SCH. 80 PVC
9	1	GAUGE GLYCER 1/4" 0-350
10	AS NEEDED	PIPE 1" CUT TO FIT SCH. 80 PVC
11	1	STAINER 1" X 1" FIPT GALV.
12	1	TEE 1" SLIP SCH. 80 PVC
13	1	UNION 1" SLIP SCH. 80 PVC
14	1	BALL VALVE 1" SLIP SCH. 80 PVC
*15	1	GAS CHLORINE CYLINDER
16	1	VALVE PRESSURE COCK 1/4" MIPT BRASS
*17	1	EJECTOR UNIT S-10 CHLORINATOR OR APPROVED EQUAL
*18	1	JACCUZZI-BOOSTER PUMP (MODEL OR APPROVED EQUAL)
19	1	BOOSTER PUMP-BRACKET
*20	AS NEEDED	PUMP HOUSE PIPING 4" ±
21	1	1/2" PVC-SOLUTION TUBE
22	1	NOZZLE-EJECTOR (MODEL)
23	1	TAILWAY-EJECTOR (MODEL)
24	2	SADDLE 4" X 1" IPT
25	1	PRESSURE REGULATOR
*26	1	CONTROL UNIT, ROTOMETER
27	AS NEEDED	TUBING
28	2	ELBOW 90° 1" FIPT SCH. 40 ~~G.I.~~ SS
29	AS NEEDED	PIPE 1" CUT AND THREADED TO FIT, ~~G.I.~~ SS
30	1	GATE VALVE, 1" BRASS, FIPT
31	1	UNION, 1" SCH. 40 ~~G.I.~~ SS

* NOT ON STANDARD LIST

*ALL PIPES 3-INCH OR GREATER THAT ARE NOT PVC SHALL BE DUCTILE IRON.

* ALL PIPES 2-INCH OR LESS THAT ARE NOT PVC SHALL BE STAINLESS STEEL.

NOTE:
1. BOOSTER INLET PIPING TO BE G.I. TO PROVIDE INCREASED SUPPORT.
2. BOOSTER PUMP INSTALLER TO MAKE TAP FOR CHLORINE AND FLUORIDE PUMP.
3. GAS CHLORINATION SHALL BE CONSIDERED FOR ALL FLOWRATES GREATER THAN 50 GPM.

REVISION	DATE		BY
1	7/99	STANDARDIZED	B.M.

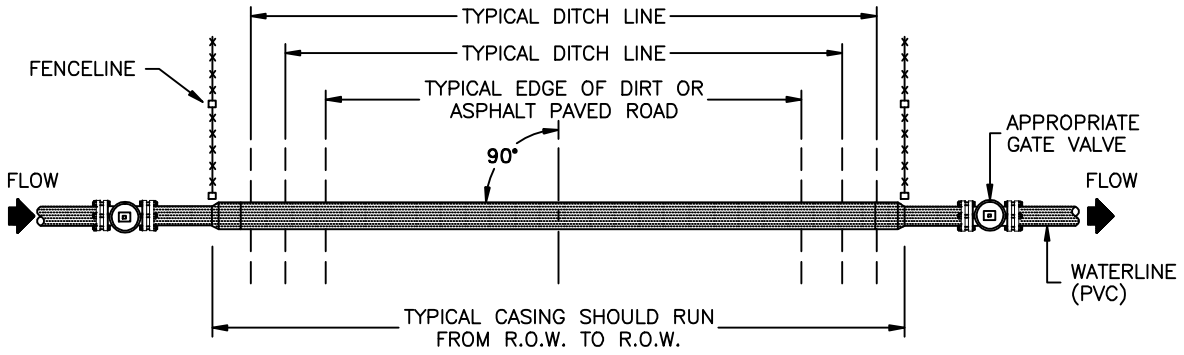
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

NAVAJO NATION,

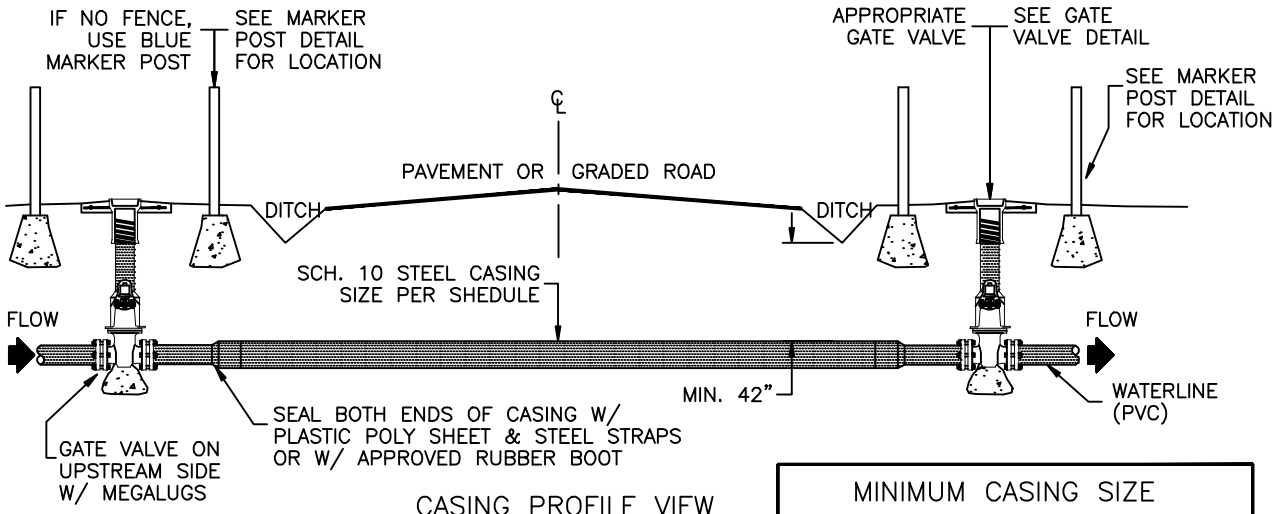
STANDARD DRAWING NO. W-15
GAS CHLORINATION
LIST NO. 902000

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

DRAWN BY: L.S. DATE: 1/93	CHECKED BY: P.S. DATE: 1/93	APPR. BY: P.S. DATE: 1/93	AUTOCAD DRAWING



CASING PLAN VIEW



CASING PROFILE VIEW

MINIMUM CASING SIZE	
PIPE SIZE (O.D.)	CASING SIZE (I.D.)
4"	12"
6"	14"
8"	16"
10"	18"
12"	20"
14"	22"

NOTES:

1. ALL CASINGS WILL TYPICALLY RUN FROM ROW TO ROW UNLESS OTHERWISE SPECIFIED.
2. BACKFILL SHALL BE 95% OF STANDARD PROCTOR DENSITY – TESTED IN 6" LIFTS.
3. ALL WOOD SKIDS ARE TO BE REDWOOD GRADE OR APPROVED EQUAL (OAE)
4. ALL SKIDS WILL BE SECURELY FASTENED TO PIPE WITH STAINLESS STEEL STRAPS.
5. ROAD SHALL BE BORED UNDER EXISTING PAVEMENT AND OPEN TRENCH ON REMAINDER, UNLESS OTHERWISE SPECIFIED.
6. IF SYSTEM IS LOOPED FOR A ROAD BORING APPLICATION, INSTALL GATE VALVE ON UPSTREAM AND DOWNSTREAM SIDES OF ROADWAY.
7. DUCTILE IRON SHALL BE CLASS 50.
8. DUCTILE IRON ROAD CROSSING IN B.I.A. RURAL AREAS SHALL BE FROM 10' BEYOND DITCH LINE UNLESS OTHERWISE SPECIFIED.

DESIGNED BY:	NTUA
SURVEYED BY:	
DRAWN BY:	NTUA
APPROVED BY:	NTUA
DATE:	04/08
PROJECT NO.	
SCALE:	NTS
ACAD FILENAME:	Water Standard
DWG. NO.	WS-17a.DWG

NAVAJO TRIBAL UTILITY AUTHORITY
HQ CIVIL ENGINEERING DEPARTMENT

TYPICAL ROAD CROSSING FOR NTUA WATERLINES

HQ–ENGINEERING FT.DEFIANCE, AZ

REVISIONS			
No.	Date	Brief	By
01	04/08	Revised	L.H.
02			
03			
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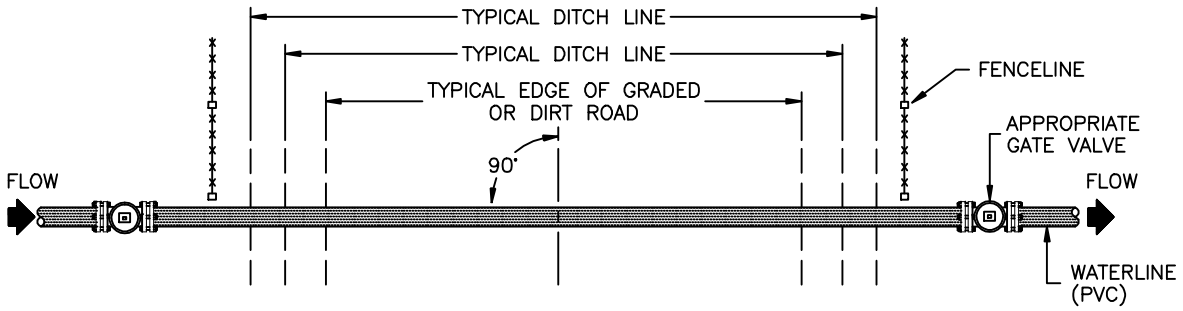
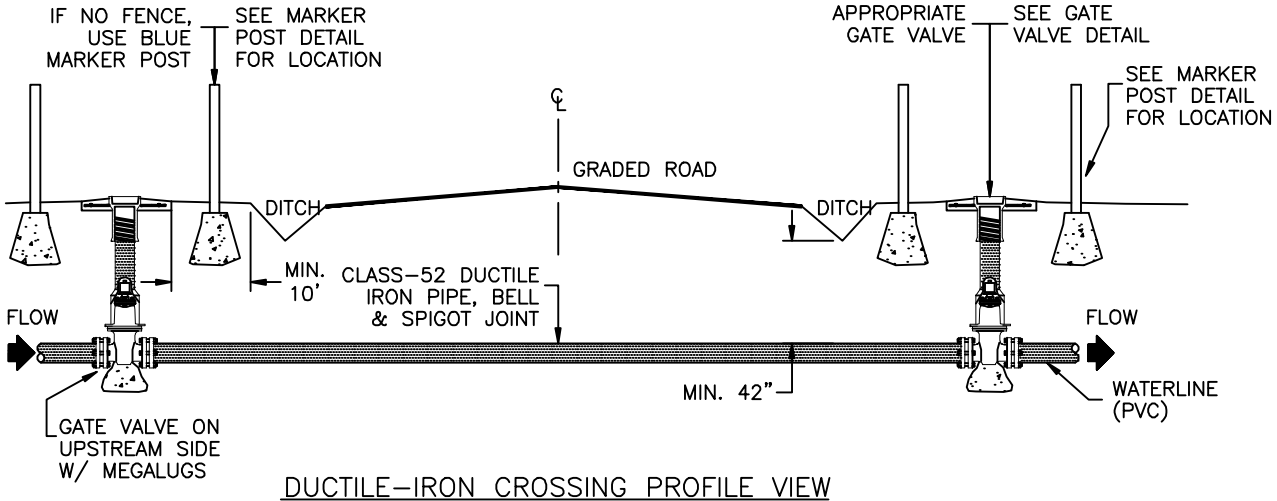
06			



DUCTILE–IRON CROSSING PLAN VIEW



DUCTILE–IRON CROSSING PROFILE VIEW

NOTES:

1. ALL CASINGS WILL TYPICALLY RUN FROM ROW TO ROW, UNLESS OTHERWISE SPECIFIED.
2. BACKFILL SHALL BE 95% OF STANDARD PROCTOR DENSITY – TESTED IN 6" LIFTS.
3. ALL WOOD SKIDS ARE TO BE REDWOOD GRADE OR APPROVED EQUAL (OAE)
4. ALL SKIDS WILL BE SECURELY FASTENED TO PIPE WITH STAINLESS STEEL STRAPS.
5. ROAD SHALL BE BORED UNDER EXISTING PAVEMENT AND OPEN TRENCH ON REMAINDER, UNLESS OTHERWISE SPECIFIED.
6. IF SYSTEM IS LOOPED FOR A ROAD BORING APPLICATION, INSTALL GATE VALVE ON UPSTREAM AND DOWNSTREAM SIDES OF THE ROADWAY.
7. DUCTILE IRON SHALL BE CLASS 52.
8. DUCTILE IRON ROAD CROSSING IN B.I.A. RURAL AREAS SHALL BE FROM 10' BEYOND DITCH LINE UNLESS OTHERWISE SPECIFIED.

DESIGNED BY:	NTUA
SURVEYED BY:	
DRAWN BY:	NTUA
APPROVED BY:	NTUA
DATE:	04/08
PROJECT NO.	
SCALE:	NTS
ACAD FILENAME:	Water Standard
DWG. NO.	WS-17b.DWG

NAVAJO TRIBAL UTILITY AUTHORITY
HQ CIVIL ENGINEERING DEPARTMENT

TYPICAL ROAD CROSSING FOR NTUA WATERLINES

HQ–ENGINEERING FT.DEFIANCE, AZ

REVISIONS			
No.	Date	Brief	By
01	04/08	Revised	L.H.
02			
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04			
05			
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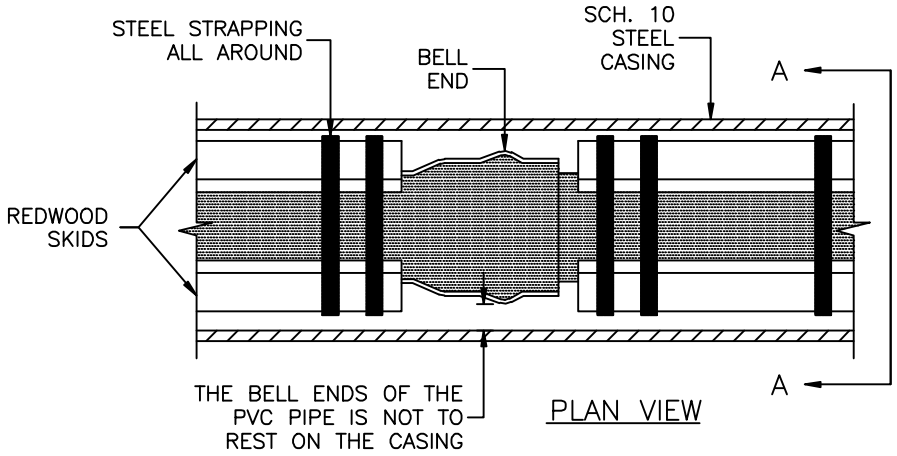
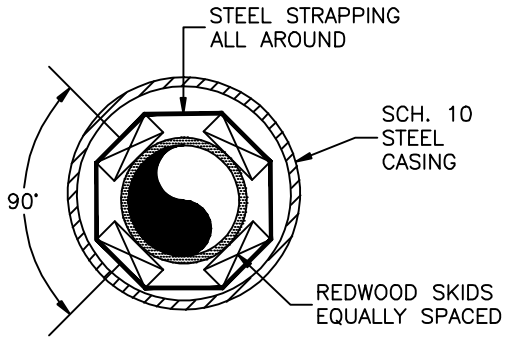


PLAN VIEW



SECTION A–A

NOTES:

1. ALL SKIDS SHALL RUN THE LENGTH OF THE PVC PIPE, BELL TO BELL.
2. ALL SKIDS TO BE REDWOOD LUMBER, OR APPROVED EQUAL.
3. BELL AND SPIGOT DUCTILE IRON PIPE MAY BE INSTALLED DIRECTLY WITHIN THE CASING.
4. TYPICAL ROAD BORES BY NAVAJO ENGINEERING AND CONSTRUCTION AUTHORITY ARE 8" AND 14" CASING SIZES.
5. ALL STRAPPING MUST BE STAINLESS STEEL AND BE SECURELY FASTENED TO THE PVC CARRIER PIPE FOR PROPER SUPPORT OF PIPE DURING INSTALLATION.
6. SEAL ENDS OF CASING W/ PLASTIC POLY SHEET AND STAINLESS STEEL STRAPS OR AN APPROVED RUBBER BOOT.

MINIMUM CASING SIZE	
PIPE SIZE (O.D.)	CASING SIZE (I.D.)
4"	12"
6"	14"
8"	16"
10"	18"
12"	20"
14"	22"

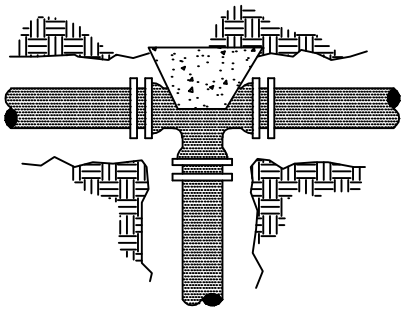
DESIGNED BY:	NTUA
SURVEYED BY:	
DRAWN BY:	NTUA
APPROVED BY:	NTUA
DATE:	04/08
PROJECT NO.	
SCALE:	NTS
ACAD FILENAME:	Water Standard
DWG. NO.	WS-18.DWG

NAVAJO TRIBAL UTILITY AUTHORITY
HQ CIVIL ENGINEERING DEPARTMENT

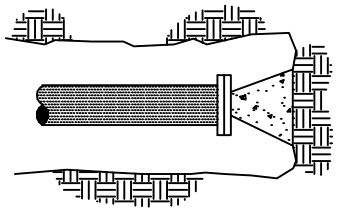
INSTALLATION OF SKIDS INSIDE CASING

HQ-ENGINEERING FT.DEFIANCE, AZ

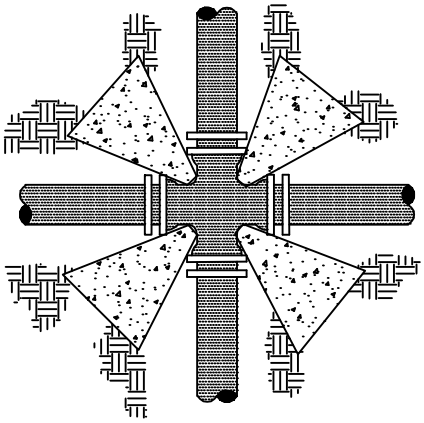
REVISIONS			
No.	Date	Brief	By
01	04/08	Revised	L.H.
02			
03			
04			
05			
06			



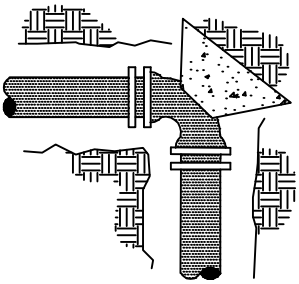
TEE
(PLAN VIEW)



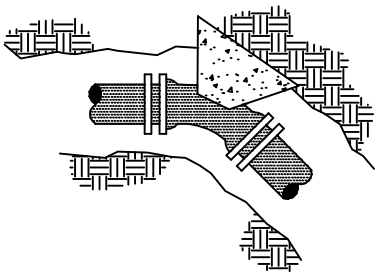
DEAD END CAPPED OR PLUG
(PLAN VIEW)



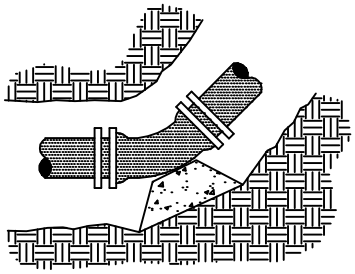
CROSS
(PLAN VIEW)



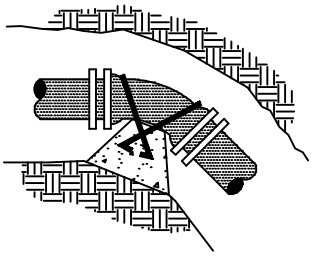
90° ELBOW
(PLAN VIEW)



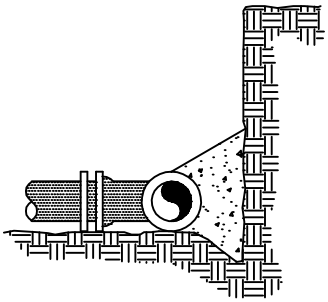
45° ELBOW
(PLAN VIEW)



VERTICAL BENDS
(SECTION VIEW)



VERTICAL GRAVITY THRUST BLOCK
(SECTION VIEW)



BEARING AREA
(SECTION VIEW)

MINIMUM BEARING AREAS IN SQUARE FEET				
PIPE SIZE	TEE & PLUG	90° ELBOW	45° OR 22 1/2° ELBOW	CROSS
2"	0.5	0.5	0.5	0.5
4"	1.5	2.0	1.5	1.0
6"	3.0	4.5	2.5	2.0
8"	5.0	7.5	4.0	4.0
10"	8.0	11.0	6.5	5.5
12"	11.0	15.5	9.0	8.0
14"	15.0	21.0	12.0	10.5
16"	19.0	27.0	15.5	13.5
18"	24.0	34.0	19.0	17.0

NOTES:

1. DO NOT COVER GASKETED JOINTS AND NUTS/BOLTS.

DESIGNED BY:	NTUA
SURVEYED BY:	
DRAWN BY:	NTUA
APPROVED BY:	NTUA
DATE:	04/08
PROJECT NO.	
SCALE:	NTS
ACAD FILENAME:	Water Standard
DWG. NO.	WS-19.DWG

NAVAJO TRIBAL UTILITY AUTHORITY
HQ CIVIL ENGINEERING DEPARTMENT

GRAVITY/THRUST BLOCK DETAILS

HQ-ENGINEERING FT.DEFIANCE, AZ

REVISIONS			
No.	Date	Brief	By
01	04/08	Revised	L.H.
02			
03			
04			
05			
06			

GRAVITY THRUST BLOCK

(ALSO TO BE USED IN UNSTABLE TRENCH CONDITIONS)

RESULTANT THRUST IN POUNDS OF FITTINGS AT 100 PSI WATER PRESSURE

TOTAL POUNDS					
PIPE SIZE	DEAD END	90° ELBOW	45° ELBOW	22 1/2° ELBOW	11 1/4° ELBOW
3"	1,232	1,742	943	481	241
4"	1,810	2,559	1,385	706	355
6"	3,739	5,288	2,862	1,459	733
8"	6,433	9,097	4,923	2,510	1,261
10"	9,677	13,685	7,406	3,776	1,897
12"	13,685	19,353	10,474	5,340	2,683
14"	18,385	26,001	14,072	7,174	3,604
16"	23,799	33,628	18,199	9,278	4,661
18"	29,865	42,235	22,858	11,653	5,855
20"	36,644	51,822	28,046	14,298	7,183
24"	52,279	73,934	40,013	20,398	10,249
30"	80,425	113,738	61,554	31,380	15,766
36"	115,209	162,931	88,177	44,952	22,585
42"	155,528	219,950	119,036	60,684	30,489
48"	202,683	286,637	155,127	79,083	39,733
54"	260,214	367,999	199,160	101,531	51,011
60"	298,121	421,606	228,172	116,321	58,442
64"	338,707	479,004	259,235	132,157	66,398

NOTES:

1. THE THRUST (IN TOTAL POUNDS) IN THE CHART IS BASED ON DUCTILE IRON OUTSIDE DIAMETER PIPE DIMENSION. SURGES SHOULD BE CONSIDERED AT TWICE THE NORMAL OPERATING PRESSURE. THE VOLUME OF THE GRAVITY THRUST BLOCK IS BASED ON CONCRETE AT 150 LBS./FT3.

2. TO OBTAIN VOLUME OF CONCRETE REQUIRED, USE:
   VOLUME OF CONRETE(FT3)= THRUST(LBS.) x SYSTEM PRESSURE(PSI)/100 PSI // 150 LBS./FT3.

   E.G.: CALCULATE THE VOLUME OF THE GRAVITY THRUST BLOCK FOR AN 8" x 45° BEND AT AN OPERATING PRESSURE OF 80 PSI.

   ANSWER: 4923 LBS. x 160 PSI/100 PSI DIVIDED BY 150 LBS./CUBIC FT. = 52.5 CUBIC FEET OR 2 CUBIC YARDS.

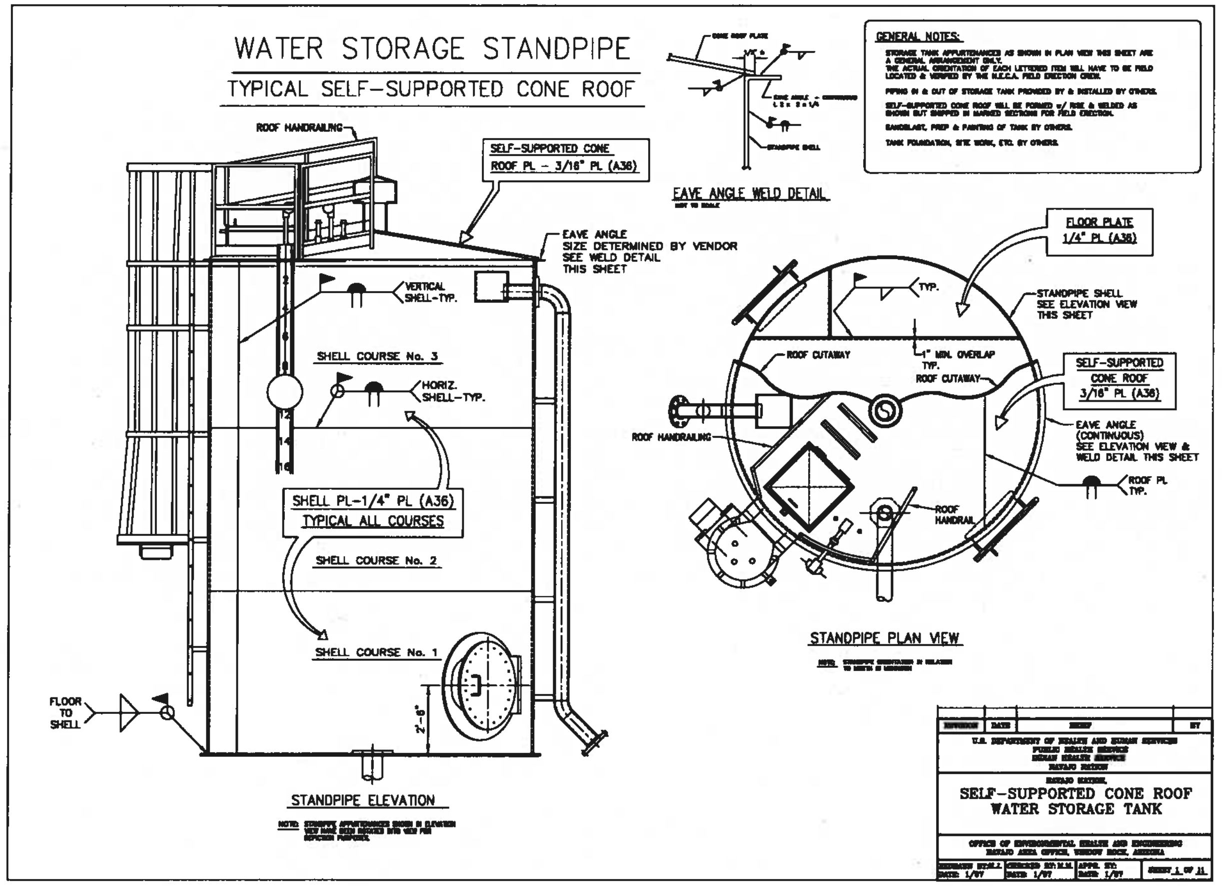
DESIGNED BY:	NTUA
SURVEYED BY:	
DRAWN BY:	NTUA
APPROVED BY:	NTUA
DATE:	04/08
PROJECT NO.	
SCALE:	NTS
ACAD FILENAME:	Water Standard
DWG. NO.	WS-19a.DWG

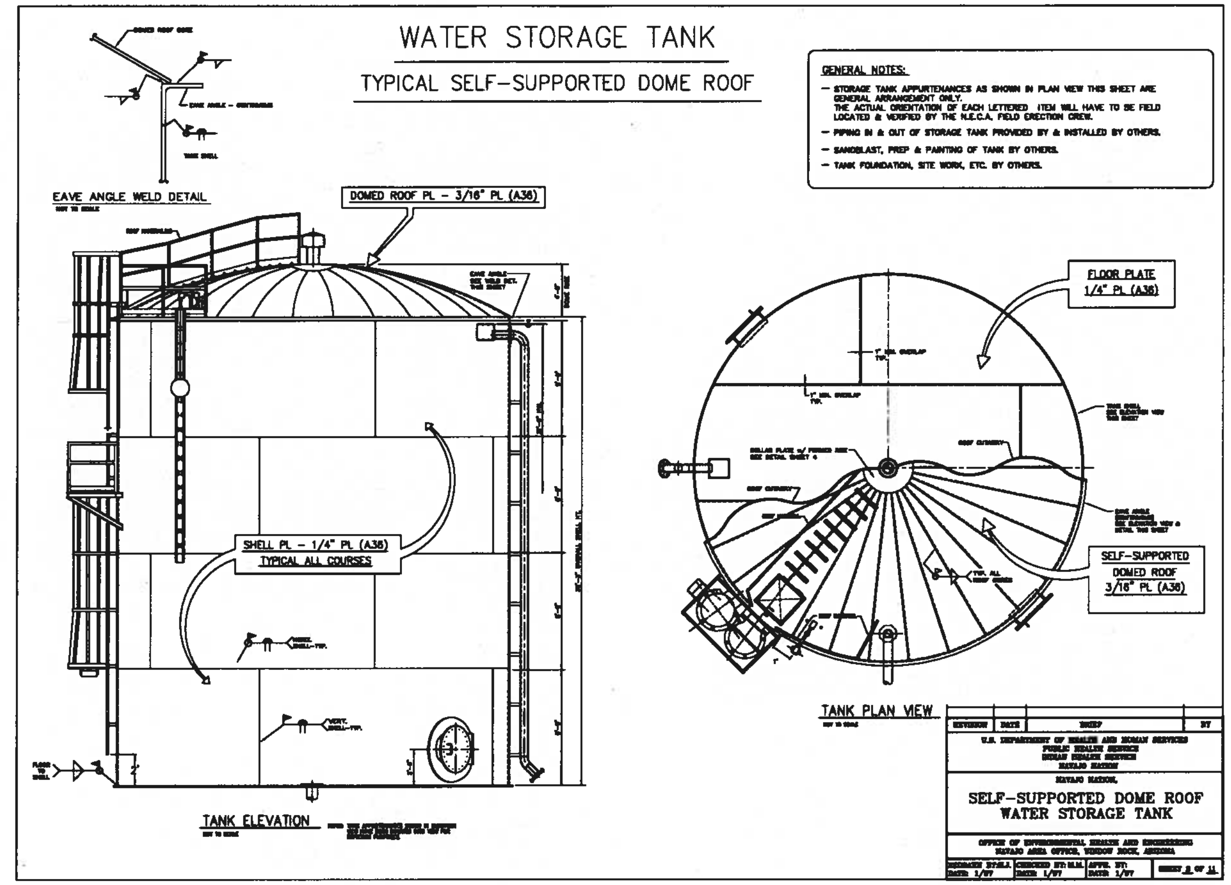
NAVAJO TRIBAL UTILITY AUTHORITY
HQ CIVIL ENGINEERING DEPARTMENT

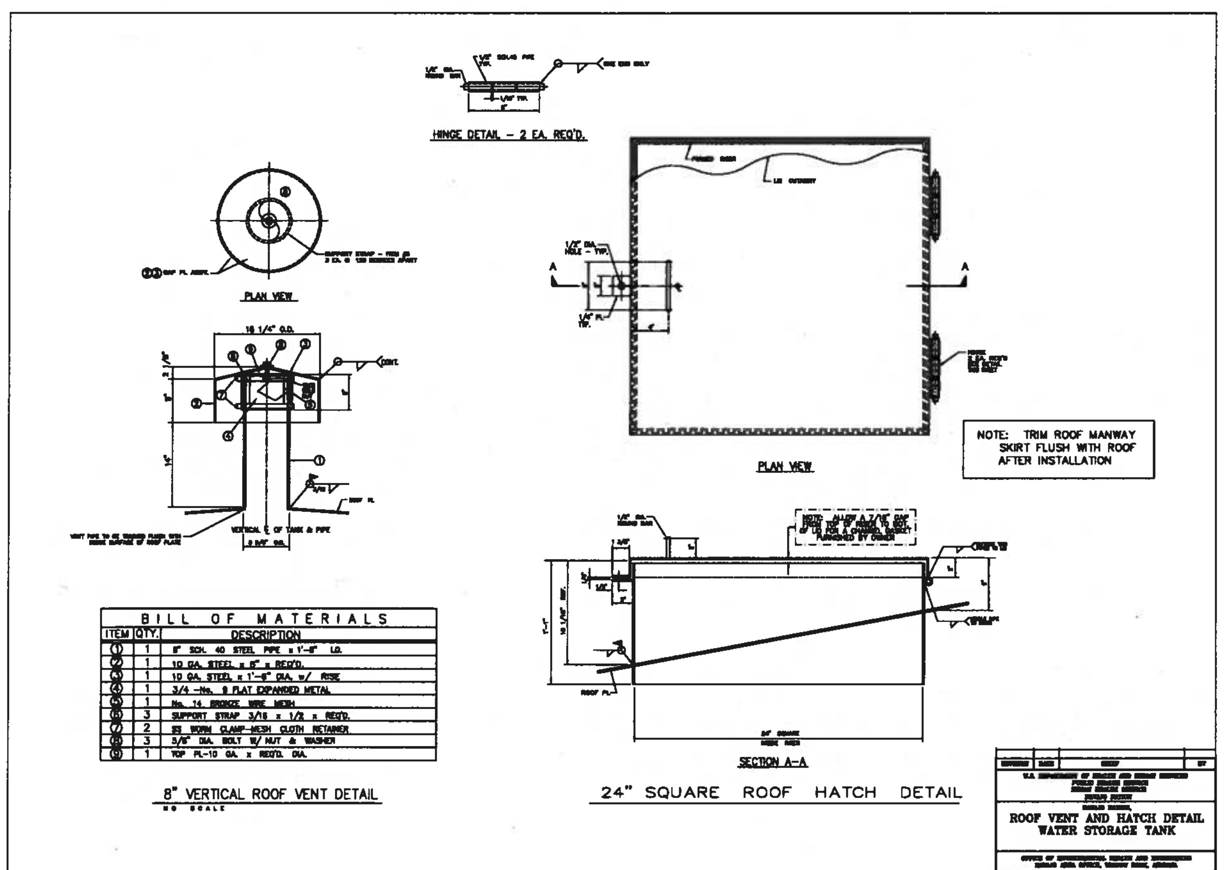
GRAVITY/THRUST BLOCK CHART

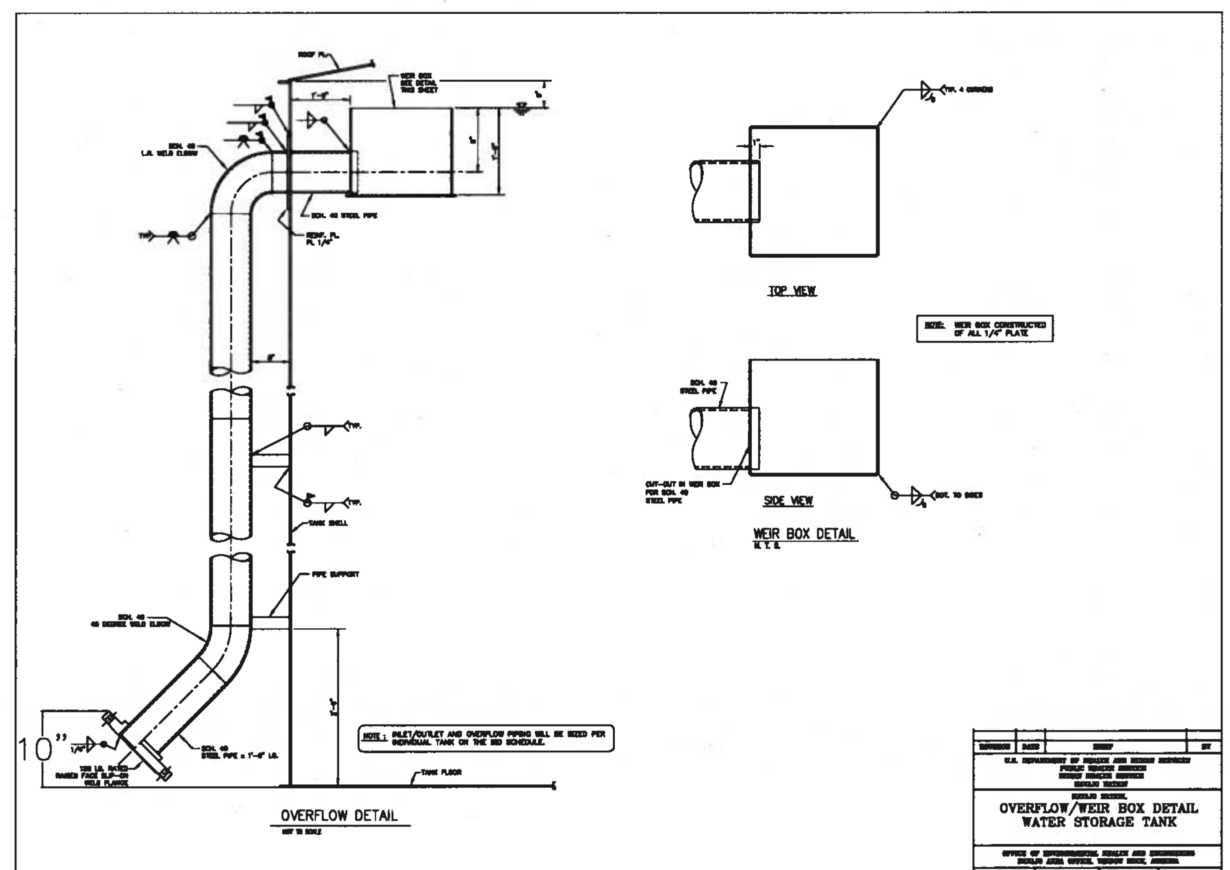
HQ-ENGINEERING FT.DEFIANCE, AZ

REVISIONS			
No.	Date	Brief	By
01	04/08	Revised	L.H.
02			
03			
04			
05			
06			









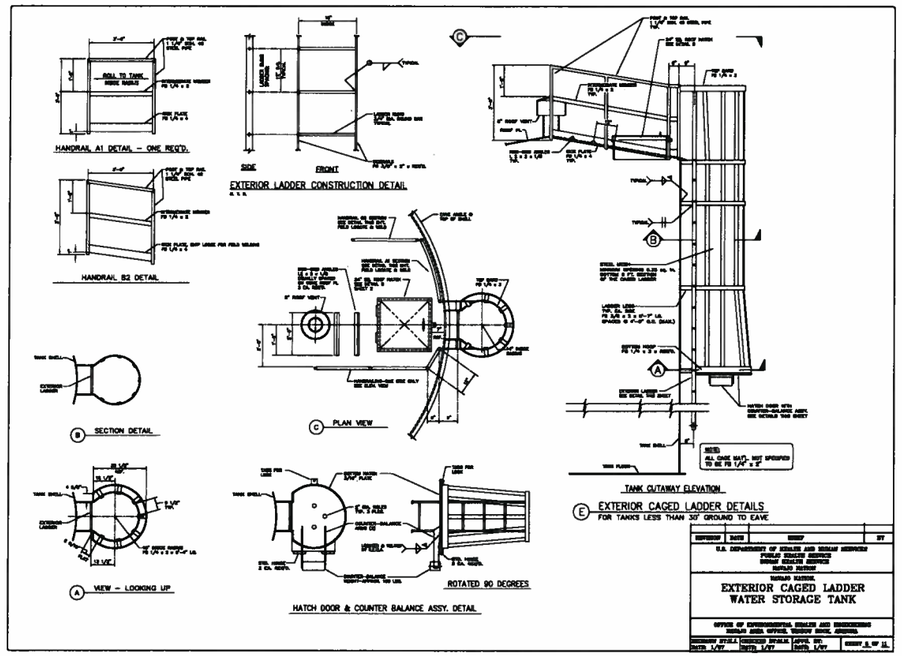
1	10/00	TITLE BLOCK CHANGE	W.S.
REVISION	DATE	BRIEF	BY

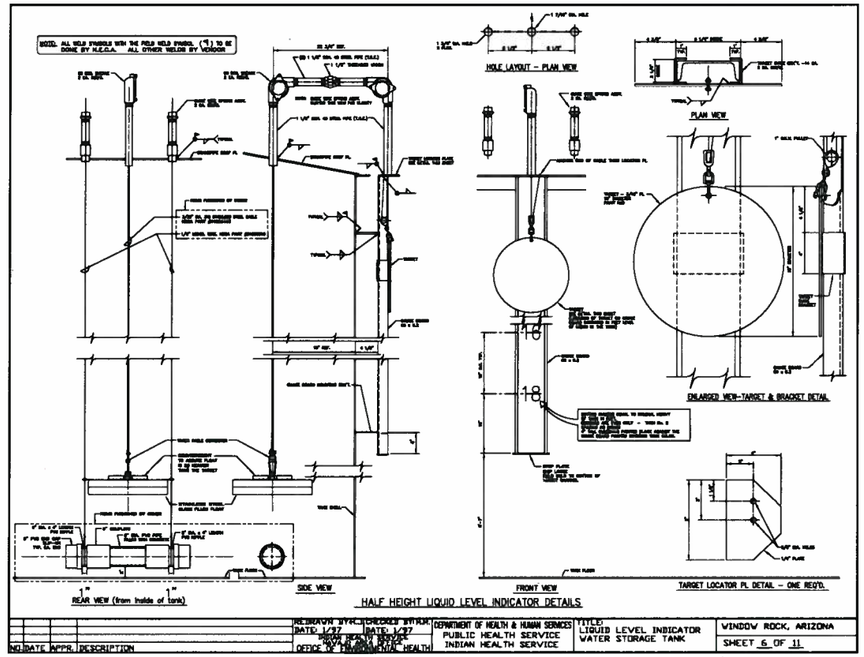
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

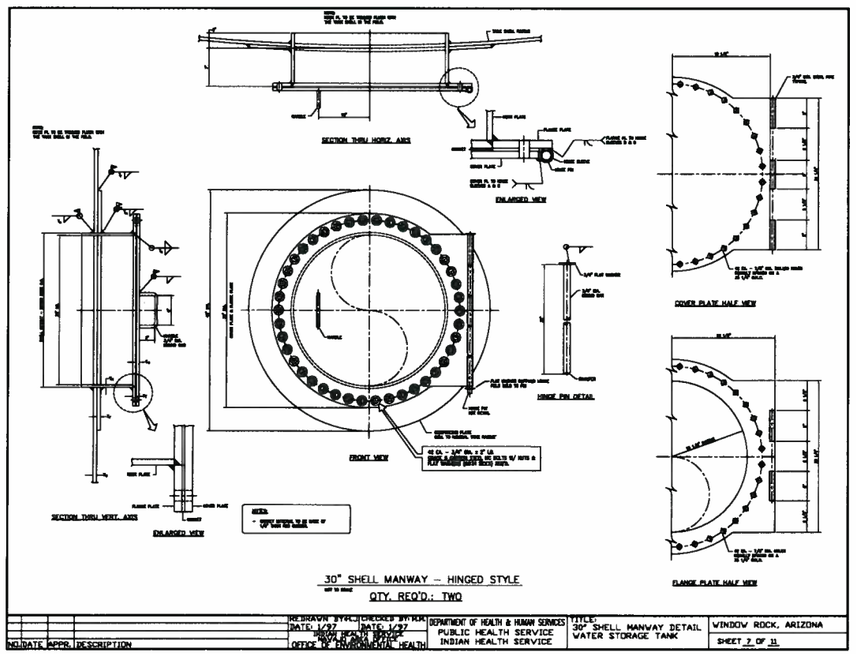
STANDARD DRAWING NO. W-20
WATER STORAGE TANK
DRAWING 1 OF 3

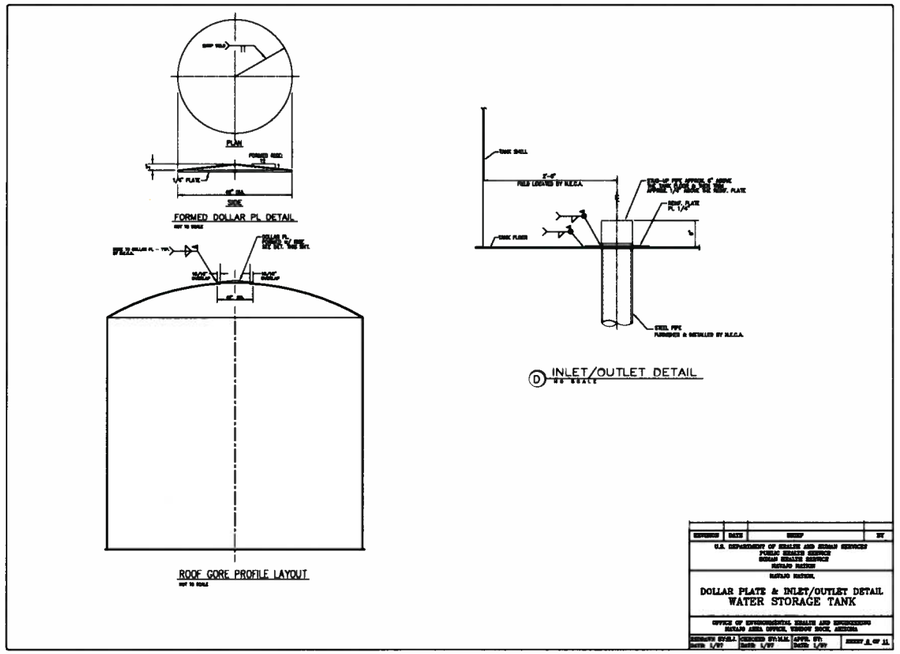
OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

REDRAWN BY: H.J. DATE: 1/97	CHECKED BY: M.M. DATE: 1/97	APPR. BY: DATE: 1/97	SHEET__ OF__









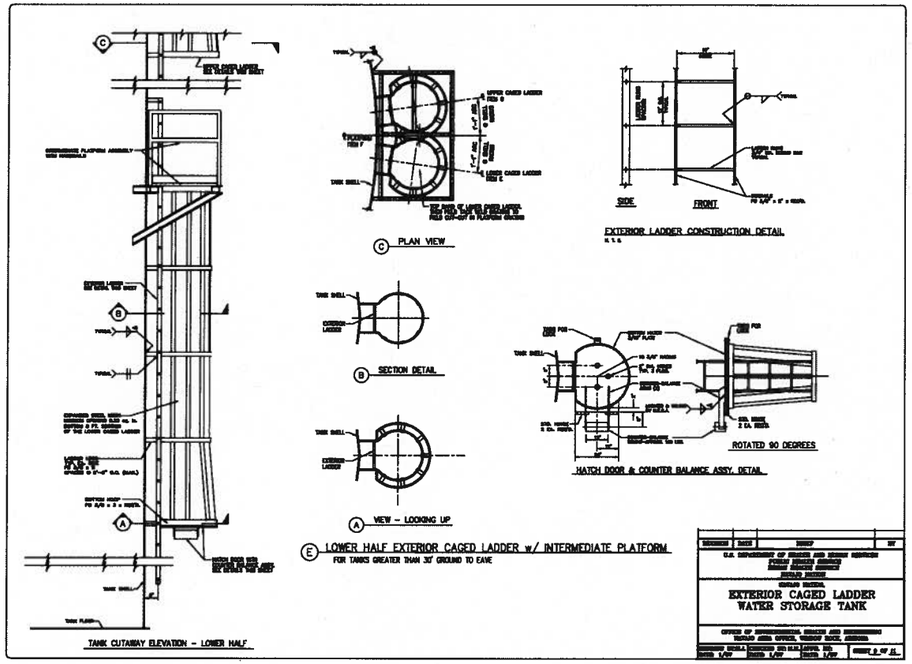
1	10/00	TITLE BLOCK CHANGE	W.S.
REVISION	DATE	BRIEF	BY

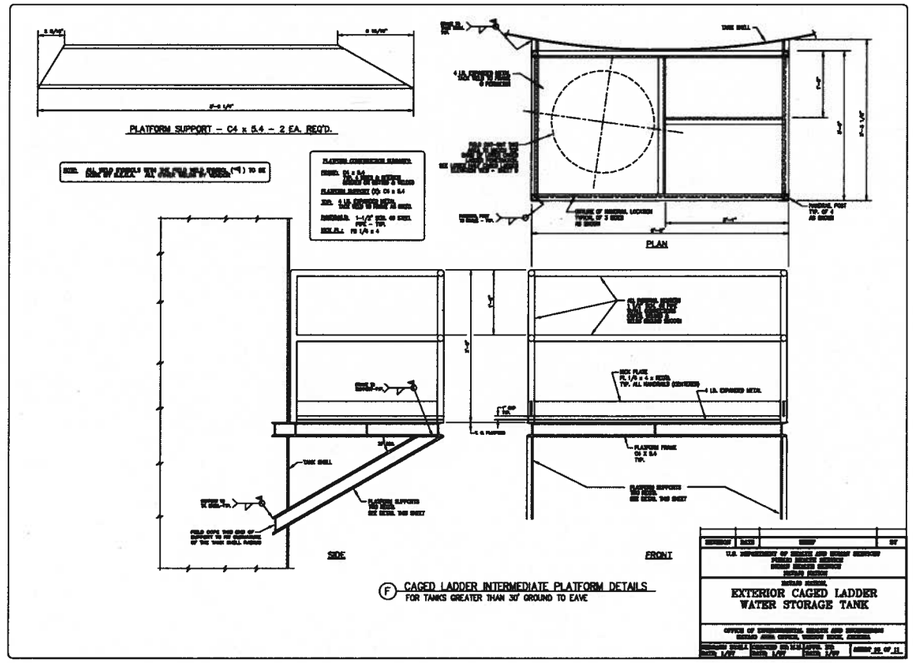
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

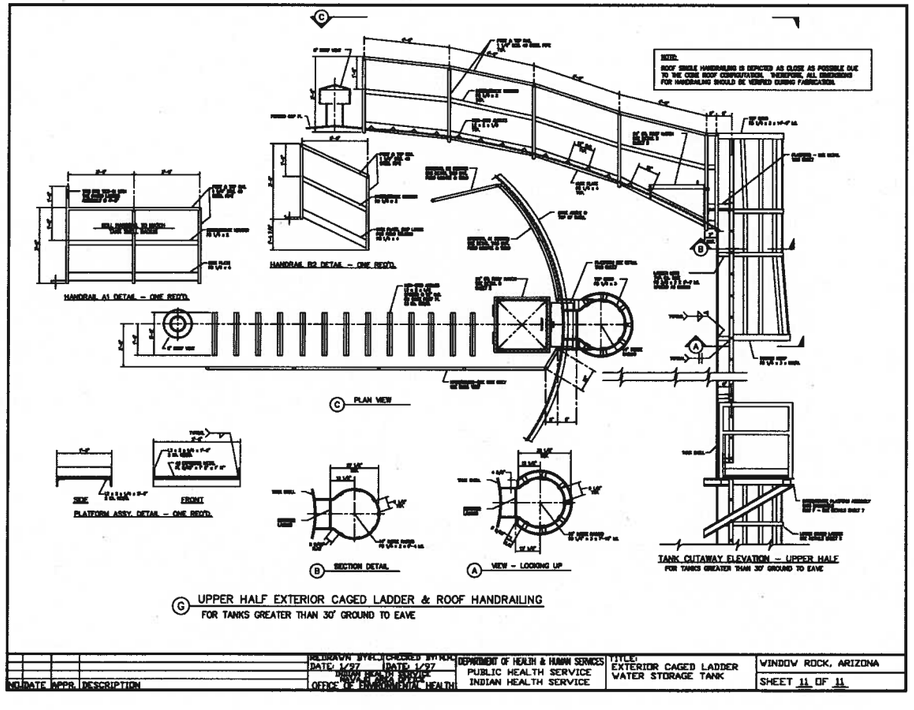
STANDARD DRAWING NO. W–20
WATER STORAGE TANK
DRAWING 2 OF 3

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

REDRAWN BY: H.J. DATE: 1/97	CHECKED BY: M.M. DATE: 1/97	APPR. BY: DATE: 1/97	SHEET ___ OF ___







NO.	DATE	DESCRIPTION	REDRAWN BY: H.J DATE: 1/97	CHECKED BY: M.M DATE: 1/97	DEPARTMENT OF HEALTH & HUMAN SERVICES PUBLIC HEALTH SERVICE INDIAN HEALTH SERVICE	TITLE: EXTERIOR CAGED LADDER WATER STORAGE TANK	WINDOW ROCK, ARIZONA
			APPR. BY: DATE: 1/97		OFFICE OF ENVIRONMENTAL HEALTH		SHEET 11 OF 11

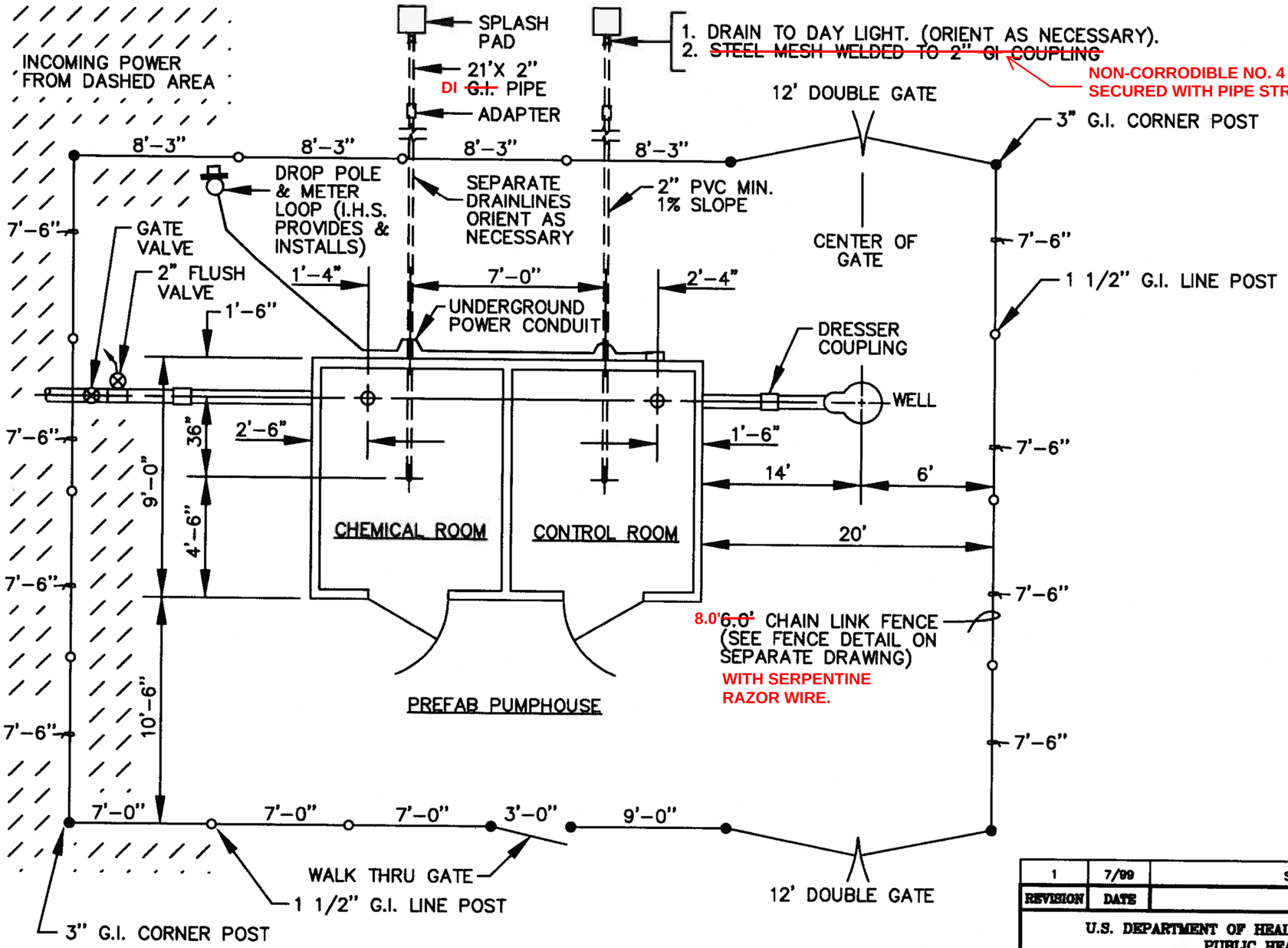
1	10/00	TITLE BLOCK CHANGE	W.S.
REVISION	DATE	BRIEF	BY

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

STANDARD DRAWING NO. W–20
WATER STORAGE TANK
DRAWING 3 OF 3

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

REDRAWN BY: H.J DATE: 1/97	CHECKED BY: M.M DATE: 1/97	APPR. BY: DATE: 1/97	SHEET__ OF__



PLAN VIEW
NOT TO SCALE

NOTES:
1. ORIENTATION IS DETERMINED BY INCOMING ELECTRICAL. CHEMICAL ROOM IS ALWAYS ON THE LEFT. DI
2. ALL ~~GALVANIZED~~ PIPE INSTALLED UNDERGROUND SHALL BE WRAPPED w/ POLYGEN TAPE. ALL DI ~~GALVANIZED~~ PIPE INSTALLED ABOVE GROUND SHALL BE PAINTED BLUE.
3. IF NOT POSSIBLE TO DRAIN TO DAYLIGHT, USE ONE SECTION OF INFILTRATOR FOR EACH LINE.
4. CONTOUR TO DRAIN AWAY FROM BUILDING.
5. DO NOT BUILD PUMPHOUSE OVER DRILL PITS.

REVISION	DATE	BRIEF	BY
1	7/99	STANDARDIZED	B.M.

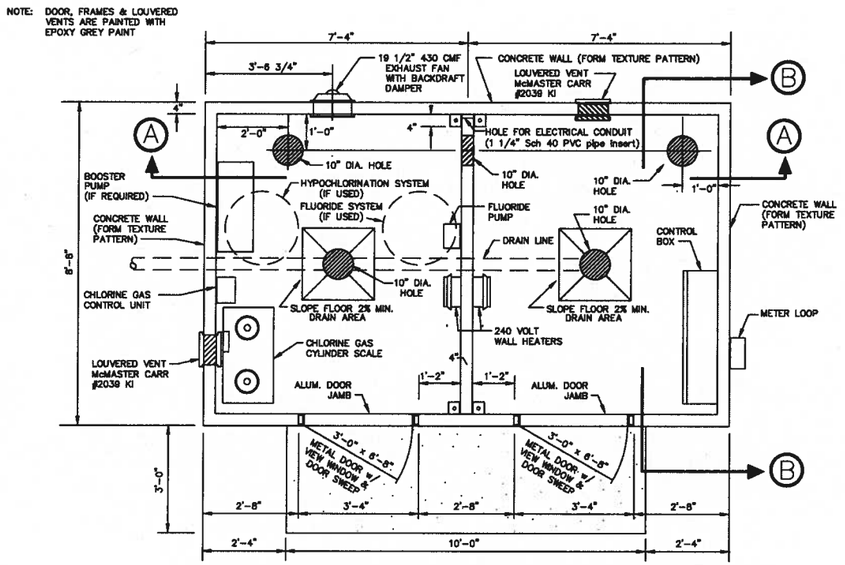
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

NAVAJO NATION,

STANDARD DRAWING NO. W-23
PREFAB PUMPHOUSE
EXTERIOR FACILITIES LAYOUT

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

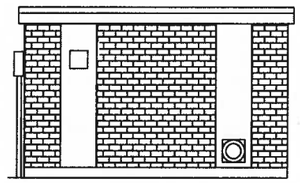
DRAWN BY: L.S. DATE: 12/98	CHECKED BY: P.S. DATE: 12/98	APPR. BY: DATE:	AUTOCAD DRAWING



NOTE: THE OWNER SHALL CONSTRUCT A 4" THICK X 10'-0" X 3'-0" CONCRETE ENTRY SLAB WITH A TOOLED CONTROL JOINT ACROSS THE SLAB AT MID-LENGTH. PROPER COMPACTION OF SUBGRADE SHALL BE ACHIEVED BENEATH THE ENTRY SLAB; USE OF SLAB REINFORCING SHALL BE OPTIONAL.

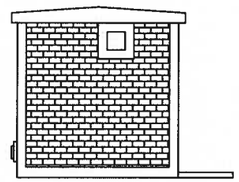
PLAN VIEW OF PUMPHOUSE w/ CHLORINATOR ROOM ON LEFT SIDE

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



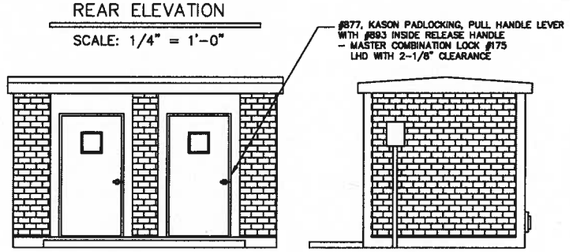
REAR ELEVATION

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



LEFT SIDE ELEVATION

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

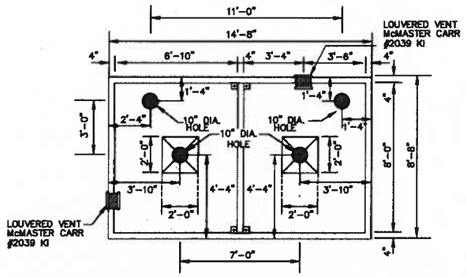


FRONT ELEVATION

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

RIGHT SIDE ELEVATION

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



BASE SLAB PLAN w/ CHLORINATOR LEFT SIDE

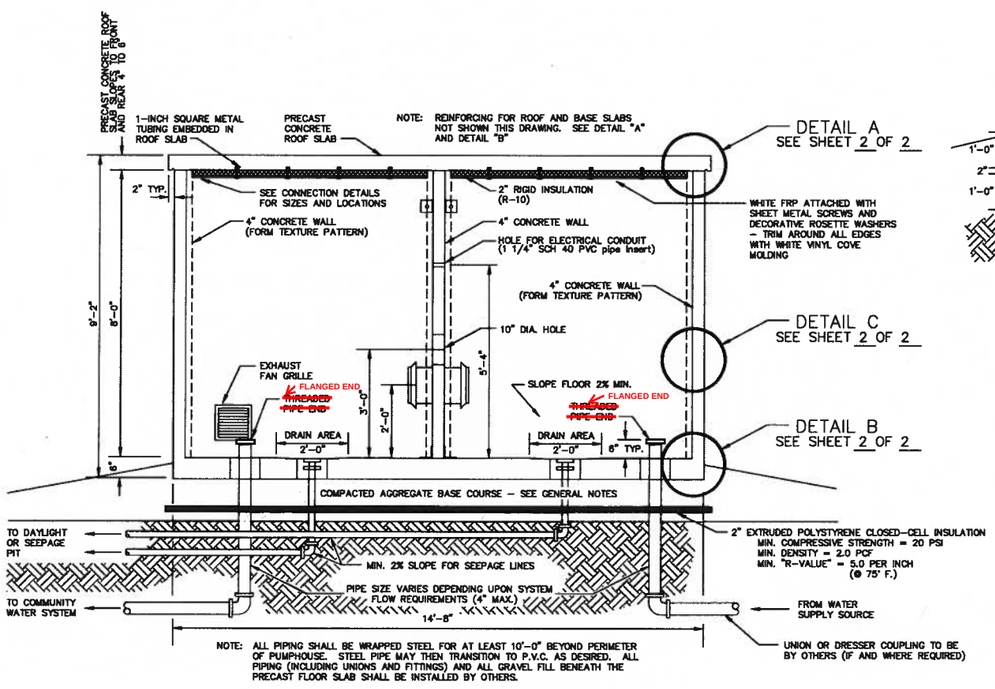
SCALE: 1/4" = 1'-0"

GENERAL NOTES

1. THE GOVERNING CODE IS THE UNIFORM BUILDING CODE, 1985 EDITION.
2. MINIMUM DESIGN LIVE LOADS SHALL BE:
   - 20 PSF – ROOF SNOW LOAD
   - 25 PSF – HORIZONTAL WIND LOAD
   - 35 PCF – EQUIVALENT BACKFILL FLUID PRESSURE
   - SEISMIC ZONE II REQUIREMENTS
3. THE GENERAL CONTRACTOR OR OWNER SHALL BE RESPONSIBLE FOR LOCATION OF THE STRUCTURE, ORIENTATION, BENCH MARKS, REFERENCE FLOOR ELEVATIONS, LINES, AND GRADES.
4. FOUNDATION DESIGN IS BASED UPON A MAXIMUM ASSUMED SOIL BEARING CAPACITY OF 1000 PSF. SOIL BEARING MATERIALS ARE ASSUMED TO CONSIST OF GRANULAR MATERIALS (COBBLE ROCK, GRAVEL, AND SAND) WITH MINOR AMOUNTS OF SILT AND/OR CLAY. IF THERE SHOULD BE REASON TO SUSPECT THE PRESENCE OF EXPANSIVE SOILS OR POORLY CONSOLIDATED SOILS AT THE PROJECT SITE, THE OWNER SHALL BE RESPONSIBLE FOR CONFIRMING THAT THE BEARING STRATA ARE CAPABLE OF SUPPORTING THE STRUCTURE WITHOUT EXPANSIVE HEAVE, EXCESSIVE SETTLEMENT, OR OTHER UNACCEPTABLE PERFORMANCE.
5. COMPACTED AGGREGATE BASE COURSE IS RECOMMENDED BENEATH THE PRECAST BASE SLAB TO PROMOTE DRAINAGE AND TO PROVIDE A STABLE FOUNDATION STRUCTURE. FOR "NORMAL" SITE CONDITIONS, TWO (2) FEET OF BASE COURSE MATERIAL IS RECOMMENDED. FOR SITES WHERE THE NATURAL SOILS ARE PREDOMINATELY CLAY OR SILT, SPECIFIC RECOMMENDATIONS SHOULD BE PROVIDED BY A GEOTECHNICAL ENGINEER. BASE COURSE SHALL NOT BE INSTALLED INTO AN EXCAVATION IN NATIVE SOIL WITHOUT PROVIDING AN OUTLET FOR DRAINAGE, EITHER THROUGH FREELY DRAINING NATURAL SOILS AT THE SITE OR BY PROVIDING A GRAVELED TRENCH OR FRENCH DRAIN TO DAYLIGHT. BASE COURSE MATERIAL SHALL CONFORM TO THE FOLLOWING GRADATION AND SHALL BE COMPACTED TO AT LEAST 95% OF STANDARD PROCTOR DENSITY.

SCREEN SIZE	% PASSING
1"	100
3/4"	95-100
3/8"	20-55
NO.4	0-10
NO.8	0-5

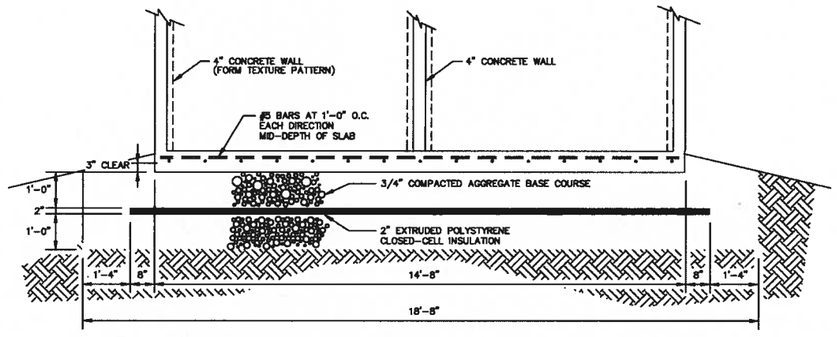
6. SITE DRAINAGE OF SURFACE MOISTURE SHALL PROVIDE A POSITIVE SLOPE OF FINISH GRADE AWAY FROM ALL SIDES OF THE BUILDING PERIMETER.
7. IT IS RECOMMENDED THAT SITE-CAST CONCRETE BE MADE WITH TYPE II (ALKALI RESISTIVE) CEMENT AND SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI WITHIN 28 DAYS. THE MIX DESIGN SHOULD INCLUDE 5% (±2%) AIR ENTRAINMENT AND SHOULD BE PLACED AND CURED IN ACCORDANCE WITH THE ACI MANUAL OF CONCRETE PRACTICE, VOLUMES 1 THRU 5. SLUMP AT THE TIME OF PLACEMENT SHOULD NOT EXCEED FOUR (4) INCHES, AND MECHANICAL VIBRATION SHOULD BE EMPLOYED FOR CONSOLIDATION TO ELIMINATE VOIDS AND HONEYCOMBING.
8. PRECAST CONCRETE COMPONENTS SHALL BE CERTIFIED BY THE SUPPLIER TO HAVE ATTAINED A MINIMUM STRENGTH OF 3,000 PSI AT TRANSPORT TIME WITH FINAL CONCRETE STRENGTH TO BE AT LEAST 3,500 PSI WITHIN 28 DAYS. VERIFICATION OF CONCRETE STRENGTH SHALL BE PROVIDED BY THE SUPPLIER UPON REQUEST AND SHALL BE CONFIRMED THROUGH CYLINDER BREAKS FROM NORMAL PRODUCTION PROCEDURES AND IN-HOUSE QUALITY CONTROL. A SET OF FOUR (4) CYLINDERS SHALL BE TAKEN AT RANDOM IN THE PLANT NOT LESS THAN ONCE DURING EACH WEEK OF PRODUCTION. IF CONFIRMATION THROUGH CYLINDER BREAKS IS REQUIRED BY THE OWNER FOR ANY PARTICULAR PROJECT, THE COST OF ADDITIONAL TESTING SHALL BE PAID BY THE OWNER.
9. CONCRETE REINFORCING STEEL SHALL BE ASTM A-615 BILLET BARS, GRADE 40. BARS SHALL BE LAPPED AT LEAST THIRTY (30) BAR DIAMETERS AT SPLICES AND CORNER BARS SHALL BE PROVIDED TO MATCH HORIZONTAL REINFORCING.
10. STRUCTURAL STEEL, EMBEDMENT STEEL, AND CONNECTIONS SHALL CONFORM TO ASTM A-36. ALL EXPOSED STEEL PLATES AND CONNECTIONS SHALL BE PAINTED WITH ONE FIELD COAT OF COMPATIBLE PRIMER AND ONE COAT OF EPOXY PAINT.
11. FIELD WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND SHALL CONFORM TO STANDARDS OF THE AMERICAN WELDING SOCIETY FOR WELDING IN BUILDING CONSTRUCTION.



NOTE: ALL PIPING SHALL BE WRAPPED STEEL FOR AT LEAST 10'-0" BEYOND PERIMETER OF PUMPHOUSE. STEEL PIPE MAY THEN TRANSITION TO P.V.C. AS DESIRED. ALL PIPING (INCLUDING UNIONS AND FITTINGS) AND ALL GRAVEL FILL BENEATH THE PRECAST FLOOR SLAB SHALL BE INSTALLED BY OTHERS.

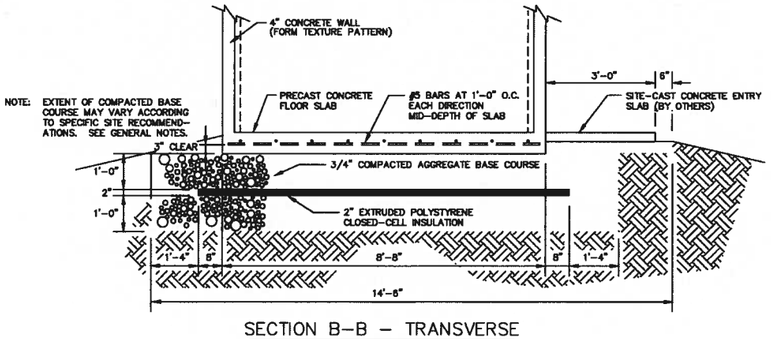
LONGITUDINAL SECTION OF PUMPHOUSE

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



SECTION A–A – LONGITUDINAL

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



NOTE: EXTENT OF COMPACTED BASE COURSE MAY VARY ACCORDING TO SPECIFIC SITE RECOMMENDATIONS. SEE GENERAL NOTES.

SECTION B–B – TRANSVERSE

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

REVISION	DATE	DESCRIPTION	BY
1	10/00	TITLE BLOCK CHANGE	W.S.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

TWO-ROOM PRECAST PUMPHOUSE

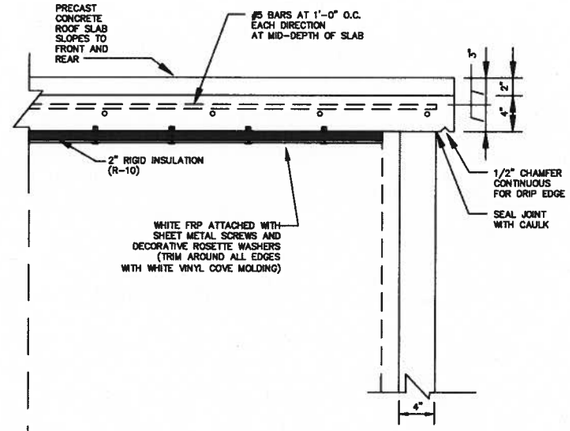
W-29

DRAWING 1 OF 2

PUBLIC LAW 86-121

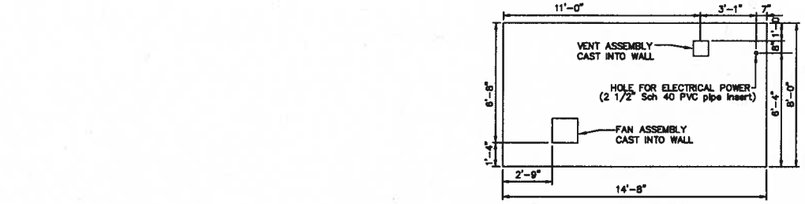
OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA INDIAN HEALTH SERVICE

DRAWN BY: G.L.G. DATE: 11-17-89	REVISED BY: H.J. DATE: 11-06-96	SHEET OF TOTAL SHEETS



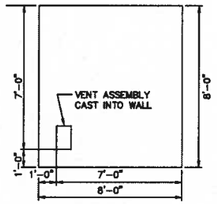
ROOF CONNECTION
DETAIL A

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



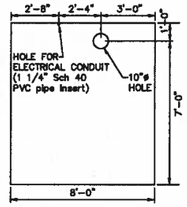
REAR WALL

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



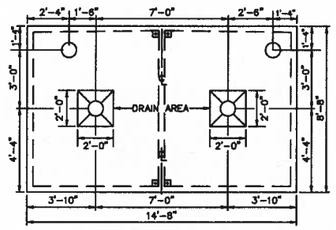
LEFT WALL

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



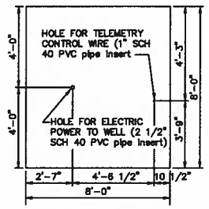
INTERIOR WALL

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



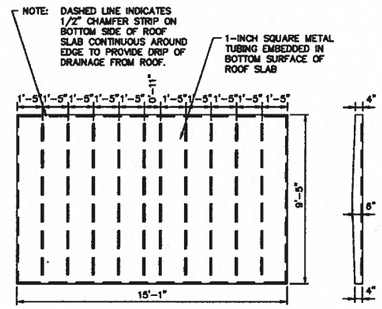
BASE (FLOOR) SLAB

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



RIGHT WALL

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



ROOF SLAB

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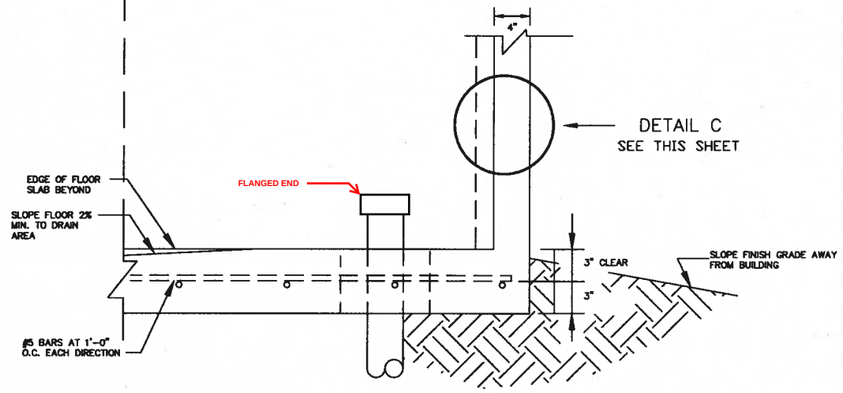
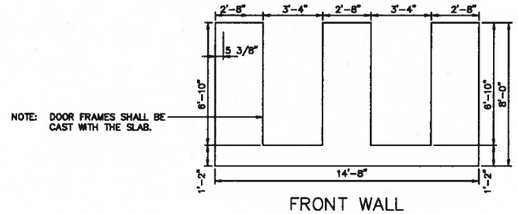


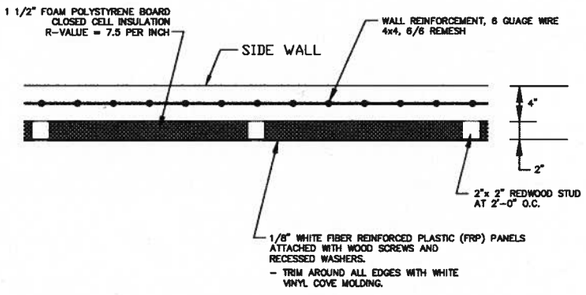
FLOOR CONNECTION
DETAIL B

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



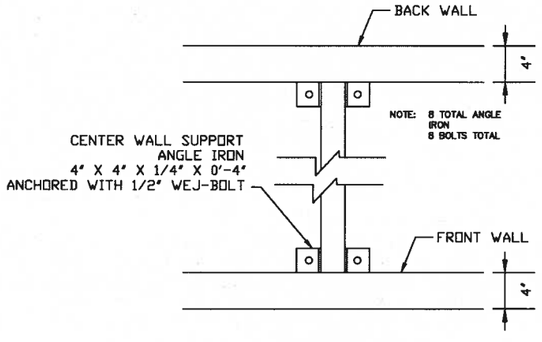
FRONT WALL

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

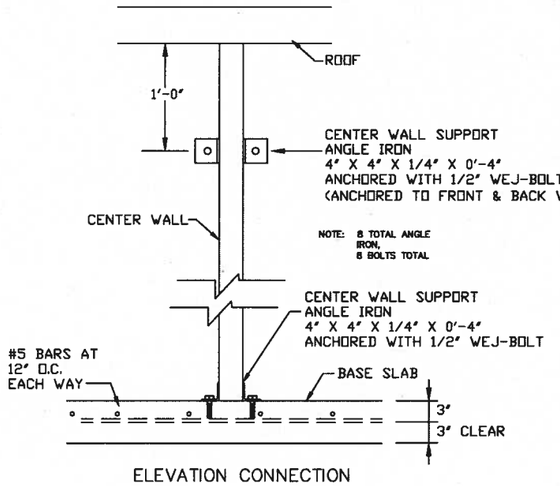


WALL PANEL
DETAIL C

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



PLAN CONNECTION
ANGLE IRON
AT CENTER WALL



ELEVATION CONNECTION
ANGLE IRON
AT CENTER WALL

1	10/00	TITLE BLOCK CHANGE	W.S.
REVISION	DATE	DESCRIPTION	BY

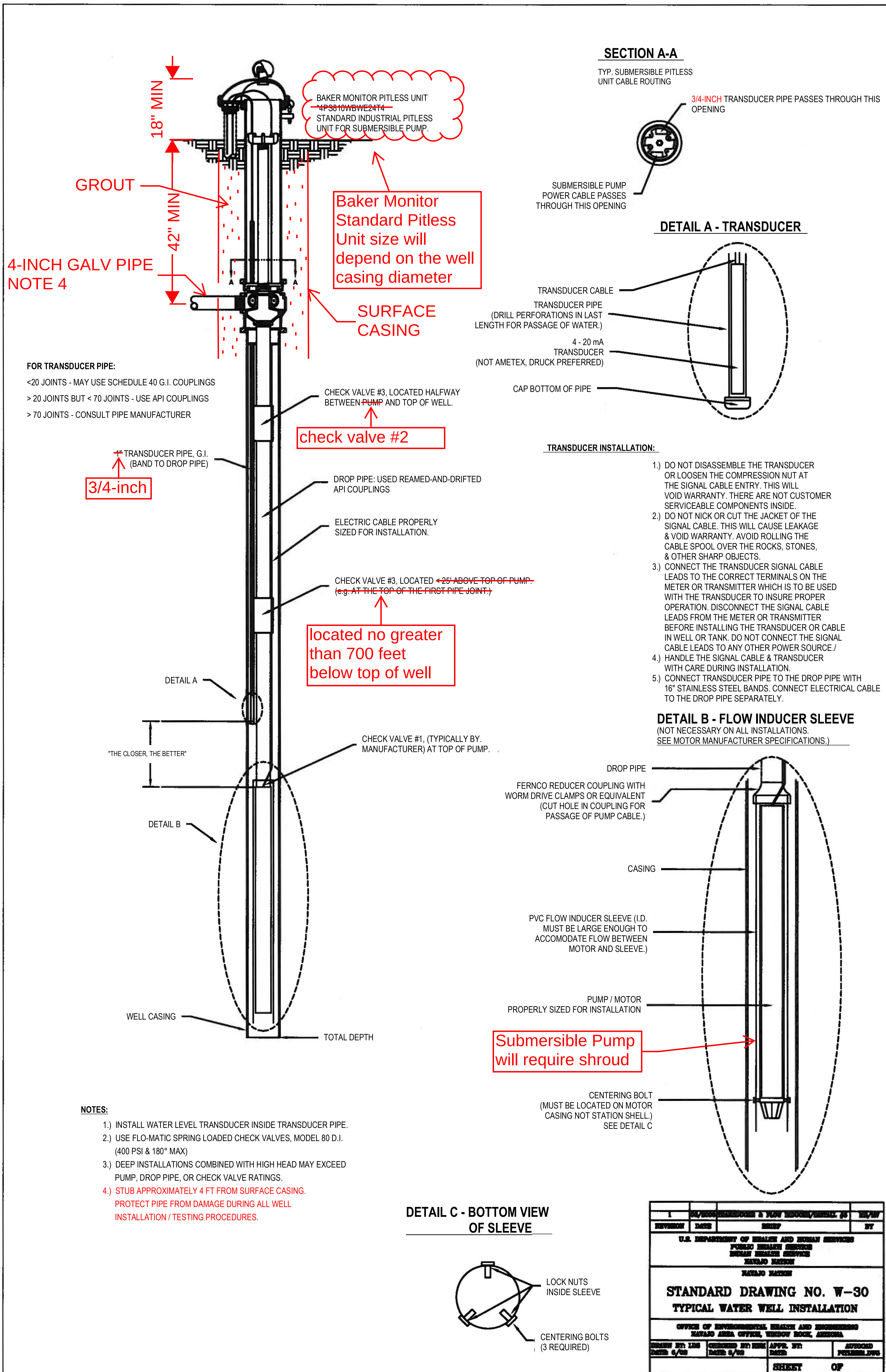
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

TWO-ROOM PRECAST PUMPHOUSE
W-29
DRAWING 2 OF 2

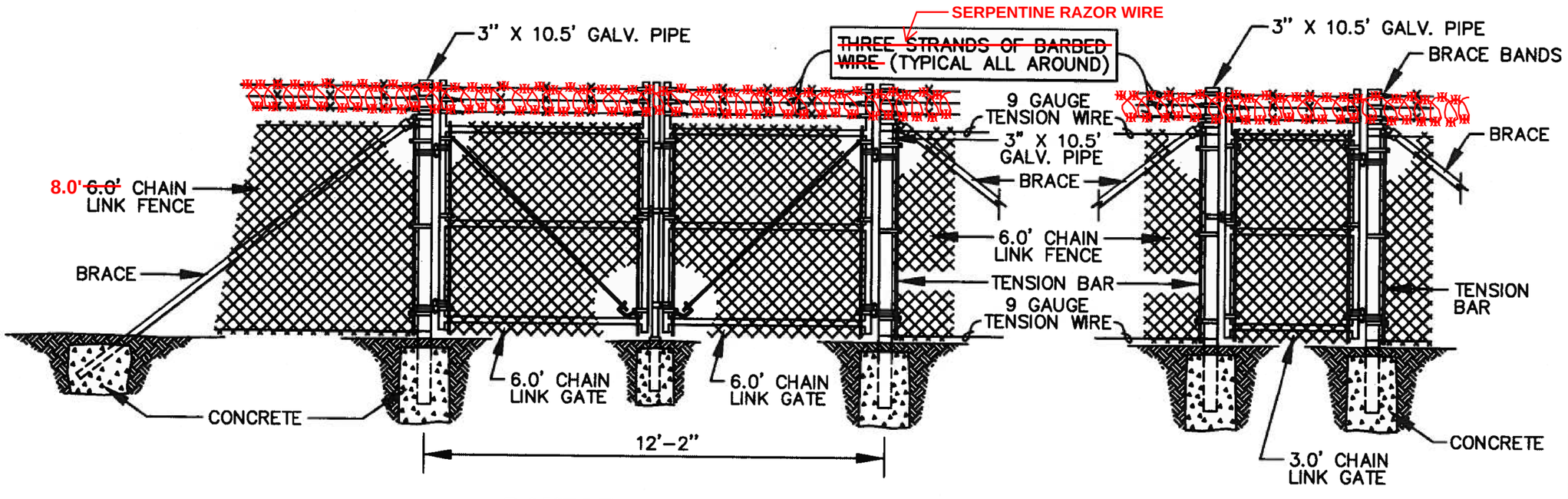
PUBLIC LAW 86-121

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA INDIAN HEALTH SERVICE

DRAWN BY: G.L.G. DATE: 11-17-89	REVISED BY: H.J. DATE: 11-06-96	SHEET OF TOTAL SHEETS

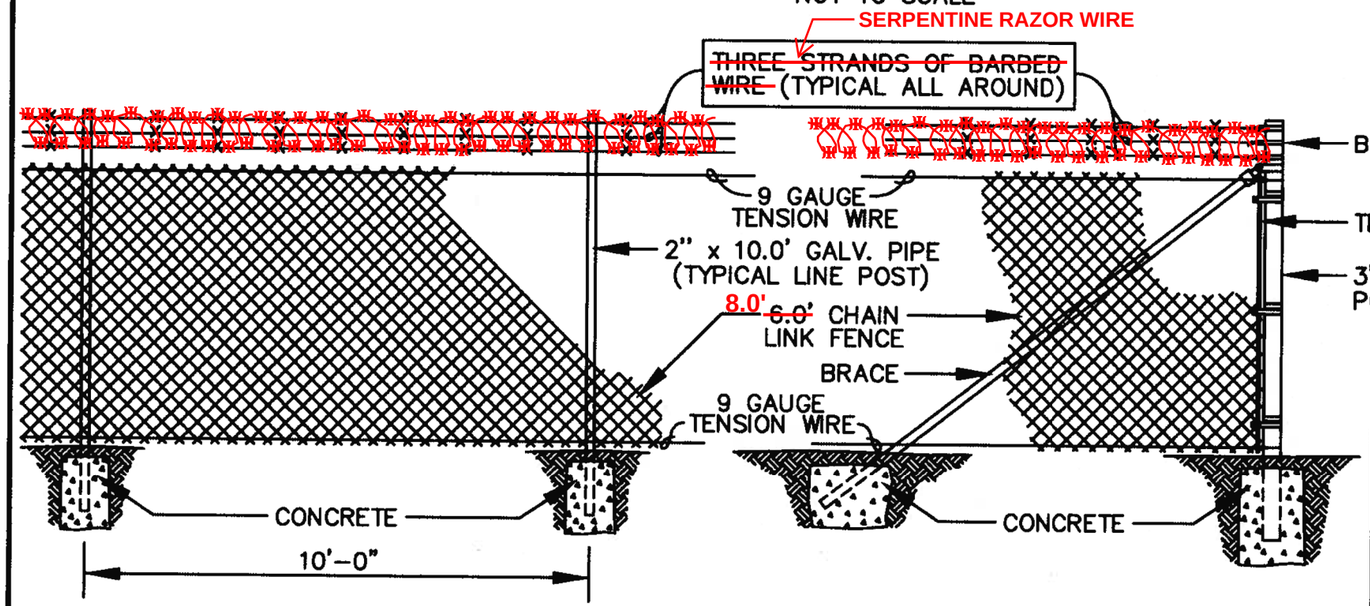


18" MIN
BAKER MONITOR PITLESS UNIT
~~4PS810WBWE24T4~~
STANDARD INDUSTRIAL PITLESS UNIT FOR SUBMERSIBLE PUMP.
GROUT
42" MIN
Baker Monitor Standard Pitless Unit size will depend on the well casing diameter
4-INCH GALV PIPE
NOTE 4
SURFACE CASING
FOR TRANSDUCER PIPE:
<20 JOINTS - MAY USE SCHEDULE 40 G.I. COUPLINGS
> 20 JOINTS BUT < 70 JOINTS - USE API COUPLINGS
> 70 JOINTS - CONSULT PIPE MANUFACTURER
CHECK VALVE #3, LOCATED HALFWAY BETWEEN ~~PUMP~~ AND TOP OF WELL.
check valve #2
~~1"~~ TRANSDUCER PIPE, G.I. (BAND TO DROP PIPE)
3/4-inch
DROP PIPE: USED REAMED-AND-DRIFTED API COUPLINGS
ELECTRIC CABLE PROPERLY SIZED FOR INSTALLATION.
CHECK VALVE #3, LOCATED ~~<25' ABOVE TOP OF PUMP. (e.g. AT THE TOP OF THE FIRST PIPE JOINT.)~~
located no greater than 700 feet below top of well
DETAIL A
"THE CLOSER, THE BETTER"
CHECK VALVE #1, (TYPICALLY BY. MANUFACTURER) AT TOP OF PUMP.
DETAIL B
WELL CASING
TOTAL DEPTH
SECTION A-A
TYP. SUBMERSIBLE PITLESS UNIT CABLE ROUTING
3/4-INCH TRANSDUCER PIPE PASSES THROUGH THIS OPENING
SUBMERSIBLE PUMP POWER CABLE PASSES THROUGH THIS OPENING
DETAIL A - TRANSDUCER
TRANSDUCER CABLE
TRANSDUCER PIPE (DRILL PERFORATIONS IN LAST LENGTH FOR PASSAGE OF WATER.)
4 - 20 mA TRANSDUCER (NOT AMETEX, DRUCK PREFERRED)
CAP BOTTOM OF PIPE
TRANSDUCER INSTALLATION:
1.) DO NOT DISASSEMBLE THE TRANSDUCER OR LOOSEN THE COMPRESSION NUT AT THE SIGNAL CABLE ENTRY. THIS WILL VOID WARRANTY. THERE ARE NOT CUSTOMER SERVICEABLE COMPONENTS INSIDE.
2.) DO NOT NICK OR CUT THE JACKET OF THE SIGNAL CABLE. THIS WILL CAUSE LEAKAGE & VOID WARRANTY. AVOID ROLLING THE CABLE SPOOL OVER THE ROCKS, STONES, & OTHER SHARP OBJECTS.
3.) CONNECT THE TRANSDUCER SIGNAL CABLE LEADS TO THE CORRECT TERMINALS ON THE METER OR TRANSMITTER WHICH IS TO BE USED WITH THE TRANSDUCER TO INSURE PROPER OPERATION. DISCONNECT THE SIGNAL CABLE LEADS FROM THE METER OR TRANSMITTER BEFORE INSTALLING THE TRANSDUCER OR CABLE IN WELL OR TANK. DO NOT CONNECT THE SIGNAL CABLE LEADS TO ANY OTHER POWER SOURCE./
4.) HANDLE THE SIGNAL CABLE & TRANSDUCER WITH CARE DURING INSTALLATION.
5.) CONNECT TRANSDUCER PIPE TO THE DROP PIPE WITH 16" STAINLESS STEEL BANDS. CONNECT ELECTRICAL CABLE TO THE DROP PIPE SEPARATELY.
DETAIL B - FLOW INDUCER SLEEVE
(NOT NECESSARY ON ALL INSTALLATIONS. SEE MOTOR MANUFACTURER SPECIFICATIONS.)
DROP PIPE
FERNCO REDUCER COUPLING WITH WORM DRIVE CLAMPS OR EQUIVALENT (CUT HOLE IN COUPLING FOR PASSAGE OF PUMP CABLE.)
CASING
PVC FLOW INDUCER SLEEVE (I.D. MUST BE LARGE ENOUGH TO ACCOMODATE FLOW BETWEEN MOTOR AND SLEEVE.)
PUMP / MOTOR PROPERLY SIZED FOR INSTALLATION
Submersible Pump will require shroud
CENTERING BOLT (MUST BE LOCATED ON MOTOR CASING NOT STATION SHELL.) SEE DETAIL C
NOTES:
1.) INSTALL WATER LEVEL TRANSDUCER INSIDE TRANSDUCER PIPE.
2.) USE FLO-MATIC SPRING LOADED CHECK VALVES, MODEL 80 D.I. (400 PSI & 180° MAX)
3.) DEEP INSTALLATIONS COMBINED WITH HIGH HEAD MAY EXCEED PUMP, DROP PIPE, OR CHECK VALVE RATINGS.
4.) STUB APPROXIMATELY 4 FT FROM SURFACE CASING. PROTECT PIPE FROM DAMAGE DURING ALL WELL INSTALLATION / TESTING PROCEDURES.
DETAIL C - BOTTOM VIEW OF SLEEVE
LOCK NUTS INSIDE SLEEVE
CENTERING BOLTS (3 REQUIRED)
REVISION
DATE
BY
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION
STANDARD DRAWING NO. W-30
TYPICAL WATER WELL INSTALLATION
OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA
SHEET
OF

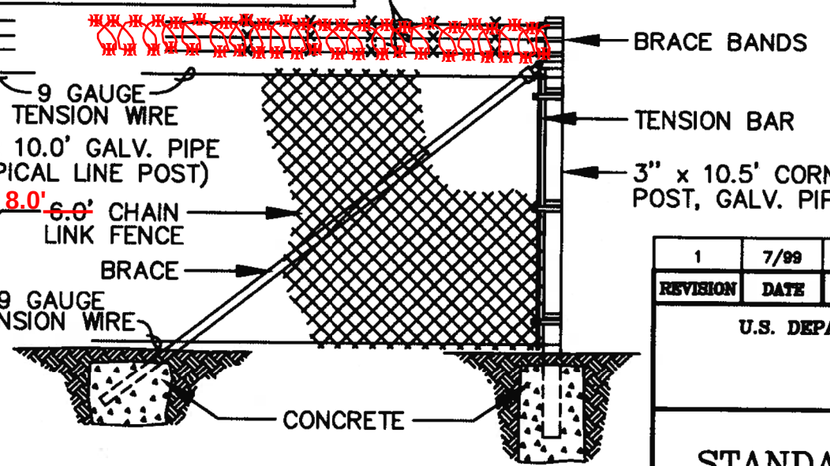


DOUBLE GATE DETAIL
NOT TO SCALE

SINGLE GATE DETAIL
NOT TO SCALE



LINE POST DETAIL
NOT TO SCALE



CORNER POST DETAIL
NOT TO SCALE

1	7/99	STANDARDIZED	B.M.
REVISION	DATE	BRIEF	BY

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

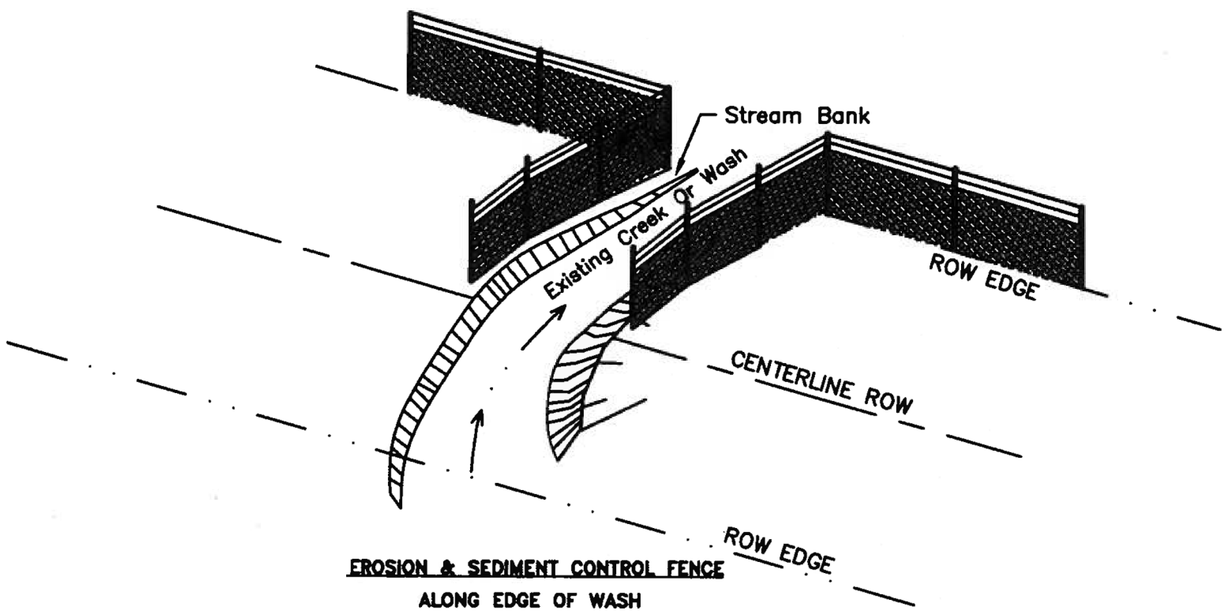
NAVAJO NATION,

STANDARD DRAWING NO. W-34
FENCE DETAIL FOR STORAGE TANK & PUMPHOUSE

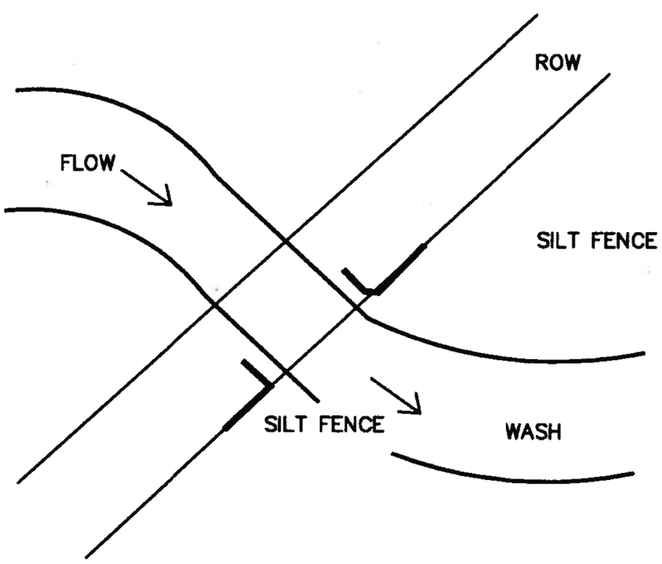
OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

DRAWN BY: L.S. DATE: 12/98	CHECKED BY: P.S. DATE: 12/98	APPR. BY: P.S. DATE: 12/98	AUTOCAD DRAWING

SILT FENCE DETAILS



EROSION & SEDIMENT CONTROL FENCE
ALONG EDGE OF WASH



SILT FENCE:
PLAN VIEW

INSTALLATION NOTES

1. THE SILT FENCING CONSISTS OF 3' SEDIMENT CONTROL FABRIC CLOTH WITH BURIED-TOE AND WOODEN OR STEEL POSTS (TEE OR U TYPE) 10' AND SHALL COMPLY WITH AASHTO M-288.

2. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY 6" AND FOLDED. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

REVISION	DATE	BRIEF	BY

DEPARTMENT OF HEALTH AND HUMAN SERVICES
U.S. PUBLIC HEATH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

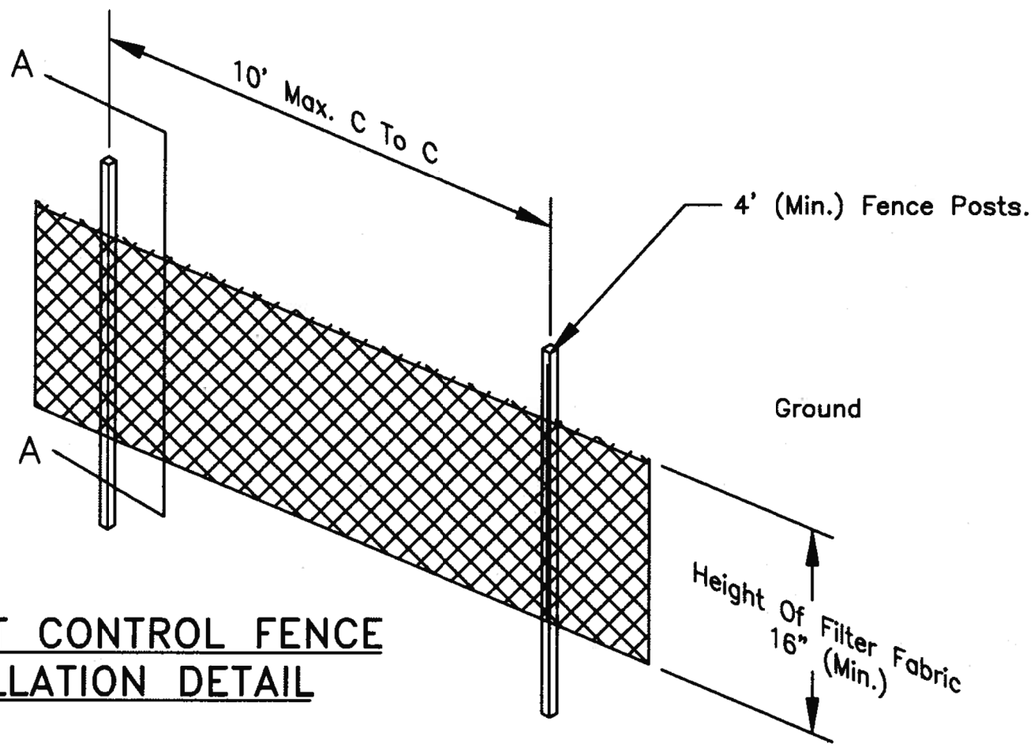
NAVAJO NATION

STANDARD DRAWING NO. W-39
SILT FENCE
DRAWING 1 OF 2

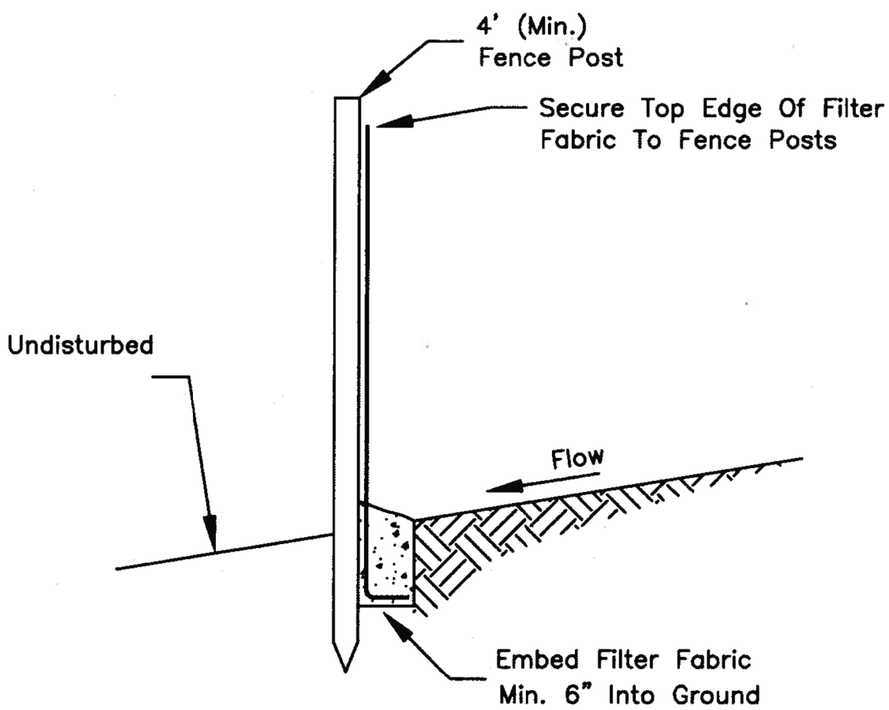
PUBLIC LAW 86-121

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

DRAWN BY: TL DATE: 9/01	CHECKED BY: RG DATE: 9/01	APPR. BY: RM DATE: 9/01	AUTOCAD DRAWING



SEDIMENT CONTROL FENCE INSTALLATION DETAIL



SECTION A–A

REVISION	DATE	BRIEF	BY

DEPARTMENT OF HEALTH AND HUMAN SERVICES
U.S. PUBLIC HEATH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

NAVAJO NATION

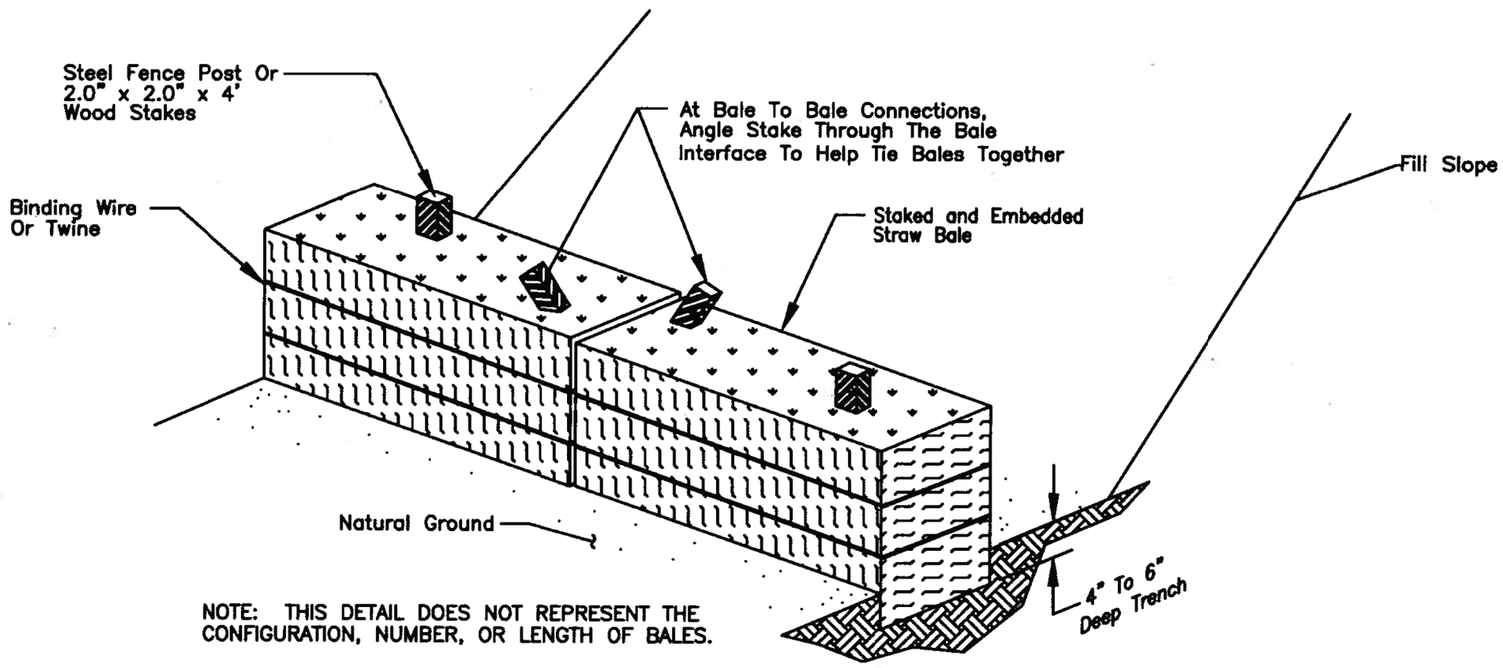
STANDARD DRAWING NO. W-39
SILT FENCE
DRAWING 2 OF 2

PUBLIC LAW 86-121

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

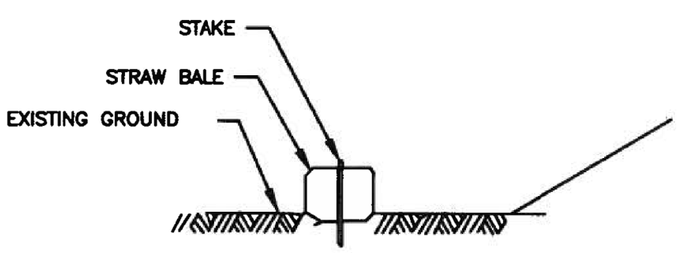
DRAWN BY: TL DATE: 9/01	CHECKED BY: RC DATE: 9/01	APPR. BY: DH DATE: 9/01	AUTOCAD DRAWING

STRAW BALE DETAILS
(For Check Dams to Retain Water and Sediment)

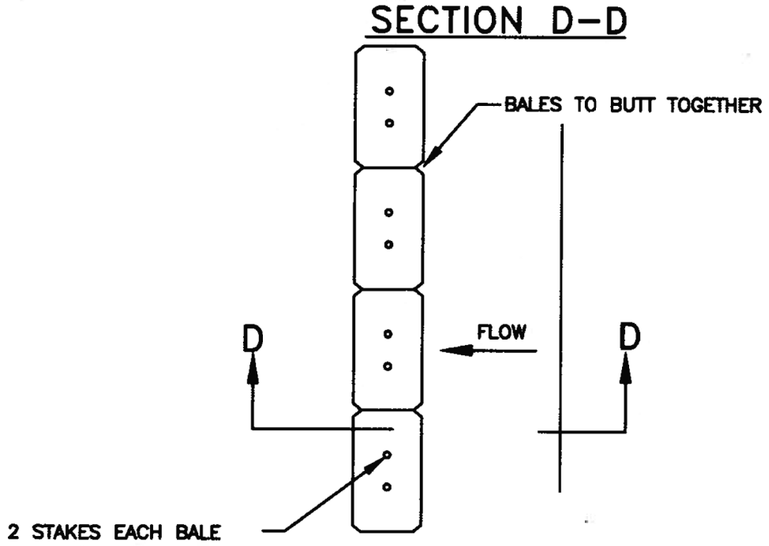


NOTE: THIS DETAIL DOES NOT REPRESENT THE CONFIGURATION, NUMBER, OR LENGTH OF BALES.

TYPICAL STRAW BALE STAKING AND TRENCHING DETAIL



SECTION D–D



PLAN
STRAW BALE SILT BARRIER

INSTALLATION NOTES

1. STRAW BALES MAY BE USED FOR DIKES PROVIDED THEY ARE PROPERLY ANCHORED WITH STEEL FENCE POSTS OR 2" X 2" X 4' WOOD STAKES (TWO PER BALE) ANCHORED 1.5' INTO THE NATURAL GROUND. STRAW BALES SHALL BE CERTIFIED 0.5% WEED FREE. DO NOT USE STRAW BALES IN AREAS OF CONCENTRATED FLOW AND CUT DITCHES.

GENERAL NOTES

1. THE CONTRACTOR SHALL HAVE ON-SITE A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) WITH PROJECT SPECIFIC COVER SHEET.

2. CONSTRUCT CHECK DAMS AND/OR FILTERS IN STRATEGIC LOCATIONS ON THE PROJECT TO FILTER STORM RUNOFF BEFORE IT LEAVES THE PROJECT CONSTRUCTION LIMITS OR ENTERS A WASH. SEE PROJECT CONSTRUCTION PLANS FOR LOCATIONS OF CHECK DAMS & FILTERS.

3. CLEAN ALL SEDIMENT BASIN AND TRAPS OF ACCUMULATED SEDIMENT WHEN HALF FULL OF SEDIMENT.

4. THE CONTRACTOR SHALL INSPECT AND MAINTAIN ALL SWPPP MEASURES MONTHLY AND AFTER EACH SIGNIFICANT STORM EVENT (i.E. 0.5 IN. OF MOISTURE IN 24 HOURS).

5. THE CONTRACTOR, IN CONSULTATION WITH THE PROJECT ENGINEER SHALL ADJUST THE DIMENSIONS AND/OR LOCATIONS OF TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES TO FIT ACTUAL FIELD CONDITIONS. ALL ADJUSTMENTS WILL BE DOCUMENTED ON THE INSPECTION FORMS INCLUDED WITH THE SWPPP.

6. REMOVE AND DISPOSE OF EROSION CONTROL MEASURES WHEN THE PERMANENT EROSION CONTROL MEASURES ARE SATISFACTORILY ESTABLISHED.

REVISION	DATE	BRIEF	BY

DEPARTMENT OF HEALTH AND HUMAN SERVICES
U.S. PUBLIC HEATH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

NAVAJO NATION

STANDARD DRAWING NO. W-40
STRAW BALES

PUBLIC LAW 86-121

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

DRAWN BY: TL DATE: 9/01	CHECKED BY: RG DATE: 9/01	APPR. BY: RM DATE: 9/01	AUTOCAD DRAWING

NAVAJO TRIBAL UTILITY AUTHORITY
CONTROL PANEL LAYOUT

SCHEDULE OF DRAWINGS			
PAGE	FILENAME	TITLE	NOTES
1	AC_CV	COVERSHEET	SHEDULE OF DRAWINGS
2	AC_DIO	DISCRETE I/O	WIRING
3	AC_AIO	ANALOG I/O	WIRING
4	AC_PWR	POWER DISTRIBUTION	WIRING
5	AC_BP	BACKPLANE LAYOUT	BP W/ BOM
6	AC_CBL	COMM CABLES PINOUT	WIRING

AC TANK CONTROL PANEL

NO.	DATE	DESCRIPTION	BY

NAVAJO TRIBAL UTILITY AUTHORITY

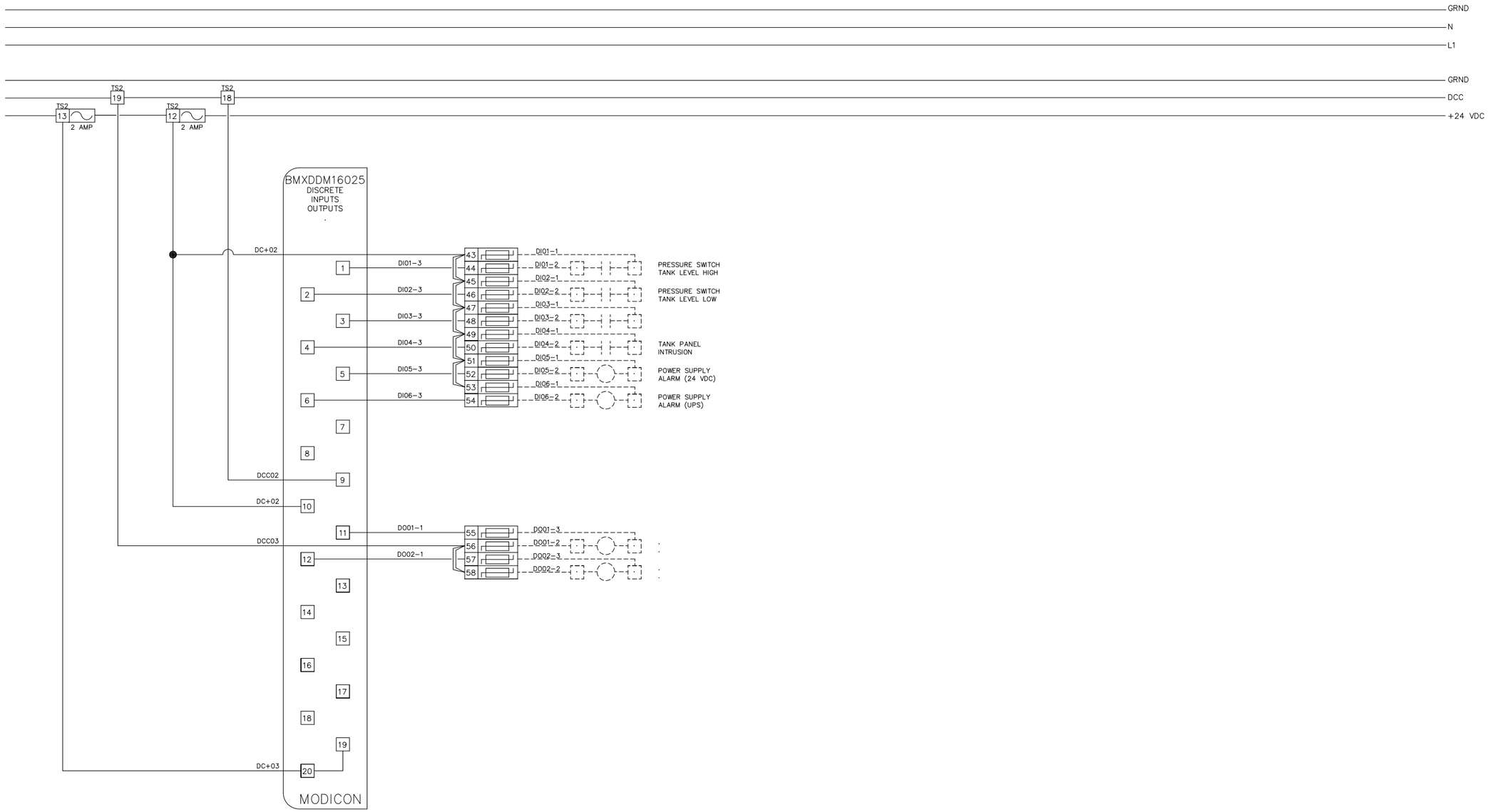
SCALE: NONE	REVISIONS	BY	DATE
DATE:			
DR'N: CKD.			
AP'VD.			

TITLE: AC TANK PANEL
COVER SHEET

W.O.#

SHEET 1 OF 6

POWER DISTRIBUTION THIS PAGE REFLECTS "LOGICAL" SCHEMATIC SEE "DC DISTRIBUTION" DRAWING AND "AC DISTRIBUTION" DRAWING FOR POINT TO POINT TERMINATIONS



LEGEND

Field Terminations ----------

Panel Wiring _____

NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

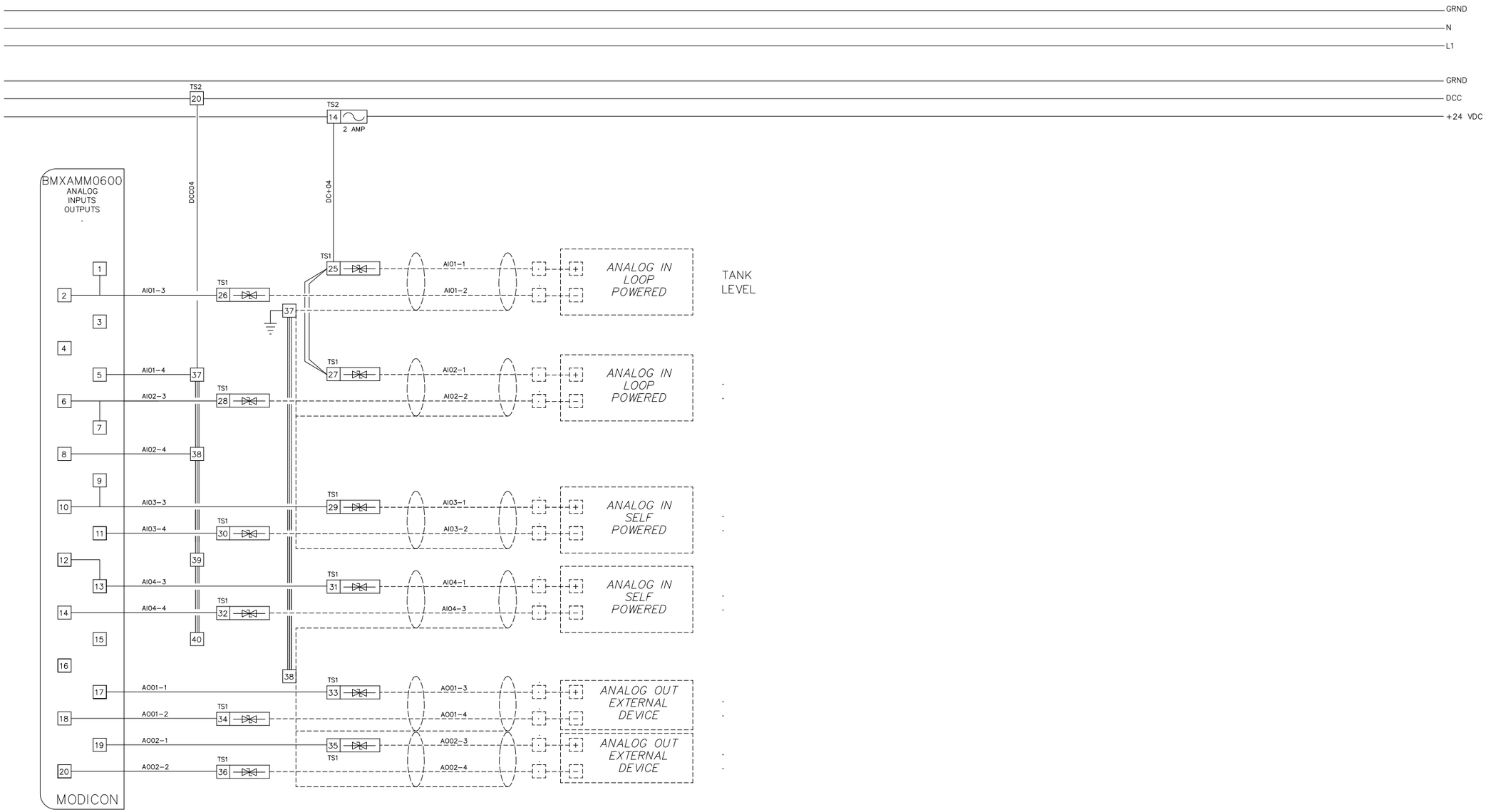
NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .	.		

TITLE: AC TANK CONTROL PANEL
DISCRETE I/O

W.O.#

POWER DISTRIBUTION THIS PAGE REFLECTS "LOGICAL" SCHEMATIC SEE "DC DISTRIBUTION" DRAWING AND "AC DISTRIBUTION" DRAWING FOR POINT TO POINT TERMINATIONS



LEGEND	
Field Terminations	----------
Panel Wiring	_____

NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

NAVAJO TRIBAL UTILITY AUTHORITY

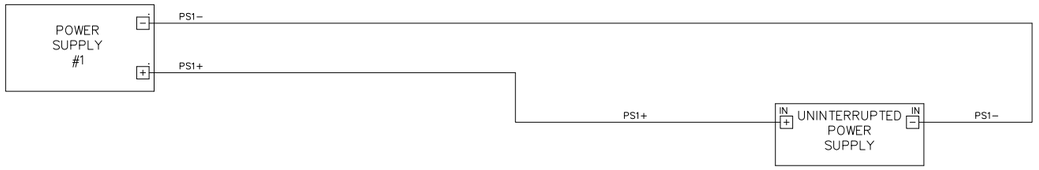
SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .			

TITLE: AC TANK CONTROL PANEL
ANALOG I/O

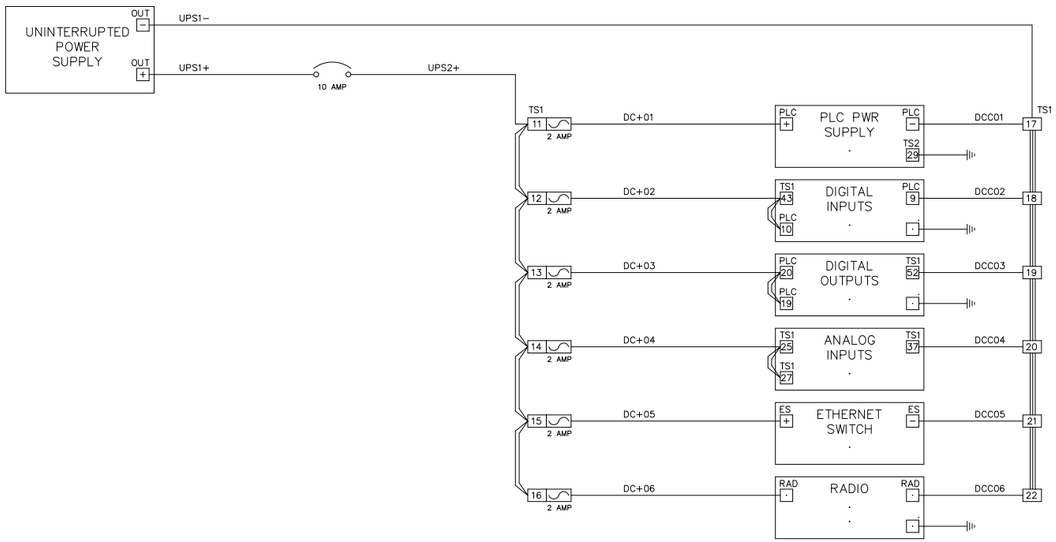
W.O.#

SHEET 3 OF 6

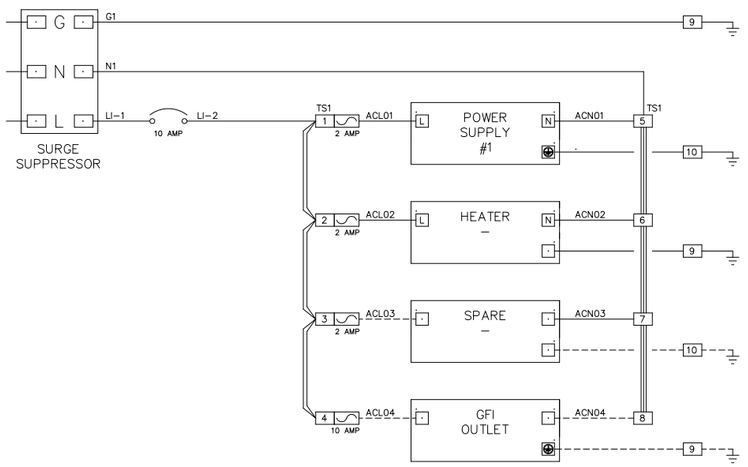
24VDC DISTRIBUTION



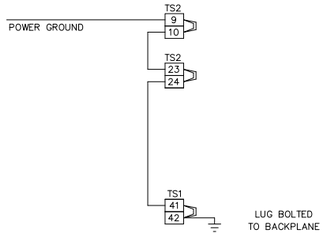
24VDC DISTRIBUTION (UPS)



120VAC DISTRIBUTION



GRND



LEGEND

Field Terminations ----------

Panel Wiring _____

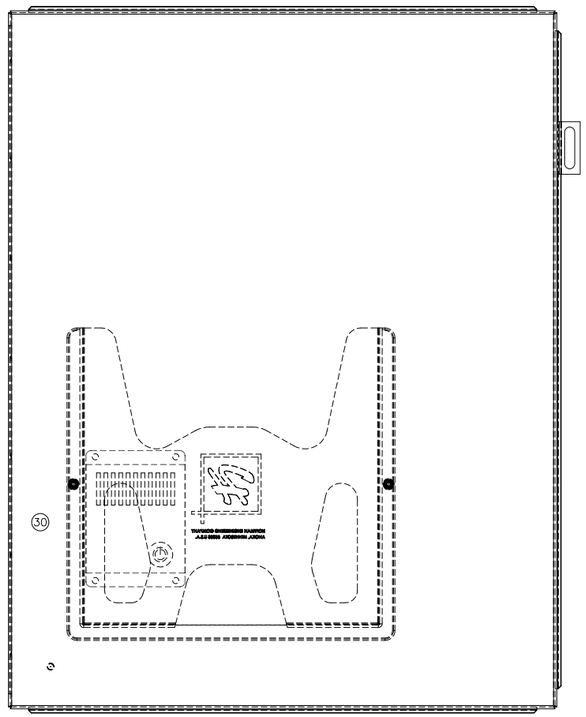
NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

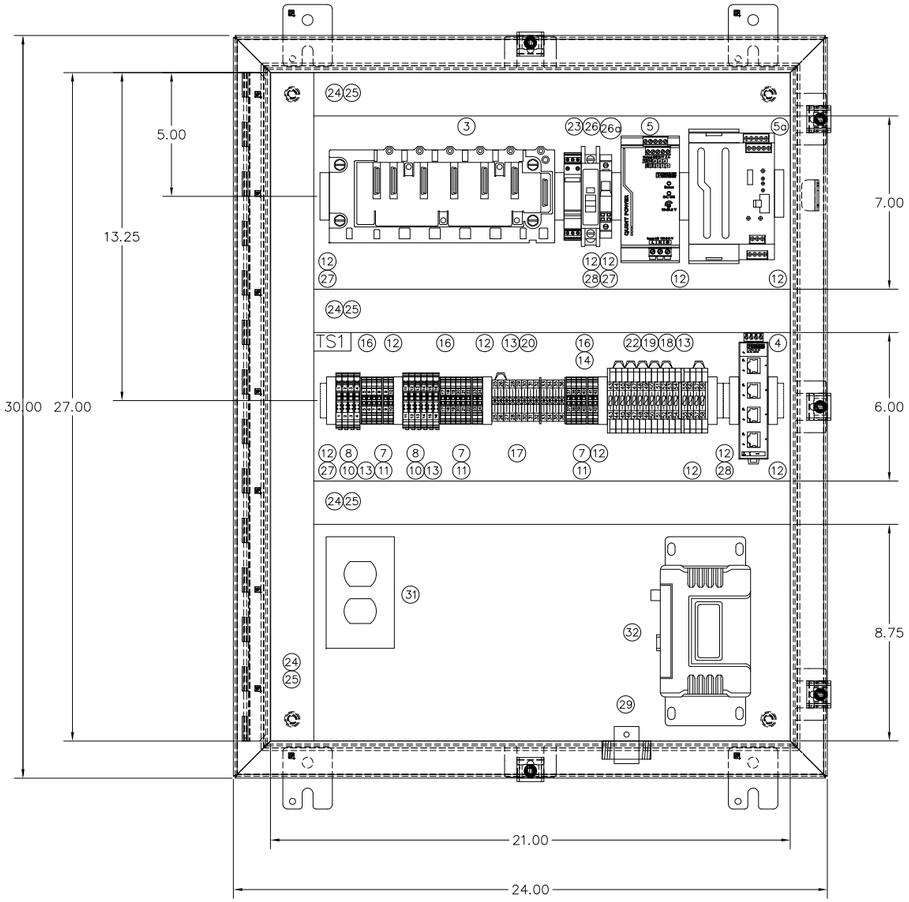
NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: .	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APV'D. .			

TITLE AC TANK CONTROL PANEL
POWER DISTRIBUTION

W.O.#





BILL OF MATERIALS

ITEM	QTY	PART NO.	DESCRIPTION	MFG
1	1	A30H24DLP	SINGLE–DOOR TYPE 4 ENCLOSURE	HOFFMAN
2	1	A30P24	BACKPLANE	HOFFMAN
3*	.	M340	MODICON M340 BOM	MODICON
3a	1	BMXXBM0400	4–SLOT RACK MODULE	MODICON
3b	1	BMXCPS3020	POWER SUPPLY MODULE	MODICON
3c	1	BMXP342020	CPU PROCESSOR MODULE	MODICON
3d	1	BMXDDM16025	DIGITAL INPUT/OUTPUT MODULE	MODICON
3e	1	BMXAMM0600	ANALOG INPUT/OUTPUT MODULE	MODICON
3f	2	BMXFTB2010	REMOVABLE CONNECTION BLOCK – SCREW CLAMP	MODICON
4	1	FL SWITCH SFN 5TX	INDUSTRIAL ETHERNET SWITCH	PHOENIX CONTACT
5	1	QUINT–PS/1AC/ 24DC/10	POWER SUPPLY 22.5–28.5V ADJUSTABLE	PHOENIX CONTACT
5a	1	QUINT–UPS/24DC /24DC/5/3.4AH	UNINTERRUPTIBLE POWER SUPPLY	PHOENIX CONTACT
7	14	UT2,5	UT2,5 TERMINALS	PHOENIX CONTACT
8	10	UT4TG	FUSE TERMINAL BASE	PHOENIX CONTACT
9	6	P–FU5X20LED24	FUSE PLUG	PHOENIX CONTACT
10	4	P–FU5X20LA250	FUSE PLUG	PHOENIX CONTACT
11	6	UT2,5PE	GROUNDING TERMINAL	PHOENIX CONTACT
12	15	E/NS35N	END CLAMP	PHOENIX CONTACT
13	3	FBS 20–6 BU #3032208	FIXED BRIDGE	PHOENIX CONTACT
14	3	FBS 20–5 BU #3036929	INSERTION BRIDGE	PHOENIX CONTACT
15	8	D–UT2,5/10	END COVER	PHOENIX CONTACT
16	4	ATP–UT	PARTITION PLATES	PHOENIX CONTACT
17	2	ATP–UK	PARTITION PLATES	PHOENIX CONTACT
18	2	DP–UKK3/5BK #2770833	SLKK5 SPACER PLATE	PHOENIX CONTACT
19	2	D–UKK3/5BK #2770228	SLKK5 ENDCOVER	PHOENIX CONTACT
20	12	TT–UK5/24DC #2794699	TERMITRAB UK5 W/SUPPRESSOR DIODE	PHOENIX CONTACT
21	1	D–TERMATRAB UK5	END COVER	PHOENIX CONTACT
22	16	TT–SLKK5/24DC #2794903	TERMITRAB SLKK5 W/VARISTOR 24DC (MOV)	PHOENIX CONTACT
23	1	PT2PE/S120FM	TERMITRAB AC SURGE PROTECTION	PHOENIX CONTACT
24	AN	F2X4LG6	TYPE F NARROW SLOT WIRING DUCT	PANDUIT
25	AN	C2LG6	WIRING DUCT COVER	PANDUIT
26	1	TMC 61C 10A #0902072	CIRCUIT BREAKER	PHOENIX CONTACT
26a	1	UT6–TMCM 10A #0916610	CIRCUIT BREAKER	PHOENIX CONTACT
27	AN	1492DR6	EXTENDED DIN RAIL	ALLEN BRADLEY
28	AN	1492–DR5	DIN RAIL	ALLEN BRADLEY
29	1	IS–50NX–C2	LIGHTNING ARRESTER	POLYPHASER
30	1	D–AH1001A	HEATER 100W 115V .9A	HOFFMAN
31	1	DRUBGFI15	DIN RAIL UTILITY BOX	HUBBELL
32	1	ORBIT OR TRANSNET	902 – 928 MHz RADIO SPREAD SPECTRUM	GEMDS
33	1	CAT6	CABLE – PLC TO HMI	BELDEN
34	1	.	CABLE – PLC TO MODEM (TO LENGTH)	.

AN – As needed
3* – BOM – To include items 3a–3g.

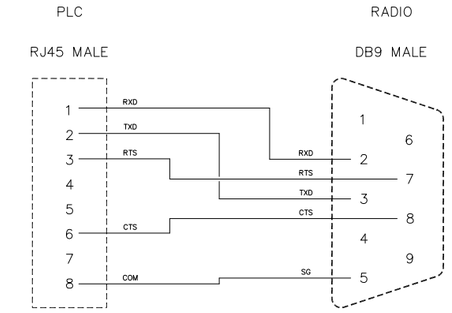
NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .			

TITLE: AC TANK CONTROL PANEL
BACKPLANE

W.O.#



A CABLE DIAGRAM: PLC TO RADIO

NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DR'N. . CKD. .	.	.	.
AP'VD. .			

TITLE AC TANK CONTROL PANEL
CABLE PINOUT

W.O.#

SHEET 6 OF 6

NAVAJO TRIBAL UTILITY AUTHORITY
PUMP CONTROL PANEL LAYOUT

SCHEDULE OF DRAWINGS			
SHEET	FILENAME	TITLE	NOTES
1	PLC_CV	COVERSHEET	SHEDULE OF DRAWINGS
2	PLC_DIO	DISCRETE I/O	WIRING
3	PLC_AIO	ANALOG I/O	WIRING
4	PLC_PWR	POWER DISTRIBUTION	WIRING
5	PLC_BP	BACKPLANE LAYOUT	BP W/ BOM
5A	PLC_SOP	SWING OUT PANEL	BP W/ BOM
6	PLC_CBL	COMM CABLES PINOUT	

PLC CONTROL PANEL

NO.	DATE	DESCRIPTION	BY

NAVAJO TRIBAL UTILITY AUTHORITY

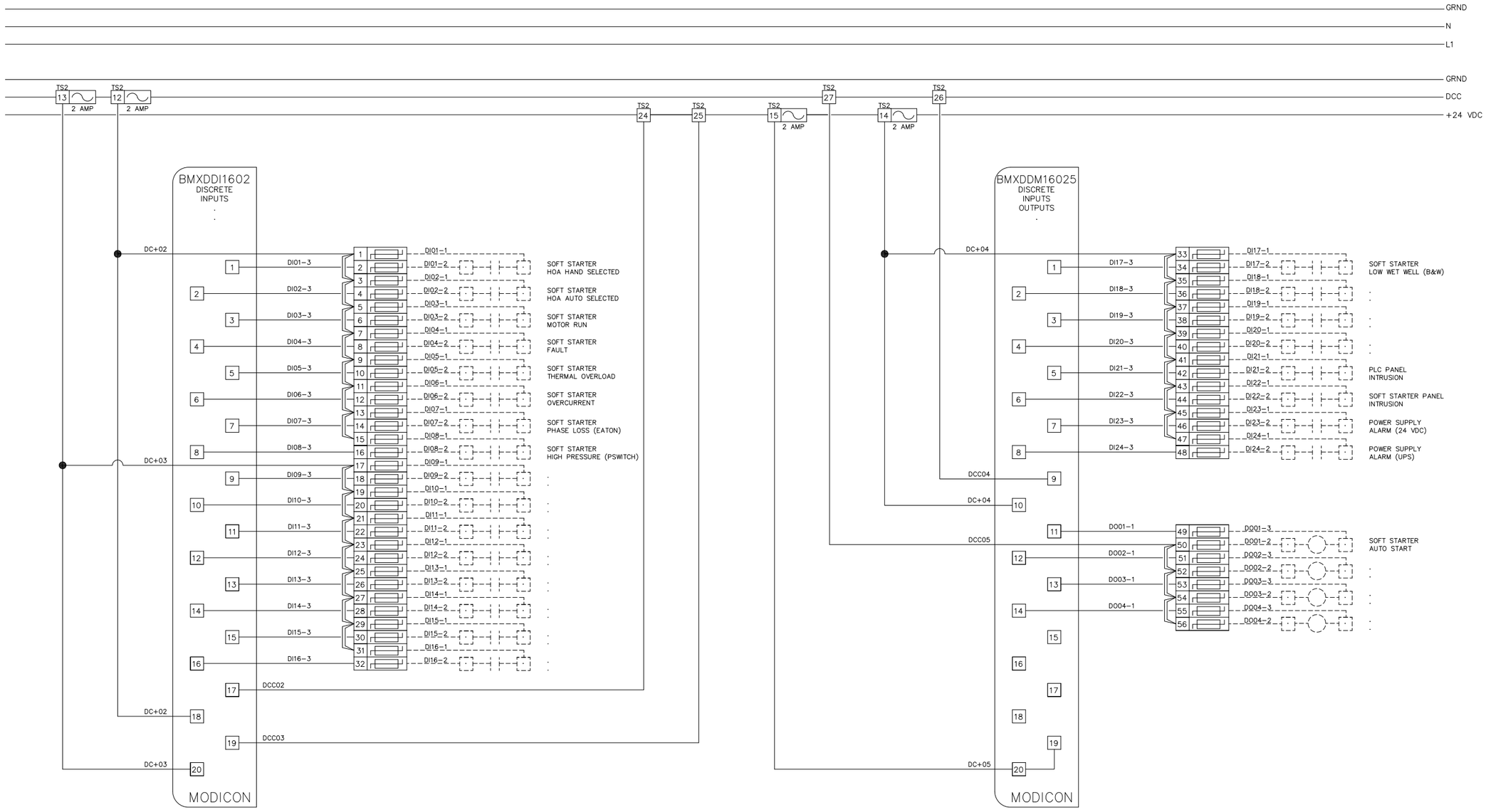
SCALE: NONE	REVISIONS	BY	DATE
DATE:			
DR'N: CKD:			
APV'D:			

TITLE: PLC CONTROL PANEL
COVER SHEET

W.O.#

SHEET 1 OF 6

POWER DISTRIBUTION THIS PAGE REFLECTS "LOGICAL" SCHEMATIC SEE "DC DISTRIBUTION" DRAWING AND "AC DISTRIBUTION" DRAWING FOR POINT TO POINT TERMINATIONS



LEGEND

Field Terminations ----------

Panel Wiring ——————

NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

NAVAJO TRIBAL UTILITY AUTHORITY

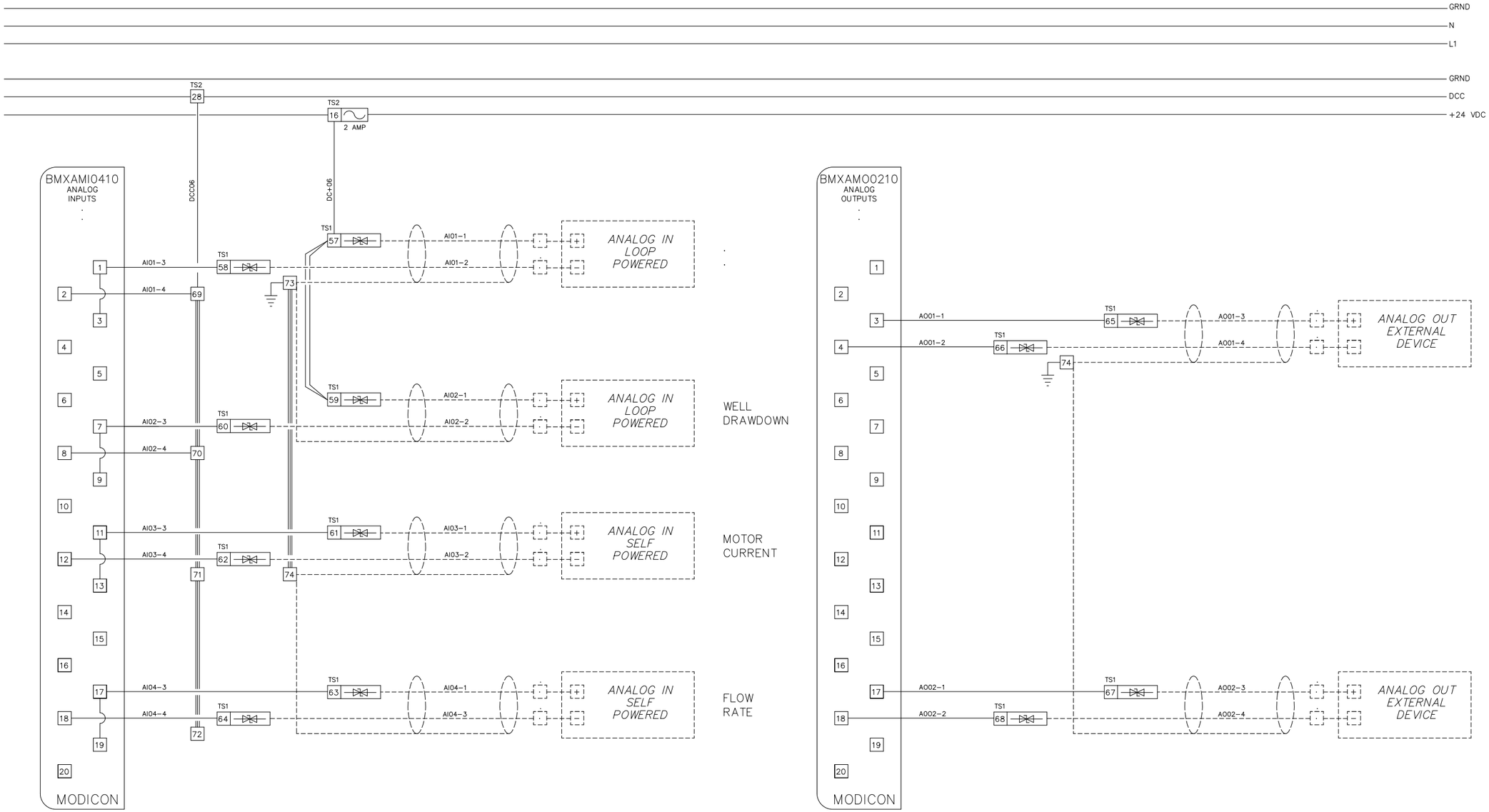
SCALE:	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .			

TITLE PLC CONTROL PANEL
DISCRETE I/O
(SIMPLEX WELL WITH SOFT STARTER)

W.O.#

SHEET 2 OF 6

POWER DISTRIBUTION THIS PAGE REFLECTS "LOGICAL" SCHEMATIC SEE "DC DISTRIBUTION" DRAWING AND "AC DISTRIBUTION" DRAWING FOR POINT TO POINT TERMINATIONS



LEGEND

Field Terminations ----------

Panel Wiring ——————

NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

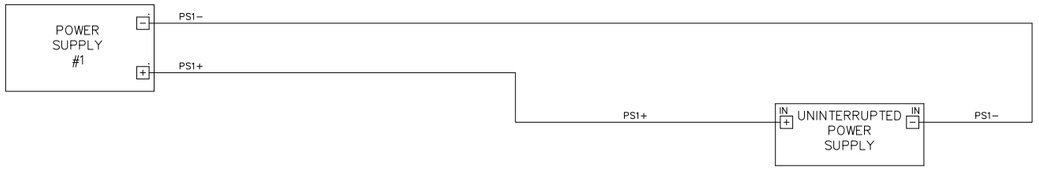
NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN: . CKD: .	.	.	.
APVD: .			

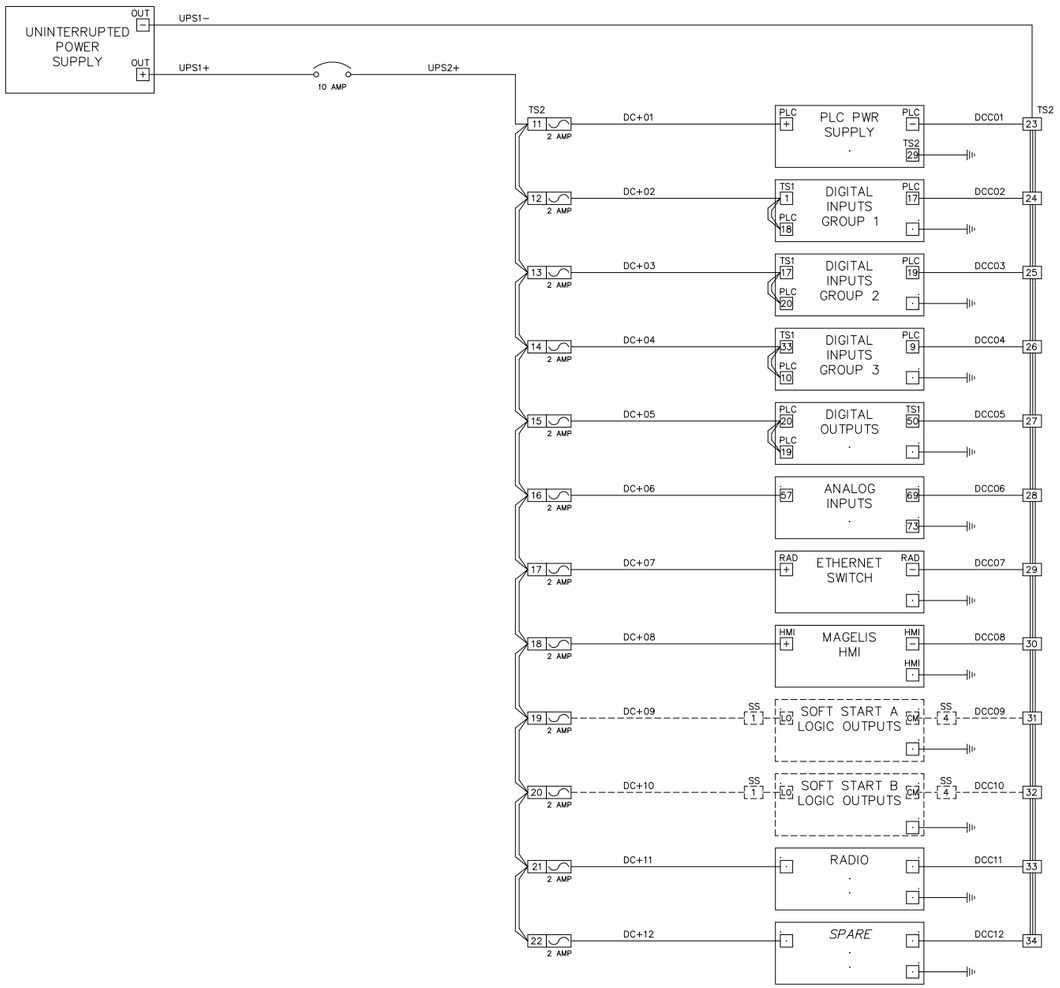
TITLE: PLC CONTROL PANEL
ANALOG I/O
(SIMPLEX WELL WITH SOFT STARTER)

W.O.#

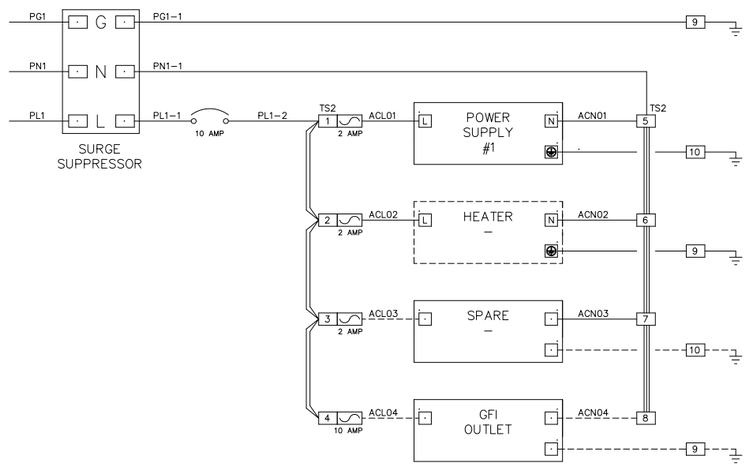
24VDC DISTRIBUTION



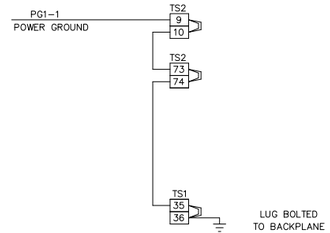
24VDC DISTRIBUTION (UPS)



120VAC DISTRIBUTION



GRND



LEGEND

Field Terminations ----------

Panel Wiring _____

NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

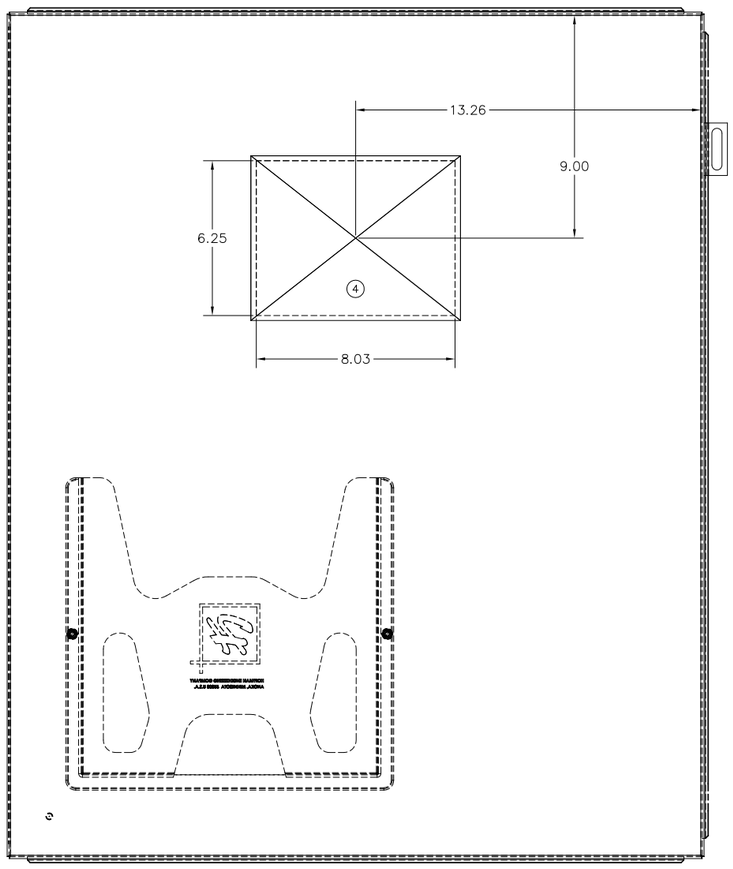
NAVAJO TRIBAL UTILITY AUTHORITY

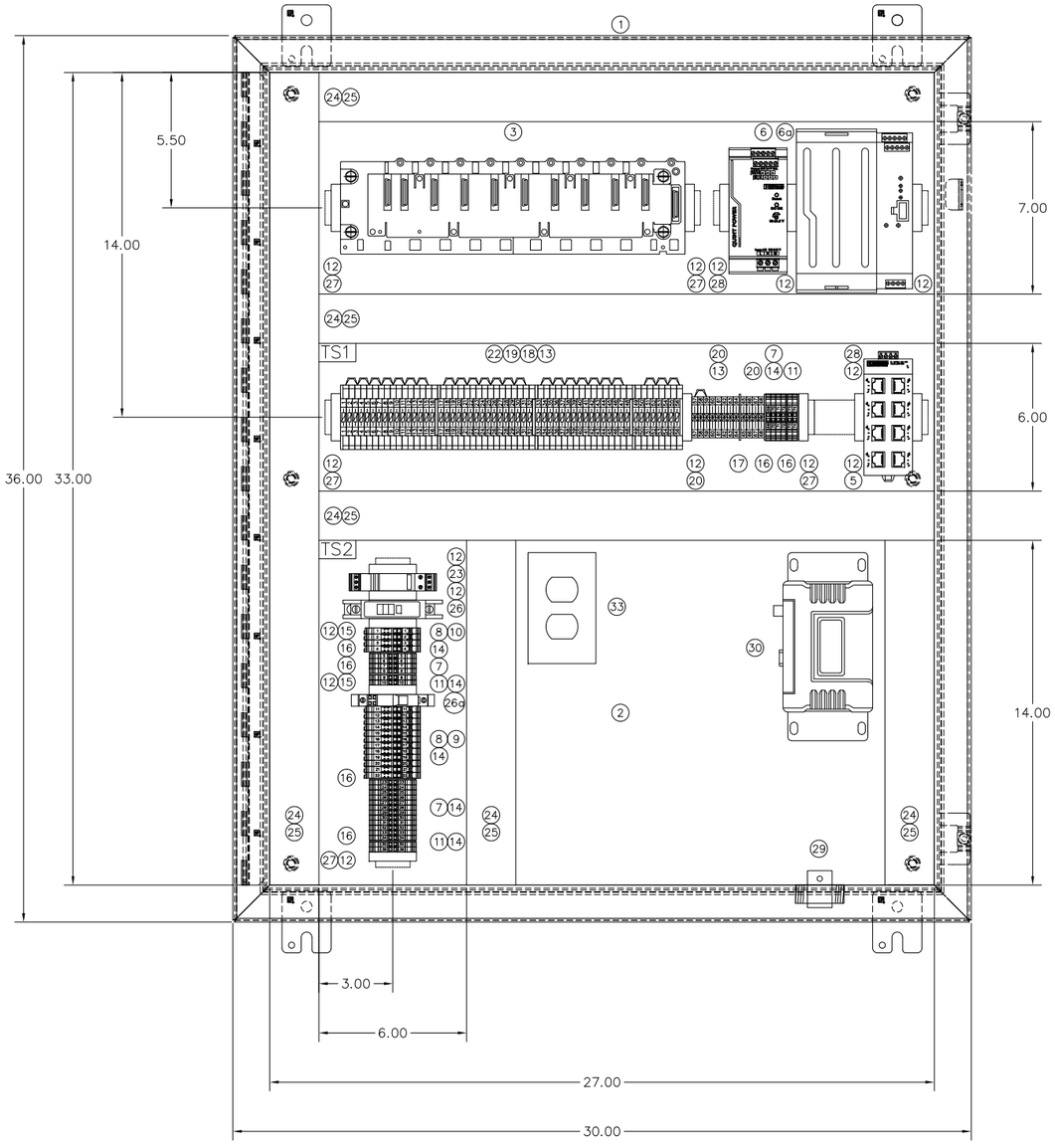
SCALE: .	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .			

TITLE PLC CONTROL PANEL
POWER DISTRIBUTION

W.O.#

SHEET 4 OF 6





BILL OF MATERIALS

ITEM	QTY	PART NO.	DESCRIPTION	MFG
1	1	A-363012LP	SINGLE-DOOR TYPE 12 ENCLOSURE	HOFFMAN
2	1	A-36P30	BACKPLANE	HOFFMAN
3*	.	M340	MODICON M340 BOM	MODICON
3a	1	BMXXBP0800	8-SLOT RACK MODULE	MODICON
3b	1	BMXCPS3020	POWER SUPPLY MODULE	MODICON
3c	1	BMXP342020	CPU PROCESSOR MODULE	MODICON
3d	1	BMXDDI1602	DIGITAL INPUT MODULE	MODICON
3e	1	BMXDDM16025	DIGITAL INPUT/OUTPUT MODULE	MODICON
3f	1	BMXAMI0410	ANALOG INPUT MODULE	MODICON
3g	1	BMXAMO0210	ANALOG OUTPUT MODULE	MODICON
3h	4	BMXFTB2010	REMOVABLE CONNECTION BLOCK - SCREW CLAMP	MODICON
4	1	HMIGTO4310	7.5 GRAPHIIC TERMINAL TOUCHSCREEN (MAGELIS)	SCHNEIDER ELECTRIC
5	1	FL SWITCH SFN 8TX	INDUSTRIAL ETHERNET SWITCH	PHOENIX CONTACT
6	1	QUINT-PS/1AC/24DC/10	POWER SUPPLY 22.5-28.5V ADJUSTABLE	PHOENIX CONTACT
6a	1	QUINT-UPS/24DC/24DC/10/3.4AH	UNINTERRUPTIBLE POWER SUPPLY	PHOENIX CONTACT
7	26	UT2,5	UT2,5 TERMINALS	PHOENIX CONTACT
8	16	UT4TG	FUSE TERMINAL BASE	PHOENIX CONTACT
9	12	P-FU5X20LED24	FUSE PLUG	PHOENIX CONTACT
10	4	P-FU5X20LA250	FUSE PLUG	PHOENIX CONTACT
11	6	UT2,5PE	GROUNDING TERMINAL	PHOENIX CONTACT
12	15	E/NS35N	END CLAMP	PHOENIX CONTACT
13	4	FBS 20-6 BU #3032208	FIXED BRIDGE	PHOENIX CONTACT
14	4	FBS 20-5 BU #3036929	INSERTION BRIDGE	PHOENIX CONTACT
15	6	D-UT2,5/10	END COVER	PHOENIX CONTACT
16	6	ATP-UT	PARTITION PLATES	PHOENIX CONTACT
17	2	ATP-UK	PARTITION PLATES	PHOENIX CONTACT
18	4	DP-UKK3/5BK #2770833	SLKK5 SPACER PLATE	PHOENIX CONTACT
19	4	D-UKK3/5BK #2770228	SLKK5 ENDCOVER	PHOENIX CONTACT
20	12	TT-UK5/24DC #2794699	TERMITRAB UK5 W/SUPPRESSOR DIODE	PHOENIX CONTACT
21	3	D-TERMITRAB UK5	END COVER	PHOENIX CONTACT
22	56	TT-SLKK5/24DC #2794903	TERMITRAB SLKK5 W/VARISTOR 24DC (MOV)	PHOENIX CONTACT
23	1	PT2PE/S120FM	TERMITRAB AC SURGE PROTECTION	PHOENIX CONTACT
24	AN	F2X4LG6	TYPE F NARROW SLOT WIRING DUCT	PANDUIT
25	AN	C2LG6	WIRING DUCT COVER	PANDUIT
26	1	TMC 61C 10A #0902072	CIRCUIT BREAKER	PHOENIX CONTACT
26a	1	UT6-TMCM 10A #0916610	CIRCUIT BREAKER	PHOENIX CONTACT
27	AN	1492DR6	EXTENDED DIN RAIL	ALLEN BRADLEY
28	AN	1492-DR5	DIN RAIL	ALLEN BRADLEY
29	1	IS-50NX-C2	LIGHTNING ARRESTER	POLYPHASER
30	1	ORBIT OR TRANSNET	902 - 928 MHz RADIO SPREAD SPECTRUM	GEMDS
31	2	CAT6	ETHERNET PATCH CABLE (4' - BLACK)	BELDEN
32	1	.	CABLE - PLC TO MODEM (TO LENGTH)	.
33	1	DRUBGFI15	DIN RAIL UTILITY BOX	HUBBELL

AN - As needed
3* - BOM - To include items 3a-3h.

NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

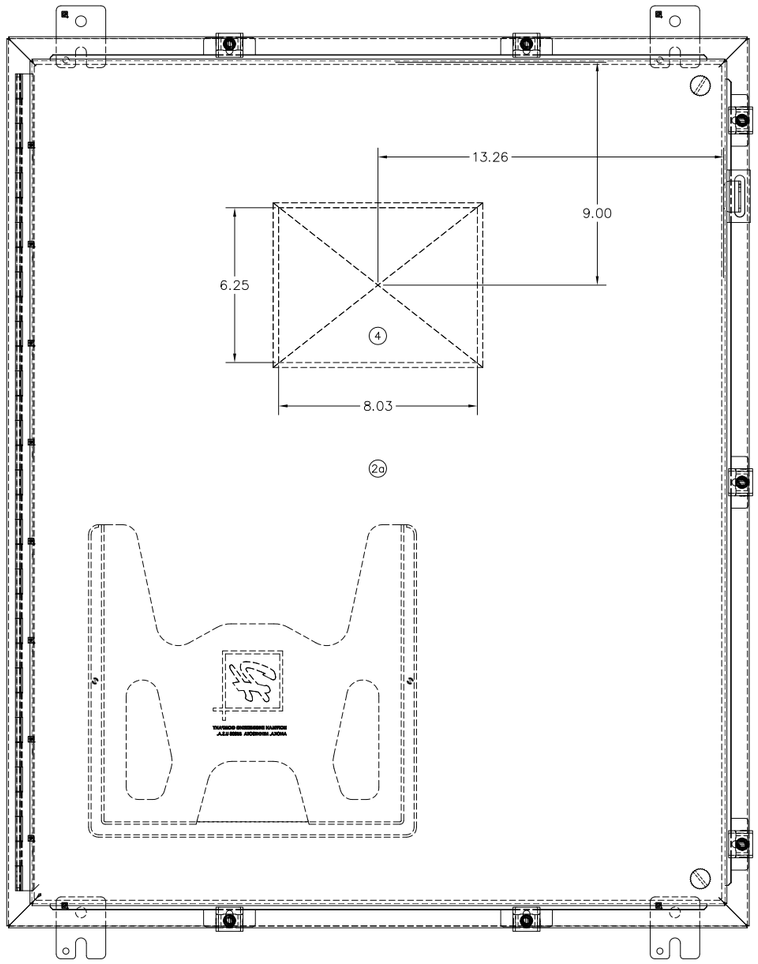
NAVAJO TRIBAL UTILITY AUTHORITY

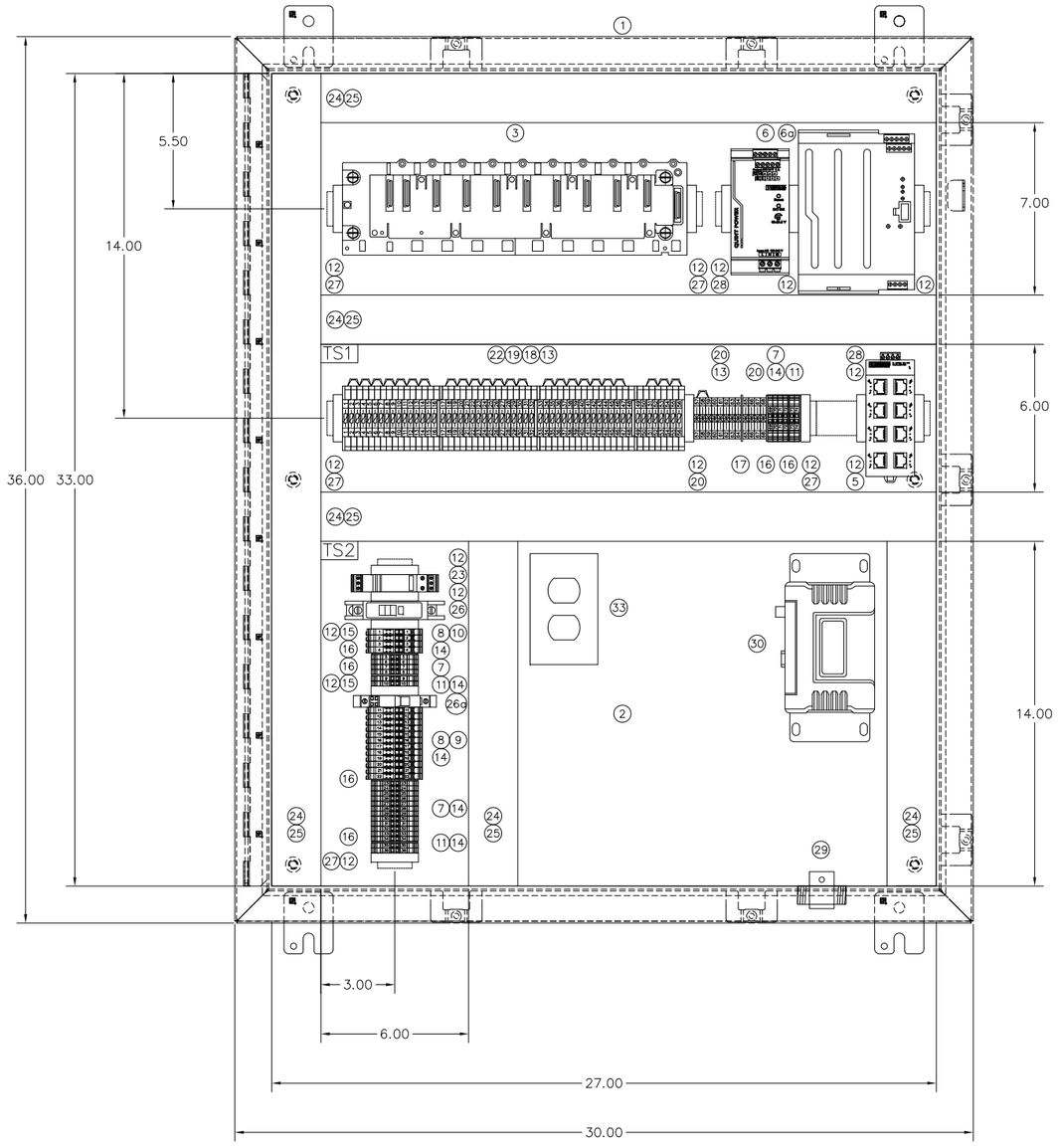
SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .			

TITLE: PLC CONTROL PANEL
BACKPLANE

W.O.#

SHEET 5 OF 6





BILL OF MATERIALS

ITEM	QTY	PART NO.	DESCRIPTION	MFG
1	1	A-36H30DLP	SINGLE-DOOR TYPE 4 ENCLOSURE	HOFFMAN
2	1	A-36P30	BACKPLANE	HOFFMAN
2a	1	A-NADFK	SWING OUT PANEL KIT	HOFFMAN
3*	.	M340	MODICON M340 BOM	MODICON
3a	1	BMXXBM0800	8-SLOT RACK MODULE	MODICON
3b	1	BMXCPS3020	POWER SUPPLY MODULE	MODICON
3c	1	BMX342020	CPU PROCESSOR MODULE	MODICON
3d	1	BMXDDI1602	DIGITAL INPUT MODULE	MODICON
3e	1	BMXDDM16025	DIGITAL INPUT/OUTPUT MODULE	MODICON
3f	1	BMXAMI0410	ANALOG INPUT MODULE	MODICON
3g	1	BMXAMO0210	ANALOG OUTPUT MODULE	MODICON
3h	4	BMXFTB2010	REMOVABLE CONNECTION BLOCK - SCREW CLAMP	MODICON
4	1	HMIGTO4310	7.5 GRAPHIC TERMINAL TOUCHSCREEN (MAGELIS)	SCHNEIDER ELECTRIC
5	1	FL SWITCH SFN 8TX	INDUSTRIAL EHTERNET SWITCH	PHOENIX CONTACT
6	1	QUINT-PS/1AC/24DC/10	POWER SUPPLY 22.5-28.5V ADJUSTABLE	PHOENIX CONTACT
6a	1	QUINT-UPS/24DC/24DC/10/3.4AH	UNINTERRUPTIBLE POWER SUPPLY	PHOENIX CONTACT
7	26	UT2,5	UT2,5 TERMINALS	PHOENIX CONTACT
8	16	UT4TG	FUSE TERMINAL BASE	PHOENIX CONTACT
9	12	P-FU5X20LED24	FUSE PLUG	PHOENIX CONTACT
10	4	P-FU5X20LA250	FUSE PLUG	PHOENIX CONTACT
11	6	UT2,5PE	GROUNDING TERMINAL	PHOENIX CONTACT
12	15	E/NS35N	END CLAMP	PHOENIX CONTACT
13	4	FBI 20-6 BU #3032208	FIXED BRIDGE	PHOENIX CONTACT
14	4	FBS 20-5 BU #3036929	INSERTION BRIDGE	PHOENIX CONTACT
15	6	D-UT2,5/10	END COVER	PHOENIX CONTACT
16	6	ATP-UT	PARTITION PLATES	PHOENIX CONTACT
17	2	ATP-UK	PARTITION PLATES	PHOENIX CONTACT
18	4	DP-UKK3/5BK #2770833	SLKK5 SPACER PLATE	PHOENIX CONTACT
19	4	D-UKK3/5BK #2770228	SLKK5 ENDCOVER	PHOENIX CONTACT
20	12	TT-UK5/24DC #2794699	TERMITRAB UK5 W/SUPPRESSOR DIODE	PHOENIX CONTACT
21	3	D-TERMITRAB UK5	END COVER	PHOENIX CONTACT
22	56	TT-SLKK5/24DC #2794903	TERMITRAB SLKK5 W/VARISTOR 24DC (MOV)	PHOENIX CONTACT
23	1	PT2PE/S120FM	TERMITRAB AC SURGE PROTECTION	PHOENIX CONTACT
24	AN	F2X4LG6	TYPE F NARROW SLOT WIRING DUCT	PANDUIT
25	AN	C2LG6	WIRING DUCT COVER	PANDUIT
26	1	TMC 61C 10A #0902072	CIRCUIT BREAKER	PHOENIX CONTACT
26a	1	UT6-TMCM 10A #0916610	CIRCUIT BREAKER	PHOENIX CONTACT
27	AN	1492DR6	EXTENDED DIN RAIL	ALLEN BRADLEY
28	AN	1492-DR5	DIN RAIL	ALLEN BRADLEY
29	1	IS-50NX-C2	LIGHTNING ARRESTER	POLYPHASER
30	1	ORBIT OR TRANSNET	902 - 928 MHz RADIO SPREAD SPECTRUM	GEMDS
31	2	CAT6	ETHERNET PATCH CABLE (4' - BLACK)	BELDEN
32	1	.	CABLE - PLC TO MODEM (TO LENGTH)	.
33	1	DRUBGFI15	DIN RAIL UTILITY BOX	HUBBELL

AN - As needed
3* - BOM - To include items 3a-3h.

NO.	DATE	DESCRIPTION	BY
01	12/16	DRAWING	NTUA

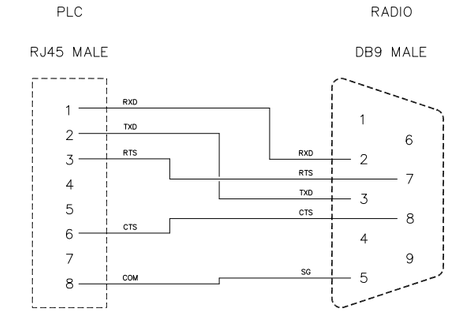
NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .		.	.
APVD. .			

TITLE: PLC CONTROL PANEL WITH SWING OUT PANEL BACKPLANE

W.O.#

SHEET 5A OF 6



A CABLE DIAGRAM: PLC TO RADIO

NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DR'N. . CKD. .	.	.	.
APV'D. .			

TITLE PLC CONTROL PANEL
CABLE PINOUT

W.O.#

SHEET 6 OF 6

NAVAJO TRIBAL UTILITY AUTHORITY
PUMP CONTROL PANEL LAYOUT

SCHEDULE OF DRAWINGS			
SHEET	FILENAME	TITLE	NOTES
1	SS_CV	COVERSHEET	SHEDULE OF DRAWINGS
2	SS_LOG	LOGIC WIRING	WIRING
3	SS_BP_*HP	GEN ARRANGEMENT	BACKPLANE LAYOUT

SOFT START PUMP PANEL

NO.	DATE	DESCRIPTION	BY

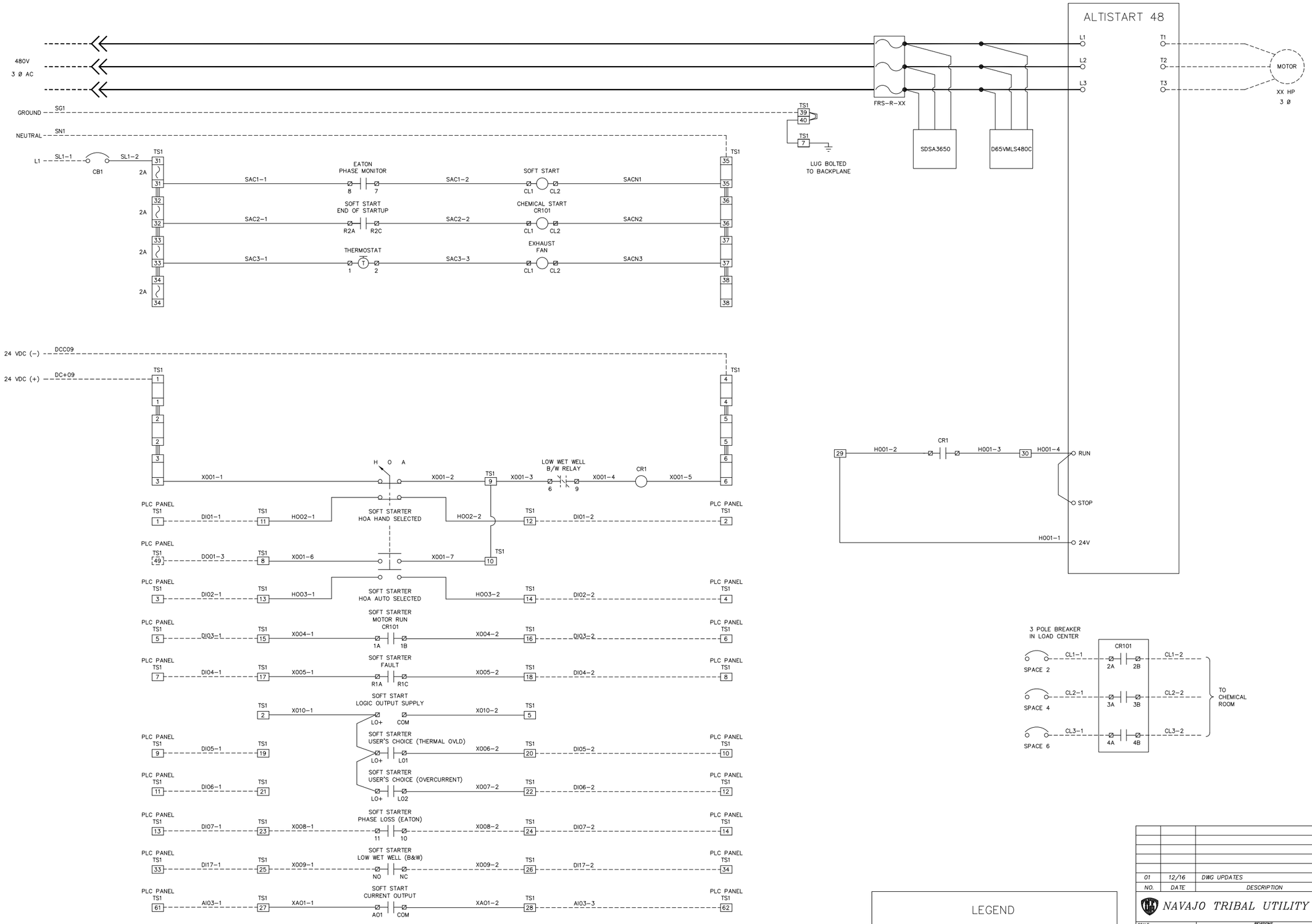
NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DR'N: . CKD: .	.	.	.
AP'VD: .			

TITLE: 3 PHASE – SOFT START PUMP PANEL COVER SHEET

W.O.#

SHEET 1 OF 3



LEGEND

Field Terminations ----------

Panel Wiring _____

NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: NONE

REVISIONS	BY	DATE

DATE:

DRN. CKD.

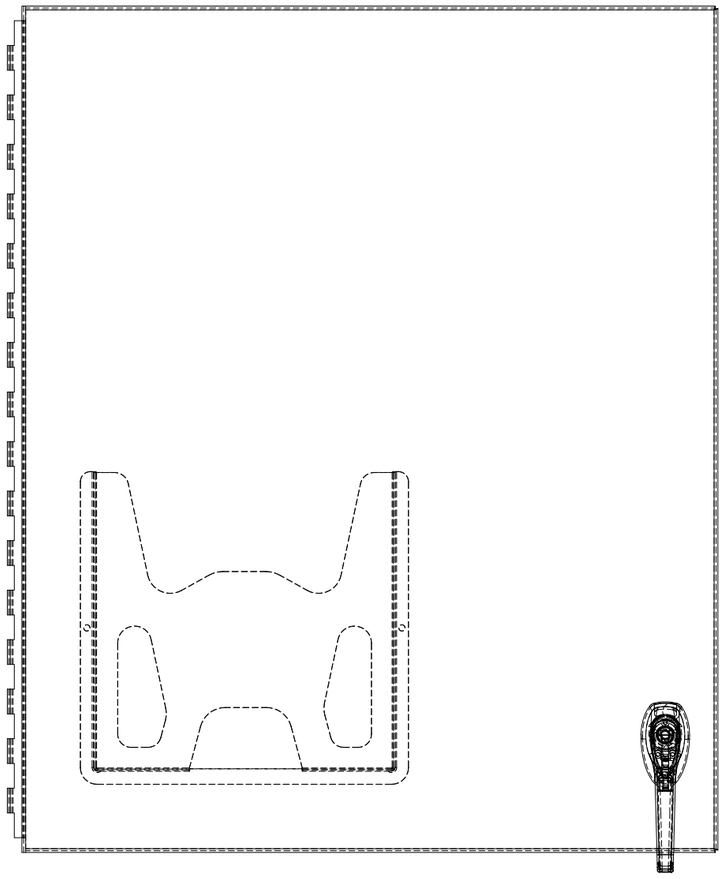
APV'D.

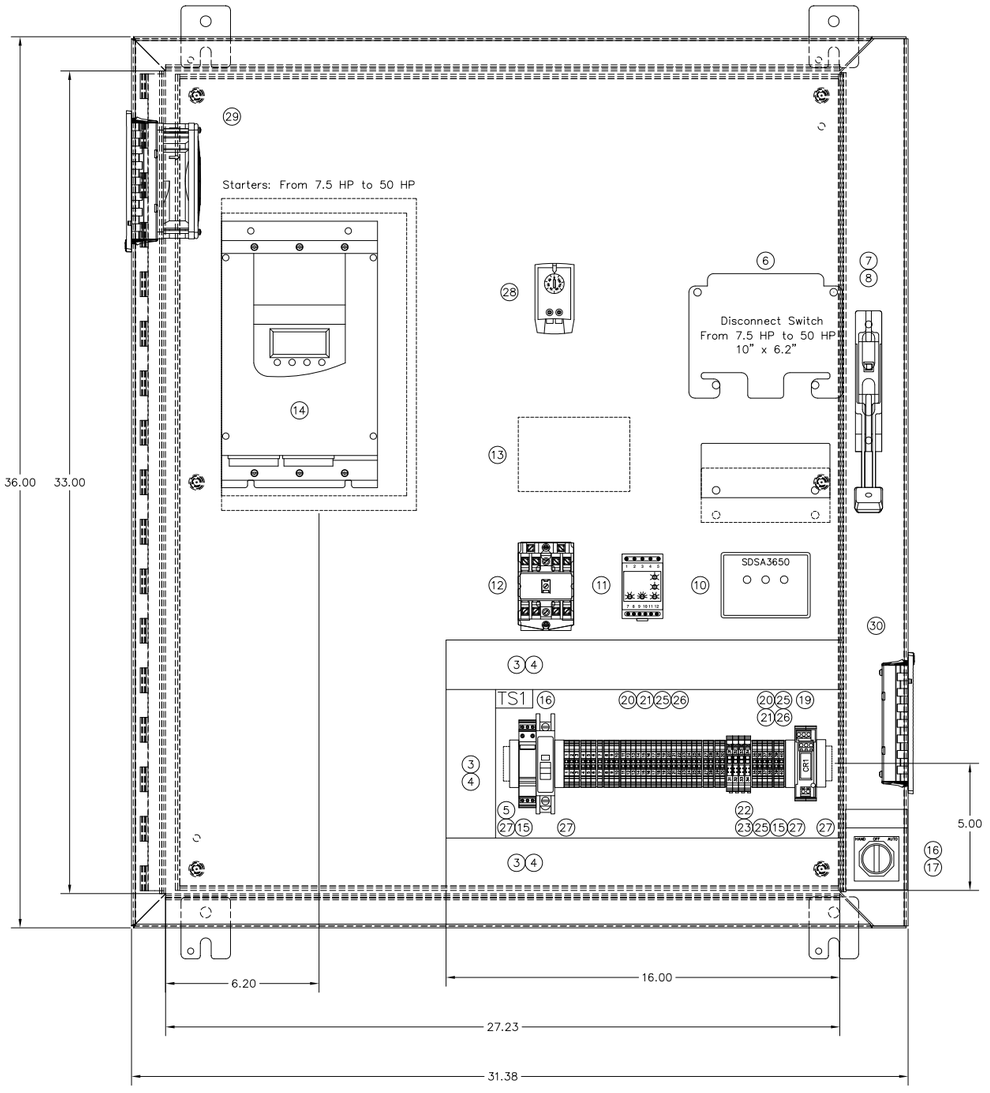
TITLE: 3 PHASE – SOFT START PUMP PANEL

LOGIC WIRING

W.O.#

SHEET 2 OF 3





BILL OF MATERIALS

ITEM	QTY	PART NO.	DESCRIPTION	MFG
1	1	A36SA3212LPPL	DISCONNET ENCLOSURE TYPE 12	HOFFMAN
2	1	A36P30	BACKPLANE	HOFFMAN
3	AN	F2X4LG6	TYPE F NARROW SLOT WIRING DUCT	PANDUIT
4	AN	C2LG6	WIRING DUCT COVER	PANDUIT
5	AN	1492DR6	EXTENDED DIN RAIL	ALLEN BRADLEY
6	1	REFER TO TABLE 1	DISCONNECT	SQUARE D
7	1	9422A1	HANDLE	SQUARE D
8	1	9422 TDK-2	DOOR MOUNT	SQUARE D
9	3	REFER TO TABLE 1	480V DISCONNECT FUSE	BUSSMAN
10	1	SDSA3650	SECONDARY SURGE ARRESTER	SQUARE D
11	1	D65VMLS480C	PHASE MONITOR	EATON
12	1	8501XMO40V02	8501 TYPE X INDUSTRIAL CONTROL RELAY	SQUARE D
13*	1	1500-G-L1-S7	INDUCTION CONTROL RELAY	B/W CONTROL
14	1	REFER TO TABLE 1	ALTISTART 48	SQUARE D
15	1	PT2PE/S120FM	TERMITRAB AC SURGE PROTECTION	PHOENIX CONTACT
16	1	TMC 61C 10A #0902072	CIRCUIT BREAKER	PHOENIX CONTACT
17	1	9001KS43BH2	SELECTOR SWITCH	SQUARE D
18	1	9001KN160WP	HOA LEGEND PLATE	SQUARE D
19	1	UMK 22 REL 24	RELAY MODULE, DPDT	PHOENIX CONTACT
20	36	UT2,5	UT2,5 TERMINALS	PHOENIX CONTACT
21	1	UT2,5PE	GROUND TERMINAL	PHOENIX CONTACT
22	4	UT4TG	FUSE TERMINAL BASE	PHOENIX CONTACT
23	4	P-FU5X20LA250	FUSE PLUG	PHOENIX CONTACT
24	3	FBS 20-5 #3036929	FIXED BRIDGE	PHOENIX CONTACT
25	3	D-UT2,5/10	END COVER	PHOENIX CONTACT
26	6	ATP-UT	PARTITION PLATES	PHOENIX CONTACT
27	4	E/NS35N	END CLAMP	PHOENIX CONTACT
28*	1	FLZ 530	THERMOSTAT	PFANNENBERG
29*	1	PF 22000	FAN FILTER KIT	PFANNENBERG
30*	1	PFA 20000	LOUVER FILTER KIT	PFANNENBERG

13 – WILL BE USED IF THERE IS NO SUBMERSIBLE TRANSMITTER AVAILABLE..*
28,29*,30* – WILL BE USED ON ALL INDOOR APPLICATIONS..*

TABLE 1 – ADDITIONAL PART NUMBERS

STARTER	APPLICATION	ALTISTART 48	DISCONNECT	DISCONNECT FUSE
10 HP	7.5 HP	ATS48D17Y	TCF331	FRS-R-20
15 HP	10 HP	ATS48D22Y	TCF331	FRS-R-30
20 HP	15 HP	ATS48D32Y	TDF631	FRS-R-40
25 HP	20 HP	ATS48D38Y	TDF631	FRS-R-45
30 HP	25 HP	ATS48D47Y	TDF631	FRS-R-60
40 HP	30 HP	ATS48D62Y	TEF101	FRS-R-70
50 HP	40 HP	ATS48D75Y	TEF101	FRS-R-90
60 HP	50 HP	ATS48D88Y	TEF101	FRS-R-110

NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

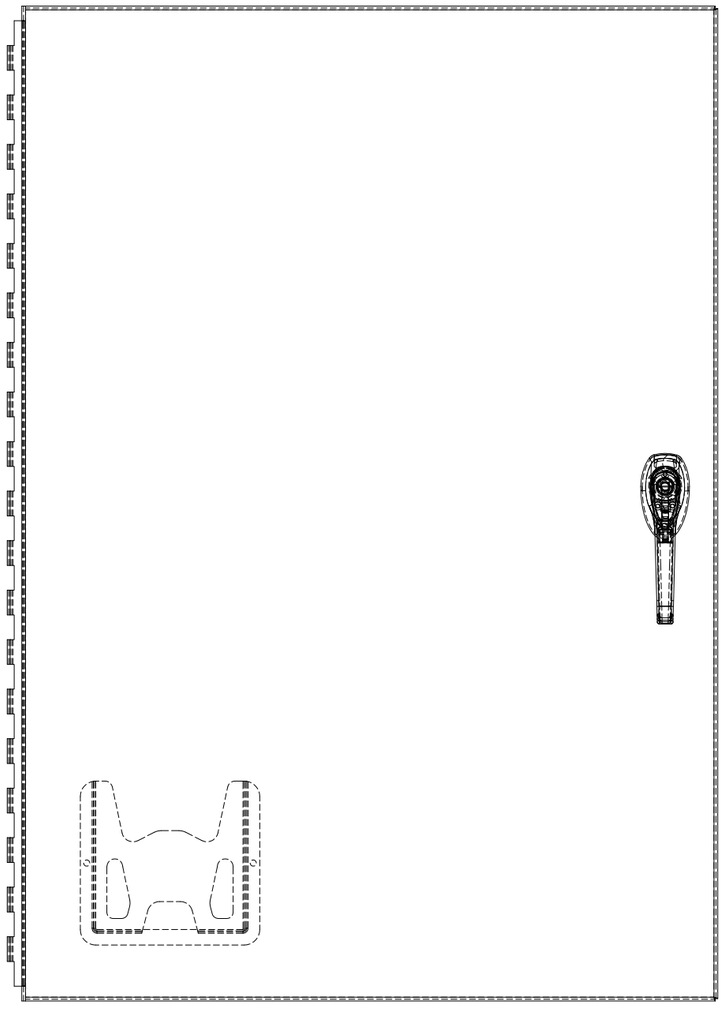
NAVAJO TRIBAL UTILITY AUTHORITY

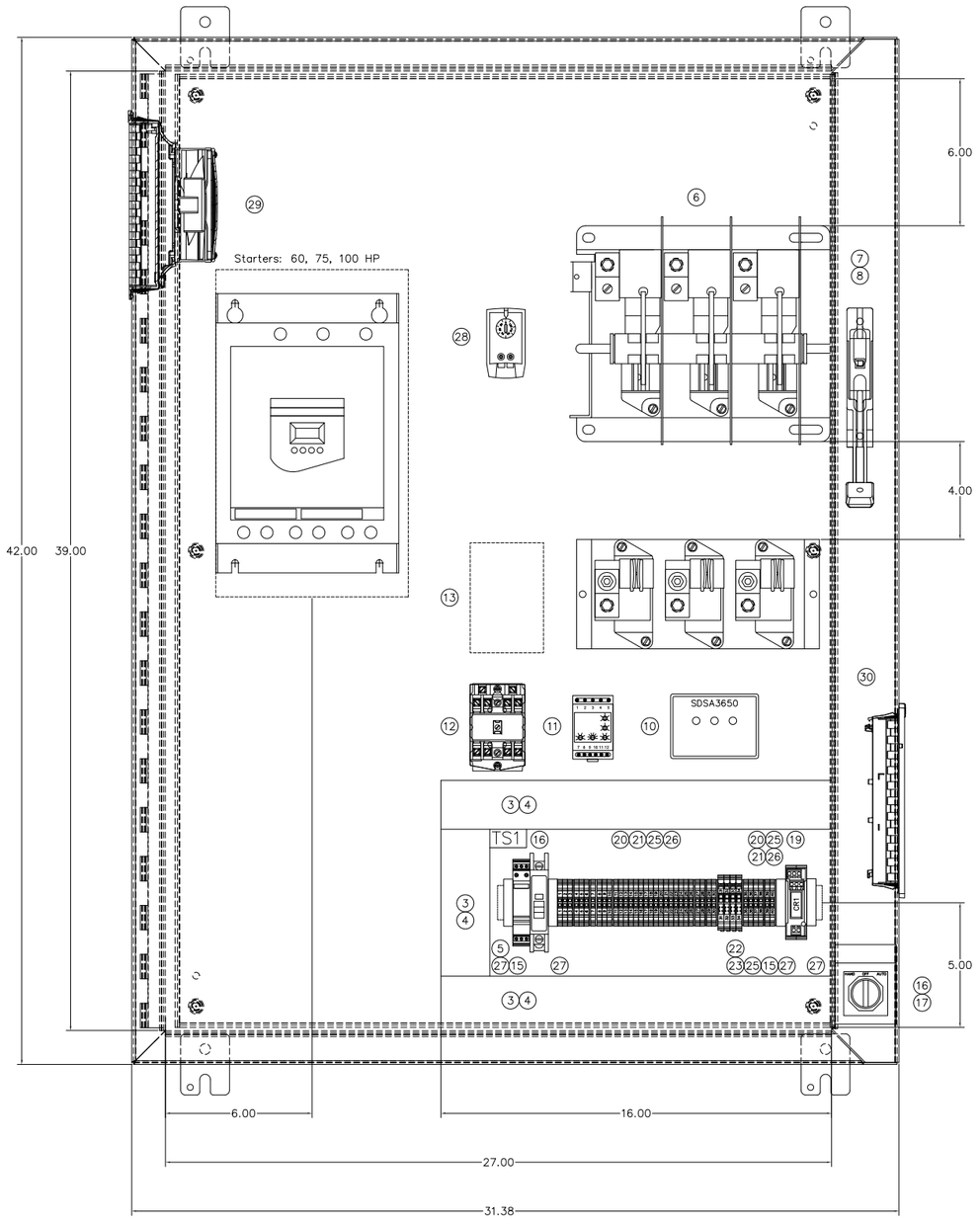
SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .			

TITLE: 3 PHASE – SOFT START PUMP PANEL
7.5 HP TO 50 HP APPLICATIONS
.
BACKPLANE

W.O.#

SHEET 3 OF 3





BILL OF MATERIALS

ITEM	QTY	PART NO.	DESCRIPTION	MFG
1	1	A-42SA3212LPPL	DISCONNET ENCLOSURE TYPE 12	HOFFMAN
2	1	A-42P30	BACKPLANE	HOFFMAN
3	AN	F2X4LG6	TYPE F NARROW SLOT WIRING DUCT	PANDUIT
4	AN	C2LG6	WIRING DUCT COVER	PANDUIT
5	AN	1492DR6	EXTENDED DIN RAIL	ALLEN BRADLEY
6	1	REFER TO TABLE 1	DISCONNECT	SQUARE D
7	1	9422A1	HANDLE	SQUARE D
8	1	9422 TDK-2	DOOR MOUNT	SQUARE D
9	3	REFER TO TABLE 1	480V DISCONNECT FUSE	BUSSMAN
10	1	SDSA3650	SECONDARY SURGE ARRESTER	SQUARE D
11	1	D65VMLS480C	PHASE MONITOR	EATON
12	1	8501XMO40V02	8501 TYPE X INDUSTRIAL CONTROL RELAY	SQUARE D
13*	1	1500-G-L1-S7	INDUCTION CONTROL RELAY	B/W CONTROL
14	1	REFER TO TABLE 1	ALTISTART 48	SQUARE D
15	1	PT2PE/S120FM	TERMITRAB AC SURGE PROTECTION	PHOENIX CONTACT
16	1	TMC 61C 10A #0902072	CIRCUIT BREAKER	PHOENIX CONTACT
17	1	9001KS43BH2	SELECTOR SWITCH	SQUARE D
18	1	9001KN160WP	HOA LEGEND PLATE	SQUARE D
19	1	UMK 22 REL 24	RELAY MODULE, DPDT	PHOENIX CONTACT
20	36	UT2,5	UT2,5 TERMINALS	PHOENIX CONTACT
21	1	UT2,5PE	GROUND TERMINAL	PHOENIX CONTACT
22	4	UT4TG	FUSE TERMINAL BASE	PHOENIX CONTACT
23	4	P-FU5X20LA250	FUSE PLUG	PHOENIX CONTACT
24	3	FBS 20-5 #3036929	FIXED BRIDGE	PHOENIX CONTACT
25	3	D-UT2,5/10	END COVER	PHOENIX CONTACT
26	6	ATP-UT	PARTITION PLATES	PHOENIX CONTACT
27	4	E/NS35N	END CLAMP	PHOENIX CONTACT
28*	1	FLZ 530	THERMOSTAT	PFANNENBERG
29*	1	PF 32000	FAN FILTER KIT	PFANNENBERG
30*	1	PFA 30000	LOUVER FILTER KIT	PFANNENBERG

13 – WILL BE USED IF THERE IS NO SUBMERSIBLE TRANSMITTER AVAILABLE..*
28,29*,30* – WILL BE USED ON ALL INDOOR APPLICATIONS..*

TABLE 1 – ADDITIONAL PART NUMBERS

STARTER	APPLICATION	ALTISTART 48	DISCONNECT	DISCONNECT FUSE
75 HP	60 HP	ATS48C11Y	TF2	FRS-R-150
100 HP	75 HP	ATS48C14Y	TF2	FRS-R-175
125 HP	100 HP	ATS48C17Y	TF2	FRS-R-200

NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: NONE	REVISIONS	BY	DATE
DATE:			
DRN. CKD.			
APV'D.			

TITLE: 3 PHASE – SOFT START PUMP PANEL
60, 75, 100 HP APPLICATIONS

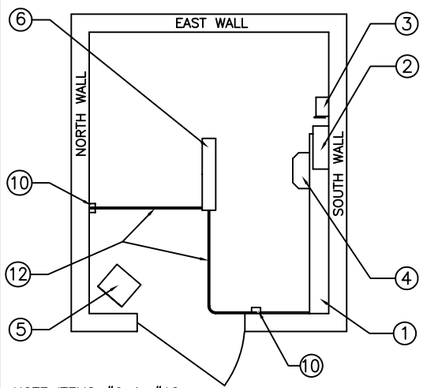
BACKPLANE

W.O.#

SHEET 3 OF 3

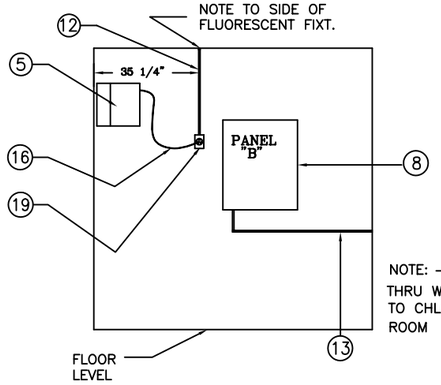
CONTROL ROOM

FLOOR PLAN

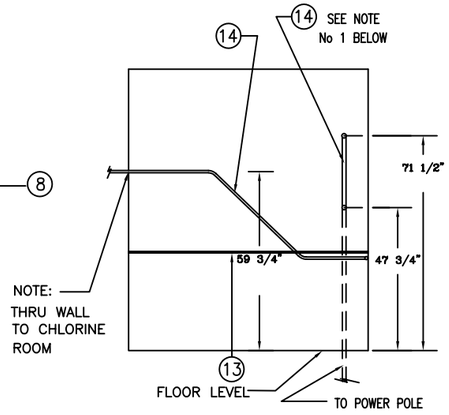


NOTE ITEMS #6 & #12
ARE ON CELLING

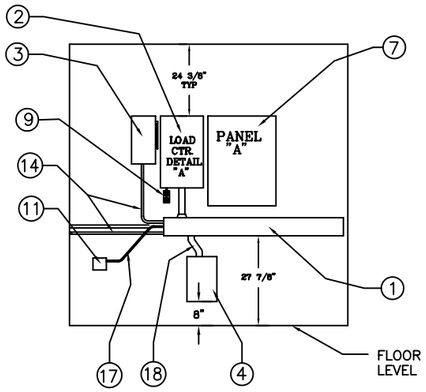
NORTH WALL



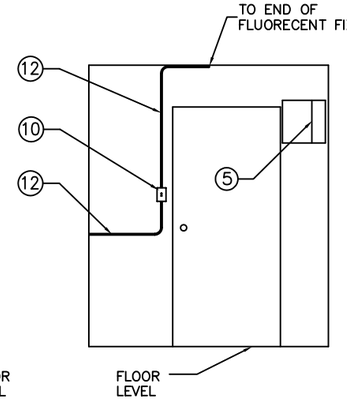
EAST WALL



SOUTH WALL



WEST WALL



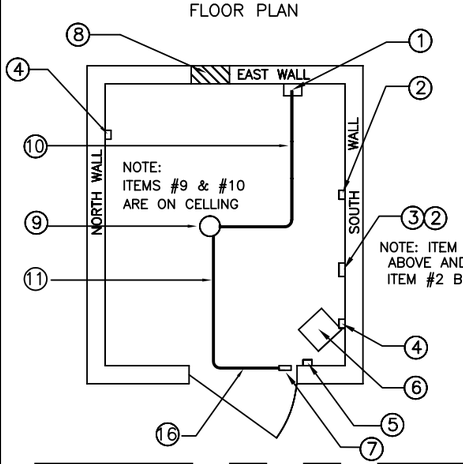
NOTE: 1.
ITEM No 14, w/3-#2 THHN AND 1-#2 GRND. (CABLES PULLED FROM POWER POLE).
CABLES ARE STUBBED OUT AND ARE TO BE TERMINATED IN THE PUMP PANELS

BILL OF MATERIAL — CONTROL ROOM

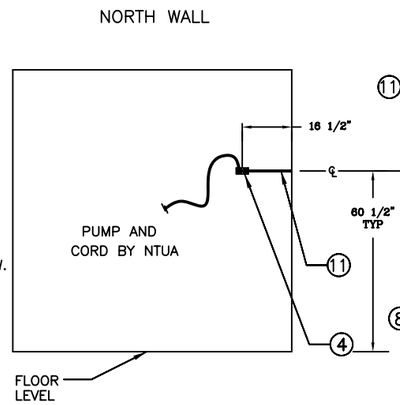
ITEM	DESCRIPTION	QTY.	BRAND, MODEL, SIZE
1	GUTTER	1	6 x 60" x 6-3/8
2	LOAD CENTER W/100 AMP MAIN BREAKER	1	SQUARE D Q 016W 100 RB 22-1/8 x 14-3/8 x 5-1/4
3	DISC SW W/HANDLE W/FRS-30R FUSES	1	SQUARE D H 361 NRB 15-1/8 x 6-3/8 x 4-1/4
4	TRANSFORMER	1	ACME # T253517-3S 15 x 12 x 12 15KVA, 3PH, 460/240-120 VAC
5	HEATER, 220V, 4000 WATT	1	DAYTON # 3UG52 11 x 10-1/2 x 9-3/4
6	FLUORESCENT LIGHT	1	4-1/2 W x 48 LONG
7	PROPOSED PANEL "A"	1	HONEYWELL # L404B-1353 4-1/2 x 3 x 2
8	PROPOSED PANAL "B"	1	SAGINAW # SCE-362410LP 36H x 24W x 10D NEMA 12
9	DUPLEX RECPT - 120V	1	4-1/2 x 3 x 2
10	LIGHT SWITCH	1	4-1/2 x 3 x 2
11	PRESSURE SWITCH, DPDT	1	HONEYWELL # L404B-1353 4-1/2 x 3 x 2
12	1/2" RIDGID CONDUIT	As Req	X
13	3/4" RIDGID CONDUIT	As Req	X
14	1" RIDGID CONDUIT	As Req	X
15	2" RIDGID CONDUIT	As Req	X
16	# 14/3 SJT CORD	As Req	X
17	1/2" SEALTITE	As Req	X
18	2" SEALTITE	As Req	X
19	SINGLE RECPT - 220V	1	4-1/2 x 3 x 2

CHLORINE ROOM

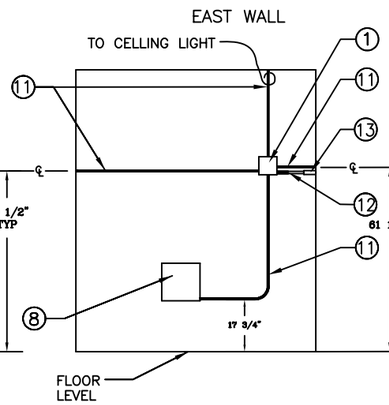
FLOOR PLAN



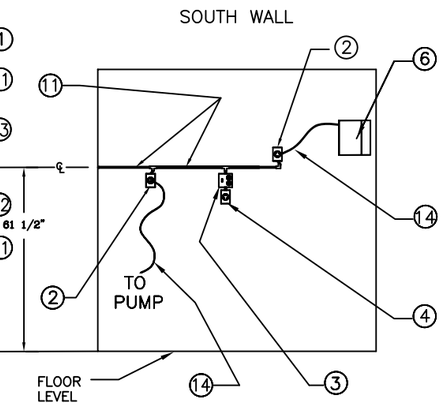
NORTH WALL



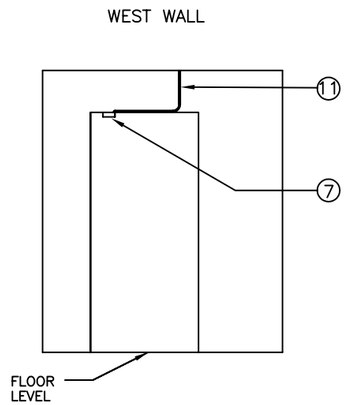
EAST WALL



SOUTH WALL



WEST WALL

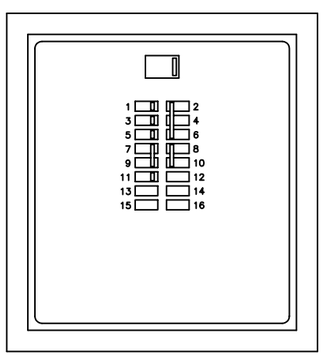


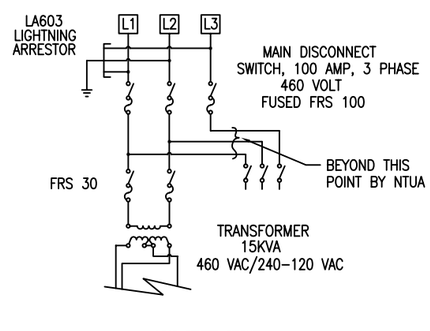
BILL OF MATERIAL — CHLORINE ROOM

ITEM	DESCRIPTION	QTY.	BRAND, MODEL, SIZE
1	JCT BOX	1	6 x 6 x 4
2	ONE GANG REC. BOX, 220V	1	4-1/2 x 3 x 2
3	TWO GANG DUP RECP W/SP SW	1	4-1/2 x 4-1/2 x 2
4	ONE GANG RECP BOX, 120V	1	4-1/2 x 3 x 2
5	ONE GANG SW BOX, S/P	1	4-1/2 x 3 x 2
6	HEATER, 220V	1	DAYTON # 3UG52 11 x 10-1/2 x 9-3/4
7	DOOR SWITCH (LIMIT) FOR EXHAUST FAN	1	CUTLER HAMMER # E50 AR/E50 KL25 4 x 1-1/2 x 2
8	EXHAUST FAN, (BY CUSTOMER)	1	12-1/2 x 12-3/4 x THRU WALL
9	VAPOR TITE LIGH FIXT, 100W	1	X
10	1/2" RIDGID CONDUIT	As Req	X
11	3/4" RIDGID CONDUIT	As Req	X
12	1" RIDGID CONDUIT	As Req	X
13	1" SEALOFF (To Ctrl Room)	As Req	X
14	#16/3 S/O CORD	As Req	X
15	# 14/3 SJT CORD	As Req	X
16	1/2" SEALTITE	As Req	X

LOAD CENTER DETAIL "A"

LOAD CENTER CIRCUITS, BREAKER LOCATION & BKR/CAT No.							
SPACE No.	BREAKER FOR	AMP	POLES	SPACE No.	BREAKER FOR	AMP	POLES
1	PUMP CONTRL	QO 115	SP	2	BOOSTER CHEMICAL PUMPS	QO 315	3P
3	CONTROL RM LIGHTS	QO 115	SP	4			
5	CHLORINE RM LIGHTS	QO 115	SP	6			
7	CONTROL ROOM HEATER	QO 215	DP	8	CHLORINE ROOM HEATER	QO 215	DP
9				10			
11	RECEPTACLE - 120 V	QO 115	SP	12	SPACE		
13	SPACE			14	SPACE		
15	SPACE			16	SPACE		





LOAD CENTER CIRCUIT

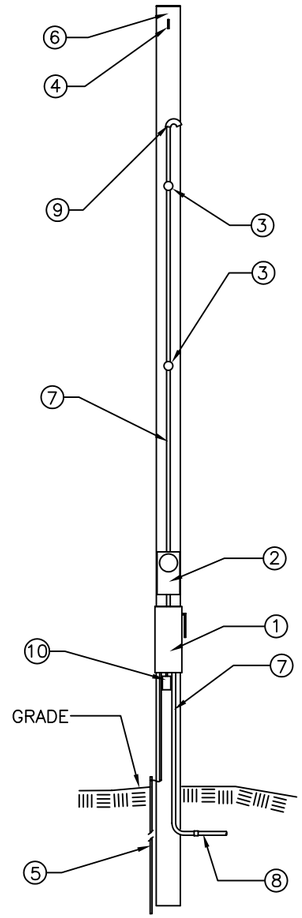
REVISION	DATE	DESCRIPTION	BY

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

PUMP HOUSE LAYOUT

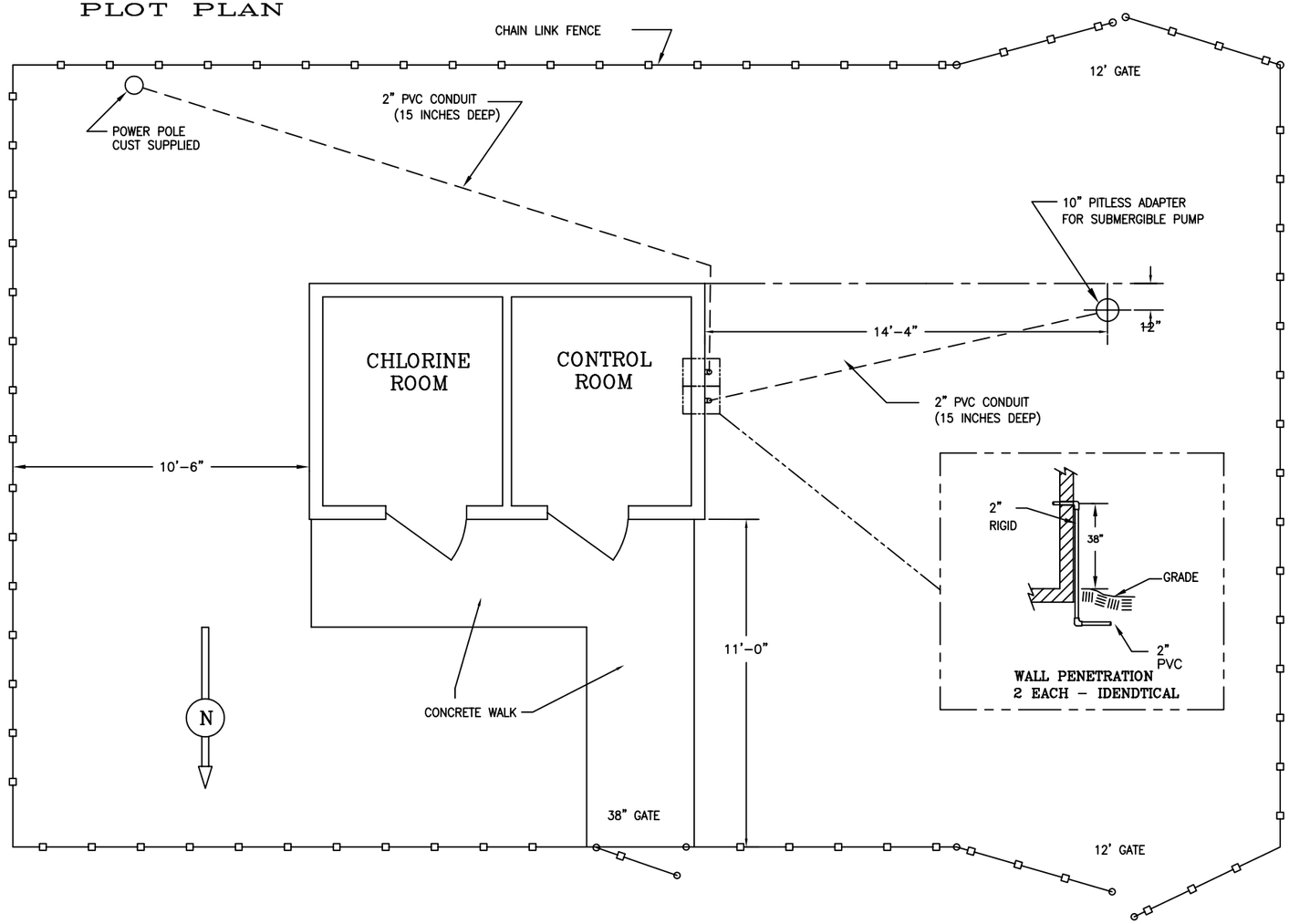
PUBLIC LAW 86-121
OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA INDIAN HEALTH SERVICE

DRAWN BY: PLOTCAD DATE: 9/19/97	CHECKED BY: M.N. DATE: 1/16/98	SURVEYED BY: DATE:	AUTOCAD DRAWING
FARMINGTON FIELD OFFICE FARMINGTON, NEW MEXICO	FILENAME: CARSON PUMP HSES.dwg UPDATED: 1/16/98	SHEET 1 OF 2 TOTAL SHEETS	



POWER POLE

PLOT PLAN



BILL OF MATERIAL POWER POLE

ITEM	DESCRIPTION	QTY.	BRAND, MODEL, SIZE
1	R/T DISCONNECT FRS-100R W/FUSES	1	SQUARE D 100 AMP # 361 NRB 15-1/8 x 6-3/8 x 4-1/4
2	METER SOCKET, 7 TERM, 3 PHASE	1	DURHAM # R6821-7N-N 22-1/8 x 14-3/8 x 5-1/4
3	STAND OFFS	1	15-1/8 x 6-3/8 x 4-1/4
4	EYEBOLT	1	15 x 12 x 12
5	GROUND ROD	1	5/8 DIA x 10 FT LG
6	POLE	1	8 in DIA x 25 ft LONG BY CUST
7	2" RIDGID CONDUIT	As Req	
8	2" PVC	As Req	
9	ENTRANCE HEAD	1	
10	LIGHTNING ARRESTOR	1	DELTA LIGHTNING ARRESTOR Co. # LA603

REVISION	DATE	DESCRIPTION	BY

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

PUMP HOUSE LAYOUT

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