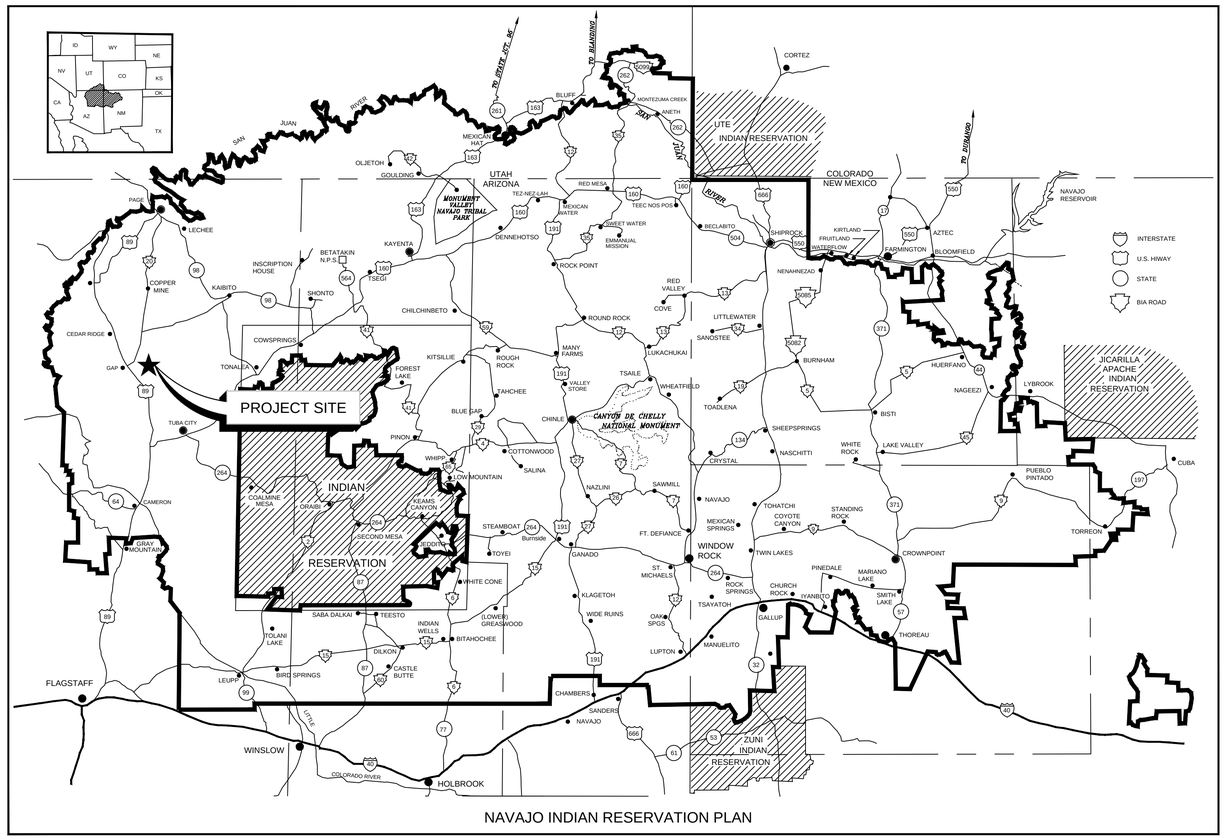
NAVAJO NATION

WESTERN NAVAJO PIPELINE PHASE I
BODAWAY-GAP WELL, TANK, AND PIPELINE PROJECT
OCTOBER 2021
BID ISSUE



NAVAJO INDIAN RESERVATION PLAN

LOCATION MAP
PLAN
NOT TO SCALE

PLAN NORTH

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

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Registered Professional Surveyor Certificate
63511
STEVEN BRENCHLEY
Date Signed 10/3/21
ARIZONA, U.S.A.

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS		
REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	J. YAZZIE
DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
G-000.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

GENERAL

COVER SHEET

DRAWING NUMBER
G-000

SHEET NUMBER
1 OF 76

Path: C:\BCPW\D1020278 FILENAME: G-000.DWG PLOT DATE: 10/1/2021 3:36 PM CAD USER: TYLER PRIDEMORE

GENERAL

SHEET NO.	DWG NO.	DWG TITLE
1	G-000	COVER SHEET
2	G-001	DRAWING INDEX
3	G-002	STANDARD SYMBOLS
4	G-003	STANDARD ABBREVIATIONS
5	G-004	VICINITY MAP

SURVEY

SHEET NO.	DWG NO.	DWG TITLE
6	V-001	RESULTS OF SURVEY
7	V-002	RESULTS OF SURVEY
8	V-003	RESULTS OF SURVEY

CIVIL

SHEET NO.	DWG NO.	DWG TITLE
9	C-001	GENERAL CIVIL NOTES AND SYMBOLS
10	C-002	CONTROL COORDINATES
11	C-003	MISCELLANEOUS DETAILS
12	C-004	MISCELLANEOUS DETAILS
13	C-100	BODAWAY-GAP WELL NO. 3 SITE AND GRADING PLAN
14	C-101	BODAWAY-GAP WELL NO. 3 PIPING PLAN
15	C-102	BODAWAY-GAP WELL NO. 3 SITE ELEVATION
16	C-110	BODAWAY-GAP STORAGE TANK NO. 2 SITE AND GRADING PLAN
17	C-111	BODAWAY-GAP STORAGE TANK NO. 2 PIPING PLAN
18	C-112	BODAWAY-GAP STORAGE TANK NO. 2 DRAIN LINE PLAN & PROFILE
19	C-113	BODAWAY-GAP STORAGE TANK NO. 2 PIPING PLAN & ELEVATION
20	C-114	BODAWAY-GAP STORAGE TANK NO. 2 PLAN & ELEVATION
21	C-120	BOADWAY GAP ALTITUDE AND FLOW CONTROL VALVE SITE PLAN & DETAILS
22	C-200	KEY MAP
23	C-201	STA 10+00 - STA 19+00 PLAN & PROFILE
24	C-202	STA 19+00 - STA 28+00 PLAN & PROFILE
25	C-203	STA 28+00 - STA 37+00 PLAN & PROFILE
26	C-204	STA 37+00 - STA 46+00 PLAN & PROFILE
27	C-205	STA 46+00 - STA 55+00 PLAN & PROFILE
28	C-206	STA 55+00 - STA 64+00 PLAN & PROFILE
29	C-207	STA 64+00 - STA 73+00 PLAN & PROFILE
30	C-208	STA 73+00 - STA 82+00 PLAN & PROFILE
31	C-209	STA 82+00 - STA 91+00 PLAN & PROFILE
32	C-210	STA 91+00 - STA 100+00 PLAN & PROFILE
33	C-211	STA 100+00 - STA 109+00 PLAN & PROFILE
34	C-212	STA 109+00 - STA 118+00 PLAN & PROFILE
35	C-213	STA 118+00 - STA 127+00 PLAN & PROFILE
36	C-214	STA 127+00 - STA 136+00 PLAN & PROFILE
37	C-215	STA 136+00 - STA 145+00 PLAN & PROFILE
38	C-216	STA 145+00 - STA 154+00 PLAN & PROFILE
39	C-217	STA 154+00 - STA 163+00 PLAN & PROFILE
40	C-218	STA 163+00 - STA 172+00 PLAN & PROFILE
41	C-219	STA 172+00 - STA 181+00 PLAN & PROFILE
42	C-220	STA 181+00 - STA 190+00 PLAN & PROFILE
43	C-221	STA 190+00 - STA 199+00 PLAN & PROFILE
44	C-222	STA 199+00 - STA 208+00 PLAN & PROFILE
45	C-223	STA 208+00 - STA 217+00 PLAN & PROFILE
46	C-224	STA 217+00 - STA 226+00 PLAN & PROFILE
47	C-225	STA 226+00 - STA 235+00 PLAN & PROFILE
48	C-226	STA 235+00 - STA 244+00 PLAN & PROFILE
49	C-227	STA 244+00 - STA 253+00 PLAN & PROFILE
50	C-228	STA 300+00 - STA 309+00 PLAN AND PROFILE
51	C-229	STA 309+00 - STA 318+00 PLAN AND PROFILE
52	C-230	STA 318+00 - STA 327+00 PLAN AND PROFILE
53	C-231	STA 327+00 - STA 336+00 PLAN AND PROFILE
54	C-232	STA 336+00 - STA 345+00 PLAN AND PROFILE
55	C-233	STA 345+00 - STA 354+00 PLAN AND PROFILE
56	C-234	STA 345+00 - STA 363+00 PLAN AND PROFILE
57	C-235	STA 363+00 - STA 372+00 PLAN AND PROFILE
58	C-236	STA 372+00 - STA 381+00 PLAN AND PROFILE
59	C-237	STA 381+00 - STA 390+00 PLAN AND PROFILE

STRUCTURAL

SHEET NO.	DWG NO.	DWG TITLE
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61	S-002	SPECIAL INSPECTIONS
62	S-110	STORAGE TANK NO. 2 FOUNDATION PLAN & SECTION

ELECTRICAL

SHEET NO.	DWG NO.	DWG TITLE
63	E-001	SYMBOLS, ABBREVIATIONS, AND NOTES
64	E-002	CONTROL AND ONE-LINE DIAGRAM LEGENDS AND SYMBOLS
65	E-003	STANDARD DETAILS 1
66	E-004	STANDARD DETAILS 2
67	E-005	STANDARD DETAILS 3
68	E-100	BODAWAY-GAP WELL NO. 3 ELECTRICAL SITE PLAN
69	E-101	BODAWAY-GAP WELL NO. 3 PUMP HOUSE PLAN
70	E-102	BODAWAY-GAP WELL NO. 3 ONE-LINE DIAGRAM
71	E-110	BODAWAY-GAP STORAGE TANK NO. 2 SITE PLAN
72	E-120	EXISTING BODAWAY-GAP STORAGE TANK SITE PLAN
73	E-130	BODAWAY-GAP ELECTRICAL SUBSTATION SITE PLAN
74	E-140	PRESTON MESA SITE PLAN

INSTRUMENTATION

SHEET NO.	DWG NO.	DWG TITLE
75	I-001	BODAWAY-GAP COMMUNICATIONS BLOCK DIAGRAM

PROCESS

SHEET NO.	DWG NO.	DWG TITLE
76	P-100	HYDRAULIC GRADE LINE DIAGRAM

NTUA STANDARD DETAILS FOR WATER

DWG NO.	DWG TITLE
WS-10	AIR RELEASE VALVE DETAIL
WS-11	2" FLUSH VALVE DETAIL
WS-13	MARKER POST DETAIL
WS-14	WATER MAIN VALVE INSTALLATION
WS-17a	TYPICAL ROAD CROSSING FOR NTUA WATERLINES
WS-18	INSTALLATION OF SKIDS INSIDE CASING
WS-19	GRAVITY/THRUST BLOCK DETAILS
WS-19a	GRAVITY/THRUST BLOCK CHART

IHS STANDARD DETAILS

DWG NO.	DWG TITLE
W-14	4" PUMPHOUSE PIPING LIST NO. 901550
W-15	GAS CHLORINATION LIST NO. 902000
W-20	WATER STORAGE TANK (MODIFIED BY BC) (1 THRU 4)
W-23	PREFAB PUMP HOUSE EXTERIOR FACILITIES LAYOUT
W-28	ALTITUDE VALVE
W-29	TWO-ROOM PRECAST PUMPHOUSE
W-32	TANK VAULT ELECTRONIC TRANSMITTER PIPING SYSTEM
W-34	FENCE DETAIL FOR STORAGE TANK AND PUMPHOUSE
W-39	SILT FENCE
W-40	STRAW BALES

NTUA TECHNICAL PROVISIONS

DWG NO.	DWG TITLE
1 OF 6	DC TANK PANEL COVER SHEET
2 OF 6	DC TANK CONTROL PANEL DISCRETE IO
3 OF 6	DC TANK CONTROL PANEL ANALOG IO
4 OF 6	DC TANK CONTROL PANEL POWER DISTRIBUTION
5 OF 6	DC TANK CONTROL PANEL BDCKPLANE
6 OF 6	DC TANK CONTROL PANEL CABLE PINOUT
1 OF 6	AC TANK PANEL COVER SHEET
2 OF 6	AC TANK CONTROL PANEL DISCRETE IO
3 OF 6	AC TANK CONTROL PANEL ANALOG IO
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
1 OF 2	PUMP HOUSE LAYOUT
2 OF 2	PUMP HOUSE LAYOUT

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Billings, Montana 59101
406-656-6399

Registered Professional Engineer CERTIFICATE NO. 63511 STEVEN BRENCHLEY Date Signed 10/3/21 ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED: J. YAZZIE
DRAWN: T. PRIDEMORE
CHECKED: J. YAZZIE
CHECKED: E. DESOUZA
APPROVED: S. BRENCHLEY

FILENAME
G-001.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

GENERAL

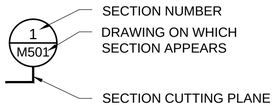
DRAWING INDEX

DRAWING NUMBER
G-001

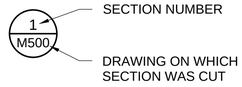
SHEET NUMBER
2 OF 76

SECTION AND DETAIL DESIGNATION

(1) SECTION CUT ON DWG M500



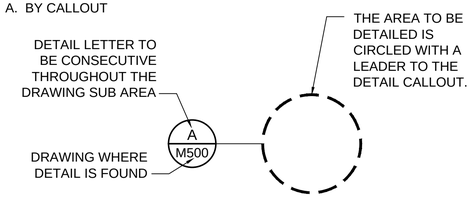
(2) ON DWG M501 THIS SECTION IS IDENTIFIED



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

(4) DETAIL CALLOUT:

A. BY CALLOUT



B. BY NOTE: "SEE DETAIL B/C-007"

- B IS DETAIL REFERENCE LETTER
- C-007 IS DRAWING WHERE DETAIL IS SHOWN

DRAWING NUMBERING SYSTEM

1. THE DRAWINGS ARE SUBDIVIDED BY DISCIPLINE AS FOLLOWS:

G	GENERAL
V	SURVEY
C	CIVIL
S	STRUCTURAL
E	ELECTRICAL
I	INSTRUMENTATION
P	PROCESS

GENERAL SYMBOLS

	NEW FACILITIES
	PROPERTY LINE
	RIGHT OF WAY (EASEMENT)
	EDGE OF PAVEMENT
	CENTERLINE
	HIDDEN LINE
	FENCE
	WATER SURFACE
@	AT
&	AND
Ø	DIAMETER
℄	CENTER LINE
'	FEET
"	INCHES

	NATURAL GROUND OR GRADE
	COMPACTED GRADE OR FILL
	GRANULAR MATERIAL/ AGGREGATE BASE
	AC PAVEMENT IN PLAN OR SECTION
	EXISTING ROADWAY
	PAVEMENT IN PLAN
	GRAVEL SURFACE WITH GEOTEXTILE IN PLAN

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

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Registered Professional Engineer (Civil) CERTIFICATE NO. 63511 STEVEN BRENCHLEY Date Signed 10/3/19 ARIZONA, U.S.A.

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REVISIONS

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DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
G-002.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

GENERAL

STANDARD SYMBOLS

DRAWING NUMBER
G-002

SHEET NUMBER
3 OF 76

A	AMPERE
AC	ASPHALTIC CONCRETE
A/C	AIR CONDITIONING
ACC	AREA CONTROL CENTER
ACP	ASBESTOS CEMENT PIPE
ACST	ACOUSTIC
ACU	AIR CONDITIONING UNIT
AF	AIR FILTER
AHU	AIR HANDLING UNIT
AMD	AIR MONITORING DEVICE
.ANC	ANCHOR
AR	AIR RETURN
ARV	AIR RELEASE VALVE
AS	AIR SUPPLY
ATP	VERTICAL TURBINE PUMP AIR RELEASE VALVE
ATS	AUTOMATIC TRANSFER SWITCH
AV	ANGLE VALVE
BAC	BACTERIOLOGICAL
BAV	BALL VALVE
BC	BEGINNING OF CURVE
BCR	BEGINNING OF CURVE RETURN
BCOP	BARE COPPER
BFP	BACK FLOW PREVENTER
BFV	BUTTERFLY VALVE
BGAT	BOOLEAN GATE
BF	BLIND FLANGE
BHP	BRAKE HORSEPOWER
BSN	BAR SCREEN
BUV	BUTTERFLY 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
C	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
DU	DRIVE UNIT
DWF	DRY WEATHER FLOW
EA	EXHAUST AIR / ENVIRONMENTAL ASSESSMENT
EAT	ENTERING AIR TEMPERATURE
EAU	ENGINE ALTERNATOR UNIT
EC	END OF CURVE
ECU	EVAPORATIVE COOLING UNIT
ED	EXTRACTOR DAMPER, EQUIPMENT DRAIN
EE	EACH END
EF	EXHAUST FAN
EFF	EFFLUENT
EG	EXHAUST GRILLE
EJ	EXPANSION JOINT
EL	ELEVATION
ELL	ELBOW
EMBD	EMBEDDED
ENCL	ENCLOSURE
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), FAN
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
FIT	FLOW INDICATING TRANSMITTER
FL	FLOW LINE
FLC	FLOCCULATOR
FLP	FLUID POWER UNIT
FLR	FLOOR
FLT	FILTER
FM	FORCE MAIN , FLOW METER
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
GAC	GRANULATING ACTIVATED CARBON
GB	GRADE BREAK
GBV	GLOBE VALVE
GDR	GRINDER
GEN	GENERATOR
GFI	GROUND FAULT INTERRUPTOR
GPD	GALLONS PER DAY
GRDR	GRINDER
GRT	GROUT
GSP	GALVANIZED STEEL PIPE
GT	GATE
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
LCP	LOCAL CONTROL PANEL
LE	LEVEL METER
LEL	LOWER EXPLOSIVE LIMIT
LGW	LOWER GREASEWOOD
LIT	LEVEL INDICATION TRANSMITTER
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
MOV	MOTOR OPERATED VALVE
MUL/DIV	MULTIPLY/DIVIDE
MV	MUD VALVE, MILLIVOLT
MX	MIXER
N	NEUTRAL
NA	NONAUTOMATIC
NAOH	SODIUM HYDROXIDE
NEG	NEGATIVE
NC	NORMALLY CLOSED
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 , PRESSURE GAUGE
PID	PROPORTIONAL PLUS INTEGRAL PLUS DERIVATIVE CONTROL
PIT	PRESSURE INDICATING TRANSMITTER
PIVC	POINT OF INTERSECTION ON VERTICAL CURVE
PL	PROPERTY LINE, PIPELINE, PLATE
PLV	PLUG VALVE
PLYWD	PLYWOOD
PMP	PUMP
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 , PUMP STATION
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
RW	RECLAIMED WATER
RWCD	RECALIMED WATER CONSERVATION DISTRICT
RWL	RAINWATER LEADER
S	SOUTH, SILENCER
SB	SIGNAL BOX
SBD	SWITCHBOARD
SCR	SCRUBBER
SD	SPLITTER DAMPER, SMOKE DETECTOR
SEP	SEPARATOR
SG	SUPPLY GRILLE, SLUICE GATE
SI	SPEED INCREASER
SIM	SIMILAR
SL	SLOPE
SLG	SLIDE GATE
SLR	SILENCER
SN	SCREEN
SP	SPACE, SET POINT, STATIC PRESSURE
SPG	SPACING
SPT	SOUND POWERED TELEPHONE
SO2	SULFUR DIOXIDE
SPL	SPLICE
SR	SPEED REDUCER, SALT RIVER PROJECT
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
SUP	SUMP PUMP
SV	SOLENOID VALVE
SWB	SWITCHBOARD
SWGR	SWITCHGEAR
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
TNK	TANK
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
UG	UNDERGROUND
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
VEN	VENTILATOR
VFD	VARIABLE FREQUENCY DRIVE
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
WM	WATER METER
WSR	WALL SUPPLY REGISTER, WASHER
WSTP	WATERSTOP
WT	WATERTIGHT
WTP	WATER TREATMENT PLANT
WV	WATER VALVE
WWF	WELDED WIRE FABRIC, WET WEATHER FLOW
X	SPARE CONDUIT
XLP	CROSS LINKED POLYETHYLENE
XP	EXPLOSION-PROOF
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

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222 N. 32nd Street, #700
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406-656-6399

Registered Professional Engineer CERTIFICATE NO. 63511 STEVEN BRENCHLEY Date Signed 10/3/19 ARIZONA, U. S. A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	J. YAZZIE
DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
G-003.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

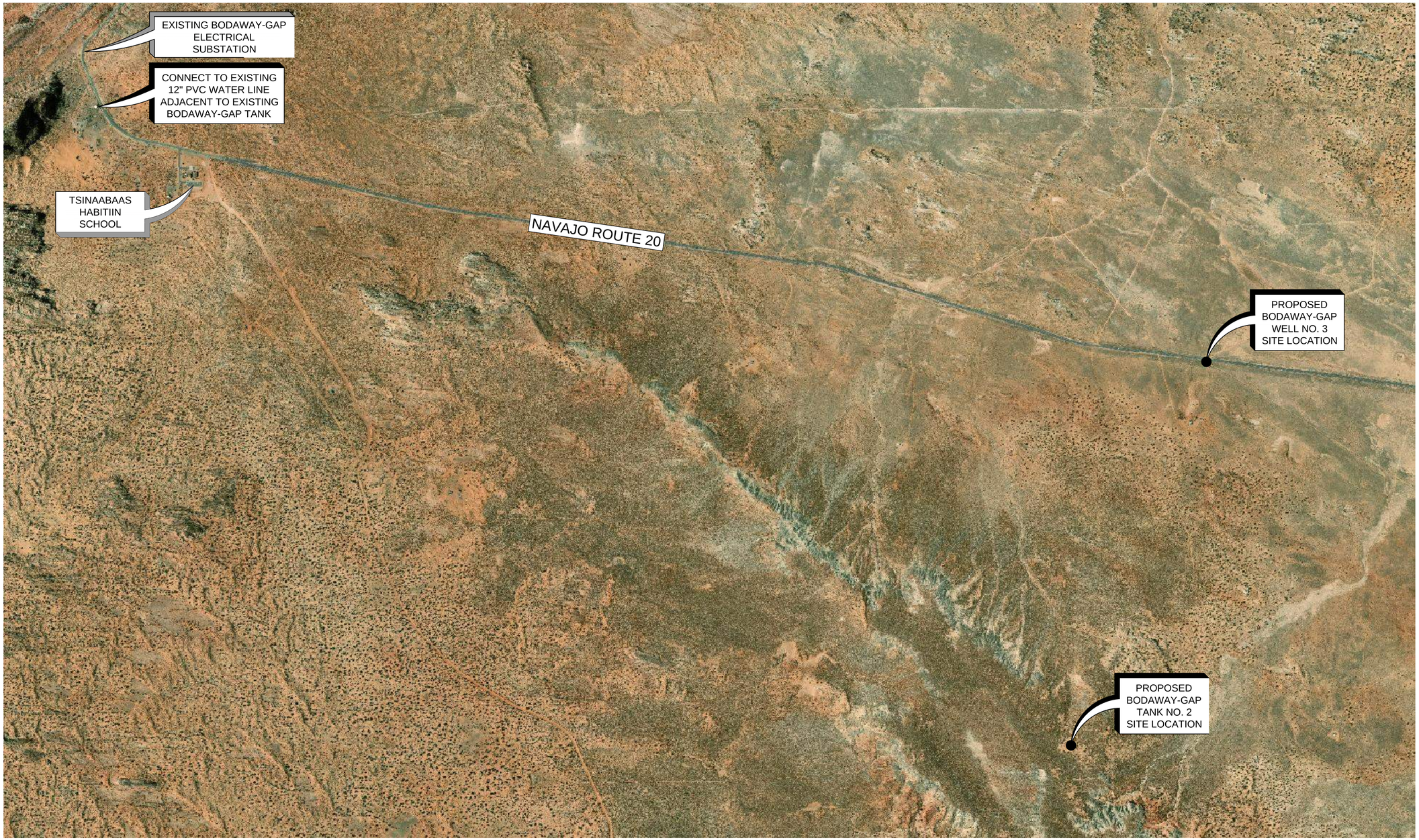
GENERAL

STANDARD ABBREVIATIONS

DRAWING NUMBER
G-003

SHEET NUMBER
4 OF 76

Path: P:\PROJECTS\NAVAJO NATION\150360_WESTERN NAVAJO PIPELINE DESIGN PHASE 1_CAD\01_BODAWAY GAP\2-SHEETS\G-GENERAL FILENAME: G-003.DWG PLOT DATE: 5/12/2020 3:36 PM CAD USER: TYLER PRIDEMORE



VICINITY MAP
PLAN

0 1000 2000
SCALE IN FEET

PLAN NORTH

Path: P:\PROJECTS\NAVAJO NATION\150360_WESTERN NAVAJO PIPELINE DESIGN PHASE 1_CAD\01_BODAWAY GAP\2-SHEETS\G-GENERAL FILENAME: G-004.DWG PLOT DATE: 5/12/2020 3:39 PM CAD USER: TYLER PRIDEMORE

Brown AND Caldwell

###
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Billings, Montana 59101
406-656-6399

Registered Professional Engineer (Civil)
CERTIFICATE NO.
63511
STEVEN
BRENCHLEY
Date Signed 10/3/19
ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	J. YAZZIE
DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
G-004.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

GENERAL

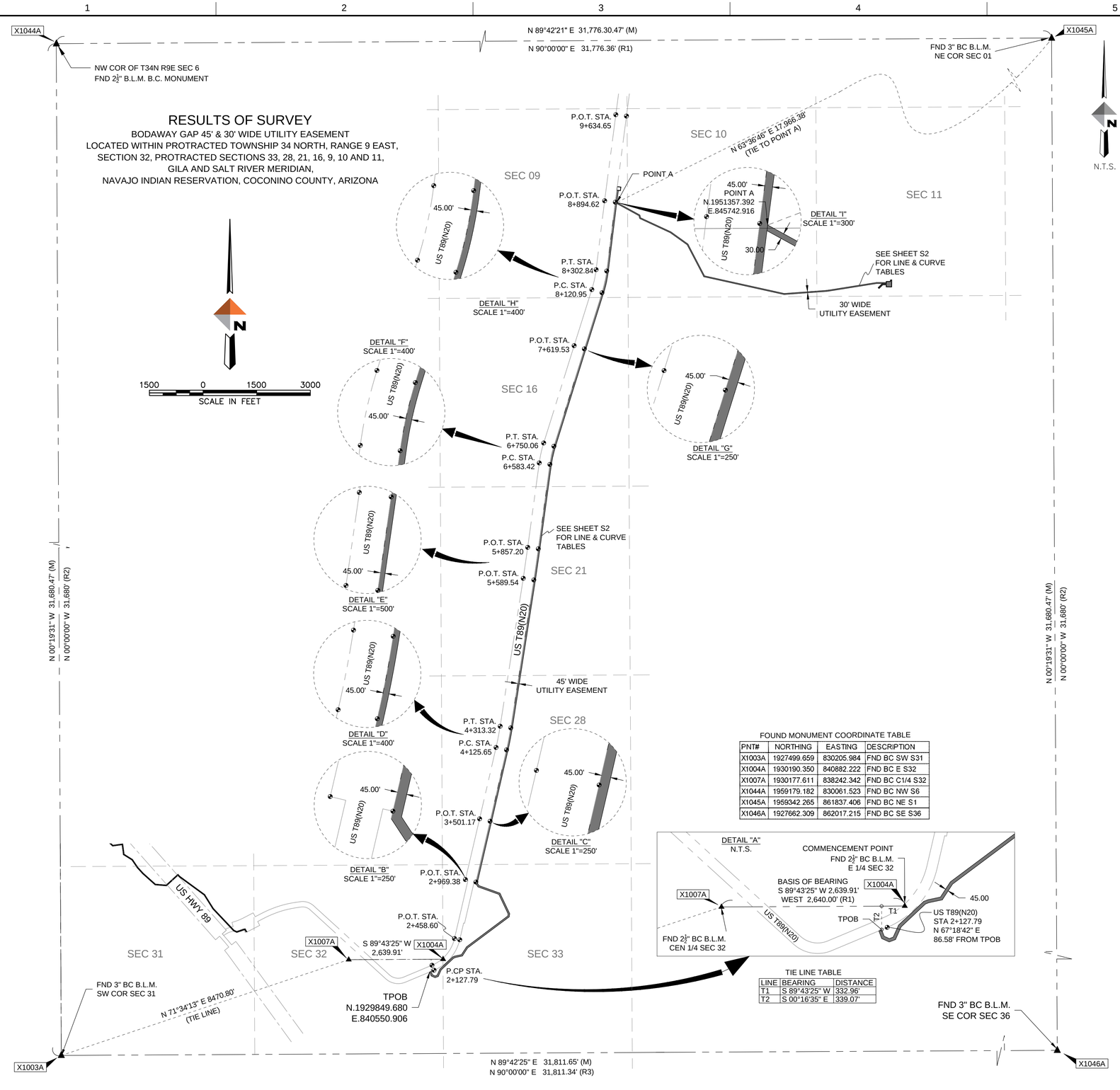
VICINITY MAP

DRAWING NUMBER
G-004

SHEET NUMBER
5 OF 76

RESULTS OF SURVEY

BODAWAY GAP 45' & 30' WIDE UTILITY EASEMENT
LOCATED WITHIN PROTRACTED TOWNSHIP 34 NORTH, RANGE 9 EAST,
SECTION 32, PROTRACTED SECTIONS 33, 28, 21, 16, 9, 10 AND 11,
GILA AND SALT RIVER MERIDIAN,
NAVAJO INDIAN RESERVATION, COCONINO COUNTY, ARIZONA



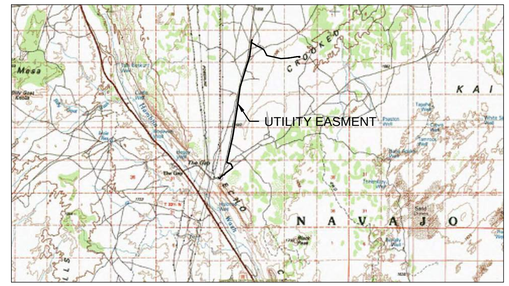
FOUND MONUMENT COORDINATE TABLE

PNT#	NORTHING	EASTING	DESCRIPTION
X1003A	1927499.659	830205.984	FND BC SW S31
X1004A	1930190.350	840882.222	FND BC E S32
X1007A	1930177.611	838242.342	FND BC C1/4 S32
X1044A	1959179.182	830061.523	FND BC NW S6
X1045A	1959342.265	861837.406	FND BC NE S1
X1046A	1927662.309	862017.215	FND BC SE S36

TIE LINE TABLE

LINE	BEARING	DISTANCE
T1	S 89°43'25" W	332.96'
T2	S 00°16'35" E	339.07'

VICINITY MAP



N.T.S.

LEGEND:

- FOUND B.L.M.SECTION MONUMENT AS NOTED
- HIGHWAY STATION IDENTIFIER
- SECTION LINE
- PROTRACTED SECTION LINE
- TIE LINE
- HIGHWAY RIGHT OF WAY LINE

BASIS OF BEARING

THE CENTRAL EAST SECTION LINE OF SECTION 32, T34N, R9E, WITH ARIZONA STATE PLANE COORDINATE CENTRAL ZONE GRID BEARING OF S 89°43'25" W.
UNITS: INTERNATIONAL FEET

REFERENCES:

R1) BUREAU OF LAND MANAGEMENT SURVEY PLAT 1294-4B, DATED MAY 10, 2013

R2) BUREAU OF LAND MANAGEMENT SURVEY PLAT 1294-4, DATED 1/27/2011

R3) BUREAU OF LAND MANAGEMENT SURVEY PLAT 1289-32, DATED 11/24/2010

R4) US89T(N20) EASEMENT FOR RIGHT OF WAY, BIA LAND TITLES-W427000049

CERTIFICATION:

I HEREBY CERTIFY THAT THE SURVEY SHOWN ON THIS DRAWING WAS PERFORMED UNDER MY DIRECTION AND THAT EXISTING OR PROPOSED SURVEY MONUMENTS AND MARKERS SHOWN ARE CORRECTLY DESCRIBED. I FURTHER CERTIFY THAT THIS DRAWING WAS PREPARED UNDER MY DIRECTION.

MICHAEL F. YORK, RLS
REGISTERED LAND SURVEYOR
RLS NUMBER 19862

GENERAL NOTE

- THIS SURVEY IS BASED ON NAD 83 AND THE ARIZONA STATE PLANE CENTRAL ZONE MEASURED IN INTERNATIONAL FEET.
- SURVEY ELEVATIONS ARE BASED ON NAVD 88 EXPRESSED IN U.S. SURVEY FEET.
- SHOWN MEASUREMENTS ARE AT GROUND VALUES NOT GRID VALUES. TO OBTAIN SPC GRID VALUES MULTIPLY THE DISTANCES SHOWN BY THE COMBINED SPC GRID FACTOR OF 0.999655550

Brown AND Caldwell
SALT LAKE CITY, UTAH

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Billings, Montana 59101
406-656-6399

Registered Professional Land Surveyor
19862
MICHAEL F. YORK
Date Signed 4/12/19
ARIZONA, U.S.A.
Expires 12/31/19

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	
DRAWN:	F. ORMSBY
CHECKED:	M. YORK
CHECKED:	
APPROVED:	M.YORK
FILENAME	SA14-VP-PR-21254-1-BASE.DWG
BC PROJECT NUMBER	150360
CLIENT PROJECT NUMBER	4028.21254.01

SURVEY

RESULTS OF SURVEY

DRAWING NUMBER
V-001

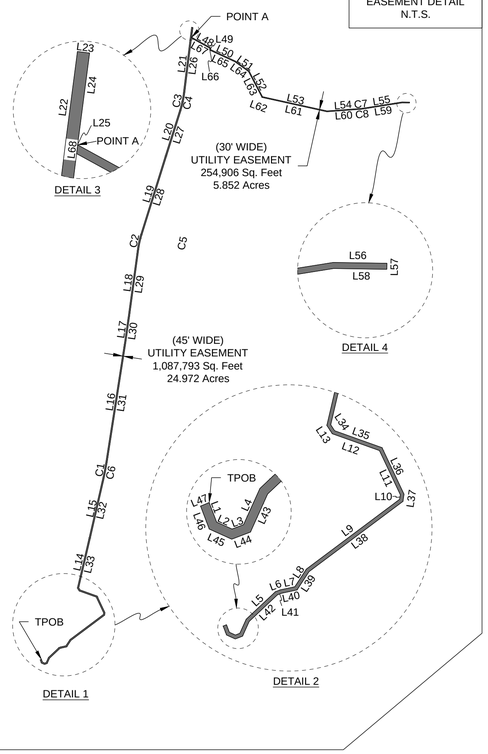
SHEET NUMBER
6 OF 76

Path: Q:\27\21254-01\70SURVEY\7-DRAWINGS\BODAWAY-CEDAR RIDGE FILENAME: SA14-VP-PR-21254-1-BASE.DWG PLOT DATE: 8/13/2019 11:33 AM CAD USER: FRANK ORMSBY III

RESULTS OF SURVEY

BODAWAY GAP 45' & 30' WIDE UTILITY EASEMENT
LOCATED WITHIN PROTRACTED TOWNSHIP 34 NORTH, RANGE 9 EAST, SECTION 32, PROTRACTED SECTIONS 33, 28, 21, 16, 9, 10 AND 11, GILA AND SALT RIVER MERIDIAN,
NAVAJO INDIAN RESERVATION, COCONINO COUNTY, ARIZONA

45' & 30' WIDE UTILITY EASEMENT DETAIL
N.T.S.



UTILITY EASEMENT LINE & CURVE TABLES

LINE TABLE

LINE	BEARING	DISTANCE
L1	S 20°44'38" E	100.71'
L2	S 65°44'38" E	81.26'
L3	N 69°15'22" E	58.93'
L4	N 24°15'22" E	191.13'
L5	N 46°45'22" E	497.92'
L6	N 69°15'22" E	66.52'
L7	N 78°05'24" E	180.52'
L8	N 33°08'42" E	261.52'
L9	N 53°13'54" E	1439.59'
L10	N 08°51'04" E	58.10'
L11	N 25°19'46" W	604.49'
L12	N 70°20'54" W	618.69'
L13	N 33°12'20" W	123.33'
L14	N 13°08'52" E	1780.74'
L15	N 12°58'36" E	2049.06'
L16	N 08°52'19" E	4187.98'
L17	N 08°10'44" E	879.56'
L18	N 07°47'13" E	2383.12'
L19	N 17°21'16" E	2852.44'
L20	N 17°28'59" E	1644.90'
L21	N 07°02'24" E	1941.04'
L22	N 07°24'52" E	336.28'
L23	S 82°35'08" E	45.00'
L24	S 07°24'52" W	336.13'
L25	S 07°02'24" W	277.00'
L26	S 07°02'24" W	1938.12'
L27	S 17°28'59" W	1644.85'
L28	S 17°21'16" W	2852.39'
L29	S 07°47'13" W	2383.28'
L30	S 08°10'44" W	879.99'
L31	S 08°52'19" W	4188.25'
L32	S 12°58'36" W	2049.13'
L33	S 13°08'52" W	1761.54'
L34	S 33°12'20" E	88.95'

LINE TABLE

LINE	BEARING	DISTANCE
L35	S 70°20'54" E	622.22'
L36	S 25°19'46" E	636.97'
L37	S 08°51'04" W	90.29'
L38	S 53°13'54" W	1449.97'
L39	S 33°08'42" W	272.17'
L40	S 78°05'24" W	195.66'
L41	S 69°15'22" W	54.09'
L42	S 46°45'22" W	480.02'
L43	S 24°15'22" W	200.82'
L44	S 69°15'22" W	96.21'
L45	N 65°44'38" W	118.54'
L46	N 20°44'38" W	117.82'
L47	N 67°18'42" E	45.03'
L48	S 61°18'39" E	732.17'
L49	S 16°18'39" E	82.44'
L50	S 65°07'29" E	930.40'
L51	S 54°31'18" E	588.45'
L52	S 27°31'18" E	1004.24'
L53	S 77°31'27" E	2280.17'
L54	N 85°49'30" E	1143.50'
L55	N 80°58'23" E	1362.80'
L56	S 89°07'52" E	265.84'
L57	S 00°43'30" W	30.00'
L58	N 89°07'52" W	263.32'
L59	S 80°58'23" W	1360.20'
L60	S 85°49'30" W	1147.89'
L61	N 77°31'27" W	2291.73'
L62	N 69°31'18" W	7.81'
L63	N 27°31'18" W	1009.61'
L64	N 54°31'18" W	578.46'
L65	N 65°07'29" W	941.23'
L66	N 16°18'39" W	83.63'
L67	N 61°18'39" W	707.84'
L68	N 07°02'24" E	32.28'

CURVE TABLE

CURVE	DELTA ANGLE	RADIUS	ARC LENGTH	CHORD BEARING	CHORD LENGTH
C1	4°06'17"	8744.37'	626.46'	N 10°55'27" E	626.32'
C2	9°34'03"	3124.04'	521.67'	N 12°34'15" E	521.07'
C3	10°26'35"	3424.04'	624.09'	N 12°15'41" E	623.23'
C4	10°26'35"	3469.04'	632.29'	S 12°15'41" W	631.42'
C5	9°34'03"	3079.04'	514.16'	S 12°34'15" W	513.56'
C6	4°06'17"	8789.37'	629.68'	S 10°55'27" W	629.55'
C7	4°51'07"	1235.52'	104.63'	N 83°23'57" E	104.60'
C8	4°51'07"	1265.52'	107.17'	S 83°23'57" W	107.14'

LEGAL DESCRIPTION

A 45-FOOT-WIDE UTILITY EASEMENT FOR THE PURPOSE OF WATER AND ELECTRIC DISTRIBUTION, LYING WITHIN PROTRACTED TOWNSHIP 34 NORTH, RANGE 9 EAST, SECTION 32, PROTRACTED SECTIONS 33, 28, 21, 16, AND 9, GILA AND SALT RIVER MERIDIAN, NAVAJO INDIAN RESERVATION, COCONINO COUNTY, ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A FOUND U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT CADASTRAL SURVEY 2 ½" BRASS CAP SURVEY MONUMENT MARKED, "T34N R9E 1/4 S32IS33 2012," BEING AT THE EAST ¼ CORNER OF SAID SECTION 32, FROM WHICH A FOUND U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT CADASTRAL SURVEY 2 ½" BRASS CAP SURVEY MONUMENT MARKED, "T34N R9E C 1/4 S32 2012," BEING AT THE CENTER ¼ CORNER OF SAID SECTION 32, BEARS SOUTH 89°43'25" WEST, A DISTANCE OF 2,639.91 FEET:

THENCE FROM SAID COMMENCEMENT POINT, SOUTH 89°43'25" WEST A DISTANCE OF 332.96 FEET ALONG THE CENTRAL EAST SECTION LINE OF SAID SECTION 32 TO A POINT;

THENCE SOUTH 00°16'35" EAST A DISTANCE OF 339.07 FEET TO THE TRUE POINT OF BEGINNING, SAID POINT BEING ON THE SOUTHERN RIGHT OF WAY LINE OF U.S. 89T(N20), WHICH IS NORTH 67°18'42" EAST A DISTANCE OF 86.58 FEET TO U.S. 89T(N20) STATION MARKER 2+127.79;
THENCE SOUTH 20°44'38" EAST A DISTANCE OF 100.71 FEET TO A POINT;
THENCE SOUTH 65°44'38" EAST A DISTANCE OF 81.26 FEET TO A POINT;
THENCE NORTH 69°15'22" EAST A DISTANCE OF 58.93 FEET TO A POINT;
THENCE NORTH 24°15'22" EAST A DISTANCE OF 191.13 FEET TO A POINT;
THENCE NORTH 46°45'22" EAST A DISTANCE OF 497.92 FEET TO A POINT;
THENCE NORTH 69°15'22" EAST A DISTANCE OF 66.52 FEET TO A POINT;
THENCE NORTH 78°05'24" EAST A DISTANCE OF 180.52 FEET TO A POINT;
THENCE NORTH 33°08'42" EAST A DISTANCE OF 261.52 FEET TO A POINT;
THENCE NORTH 53°13'54" EAST A DISTANCE OF 1,439.59 FEET TO A POINT;
THENCE NORTH 08°51'04" EAST A DISTANCE OF 58.10 FEET TO A POINT;
THENCE NORTH 25°19'46" WEST A DISTANCE OF 604.49 FEET TO A POINT;
THENCE NORTH 70°20'54" WEST A DISTANCE OF 618.69 FEET TO A POINT;
THENCE NORTH 33°12'20" WEST A DISTANCE OF 123.33 FEET TO A POINT BEING ON THE EAST RIGHT OF WAY LINE OF U.S. 89T(N20);
THENCE CONTINUING FOR THE NEXT 12 COURSES, ALONG THE SAID EAST RIGHT OF WAY LINE OF U.S. 89T(N20), NORTH 13°08'52" EAST A DISTANCE OF 1,780.74 FEET TO A POINT;
THENCE NORTH 12°58'36" EAST A DISTANCE OF 2,049.06 FEET TO A POINT BEING ON A TANGENT CURVE TO THE LEFT;
THENCE ALONG SAID TANGENT CURVE TO THE LEFT WITH A RADIUS OF 8,744.37 FEET, AN ARC LENGTH OF 626.46 FEET, A CENTRAL ANGLE OF 04°06'17", WITH A CHORD BEARING OF NORTH 10°55'27" EAST, AND A CHORD DISTANCE OF 626.32 FEET TO A POINT;
THENCE NORTH 08°52'19" EAST A DISTANCE OF 4,187.98 FEET TO A POINT;
THENCE NORTH 08°10'44" EAST A DISTANCE OF 879.56 FEET TO A POINT;
THENCE NORTH 07°47'13" EAST A DISTANCE OF 2,383.12 FEET TO A POINT BEING ON A TANGENT CURVE TO THE RIGHT;
THENCE ALONG SAID TANGENT CURVE TO THE RIGHT WITH A RADIUS OF 3,124.04 FEET, AN ARC LENGTH OF 521.67 FEET, A CENTRAL ANGLE OF 09°34'03", WITH A CHORD BEARING OF NORTH 12°34'15" EAST, AND A CHORD DISTANCE OF 521.07 FEET TO A POINT;
THENCE NORTH 17°21'16" EAST A DISTANCE OF 2,852.44 FEET TO A POINT;
THENCE NORTH 17°28'59" EAST A DISTANCE OF 1,644.90 FEET TO A POINT BEING ON A TANGENT CURVE TO THE LEFT;
THENCE ALONG SAID TANGENT CURVE TO THE LEFT WITH A RADIUS OF 3,424.04 FEET, AN ARC LENGTH OF 624.09 FEET, A CENTRAL ANGLE OF 10°26'35", WITH A CHORD BEARING OF NORTH 12°15'41" EAST, AND A CHORD DISTANCE OF 623.23 FEET TO A POINT;
THENCE NORTH 07°02'24" EAST A DISTANCE OF 1,941.04 FEET TO A POINT;
THENCE NORTH 07°24'52" EAST A DISTANCE OF 336.28 FEET TO A POINT;
THENCE LEAVING SAID RIGHT OF WAY LINE OF U.S. 89T(N20), SOUTH 82°35'08" EAST A DISTANCE OF 45.00 FEET TO A POINT;
THENCE SOUTH 07°24'52" WEST A DISTANCE OF 336.13 FEET TO A POINT;
THENCE SOUTH 07°02'24" WEST A DISTANCE OF 2.77 FEET TO A POINT LABELED AS POINT A;
THENCE CONTINUING, SOUTH 07°02'24" WEST A DISTANCE OF 1,938.12 FEET TO A POINT BEING ON A TANGENT CURVE TO THE RIGHT;
THENCE ALONG SAID TANGENT CURVE TO THE RIGHT WITH A RADIUS OF 3,469.04 FEET, AN ARC LENGTH OF 632.29 FEET, A CENTRAL ANGLE OF 10°26'35", WITH A CHORD BEARING OF SOUTH 12°15'41" WEST, AND A CHORD DISTANCE OF 631.42 FEET TO A POINT;
THENCE SOUTH 17°28'59" WEST A DISTANCE OF 1,644.85 FEET TO A POINT;
THENCE SOUTH 17°21'16" WEST A DISTANCE OF 2,852.39 FEET TO A POINT BEING ON A TANGENT CURVE TO THE LEFT;
THENCE ALONG SAID TANGENT CURVE TO THE LEFT WITH A RADIUS OF 3,079.04 FEET, AN ARC LENGTH OF 514.16 FEET, A CENTRAL ANGLE OF 09°34'03", WITH A CHORD BEARING OF SOUTH 12°34'15" WEST, AND A CHORD DISTANCE OF 513.56 FEET TO A POINT;

LEGAL DESCRIPTION-CONTINUED

THENCE SOUTH 07°47'13" WEST A DISTANCE OF 2,383.28 FEET TO A POINT;
THENCE SOUTH 08°10'44" WEST A DISTANCE OF 879.99 FEET TO A POINT;
THENCE SOUTH 08°52'19" WEST A DISTANCE OF 4,188.25 FEET TO A POINT BEING ON A TANGENT CURVE TO THE RIGHT;
THENCE ALONG SAID TANGENT CURVE TO THE RIGHT WITH A RADIUS OF 8,789.37 FEET, AN ARC LENGTH OF 629.68 FEET, A CENTRAL ANGLE OF 04°06'17", WITH A CHORD BEARING OF SOUTH 10°55'27" WEST, AND A CHORD DISTANCE OF 629.55 FEET TO A POINT;
THENCE SOUTH 12°58'36" WEST A DISTANCE OF 2,049.13 FEET TO A POINT;
THENCE SOUTH 13°08'52" WEST A DISTANCE OF 1,761.54 FEET TO A POINT;
THENCE SOUTH 33°12'20" EAST A DISTANCE OF 88.95 FEET TO A POINT;
THENCE SOUTH 70°20'54" EAST A DISTANCE OF 622.22 FEET TO A POINT;
THENCE SOUTH 25°19'46" EAST A DISTANCE OF 636.97 FEET TO A POINT;
THENCE SOUTH 08°51'04" WEST A DISTANCE OF 90.29 FEET TO A POINT;
THENCE SOUTH 53°13'54" WEST A DISTANCE OF 1,449.97 FEET TO A POINT;
THENCE SOUTH 33°08'42" WEST A DISTANCE OF 272.17 FEET TO A POINT;
THENCE SOUTH 78°05'24" WEST A DISTANCE OF 195.66 FEET TO A POINT;
THENCE SOUTH 69°15'22" WEST A DISTANCE OF 54.09 FEET TO A POINT;
THENCE SOUTH 46°45'22" WEST A DISTANCE OF 480.02 FEET TO A POINT;
THENCE SOUTH 24°15'22" WEST A DISTANCE OF 200.82 FEET TO A POINT;
THENCE SOUTH 69°15'22" WEST A DISTANCE OF 96.21 FEET TO A POINT;
THENCE NORTH 65°44'38" WEST A DISTANCE OF 118.54 FEET TO A POINT;
THENCE NORTH 20°44'38" WEST A DISTANCE OF 117.82 FEET TO A POINT BEING ON THE SAID SOUTHERN RIGHT OF WAY LINE OF U.S. 89T(N20);
THENCE ALONG SAID RIGHT OF WAY LINE OF U.S. 89T(N20), NORTH 67°18'42" EAST A DISTANCE OF 45.03 FEET TO THE SAID TRUE POINT OF BEGINNING.

THE ABOVE DESCRIBED FIRST PORTION OF THE EASEMENT CONTAINS APPROXIMATELY 1,087,793 SQUARE FEET OR 24.972 ACRES MORE OR LESS.

TOGETHER WITH THE FOLLOWING DESCRIPTION WHICH DELINEATES THE SECOND PORTION OF THIS 30-FOOT-WIDE UTILITY EASEMENT FOR THE PURPOSE OF WATER DISTRIBUTION, BEING WITHIN PROTRACTED TOWNSHIP 34 NORTH, RANGE 9 EAST, SECTIONS 9, 10, AND 11, GILA AND SALT RIVER MERIDIAN, NAVAJO INDIAN RESERVATION, COCONINO COUNTY, ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT SAID POINT LABELED AS POINT A, BEING ON THE EAST RIGHT OF WAY LINE OF U.S. 89T(N20);

THENCE SOUTH 61°18'39" EAST A DISTANCE OF 732.17 FEET TO A POINT;
THENCE SOUTH 16°18'39" EAST A DISTANCE OF 82.44 FEET TO A POINT;
THENCE SOUTH 65°07'29" EAST A DISTANCE OF 930.40 FEET TO A POINT;
THENCE SOUTH 54°31'18" EAST A DISTANCE OF 588.45 FEET TO A POINT;
THENCE SOUTH 27°31'18" EAST A DISTANCE OF 1,004.24 FEET TO A POINT;
THENCE SOUTH 77°31'27" EAST A DISTANCE OF 2,280.17 FEET TO A POINT;
THENCE NORTH 85°49'30" EAST A DISTANCE OF 1,143.50 FEET TO A POINT BEING ON A TANGENT CURVE TO THE LEFT;
THENCE ALONG SAID TANGENT CURVE TO THE LEFT WITH A RADIUS OF 1,235.52 FEET, AN ARC LENGTH OF 104.63 FEET, A CENTRAL ANGLE OF 04°51'07", WITH A CHORD BEARING OF NORTH 83°23'57" EAST, AND A CHORD DISTANCE OF 104.60 FEET TO A POINT;
THENCE NORTH 80°58'23" EAST A DISTANCE OF 1,362.80 FEET TO A POINT;
THENCE SOUTH 89°07'52" EAST A DISTANCE OF 265.84 FEET TO A POINT;
THENCE SOUTH 00°43'30" WEST A DISTANCE OF 30.00 FEET TO A POINT;
THENCE NORTH 89°07'52" WEST A DISTANCE OF 263.32 FEET TO A POINT;
THENCE SOUTH 80°58'23" WEST A DISTANCE OF 1,360.20 FEET TO A POINT BEING ON A TANGENT CURVE TO THE RIGHT;
THENCE ALONG SAID TANGENT CURVE TO THE RIGHT WITH A RADIUS OF 1,265.52 FEET, AN ARC LENGTH OF 107.17 FEET, A CENTRAL ANGLE OF 04°51'07", WITH A CHORD BEARING OF SOUTH 83°23'57" WEST, AND A CHORD DISTANCE OF 107.14 FEET TO A POINT;
THENCE SOUTH 85°49'30" WEST A DISTANCE OF 1,147.89 FEET TO A POINT;
THENCE NORTH 77°31'27" WEST A DISTANCE OF 2,291.73 FEET TO A POINT;
THENCE NORTH 69°31'18" WEST A DISTANCE OF 7.81 FEET TO A POINT;
THENCE NORTH 27°31'18" WEST A DISTANCE OF 1,009.61 FEET TO A POINT;
THENCE NORTH 54°31'18" WEST A DISTANCE OF 578.46 FEET TO A POINT;
THENCE NORTH 65°07'29" WEST A DISTANCE OF 941.23 FEET TO A POINT;
THENCE NORTH 16°18'39" WEST A DISTANCE OF 83.63 FEET TO A POINT;
THENCE NORTH 61°18'39" WEST A DISTANCE OF 707.84 FEET TO A POINT, BEING ON THE SAID EAST RIGHT OF WAY LINE OF U.S. 89T(N20);
THENCE ALONG SAID U.S. 89T(N20) RIGHT OF WAY LINE, NORTH 07°02'24" EAST A DISTANCE OF 32.28 FEET TO THE SAID POINT LABELED AS POINT A.

THE ABOVE DESCRIBED SECOND PORTION OF THIS EASEMENT CONTAINS APPROXIMATELY 254,906 SQUARE FEET OR 5.852 ACRES MORE OR LESS.

THE TOTAL COMBINED PORTIONS OF THE DESCRIBED EASEMENTS CONTAIN APPROXIMATELY 1,342,699 SQUARE FEET OR 30.824 ACRES MORE OR LESS.

VICINITY MAP

CERTIFICATION:

I HEREBY CERTIFY THAT THE SURVEY SHOWN ON THIS DRAWING WAS PERFORMED UNDER MY DIRECTION AND THAT EXISTING OR PROPOSED SURVEY MONUMENTS AND MARKERS SHOWN ARE CORRECTLY DESCRIBED. I FURTHER CERTIFY THAT THIS DRAWING WAS PREPARED UNDER MY DIRECTION.

MICHAEL F. YORK, RLS
REGISTERED LAND SURVEYOR
RLS NUMBER 19862

GENERAL NOTE

- THIS SURVEY IS BASED ON NAD 83 AND THE ARIZONA STATE PLANE CENTRAL ZONE MEASURED IN INTERNATIONAL FEET.
- SURVEY ELEVATIONS ARE BASED ON NAVD 88 EXPRESSED IN U.S. SURVEY FEET.
- SHOWN MEASUREMENTS ARE AT GROUND VALUES NOT GRID VALUES. TO OBTAIN SPC GRID VALUES MULTIPLY THE DISTANCES SHOWN BY THE COMBINED SPC GRID FACTOR OF 0.999655550

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Registered Professional Land Surveyor
19862
MICHAEL F. YORK
Date Signed 11/12/19
ARIZONA, U.S.A.
Expires 12/31/19

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:
DRAWN: F. ORMSBY
CHECKED: M. YORK
CHECKED:
APPROVED: M.YORK

FILENAME
SA14-VP-PR-21254-1-BASE.DWG
BC PROJECT NUMBER
150360
CLIENT PROJECT NUMBER
4028.21254.01

SURVEY

RESULTS OF SURVEY

DRAWING NUMBER
V-002

SHEET NUMBER
7 OF 76

Path: Q:\27\21254-01\70SURVEY\7-DRAWINGS\BODAWAY-CEDAR RIDGE FILENAME: SA14-VP-PR-21254-1-BASE.DWG PLOT DATE: 8/13/2019 11:34 AM CAD USER: FRANK ORMSBY III

BASIS OF BEARING

THE NORTH TOWNSHIP LINE OF PROTRACTED T34N, R9E, WITH
ARIZONA STATE PLANE COORDINATE CENTRAL ZONE GRID BEARING
OF S 89°42'21" W
UNITS: INTERNATIONAL FEET

REFERENCES:

R1) BUREAU OF LAND MANAGEMENT SURVEY PLAT 1294-4, DATED 1/27/2011

R2) US89T(N20) EASEMENT FOR RIGHT OF WAY, BIA LAND TITLES-W427000049

GENERAL NOTE

- THIS SURVEY IS BASED ON NAD 83 AND THE ARIZONA STATE PLANE CENTRAL ZONE MEASURED IN INTERNATIONAL FEET.
- SURVEY ELEVATIONS ARE BASED ON NAVD 88 EXPRESSED IN U.S. SURVEY FEET.
- SHOWN MEASUREMENTS ARE AT GROUND VALUES NOT GRID VALUES. TO OBTAIN SPC GRID VALUES MULTIPLY THE DISTANCES SHOWN BY THE COMBINED SPC GRID FACTOR OF 0.999655550

RESULTS OF SURVEY

BODAWAY GAP WATER WELL, WATER TANK AND ACCESS EASEMENT
LOCATED WITHIN PROTRACTED TOWNSHIP 34 NORTH, RANGE 9 EAST, WITHIN A PORTION OF THE NE ¼ OF SECTION 9, AND WITHIN A PORTION OF THE SW ¼ OF SECTION 11, GILA AND SALT RIVER MERIDIAN, NAVAJO INDIAN RESERVATION, COCONINO COUNTY, ARIZONA

CERTIFICATION:

I HEREBY CERTIFY THAT THE SURVEY SHOWN ON THIS DRAWING WAS PERFORMED UNDER MY DIRECTION AND THAT EXISTING FEATURES AND CONDITIONS SHOWN ARE CORRECTLY DESCRIBED. I FURTHER CERTIFY THAT THIS DRAWING WAS PREPARED UNDER MY DIRECTION.

MICHAEL F. YORK, RLS
REGISTERED LAND SURVEYOR
RLS NUMBER 19862

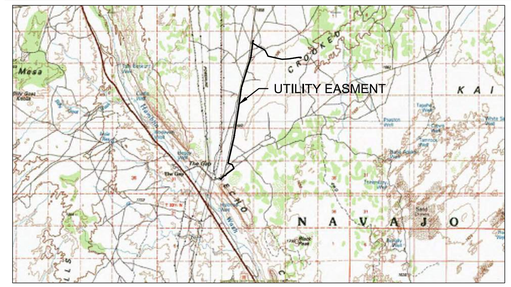
N

400 0 400 800
SCALE IN FEET

N

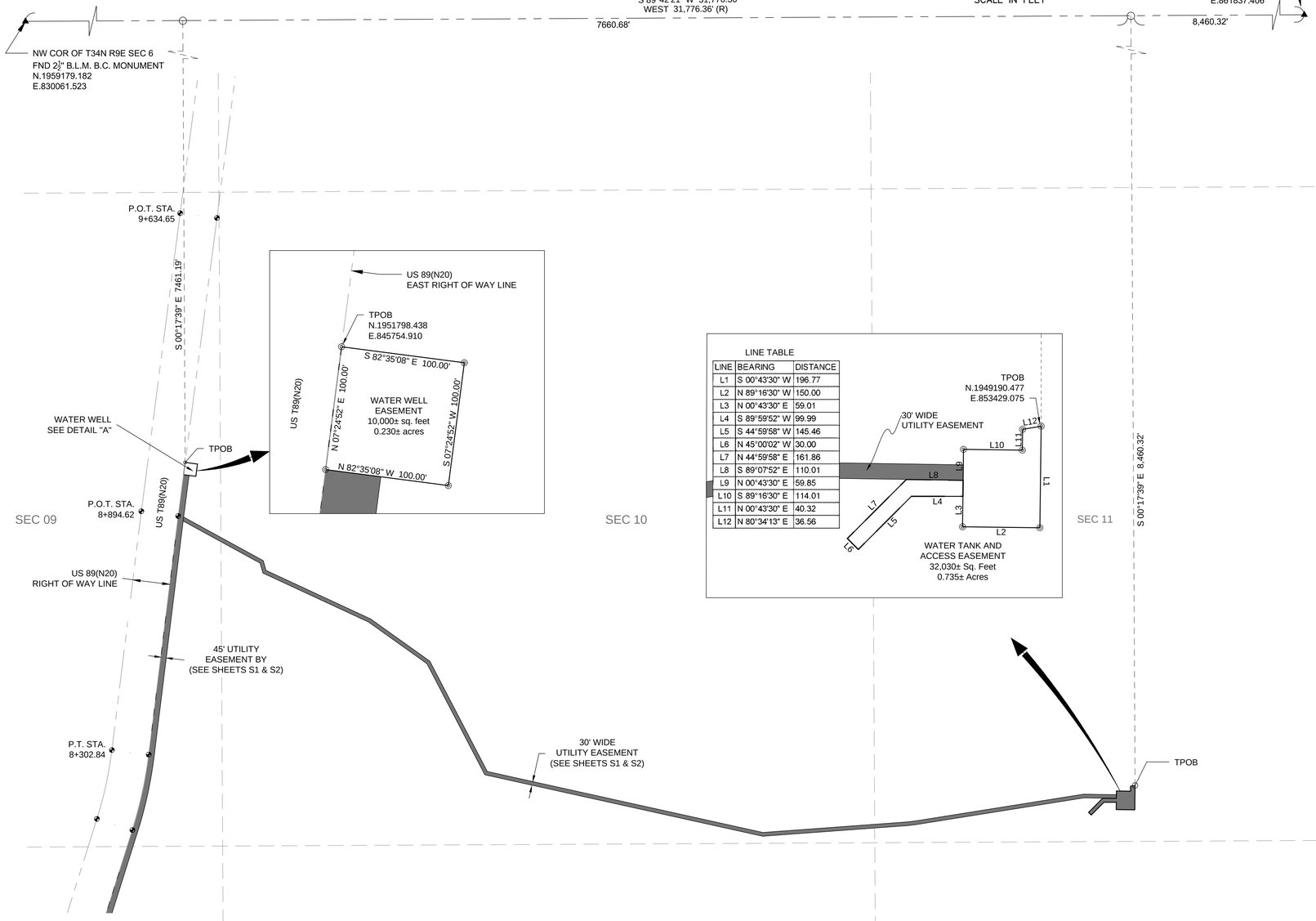
N.T.S.

VICINITY MAP



LEGEND:

- ▲ FOUND B.L.M.SECTION MONUMENT AS NOTED
- HIGHWAY STATION IDENTIFIER
- ◎ SET SURVEY MONUMENT "RLS 19862
- SECTION LINE
- PROTRACTED SECTION LINE
- TIE LINE
- HIGHWAY RIGHT OF WAY LINE



LEGAL DESCRIPTION (WATER WELL)

AN EASEMENT FOR A WATER WELL, LYING WITHIN PROTRACTED TOWNSHIP 34 NORTH, RANGE 9 EAST, WITHIN A PORTION OF THE NE ¼ OF SECTION 9, GILA AND SALT RIVER MERIDIAN, NAVAJO INDIAN RESERVATION, COCONINO COUNTY, ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A FOUND U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT CADASTRAL SURVEY 2 ½" BRASS CAP SURVEY MONUMENT MARKED, "T35N R9E T35N R10E S36/S1IS31/S6 T34N R9E T34N R10E," BEING AT THE NORTHEAST CORNER OF SECTION 1, FROM WHICH A FOUND U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT CADASTRAL SURVEY 2 ½" BRASS CAP SURVEY MONUMENT MARKED, "T35N R8E R9E S36/S1IS31/S6 T34N 2009," BEING AT THE NORTHWEST CORNER OF SAID SECTION 6, BEARS SOUTH 89°42'21" WEST, A DISTANCE OF 31,776.30 FEET:

THENCE FROM SAID COMMENCEMENT POINT, ALONG THE NORTH PROTRACTED TOWNSHIP LINE OF SAID TOWNSHIP 34 NORTH, RANGE 9 EAST, SOUTH 89°42'21" WEST A DISTANCE OF 16,121.00 FEET TO A POINT;
THENCE SOUTH 00°17'39" EAST A DISTANCE OF 7,461.19 FEET TO THE TRUE POINT OF BEGINNING, SAID POINT BEING ON THE EAST RIGHT OF WAY LINE OF U.S. 89T(N20);
THENCE SOUTH 82°35'08" EAST A DISTANCE OF 100.00 FEET TO A POINT;
THENCE SOUTH 07°24'52" WEST A DISTANCE OF 100.00 FEET TO A POINT;
THENCE NORTH 82°35'08" WEST A DISTANCE OF 100.00 FEET TO A POINT BEING ON THE SAID EAST RIGHT OF WAY LINE OF U.S. 89T(N20);
THENCE ALONG THE SAID EAST RIGHT OF WAY LINE OF U.S. 89T(N20), NORTH 07°24'52" EAST A DISTANCE OF 100.00 FEET, TO THE SAID TRUE POINT OF BEGINNING.

THE ABOVE DESCRIBED EASEMENT CONTAINS APPROXIMATELY 10,000 SQUARE FEET OR 0.230 ACRES MORE OR LESS.

LEGAL DESCRIPTION (WATER TANK AND ACCESS)

AN EASEMENT FOR A WATER TANK AND ACCESS, LYING WITHIN PROTRACTED TOWNSHIP 34 NORTH, RANGE 9 EAST, WITHIN A PORTION OF THE SW ¼ OF SECTION 11, GILA AND SALT RIVER MERIDIAN, NAVAJO INDIANRESERVATION, COCONINO COUNTY, ARIZONA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A FOUND U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT CADASTRAL SURVEY 2 ½ " BRASS CAP SURVEY MONUMENT MARKED, "T35N R9E T35N R10E S36/S1IS31/S6 T34N R9E T34N R10E," BEING AT THE NORTHEAST CORNER OF SECTION 1, FROM WHICH A FOUND U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT CADASTRAL SURVEY 2 ½ " BRASS CAP SURVEY MONUMENT MARKED, "T35N R8E R9E S36/S1IS31/S6 T34N 2009," BEING AT THE NORTHWEST CORNER OF SAID SECTION 6, BEARS NORTH 89°42'21" WEST, A DISTANCE OF 31,776.30 FEET:

THENCE FROM SAID COMMENCEMENT POINT, ALONG THE NORTH PROTRACTED TOWNSHIP LINE OF SAID TOWNSHIP 34 NORTH, RANGE 9 EAST, SOUTH 89°42'21" WEST A DISTANCE OF 10,108.50 FEET TO A POINT;
THENCE SOUTH 00°17'39" EAST A DISTANCE OF 8,460.32 FEET TO THE TRUE POINT OF BEGINNING;
THENCE SOUTH 00°43'30" WEST A DISTANCE OF 196.77 FEET TO A POINT;
THENCE NORTH 89°16'30" WEST A DISTANCE OF 150.00 FEET TO A POINT;
THENCE NORTH 00°43'30" EAST A DISTANCE OF 59.01 FEET TO A POINT;
THENCE SOUTH 89°59'52" WEST A DISTANCE OF 99.99 FEET TO A POINT;
THENCE SOUTH 44°59'58" WEST A DISTANCE OF 145.46 FEET TO A POINT;
THENCE NORTH 45°00'02" WEST A DISTANCE OF 30.00 FEET TO A POINT;
THENCE NORTH 44°59'58" EAST A DISTANCE OF 161.86 FEET TO A POINT;
THENCE SOUTH 89°07'52" EAST A DISTANCE OF 110.01 FEET TO A POINT;
THENCE NORTH 00°43'30" EAST A DISTANCE OF 59.85 FEET TO A POINT;
THENCE SOUTH 89°16'30" EAST A DISTANCE OF 114.01 FEET TO A POINT;
THENCE NORTH 00°43'30" EAST A DISTANCE OF 40.32 FEET TO A POINT;
THENCE NORTH 80°34'13" EAST A DISTANCE OF 36.56 FEET TO THE SAID TRUE POINT OF BEGINNING.

THE ABOVE DESCRIBED EASEMENT CONTAINS APPROXIMATELY32,030 SQUARE FEET OR 0.735 ACRES MORE OR LESS.

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SALT LAKE CITY, UTAH

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406-656-6399

REGISTERED LAND SURVEYOR
19862
MICHAEL F. YORK
Date Signed 11/12/19
ARIZONA, U.S.A.
Expires 12/31/19

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:
DRAWN: F. ORMSBY
CHECKED: M. YORK
CHECKED:
APPROVED: M.YORK

FILENAME
SA14-VP-PR-21254-1-BASE.DWG
BC PROJECT NUMBER
150360
CLIENT PROJECT NUMBER
4028.21254.01

SURVEY

RESULTS OF SURVEY

DRAWING NUMBER
V-003

SHEET NUMBER
8 OF 76

Path: Q:\27\21254-01\70\SURVEY\7-DRAWINGS\BODAWAY-CEDAR RIDGE FILENAME: SA14-VP-PR-21254-1-BASE.DWG PLOT DATE: 8/13/2019 11:34 AM CAD USER: FRANK ORMSBY III

CIVIL SYMBOLS

W	WATERLINE
W	EXISTING WATERLINE
OHP	OVERHEAD POWER LINE
OHP	EXISTING OVERHEAD POWER LINE
UGTEL	EXISTING UNDERGROUND TELEPHONE LINE
G	EXISTING GAS LINE
O O	FENCE
X X	EXISTING FENCE
6700	CONTOUR LINE
6700	EXISTING CONTOUR LINE
	GATE VALVE
WV	EXISTING GATE VALVE
	WELL
	EXISTING WELL
	POWER POLE
	EXISTING POWER POLE
	EXISTING GUY WIRE
	REDUCER
	EXISTING REDUCER
	FLUSH VALVE
	AIR RELEASE VALVE
	SURVEY MARKING
	WATER LINE CASING

GENERAL CIVIL NOTES

GENERAL 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 AREAS DISTURBED BY THE CONTRACTOR BEYOND THE LIMIT OF WORK SHALL BE RESTORED AT NO ADDITIONAL COST TO THE OWNER.
4. THE CONTRACTOR SHALL NOT STORE ANY APPARATUS, MATERIALS, SUPPLIES, AND EQUIPMENT ON DRAINAGE STRUCTURES OR WITHIN 100 FEET OF WETLANDS.
5. THE CONTRACTOR SHALL GRADE PROPOSED SLOPES TO MEET EXISTING SLOPES WHERE SHOWN ON PLANS.
6. THE CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL DEVICES.
7. THE CONTRACTOR SHALL NOTIFY NTUA AT LEAST 72 HOURS PRIOR TO EXCAVATING NEAR ANY UTILITIES.
8. CONTRACTOR LAYOUT AREAS SHALL BE COORDINATED AND APPROVED BY THE CONSTRUCTION MANAGER AND NTUA. LIMITED SPACE IS AVAILABLE WITHIN THE SITE. NTUA 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.
9. ALL EXISTING UTILITY INFORMATION WAS OBTAINED FROM NTUA AND FIELD SURVEY. THIS INFORMATION MAY NOT BE COMPLETELY ACCURATE OR INDICATE ALL OF THE UTILITIES, UNDERGROUND PIPING, OR BURIED STRUCTURES PRESENT.
10. 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.
11. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
12. REFER TO THE SPECIFICATIONS FOR INFORMATION REGARDING ANY NECESSARY COORDINATION WITH OTHERS, INCLUDING RESPONSIBILITIES AND RELATED COSTS.

SITE GRADING NOTES

10. STRIPPING OF TOPSOIL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200, EARTHWORK.
11. ALL ROAD AND PARKING AREA SURFACES SHALL PITCH 2 PERCENT MINIMUM UNLESS OTHERWISE NOTED. REFER TO DRAWING C-100, C-101, C-102, C-110 AND C-111 FOR DETAILS.
12. 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.
13. 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.
14. 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 NAVAJO NATION REGULATIONS.
15. WHERE EXISTING PAVEMENT IS REMOVED AND REPLACED, MATCH EXISTING GRADES TO THE EXTENT POSSIBLE. COORDINATE FINE GRADING WITH THE CONSTRUCTION MANAGER.
16. CONTRACTOR TO REGRADE, AND RESEED ALL DISTURBED AREAS PER CONSTRUCTION MANAGER AND PER SPEC 02270.

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.
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.

SITE PIPING NOTES (CONT'D.)

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. 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 BEFORE ORDERING MATERIALS.
11. 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.
12. 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. A HORIZONTAL SEPARATION OF AT LEAST 10 FEET MUST ALSO BE MAINTAINED.

SITE PIPING NOTES (CONT'D.)

13. 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.
14. ALL EXISTING UTILITIES ENCOUNTERED DURING CONSTRUCTION ARE TO REMAIN IN SERVICE THROUGHOUT THE PROJECT, UNLESS OTHERWISE NOTED.
15. ALL EXISTING UTILITIES REPLACED OR RELOCATED SHALL BE CONSTRUCTED OF NEW MATERIALS, APPROVED BY THE CONSTRUCTION MANAGER, SIMILAR TO THOSE OF THE EXISTING UTILITY.
16. WHERE PIPES ARE TO BE ABANDONED, FILL WITH CONCRETE SLURRY PRIOR TO INSTALLING CAP.
17. 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.
18. SURVEY COORDINATES AND ELEVATIONS SHALL BE PROVIDED FOR ALL BURIED PIPING BENDS AND VALVES ON AS-BUILT DRAWINGS.
19. PROVIDE VALVE BOXES FOR ALL BURIED VALVES.
20. THE CONTRACTOR WILL POTHOLE AS REQUIRED AND SHALL 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.
21. UNLESS NOTED OTHERWISE ALL UNDERGROUND PIPING SHALL BE INSTALLED PER TRENCH DETAIL A/C-004
22. ASPHALT SURFACES DISTURBED DURING UNDERGROUND PIPING INSTALLATION, DUCT BANK INSTALLATION AND OTHER ACTIVITIES SHALL BE REPAIRED.

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 SHEET V-001 THROUGH V-003 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.

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. SURVEY IS BASED ON NAD 83 AND THE ARIZONA STATE PLANE CENTRAL ZONE MEASURED IN INTERNATIONAL FEET. SURVEY ELEVATIONS ARE BASED ON NAVD 88 EXPRESSED IN U.S. SURVEY FEET. SHOWN COORDINATES ON CIVIL DRAWINGS ARE AT GROUND VALUES NOT GRID VALUES. TO OBTAIN SPC GRID VALUES MULTIPLY THE DISTANCES SHOWN BY THE COMBINED SPC GRID FACTOR OF 0.999655550.

PERMITS AND NOTIFICATION NOTES

1. THE CONTRACTOR SHALL COMPLETE A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR THE PROJECT. SEE SPECIFICATION SECTION 01561.
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.

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Registered Professional Engineer (Civil)
CERTIFICATE NO.
63511
STEVEN
BRENCHLEY
Date Signed 10/3/19
ARIZONA, U. S. A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS		
REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	J. YAZZIE
DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
C-001.DWG
BC PROJECT NUMBER
150360
CLIENT PROJECT NUMBER
C010232

CIVIL

GENERAL CIVIL NOTES AND SYMBOLS

DRAWING NUMBER
C-001

SHEET NUMBER
9 OF 76

Path: P:\PROJECTS\NAVAJO NATION\150360_WESTERN NAVAJO PIPELINE DESIGN PHASE 1_CAD\01_BODAWAY GAP\2-SHEETS\C-CIVIL FILENAME: C-001.DWG PLOT DATE: 5/12/2020 5:02 PM CAD USER: TYLER PRIDEMORE

TABLE 1 – WELL NO. 3 SITE GRADING

MARK	NORTHING	EASTING	FINISHED GRADE ELEVATION	DESCRIPTION
1	1951738.38	845788.61	5460.50	SW CORNER OF WELL NO. 3
2	1951745.08	845804.27	5460.50	NE CORNER OF WELL NO. 3
3	1951729.85	845778.25	5460.10	SW FENCE CORNER
4	1951759.60	845782.13	5460.10	NW FENCE CORNER
5	1951753.79	845826.75	5460.10	NE FENCE CORNER / GATE POST
6	1951724.05	845822.88	5460.10	SE FENCE CORNER / GATE POST
7	1951725.59	845810.98	5460.10	SOUTH GATE INSIDE POST
8	1951755.34	845814.85	5460.10	NORTH GATE INSIDE POST
9	1951725.46	845811.97	5460.10	EDGE OF GRAVEL
10	1951724.17	845821.89	5460.10	EDGE OF GRAVEL
11	1951706.91	845809.56	5460.00	EDGE OF GRAVEL
12	1951703.33	845819.17	5459.96	EDGE OF GRAVEL
13	1951690.28	845784.16	5457.91	EDGE OF GRAVEL
14	1951680.91	845836.43	5459.36	EDGE OF GRAVEL
15	1951681.62	845836.53	5459.00	DITCH FLOWLINE
16	1951696.00	845828.48	5458.70	DITCH FLOWLINE
17	1951757.69	845836.51	5457.60	DITCH FLOWLINE
18	1951780.09	845819.40	5457.00	DITCH FLOWLINE

TABLE 2 – WELL NO. 3 SITE FITTINGS

MARK	DESCRIPTION	ELEVATION	NORTHING	EASTING
19	10"x4" TEE		1951749.04	845763.60
20	10" W CAP		1951754.99	845764.38
21	4"x2" TEE		1951746.49	845783.19
22	WELL NO. 3 LID	5460.20	1951741.95	845817.98

TABLE 3 – STORAGE TANK SITE GRADING

MARK	NORTHING	EASTING	FINISHED GRADE ELEVATION	DESCRIPTION
100	1949094.63	853352.93	5740.00	CENTER OF STORAGE TANK
101	1949078.38	853352.93	5740.00	SOUTH QUADRANT OF STORAGE TANK
102	1949110.88	853352.93	5740.00	NORTH QUADRANT OF STORAGE TANK
103	1949143.59	853280.47	5735.87	NW FENCE CORNER
104	1949141.89	853414.46	5738.43	ACCESS GATE INSIDE POST
105	1949141.74	853426.46	5738.56	ACCESS GATE OUTSIDE POST
106	1948995.75	853424.61	5739.84	SE FENCE CORNER
107	1948997.60	853278.62	5742.51	SW FENCE CORNER
108	1949192.77	853442.48	5737.91	EDGE OF GRAVEL
109	1949184.48	853393.00	5737.28	EDGE OF GRAVEL
110	1949164.42	853415.74	5738.59	EDGE OF GRAVEL
111	1949173.31	853425.86	5739.25	EDGE OF GRAVEL
112	1949140.94	853415.49	5738.46	EDGE OF GRAVEL
113	1949104.95	853424.92	5738.26	EDGE OF GRAVEL
114	1949102.45	853422.20	5738.22	EDGE OF GRAVEL
115	1949101.90	853415.39	5738.15	EDGE OF GRAVEL
116	1949101.59	853369.46	5739.50	EDGE OF GRAVEL
117	1949141.51	853369.61	5737.17	EDGE OF GRAVEL

TABLE 4 – STORAGE TANK SITE FITTINGS

MARK	DESCRIPTION	ELEVATION	NORTHING	EASTING
18	PRV LID	5736.33	1949105.55	853292.02
19	10"x10" TEE		1949105.18	853317.01
20	10"x10" TEE		1949095.33	853306.87
21	10" W CAP		1949081.65	853306.71
22	10" 22.5D BEND		1949104.89	853335.77
23	10" W CAP		1949085.47	853296.78
24	10"x10" TEE		1949095.48	853296.87
25	10" 90d BEND		1949085.18	853316.71
26	10"x10" TEE		1949069.63	853347.57
27	10"x10" TEE		1949069.58	853350.57
28	10"x10" TEE		1949069.48	853357.93
29	10" W CAP		1949065.81	853357.88
30	10" W CAP		1949062.92	853350.47
31	10" x 10" TEE		1949085.33	853306.72
32	11.25 BEND		1949071.78	853205.62
33	DRAIN LINE END	5732.50	1949044.82	853058.46

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222 N. 32nd Street, #700
Billings, Montana 59101
406-656-6399

Registered Professional Engineer (Civil)
CERTIFICATE NO.
63511
STEVEN
BRENCHLEY
Date Signed 10/3/19
ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED: J. YAZZIE
DRAWN: T. PRIDEMORE
CHECKED: J. YAZZIE
CHECKED: E. DESOUZA
APPROVED: S. BRENCHLEY

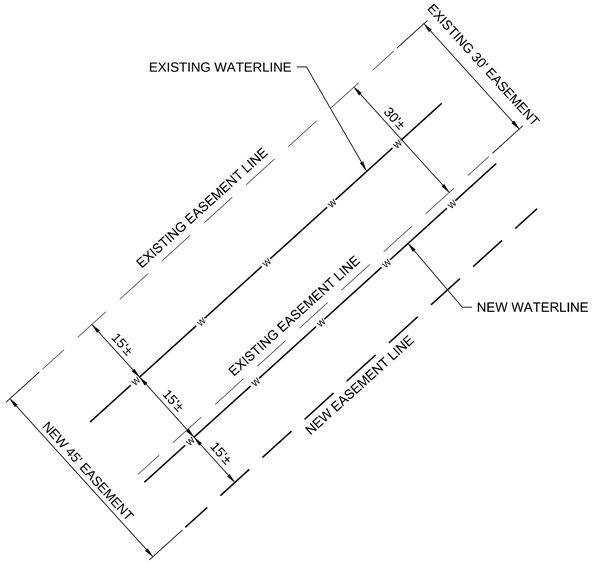
FILENAME C-002.DWG
BC PROJECT NUMBER 150360
CLIENT PROJECT NUMBER C010232

CIVIL

CONTROL COORDINATES

DRAWING NUMBER
C-002

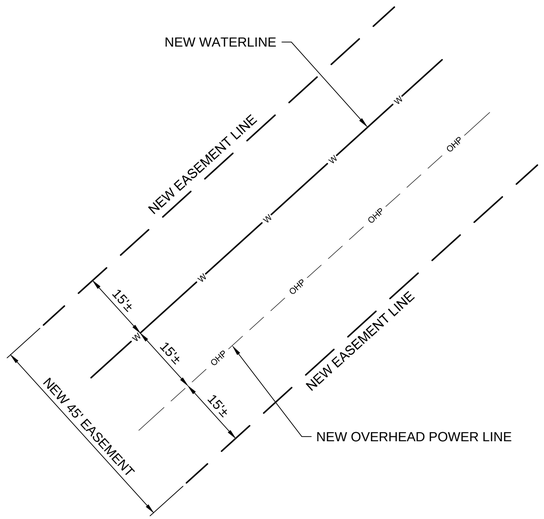
SHEET NUMBER
10 OF 76



PIPELINE EASEMENT, STA 20+00 TO STA 39+00

DETAIL A/-

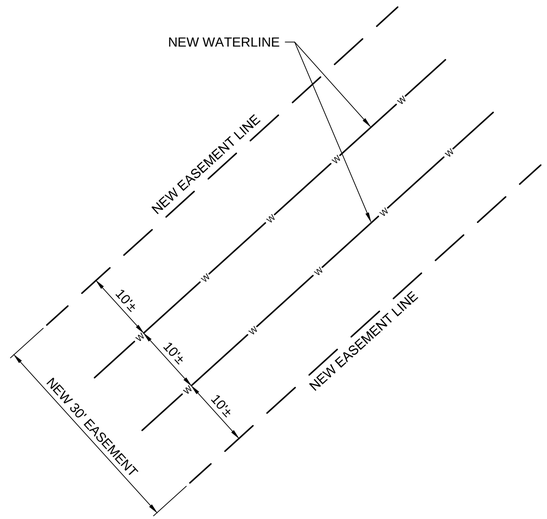
NOT TO SCALE



PIPELINE EASEMENT,
STA 10+00 TO STA 20+00 AND STA 39+00 TO STA 251+28

DETAIL B/-

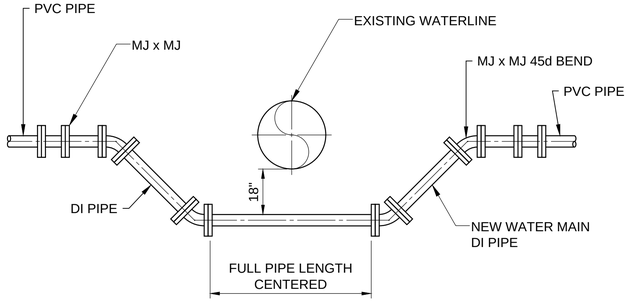
NOT TO SCALE



PIPELINE EASEMENT,
STA 300+00 TO STA 385+28

DETAIL C/-

NOT TO SCALE



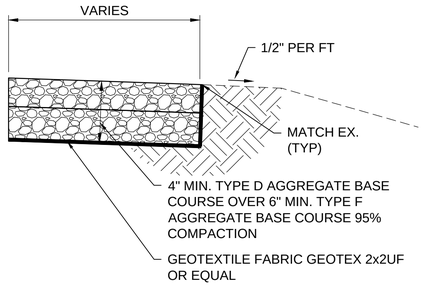
NOTES:

1. PIPE SHALL BE DUCTILE IRON AND CONFORM TO AWWA C151, THICKNESS CLASS 50.
2. MECHANICAL JOINT PIPE SHALL CONFORM TO AWWA C110, JOINTS TO CONFORM TO AWWA C111.
3. MECHANICAL JOINT FITTINGS SHALL CONFORM TO AWWA C153, JOINTS TO CONFORM TO AWWA C111.
4. MECHANICAL JOINT PIPE AND FITTINGS SHALL BE RESTRAINED EBBA IRON MEGALUGS, OR EQUAL.

WATER MAIN LOOP

DETAIL D/-

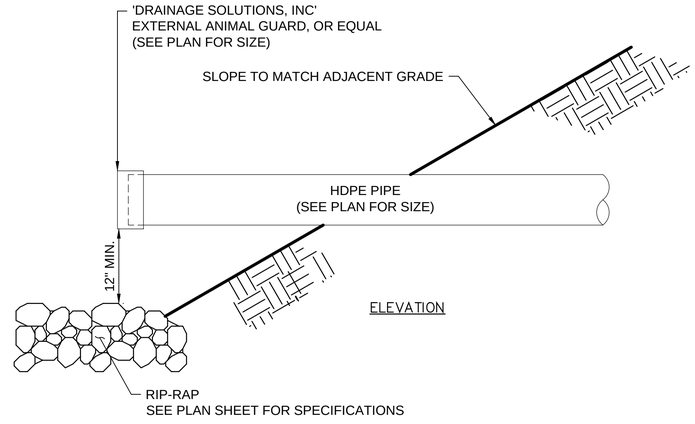
NOT TO SCALE



GRAVEL ROAD SECTION

DETAIL E/-

NOT TO SCALE



WELL HOUSE DRAIN PIPE DISCHARGE

DETAIL F/C-100

NOT TO SCALE

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Registered Professional Engineer (Civil)
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STEVEN
BRENCHLEY
Date Signed 10/3/20
ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	J. YAZZIE
DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
C-003.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

CIVIL

MISCELLANEOUS DETAILS

DRAWING NUMBER

C-003

SHEET NUMBER
11 OF 76

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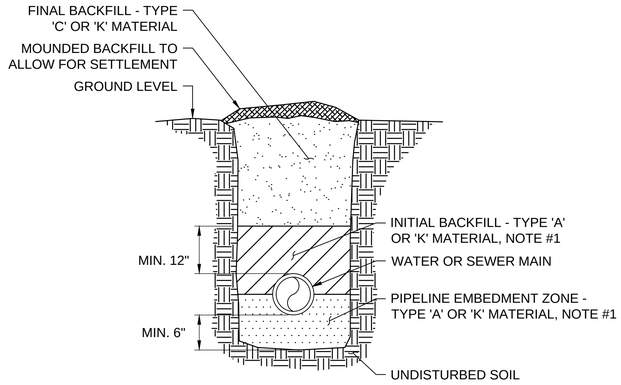


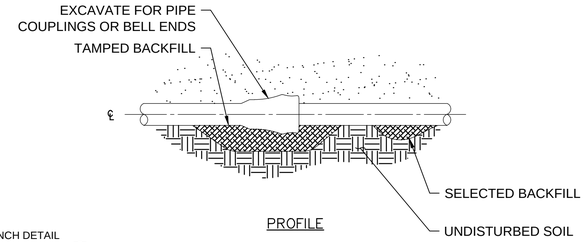
TRENCH DETAIL

DETAIL A -

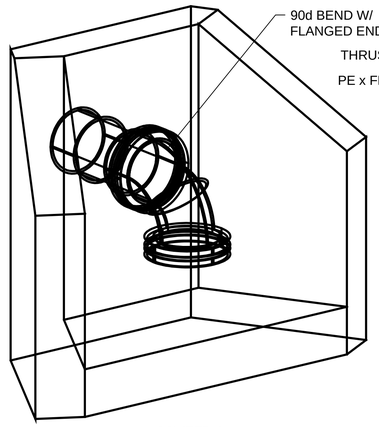
NOT TO SCALE

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 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.
5. SEE SPECIFICATION 02200 FOR MATERIAL TYPE AND COMPACTION REQUIREMENTS.



PROFILE



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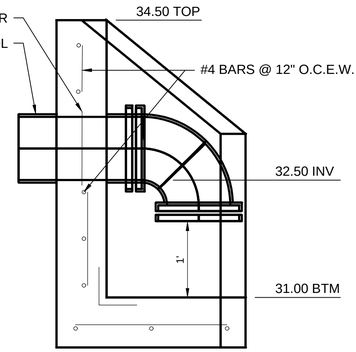
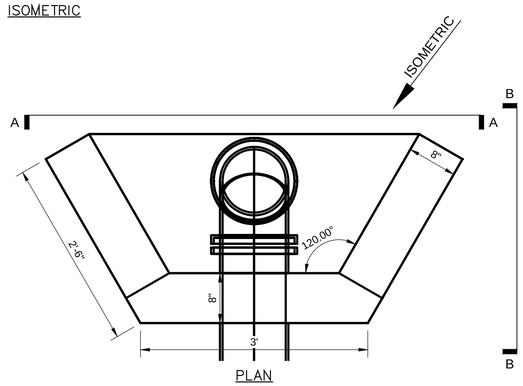
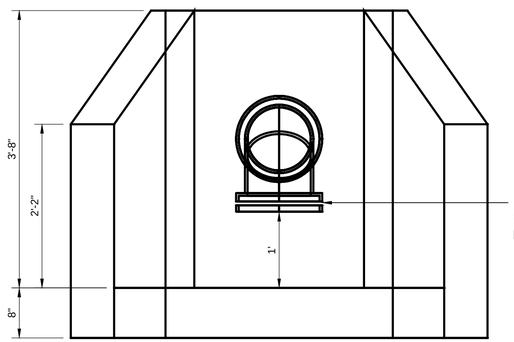


B–B



PLAN



A–A

OUTET WINGWALL

DETAIL B C-112

SCALE : 1" = 1'

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GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	J. YAZZIE
DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
C-004.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

CIVIL

MISCELLANEOUS DETAILS

DRAWING NUMBER

C-004

SHEET NUMBER
12 OF 76

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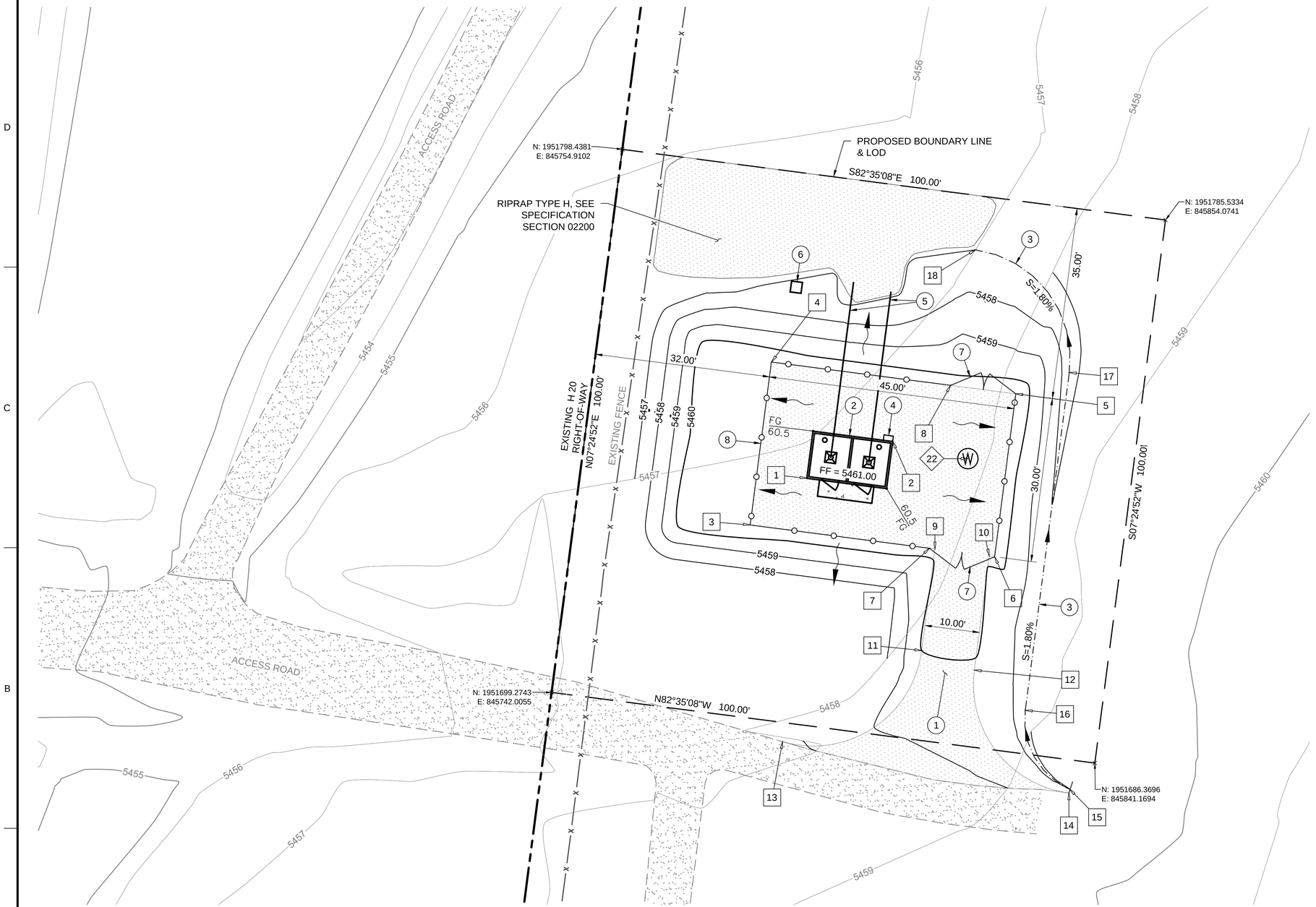

PLAN

0 10 20

SCALE IN FEET

PLAN NORTH

GENERAL NOTES

1. GRADING FROM PROPOSED ENCLOSED AREA TO NATURAL GRADE SHALL NOT EXCEED 3:1 MAX.
2. SEE TABLE 1 / C-002 FOR CONTROL COORDINATE INFORMATION. [X]
3. SEE SHEET G-002 FOR LEGEND.
4. SEE SHEET C-102 FOR PLAN & SECTION OF PROPOSED SITE.

KEY NOTES

1. GRAVEL SURFACE W/ GEOTEXILE, SEE DETAIL E / C-003. APPROX. 1820SF.
2. PRECAST PUMPHOUSE SEE IHS STD DWG W-14, W-15, W-23 & W-29.
3. DRAINAGE SWALE, SEE SHEET C-102.
4. ELECTRICAL EQUIPMENT, SEE ELECTRICAL.
5. DRAIN PIPE OUTLET, SEE DETAIL F / C-003.
6. FLUSH LINE OUTLET PER NTUA STD DWG WS-11.
7. 12.0' DOUBLE-WIDE SWING GATE SEE IHS STD DWG W-34
8. CHAINLINK FENCING SEE IHS STD DWG W-34

Call at least two full working days before you begin excavation.

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ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	J. YAZZIE
DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
C-100.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

CIVIL

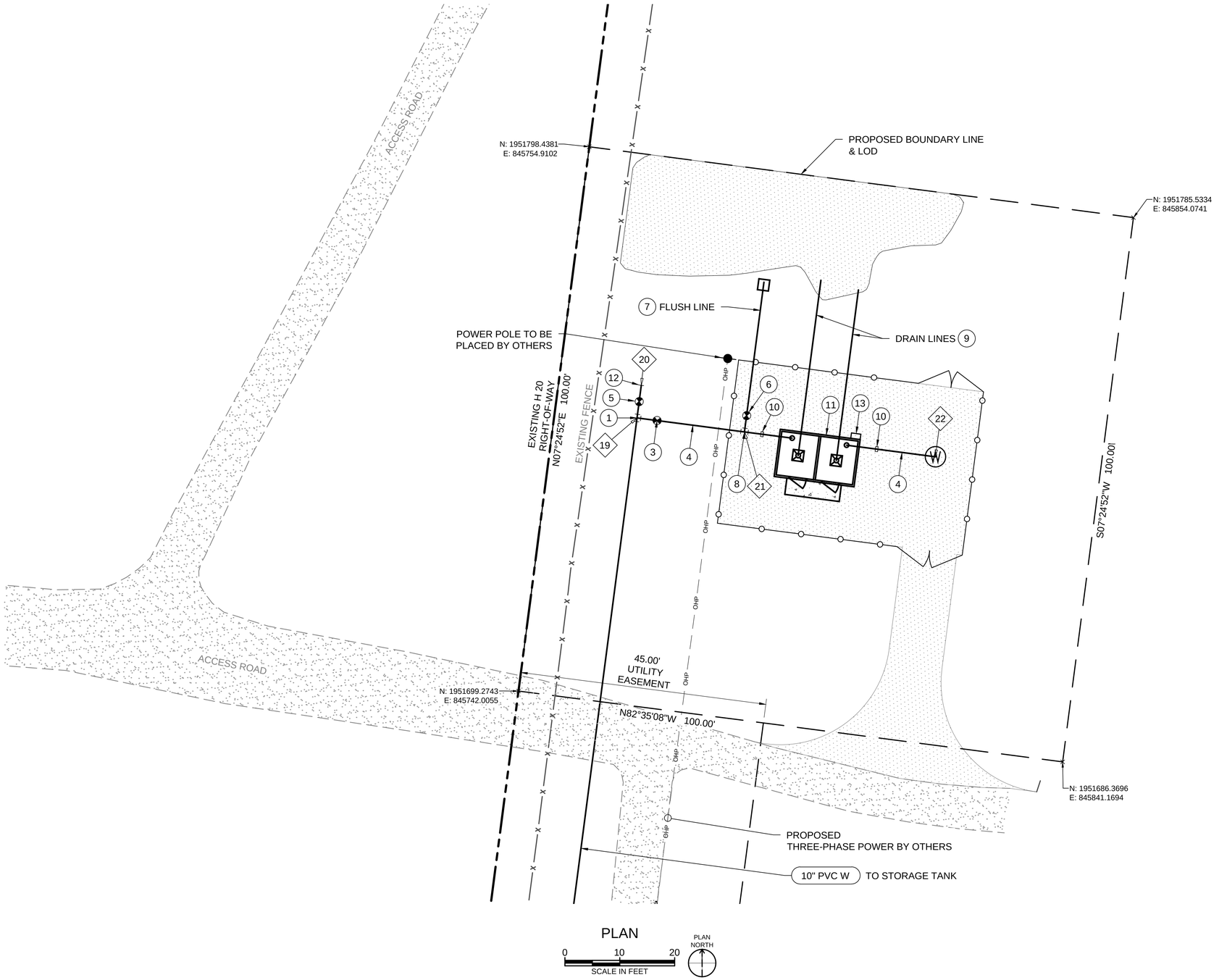
BODAWAY-GAP WELL NO. 3 SITE AND GRADING PLAN

DRAWING NUMBER

C-100

SHEET NUMBER
13 OF 76

Path: P:\PROJECTS\NAVAJO NATION\150360_WESTERN NAVAJO PIPELINE DESIGN PHASE 1_CAD\01_BODAWAY GAP\2-SHEETS\C-CIVIL FILENAME: C-100.DWG PLOT DATE: 5/12/2020 4:57 PM CAD USER: TYLER PRIDEMORE



PLAN

0 10 20

SCALE IN FEET

PLAN NORTH

GENERAL NOTES

1. ALL LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY AND POTHOLE AS REQUIRED TO COMPLETE THE WORK.
2. CONTRACTOR TO FIELD VERIFY LOCATION, ELEVATIONS, INVERTS, MATERIAL, DIMENSIONS AND CONDITION OF EXISTING UTILITIES.
3. CONTRACTOR TO PROVIDE THRUST BLOCKS AT ALL ELBOWS, TEES AND CROSSES PER NTUA STD DWG WS-19.
4. CONTRACTOR TO INSTALL PIPE IN TRENCH PER DETAIL A/C-004.
5. CONTRACTOR TO INSTALL MARKER POST PER NTUA STD DWG WS-13.
6. EASEMENT DIMENSIONS AND PIPELINE OFFSETS ARE SHOWN IN DETAIL B/C-003.
7. SEE TABLE 2 / C-002 FOR COORDINATE CONTROL INFORMATION. (X)
8. SEE SHEET G-002 FOR LEGEND.

KEY NOTES

1. 10" x 10" x 4" TEE
2. NOT USED
3. 4" DIA GATE VALVE PER NTUA STD DWG WS-14 AND SECTION 15102.
4. 4" DIA DI PC 350
5. 10" DIA GATE VALVE PER NTUA STD DWG WS-14 AND SECTION 15102.
6. 2" DIA GATE VALVE PER NTUA STD DWG WS-11 AND SECTION 15102.
7. 2" DIA DI PC 350 PER NTUA STD DWG WS-11.
8. 4" x 4" x 2" TEE
9. 2" DIA HDPE, SEE IHS STD DWG W-23.
10. PROVIDE FLEXIBLE SLEEVE JOINT OUTSIDE OF WELL SURFACE CASING PER GENERAL SITE PIPING NOTE 3 ON C-001.
11. PRECAST PUMPHOUSE SEE STD DWG W-14, W-15, W-23 & W-29.
12. 10" DIA CAP - FUTURE CONNECTION
13. ELECTRICAL CABINET, SEE ELECTRICAL.

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406-656-6399

Registered Professional Engineer (Certificate No.) 63511 STEVEN BRENCHLEY Date Signed 10/3/19 ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	J. YAZZIE
DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
C-101.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

CIVIL

BODAWAY-GAP WELL NO. 3 PIPING PLAN

DRAWING NUMBER

C-101

SHEET NUMBER
14 OF 76

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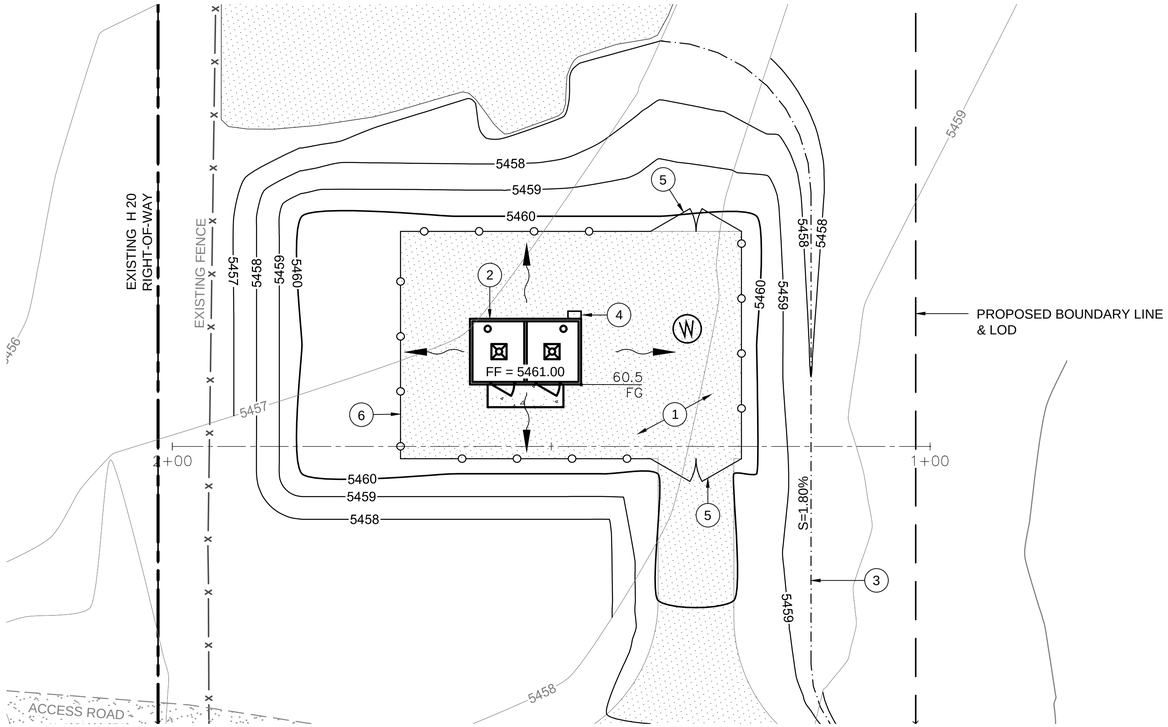
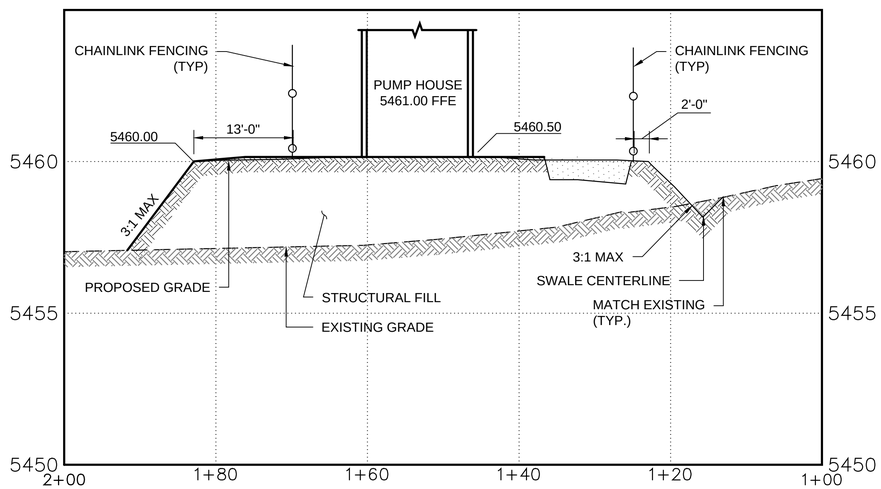


PLAN

0 10 20

SCALE IN FEET

PLAN NORTH



PROFILE

SCALE H: 1" = 10'
V: 1" = 2'-6"

GENERAL NOTES

1. GRADING FROM PROPOSED ENCLOSED AREA TO NATURAL GRADE SHALL NOT EXCEED 3:1 MAX.
2. SEE SHEET G-002 FOR LEGEND.

KEY NOTES

1. GRAVEL SURFACE W/ GEOTEXILE, SEE DETAIL E/C-003. APPROX. 1820SF.
2. PRECAST PUMPHOUSE SEE IHS STD DWG W-14, W-15, W-23 & W-29.
3. DRAINAGE SWALE, SEE PROFILE ON THIS SHEET.
4. ELECTRICAL CABINET, SEE ELECTRICAL.
5. 12.0' DOUBLE-WIDE SWING GATE SEE IHS STD DWG W-34
6. CHAINLINK FENCING SEE IHS STD DWG W-34

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REGISTERED PROFESSIONAL ENGINEER
CERTIFICATE NO.
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STEVEN
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Date Signed 10/3/19
ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS		
REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	J. YAZZIE
DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
C-102.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

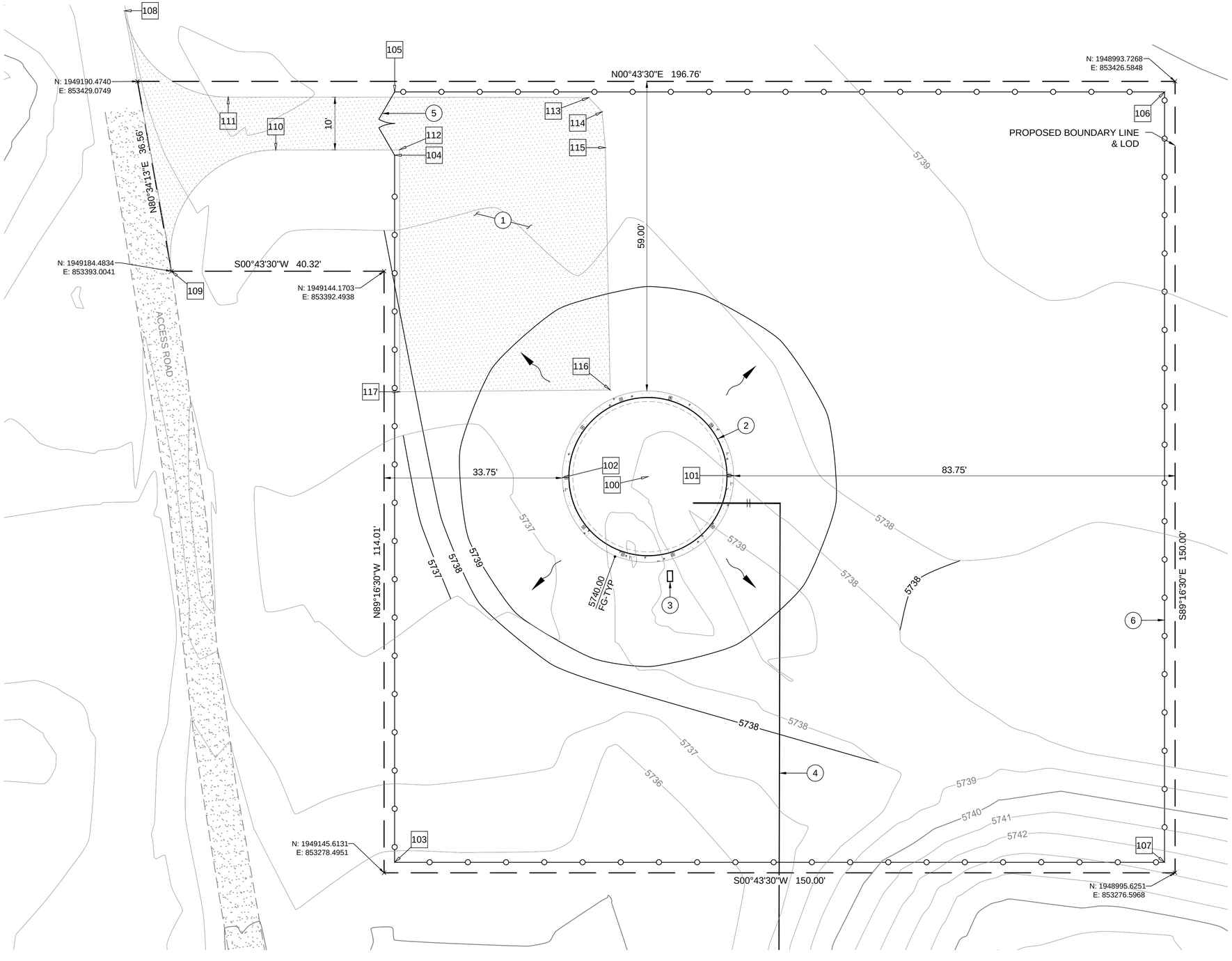
CIVIL

BODAWAY-GAP WELL NO. 3 SITE ELEVATION

DRAWING NUMBER
C-102

SHEET NUMBER
15 OF 76

Path: P:\PROJECTS\NAVAJO NATION\150360_WESTERN NAVAJO PIPELINE DESIGN PHASE 11_CAD\01_BODAWAY GAP\2-SHEETS\C-CIVIL FILENAME: C-102.DWG PLOT DATE: 5/12/2020 4:47 PM CAD USER: TYLER PRIDEMORE



STORAGE TANK			
VOLUME (GALLONS)	DIAMETER (FT)	BASE ELEVATION (FT)	OVERFLOW ELEVATION (FT)
80,000	30	5740	5754

PLAN

0 10 20

SCALE IN FEET

PLAN NORTH

GENERAL NOTES

1. GRADING FROM PROPOSED STORAGE TANK TO NATURAL GRADE SHALL NOT EXCEED 4:1 MAX.
2. SEE TABLE 3 / C-002 FOR CONTROL COORDINATE INFORMATION. X
3. SEE SEE G-002 FOR LEGEND.

KEY NOTES

1. GRAVEL SURFACE W/ GEOTEXTILE, SEE DETAIL E/C-003. APPROX. 2850SF.
2. 80,000 GAL. STORAGE TANK, SEE SHEET C-113.
3. ELECTRICAL CABINET, SEE ELECTRICAL.
4. DRAIN & OVERFLOW LINE, SEE SHEET C-112.
5. 12' DOUBLE-WIDE SWING GATE SEE STD DWG W-34
6. CHAINLINK FENCING SEE STD DWG W-34

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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222 N. 32nd Street, #700
Billings, Montana 59101
406-656-6399

CERTIFICATE
63511
STEVEN BRENCHLEY
Date Signed 10/3/21
ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	J. YAZZIE
DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
C-110.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

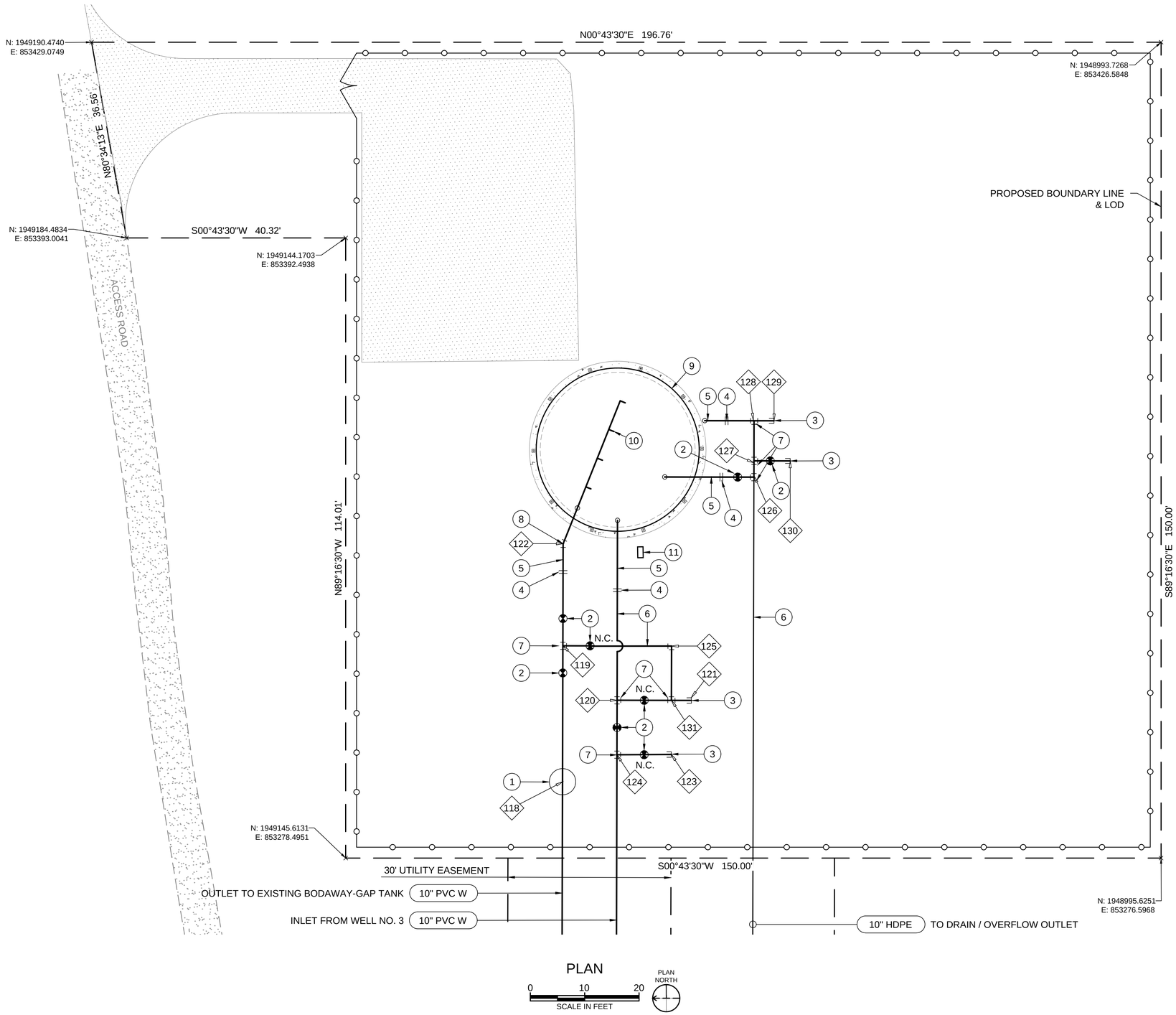
CIVIL

BODAWAY-GAP STORAGE TANK NO. 2 SITE AND GRADING PLAN

DRAWING NUMBER
C-110

SHEET NUMBER
16 OF 76

Path: C:\BCPW\D1020272 FILENAME: C-110.DWG PLOT DATE: 10/1/2021 2:57 PM CAD USER: TYLER PRIDEMORE



PLAN

0 10 20

SCALE IN FEET

PLAN NORTH

GENERAL NOTES

1. ALL LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY AND POTHOLE AS REQUIRED TO COMPLETE THE WORK.
2. CONTRACTOR TO FIELD VERIFY LOCATION, ELEVATIONS, INVERTS, MATERIAL, DIMENSIONS AND CONDITION OF EXISTING UTILITIES.
3. CONTRACTOR TO PROVIDE THRUST BLOCKS AT ALL ELBOWS, TEES AND CROSSES PER NTUA STD DWG WS-19.
4. CONTRACTOR TO INSTALL PIPE IN TRENCH PER DETAIL A/C-004.
5. CONTRACTOR TO INSTALL MARKER POST PER NTUA STD DWG WS-13.
6. EASEMENT DIMENSIONS AND PIPELINE OFFSETS ARE SHOWN IN DETAIL C/C-003.
7. SEE TABLE 4 / C-002 FOR COORDINATE CONTROL INFORMATION. (X)
8. SEE SHEET G-002 FOR LEGEND.
9. SEE SHEET C-113 FOR DETAILS ON ALL TANK PENETRATIONS.

KEY NOTES

1. PRESSURE TRANSMITTER VAULT, SEE IHS STD DWG W-32.
2. 10" DIA GATE VALVE, SEE NTUA STD DWG WS-14 AND SECTION 15102.
3. 10" DIA CAP - FUTURE CONNECTION
4. FLEXIBLE JOINT COUPLING
5. 10" DIA STEEL PIPE PER SHEET C-113.
6. 10" DIA HDPE PIPE
7. 10" x 10" x 10" TEE
8. 10" DIA 22.5d BEND
9. 80,000 GAL. STORAGE TANK, SEE SHEET C-113.
10. INLET MANIFOLD PER ELEVATION SHOWN ON SHEET C-113.
11. ELECTRICAL EQUIPMENT, SEE ELECTRICAL.

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Date Signed 10/3/21
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GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	J. YAZZIE
DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
C-111.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

CIVIL

BODAWAY-GAP STORAGE TANK NO. 2 PIPING PLAN

DRAWING NUMBER

C-111

SHEET NUMBER
17 OF 76

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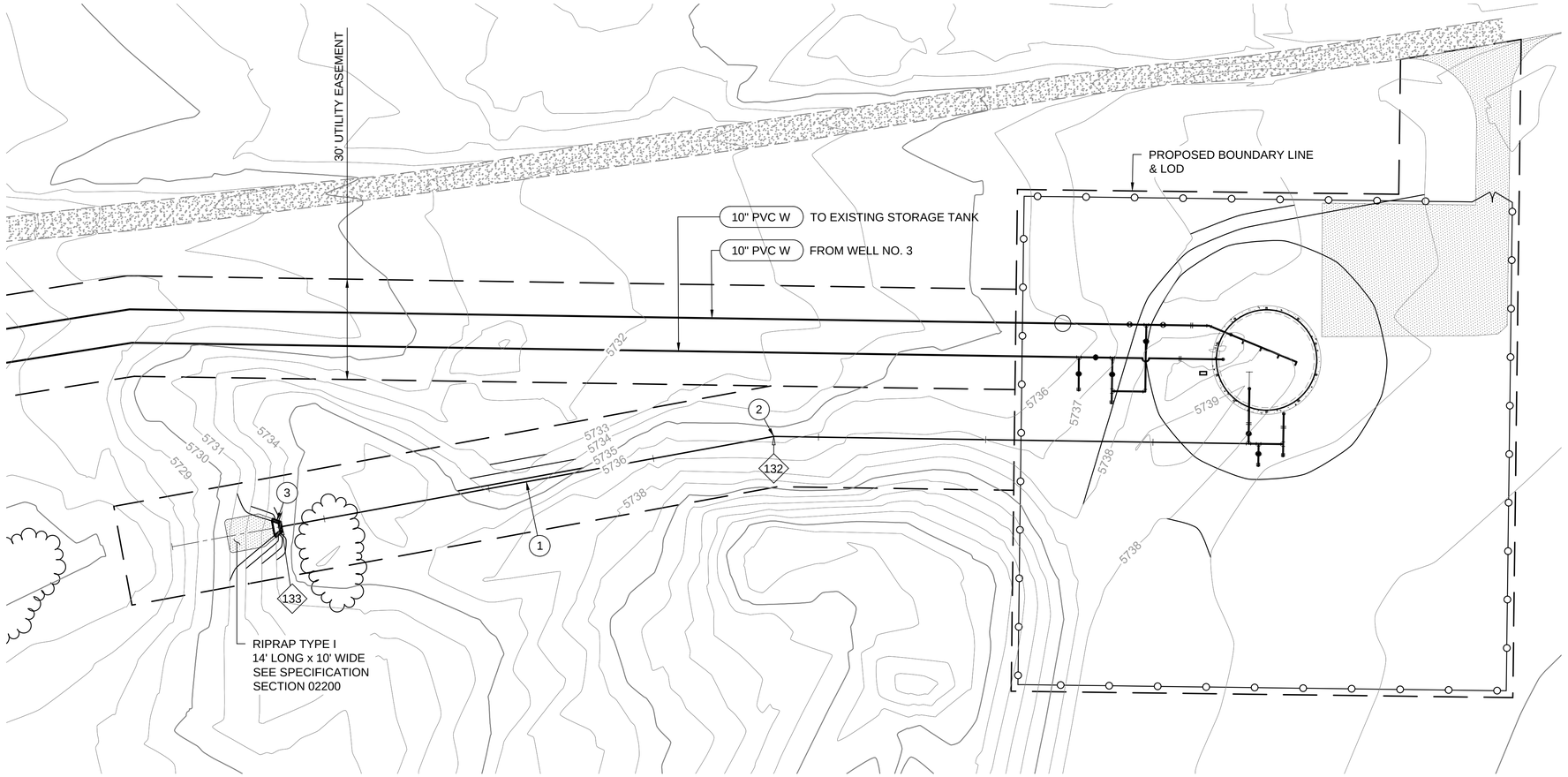
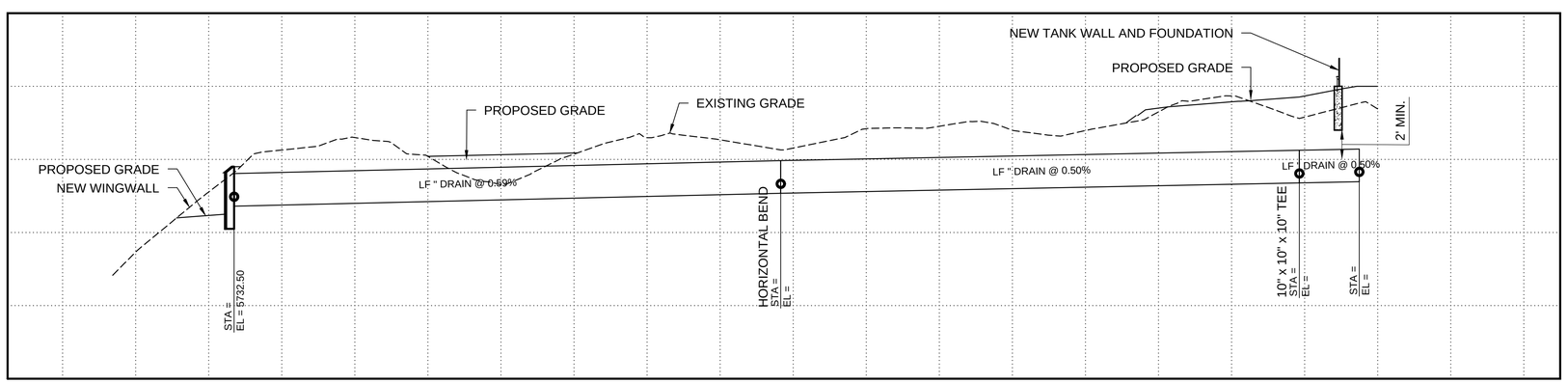


DRAIN & OVERFLOW
PLAN

PLAN NORTH

0 20 40
SCALE IN FEET



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

GENERAL NOTES

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4. CONTRACTOR TO INSTALL PIPE IN TRENCH PER DETAIL A/C-004.
5. CONTRACTOR TO INSTALL MARKER POST PER NTUA STD DWG WS-13.
6. EASEMENT DIMENSIONS AND PIPELINE OFFSETS ARE SHOWN IN DETAIL C/C-003.
7. GRADING OVER DRAIN PIPE SHALL NOT EXCEED 3:1 MAX.
8. SEE SHEET C-002 FOR CONTROL COORDINATE INFORMATION.
9. SEE SEE G-002 FOR LEGEND.

KEY NOTES

1. 10" DIA HDPE PIPE
2. 10" 11.25d BEND
3. DRAIN & OVERFLOW OUTLET W/ WINGWALL PER DETAIL B/C-004.

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Registered Professional Engineer (Civil)
CERTIFICATE NO.
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STEVEN
BRENCHLEY
Date Signed 10/3/21
ARIZONA, U. S. A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	J. YAZZIE
DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
C-112.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

CIVIL

BODAWAY-GAP STORAGE TANK NO. 2 DRAIN LINE PLAN & PROFILE

DRAWING NUMBER

C-112

SHEET NUMBER
18 OF 76

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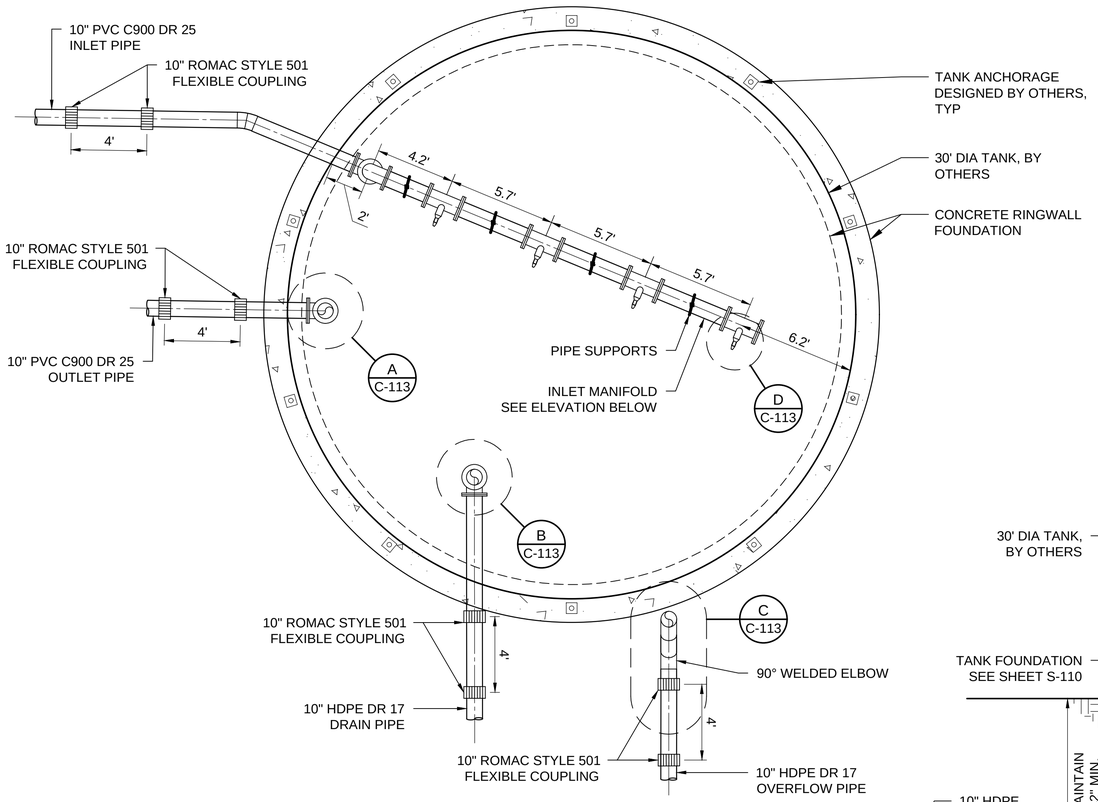
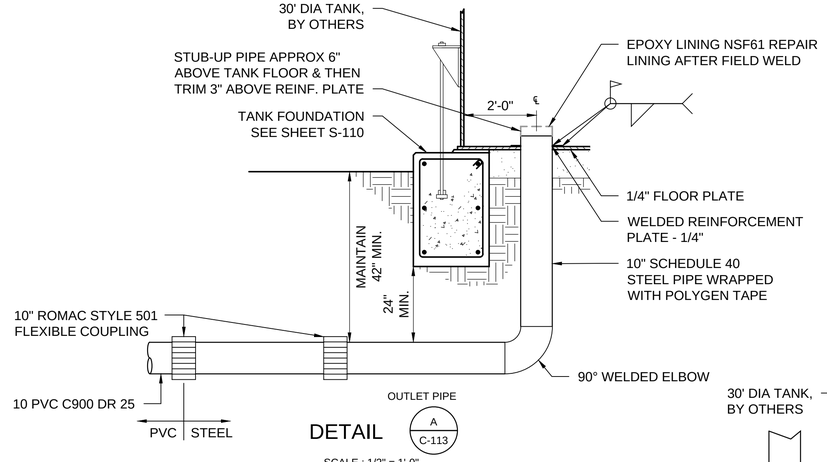
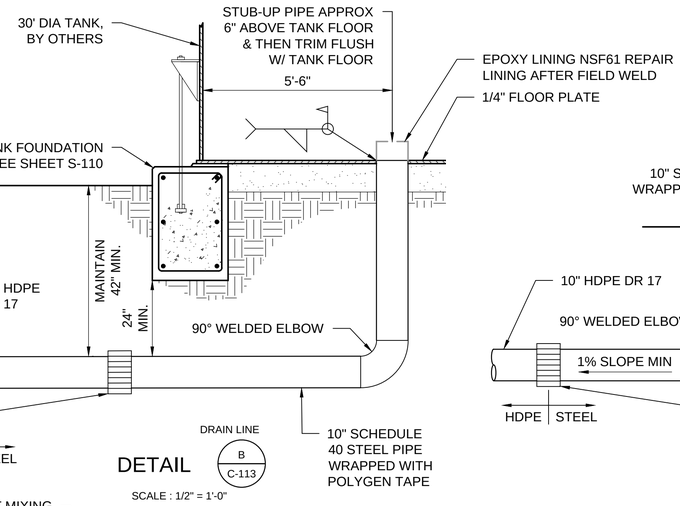


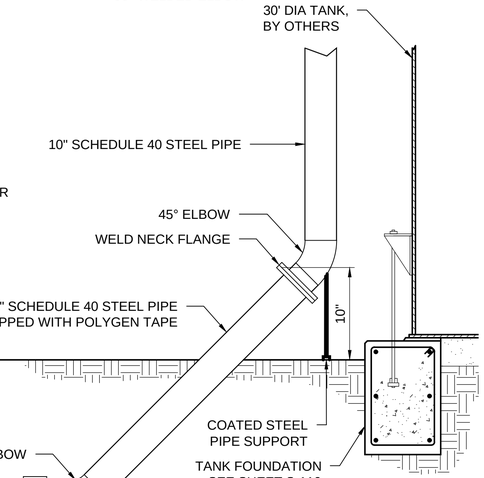
STORAGE TANK PIPING
PLAN
SCALE : 1/4" = 1'-0"



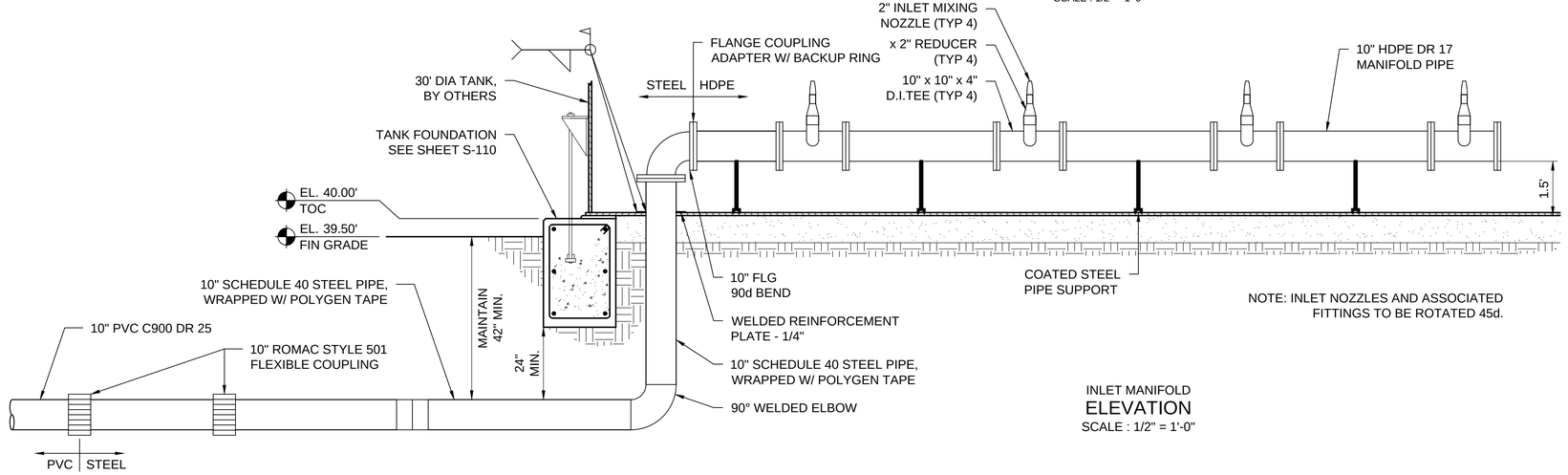
DETAIL
SCALE : 1/2" = 1'-0"



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

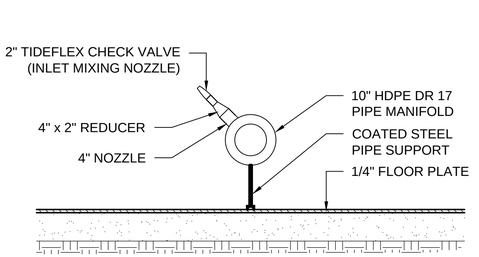


DETAIL
SCALE : 1/2" = 1'-0"



INLET MANIFOLD
ELEVATION
SCALE : 1/2" = 1'-0"

NOTE: INLET NOZZLES AND ASSOCIATED FITTINGS TO BE ROTATED 45d.



MAINFOLD
CROSS-SECTION
DETAIL
D
C-113
SCALE : 1/2" = 1'-0"

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Billings, Montana 59101
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CERTIFICATE NO.
63511
STEVEN
BRENCHLEY
Date Signed 10/3/21
ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	J. YAZZIE
DRAWN:	T. PRIDEMORE
CHECKED:	J. YAZZIE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
C-113.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

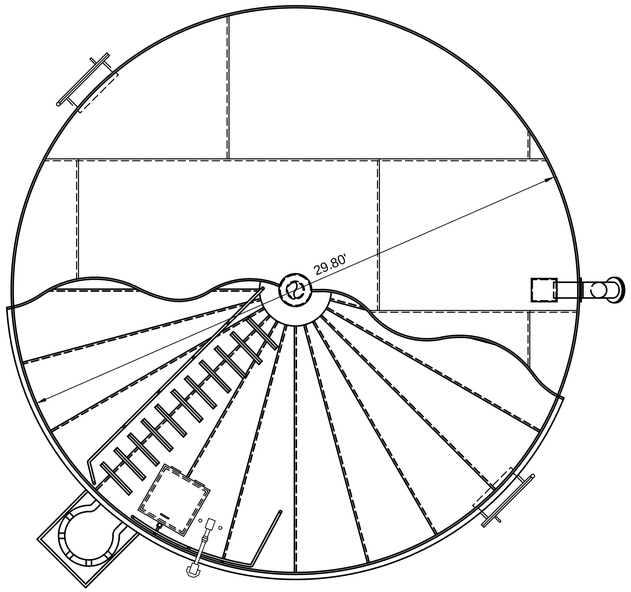
CIVIL

BODAWAY-GAP STORAGE TANK NO. 2 PIPING PLAN & ELEVATION

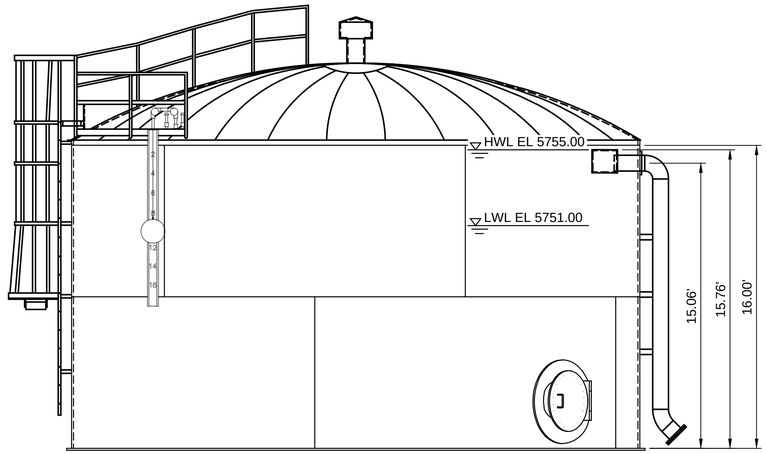
DRAWING NUMBER
C-113

SHEET NUMBER
19 OF 76

Path: C:\BCPWD\1020272 FILENAME: C-113.DWG PLOT DATE: 10/1/2021 2:59 PM CAD USER: TYLER PRIDEMORE



STORAGE TANK
PLAN
SCALE : 1/4" = 1'-0"



STORAGE TANK
ELEVATION
SCALE : 1/4" = 1'-0"

GENERAL NOTES

KEY NOTES

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GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP
WELL, TANK, AND
PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES
AT FULL SIZE

DESIGNED: J. YAZZIE
DRAWN: T. PRIDEMORE
CHECKED: J. YAZZIE
CHECKED: E. DESOUZA
APPROVED: S. BRENCHLEY

FILENAME
C-114.DWG
BC PROJECT NUMBER
150360
CLIENT PROJECT NUMBER
C010232

CIVIL

BODAWAY-GAP
STORAGE TANK NO.
2 PLAN AND
ELEVATION

DRAWING NUMBER
C-114

SHEET NUMBER
20 OF 76

Path: C:\BCPW\D1020272 FILENAME: C-114.DWG PLOT DATE: 10/1/2021 2:59 PM CAD USER: TYLER PRIDEMORE

ALTITUDE VALVE NOTES:

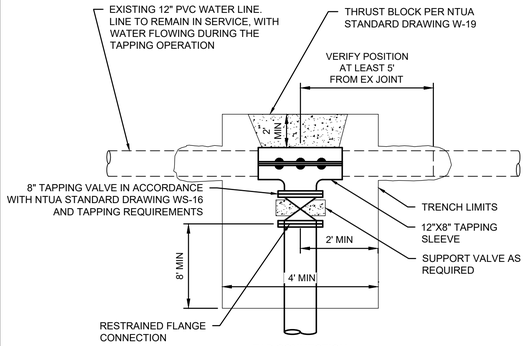
PROVIDE 6" COMBINATION PRESSURE REDUCING, PRESSURE SUSTAINING AND SOLENOID CONTROL VALVE WITH GLOBE-STYLE REDUCED PORT BODY, 150# FLANGES, AND STAINLESS STEEL TRIM, FITTINGS, AND TUBING. SEE SPEC. SECTION 15147 FOR VALVE FUNCTION AND OTHER REQUIREMENTS.

MODEL: CLA-VAL NO. 692-07-BDCPSYKC

VALVE OPENS AT EXISTING GAP TANK LEVEL: 5475 FT
PRESSURE REDUCING SETTING: 30 PSI (RANGE: 30-300 PSI)
PRESSURE SUSTAINING SETTING: 120 PSI (RANGE: 20-200 PSI)
FLOW RATE: 160 GPM (INITIAL AVG.); 640 GPM (PEAK FUTURE)

REVISIONS TO IHS STD DWG W-28:

1. PROVIDE 6" CLA VALVE IN LIEU OF 2" VALVE, ITEM 16 PER W-28 AND 6" FITTINGS, APPURTENANCES AND PIPING.
2. PROVIDE 10"x6" REDUCERS BETWEEN EXTERIOR GATE VALVES AND VAULT WALL ON BOTH INLET AND OUTLET SIDES.
3. PROVIDE 6" GATE VALVE IN LIEU OF CHECK VALVE, ITEM 34 PER W-28 AND 6" PIPING, FITTINGS AND APPURTENANCES ON BYPASS LINE.
4. PROVIDE 8'x6'x6' PRECAST CONCRETE VAULT AS SPECIFIED PER ITEM 23 NTUA STANDARD 4"x2" PRV DETAIL, WITH 8' LENGTH AND WITHOUT CONCRETE BASE, IN LIEU OF VAULT, ITEM 21 PER W-28.
5. PROVIDE 5'x5' INSULATED DOUBLE DOOR COVER & SAFETY GRATE PER ITEM 24 NTUA STANDARD 4"x2" PRV DETAIL, IN LIEU OF ITEM 23 PER W-28.
6. IN LIEU OF CONCRETE BLOCK SUPPORT FOR TEE, PROVIDE ADJUSTABLE METAL PIPE SUPPORT PER ITEM 27 NTUA STANDARD 4"x2" PRV DETAIL.
7. PROVIDE VAULT STEPS PER ITEM 22 NTUA STANDARD 4"x2" PRV DETAIL.
8. IN LIEU OF ITEM 29, HYDRAULIC SENSING LINE, PROVIDE 1" SOLENOID SIGNAL WIRE CONDUIT. SECTION A-A IS NOT APPLICABLE.
9. VAULT JOIST TO BE SEALED WITH BITUMASTIC GASKET.
10. PROVIDE 6" DIA BOLLARDS AT 12" MIN FROM VAULT CORNERS PER ITEM 31 NTUA STANDARD 4"x2" PRV DETAIL.
11. CONCRETE COLLARS FOR VALVE BOXES PER ITEM 26 NTUA STANDARD 4"x2" PRV DETAIL.
12. GENERAL NOTES:
    a. PROVIDE ADEQUATE CLEARANCE BETWEEN FLANGE BOLTS AND VAULT WALLS FOR MAINTENANCE.
    b. GATE VALVES TO BE SUPPORTED ON 95% STANDARD PROCTOR.
    c. ALL PIPES AND FITTINGS 2" OR LESS TO BE STAINLESS STEEL.
    d. A.R. = AS REQUIRED



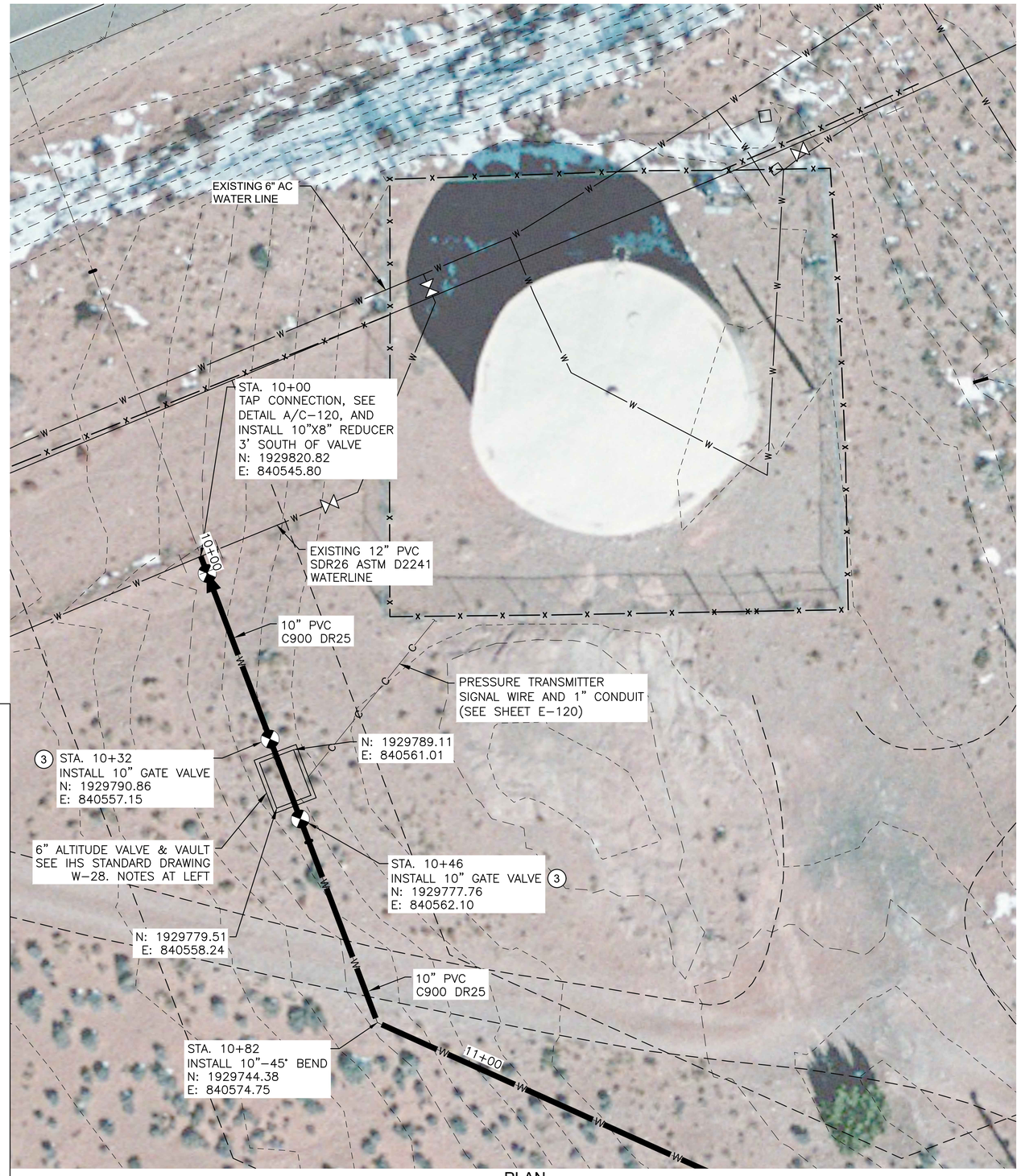
TAP CONNECTION

DETAIL A C-120

SCALE: NTS

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.



PLAN

SCALE: 1" = 20'

GENERAL NOTES

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2. CONTRACTOR TO FIELD VERIFY PHYSICAL LOCATIONS, ELEVATIONS, AND INVERTS OF ALL FEATURES.
3. CONTRACTOR TO INSTALL PIPE TRENCH PER DETAIL A ON SHEET C-004.
4. CONTRACTOR TO INSTALL MARKER POSTS AT ALL GATE VALVES, AIR VALVES, TEES, BENDS, AND GRADE CHANGES AS DIRECTED PER NTUA STD. DRAWING WS-13.
5. CONTRACTOR TO PROVIDE THRUST BLOCKS AT ALL BENDS, TEES, CAPS, AND CROSSES PER NTUA STD. DRAWING WS-19. FOR REDUCERS, PROVIDE THRUST BLOCKS WITH THE SAME BEARING AREA AS 22.5-DEG BENDS BASED ON THE LARGEST DIAMETER.
6. EASEMENT DIMENSIONS AND PIPELINE OFFSETS ARE SHOWN IN DETAIL A ON SHEET C-002.
7. DEFLECT PIPE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AS NECESSARY.

KEY NOTES

(3) GATE VALVE PER NTUA STD. DWG WS-14

0 10 20
SCALE IN FEET

PLAN NORTH

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Registered Professional Engineer (Civil) CERTIFICATE NO. 67639 PAUL A. SWENSON Date Signed 9/29/21 ARIZONA, U.S.A.
Expires 12/31/21

GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

REVISIONS		
REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:
DRAWN:
CHECKED:
CHECKED:
APPROVED:

FILENAME
SC-DT-VAULT-21254.DWG
BC PROJECT NUMBER
150360
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

BODAWAY GAP ALTITUDE AND FLOW CONTROL VALVE SITE PLAN

DRAWING NUMBER
C-120

SHEET NUMBER
21 OF 76

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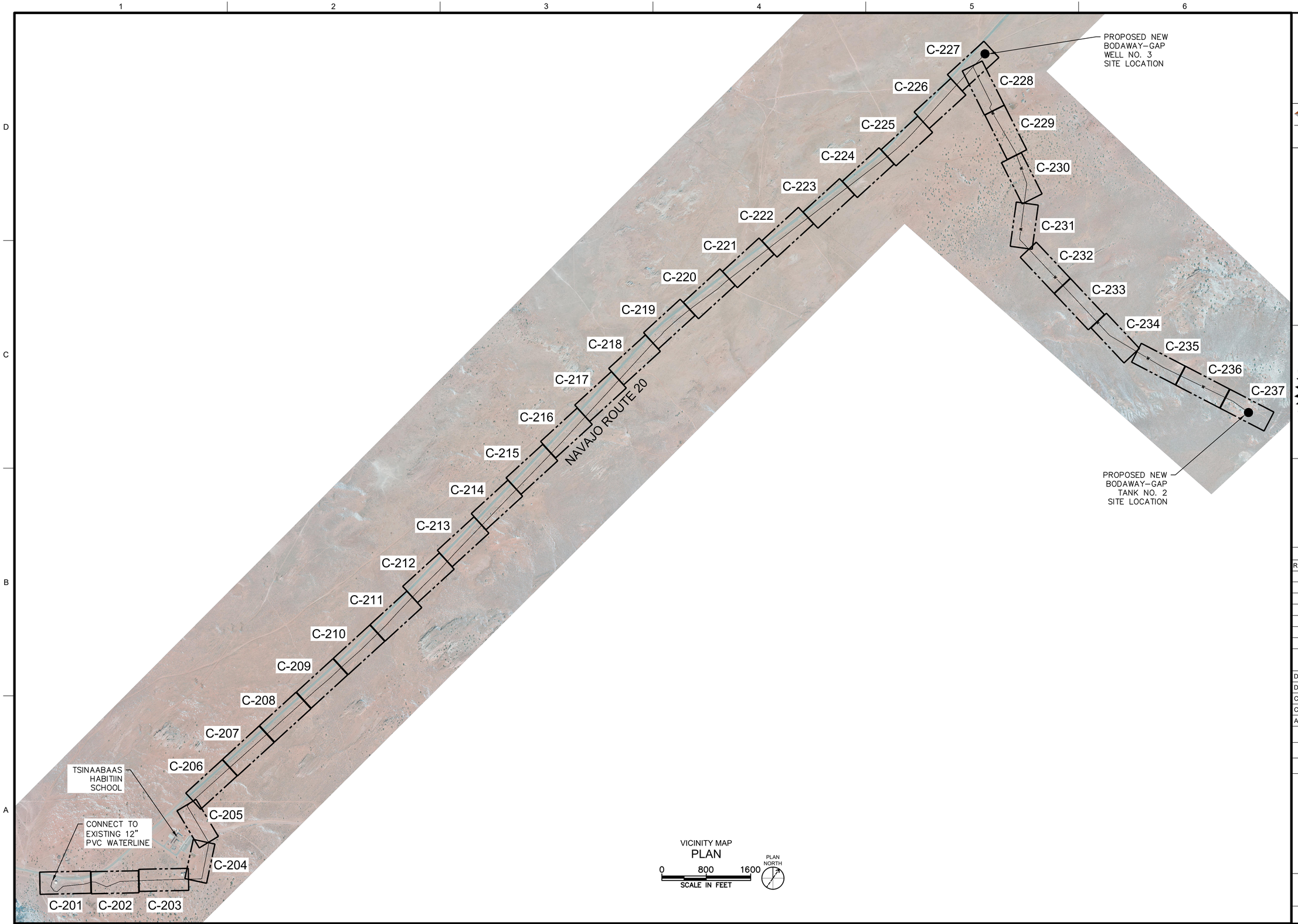

VICINITY MAP
PLAN
0 800 1600
SCALE IN FEET
PLAN NORTH

Path: W:\28\21254-01165\CAD\CIVIL FILENAME: SC-KM-BODAWAY-21254.DWG PLOT DATE: 10/4/2021 4:50 PM CAD USER: JOHN BRIDGEWATER

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Billings, Montana 59101
406-656-6399

Registered Professional Engineer (Civil)
CERTIFICATE NO.
67639
PAUL A. SWENSON
Date Signed 9/29/21
ARIZONA, U.S.A.
Expires 12/31/21

GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

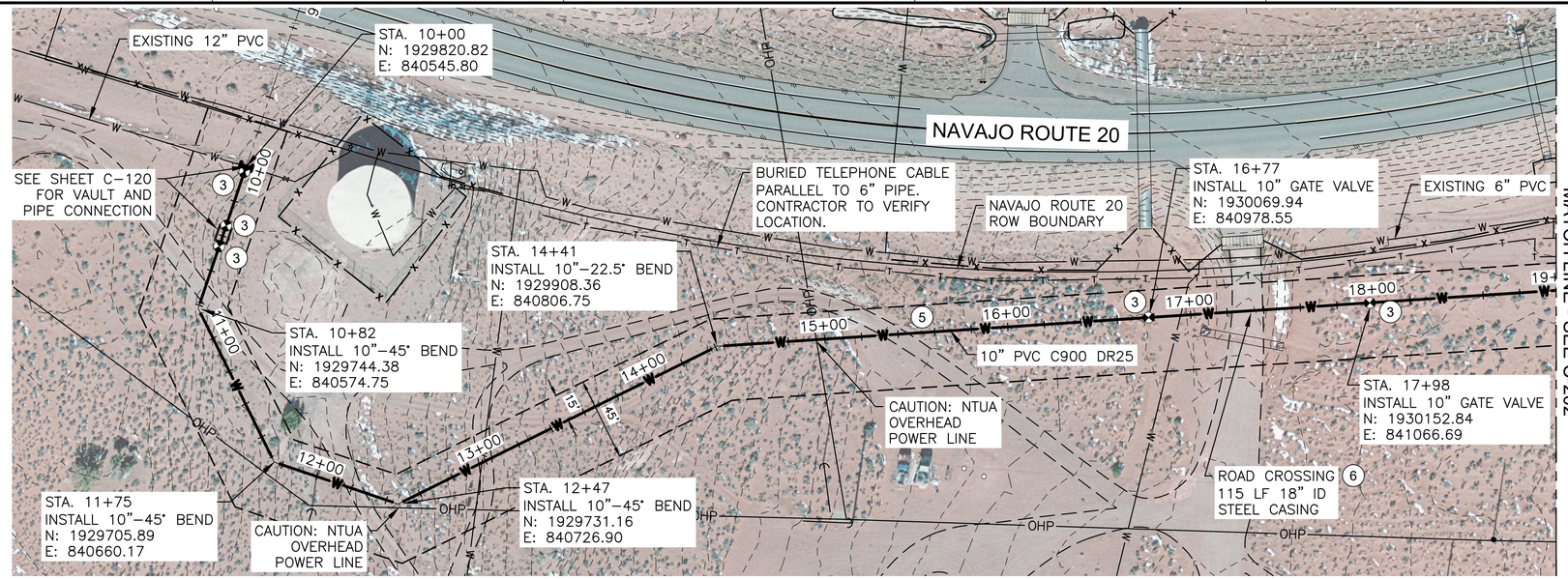
DESIGNED:	
DRAWN:	
CHECKED:	
CHECKED:	
APPROVED:	

FILENAME
SC-KM-BODAWAY-21254.DWG
BC PROJECT NUMBER
150360
CLIENT PROJECT NUMBER
4028.21254.01

GENERAL

VICINITY MAP

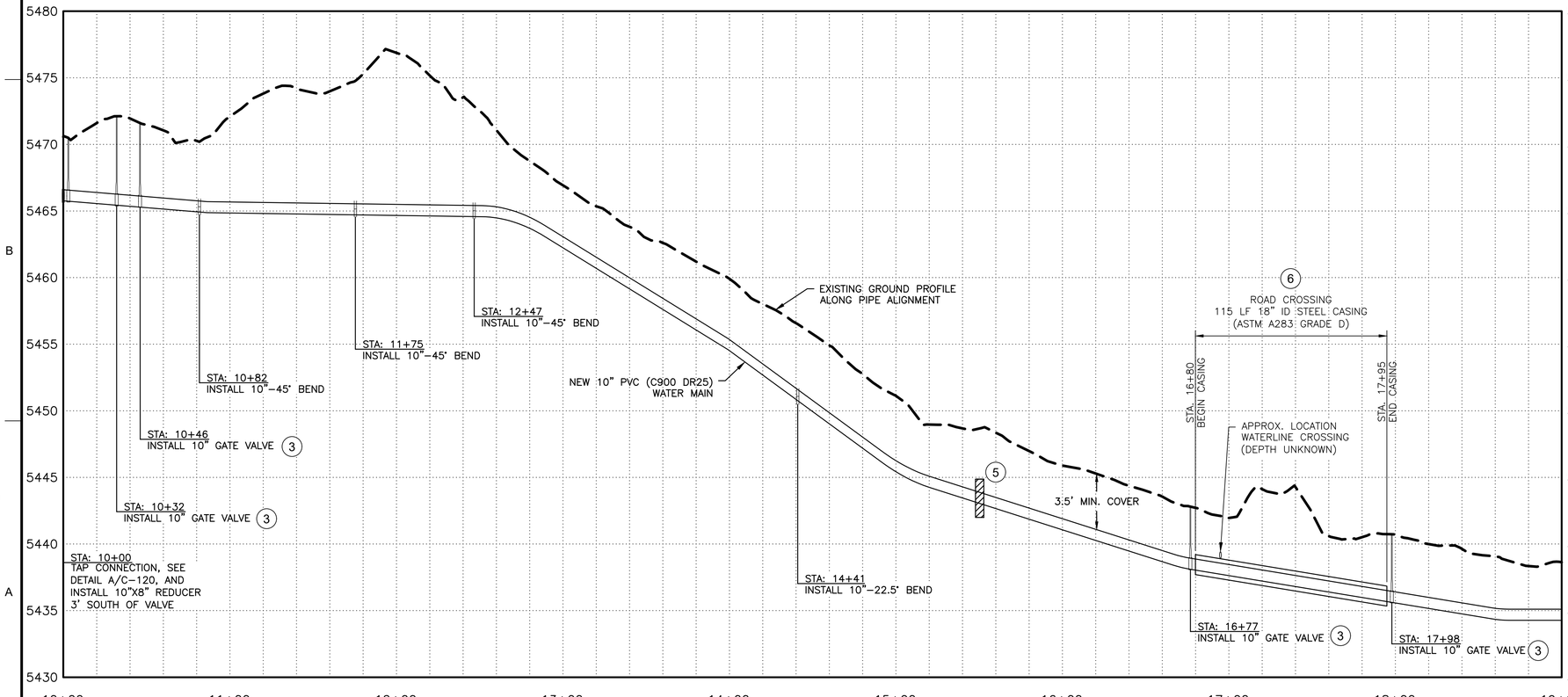
DRAWING NUMBER
C-200
SHEET NUMBER
22 OF 76



STA 10+00 - STA 19+00

PLAN

SCALE: 1" = 40'



PROFILE

SCALE H: 1" = 40'
V: 1" = 5'

GENERAL NOTES

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7. DEFLECT PIPE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AS NECESSARY.

KEY NOTES

(3) GATE VALVE PER NTUA STD. DWG WS-14

(5) WATER BAR PER SPEC. SECTION 02200.

(6) STEEL ENCASED ROAD CROSSING PER IHS STD. DWG W-35 AND NTUA STD. DWG WS-17a

SCALE IN FEET: 0 40 80

PLAN NORTH

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ARIZONA 811 Arizona Blue Stake, Inc.

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Brown AND Caldwell
SALT LAKE CITY, UTAH

DOWL www.DOWL.COM
222 N. 32nd Street, #700
Billings, Montana 59101
406-656-6399

Registered Professional Engineer
CERTIFICATE NO.
67639
PAUL A. SWENSON
Date Signed 9/29/21
ARIZONA, U.S.A.
Expires 12/31/21

GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:
DRAWN:
CHECKED:
CHECKED:
APPROVED:

FILENAME
SC-WA-PP4_13-21254.DWG
BC PROJECT NUMBER
150360
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 10+00 TO 19+00
PLAN & PROFILE

DRAWING NUMBER
C-201

SHEET NUMBER
23 OF 76

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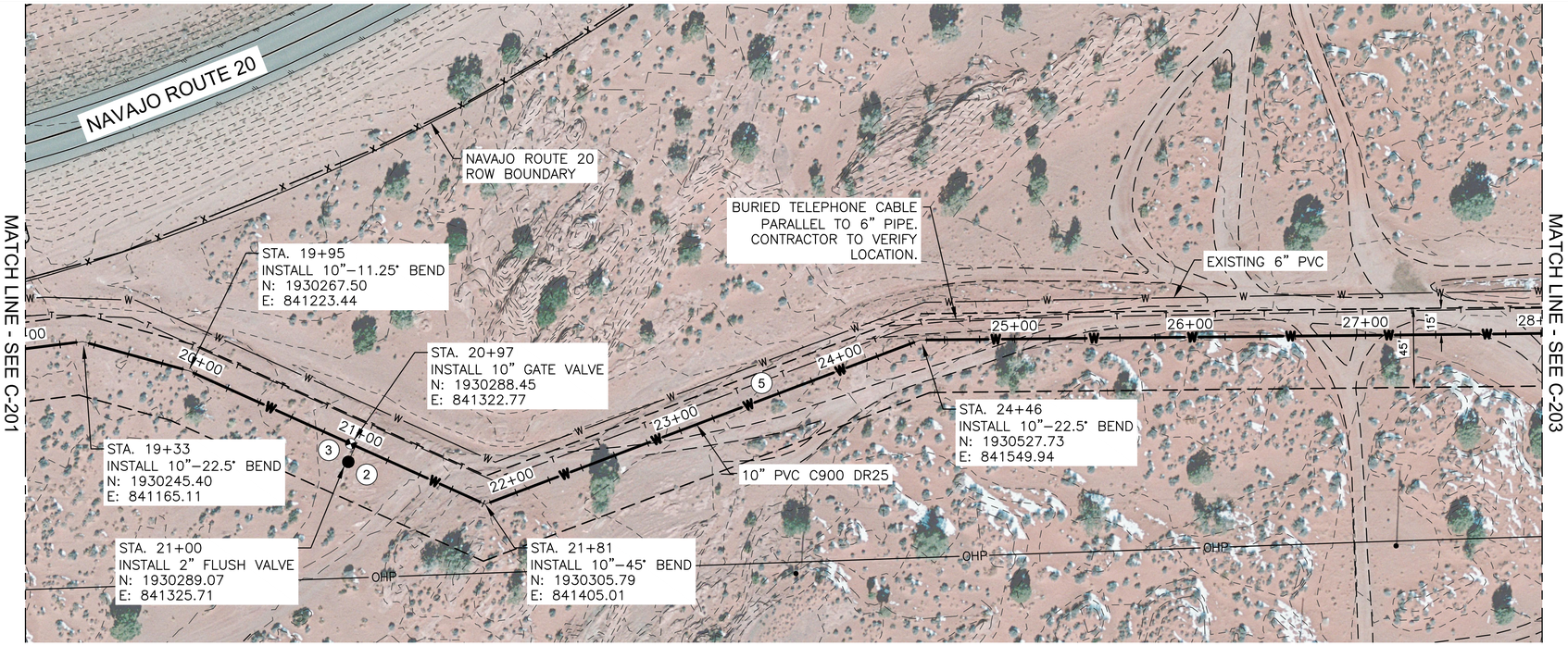
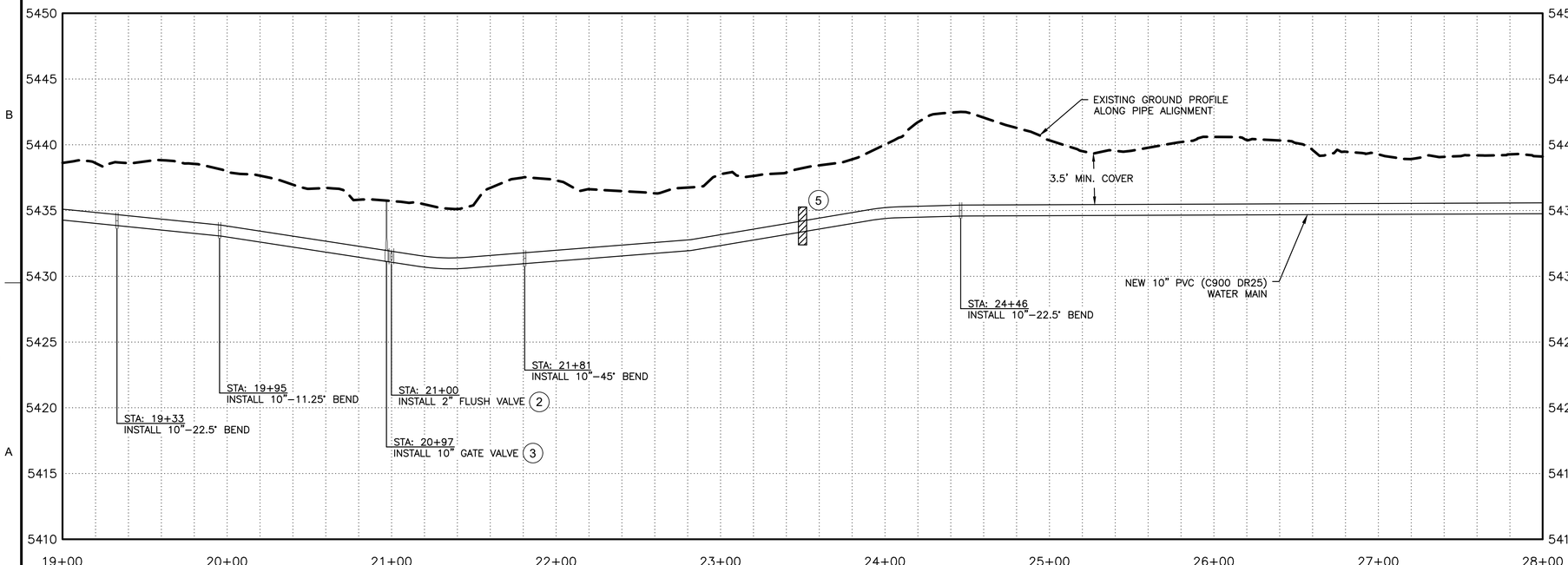


STA 19+00 - STA 28+00

PLAN

SCALE: 1" = 40'



PROFILE

SCALE H: 1" = 40'

V: 1" = 5'

GENERAL NOTES

1. ALL LOCATIONS OF EXISTING UTILITIES ARE SHOWN APPROXIMATELY. CONTRACTOR TO FIELD VERIFY AND POTHOLE AS REQUIRED TO COMPLETE THE WORK. POTHOLE 300 FEET AHEAD OF THE WORK TO VERIFY EXISTING WATER LINE LOCATIONS AND OTHER BURIED UTILITIES.
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6. EASEMENT DIMENSIONS AND PIPELINE OFFSETS ARE SHOWN IN DETAIL A ON SHEET C-002.
7. DEFLECT PIPE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AS NECESSARY.

KEY NOTES

(2) FLUSH VALVE PER NTUA STD. DWG WS-11

(3) GATE VALVE PER NTUA STD. DWG WS-14

(5) WATER BAR PER SPEC. SECTION 02200.

0 40 80
SCALE IN FEET

PLAN NORTH

Call at least two full working days before you begin excavation.

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BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 19+00 TO 28+00
PLAN & PROFILE

DRAWING NUMBER
C-202

SHEET NUMBER
24 OF 76

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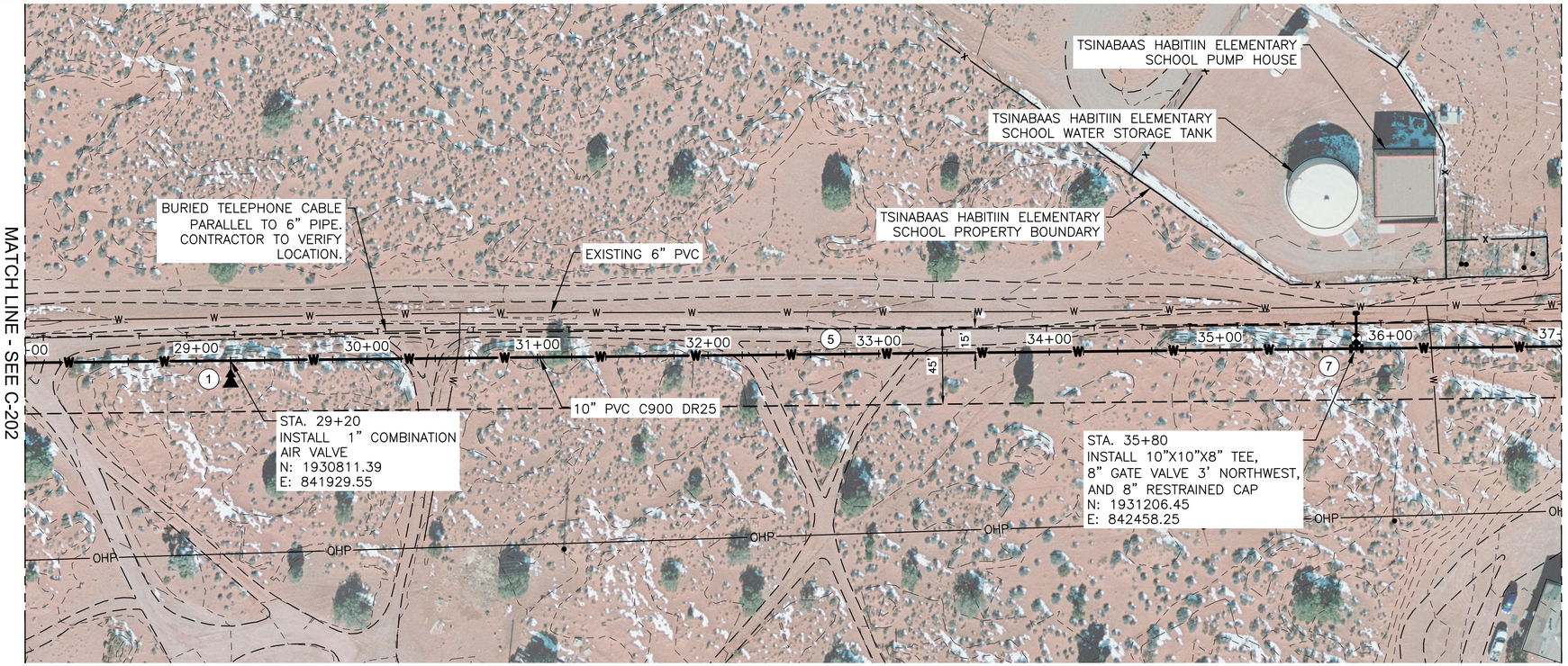
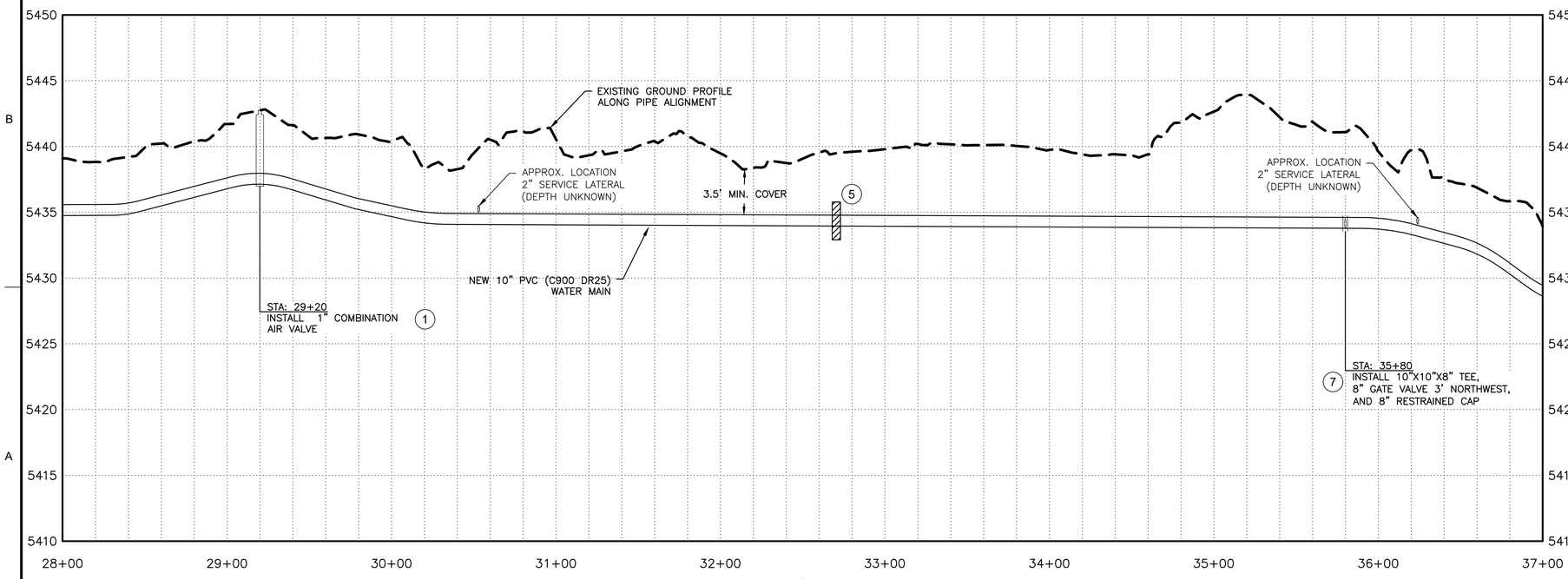


STA 28+00 - STA 37+00

PLAN

SCALE: 1" = 40'



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KEY NOTES

(1) AIR VALVE PER NTUA STD. DWG WS-10

(5) WATER BAR PER SPEC. SECTION 02200.

(7) PROVIDE 1 JOINT (20') OF 8" PVC (C-900 DR25) WITH CAP DOWNSTREAM OF GATE VALVE PER NTUA STD. DWG WS-16. RESTRAIN VALVE TO TEE.

0 40 80
SCALE IN FEET

PLAN NORTH

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BC PROJECT NUMBER
150360

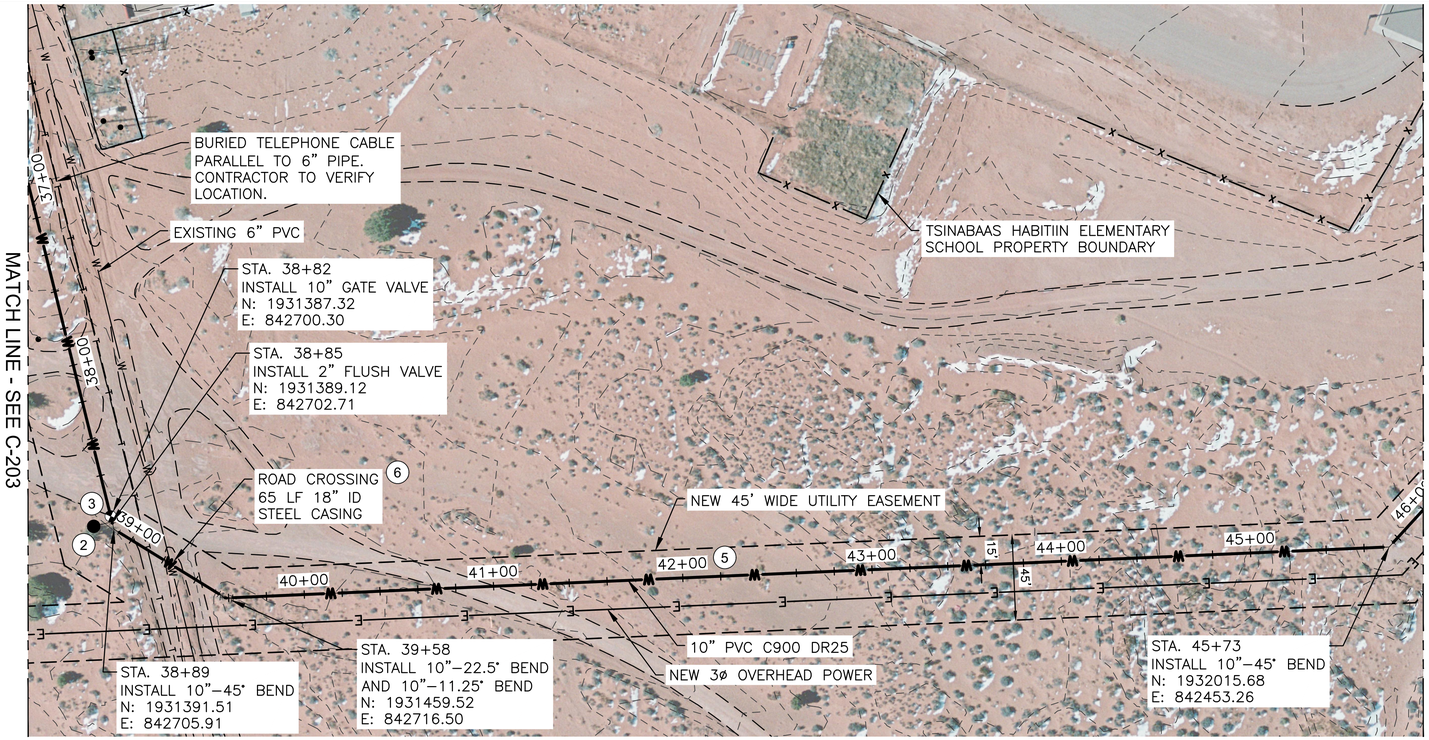
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 28+00 TO 37+00
PLAN & PROFILE

DRAWING NUMBER
C-203

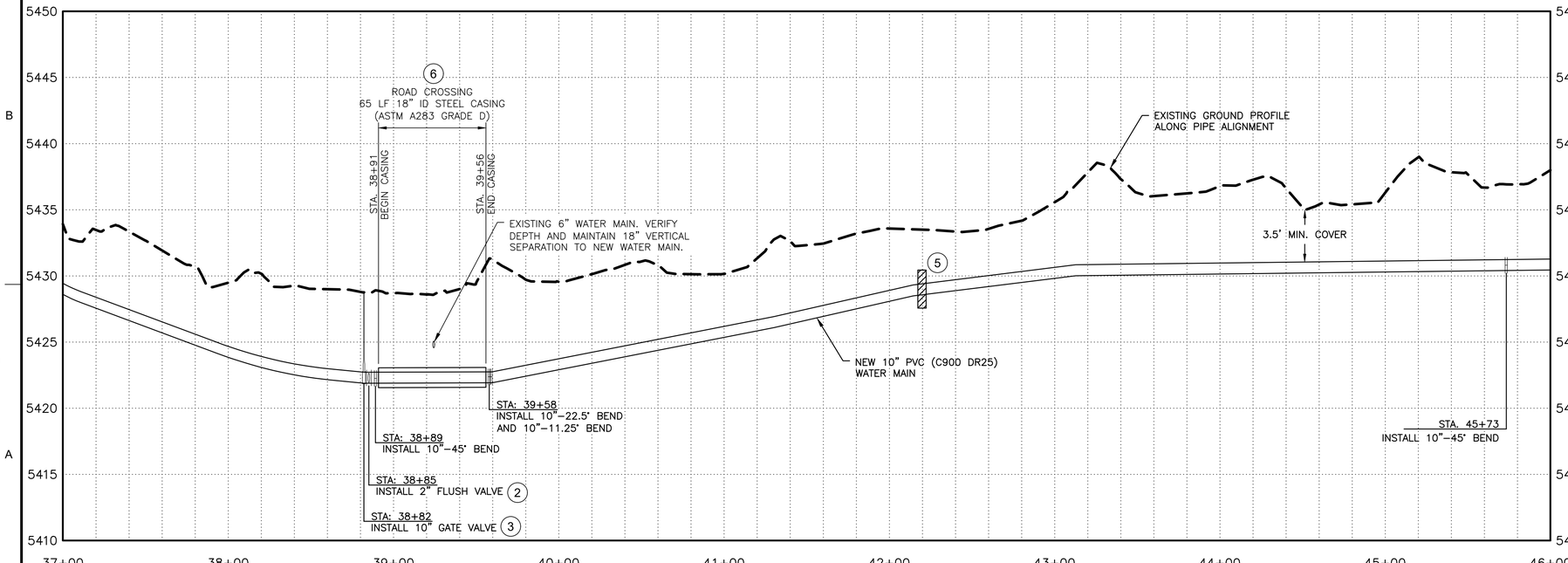
SHEET NUMBER
25 OF 76



STA 37+00 - STA 46+00

PLAN

SCALE: 1" = 40'



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KEY NOTES

(2) FLUSH VALVE PER NTUA STD. DWG WS-11

(3) GATE VALVE PER NTUA STD. DWG WS-14

(5) WATER BAR PER SPEC. SECTION 02200.

(6) STEEL ENCASED ROAD CROSSING PER IHS STD. DWG W-35 AND NTUA STD. DWG WS-17a

0 40 80

SCALE IN FEET

PLAN NORTH

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BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 37+00 TO 46+00
PLAN & PROFILE

DRAWING NUMBER
C-204

SHEET NUMBER
26 OF 76

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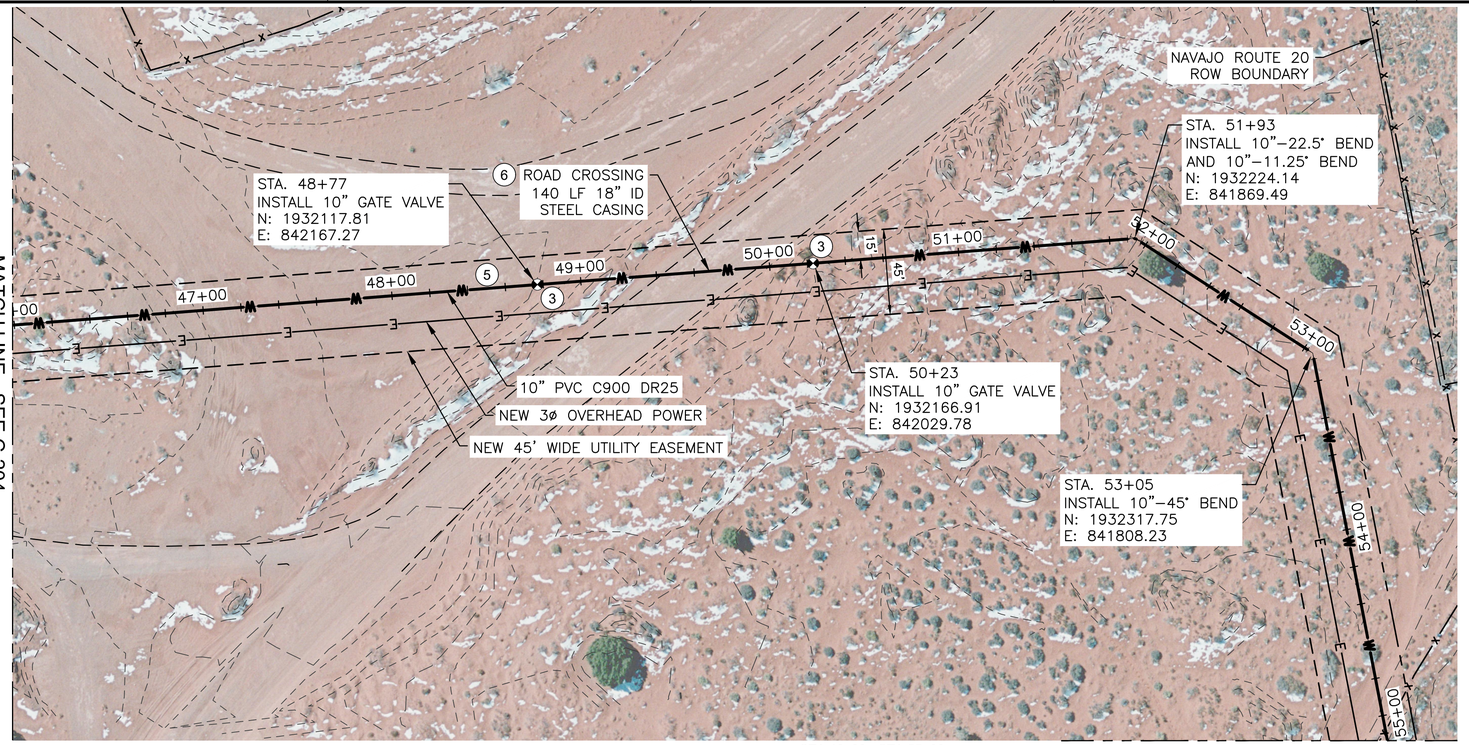
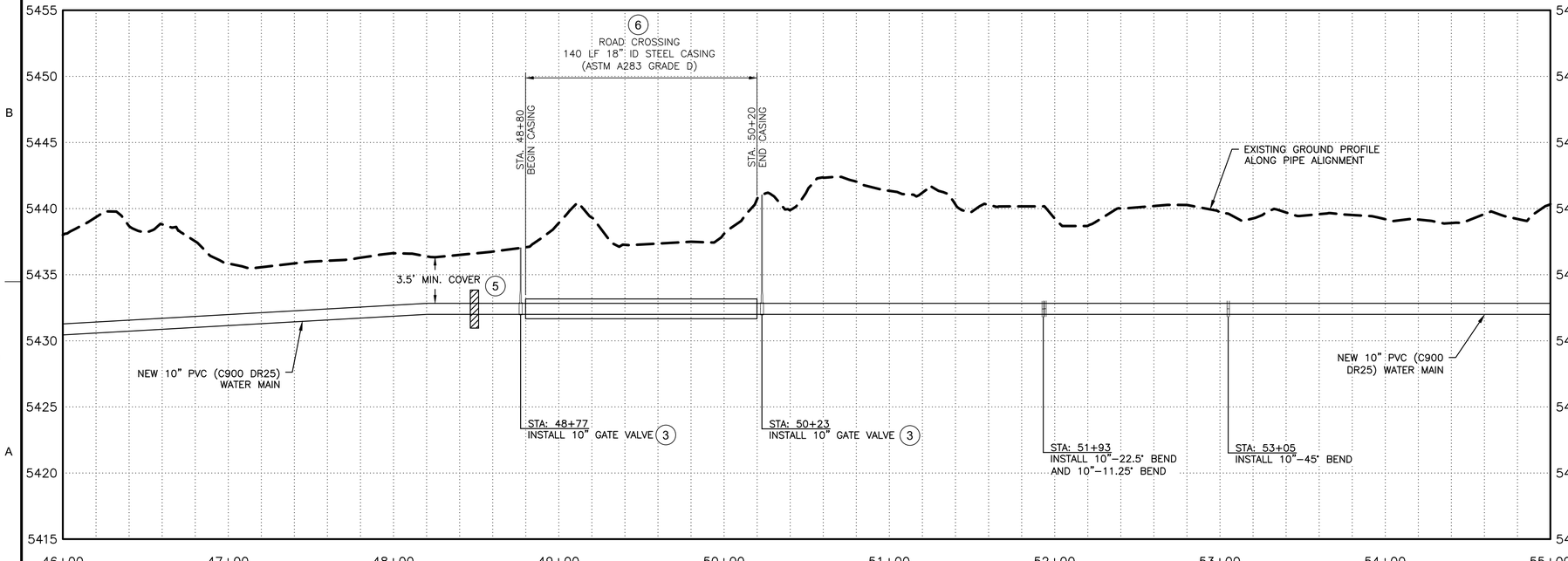


STA 46+00 - STA 55+00

PLAN

SCALE: 1" = 40'



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KEY NOTES

(3) GATE VALVE PER NTUA STD. DWG WS-14

(5) WATER BAR PER SPEC. SECTION 02200.

(6) STEEL ENCASED ROAD CROSSING PER IHS STD. DWG W-35 AND NTUA STD. DWG WS-17a

0 40 80
SCALE IN FEET

PLAN NORTH

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BC PROJECT NUMBER
150360

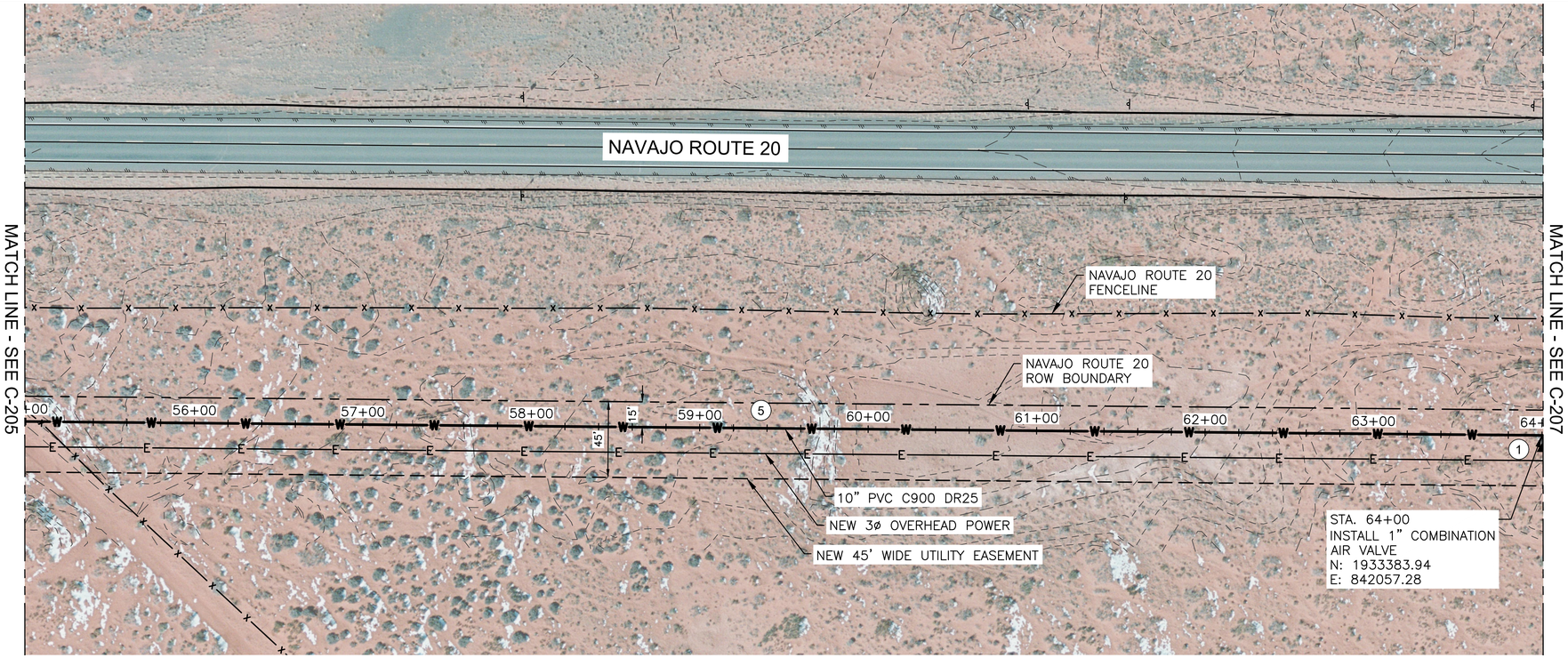
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 46+00 TO 55+00 PLAN & PROFILE

DRAWING NUMBER
C-205

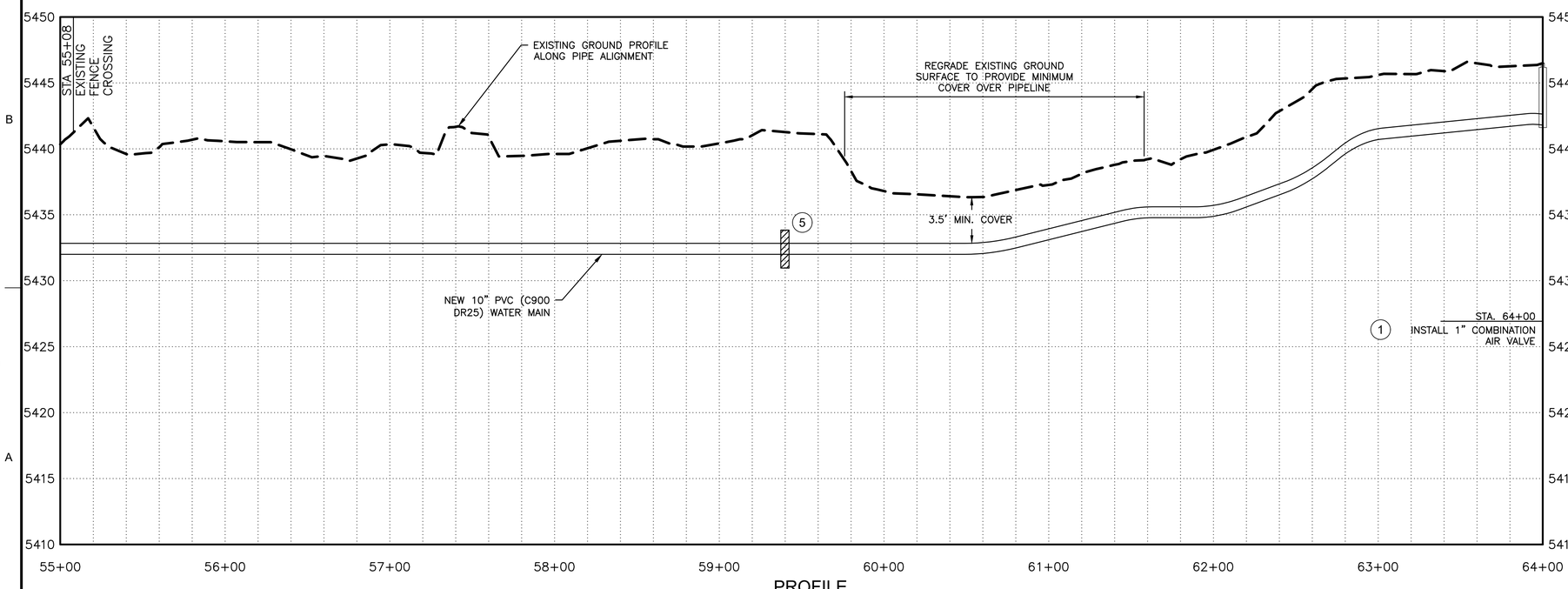
SHEET NUMBER
27 OF 76



STA 55+00 - STA 64+00

PLAN

SCALE: 1" = 40'



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KEY NOTES

(1) AIR VALVE PER NTUA STD. DWG WS-10

(5) WATER BAR PER SPEC. SECTION 02200.

0 40 80
SCALE IN FEET

PLAN NORTH

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CLIENT PROJECT NUMBER
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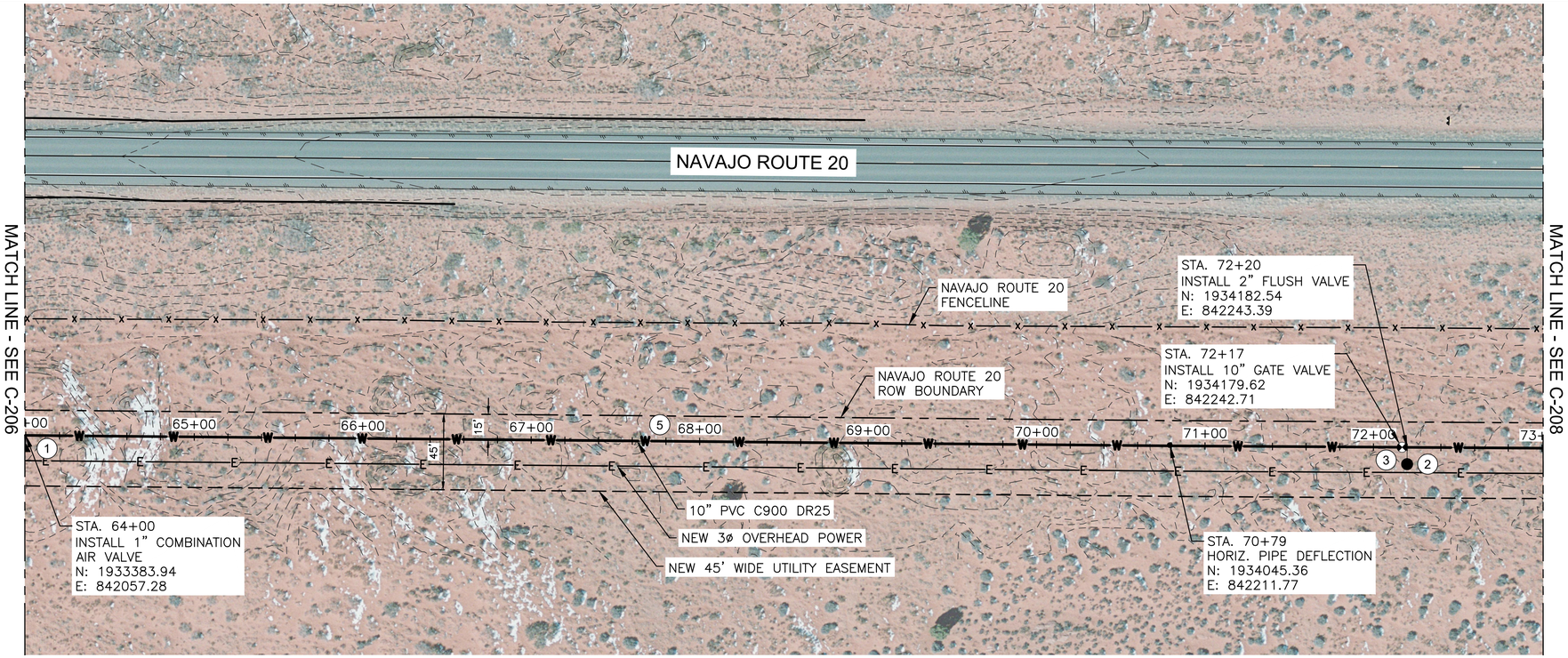
CIVIL

STA 55+00 TO 64+00
PLAN & PROFILE

DRAWING NUMBER
C-206

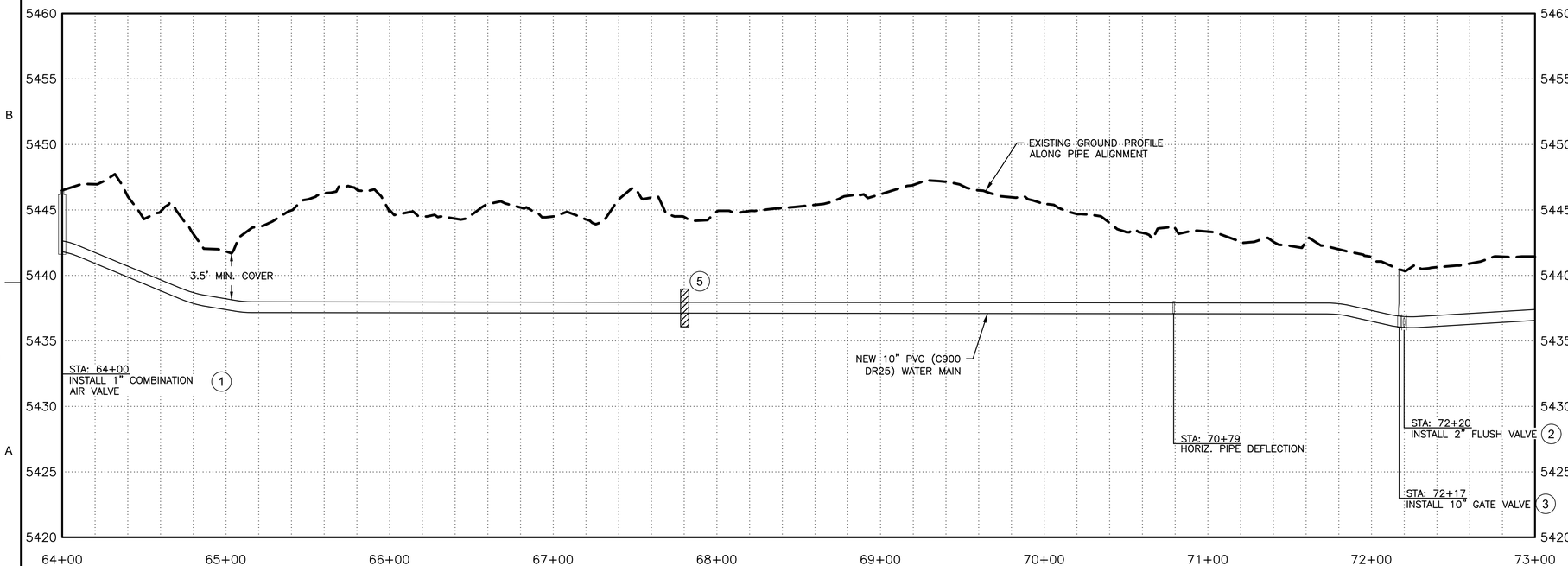
SHEET NUMBER
28 OF 76



STA 64+00 - STA 73+00

PLAN

SCALE: 1" = 40'



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(2) FLUSH VALVE PER NTUA STD. DWG WS-11

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SCALE IN FEET

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CIVIL

STA 64+00 TO 73+00
PLAN & PROFILE

DRAWING NUMBER
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SHEET NUMBER
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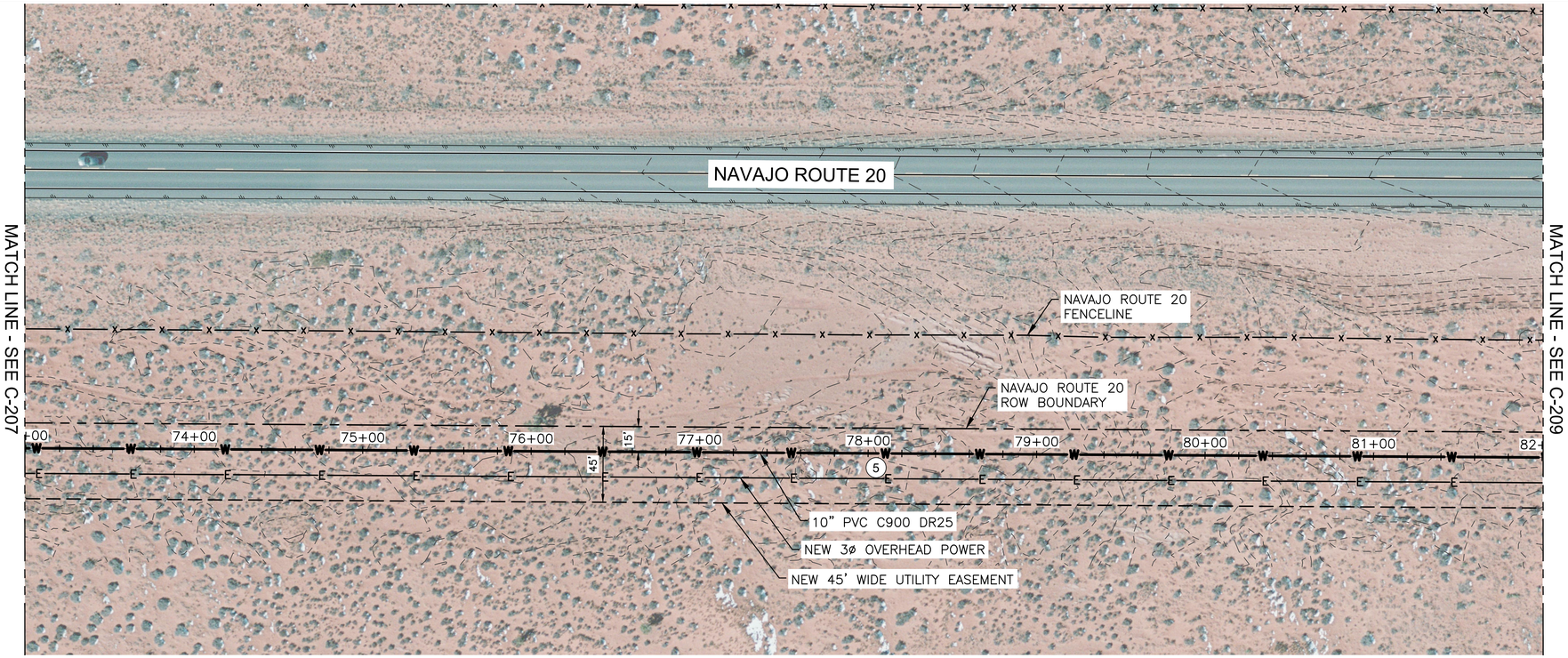
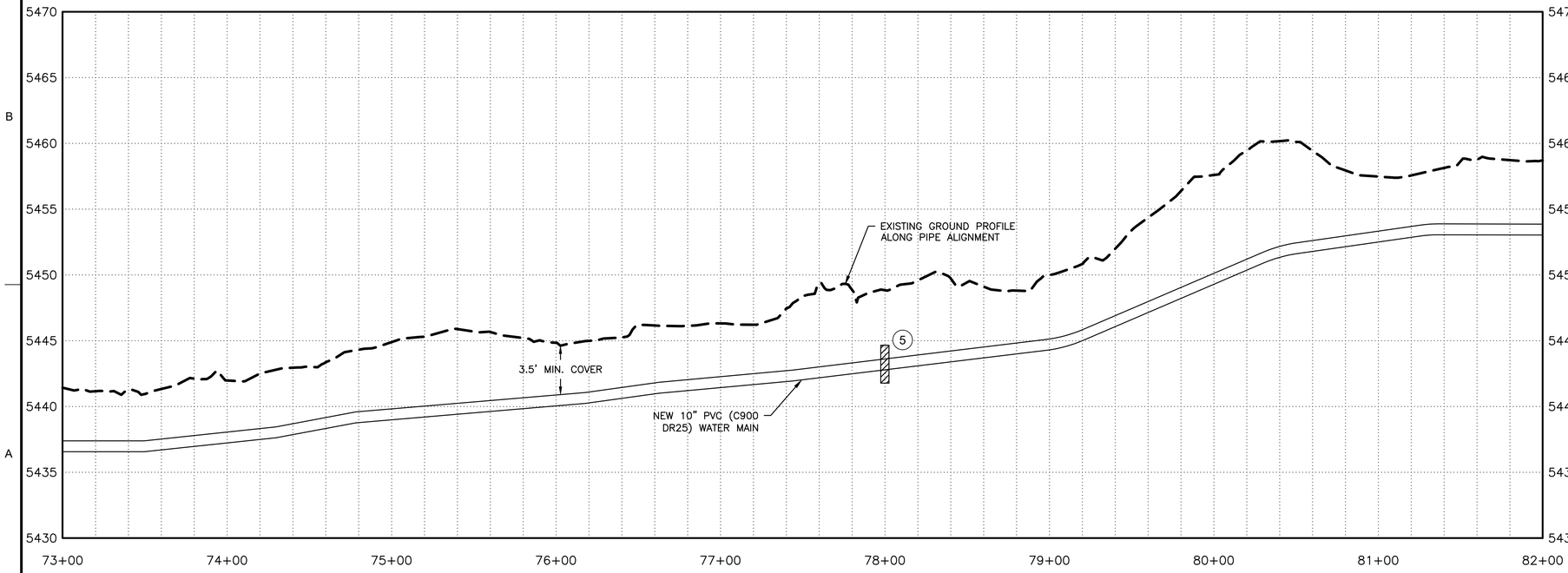


STA 73+00 - STA 82+00

PLAN

SCALE: 1" = 40'



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KEY NOTES

(5) WATER BAR PER SPEC. SECTION 02200.

0 40 80
SCALE IN FEET

PLAN NORTH

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LINE IS 2 INCHES AT FULL SIZE

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DRAWN:
CHECKED:
CHECKED:
APPROVED:

FILENAME
SC-WA-PP4_13-21254.DWG

BC PROJECT NUMBER
150360

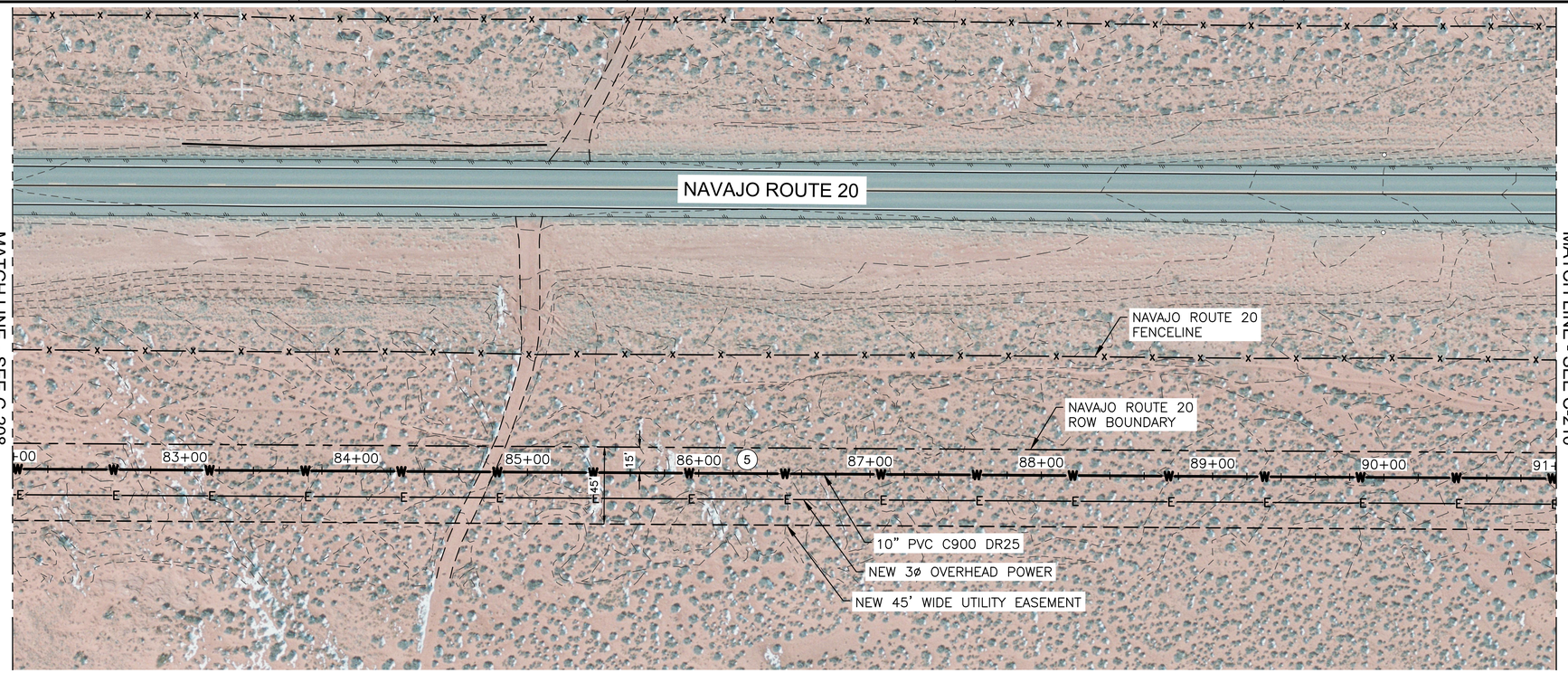
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 73+00 TO 82+00
PLAN & PROFILE

DRAWING NUMBER
C-208

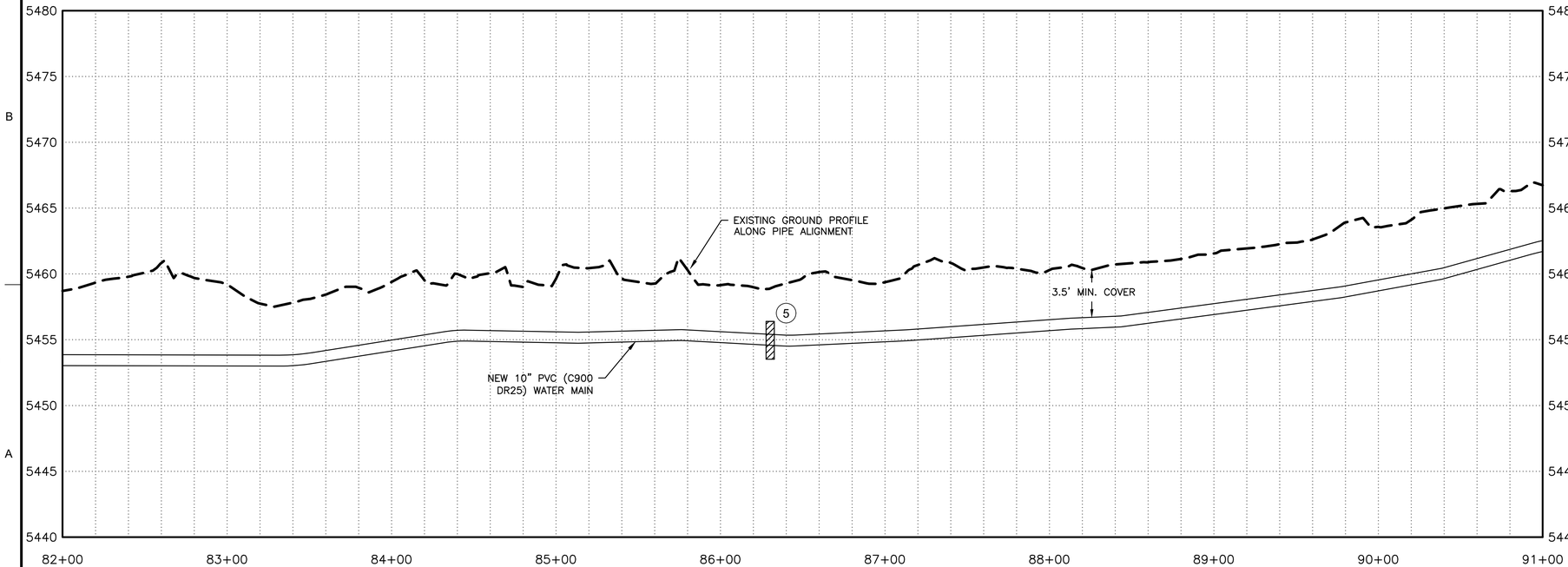
SHEET NUMBER
30 OF 76



STA 82+00 - STA 91+00

PLAN

SCALE: 1" = 40'



PROFILE

SCALE H: 1" = 40'
V: 1" = 5'

GENERAL NOTES

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6. EASEMENT DIMENSIONS AND PIPELINE OFFSETS ARE SHOWN IN DETAIL A ON SHEET C-002.
7. DEFLECT PIPE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AS NECESSARY.

KEY NOTES

(5) WATER BAR PER SPEC. SECTION 02200.

0 40 80
SCALE IN FEET

PLAN NORTH

Call at least two full working days before you begin excavation.

ARIZONA 811 Arizona Blue Stake, Inc.

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DOWL www.dowl.com
222 N. 32nd Street, #700
Billings, Montana 59101
406-656-6399

Registered Professional Engineer
CERTIFICATE NO.
67639
PAUL A. SWENSON
Date Signed 9/29/21
ARIZONA, U.S.A.
Expires 12/31/21

GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

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CHECKED:
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APPROVED:

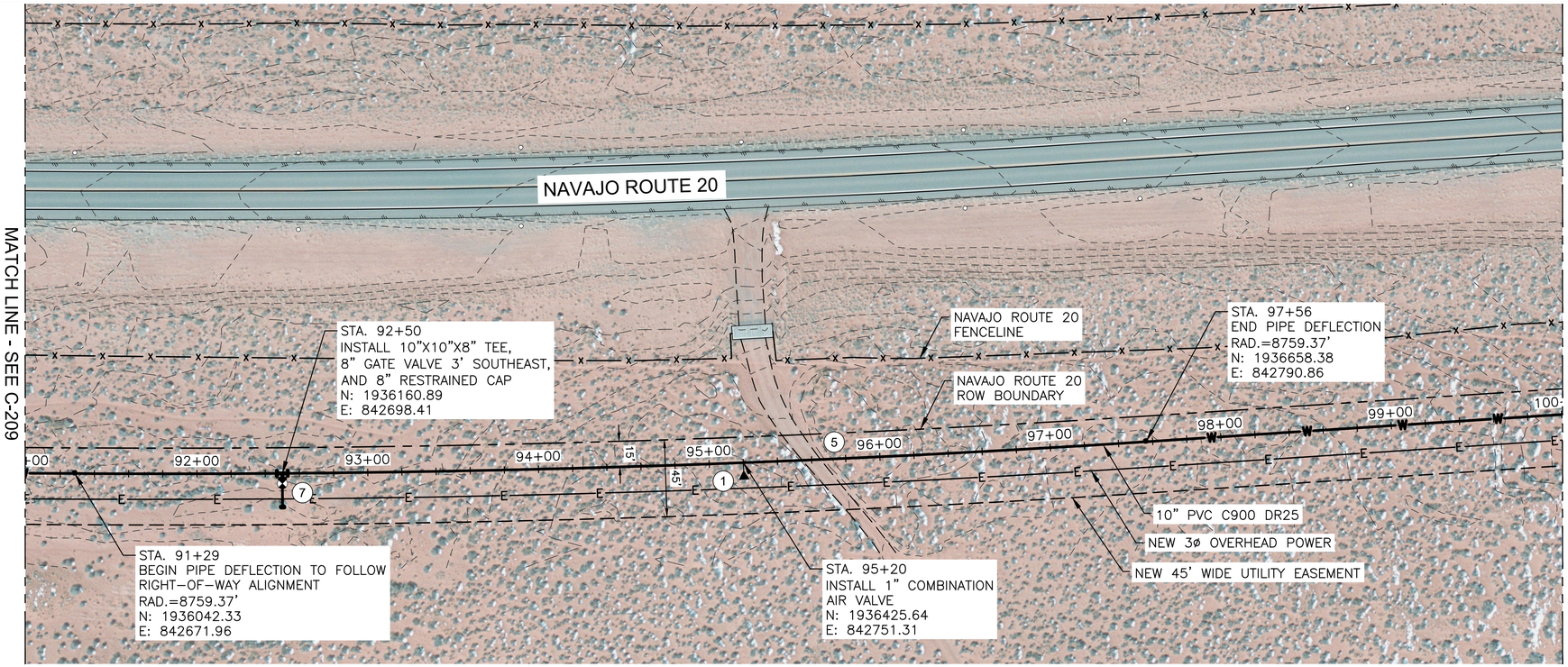
FILENAME
SC-WA-PP4_13-21254.DWG
BC PROJECT NUMBER
150360
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 82+00 TO 91+00
PLAN & PROFILE

DRAWING NUMBER
C-209

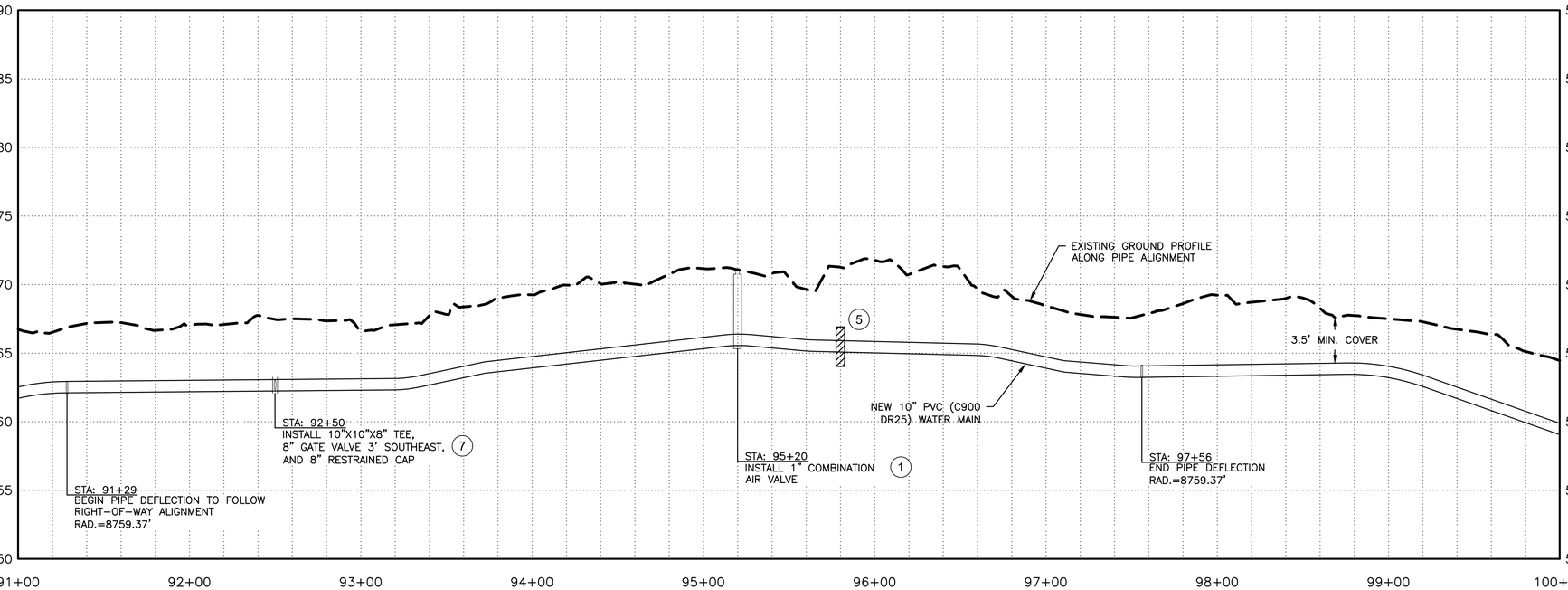
SHEET NUMBER
31 OF 76



STA 91+00 - STA 100+00

PLAN

SCALE: 1" = 40'



PROFILE

SCALE H: 1" = 40'
V: 1" = 5'

GENERAL NOTES

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KEY NOTES

(1) AIR VALVE PER NTUA STD. DWG WS-10

(5) WATER BAR PER SPEC. SECTION 02200.

(7) PROVIDE 1 JOINT (20') OF 8" PVC (C-900 DR25) WITH CAP DOWNSTREAM OF GATE VALVE PER NTUA STD. DWG WS-16. RESTRAIN VALVE TO TEE.

0 40 80
SCALE IN FEET

PLAN NORTH

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GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

REVISIONS		
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FILENAME	SC-WA-PP4_13-21254.DWG
BC PROJECT NUMBER	150360
CLIENT PROJECT NUMBER	4028.21254.01

CIVIL

STA 91+00 TO 100+00
PLAN & PROFILE

DRAWING NUMBER
C-210

SHEET NUMBER
32 OF 76

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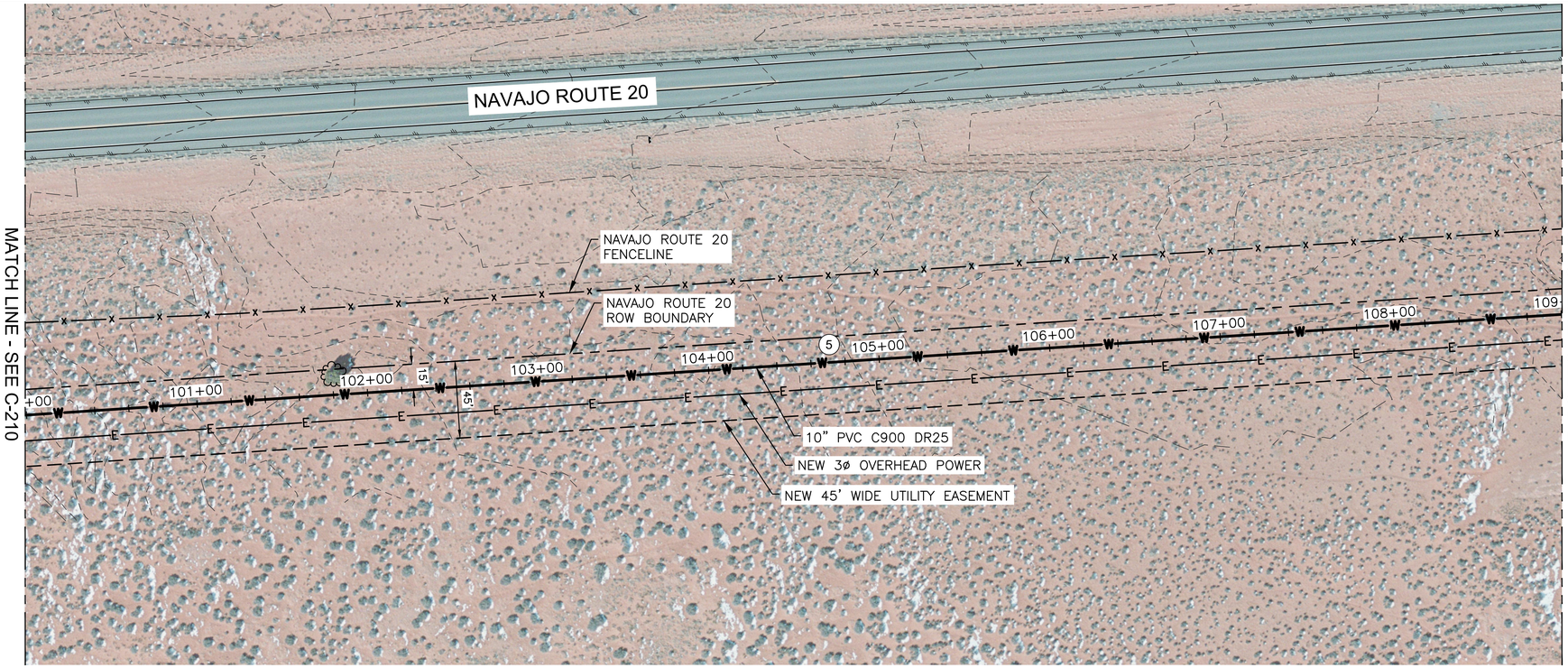
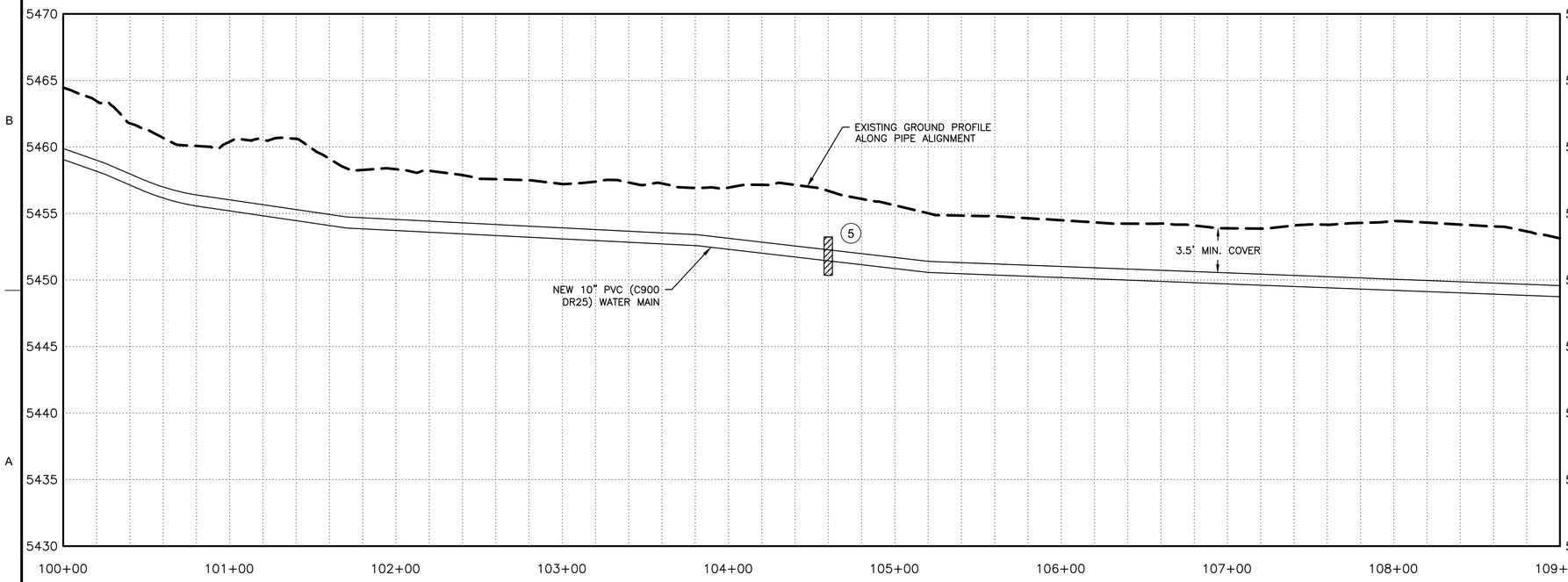


STA 100+00 - STA 109+00

PLAN

SCALE: 1" = 40'



PROFILE

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V: 1" = 5'

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KEY NOTES

(5) WATER BAR PER SPEC. SECTION 02200.

0 40 80
SCALE IN FEET

PLAN NORTH

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CERTIFICATE NO.
67639
PAUL A. SWENSON
Date Signed 9/29/21
ARIZONA, U.S.A.
Expires 12/31/21

GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

REVISIONS

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BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 100+00 TO 109+00
PLAN & PROFILE

DRAWING NUMBER
C-211

SHEET NUMBER
33 OF 76

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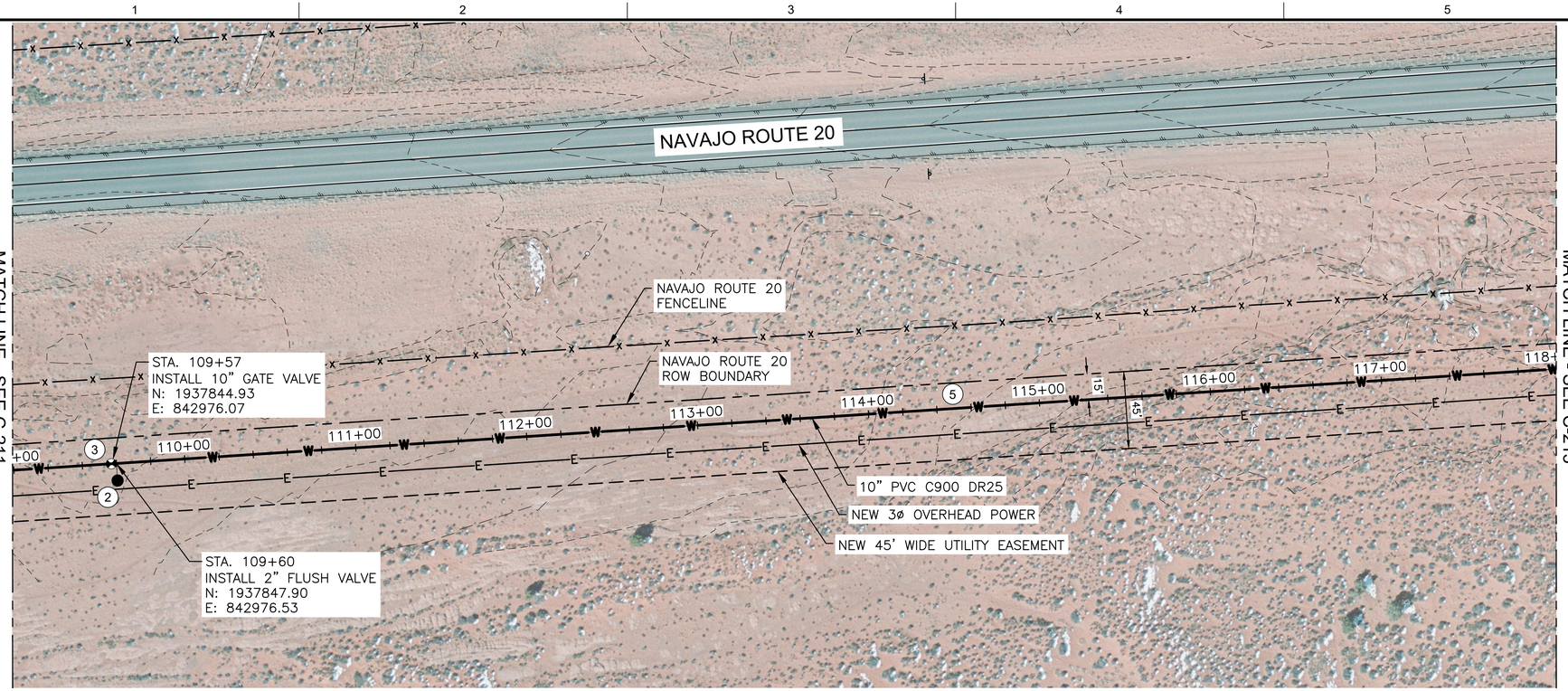
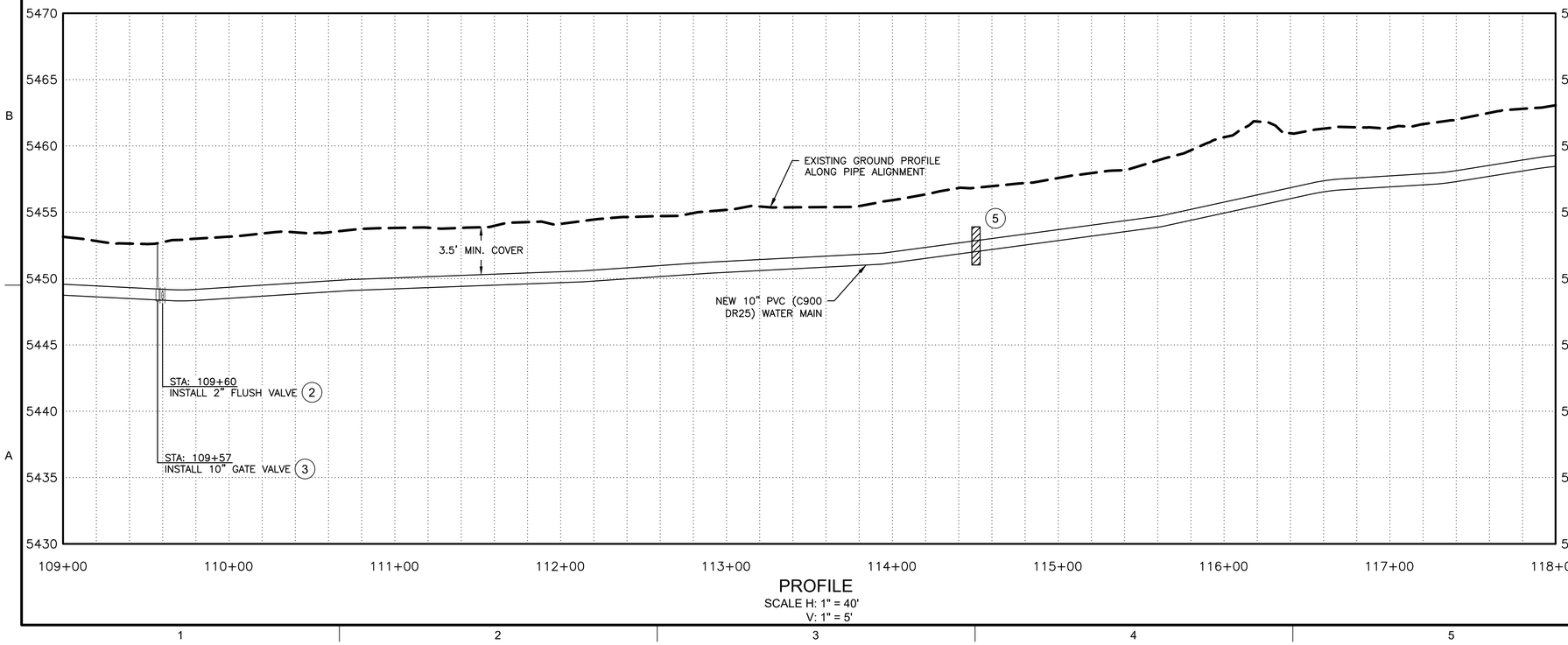


STA 109+00 - STA 118+00

PLAN

SCALE: 1" = 40'



PROFILE

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V: 1" = 5'

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KEY NOTES

(2) FLUSH VALVE PER NTUA STD. DWG WS-11

(3) GATE VALVE PER NTUA STD. DWG WS-14

(5) WATER BAR PER SPEC. SECTION 02200.

0 40 80
SCALE IN FEET

PLAN NORTH

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CERTIFICATE NO.
67639
PAUL A. SWENSON
Date Signed 9/29/21
ARIZONA, U.S.A.
Expires 12/31/21

GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

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FILENAME
SC-WA-PP14_23-21254.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 109+00 TO 118+00
PLAN & PROFILE

DRAWING NUMBER
C-212

SHEET NUMBER
34 OF 76

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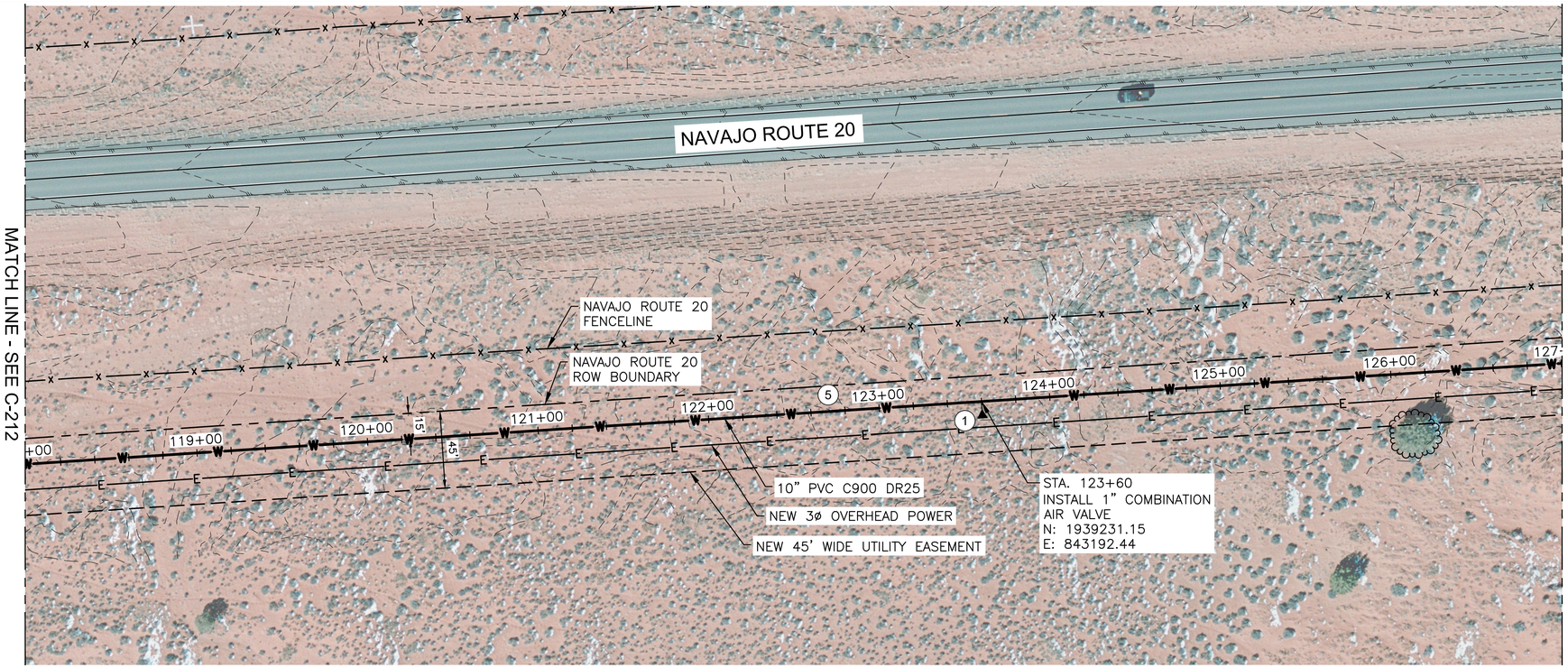
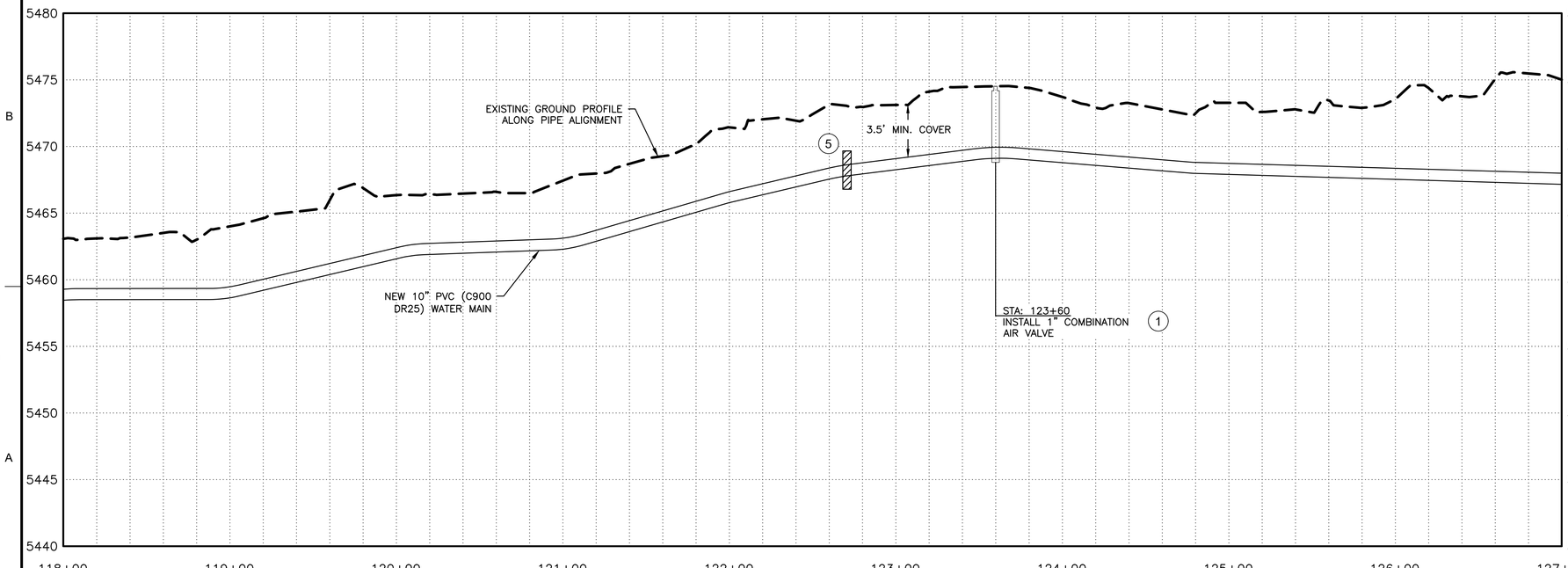


STA 118+00 - STA 127+00

PLAN

SCALE: 1" = 40'



PROFILE

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(1) AIR VALVE PER NTUA STD. DWG WS-10

(5) WATER BAR PER SPEC. SECTION 02200.

0 40 80
SCALE IN FEET

PLAN NORTH

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Expires 12/31/21

GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

REVISIONS

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SC-WA-PP14_23-21254.DWG

BC PROJECT NUMBER
150360

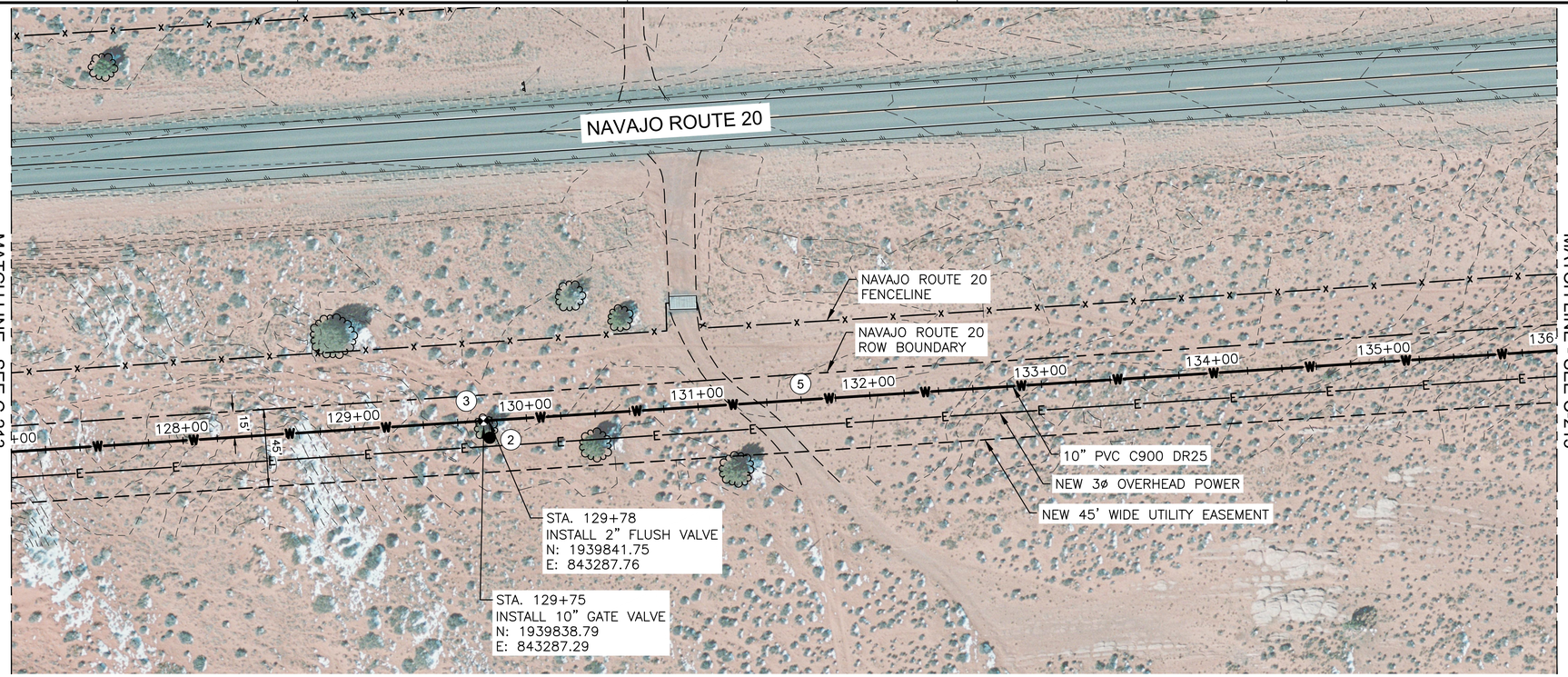
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 118+00 TO 127+00
PLAN & PROFILE

DRAWING NUMBER
C-213

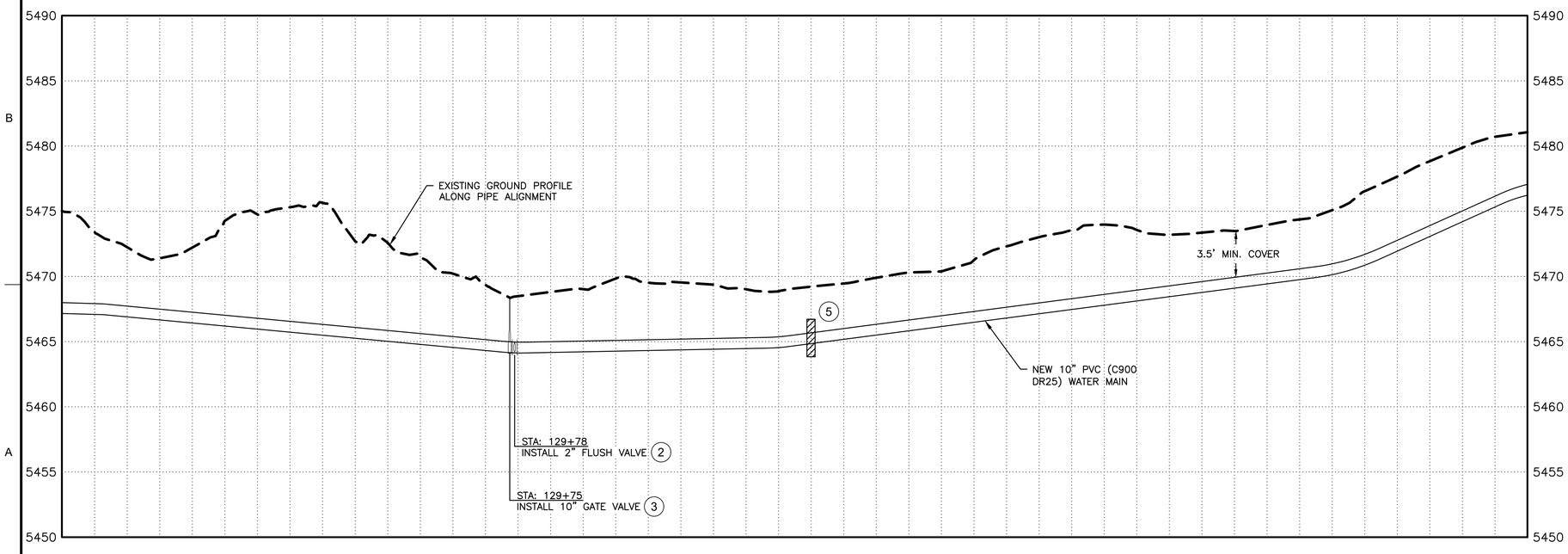
SHEET NUMBER
35 OF 76



STA 127+00 - STA 136+00

PLAN

SCALE: 1" = 40'



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(3) GATE VALVE PER NTUA STD. DWG WS-14

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0 40 80

SCALE IN FEET

PLAN NORTH

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GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

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BC PROJECT NUMBER
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CLIENT PROJECT NUMBER
4028.21254.01

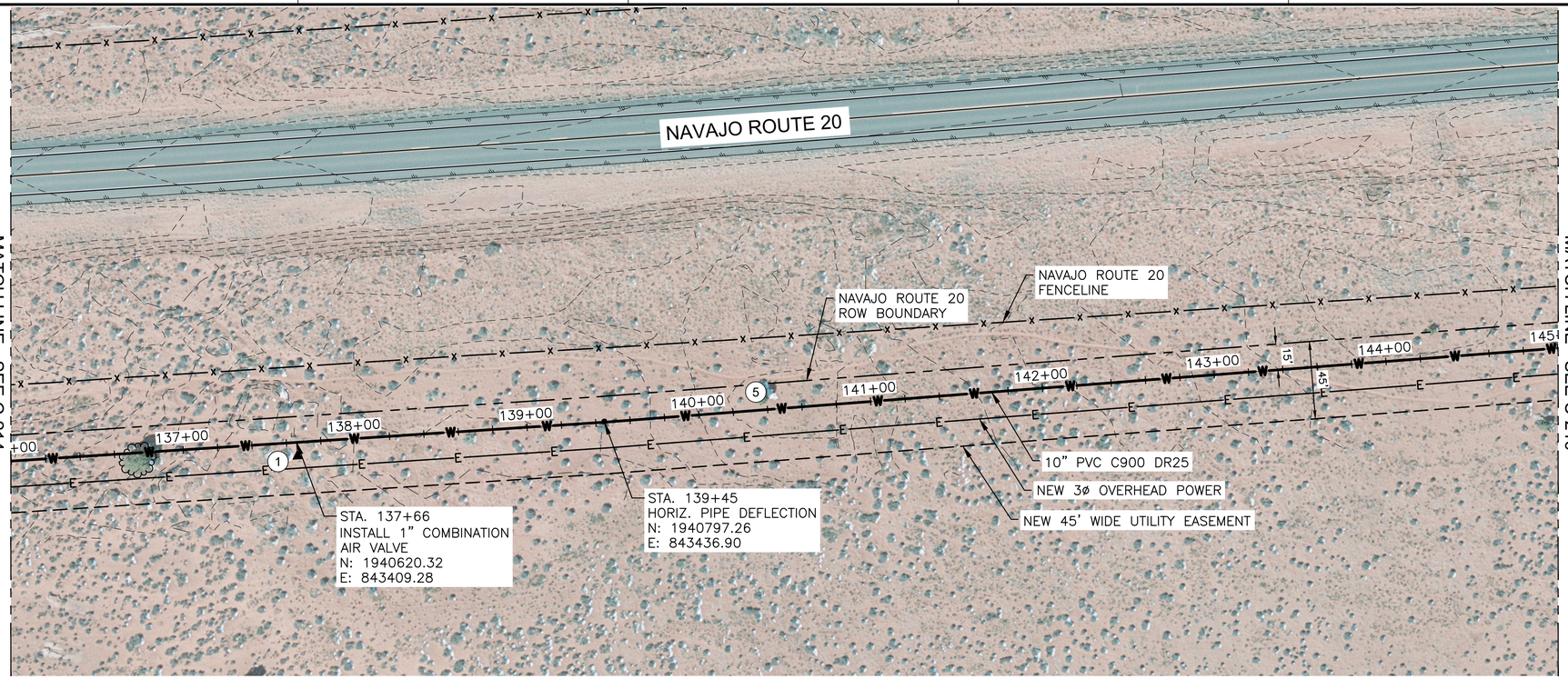
CIVIL

STA 127+00 TO 136+00
PLAN & PROFILE

DRAWING NUMBER

C-214

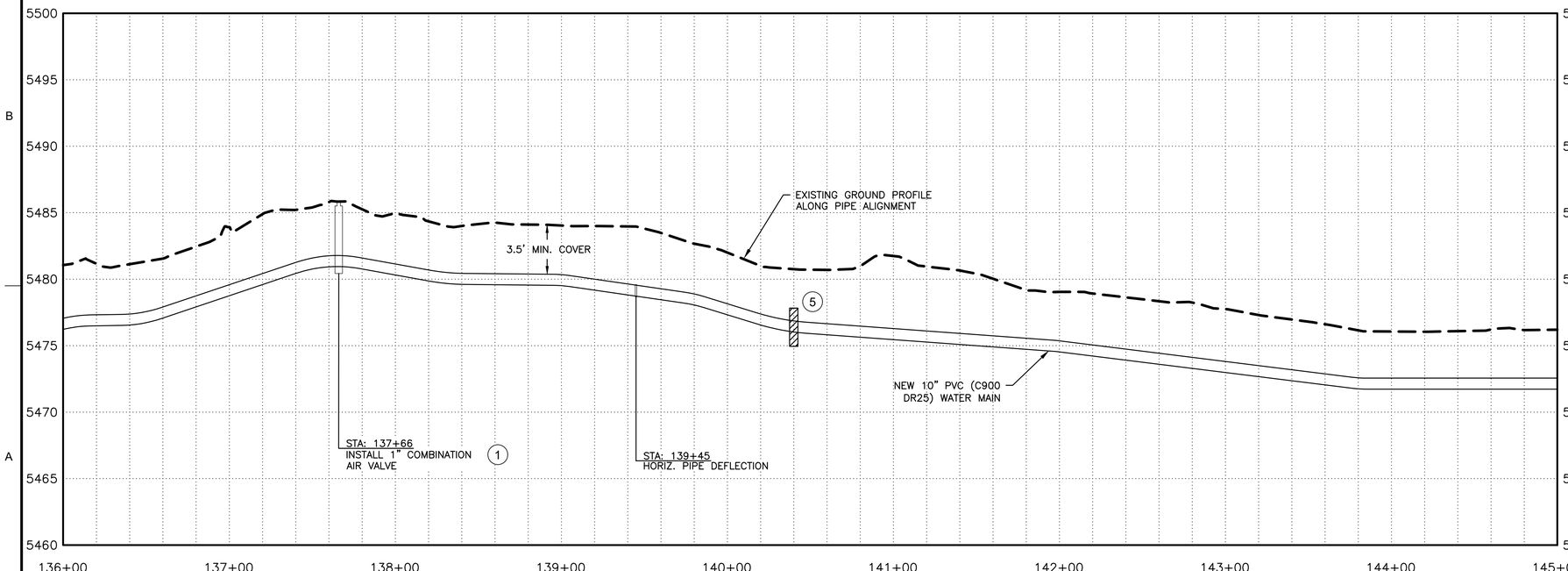
SHEET NUMBER
36 OF 76



STA 136+00 - STA 145+00

PLAN

SCALE: 1" = 40'



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(1) AIR VALVE PER NTUA STD. DWG WS-10

(5) WATER BAR PER SPEC. SECTION 02200.

0 40 80
SCALE IN FEET

PLAN NORTH

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Expires 12/31/21

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Bodaway-Gap Well, Tank, and Pipeline

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BC PROJECT NUMBER
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CLIENT PROJECT NUMBER
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CIVIL

STA 136+00 TO 145+00
PLAN & PROFILE

DRAWING NUMBER
C-215

SHEET NUMBER
37 OF 76

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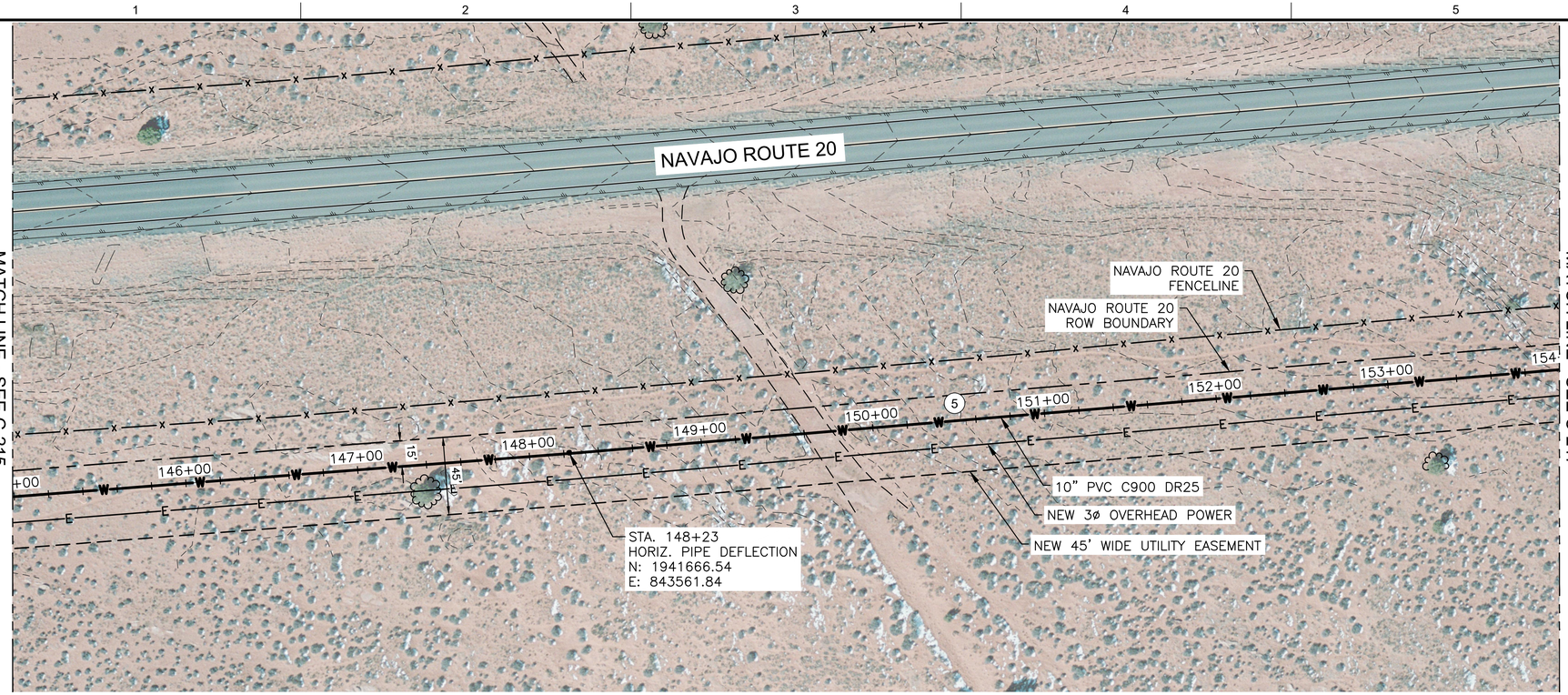
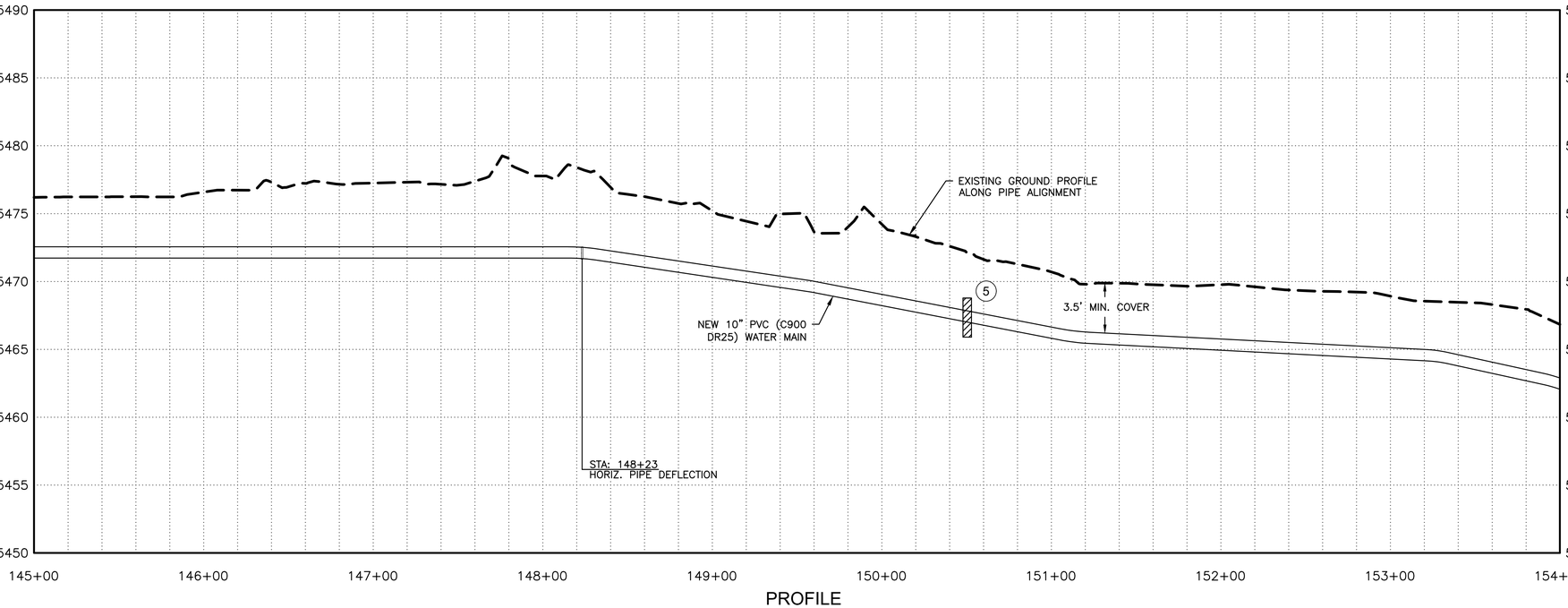


STA 145+00 - STA 154+00

PLAN

SCALE: 1"= 40'



PROFILE

SCALE H: 1" = 40'

V: 1" = 5'

GENERAL NOTES

1. ALL LOCATIONS OF EXISTING UTILITIES ARE SHOWN APPROXIMATELY. CONTRACTOR TO FIELD VERIFY AND POTHOLE AS REQUIRED TO COMPLETE THE WORK. POTHOLE 300 FEET AHEAD OF THE WORK TO VERIFY EXISTING WATER LINE LOCATIONS AND OTHER BURIED UTILITIES.
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KEY NOTES

(5) WATER BAR PER SPEC. SECTION 02200.

0 40 80
SCALE IN FEET

PLAN NORTH

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Brown AND Caldwell

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222 N. 32nd Street, #700
Billings, Montana 59101
406-656-6399

Registered Professional Engineer (Civil)
CERTIFICATE NO.
67639
PAUL A. SWENSON
Date Signed 9/29/21
ARIZONA, U.S.A.
Expires 12/31/21

GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

REVISIONS		
REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

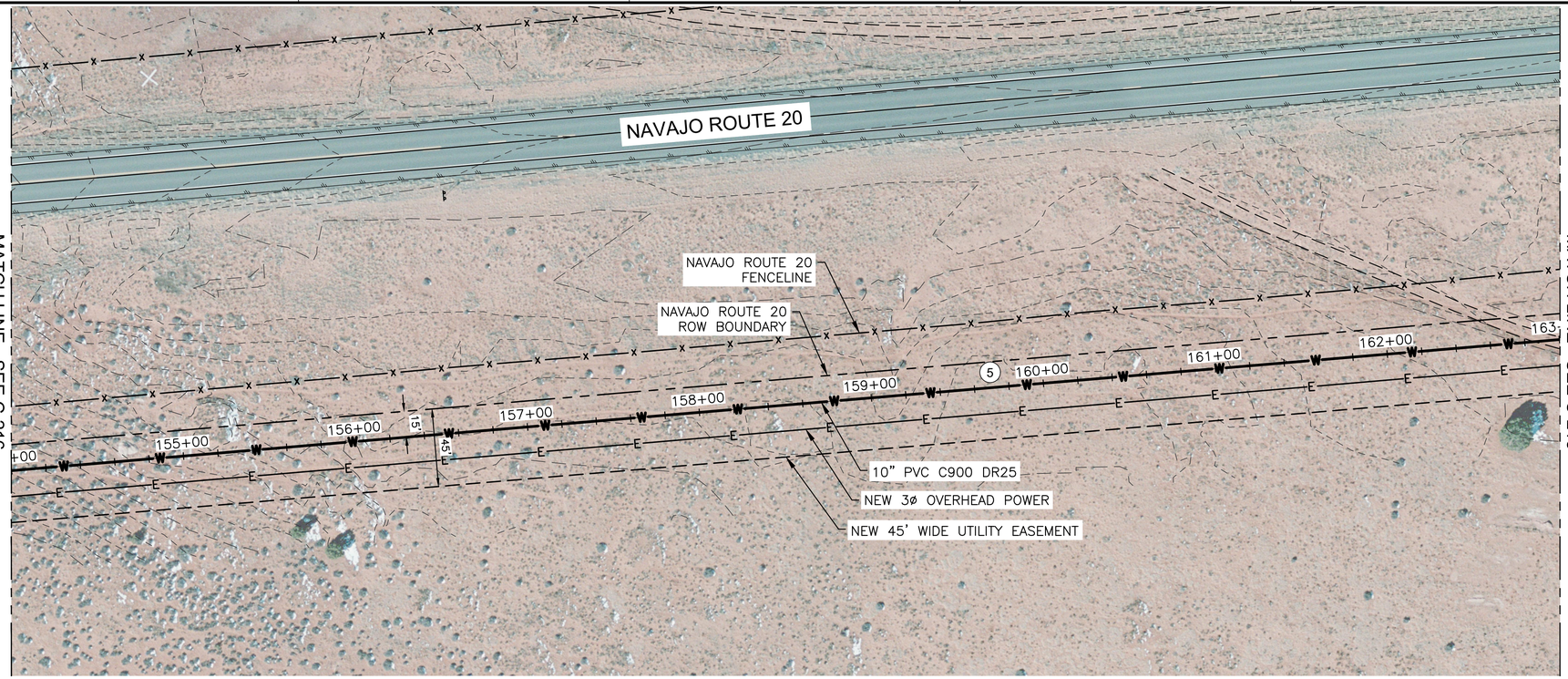
DESIGNED:	
DRAWN:	
CHECKED:	
CHECKED:	
APPROVED:	
FILENAME	SC-WA-PP14_23-21254.DWG
BC PROJECT NUMBER	150360
CLIENT PROJECT NUMBER	4028.21254.01

CIVIL

STA 145+00 TO 154+00
PLAN & PROFILE

DRAWING NUMBER
C-216

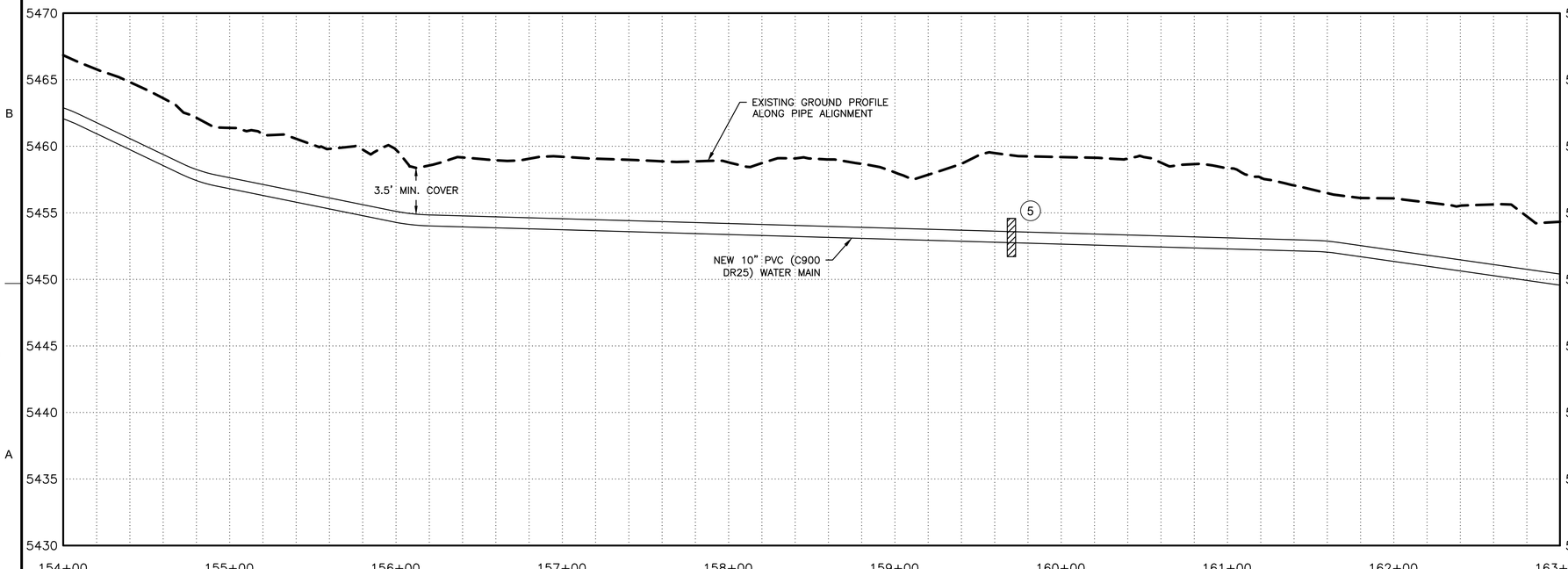
SHEET NUMBER
38 OF 76



STA 154+00 - STA 163+00

PLAN

SCALE: 1" = 40'



PROFILE

SCALE H: 1" = 40'
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KEY NOTES

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0 40 80
SCALE IN FEET

PLAN NORTH

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GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

REVISIONS

REV	DATE	DESCRIPTION

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CHECKED:
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APPROVED:

FILENAME
SC-WA-PP14_23-21254.DWG

BC PROJECT NUMBER
150360

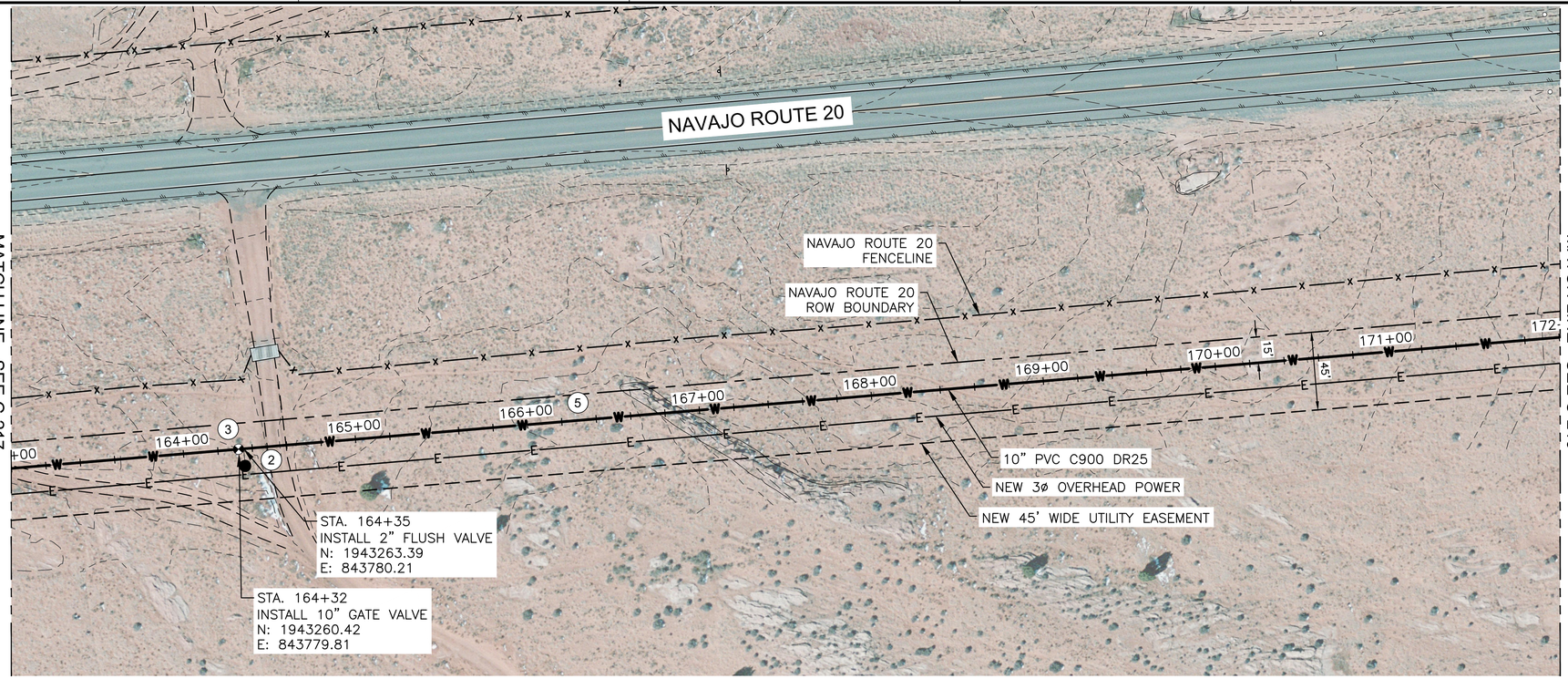
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 154+00 TO 163+00
PLAN & PROFILE

DRAWING NUMBER
C-217

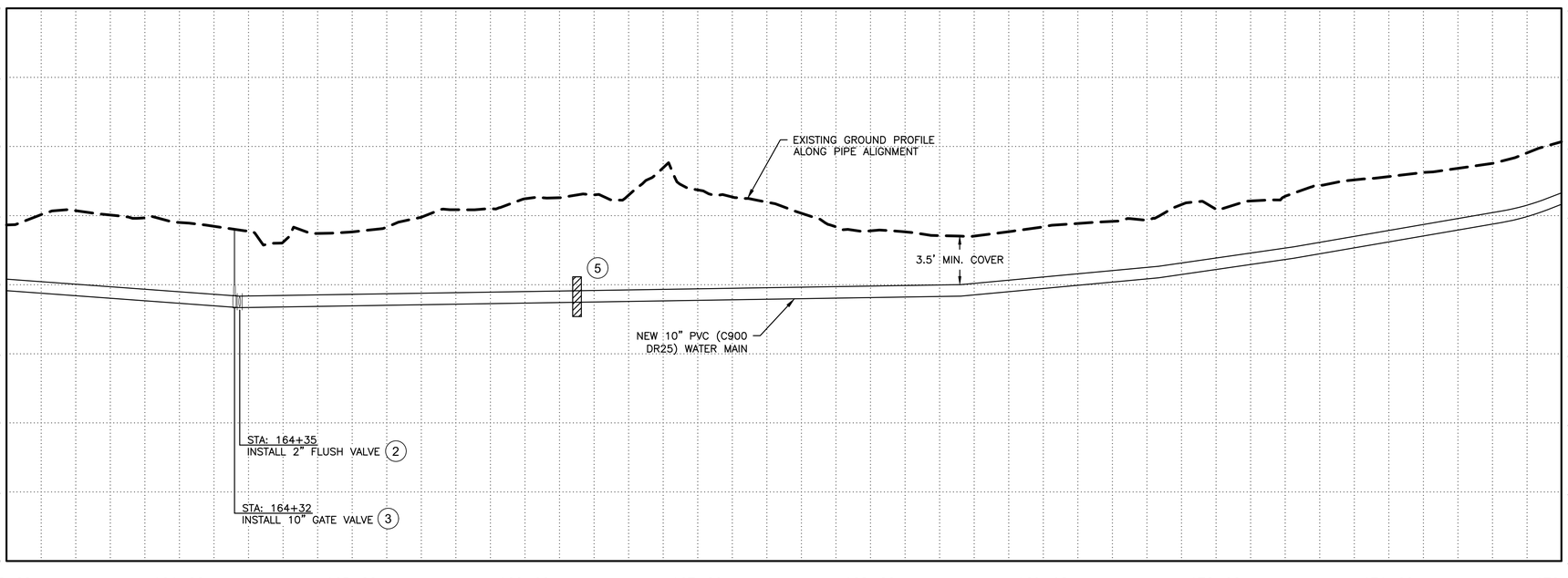
SHEET NUMBER
39 OF 76



STA 163+00 - STA 172+00

PLAN

SCALE: 1" = 40'



PROFILE

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KEY NOTES

(2) FLUSH VALVE PER NTUA STD. DWG WS-11

(3) GATE VALVE PER NTUA STD. DWG WS-14

(5) WATER BAR PER SPEC. SECTION 02200.

0 40 80
SCALE IN FEET

PLAN NORTH

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GREAT SEAL OF THE NAVAJO NATION

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APPROVED:

FILENAME
SC-WA-PP14_23-21254.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 163+00 TO 172+00
PLAN & PROFILE

DRAWING NUMBER
C-218

SHEET NUMBER
40 OF 76

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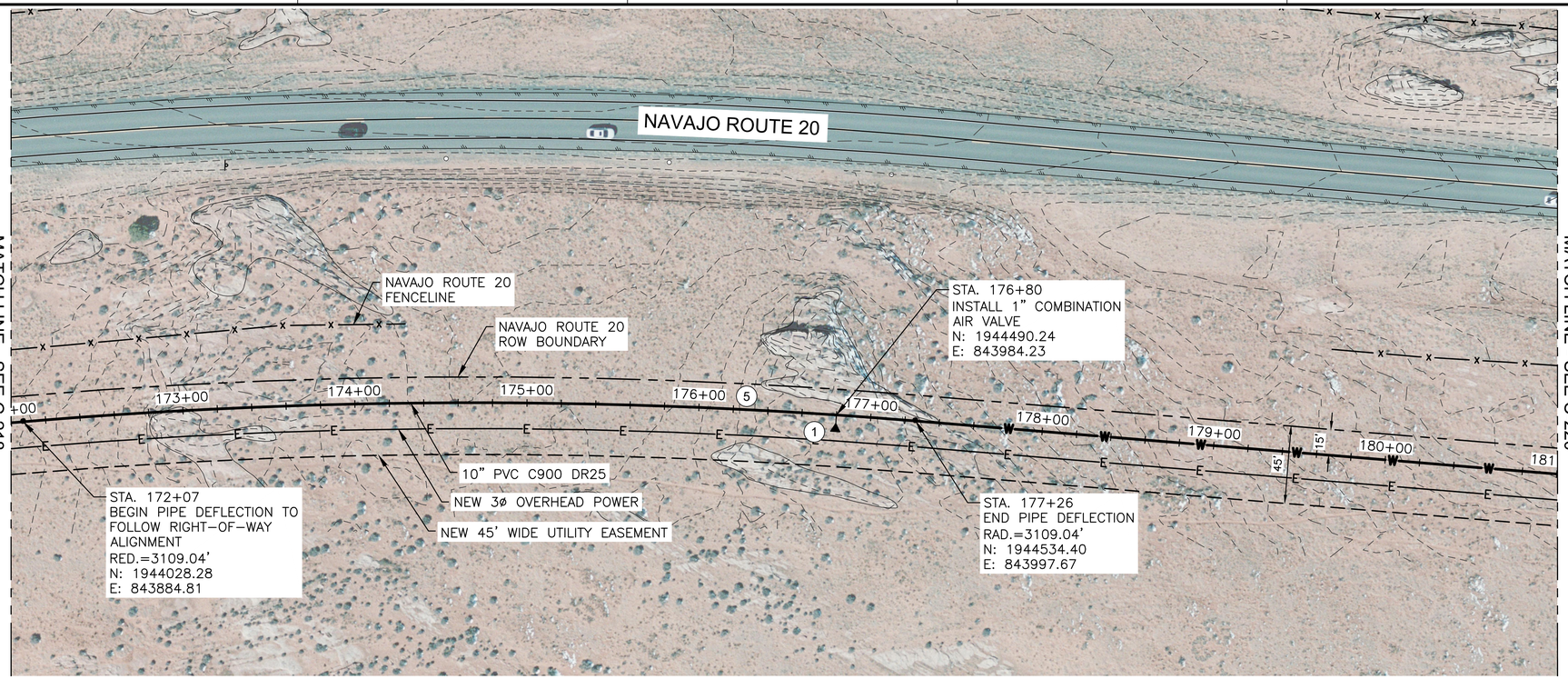
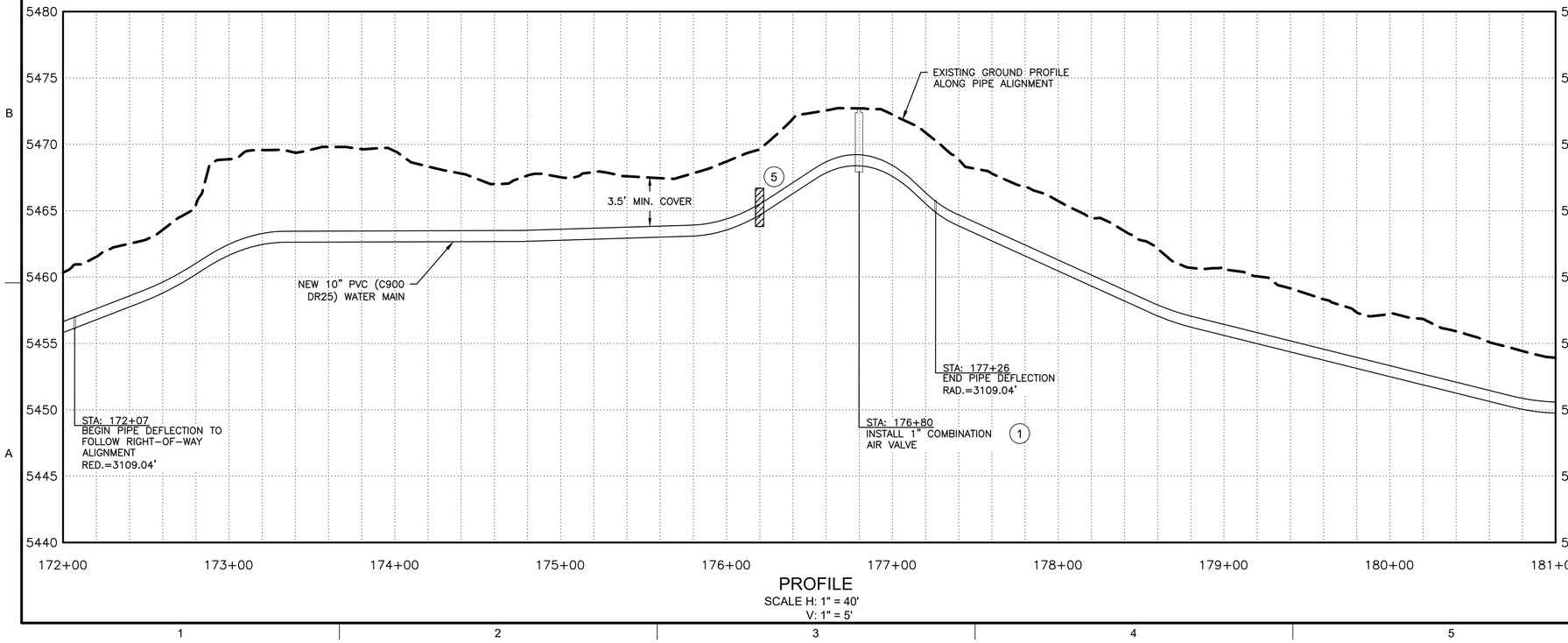


STA 172+00 - STA 181+00

PLAN

SCALE: 1" = 40'



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KEY NOTES

(1) AIR VALVE PER NTUA STD. DWG WS-10

(5) WATER BAR PER SPEC. SECTION 02200.

0 40 80
SCALE IN FEET

PLAN NORTH

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Bodaway-Gap Well, Tank, and Pipeline

REVISIONS

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APPROVED:

FILENAME
SC-WA-PP14_23-21254.DWG

BC PROJECT NUMBER
150360

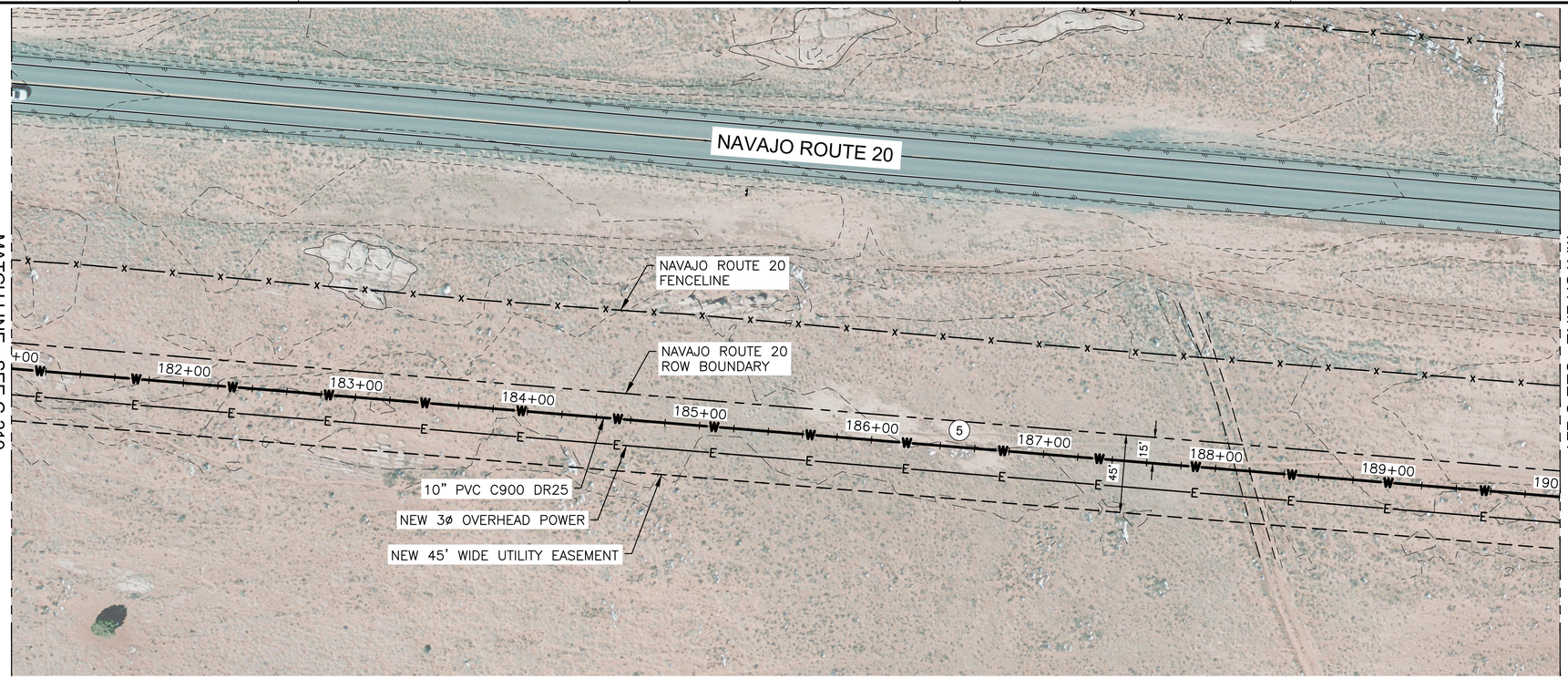
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 172+00 TO 181+00
PLAN & PROFILE

DRAWING NUMBER
C-219

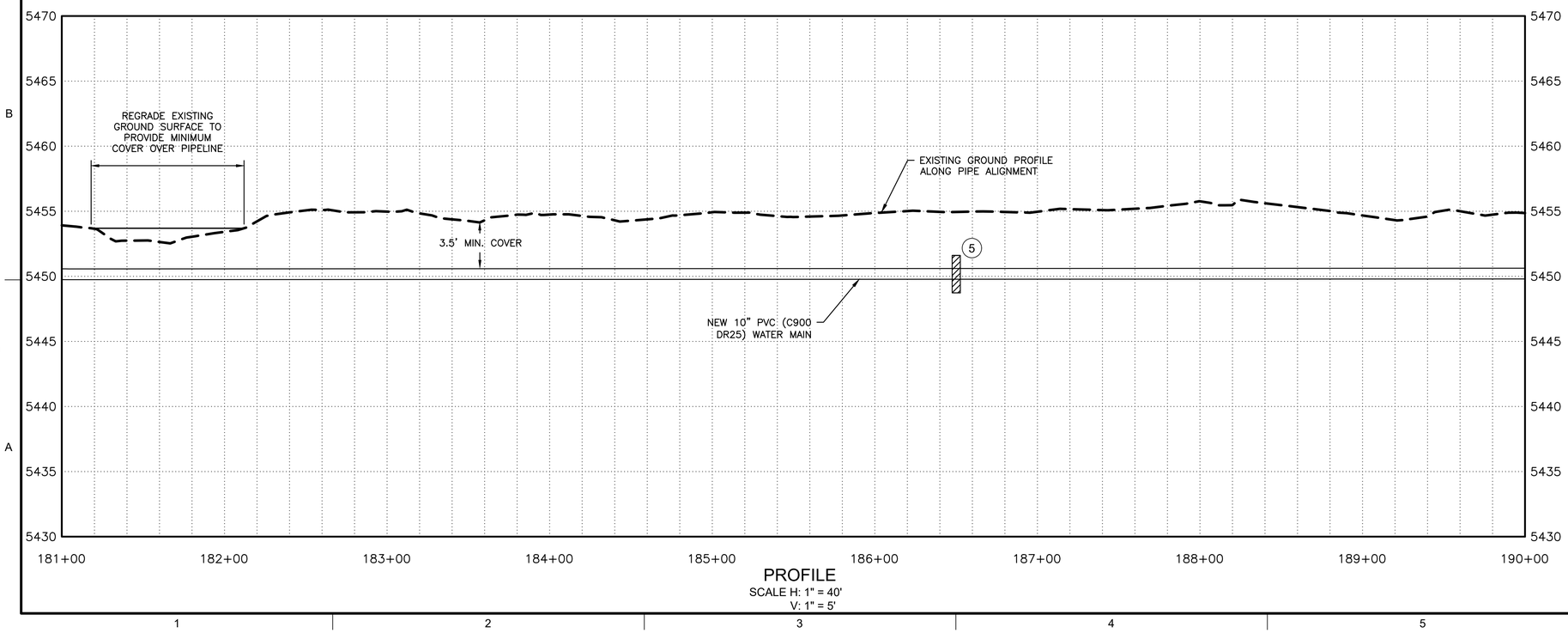
SHEET NUMBER
41 OF 76



STA 181+00 - STA 190+00

PLAN

SCALE: 1" = 40'



PROFILE

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0 40 80

SCALE IN FEET

PLAN NORTH

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ARIZONA, U.S.A.
Expires 12/31/21

GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

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APPROVED:

FILENAME
SC-WA-PP14_23-21254.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 181+00 TO 190+00
PLAN & PROFILE

DRAWING NUMBER
C-220

SHEET NUMBER
42 OF 76

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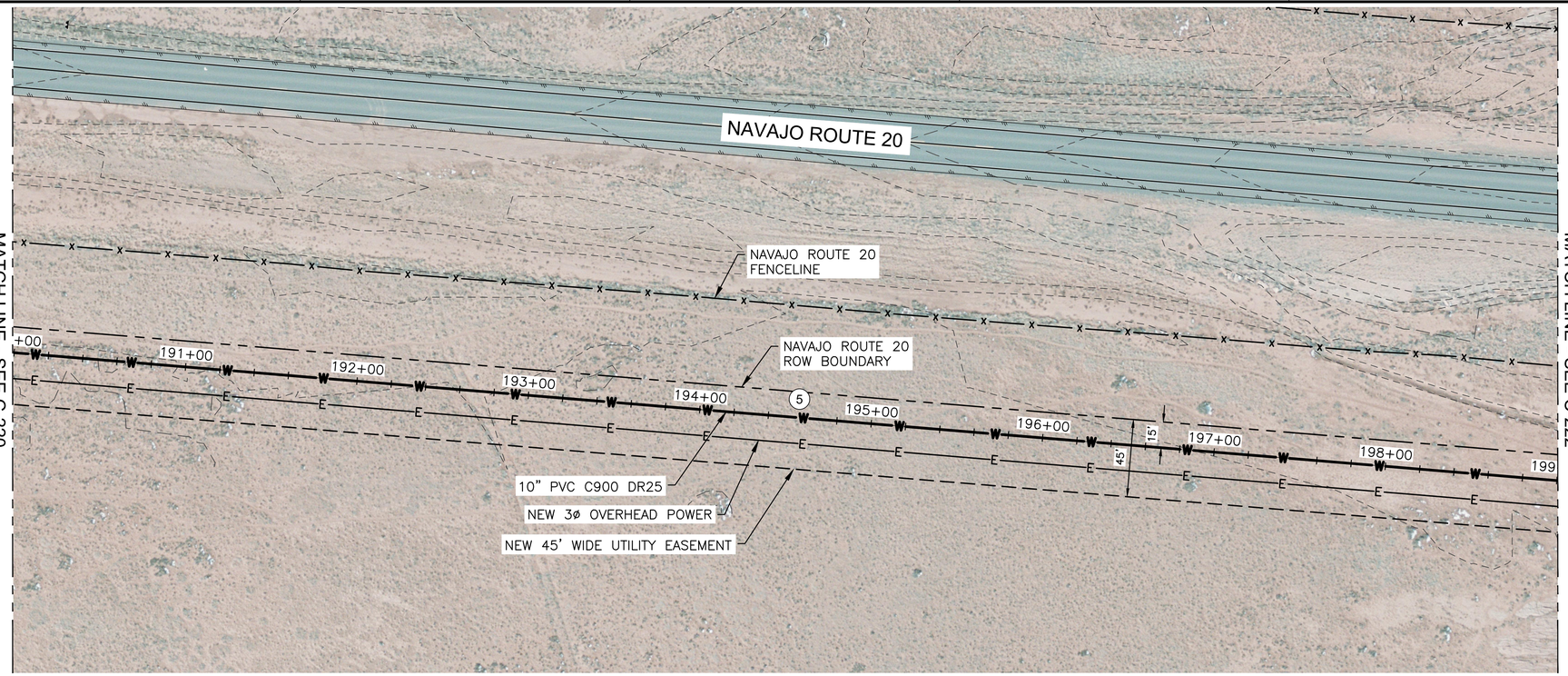
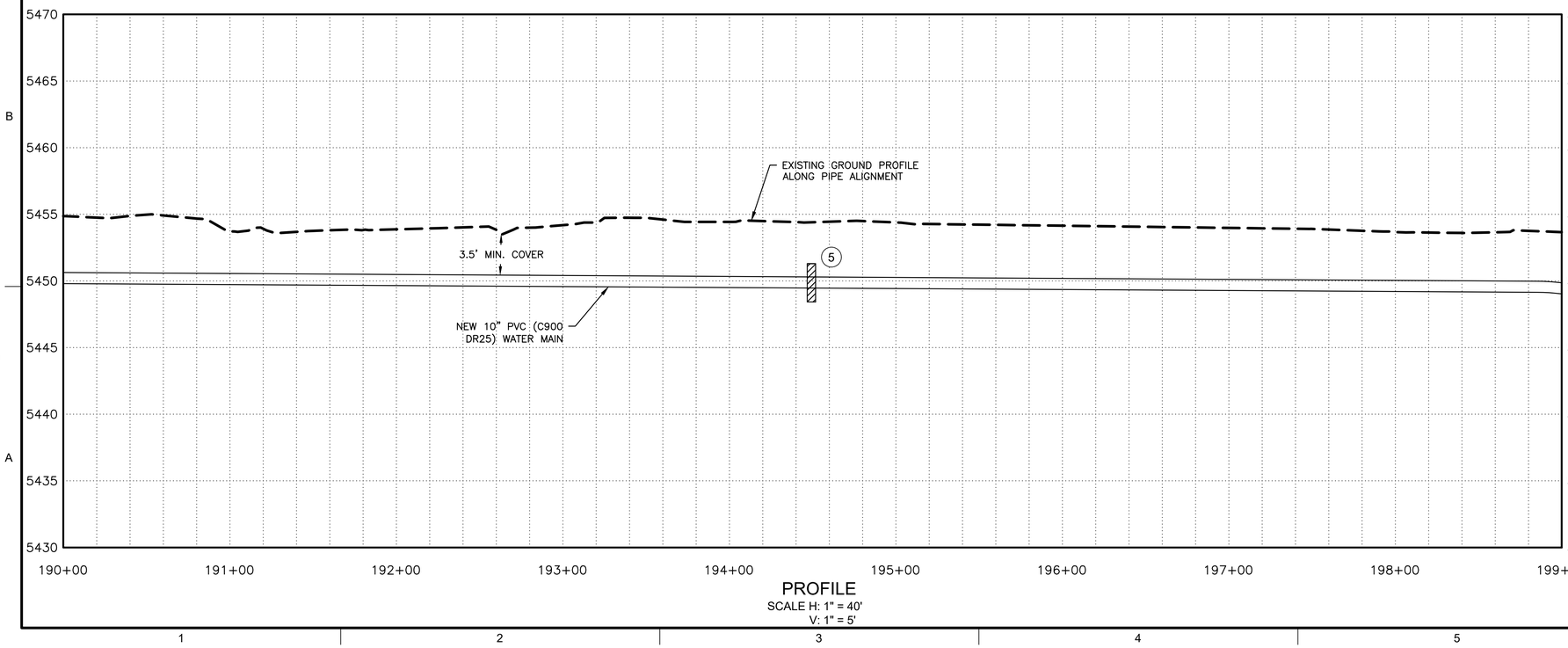


STA 190+00 - STA 199+00

PLAN

SCALE: 1" = 40'



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0 20 40
SCALE IN FEET

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BC PROJECT NUMBER
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CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 190+00 TO 199+00
PLAN & PROFILE

DRAWING NUMBER
C-221

SHEET NUMBER
43 OF 76

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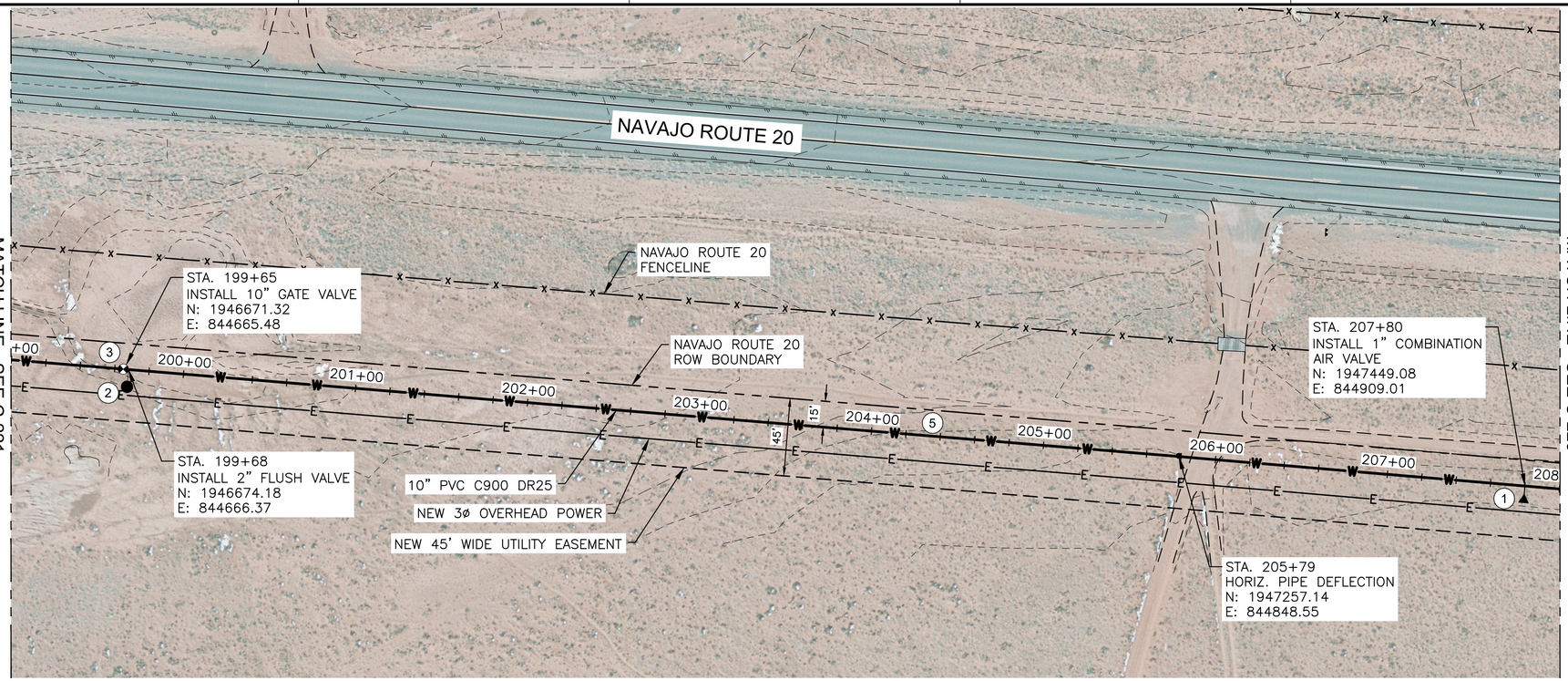
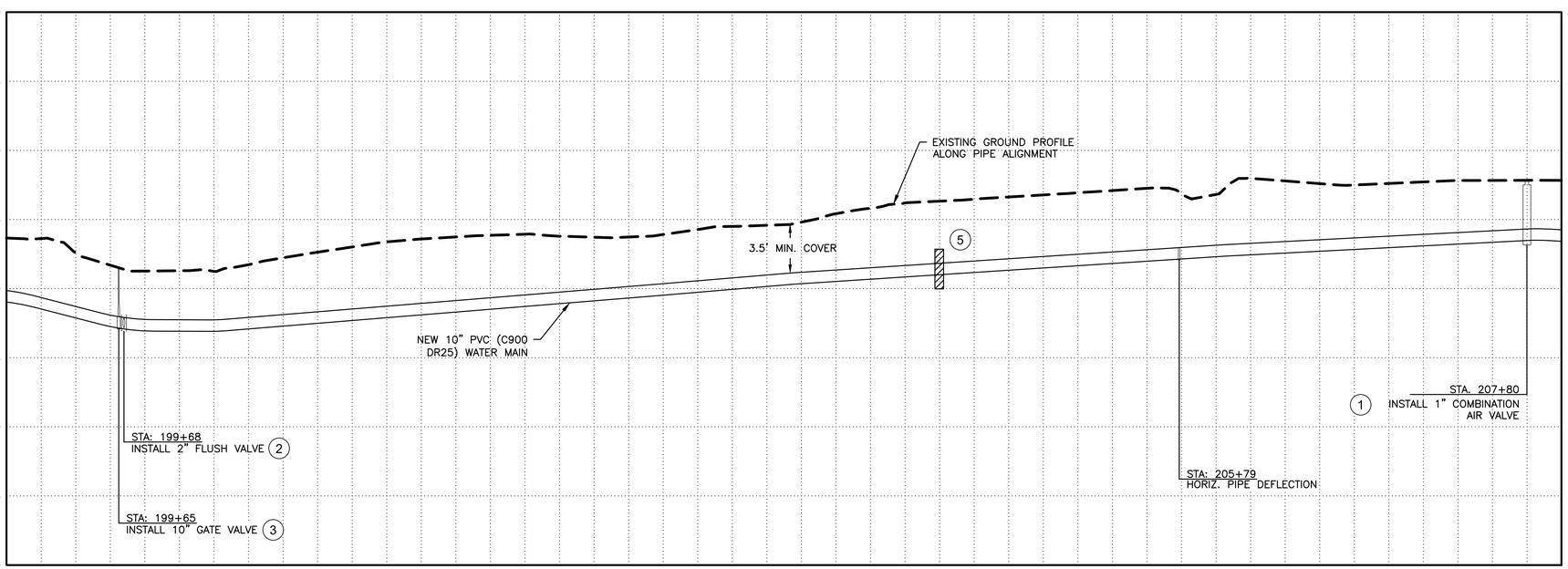


STA 199+00 - STA 208+00

PLAN

SCALE: 1" = 40'



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KEY NOTES

1. AIR VALVE PER NTUA STD. DWG WS-10
2. FLUSH VALVE PER NTUA STD. DWG WS-11
3. GATE VALVE PER NTUA STD. DWG WS-14
5. WATER BAR PER SPEC. SECTION 02200.

0 20 40
SCALE IN FEET

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Bodaway-Gap
Well, Tank,
and Pipeline

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AT FULL SIZE

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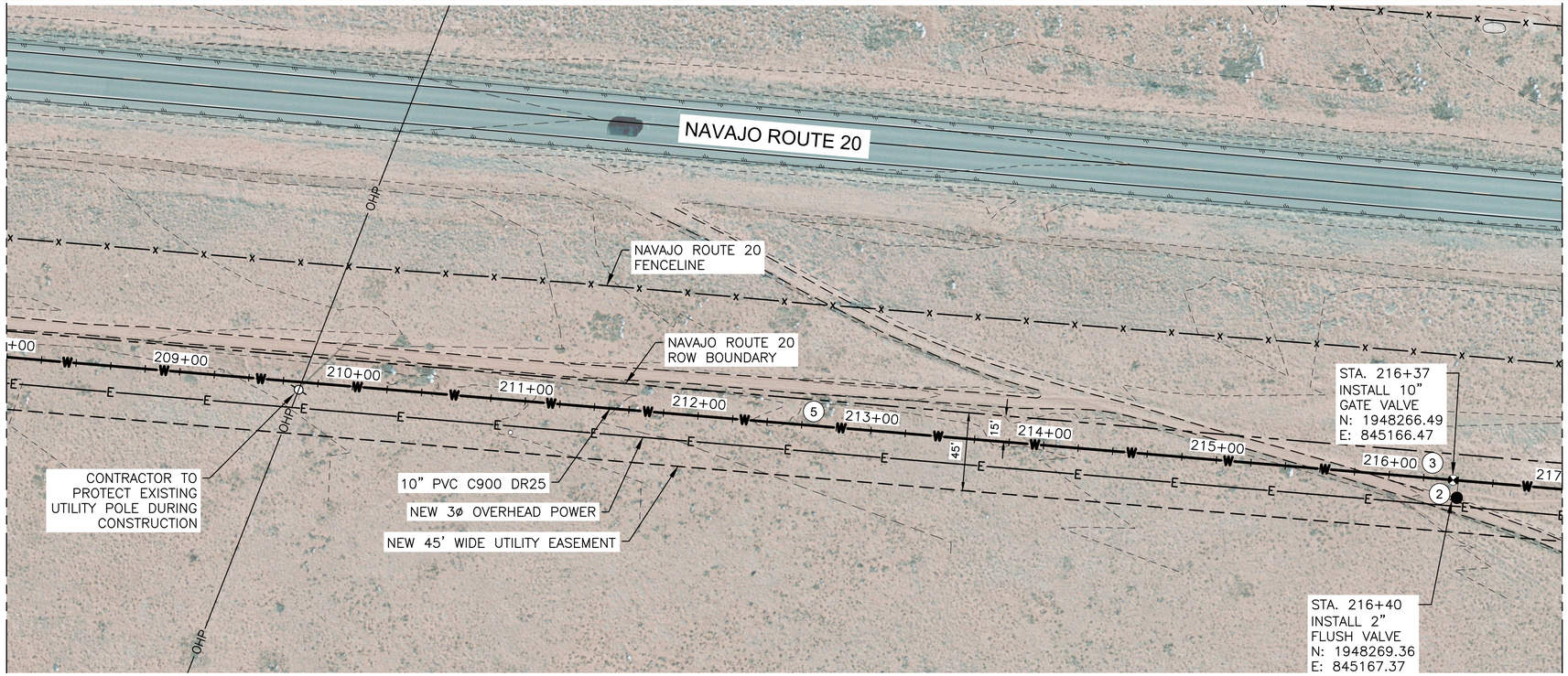
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 199+00 TO
208+00
PLAN & PROFILE

DRAWING NUMBER
C-222

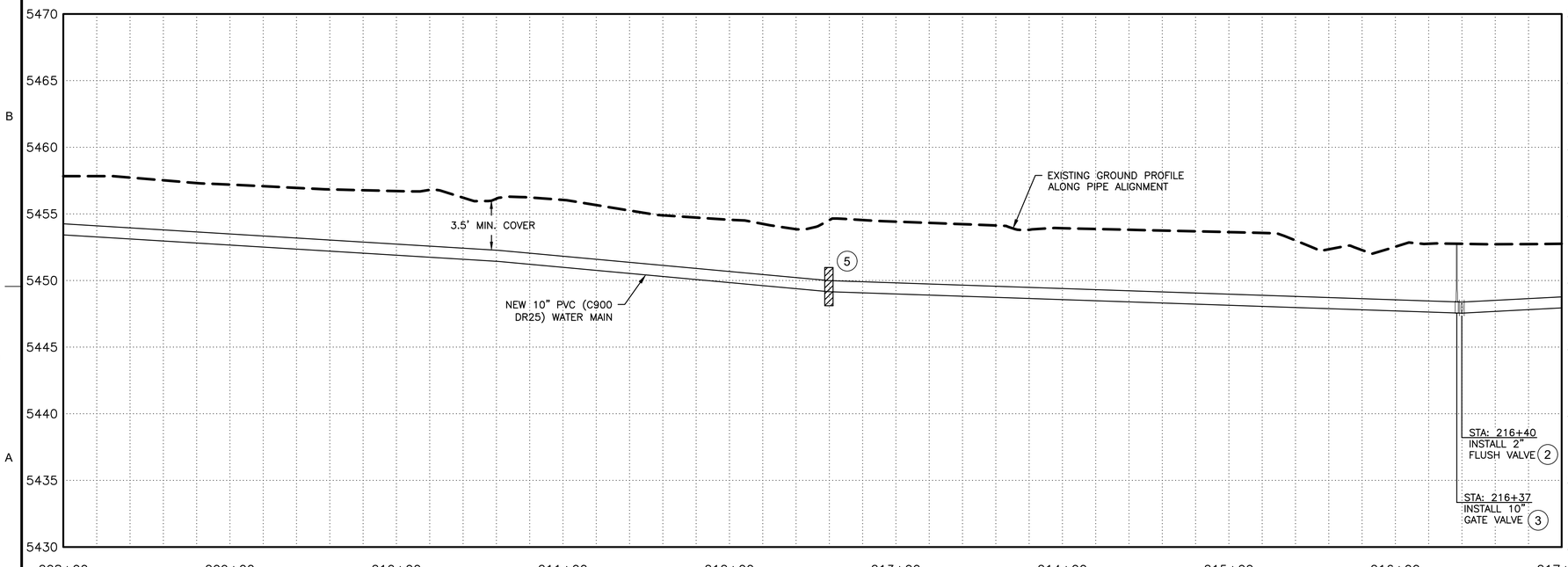
SHEET NUMBER
44 OF 76



STA 208+00 - STA 217+00

PLAN

SCALE: 1" = 40'



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KEY NOTES

(2) FLUSH VALVE PER NTUA STD. DWG WS-11

(3) GATE VALVE PER NTUA STD. DWG WS-14

(5) WATER BAR PER SPEC. SECTION 02200.

0 20 40

SCALE IN FEET

PLAN NORTH

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ARIZONA 811 Arizona Blue Stake, Inc.

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Brown AND Caldwell

SALT LAKE CITY, UTAH

DOWL www.dowl.com

222 N. 32nd Street, #700
Billings, Montana 59101
406-656-6399

Registered Professional Engineer
CERTIFICATE NO.
67639
PAUL A. SWENSON
Date Signed 9/29/21
ARIZONA, U.S.A.

Expires 12/31/21

GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:

DRAWN:

CHECKED:

CHECKED:

APPROVED:

FILENAME
SC-WA-PP24_30-21254.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
4028.21254.01

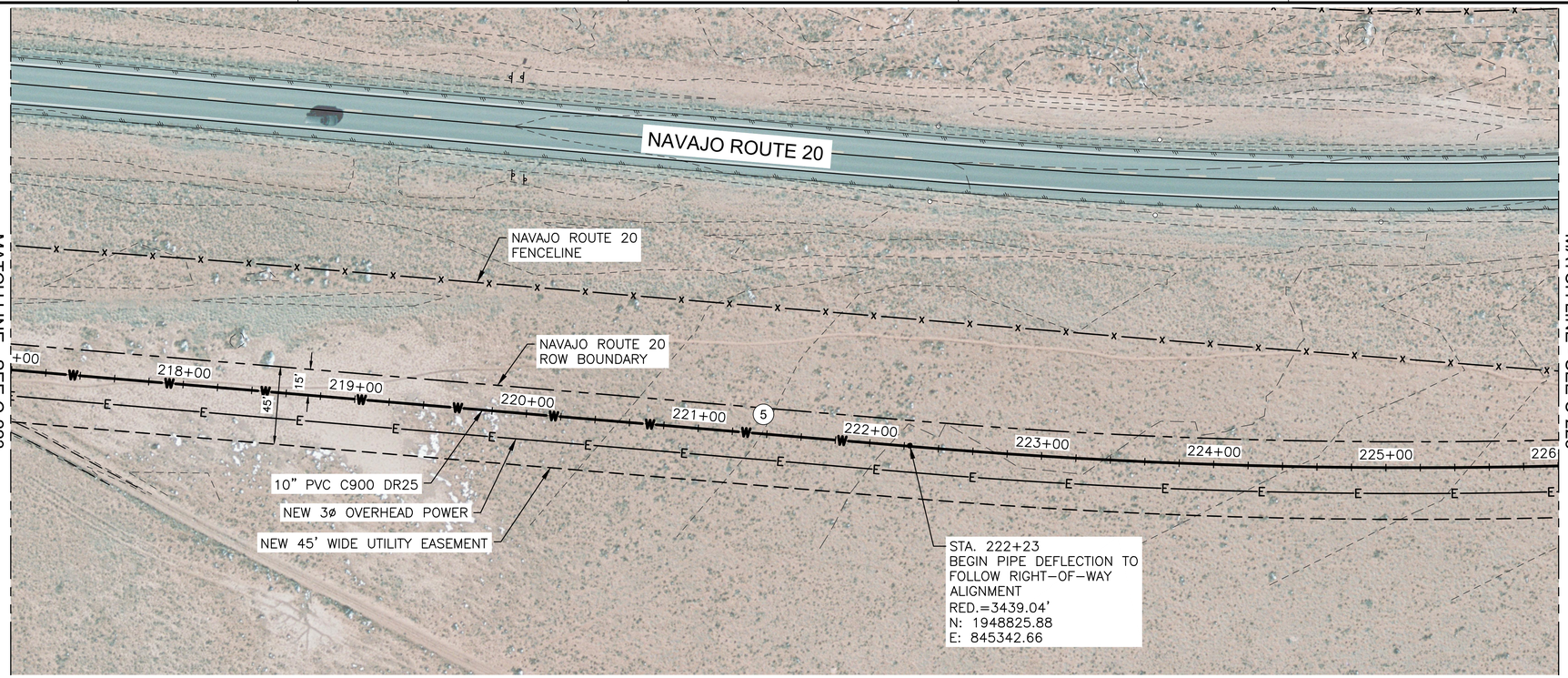
CIVIL

STA 208+00 TO 217+00
PLAN & PROFILE

DRAWING NUMBER

C-223

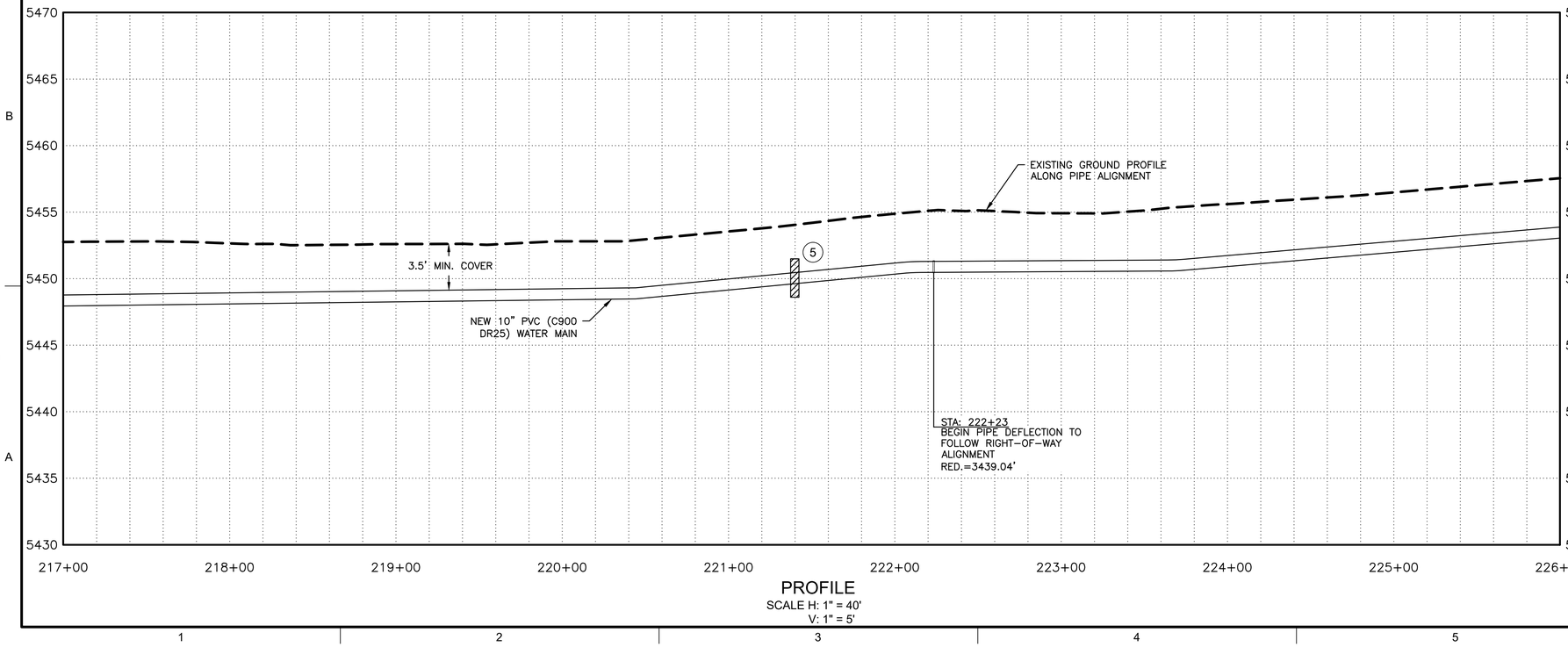
SHEET NUMBER
45 OF 76



STA 217+00 - STA 226+00

PLAN

SCALE: 1" = 40'



PROFILE

SCALE H: 1" = 40'
V: 1" = 5'

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KEY NOTES

(5) WATER BAR PER SPEC. SECTION 02200.

0 20 40
SCALE IN FEET

PLAN NORTH

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67639
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Date Signed 9/29/21
ARIZONA, U.S.A.
Expires 12/31/21

GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

REVISIONS

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APPROVED:

FILENAME
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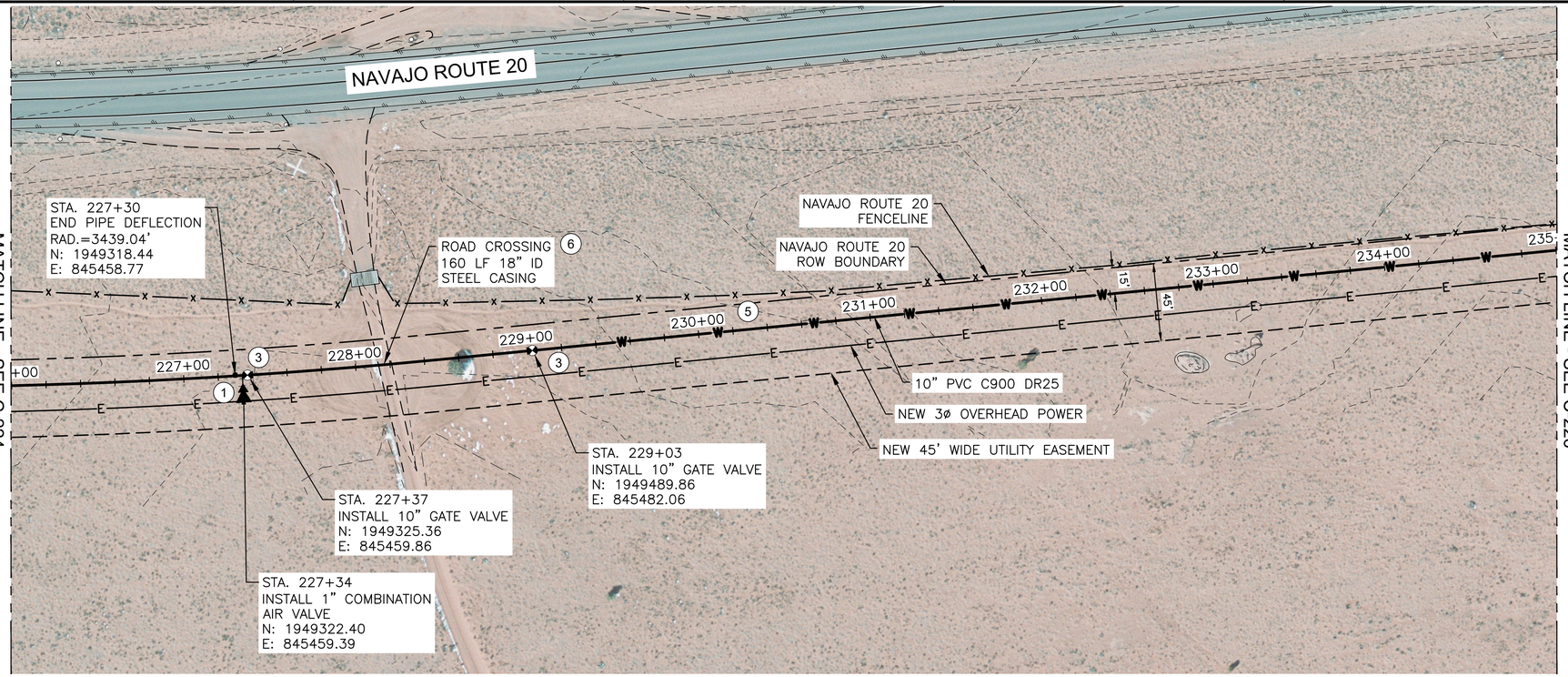
BC PROJECT NUMBER
150360
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 217+00 TO 226+00
PLAN & PROFILE

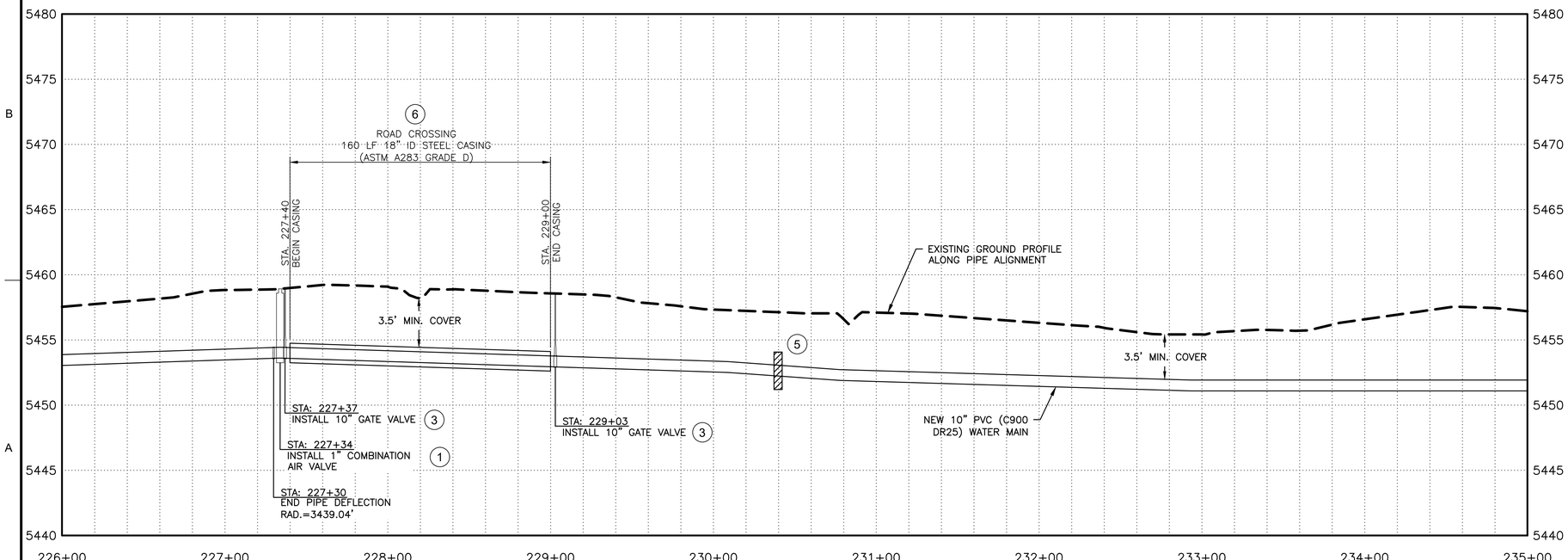
DRAWING NUMBER
C-224
SHEET NUMBER
46 OF 76



STA 226+00 - STA 235+00

PLAN

SCALE: 1" = 40'



PROFILE

SCALE H: 1" = 40'

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KEY NOTES

(1) AIR VALVE PER NTUA STD. DWG WS-10

(3) GATE VALVE PER NTUA STD. DWG WS-14

(5) WATER BAR PER SPEC. SECTION 02200.

(6) STEEL ENCASED ROAD CROSSING PER IHS STD. DWG W-35 AND NTUA STD. DWG WS-17a

0 20 40
SCALE IN FEET

PLAN NORTH

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BC PROJECT NUMBER
150360

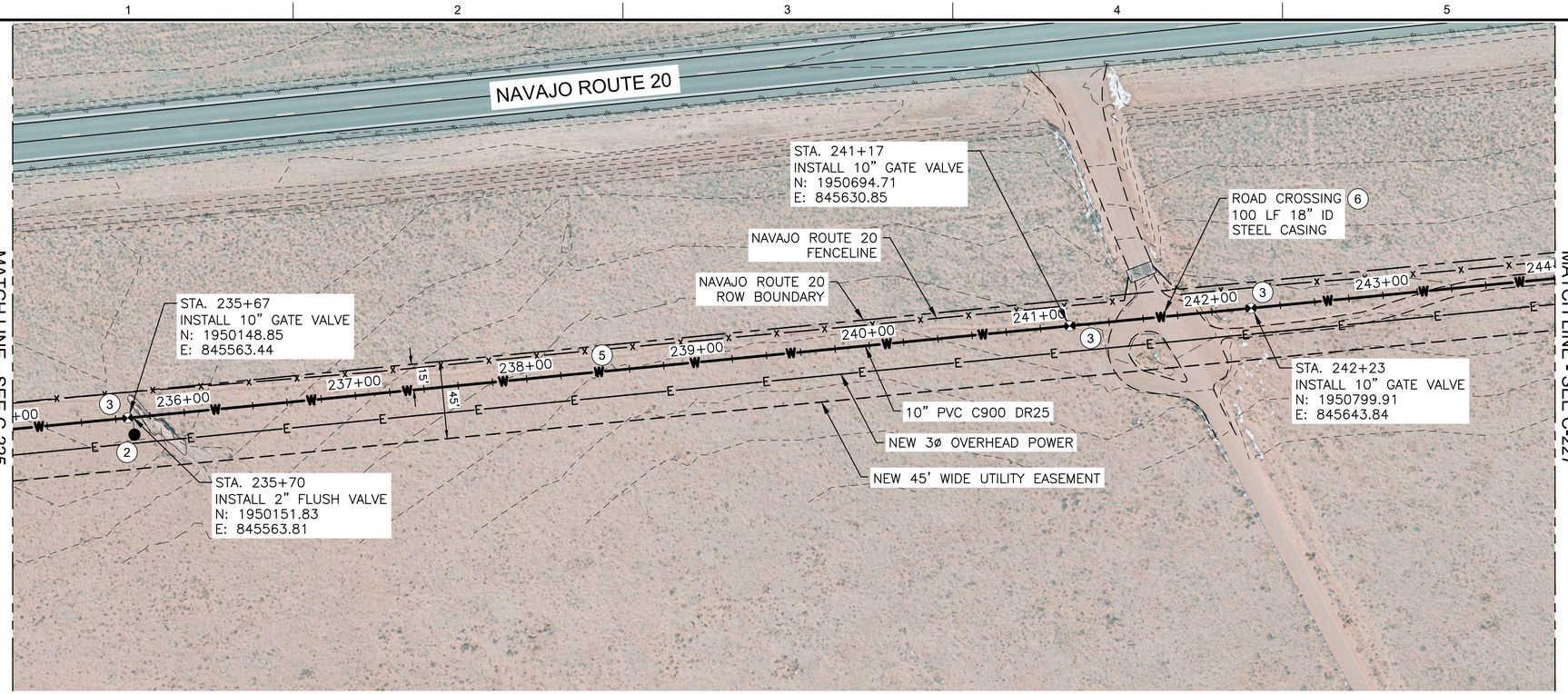
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 226+00 TO 235+00
PLAN & PROFILE

DRAWING NUMBER
C-225

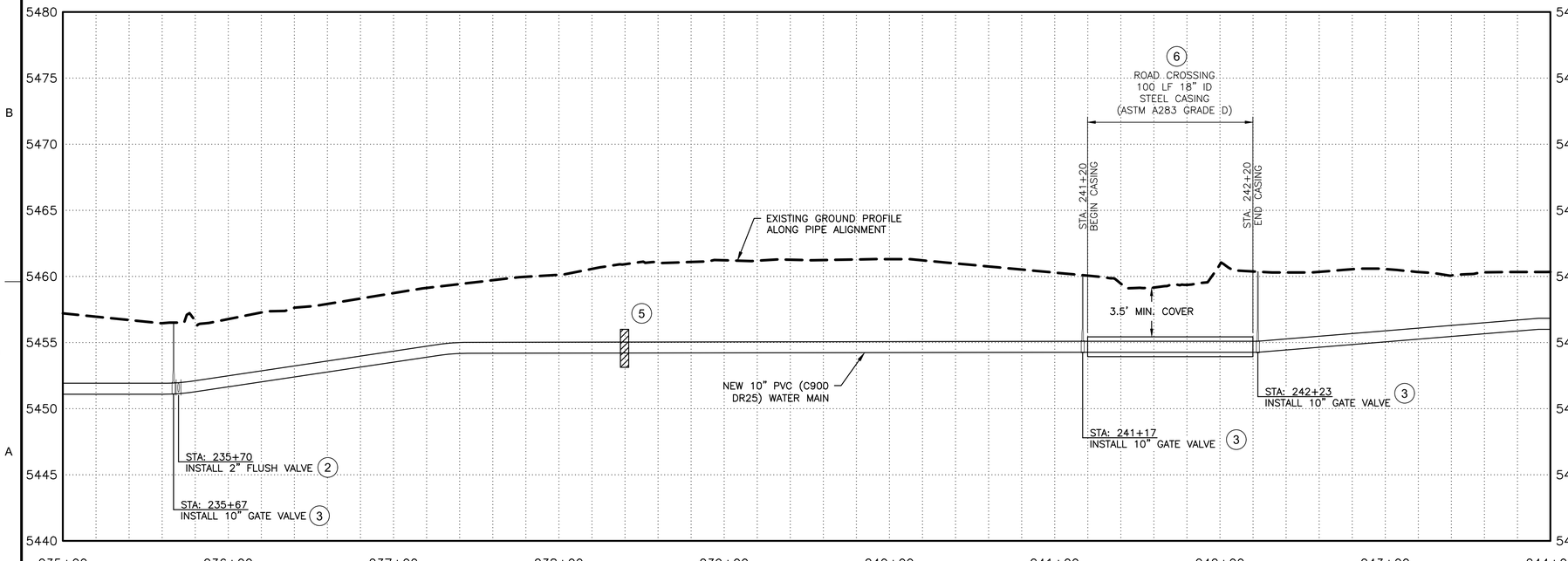
SHEET NUMBER
47 OF 76



STA 235+00 - STA 244+00

PLAN

SCALE: 1" = 40'



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0 20 40
SCALE IN FEET

PLAN NORTH

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Expires 12/31/21

GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

REVISIONS

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BC PROJECT NUMBER
150360

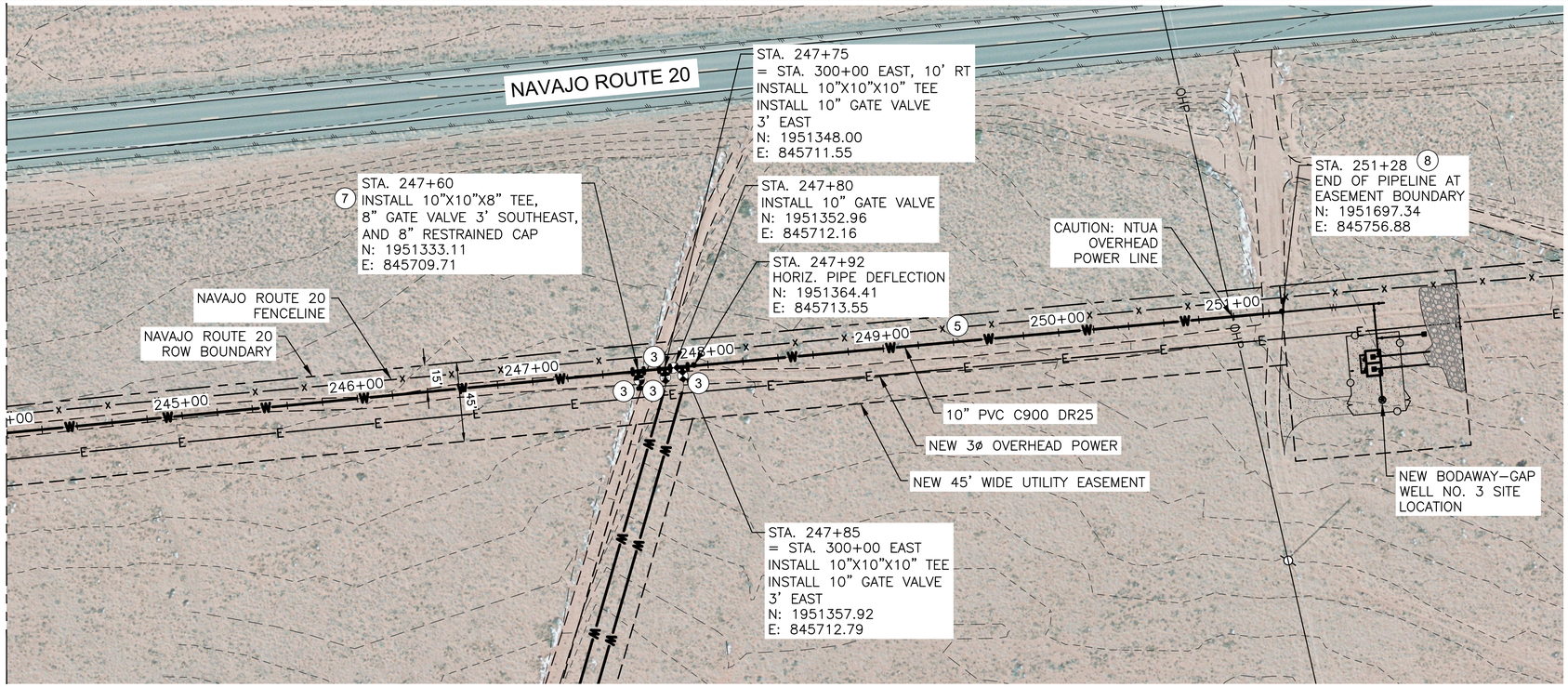
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 235+00 TO 244+00 PLAN & PROFILE

DRAWING NUMBER
C-226

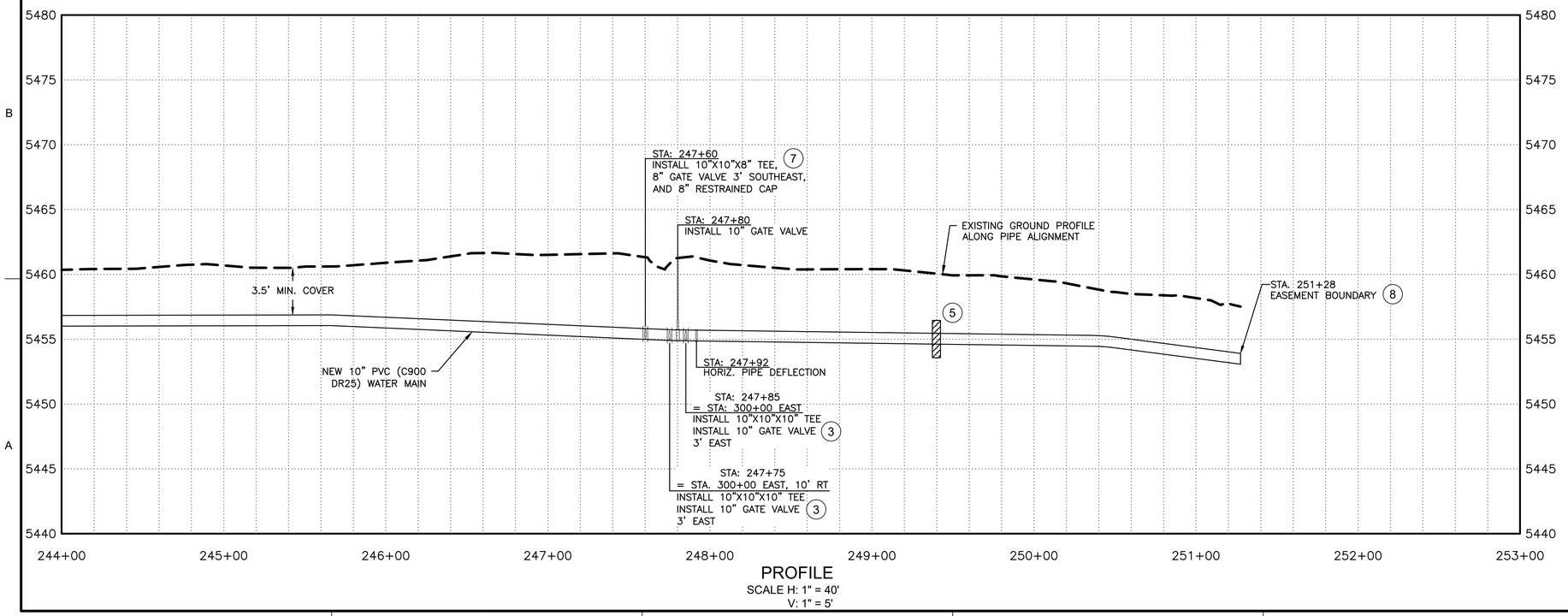
SHEET NUMBER
48 OF 76



STA 244+00 - STA 251+28

PLAN

SCALE: 1" = 40'



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KEY NOTES

(3) GATE VALVE PER NTUA STD. DWG WS-14

(5) WATER BAR PER SPEC. SECTION 02200.

(7) PROVIDE 1 JOINT (20') OF 8" PVC (C-900 DR25) WITH CAP DOWNSTREAM OF GATE VALVE PER NTUA STD. DWG WS-16. RESTRAIN VALVE TO TEE.

(8) SEE NEW WELL SITE PLAN C-100 FOR CONTINUATION OF PIPELINE

0 20 40
SCALE IN FEET

PLAN NORTH

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67639
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Expires 12/31/21

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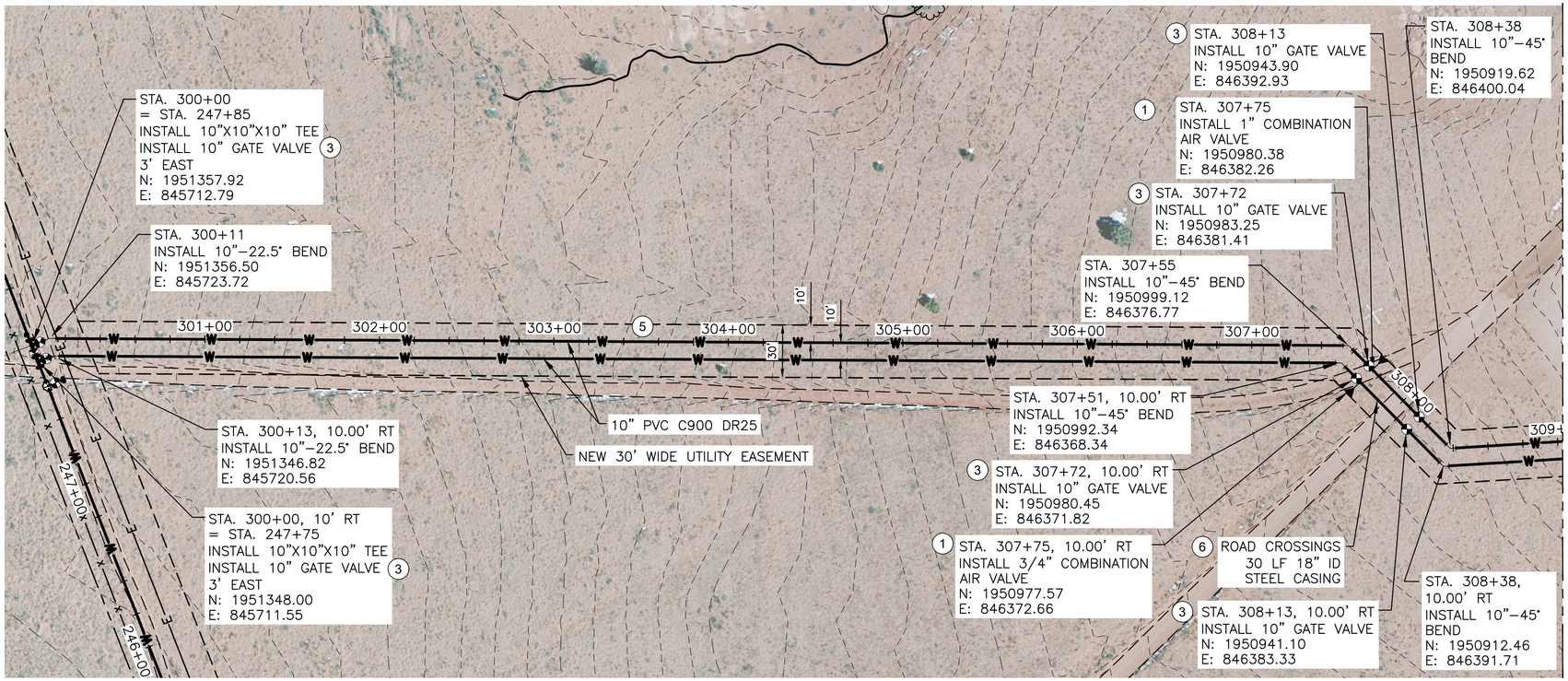
CLIENT PROJECT NUMBER	4028.21254.01

CIVIL

STA 244+00 TO 251+28 PLAN & PROFILE

DRAWING NUMBER
C-227

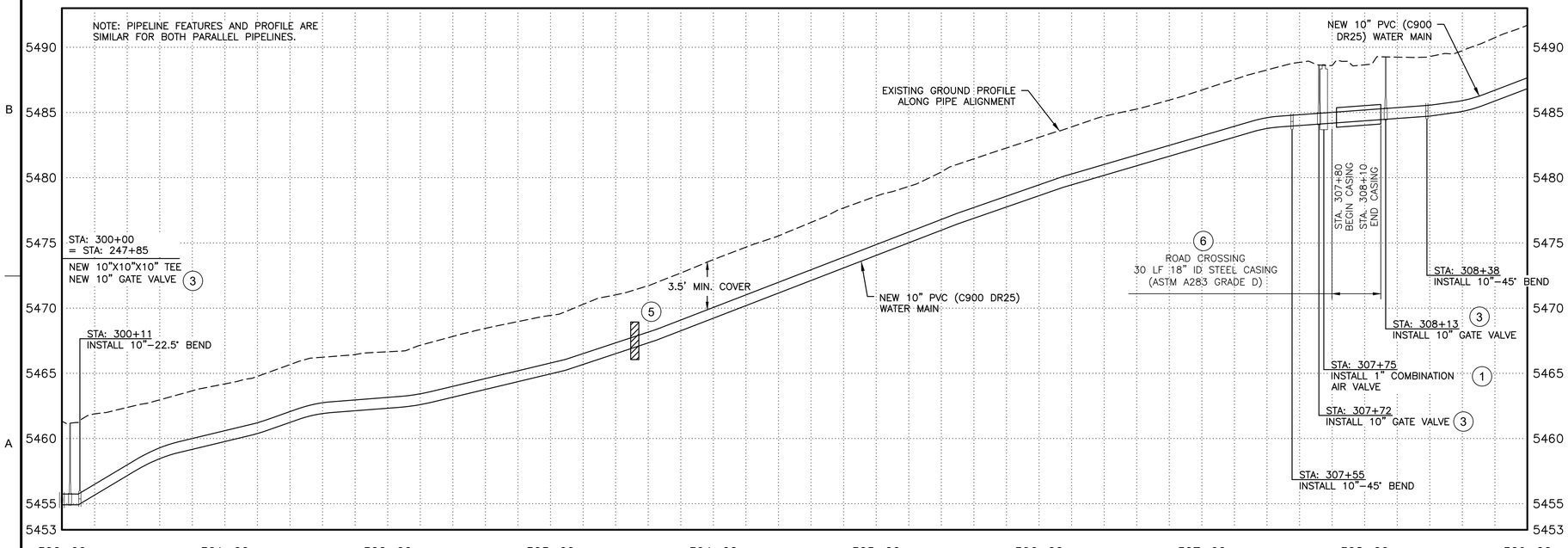
SHEET NUMBER
49 OF 76



STA 300+00 - STA 309+00

PLAN

SCALE: 1" = 40'



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0 40 80
SCALE IN FEET

PLAN NORTH

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CLIENT PROJECT NUMBER	4028.21254.01

CIVIL

STA 300+00 TO 309+00 PLAN & PROFILE

DRAWING NUMBER

C-228

SHEET NUMBER

50 OF 76

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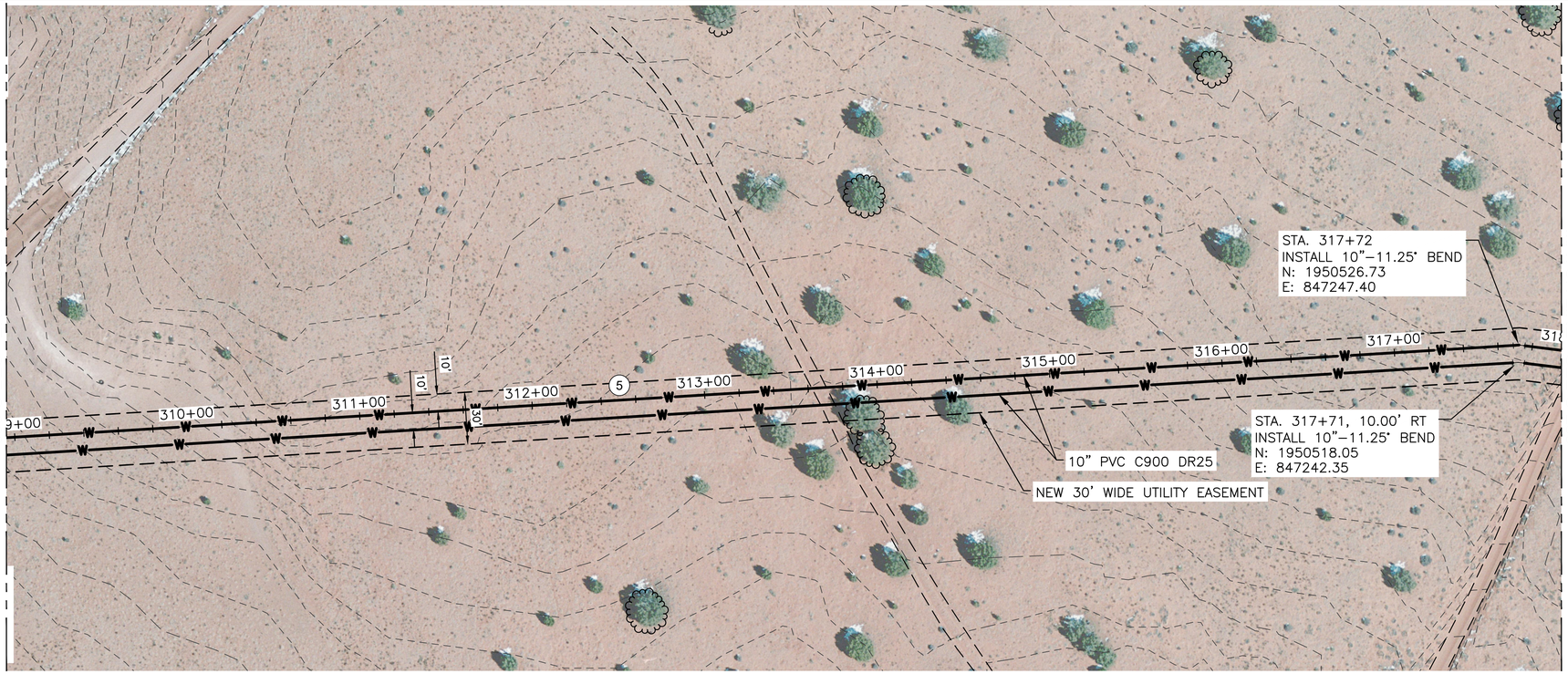
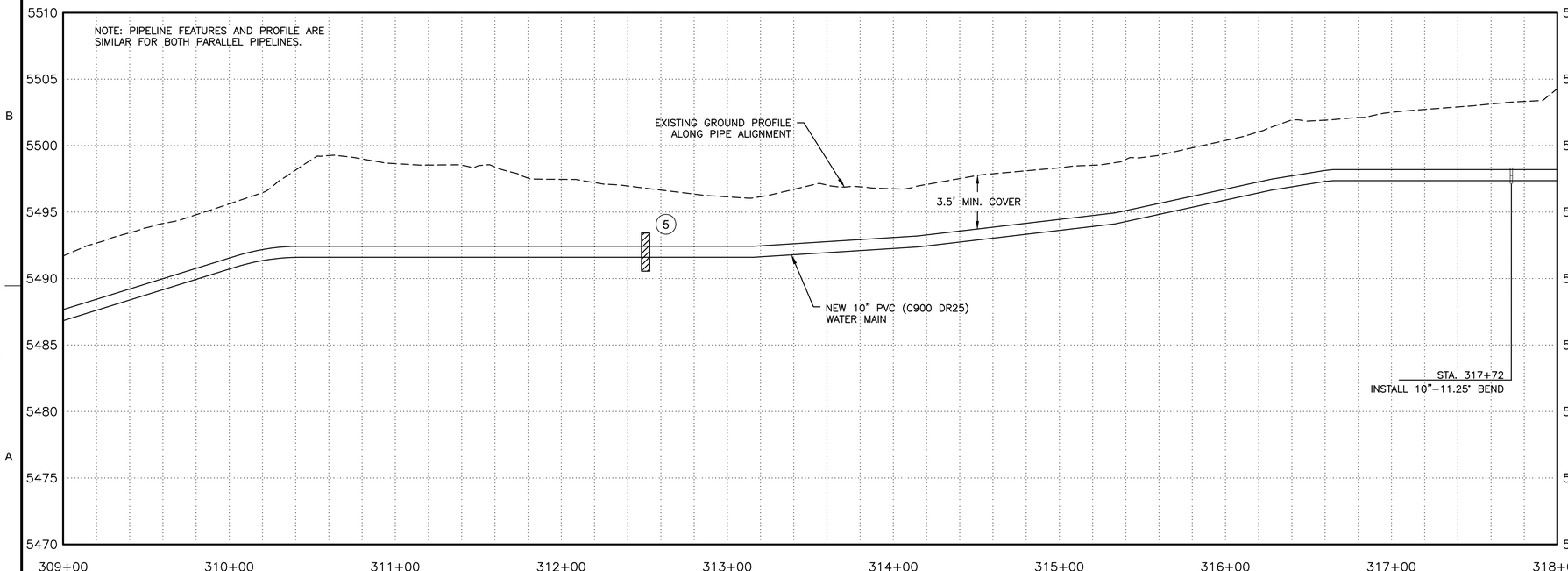


STA 309+00 - STA 318+00

PLAN

SCALE: 1" = 40'



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0 40 80
SCALE IN FEET

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CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 309+00 TO 318+00
PLAN & PROFILE

DRAWING NUMBER
C-229

SHEET NUMBER
51 OF 76

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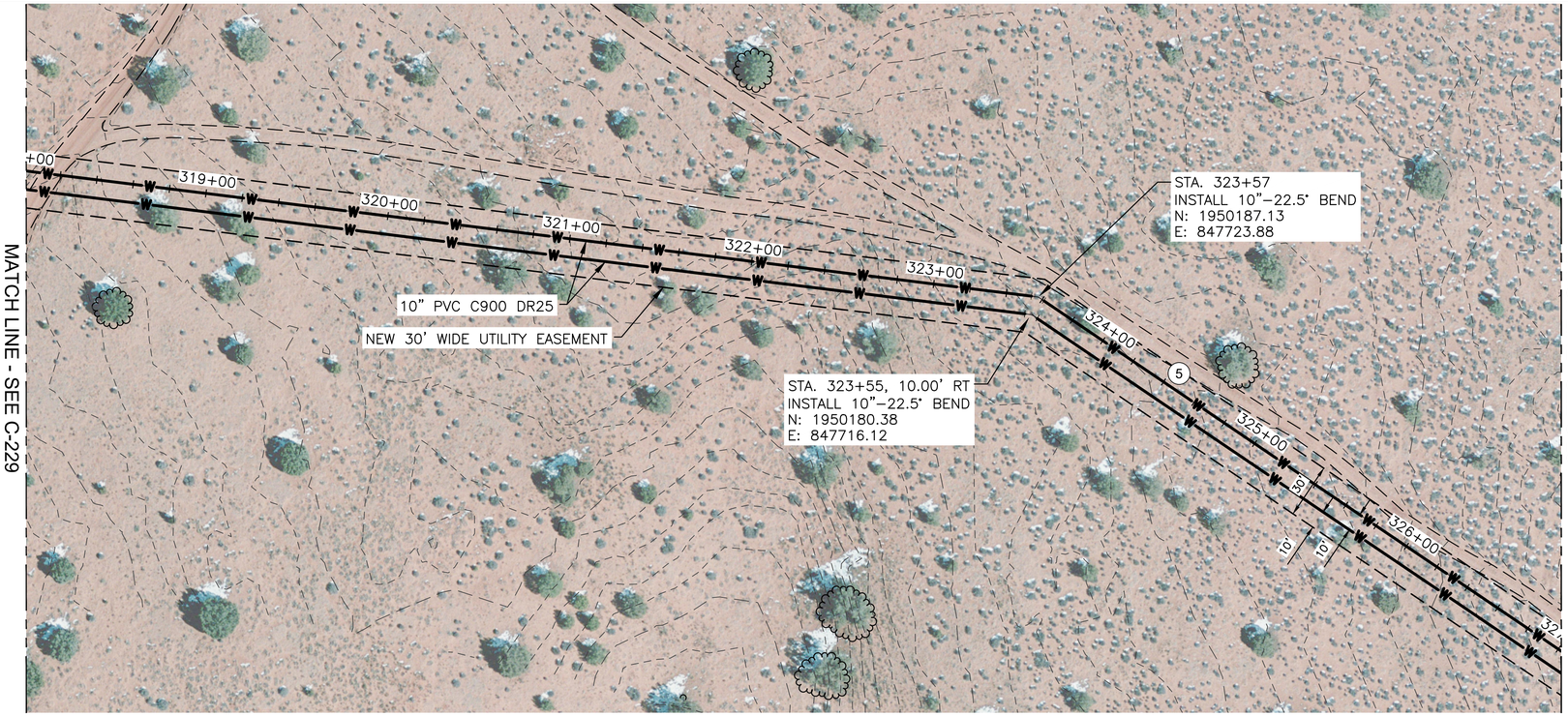
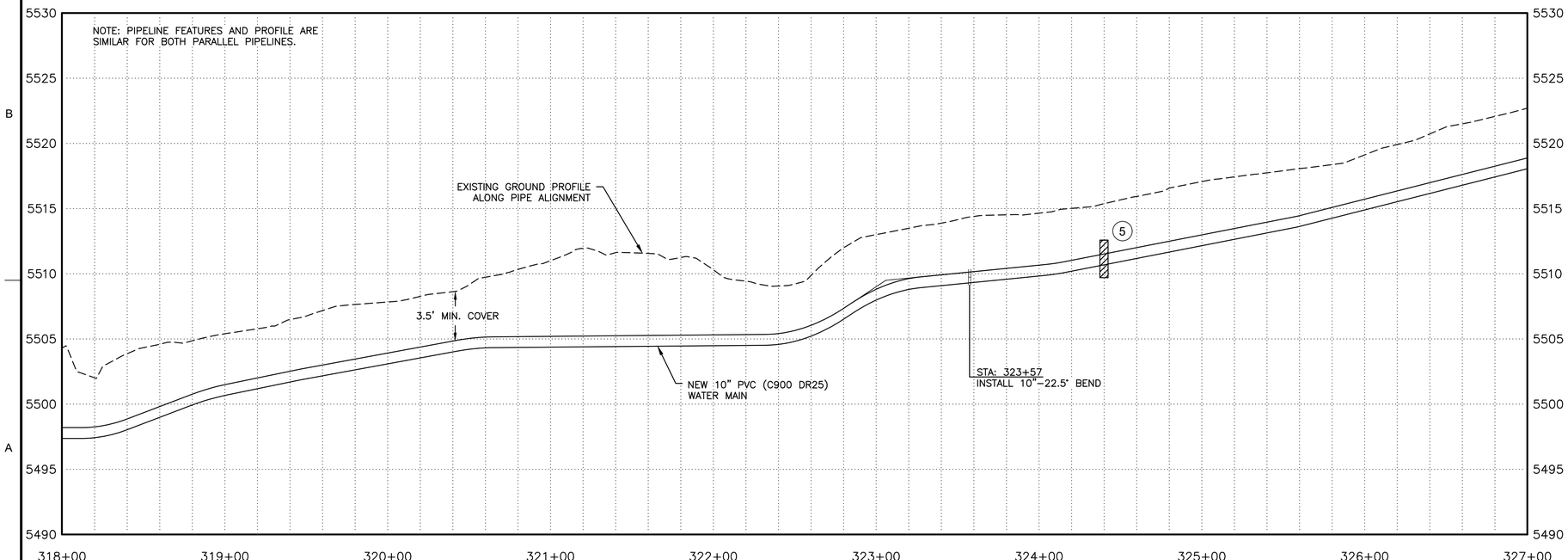


STA 318+00 - STA 327+00

PLAN

SCALE: 1" = 40'



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(5) WATER BAR PER SPEC. SECTION 02200.

0 40 80
SCALE IN FEET

PLAN NORTH

Call at least two full working days before you begin excavation.

ARIZONA 811
Arizona Blue Stake, Inc.

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Brown AND Caldwell

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222 N. 32nd Street, #700
Billings, Montana 59101
406-656-6399

Registered Professional Engineer
CERTIFICATE NO.
67639
PAUL A. SWENSON
Date Signed 9/29/21
ARIZONA, U.S.A.
Expires 12/31/21

GREAT SEAL OF THE NAVAJO NATION

Bodaway-Gap Well, Tank, and Pipeline

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:
DRAWN:
CHECKED:
CHECKED:
APPROVED:

FILENAME
SC-WA-PP31_40-21254.DWG

BC PROJECT NUMBER
150360

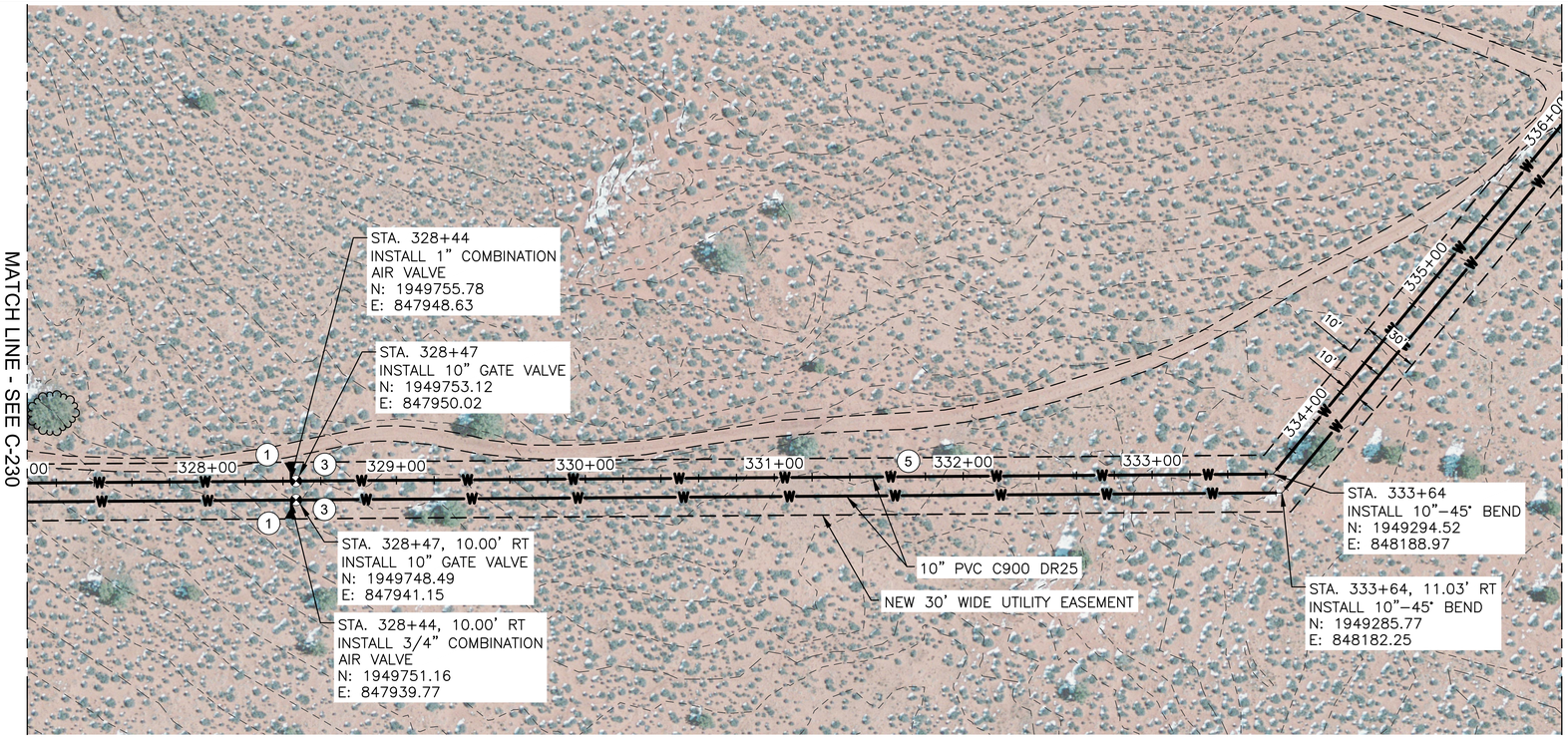
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 318+00 TO 327+00
PLAN & PROFILE

DRAWING NUMBER
C-230

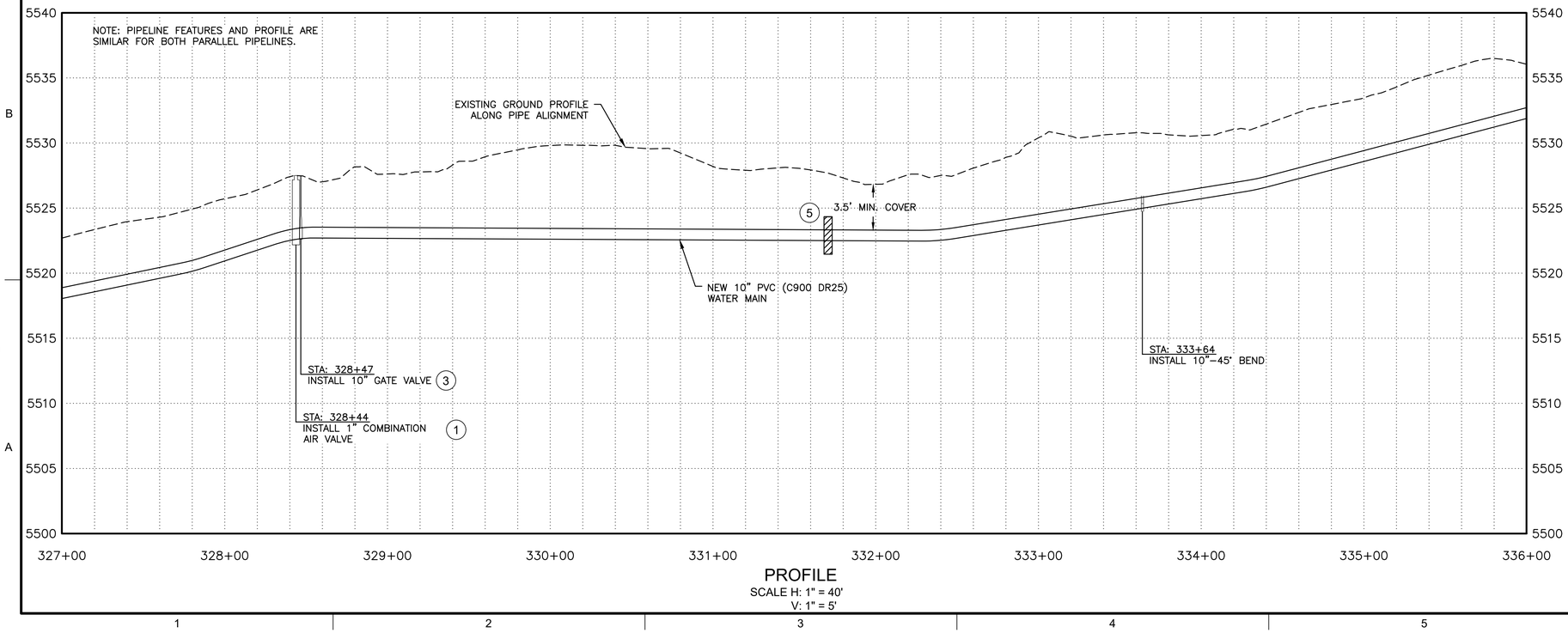
SHEET NUMBER
52 OF 76



STA 327+00 - STA 336+00

PLAN

SCALE: 1" = 40'



PROFILE

SCALE H: 1" = 40'
V: 1" = 5'

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KEY NOTES

(1) AIR VALVE PER NTUA STD. DWG WS-10

(3) GATE VALVE PER NTUA STD. DWG WS-14

(5) WATER BAR PER SPEC. SECTION 02200.

0 40 80
SCALE IN FEET

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BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 327+00 TO 336+00
PLAN & PROFILE

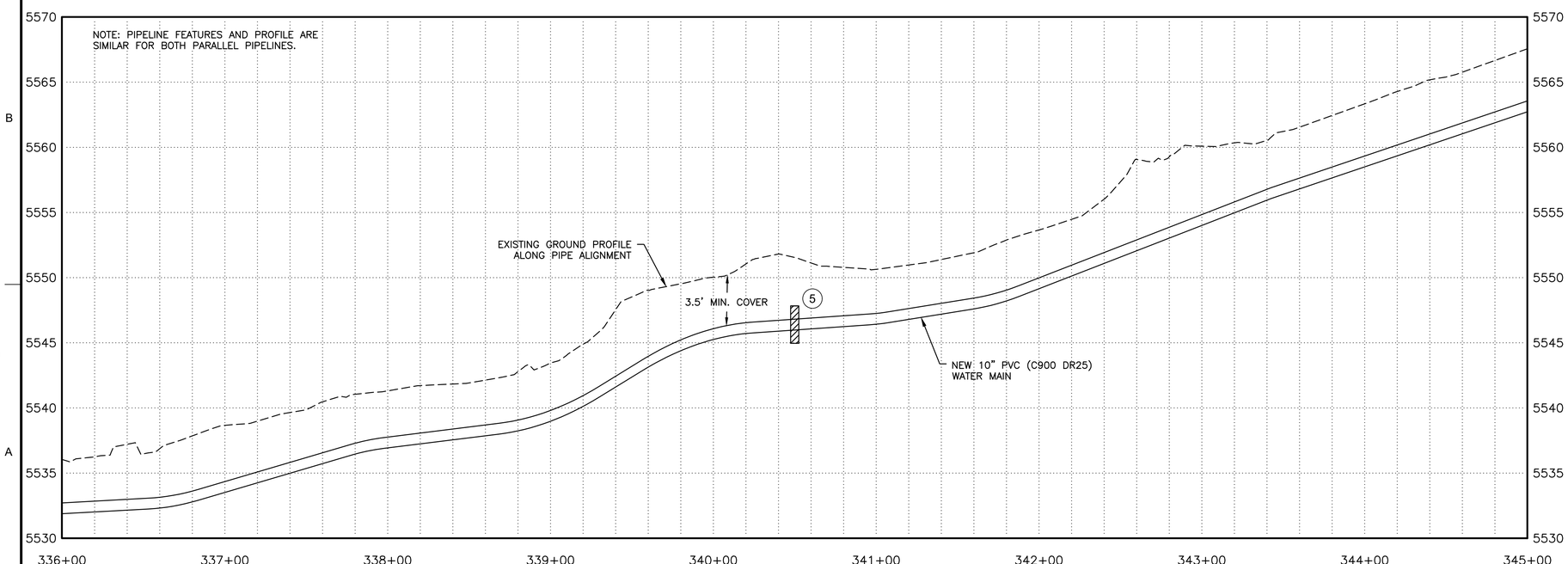
DRAWING NUMBER
C-231

SHEET NUMBER
53 OF 76

STA 336+00 - STA 345+00

PLAN

SCALE: 1" = 40'



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0 40 80
SCALE IN FEET

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BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 336+00 TO 345+00
PLAN & PROFILE

DRAWING NUMBER
C-232

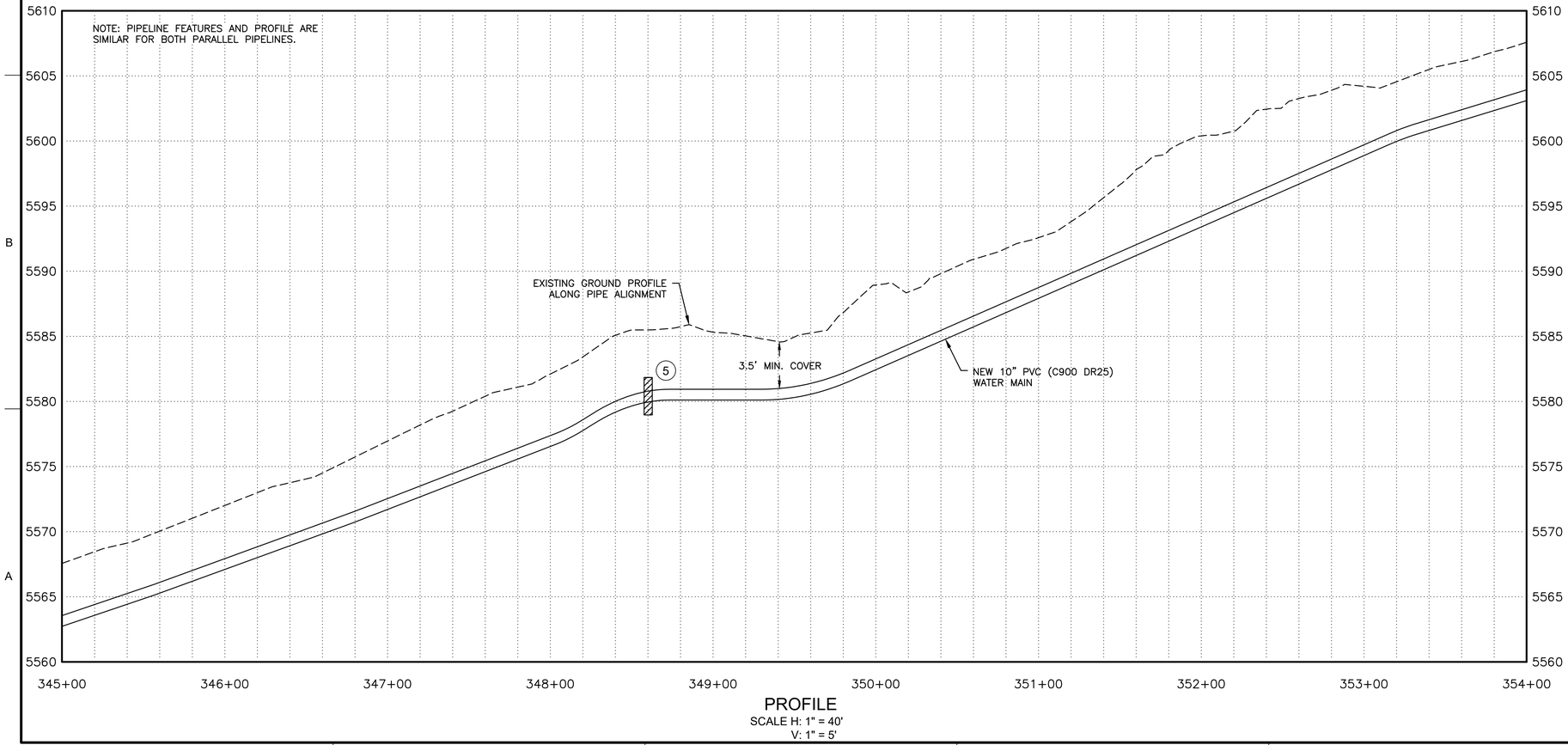
SHEET NUMBER
54 OF 76

Path: W:\28\21254-01\65CAD\CIVIL FILENAME: SC-WA-PP31_40-21254.DWG PLOT DATE: 10/4/2021 5:03 PM CAD USER: JOHN BRIDGEWATER

STA 345+00 - STA 354+00

PLAN

SCALE: 1" = 40'



PROFILE

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0 40 80
SCALE IN FEET

PLAN NORTH

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Bodaway-Gap Well, Tank, and Pipeline

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BC PROJECT NUMBER
150360

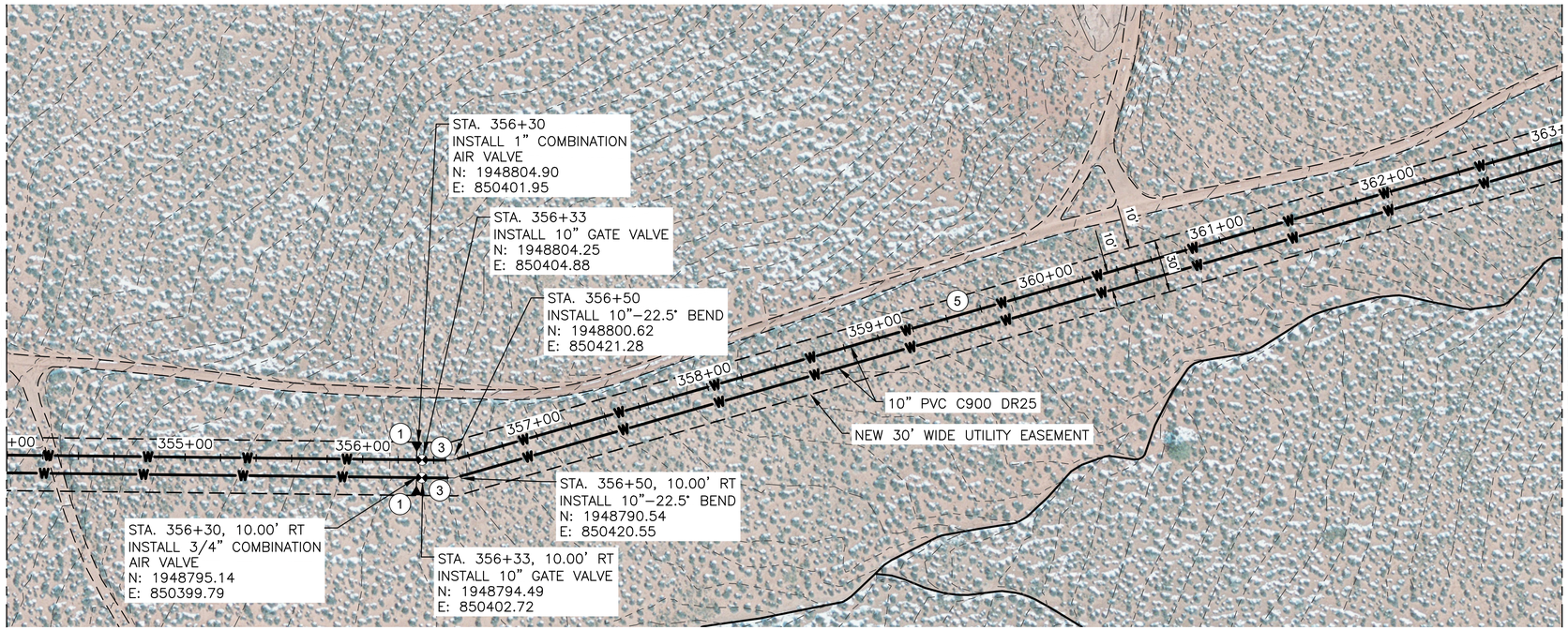
CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 345+00 TO 354+00
PLAN & PROFILE

DRAWING NUMBER
C-233

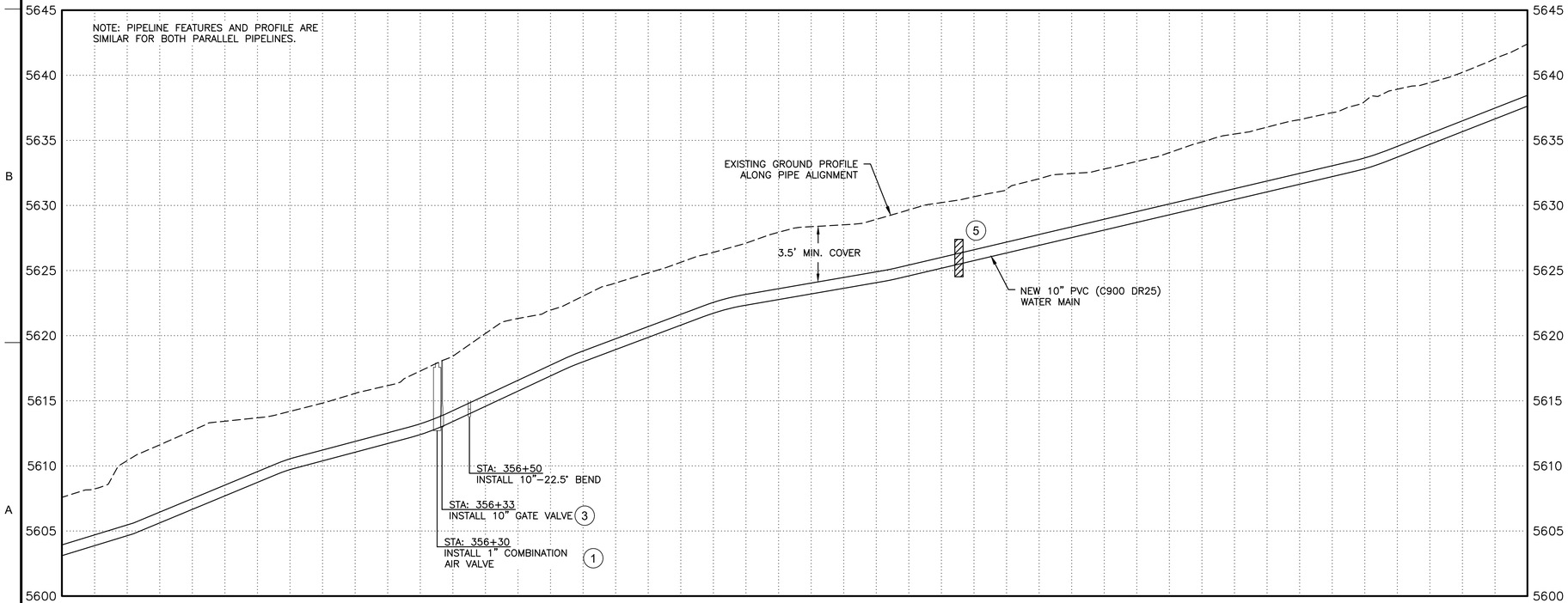
SHEET NUMBER
55 OF 76



STA 354+00 - STA 363+00

PLAN

SCALE: 1" = 40'



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0 40 80
SCALE IN FEET

PLAN NORTH

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FILENAME	SC-WA-PP31_40-21254.DWG
BC PROJECT NUMBER	150360
CLIENT PROJECT NUMBER	4028.21254.01

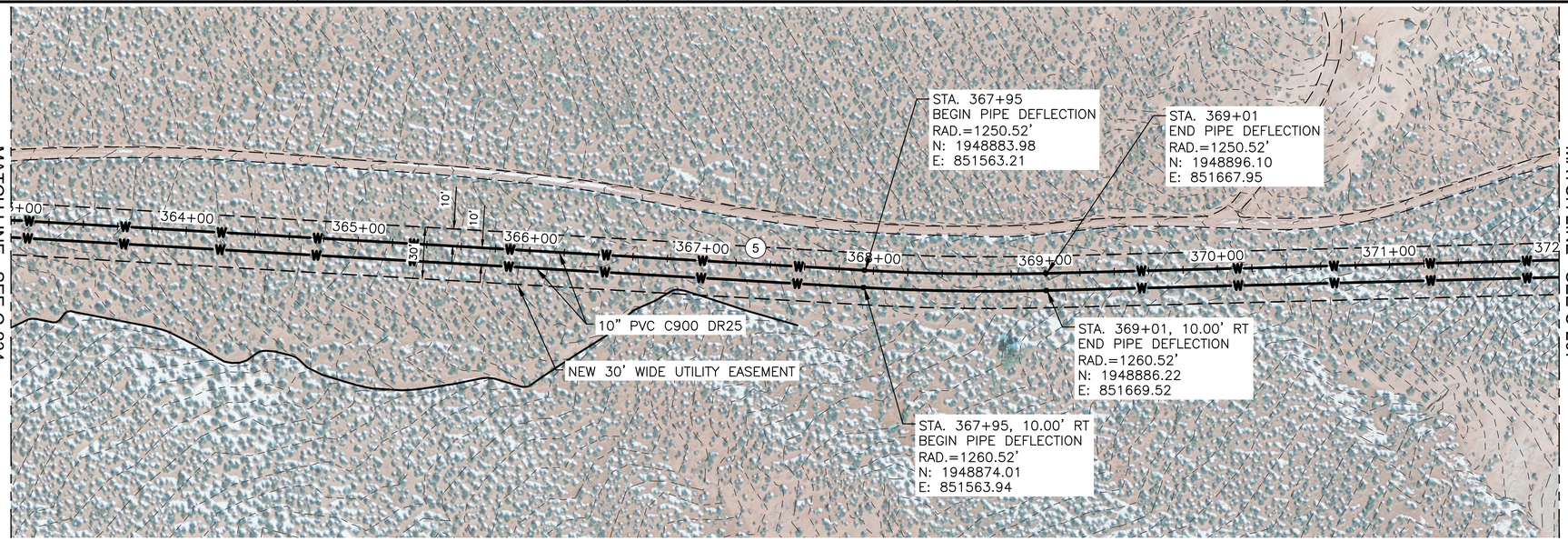
CIVIL

STA 354+00 TO 363+00
PLAN & PROFILE

DRAWING NUMBER

C-234

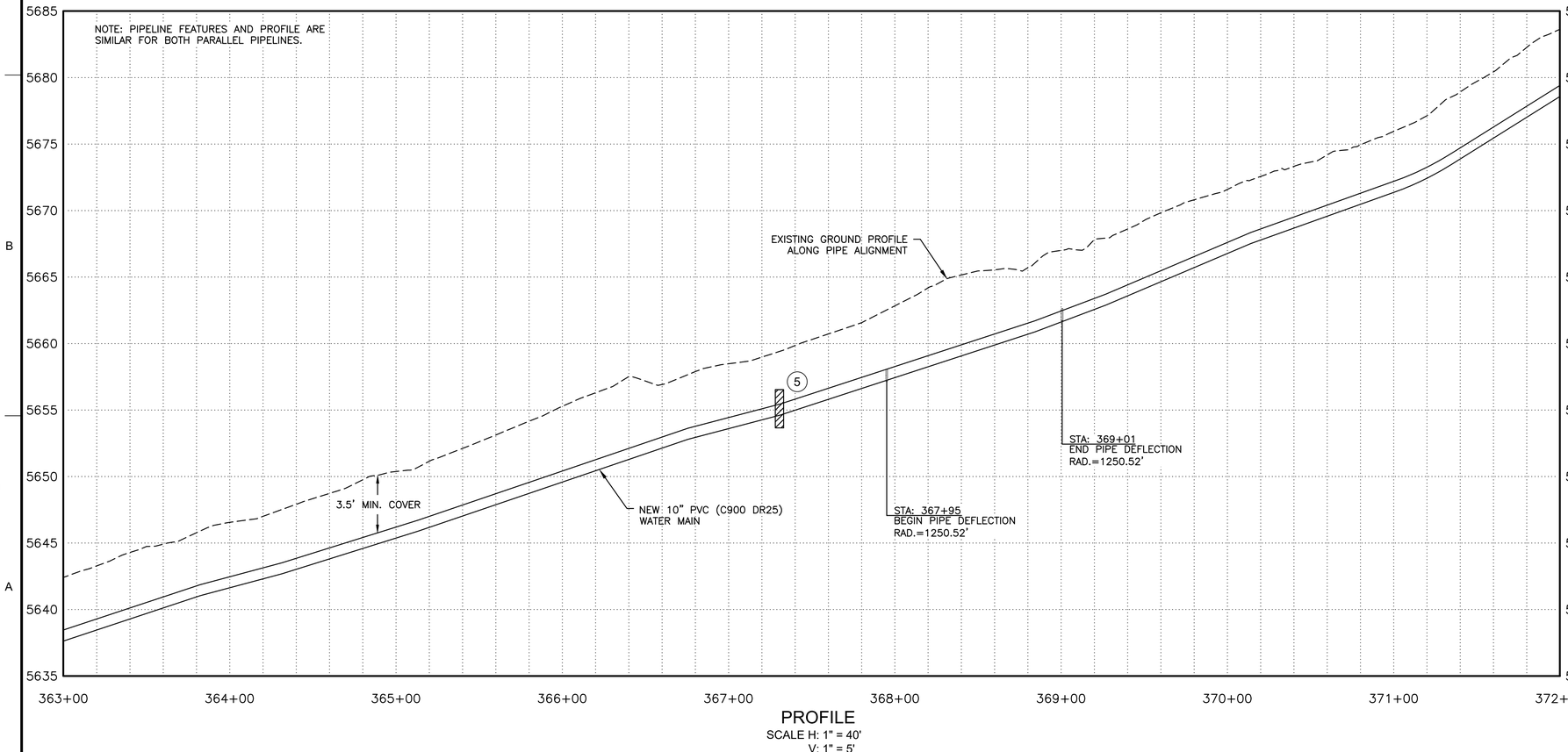
SHEET NUMBER
56 OF 76



STA 363+00 - STA 372+00

PLAN

SCALE: 1" = 40'



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BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
4028.21254.01

CIVIL

STA 363+00 TO 372+00
PLAN & PROFILE

DRAWING NUMBER
C-235

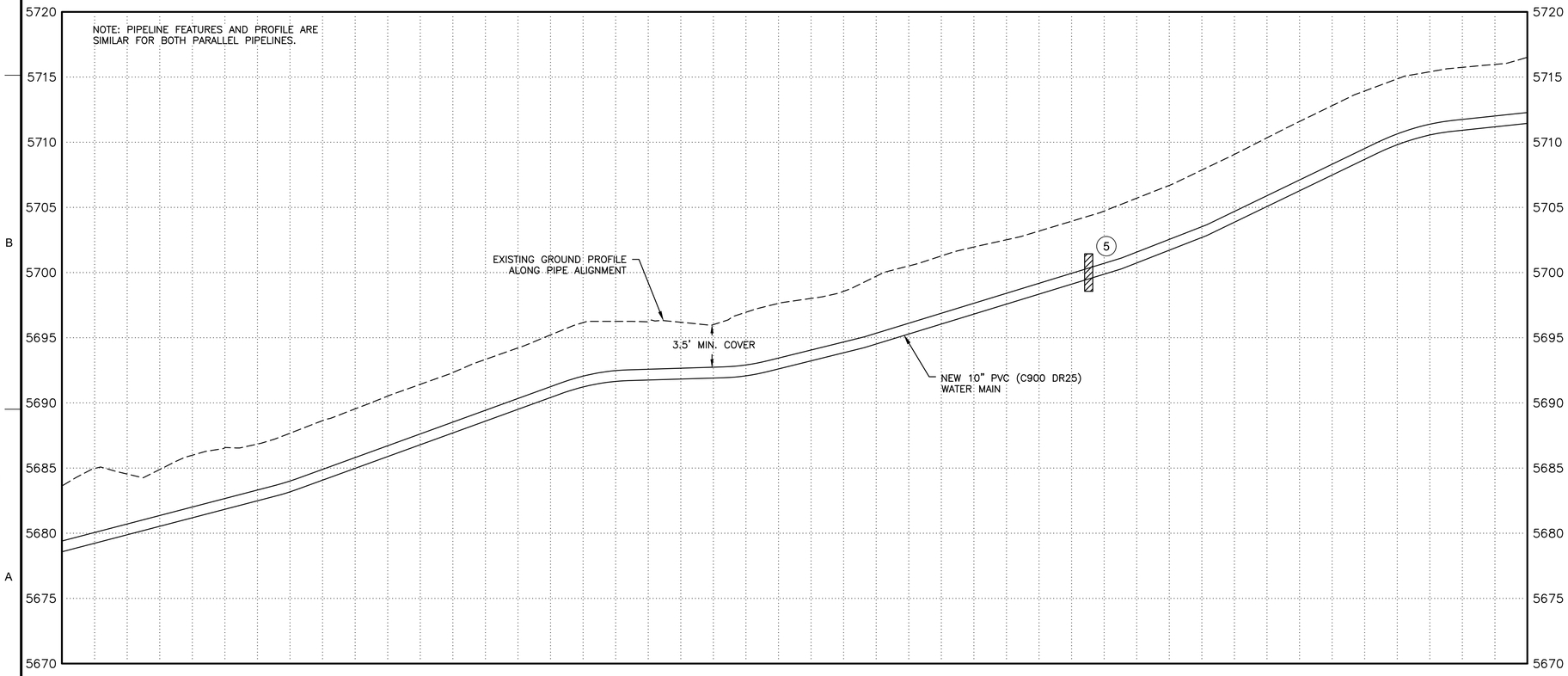
SHEET NUMBER
57 OF 76

Path: W:\28\21254-01\65\CAD\CIVIL FILENAME: SC-WA-PP31_40-21254.DWG PLOT DATE: 10/4/2021 5:04 PM CAD USER: JOHN BRIDGEWATER

STA 372+00 - STA 381+00

PLAN

SCALE: 1" = 40'



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CLIENT PROJECT NUMBER
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CIVIL

STA 372+00 TO 381+00
PLAN & PROFILE

DRAWING NUMBER
C-236

SHEET NUMBER
58 OF 76

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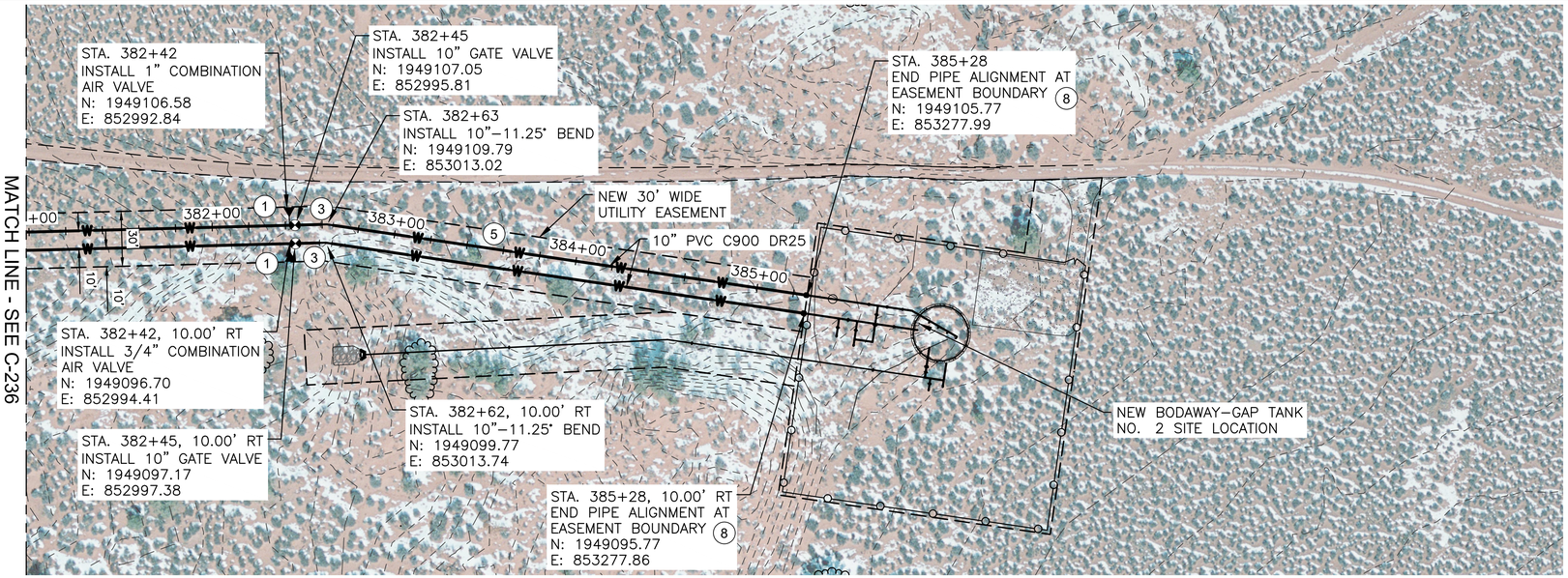
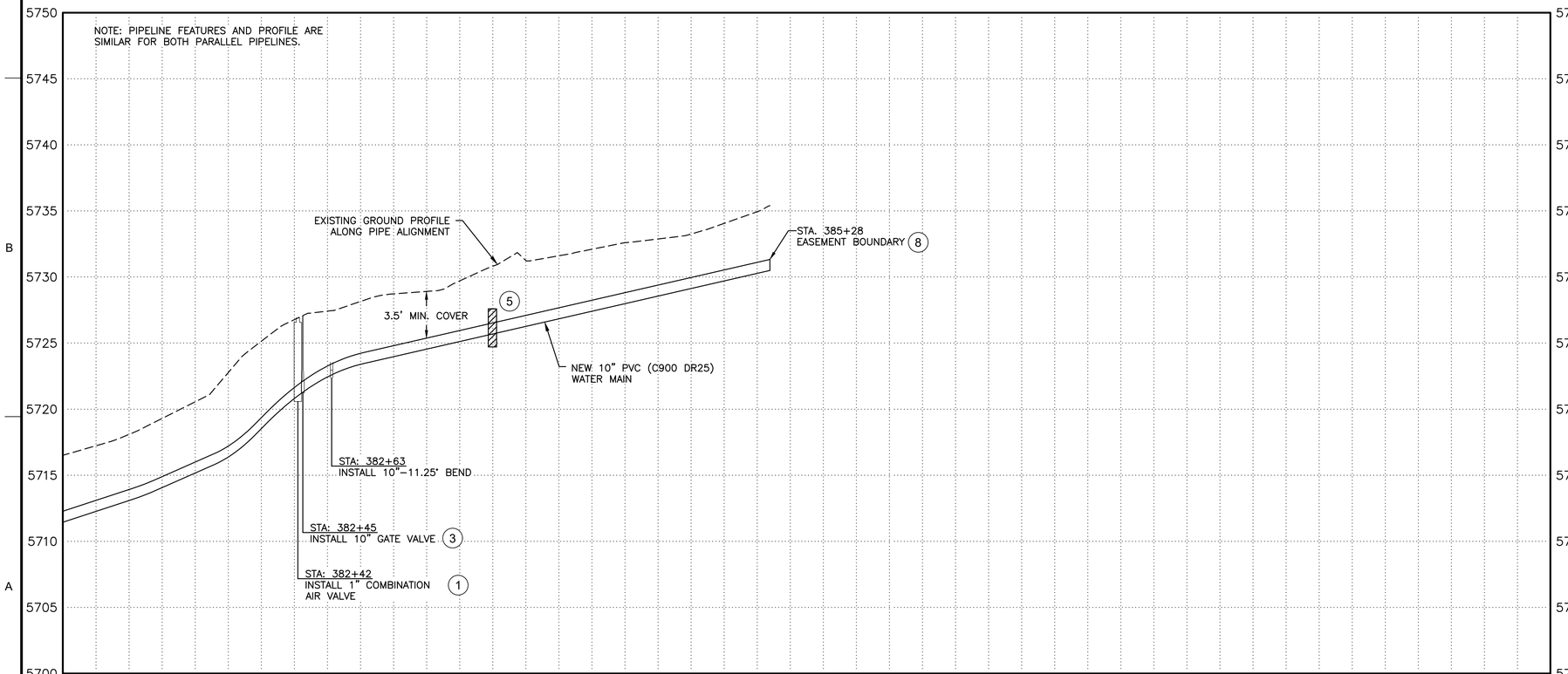


STA 381+00 - STA 385+28

PLAN

SCALE: 1" = 40'



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(5) WATER BAR PER SPEC. SECTION 02200.

(8) SEE NEW TANK SITE PLAN C-110 FOR CONTINUATION OF PIPELINES

0 40 80
SCALE IN FEET

PLAN NORTH

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CIVIL

STA 381+00 TO 385+28
PLAN & PROFILE

DRAWING NUMBER
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SHEET NUMBER
59 OF 76

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 AND DIMENSIONS RELATED TO EXISTING FACILITIES 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 AND DESIGN SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE. THIS CODE SHALL GOVERN EXCEPT WHERE OTHER APPLICABLE CODES OR CONTRACT PROVISIONS ARE MORE RESTRICTIVE.

D 2 CONSTRUCTION AND DESIGN OF STEEL TANK SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND AWWA D100-11: "WELDED CARBON STEEL TANKS FOR WATER STORAGE" (SEISMIC USE GROUP III).

D 3 LIVE LOADS
1. TANK ROOF LIVE LOAD..... 15 PSF

D 4 MAJOR EQUIPMENT LOADS
1. STEEL TANK (EMPTY)..... DL = 29 KIPS
2. STEEL TANK (FULL) ..... DL + F = 723 KIPS

D 5 SNOW LOADS
GROUND SNOW LOAD ..... p_g = 15 PSF
SNOW LOAD IMPORTANCE FACTOR ..... I_S = 1.2
FLAT ROOF SNOW LOAD ..... p_f = 25 PSF
PLUS DRIFT LOADS IN ACCORDANCE WITH ASCE 7-10

D 6 WIND
BASIC WIND SPEED (ULTIMATE) ..... 125 MPH
RISK CATEGORY IV
EXPOSURE CATEGORY C
TOPOGRAPHIC FACTOR ..... K_{ZT}= 1.0

D 7 SEISMIC
MCE ACCELERATION, SHORT PERIOD ..... S_S = 0.336 g
MCE ACCELERATION, 1-SEC PERIOD ..... S_1 = 0.099 g
SITE CLASS ..... D
DESIGN ACCEL, SHORT PERIOD ..... S_{DS} = 0.343 g
DESIGN ACCEL, 1-SEC PERIOD ..... S_{D1} = 0.158 g
RISK CATEGORY IV
SEISMIC IMPORTANCE FACTOR ..... I_e = 1.5 I_p = 1.5,
SEISMIC DESIGN CATEGORY C
GROUND SUPPORTED FLAT BOTTOM STEEL TANK,
MECHANICALLY ANCHORED (ASCE 7-10, TABLE 15.4-2) R = 3 Ω_o = 2

FOUNDATION

F 1 DESIGN BASIS
FOUNDATION DESIGN IS BASED ON RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT, "BODAWAY GAP SUPPLY WELL & PIPELINE, NAVAJO INDIAN RESERVATION, ARIZONA", BY WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC. DATED JULY 3, 2018. CONTRACTOR SHALL FOLLOW THE PROJECT SPECIFICATIONS AND TAKE INTO CONSIDERATION RECOMMENDATIONS CONTAINED IN THE REPORT. NOTIFY THE CONSTRUCTION MANAGER OF CONFLICTS BETWEEN SPECIFICATIONS AND THE REPORT RECOMMENDATIONS FOR RESOLUTION.

F 2 ALLOWABLE BEARING PRESSURE
SHALLOW FOUNDATIONS SHALL BEAR ON AT LEAST 3 FEET OF STRUCTURAL FILL AND HAVE BEEN DESIGNED FOR AN ALLOWABLE BEARING PRESSURE OF 3,000 PSF.

F 3 MINIMUM FOUNDATION PREPARATION
ALL NEW FOUNDATIONS AND BEDDING MATERIAL SHALL BE SUPPORTED ON A MINIMUM OF 3 FEET OF PROPERLY PLACED AND COMPACTED STRUCTURAL FILL (SEE GEOTECHNICAL REPORT).

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.

CONCRETE

C 1 APPLICABLE CODES
CONCRETE CONSTRUCTION SHALL CONFORM TO ACI 301-10 "SPECIFICATIONS FOR STRUCTURAL CONCRETE", AND THE FOLLOWING CODES:
ACI 318-14 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE"

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 ..... f'c = 4,500 PSI
2. REINFORCED STEEL ..... ASTM A615, GRADE 60 DEFORMED BARS UNLESS OTHERWISE NOTED

C 4 CONCRETE COVER
CONCRETE COVER FOR REINFORCING BARS SHALL CONFORM TO ACI 318 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 ACI 318-14. PROVIDE STANDARD HOOK IN BARS WHICH TERMINATE AT WALL OR SLAB EDGES / 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.

CONCRETE (continued)

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

GROUT

GR 1 EQUIPMENT GROUTING
SEE MECHANICAL SPECIFICATIONS AND SPECIFICATION SECTION 03600, GROUT.

GR 2 EPOXY ADHESIVE GROUT AT ANCHORS INTO CONCRETE: HILTI HIT-RE 500v3 EPOXY ADHESIVE ANCHOR SYSTEM BY HILTI INC. OR EQUAL APPROVED BY ENGINEER OF RECORD. INSTALLERS OF HORIZONTAL OR UPWARDLY INCLINED ADHESIVE ANCHORS SHALL BE CERTIFIED IN ACCORDANCE WITH THE ACI / CRSI ADHESIVE ANCHOR INSTALLER CERTIFICATION PROGRAM.

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 DRAWING S-002, SPECIFICATIONS AND GOVERNING CODE):

1. SOIL COMPACTION AT FOUNDATIONS.
2. REINFORCING BAR, CONCRETE PLACEMENT AND TAKING OF CONCRETE TEST SPECIMENS.
3. ANCHOR BOLTS.
4. MECHANICAL AND ELECTRICAL EQUIPMENT, PERIODIC SPECIAL INSPECTION OF STRUCTURAL COMPONENTS FOR SEISMIC RESISTANCE:
   A. ANCHORAGE OF ELECTRICAL EQUIPMENT.
   B. EMERGENCY AND STANDBY POWER SYSTEMS.
   C. INSTALLATION OF COMPONENTS WHERE THE COMPONENT IMPORTANCE FACTOR IS 1.5.
   D. TANKS, HEAT EXCHANGERS AND PRESSURE VESSELS.

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

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.

STRUCTURAL DEFERRED SUBMITTALS (IBC 2015, SECTION 107.3.4.1)

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 OR TANK ANCHORAGE.
2. CONSTRUCTION SHORING.
3. STEEL TANK

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ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED: J. HARPER
DRAWN: T. BOUFFARD
CHECKED: J. HARPER
CHECKED: E. DESOUZA
APPROVED: S. BRENCHLEY

FILENAME S-001.DWG
BC PROJECT NUMBER 150360
CLIENT PROJECT NUMBER C010232

STRUCTURAL

GENERAL STRUCTURAL NOTES

DRAWING NUMBER
S-001

SHEET NUMBER
60 OF 76

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 COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY		X	
	PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS		X	SEE TABLE 2
	VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL	X		SEE TABLE 2
	PROOF ROLLING OF SOILS DISTURBED BY GROUND IMPROVEMENTS		X	
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		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		

QUALITY ASSURANCE NOTES

1. THE QUALITY OF THE WORKMANSHIP AND THE QUALITY OF THE MATERIALS OF CONSTRUCTION ARE GOVERNED BY THE INTERNATIONAL BUILDING CODE, 2015 EDITION (IBC).
2. ALL NEW STRUCTURES AND MODIFICATIONS TO EXISTING STRUCTURES TO BE CONSTRUCTED AS A PART OF THIS PROJECT ARE CLASSIFIED AS RISK CATEGORY IV IN ACCORDANCE WITH THE IBC. THE STRUCTURES ARE CLASSIFIED AS SEISMIC DESIGN CATEGORY C.
3. 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.
4. 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.
5. 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).
6. 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.
7. CONTRACTOR SHALL PROVIDE ACCESS TO THE WORK FOR REQUIRED INSPECTIONS. CONTRACTOR SHALL PROVIDE NOTIFICATION IN ADVANCE OF REQUIRED INSPECTIONS, TESTING AND STRUCTURAL OBSERVATIONS.

TABLE 2

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	
CEMENTITIOUS AND EPOXY GROUT COMPRESSIVE STRENGTH	ASTM C942 (CEMENTITIOUS) ASTM C579 (EPOXY)		TEST 2" CUBES FOR EACH GROUT SHIPMENT TO THE FIELD

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 = 2.00 IN.			CONCRETE COVER = 3.00 IN.		
		TOP	OTHER	MIN C/C SPACING	TOP	OTHER	MIN C/C SPACING
#4	DEVELOPMENT LAP SPLICE	15 20	12 16	4.50 5.00	15 20	12 16	6.50 7.00
#5	DEVELOPMENT LAP SPLICE	19 24	15 19	4.75 5.25	19 24	15 19	6.75 7.25
#6	DEVELOPMENT LAP SPLICE	22 29	17 22	4.75 5.50	22 29	17 22	6.75 7.50

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 318-14, SECTIONS 25.4.2.3 AND 25.5, RESPECTIVELY.
3. LAP SPLICE LENGTHS ARE LAP CLASS B = 1.3 l_d (ACI 318-14, SECTION 25.5.2).
4. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 IN. OF FRESH CONCRETE CAST BELOW THE BARS. NOTE THAT IN ADDITION TO TOP BARS IN BEAMS AND SLABS, ALL HORIZONTAL BARS IN WALLS ARE CONSIDERED TO BE TOP BARS.

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GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED: J. HARPER
DRAWN: T. BOUFFARD
CHECKED: J. HARPER
CHECKED: E. DESOUZA
APPROVED: S. BRENCHLEY

FILENAME S-002.DWG
BC PROJECT NUMBER 150360
CLIENT PROJECT NUMBER C010232

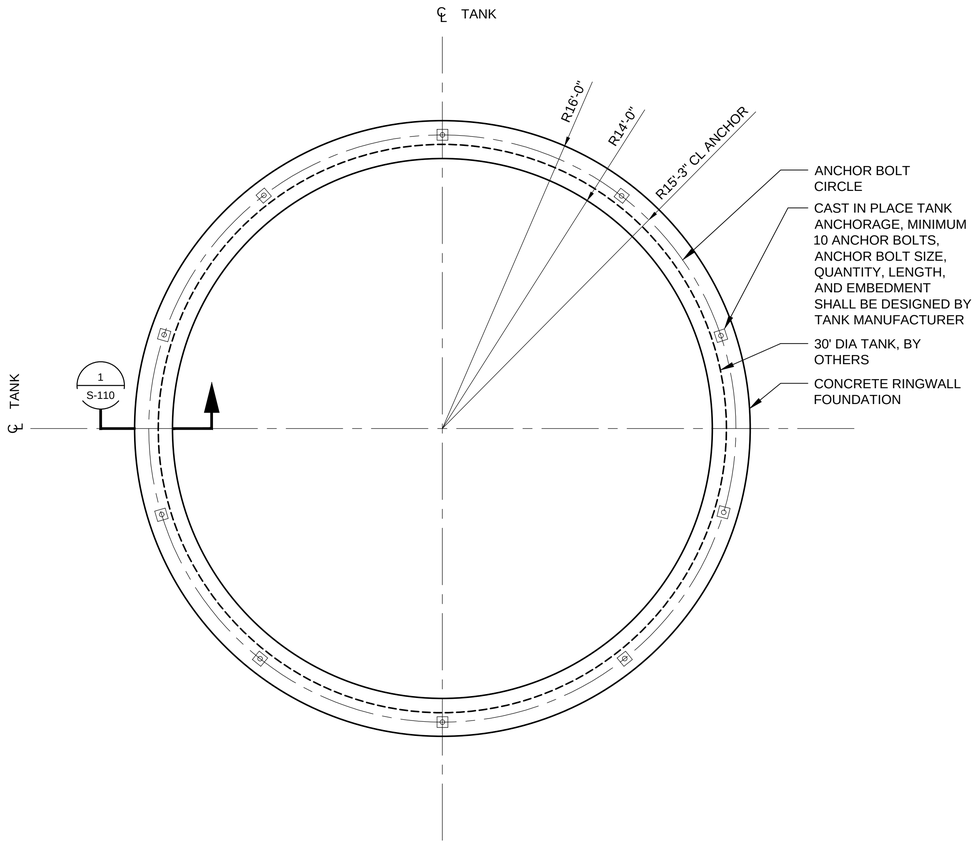
STRUCTURAL

SPECIAL INSPECTIONS

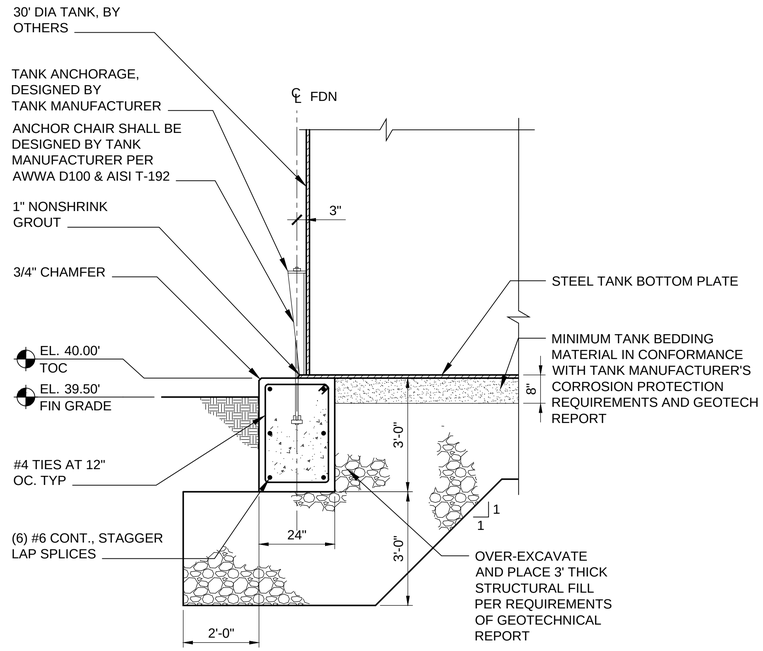
DRAWING NUMBER

S-002

SHEET NUMBER 61 OF 76



TANK FOUNDATION
PLAN
SCALE: 1/4" = 1'-0"



SECTION 1/S-110
SCALE: 1/2"=1'-0"

GENERAL NOTES

1. SEE C-100 FOR STRUCTURAL COORDINATE LOCATIONS.
2. SEE STANDARD DRAWING W20 FOR TYPICAL TANK DETAILS. NOTE THAT THESE ARE CLIENT DETAILS PROVIDED FOR INFORMATION AND EASE OF COORDINATION WITH TANK MANUFACTURER. FINAL TANK DETAILS AND LAYOUT SHALL BE REVIEWED / APPROVED PRIOR TO TANK FABRICATION.

KEY NOTES

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APPROVED:	S. BRENCHLEY

FILENAME
S-110.DWG
BC PROJECT NUMBER
150360
CLIENT PROJECT NUMBER
C010232

STRUCTURAL

STORAGE TANK NO. 2 FOUNDATION PLAN & SECTION

DRAWING NUMBER
S-110

SHEET NUMBER
62 OF 76

Path: P:\PROJECTS\NAVAJO NATION\150360_WESTERN NAVAJO PIPELINE DESIGN PHASE 1_CAD\01_BODAWAY GAP\2-SHEETS\S-STRUCTURAL FILENAME: S-110.DWG PLOT DATE: 6/10/2020 10:17 AM CAD USER: TYLER PRIDEMORE

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 — GROUNDING SYSTEM CONDUCTOR
- L — LIGHTNING SYSTEM CONDUCTOR
- G — EQUIPMENT GROUND PLATE
- OHE — OHE — OVERHEAD POWER LINE

METERING (ANSI/IEEE FUNCTIONS AS SPECIFIED):

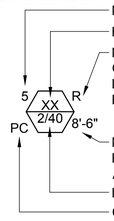
- ID# — POWER MONITOR (PM), POWER QUALITY MONITOR (HARMONIC ANALYSIS) (PQM), MOTOR MONITOR AND PROTECTION RELAY (MPR), FEEDER PROTECTION RELAY (FPR)

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:



- NUMBER OF FIXTURES (OPTIONAL)
- FIXTURE TYPE PER LUMINAIRE SCHEDULE
- MOUNTING TYPE: G = GROUND, L = POLE, P = PENDANT, R = RECESSED, S = SURFACE, W = WALL
- MOUNTING HEIGHT: FLOOR TO CENTER OF FIXTURE. AHAP = AS HIGH AS POSSIBLE
- LAMP NUMBER AND WATTAGE
- CONTROL: PHOTOCELL, SWITCH, CONTACTOR
- 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:

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

Brown AND Caldwell

SALT LAKE CITY, UTAH

Professional Engineer CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 10/20/21 ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	K. CHANDLER
DRAWN:	C. RESOP
CHECKED:	H. PACE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME E-001.DWG

BC PROJECT NUMBER 150360

CLIENT PROJECT NUMBER C010232

ELECTRICAL

SYMBOLS, ABBREVIATIONS, AND NOTES

DRAWING NUMBER

E-001

SHEET NUMBER 63 OF 76

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

U, L, 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

52A — STAB OR PULL-APART CONNECTION.

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, 3 — POTENTIAL TRANSFORMER WITH PRIMARY AND SECONDARY VOLTAGES AND WINDINGS QUANTITIES

250/5, 3 — 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

Licensed Professional Engineer — CERTIFICATE NO. 36697 — KENNETH W. CHANDLER — Date Signed 10/01/21 — ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS		
REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	K. CHANDLER
DRAWN:	C. RESOP
CHECKED:	H. PACE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
E-002.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

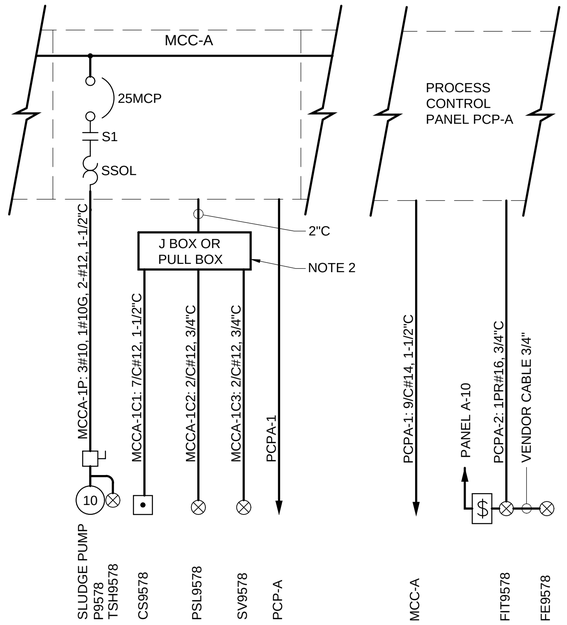
ELECTRICAL

CONTROL AND ONE-LINE DIAGRAM LEGENDS AND SYMBOLS

DRAWING NUMBER

E-002

SHEET NUMBER
64 OF 76

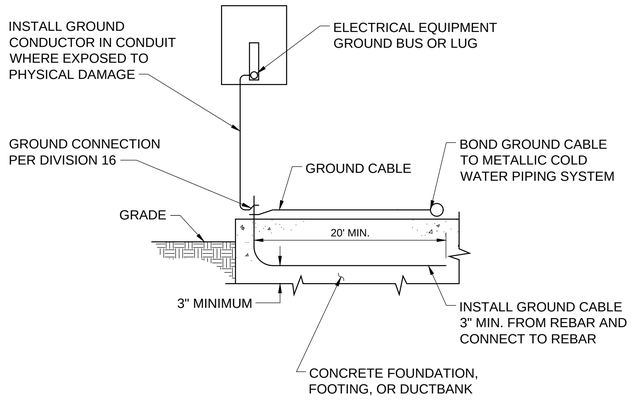


MOTOR CONTROL CENTER - A PROCESS CONTROL PANEL - A

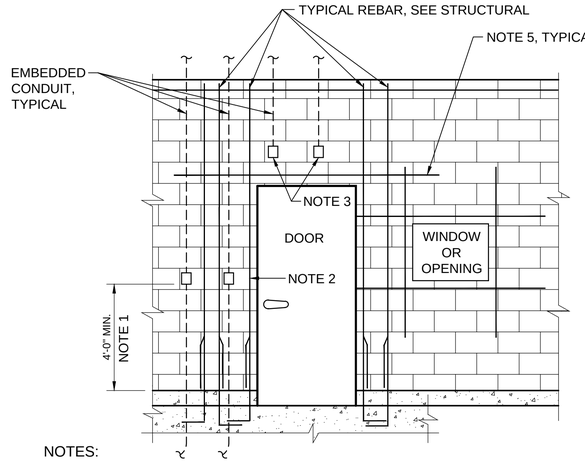
NOTES:

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



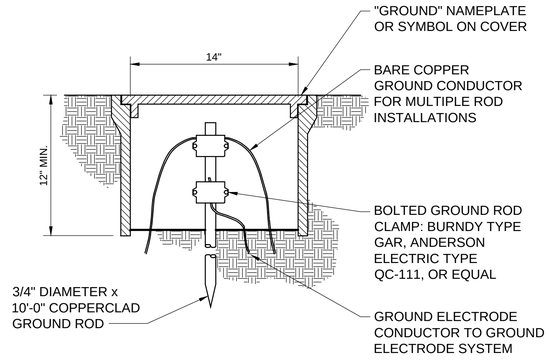
GROUND ELECTRODE
CONCRETE ENCASED
DETAIL E3001
NO SCALE



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.

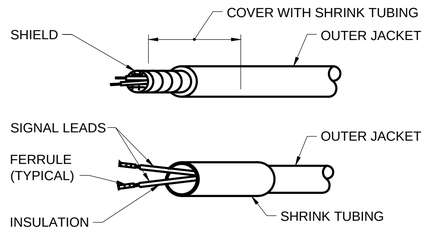
EMBEDDED RACEWAYS
CMU WALLS
DETAIL E2211
NO SCALE



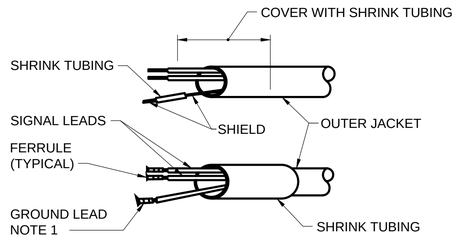
NOTES:

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



INSTRUMENT TERMINATION



PANEL TERMINATION

NOTE:

1. GROUND SHIELD AT PANEL NOT AT INSTRUMENT.

SHIELDED CABLE TERMINATION
DETAIL E / TYP.
NO SCALE

Brown AND Caldwell

SALT LAKE CITY, UTAH

Certified Professional Engineer
CERTIFICATE NO.
36697
KENNETH W. CHANDLER
Date Signed 10/31/13
ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS		
REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	K. CHANDLER
DRAWN:	C. RESOP
CHECKED:	H. PACE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
E-003.DWG

BC PROJECT NUMBER
150360

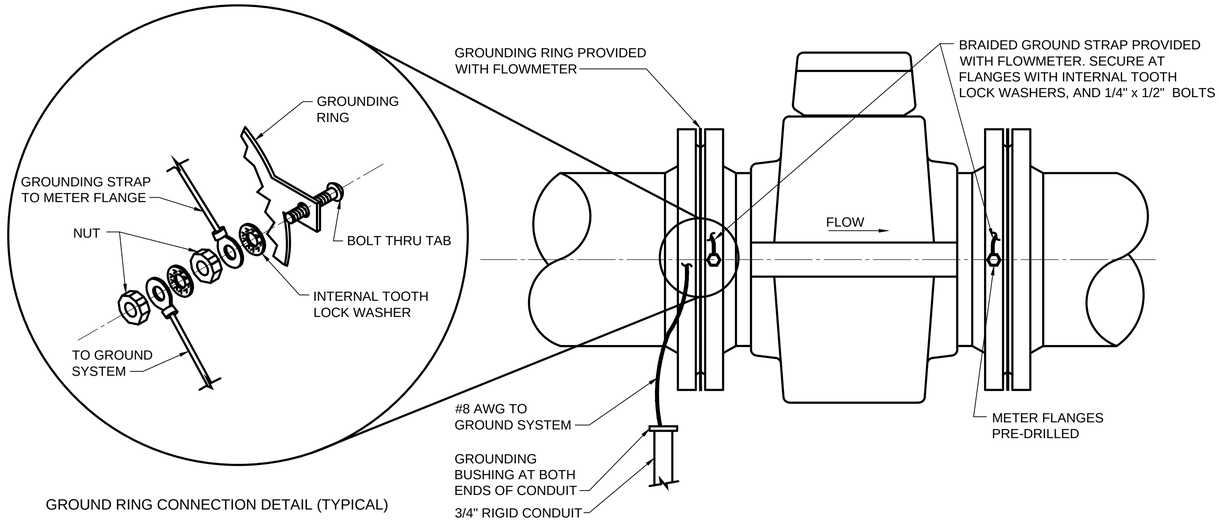
CLIENT PROJECT NUMBER
C010232

ELECTRICAL

STANDARD DETAILS 1

DRAWING NUMBER
E-003

SHEET NUMBER
69 OF 76

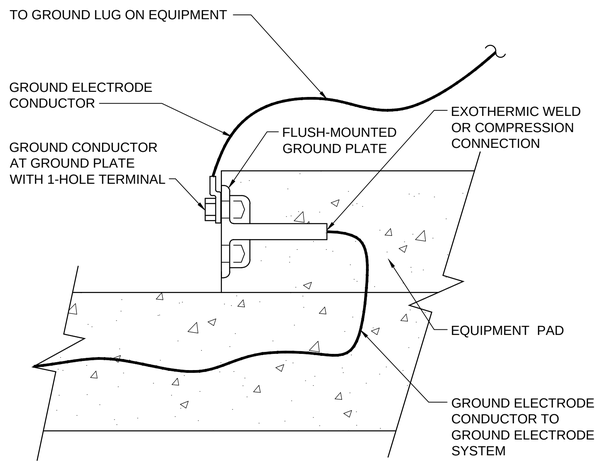


GROUND RING CONNECTION DETAIL (TYPICAL)

FLOW TRANSMITTER
MAGNETIC - GROUNDING

DETAIL I4001

SCALE: NONE

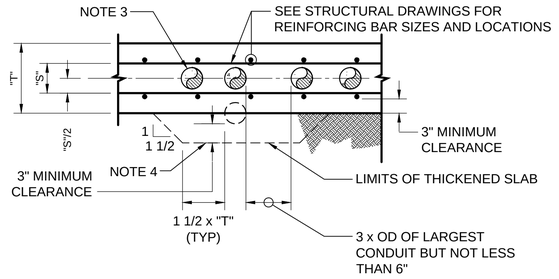


NOTE:
1. REQUIRED AT ELECTRICAL EQUIPMENT

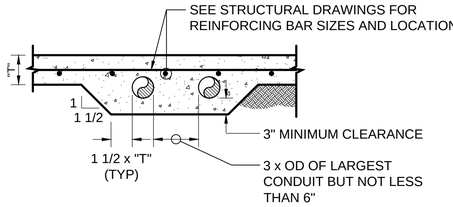
EQUIPMENT GROUNDING
GROUND PLATE IN SLAB

DETAIL E3101

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

Brown AND Caldwell

SALT LAKE CITY, UTAH

Arizona Professional Engineer Certification
CERTIFICATE NO.
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KENNETH W. CHANDLER
Date Signed 10/1/21
ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	K. CHANDLER
DRAWN:	C. RESOP
CHECKED:	H. PACE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
E-004.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

ELECTRICAL

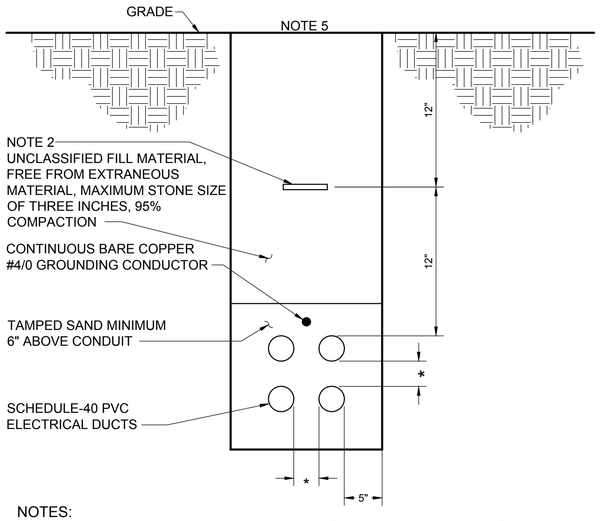
STANDARD DETAILS 2

DRAWING NUMBER

E-004

SHEET NUMBER
70 OF 76

Path: C:\BCPWD\D1020276 FILENAME: E-004.DWG PLOT DATE: 9/30/2021 10:04 AM CAD USER: CHRISTOPHER RESOP

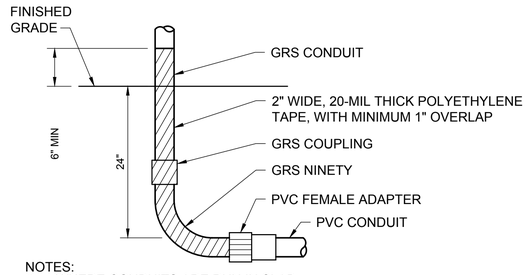


NOTES:
1. NUMBER AND SIZE OF ELECTRICAL DIRECT BURIED RACEWAYS AS INDICATED ON DRAWINGS OR SCHEDULES.
2. OSHA APPROVED 6" WIDE RED WARNING TAPE (IDEAL DU-601 OR EQUAL).
3. DIMENSIONS ARE MINIMUM.
4. BOND GROUNDING CONDUCTOR TO BUILDING GROUNDING ELECTRODES, POWER SOURCE AND LOAD ENCLOSURES.
5. REPLACE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

UNDERGROUND RACEWAYS DIRECT BURIED

DETAIL A TYP

SCALE: NONE

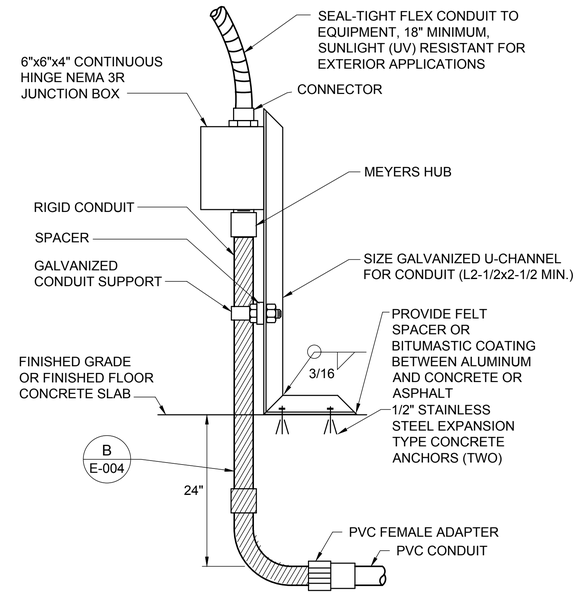


NOTES:
1. WHERE CONDUITS ARE RUN IN SLAB, THE 24" DIMENSION DOES NOT APPLY.

GRS STUB UP

DETAIL B TYP

SCALE: NONE

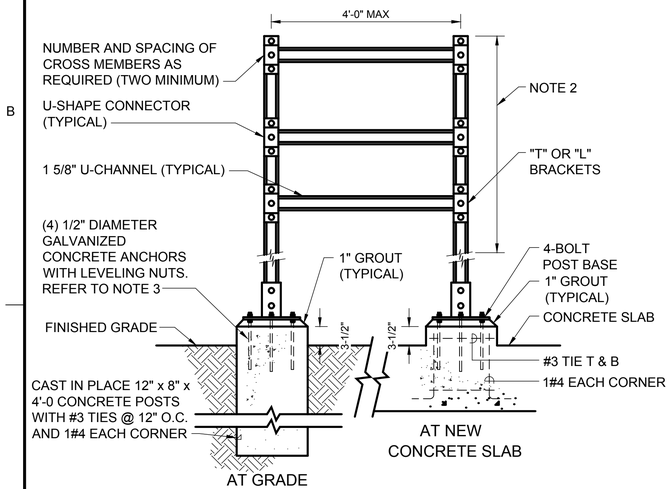


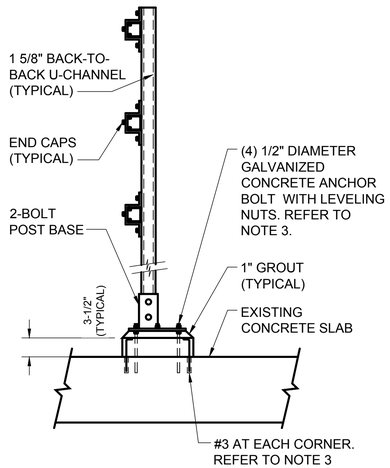
NOTES:
1. WHERE CONDUITS ARE RUN IN SLAB, THE 24" DIMENSION DOES NOT APPLY.

RIGID CONDUIT STUBUP & TRANSITION JB SUPPORT

DETAIL C TYP

SCALE: NONE





AT EXISTING CONCRETE SLAB

NOTES:
1. EQUIPMENT RACK SIZING:
   A. ONE ITEM GREATER THAN 150 SQUARE INCHES.
   B. TWO EQUIPMENT ITEMS GREATER THAN 130 SQUARE INCHES.
   C. THREE OR MORE EQUIPMENT ITEMS.
   D. PROVIDE GALVANIZED CHANNEL END-CAPS, AND FITTINGS
   E. PROVIDE 1/4" MINIMUM ALUMINUM PLATE FOR SMALL ITEMS
2. MOUNT INDICATORS OR EQUIPMENT OPERATING HANDLES FOUR FEET ABOVE FLOOR OR PLATFORM.
3. REFER TO STRUCTURAL DRAWINGS AND SPECIFICATION FOR ANCHORAGE MATERIAL AND METHOD REQUIREMENTS.
4. MATERIAL AND HARDWARE PER SPECIFICATION DIVISION 16.

EQUIPMENT RACK

DETAIL D TYP

NONE

Brown AND Caldwell

SALT LAKE CITY, UTAH

Arizona Professional Engineer CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 10/31/13 ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	K. CHANDLER
DRAWN:	C. RESOP
CHECKED:	H. PACE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME E-005.DWG

BC PROJECT NUMBER 150360

CLIENT PROJECT NUMBER C010232

ELECTRICAL

STANDARD DETAILS 3

DRAWING NUMBER

E-005

SHEET NUMBER 67 OF 76

Path: C:\BCPW\D1020276 FILENAME: E-005.DWG PLOT DATE: 9/29/2021 5:07 PM CAD USER: CHRISTOPHER.RESOP

WELL NO. 3
PLAN

0 10 20
SCALE IN FEET

PLAN NORTH

GENERAL NOTES

1. PROVIDE ELECTRICAL, INSTRUMENTATION, AND TELEMETRY EQUIPMENT.
2. POWER UTILITY: NAVAJO TRIBAL UTILITY AUTHORITY (NTUA), (928) 729-5721.

KEY NOTES

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

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

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

Arizona Professional Engineer
CERTIFICATE NO.
36697
KENNETH W. CHANDLER
Date Signed 10/20/21
ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP
WELL, TANK, AND
PIPELINE

REVISIONS		
REV	DATE	DESCRIPTION

LINE IS 2 INCHES
AT FULL SIZE

DESIGNED:	K. CHANDLER
DRAWN:	C. RESOP
CHECKED:	H. PACE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
E-100.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

ELECTRICAL

BODAWAY-GAP
WELL NO. 3
ELECTRICAL SITE
PLAN

DRAWING NUMBER
E-100

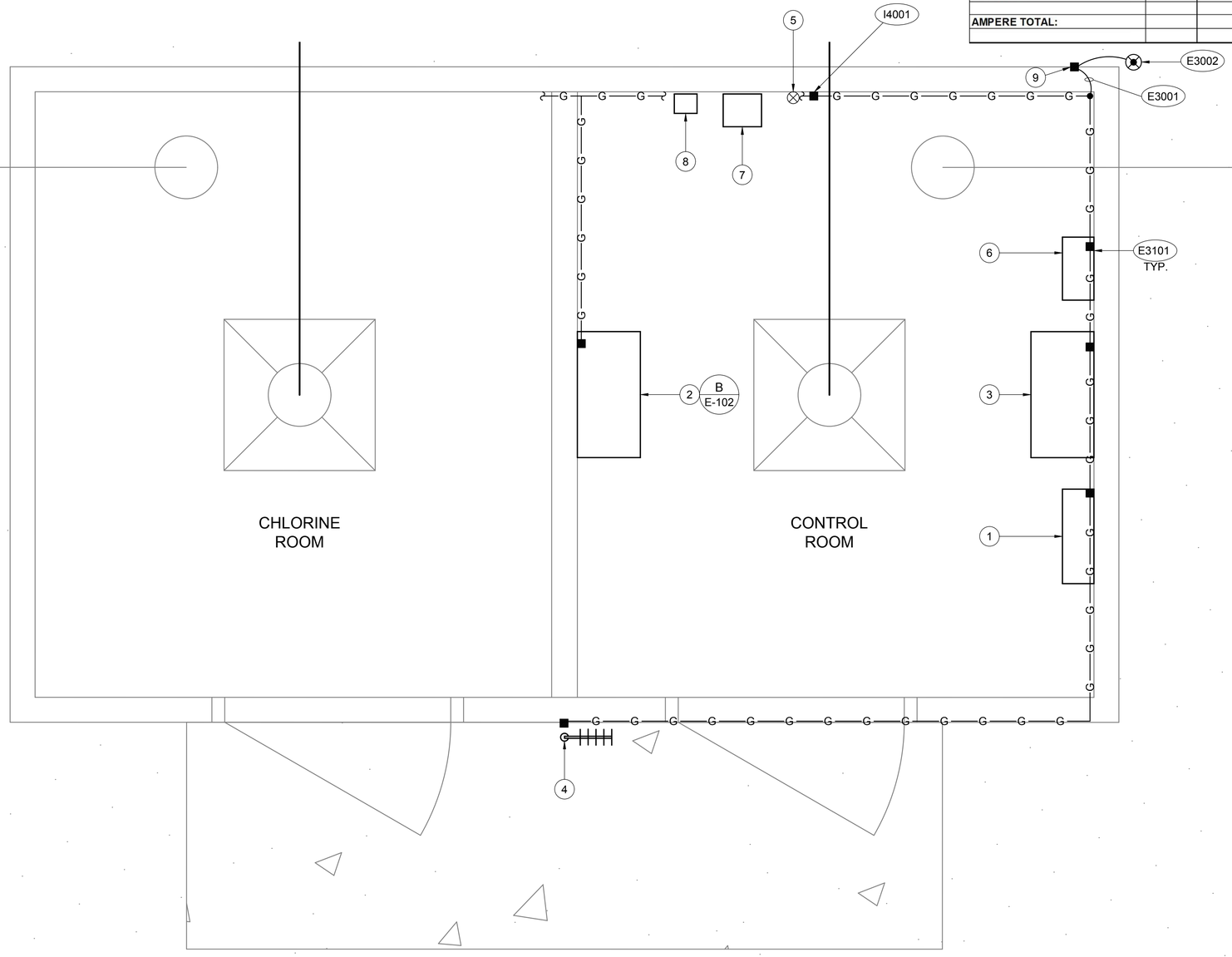
SHEET NUMBER
68 OF 76

Path: C:\BCPWD\10202276 FILENAME: E-100.DWG PLOT DATE: 9/29/2021 5:07 PM CAD USER: CHRISTOPHER RESOP

BODAWAY-GAP WELL NO. 3

LOAD SUMMARY AT 480 VAC

LOAD DESCRIPTION	KVA	HP	480 VAC FLA
WELL PUMP RVSS CONTROLLER		40	52
TRANSFORMER FOR PANEL-A	15		31.3
SUBTOTAL:	15	40	83.3
PLUS 25%:			13
AMPERE TOTAL:			96.3



PUMP HOUSE
PLAN
SCALE: 1" = 10'-0"

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

PLAN NORTH

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 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 TANK 2 SITE. PROVIDE ANTENNA CABLE IN CONDUIT. PROVIDE CGB FITTING AND EXPOSE LOOP OF CABLE FOR FINAL CONNECTION TO ANTENNA. MAKE PENETRATION TO BUILDING WATER TIGHT.
5. WELL FLOW METER.
6. LOAD CENTER TRANSFORMER DISCONNECT.
7. FLOW INDICATOR
8. FLOW AMI UNIT
9. GROUND SES

Brown AND Caldwell

SALT LAKE CITY, UTAH

Registered Professional Engineer — CERTIFICATE NO. — Registered
36697
KENNETH W. CHANDLER
Date Signed 10/01/21
ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	K. CHANDLER
DRAWN:	C. RESOP
CHECKED:	H. PACE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
E-101.DWG
BC PROJECT NUMBER
150360
CLIENT PROJECT NUMBER
C010232

ELECTRICAL

BODAWAY-GAP WELL NO. 3 PUMP HOUSE PLAN

DRAWING NUMBER
E-101

SHEET NUMBER
69 OF 76

SINGLE PHASE PANEL: LOAD CENTER (LC)

VOLTAGE, PHASE, & WIRE:	120 / 240 VAC, 1 PHASE, 3 WIRE	LOCATION:	BODAWAY GAP WELL NO. 3 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	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	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	20	2		1200	1200		2	20	8	2-12, 12G	1/2	CHLORINE ROOM HEATER
			9	-	-	1200			1200	-	-	10			
RECEPTACLE	2-12, 12G	1/2	11	15*	1		180	10		1	15	12	2-12, 12G	1/2	FLOW INDICATOR
SPACE			13	-	-				10	1	15	14	2-12, 12G	1/2	FLOW AMI UNIT
SPACE			15	-	-					-	-	16			SPACE
	COLUMN	TOTALS:				1580	1580	1260	1860						

* - GFCI CIRCUIT BREAKER

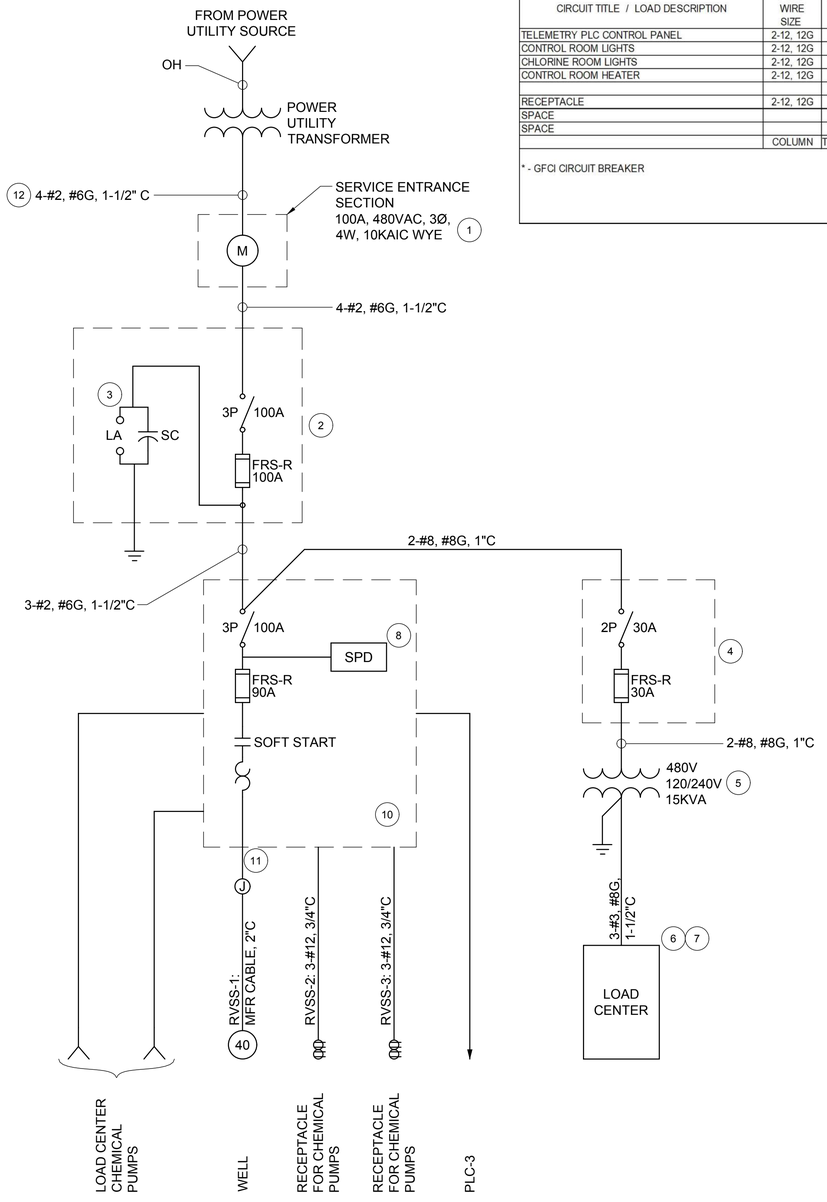
PHASE-A LOAD (VA): 3440
PHASE-B LOAD (VA): 2840

TOTAL LOAD (V. 6280 I (amp) 26.2

PANEL SCHEDULE

DETAIL C / -

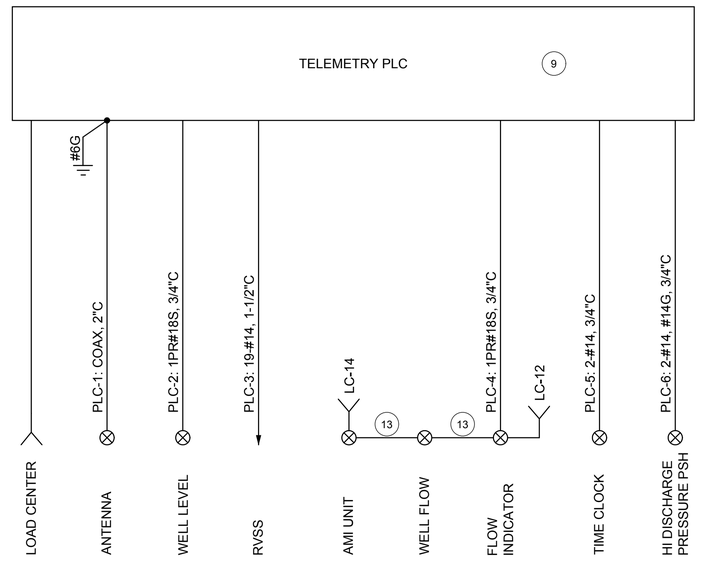
SCALE: NONE



POWER ONE-LINE DIAGRAM

DETAIL A / E-101

SCALE: NONE



CONTROL ONE-LINE DIAGRAM

DETAIL B / E-101

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 AND 17900.
6. LOAD SUMMARY: DRAWING E-101.

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-#2, #6G, 1-1/2"C
12. POWER UTILITY REQUIREMENTS FOR CONDUIT AND BURIAL PREVAIL IF DIFFERENT THAN SPECIFIED
13. 1PR#18S, 1/2"C

Brown AND Caldwell

SALT LAKE CITY, UTAH

Professional Engineer CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 10/31/21 ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	K. CHANDLER
DRAWN:	C. RESOP
CHECKED:	H. PACE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME E-102.DWG
BC PROJECT NUMBER 150360
CLIENT PROJECT NUMBER C010232

ELECTRICAL

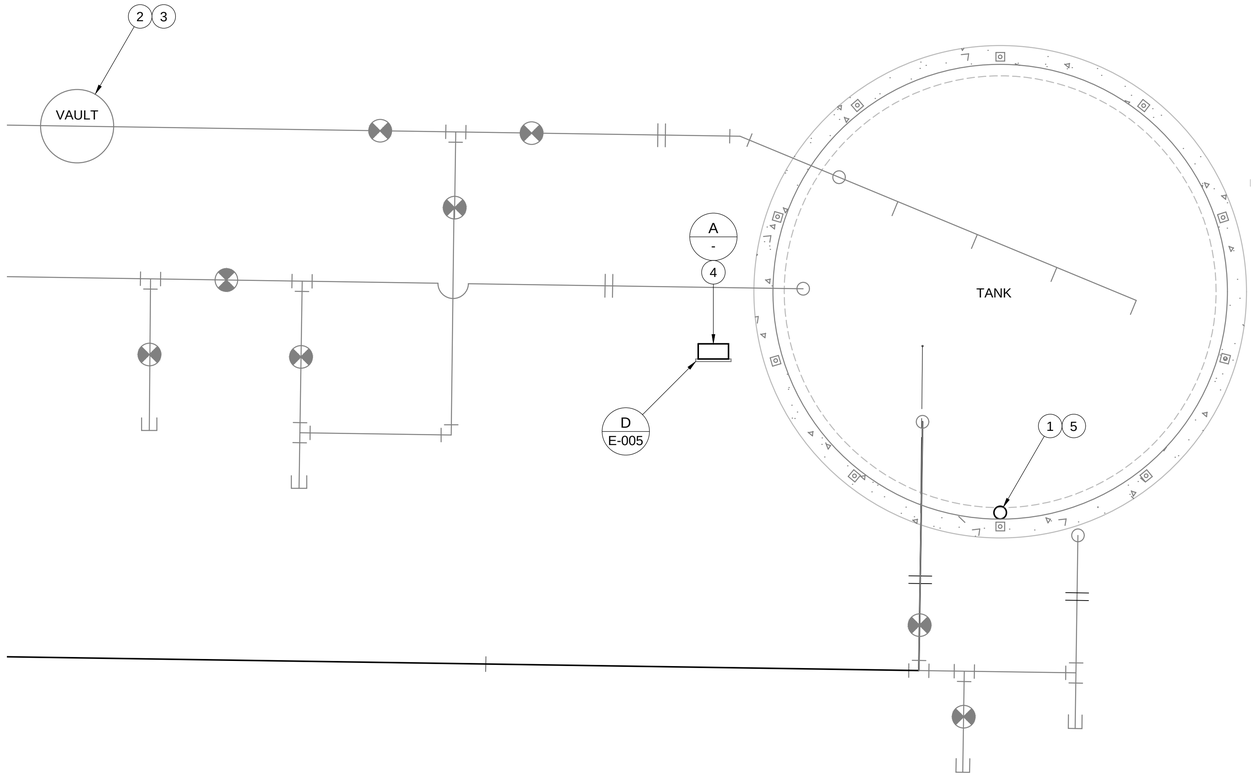
BODAWAY-GAP WELL NO. 3 ONE-LINE DIAGRAM

DRAWING NUMBER

E-102

SHEET NUMBER 70 OF 76

Path: C:\BCPWD\1020276 FILENAME: E-102.DWG PLOT DATE: 9/29/2021 5:08 PM CAD USER: CHRISTOPHER RESOP



TANK NO. 2

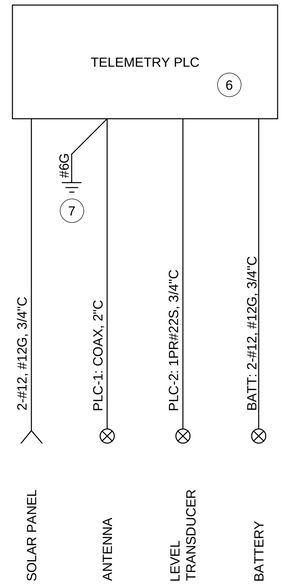
PLAN

SCALE: 1" = 5'-0"

0 5 10

SCALE: 1" = 5'-0"

PLAN NORTH



CONTROL ONE-LINE DIAGRAM

DETAIL A / -

SCALE: NONE

GENERAL NOTES

1. PROVIDE ELECTRICAL, INSTRUMENTATION, AND TELEMETRY EQUIPMENT.
2. GENERAL REQUIREMENTS: SPECIFICATION 16000.
3. TESTING: SPECIFICATION 16030.
4. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014 AND 17900.
5. CIVIL SITE PLAN: DRAWING C-110.

KEY NOTES

(1) SOLAR PANEL

(2) SOLAR POWER BATTERY IN VAULT.

(3) TANK LEVEL (PRESSURE) TRANSDUCER IN VAULT.

(4) PROVIDE TELEMETRY PLC

(5) PROVIDE OMNI-DIRECTIONAL TELEMETRY ANTENNA ON 10' 2" PIPE, ATTACHED TO OUTSIDE OF MANWAY. 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. MAKE PENETRATION TO PLC CONTROL PANEL WATER TIGHT.

(6) PROVIDE PER NTUA - TECHNICAL PROVISIONS 4.0 FOR MOTOR CONTROL CENTER AND TANK CONTROL PANEL - DC TANK PANEL.

(7) PROVIDE 10 FOOT COPPER GROUND ROD DRIVEN IN EARTH. PROVIDE #6 BOND TO EXISTING GROUND SYSTEM.

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

Arizona Professional Engineer CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 10/31/21 ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS		
REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	K. CHANDLER
DRAWN:	C. RESOP
CHECKED:	H. PACE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
E-110.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

ELECTRICAL

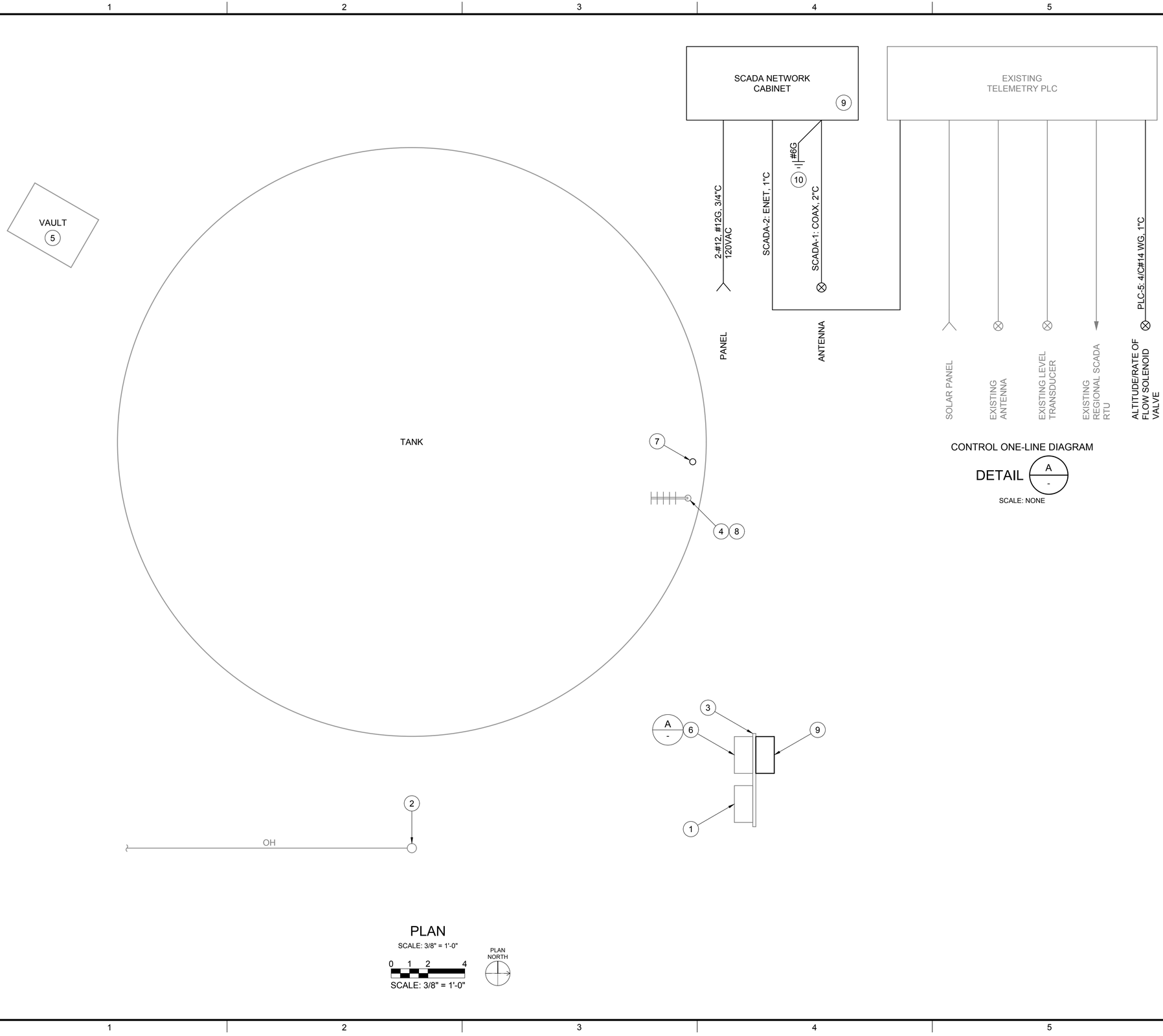
BODAWAY-GAP STORAGE TANK NO. 2 SITE PLAN

DRAWING NUMBER

E-110

SHEET NUMBER
71 OF 76

Path: C:\BCPWD\D1020276 FILENAME: E-110.DWG PLOT DATE: 9/30/2021 10:10 AM CAD USER: CHRISTOPHER RESOP



CONTROL ONE-LINE DIAGRAM

DETAIL A -

SCALE: NONE

PLAN

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

0 1 2 4

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

PLAN NORTH

GENERAL NOTES

1. PROVIDE VALVE CONTROL, SCADA NETWORK EQUIPMENT, AND ASSOCIATED ELECTRICAL
2. GENERAL REQUIREMENTS: SPECIFICATION 16000.
3. TESTING: SPECIFICATION 16030.
4. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014 AND 17900.

KEY NOTES

(1) RETAIN EXISTING REGIONAL SCADA RTU, REMOVE BY NTUA.

(2) EXISTING POWER UTILITY METER ON POLE AND 120VAC LOAD CENTER.

(3) EXISTING STRUT EQUIPMENT STAND.

(4) EXISTING REGIONAL SCADA ANTENNA.

(5) ALTITUDE VALVE LOCATED IN VAULT.

(6) EXISTING TELEMETRY PLC

(7) EXISTING BODAWAY-GAP WELL 1 AND 2 TELEMETRY OMNI-DIRECTIONAL ANTENNA

(8) PROVIDE DIRECTIONAL SCADA ANTENNA ON 10' 2" PIPE, ATTACHED TO PLC STAND. 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. MAKE PENETRATION TO PLC STAND WATER TIGHT. ORIENT ANTENNA TOWARD PRESTON MESA.

(9) SCADA NETWORK CABINET, PROVIDE PER SPECIFICATION 17710.

(10) PROVIDE 10 FOOT COPPER GROUND ROD DRIVEN IN EARTH. PROVIDE #6 BOND TO EXISTING GROUND SYSTEM.

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

Professional Engineer CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 10/20/21 ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	K. CHANDLER
DRAWN:	C. RESOP
CHECKED:	H. PACE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME E-120.DWG

BC PROJECT NUMBER 150360

CLIENT PROJECT NUMBER C010232

ELECTRICAL

EXISTING BODAWAY-GAP STORAGE TANK SITE PLAN

DRAWING NUMBER

E-120

SHEET NUMBER 72 OF 76

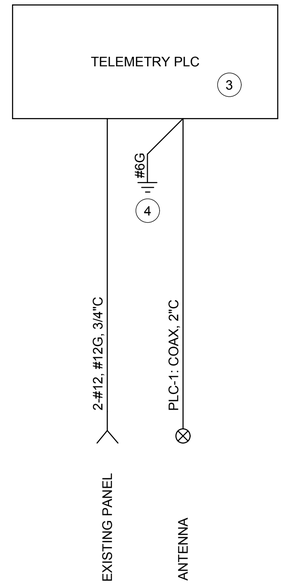
Path: C:\BCPW\D1020276 FILENAME: E-120.DWG PLOT DATE: 9/29/2021 5:09 PM CAD USER: CHRISTOPHER RESOP

PLAN

0 10 20

SCALE IN FEET

PLAN NORTH



CONTROL ONE-LINE DIAGRAM

DETAIL A -

SCALE: NONE

GENERAL NOTES

1. PROVIDE ELECTRICAL, INSTRUMENTATION, AND TELEMETRY EQUIPMENT.
2. GENERAL REQUIREMENTS: SPECIFICATION 16000.
3. TESTING: SPECIFICATION 16030.
4. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014 AND 17900.
5. PROVIDE 480 VOLT 3-PHASE POWER UTILITY, ELECTRICAL AND TELEMETRY EQUIPMENT. COORDINATE SITE ACCESS.

KEY NOTES

(1) PROVIDE TELEMETRY PLC

(2) PROVIDE OMNI-DIRECTIONAL TELEMETRY ANTENNA ON 10' 2" PIPE, ATTACHED TO PLC STAND. 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. MAKE PENETRATION TO PLC CONTROL PANEL WATER TIGHT.

(3) PROVIDE PER NTUA - TECHNICAL PROVISIONS 4.0 FOR MOTOR CONTROL CENTER AND TANK CONTROL PANEL - AC TANK PANEL.

(4) PROVIDE 10 FOOT COPPER GROUND ROD DRIVEN IN EARTH. PROVIDE #6 BOND TO EXISTING GROUND SYSTEM.

(5) EXISTING CONTROL BUILDING, POWER PANEL INSIDE.

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

Registered Professional Engineer (Certified) 36697 KENNETH W. CHANDLER Date Signed 10/01/21 ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	K. CHANDLER
DRAWN:	C. RESOP
CHECKED:	H. PACE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
E-130.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

ELECTRICAL

BODAWAY-GAP ELECTRICAL SUBSTATION SITE PLAN

DRAWING NUMBER

E-130

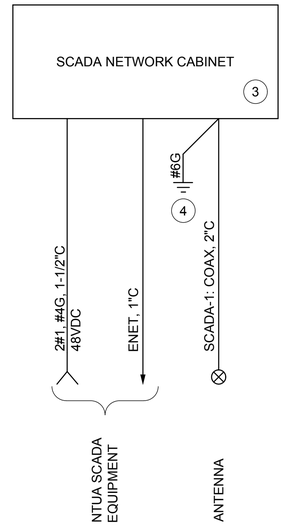
SHEET NUMBER
73 OF 76

PLAN

0 5 10 20

SCALE: 1" = 10'-0"

PLAN NORTH



CONTROL ONE-LINE DIAGRAM

DETAIL A -

SCALE: NONE

GENERAL NOTES

1. PROVIDE SCADA NETWORK EQUIPMENT, AND ASSOCIATED ELECTRICAL.
2. GENERAL REQUIREMENTS: SPECIFICATION 16000.
3. TESTING: SPECIFICATION 16030.
4. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014 AND 17900.

KEY NOTES

(1) PROVIDE, SCADA NETWORK CABINET, FIELD LOCATE WITH NTUA.

(2) PROVIDE DIRECTIONAL SCADA ANTENNA ON 10' 2" PIPE, ATTACHED TO BUILDING. 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. MAKE PENETRATION TO BUILDING WATER TIGHT. ORIENT ANTENNA TOWARD EXISTING BODAWAY-GAP TANK.

(3) PROVIDE PER SPECIFICATION 17110

(4) PROVIDE 10 FOOT COPPER GROUND ROD DRIVEN IN EARTH. PROVIDE #6 BOND TO EXISTING GROUND SYSTEM.

(5) EXISTING CONTROL BUILDING, POWER PANEL INSIDE.

(6) EXISTING NETWORK EQUIPMENT BY NTUA.

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

Registered Professional Engineer (Electrical) CERTIFICATE NO. 36697 KENNETH W. CHANDLER Date Signed 10/20/21 ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS

REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	K. CHANDLER
DRAWN:	C. RESOP
CHECKED:	H. PACE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME
E-140.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

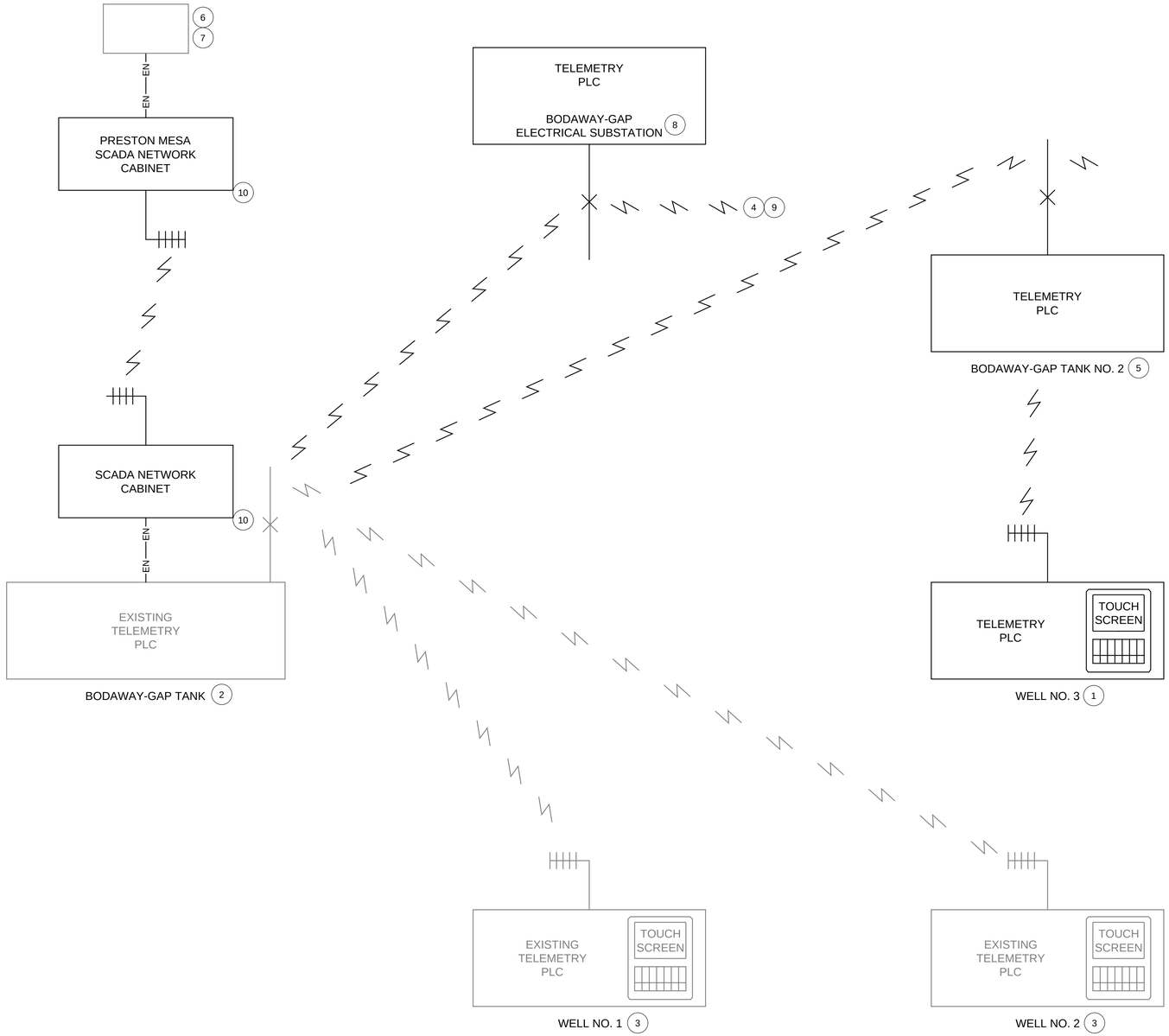
ELECTRICAL

PRESTON MESA SITE PLAN

DRAWING NUMBER

E-140

SHEET NUMBER
74 OF 76



GENERAL NOTES

1. THE EXISTING BODAWAY-GAP TANK IS FILLED BY EXISTING WELLS NO. 1 AND NO. 2. THIS TANK THEN PROVIDES WATER FOR THE CEDAR RIDGE WATER SYSTEM (NOT SHOWN).
2. PROVIDE BODAWAY-GAP TANK NO. 2, AND ASSOCIATED WELL NO. 3. PROVIDE AN ALTITUDE VALVE NEAR THE EXISTING BODAWAY-GAP TANK, SO THAT TANK NO. 2 CAN ALSO PROVIDE WATER TO THE EXISTING BODAWAY-GAP TANK.
3. SCHEDULE AND COORDINATE WORK TO MINIMIZE WATER SYSTEM CONTROL OUTAGES. REFER TO SPECIFICATION 01014 AND 17900.

KEY NOTES

1. WELL AND TELEMETRY. WELL HAS TOUCH SCREEN ENTERED TANK LEVEL SETPOINTS FOR WELL PUMP START AND STOP.
2. REVISE EXISTING BODAWAY-GAP TANK TELEMETRY PROGRAM TO STORE AND FORWARD SIGNALS FROM TANK NO. 2 AND WELL NO. 3, CEDAR RIDGE SYSTEM, AND CAMERON PUMP STATION NO. 2 AND NO. 3 TO SCADA VIA ELECTRICAL SUBSTATION.
3. EXISTING WELL
4. PLC COMMUNICATES WITH CAMERON PUMP STATION NO. 2 AND NO. 3. SEE CAMERON DRAWING I-001.
5. TANK AND TELEMETRY OF LEVEL TO WELL NO. 3 AND EXISTING TANK
6. SCADA CONNECTION TO MICROWAVE EQUIPMENT BY OTHERS
7. EXISTING SCADA MICROWAVE EQUIPMENT
8. PLC STORE AND FORWARDS CEDAR RIDGE DATA TO BODAWAY-GAP TANK, FOR FORWARDING TO SCADA AT PRESTON MESA SYSTEM AND CAMERON PUMP STATION NO. 2 AND NO. 3
9. PLC COMMUNICATES WITH CEDAR RIDGE PUMP STATION NO. 1, SEE CEDAR RIDGE DRAWING I-001
10. SCADA NETWORK CABINET, SPECIFICATION 17110-2.10

Brown AND Caldwell

SALT LAKE CITY, UTAH

Professional Engineer CERTIFICATE NO. 35940 KENNETH W. CHANDLER Date Signed 10/1/21 ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS		
REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:	K. CHANDLER
DRAWN:	C. RESOP
CHECKED:	H. PACE
CHECKED:	E. DESOUZA
APPROVED:	S. BRENCHLEY

FILENAME I-001.DWG

BC PROJECT NUMBER 150360

CLIENT PROJECT NUMBER C010232

INSTRUMENTATION

BODAWAY-GAP COMMUNICATIONS BLOCK DIAGRAM

DRAWING NUMBER

I-001

SHEET NUMBER 75 OF 76

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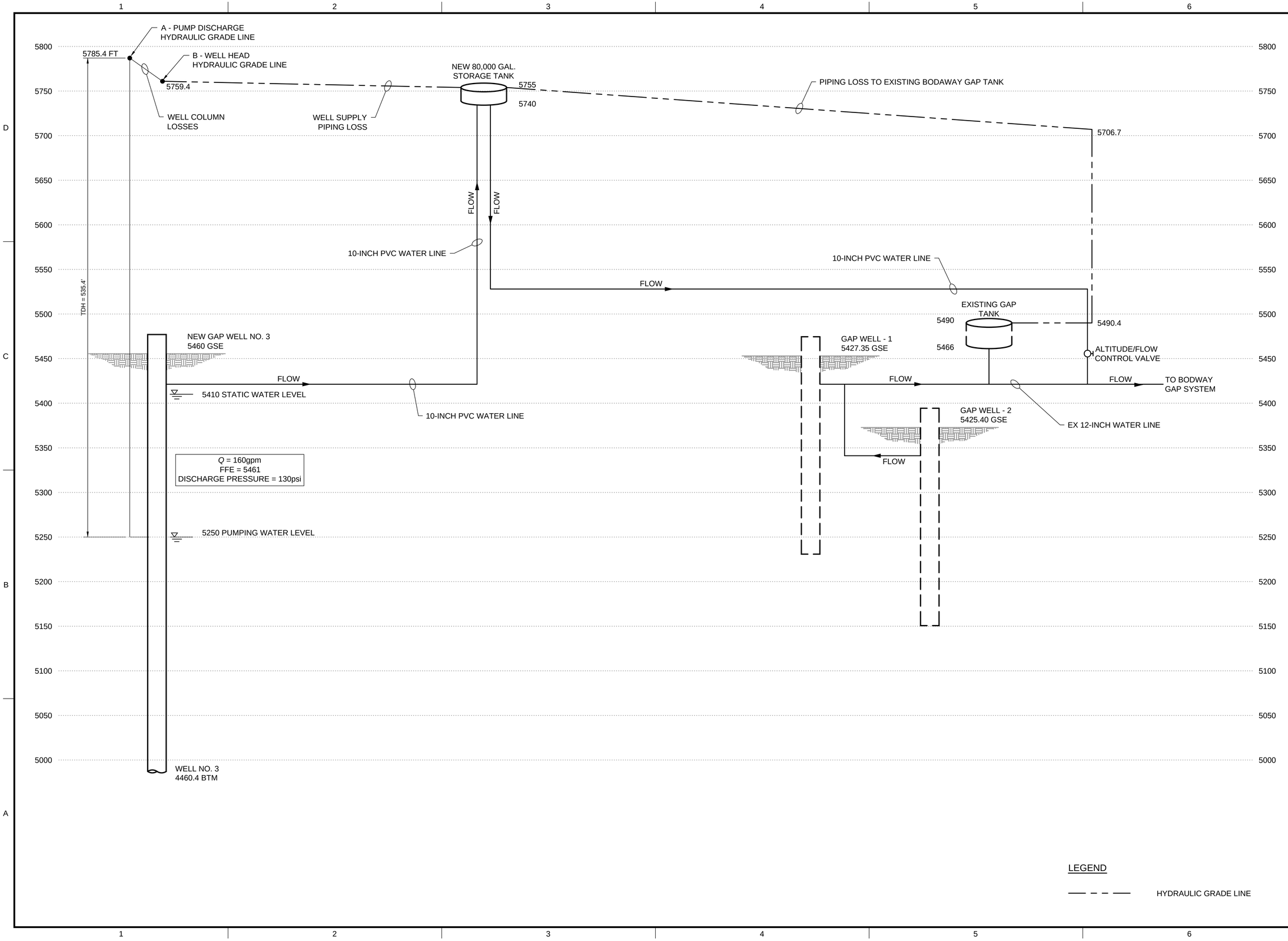

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Brown AND Caldwell

SALT LAKE CITY, UTAH

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Registered Professional Engineer (Civil)
CERTIFICATE NO.
63511
STEVEN BRENCHLEY
Date Signed 10/1/12
ARIZONA, U.S.A.

GREAT SEAL OF THE NAVAJO NATION

BODAWAY-GAP WELL, TANK, AND PIPELINE

REVISIONS		
REV	DATE	DESCRIPTION

LINE IS 2 INCHES AT FULL SIZE

DESIGNED:
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FILENAME
P-100.DWG

BC PROJECT NUMBER
150360

CLIENT PROJECT NUMBER
C010232

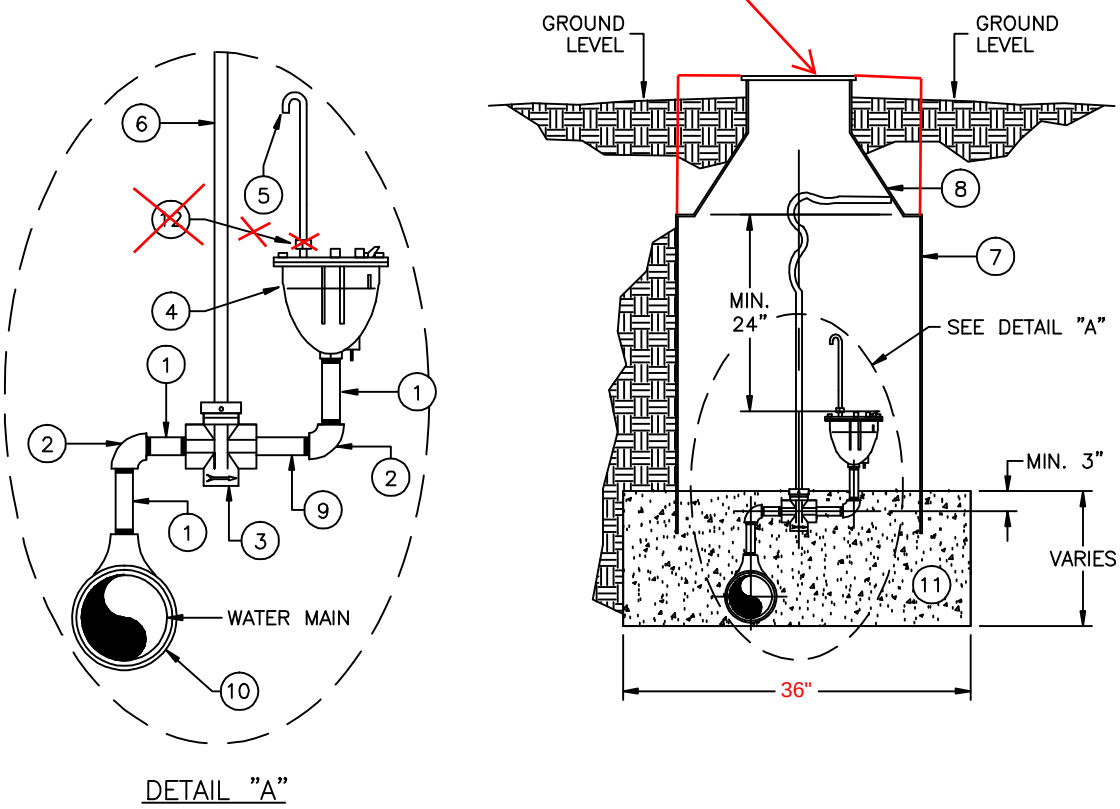
PROCESS

HYDRAULIC GRADE LINE DIAGRAM

DRAWING NUMBER
P-100

SHEET NUMBER
76 OF 76

24" LID



DETAIL "A"

MATERIAL LIST		
ITEM	QUAN	DESCRIPTION
1	3	1" x 3" NIPPLE, BRASS
2	2	1" x 90° ELBOW, BRASS
3	1	1" CURB STOP VALVE, FIPT, MUELLER H-10287, OAE
4	1	1" COMBINATOIN AIR RELEASE/VACUUM VALVE
5	1	1" O.D. PIPE, BRASS , 12" MIN.
6	1	STATIONARY ROD, 42"
7	1	METER CAN, 36" O.D. x 30" DEPTH, SONOLOC
8	1	METER CAN COVER W/ DOUBLE LID (FROST PLATE) FOR 36" O.D. CAN, CASTING M-70
9	1	1" x 6" NIPPLE, BRASS
10	1	SADDLE, BRASS, 1" TAP x APPROPRIATE PIPE O.D. SIZE
11	3 CF*	1" TO 2" FILTER ROCK
12	1	~~1" UNION~~

*CF = CUBIC FEET

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DATE:	04/08
PROJECT NO.	
SCALE:	NTS
ACAD FILENAME:	Water Standard
DWG. NO.	WS-10.DWG

NAVAJO TRIBAL UTILITY AUTHORITY
HQ CIVIL ENGINEERING DEPARTMENT

AIR RELEASE VALVE DETAIL

HQ-ENGINEERING FT.DEFIANCE, AZ

REVISIONS			
No.	Date	Brief	By
01	04/08	Revised	L.H.
02			
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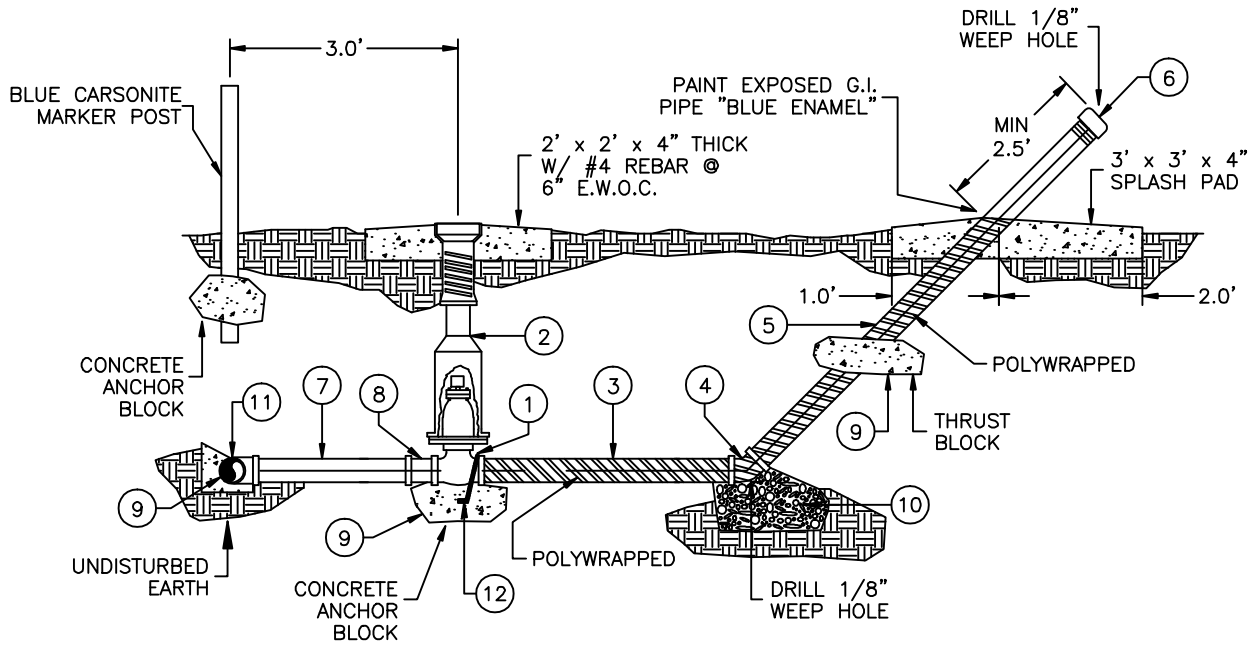

MATERIAL LIST		
ITEM	QUAN	DESCRIPTION
1	1	2' GATE VALVE, C.I., FIPT, RW, NRS, RHT, W/ 2' OPERATING NUT, MUELLER A-2360-37
2	1	VALVE BOX, SCREW-TYPE, C.I., 2 PIECE, 5 1/4" SHAFT, TYLER 6850
3	1	2" x 3' PIPE (MIN.), D.I. , COATED OR POLYWRAPPED
4	1	2" x 45° ELBOW, D.I. , W/ 1/8" WEEP HOLE
5	1	2" PIPE, D.I. x CUT TO LENGTH AS NEEDED
6	1	2" CAP, D.I. W/ 1/8" VENT HOLE
7	1	2" PIPE, D.I. CUT TO LENGTH AS NEEDED
8	1	2" ADAPTER, PVC, SLIP-GASKET x MIPT, SDR-21
9	A.R.	CONCRETE THRUST BLOCK, (DO NOT COVER JOINTS OR BOLTS), MIN. 1.5 CUBIC FEET
10	1.5 CF	CLEAN GRAVEL
11	1	MAIN LINE SADDLE OR TEE
12	A.R.	#4 REBAR

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APPROVED BY:	NTUA
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SCALE:	NTS
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DWG. NO.	WS-11.DWG

NAVAJO TRIBAL UTILITY AUTHORITY
HQ CIVIL ENGINEERING DEPARTMENT

2" FLUSH VALVE DETAIL

HQ-ENGINEERING FT.DEFIANCE, AZ

REVISIONS			
No.	Date	Brief	By
01	04/08	Revised	L.H.
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DATE:	04/08
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SCALE:	NTS
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DWG. NO.	WS-13.DWG

NAVAJO TRIBAL UTILITY AUTHORITY
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EEG-ENGINEERING

FT. DEFIANCE, AZ

MARKER POST DETAILS

REVISIONS				
No.	Date	Brief	By
01	04/08	Revised	LH
02			
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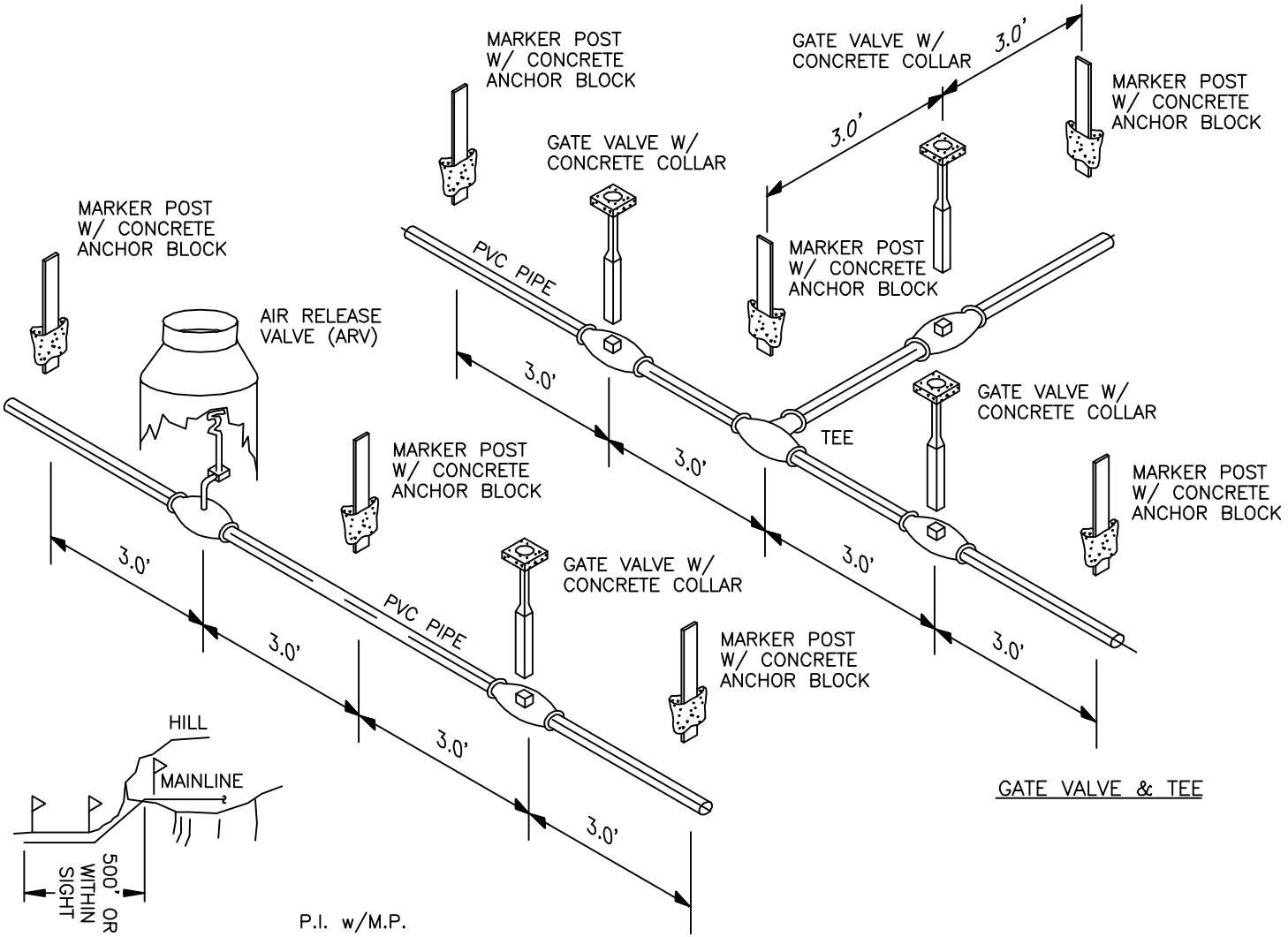
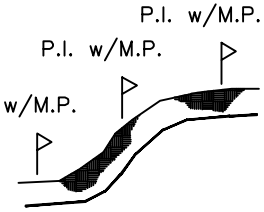


GATE VALVE & TEE

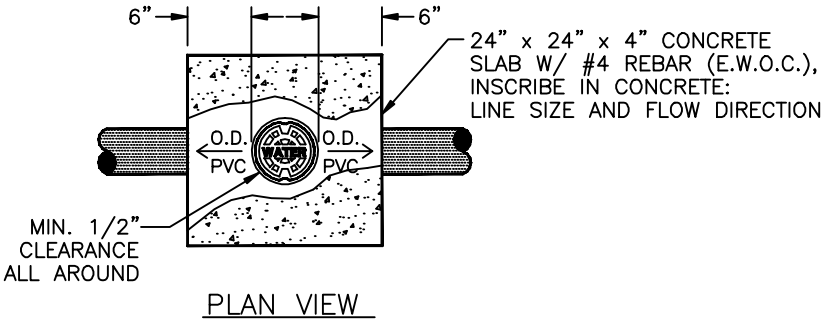
AIR RELEASE VALVE & GATE VALVE



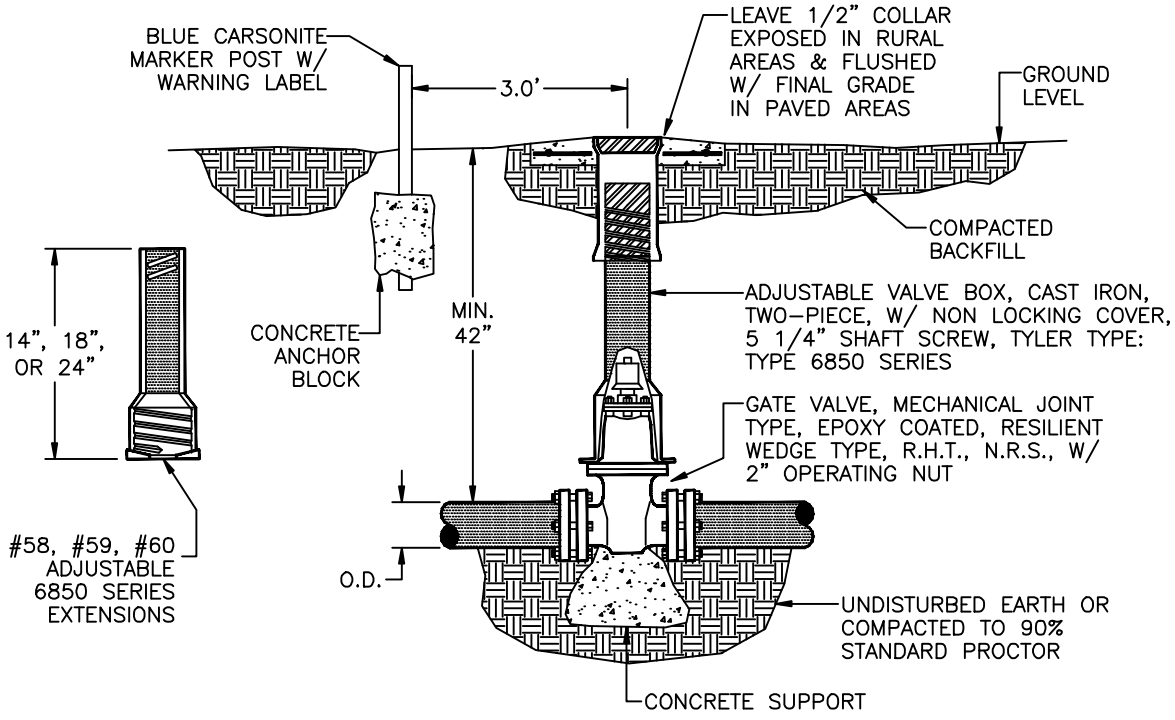
P.I. AND GRADE CHANGES

NOTES:

1. ALL MARKER POSTS TO BE "BLUE" CARSONITE (TYP.).
2. MARKER POSTS ON ALL POINT OF INTERSECTIONS (P.I.).
3. MARKER POSTS ON ALL GRADE CHANGES.
4. MARKER POSTS WILL HAVE A MAX. HEIGHT OF 30 INCHES.



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.

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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			
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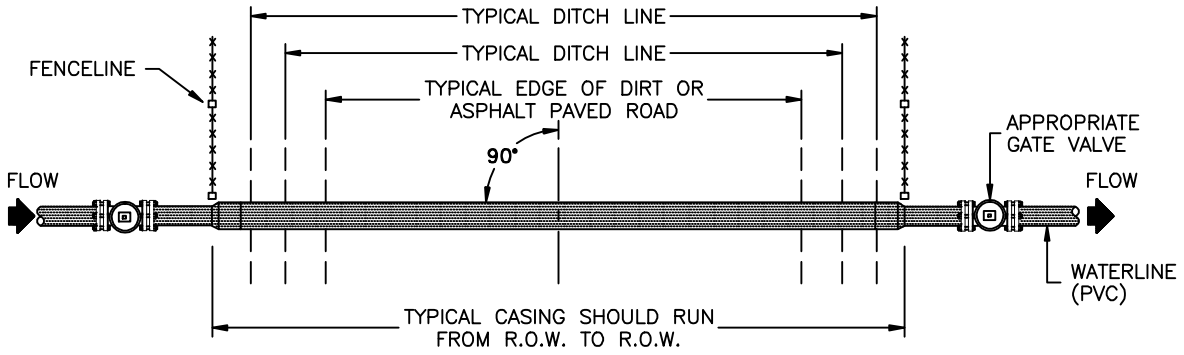
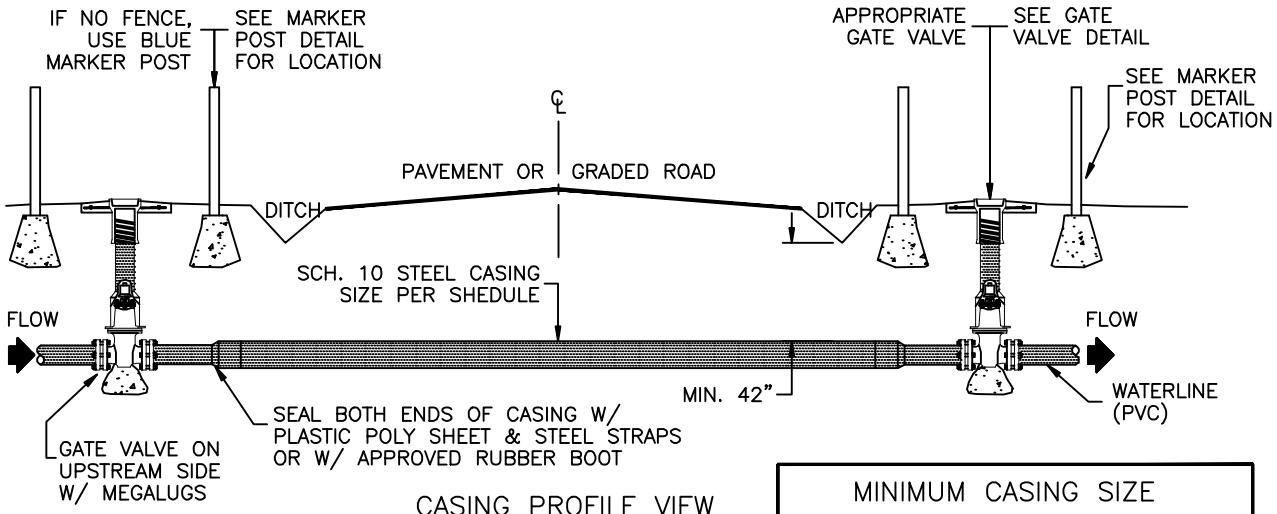


CASING PLAN VIEW



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.

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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			
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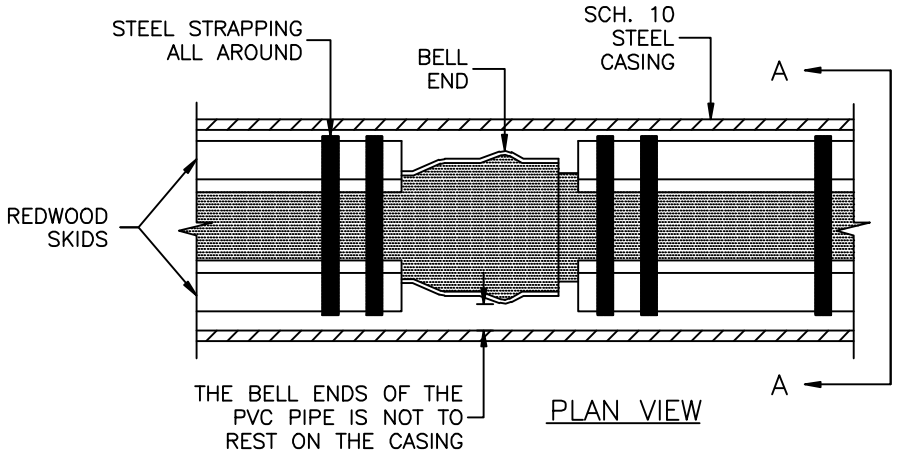
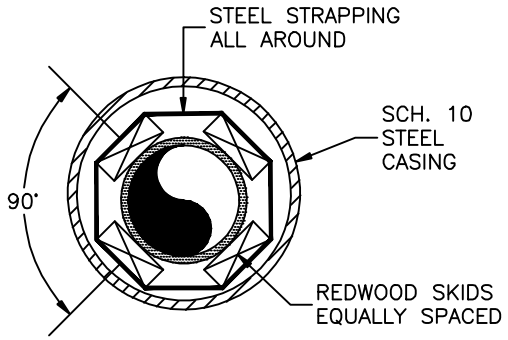


PLAN VIEW



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"

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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			
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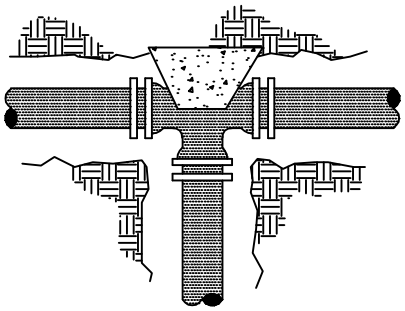
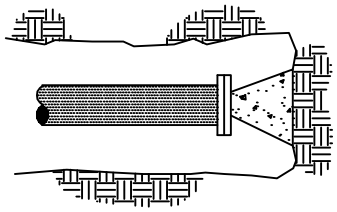
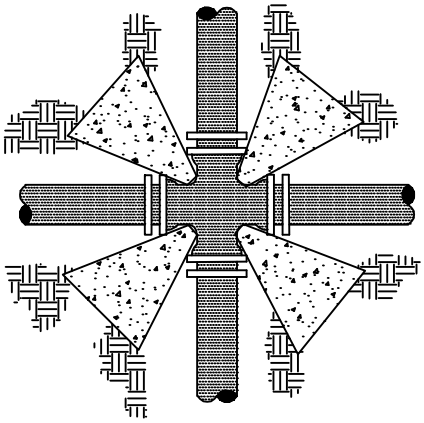


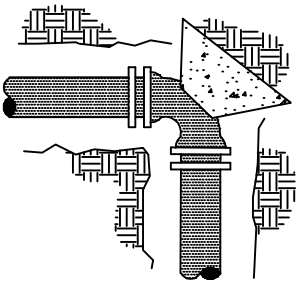
TEE
(PLAN VIEW)



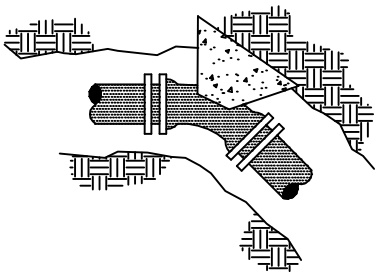
DEAD END CAPPED OR PLUG
(PLAN VIEW)



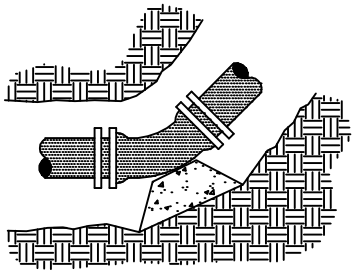
CROSS
(PLAN VIEW)



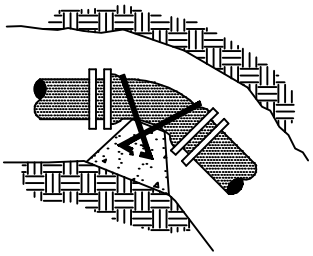
90° ELBOW
(PLAN VIEW)



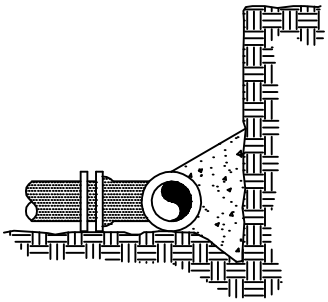
45° ELBOW
(PLAN VIEW)



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.

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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			
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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.

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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			
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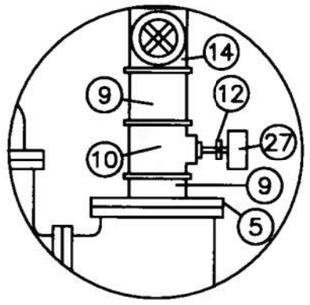
06			

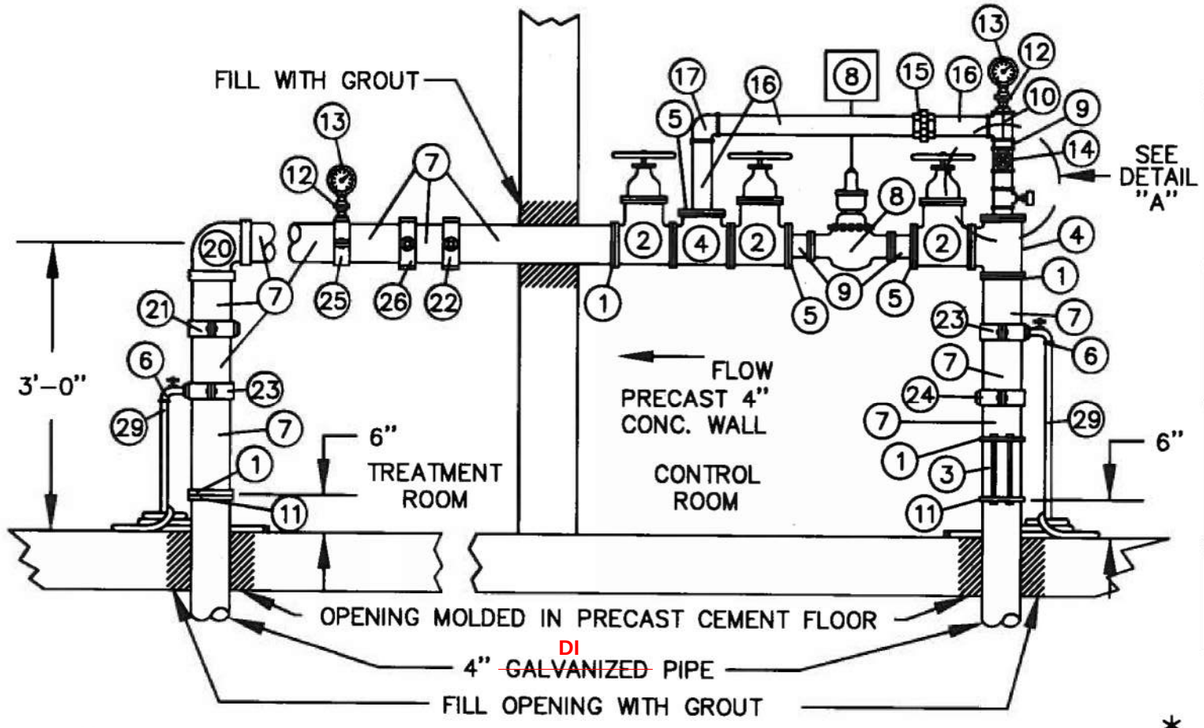
NOTES:

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

4" (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.
16	3	G.I. PIPE, 2" (CUT & THREAD IN FIELD)
17	1	ELBOW, 90°, 2" G.I.
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 G.I.

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.

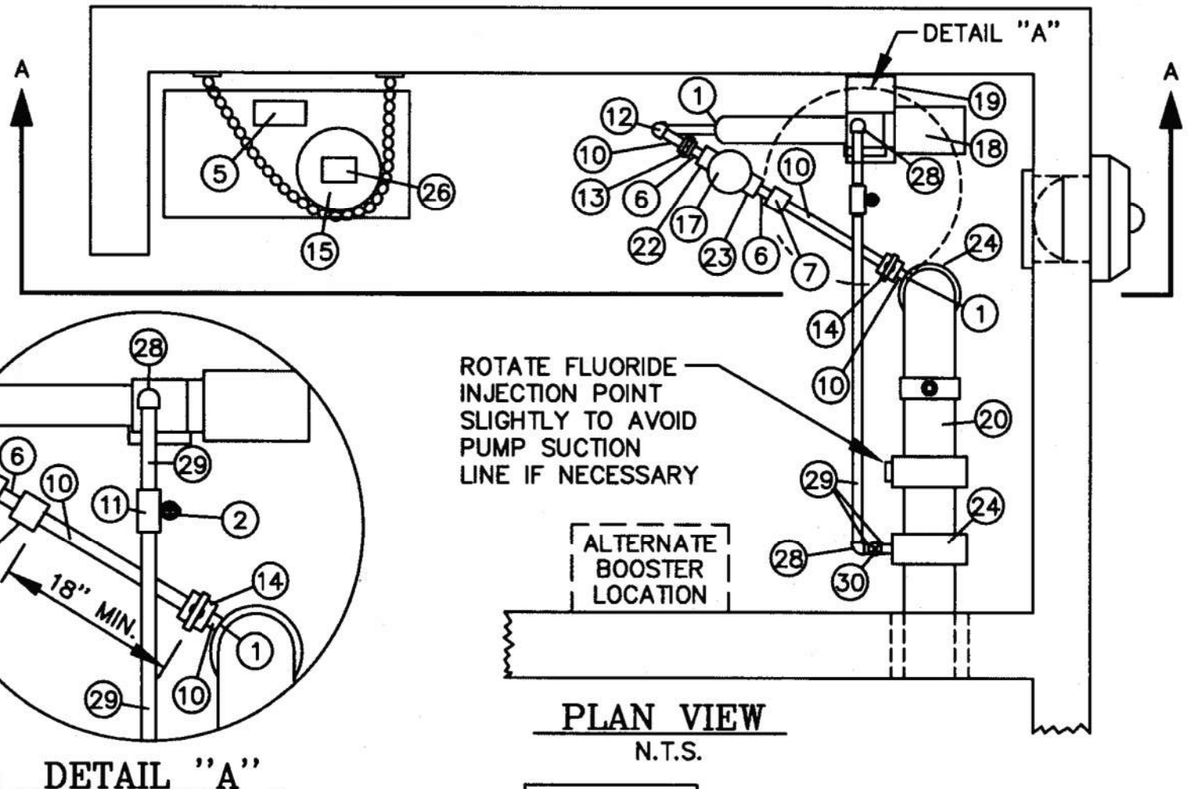
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

NAVAJO NATION,

STANDARD DRAWING NO. W-14
4" PUMPHOUSE PIPING
LIST NO. 901550

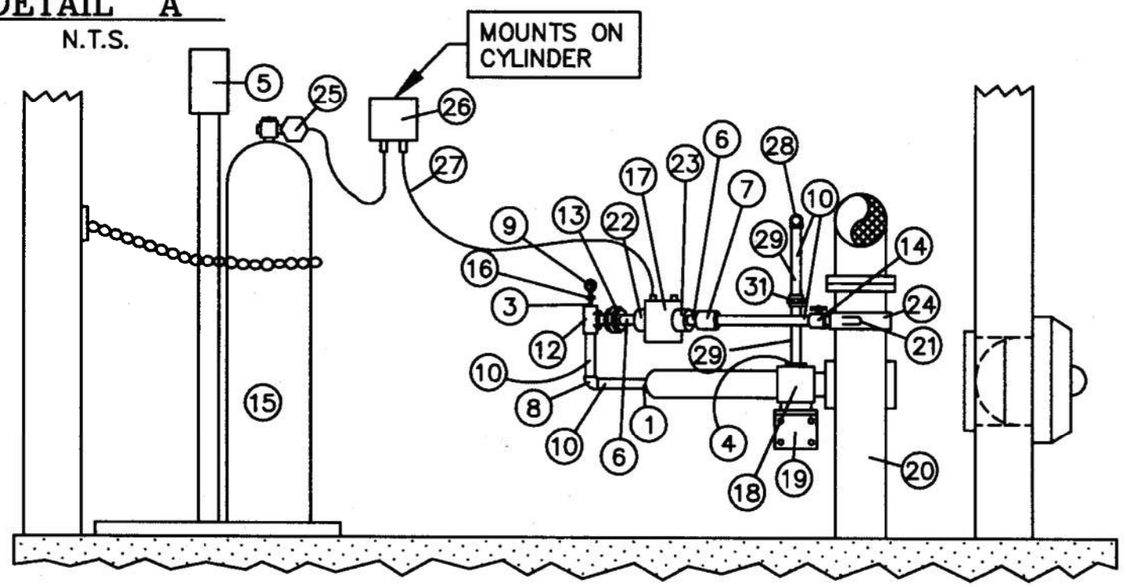
OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

DRAWN BY: L.S. DATE: 1/93	CHECKED BY: P.S. DATE: 1/93	APPR. BY: P.S. DATE: 1/93	AUTOCAD DRAWING



PLAN VIEW
N.T.S.

DETAIL "A"
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" G.I.
*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.
29	AS NEEDED	PIPE 1" CUT AND THREADED TO FIT, G.I.
30	1	GATE VALVE, 1" BRASS, FIPT
31	1	UNION, 1" SCH. 40 G.I.

* 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 G.I.

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.

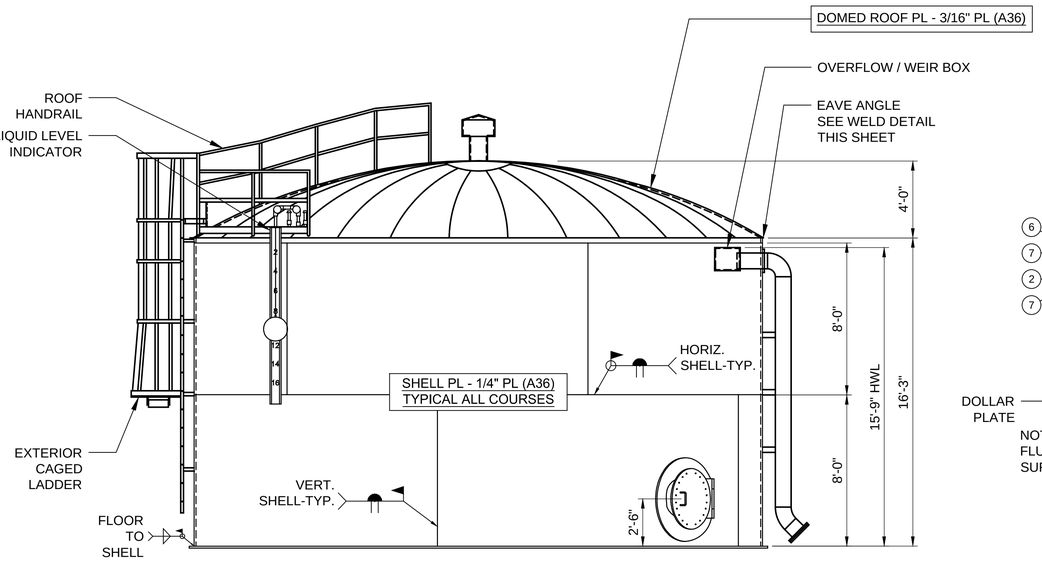
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

NAVAJO NATION,

STANDARD DRAWING NO. W-15
GAS CHLORINATION
LIST NO. 902000

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

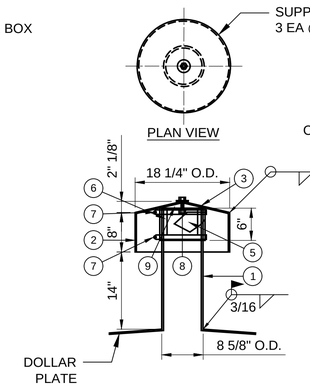
DRAWN BY: L.S. DATE: 1/93	CHECKED BY: P.S. DATE: 1/93	APPR. BY: P.S. DATE: 1/93	AUTOCAD DRAWING



SELF-SUPPORTED DOME ROOF

ELEVATION

SCALE: NOT TO SCALE

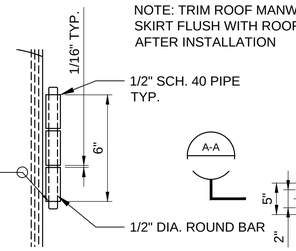


NOTE: VENT PIPE TO BE TRIMMED FLUSH WITH THE INSIDE SURFACE OF ROOF PLATE

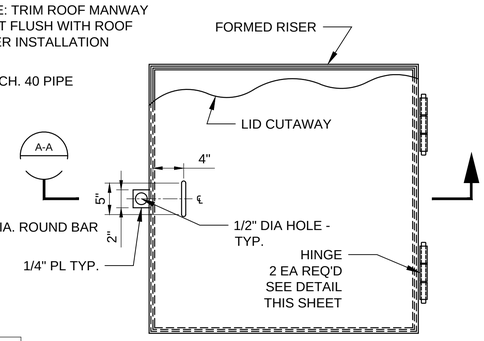
8" ROOF VENT DETAIL

DETAIL A

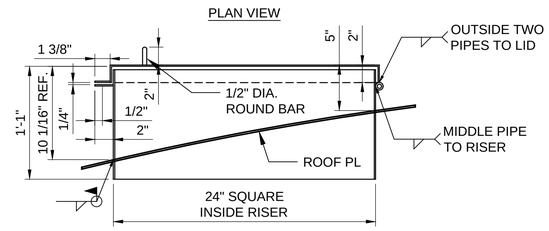
SCALE: NONE



NOTE: TRIM ROOF MANWAY SKIRT FLUSH WITH ROOF AFTER INSTALLATION



BILL OF MATERIALS		
ITEM	QTY.	DESCRIPTION
1	1	8" SCH. 40 STEEL PIPE x 1'-8" LG.
2	1	10 GA. STEEL x 8" x REQ'D.
3	1	10 GA. STEEL x 1"-6" DIA. w/ RISE
4	1	3/4 -No. 9 FLAT EXPANDED METAL
5	1	No. 14 BRONZE WIRE MESH
6	3	SUPPORT STRAP 3/16 x 1/2 x REQ'D.
7	2	SS WORM CLAMP-MESH CLOTH RETAINER
8	3	5/8" DIA. BOLT W/ NUT & WASHER
9	1	TOP PL-10 GA. x REQ'D. DIA.



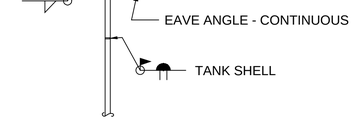
SECTION A-A

NOTE: ALLOW A 7/16" GAP FROM TOP OF RISER TO BOT. OF LID FOR A CHANNEL GASKET FURNISHED BY OWNER

ROOF VENT & HATCH DETAIL

DETAIL B

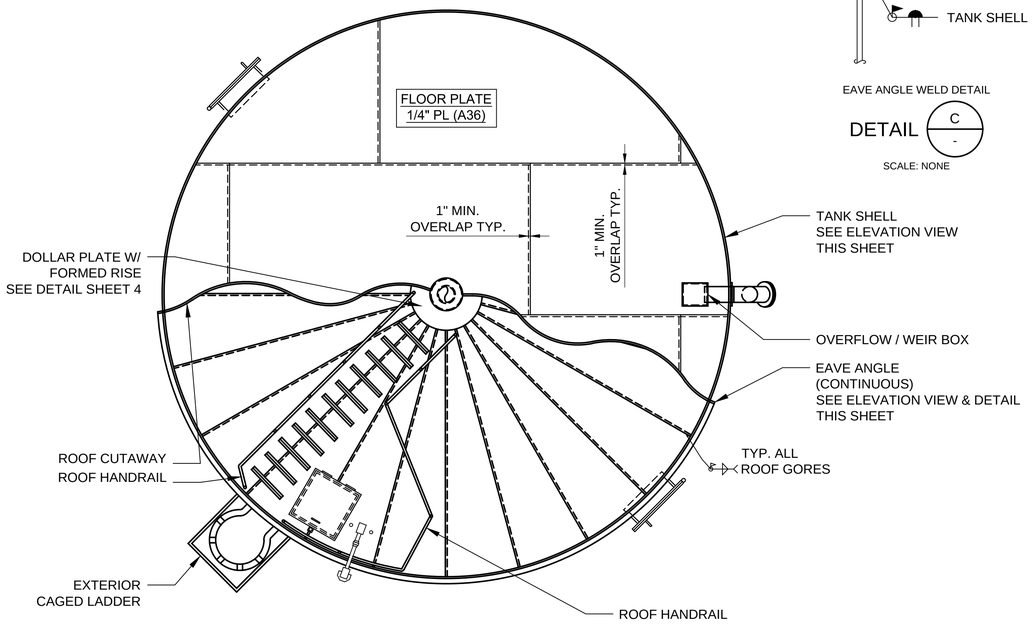
SCALE: NONE



EAVE ANGLE WELD DETAIL

DETAIL C

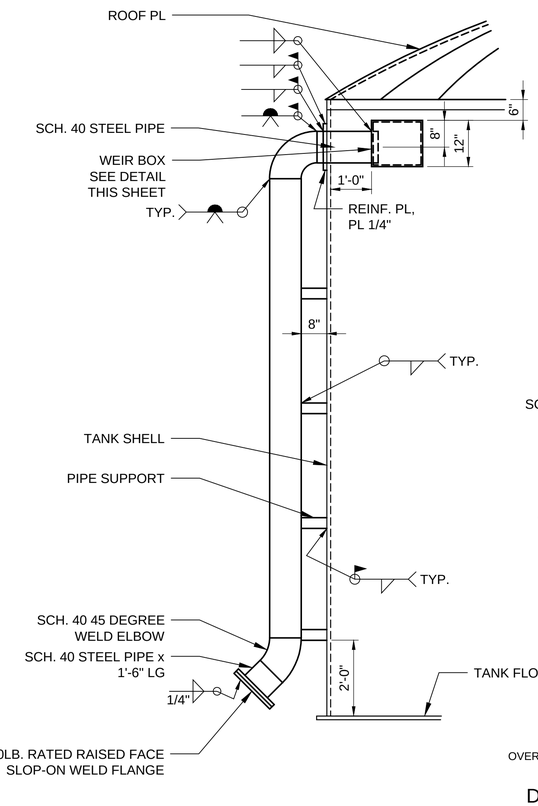
SCALE: NONE



SELF-SUPPORTED DOME ROOF

PLAN

SCALE: NOT TO SCALE

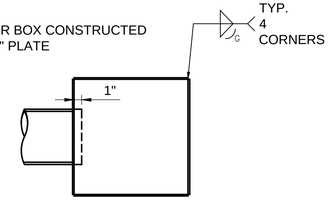


OVERFLOW / WEIR BOX DETAIL

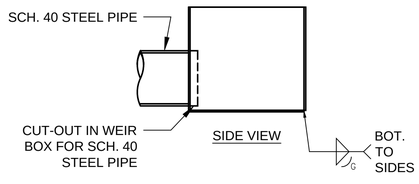
DETAIL D

SCALE: NONE

NOTE: WEIR BOX CONSTRUCTED OF ALL 1/4" PLATE



TOP VIEW



SIDE VIEW

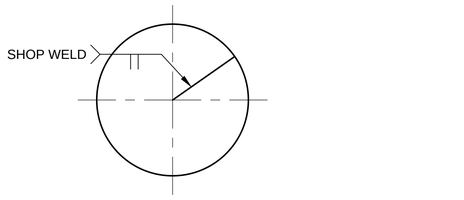
1	10/00	TITLE BLOCK CHANGE	W.S.
REVISION	DATE	BRIEF	BY

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

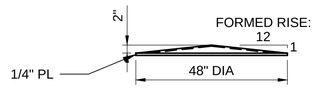
STANDARD DRAWING NO. W-20
WATER STORAGE TANK
DRAWING 1 OF 4

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

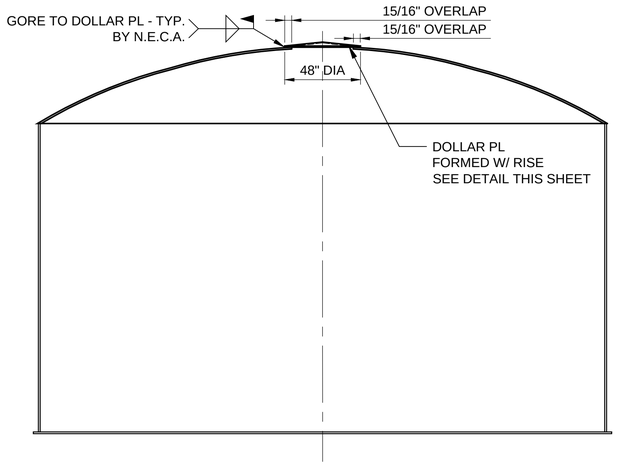
REDRAWN BY: H.J	CHECKED BY: M.M.	APPR. BY:	SHEET___ OF___
DATE: 1/97	DATE: 1/97	DATE: 1/97	



PLAN



SIDE



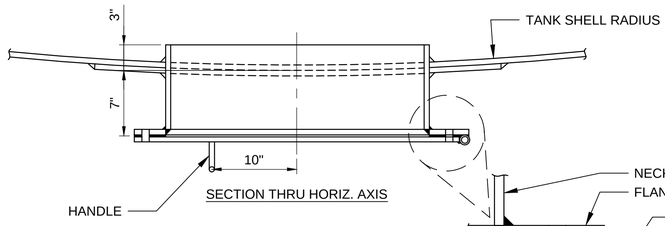
ROOF GORE PROFILE LAYOUT

DOLLAR PLATE AND INLET / OUTLET DETAIL

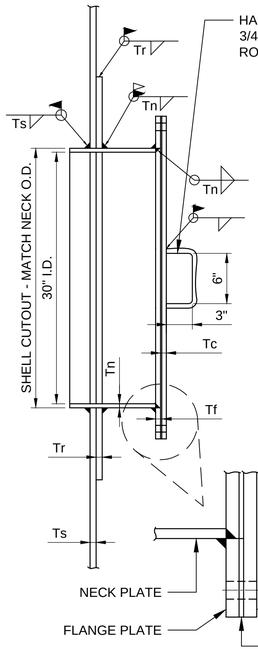
DETAIL A / -

SCALE: NONE

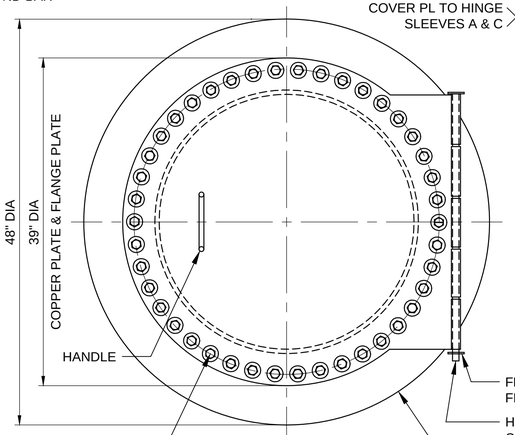
NOTE: NECK PL TO BE TRIMMED FLUSH
WITH TANK SHELL IN THE FIELD.



SECTION THRU HORIZ. AXIS



SECTION THRU VERT. AXIS



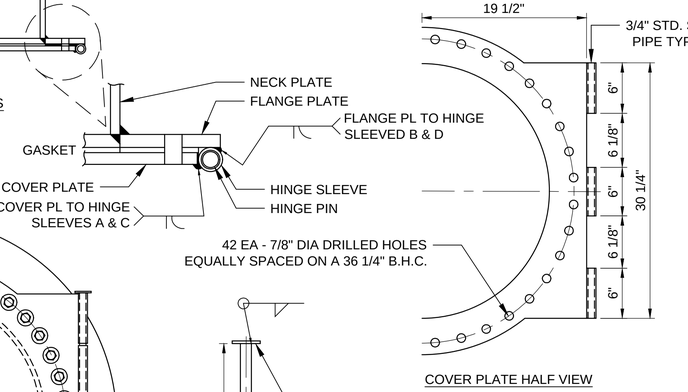
FRONT VIEW

NOTE: GASKET MATERIAL TO BE
MADE OF 1/8" THICK RED RUBBER

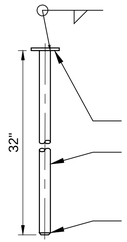
30" SHELL MANYWAY DETAIL
QTY REQ'D: TWO

DETAIL B / -

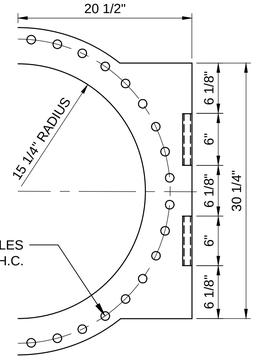
SCALE: NONE



COVER PLATE HALF VIEW



HINGE PIN DETAIL



FLANGE PLATE HALF VIEW

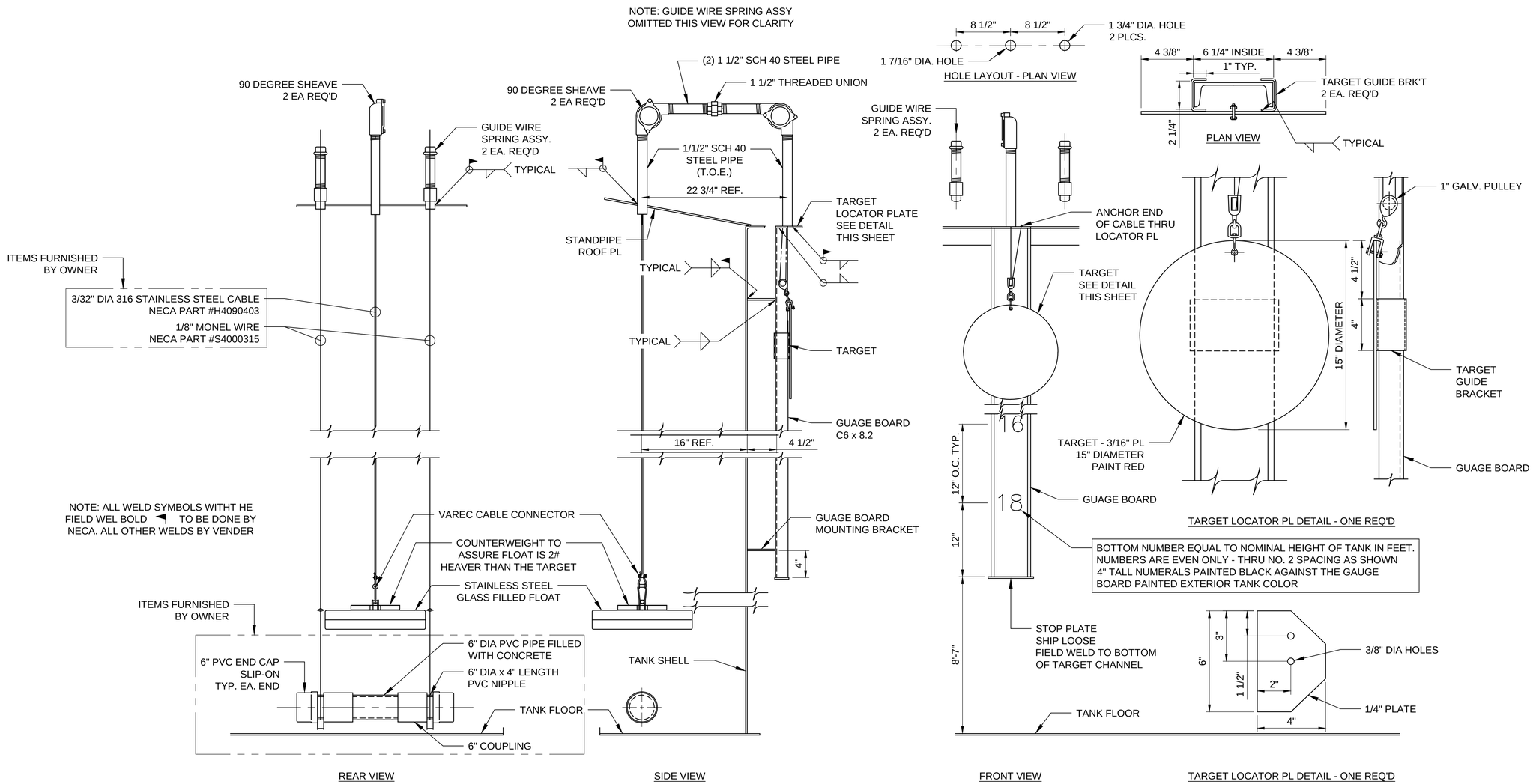
REVISION	DATE	BRIEF	BY
1	10/00	TITLE BLOCK CHANGE	W.S.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

STANDARD DRAWING NO. W-20
WATER STORAGE TANK
DRAWING 2 OF 4

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

REDRAWN BY: H.J	CHECKED BY: M.M.	APPR. BY:	SHEET___ OF ___
DATE: 1/97	DATE: 1/97	DATE: 1/97	



LIQUID LEVEL INDICATOR

DETAIL A / -

SCALE: NONE

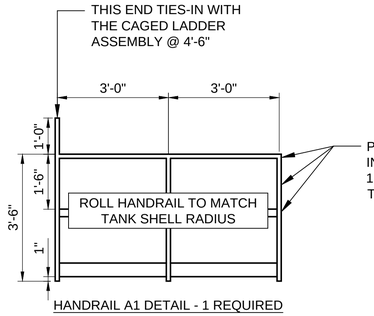
REVISION	DATE	BRIEF	BY
1	10/00	TITLE BLOCK CHANGE	W.S.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

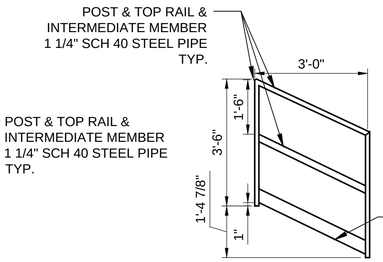
STANDARD DRAWING NO. W-20
WATER STORAGE TANK
DRAWING 3 OF 4

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

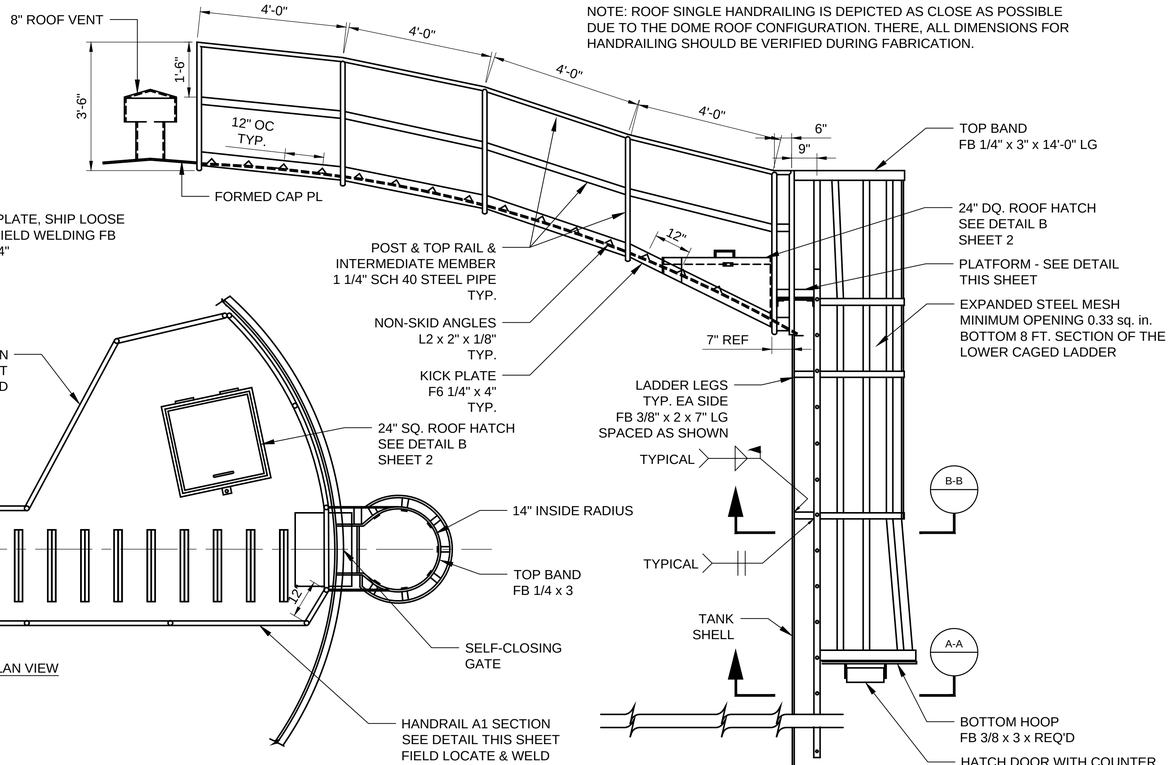
REDRAWN BY: H.J	CHECKED BY: M.M.	APPR. BY:	SHEET___ OF___
DATE: 1/97	DATE: 1/97	DATE: 1/97	



HANDRAIL A1 DETAIL - 1 REQUIRED

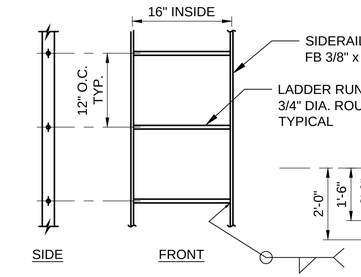


HANDRAIL B2 DETAIL - 1 REQUIRED



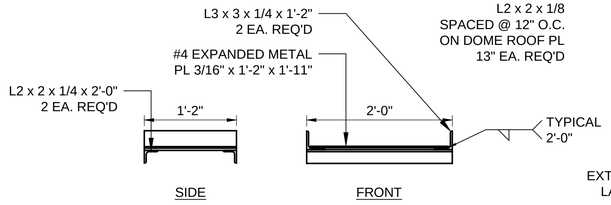
TANK CUTAWAY ELEVATION

NOTE: ROOF SINGLE HANDRAILING IS DEPICTED AS CLOSE AS POSSIBLE DUE TO THE DOME ROOF CONFIGURATION. THERE, ALL DIMENSIONS FOR HANDRAILING SHOULD BE VERIFIED DURING FABRICATION.

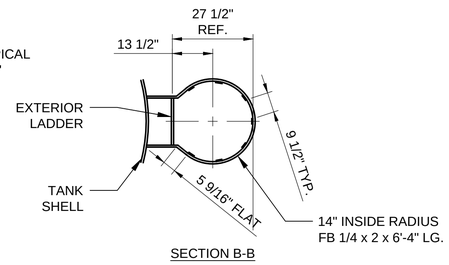


PLATFORM ASSY. DETAIL - ONE REQ'D

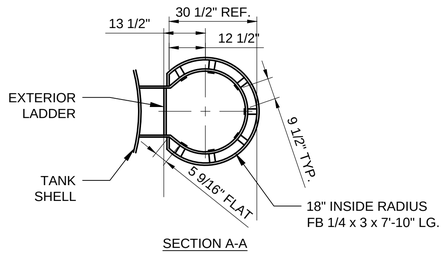
PLAN VIEW



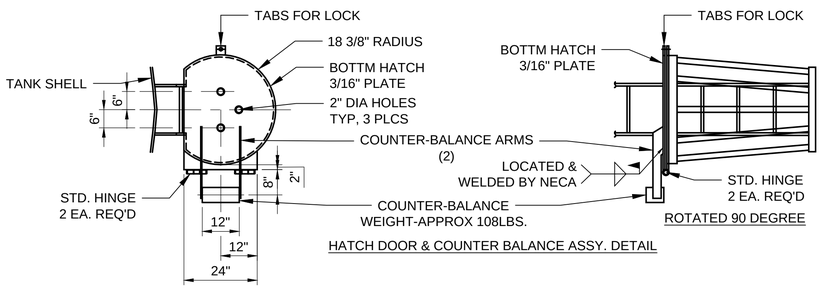
PLATFORM ASSY. DETAIL - ONE REQ'D



SECTION B-B



SECTION A-A



HATCH DOOR & COUNTER BALANCE ASSY. DETAIL

EXTERIOR LADDER DETAIL

DETAIL A -

SCALE: NONE

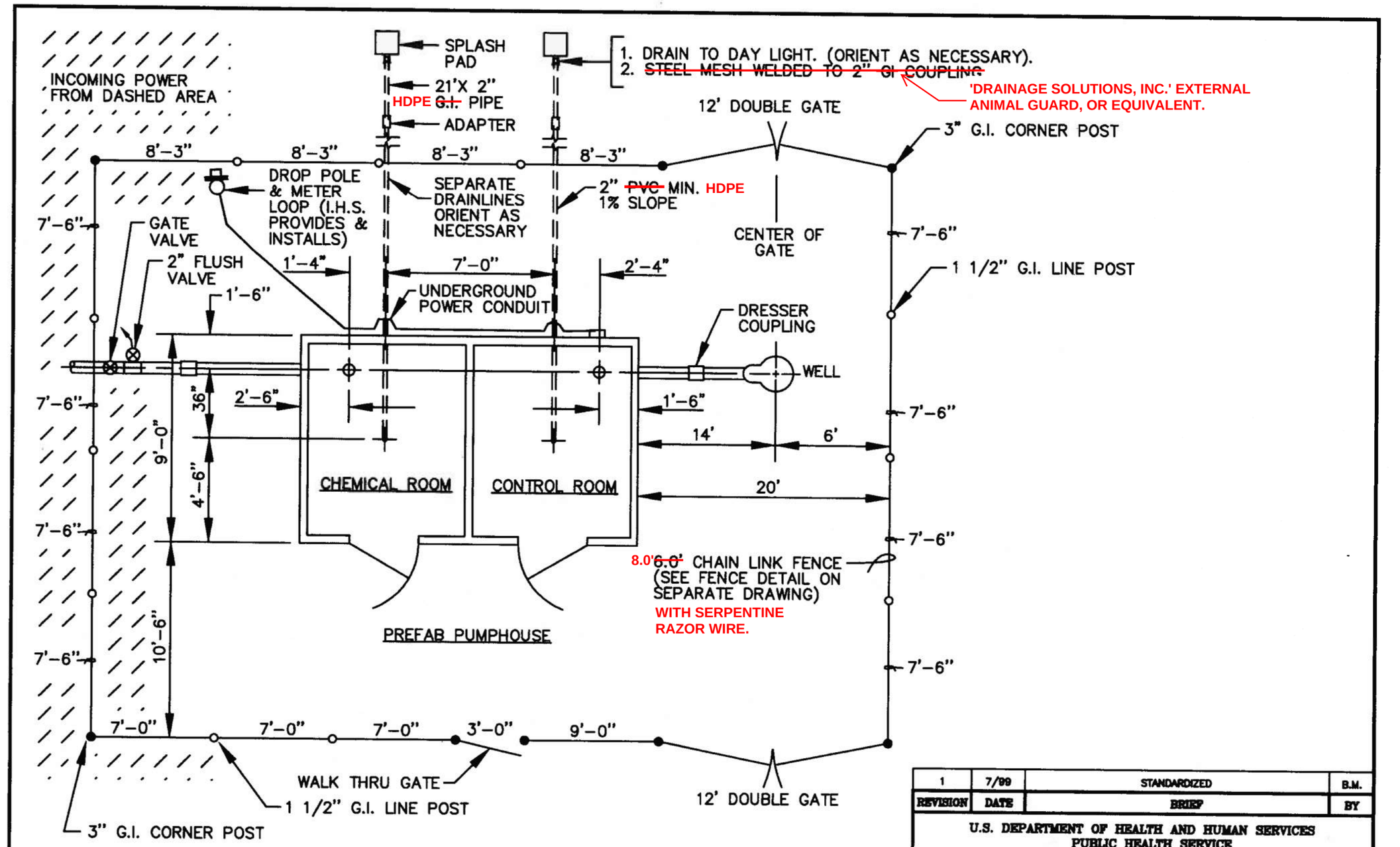
1	10/00	TITLE BLOCK CHANGE	W.S.
REVISION	DATE	BRIEF	BY

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 4 OF 4

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

REDRAWN BY: H.J	CHECKED BY: M.M.	APPR. BY:	SHEET___ OF ___
DATE: 1/97	DATE: 1/97	DATE: 1/97	



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

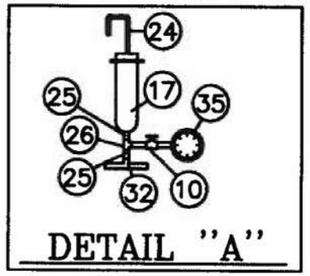
NAVAJO NATION,

STANDARD DRAWING NO. W-23
PREFAB PUMPHOUSE
EXTERIOR FACILITIES LAYOUT

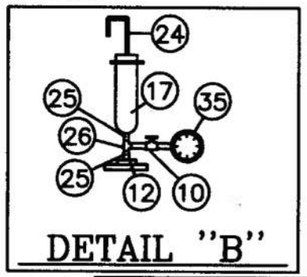
OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

DRAWN BY: L.S. DATE: 12/98	CHECKED BY: P.S. DATE: 12/98	APPR. BY: DATE:	AUTOCAD DRAWING

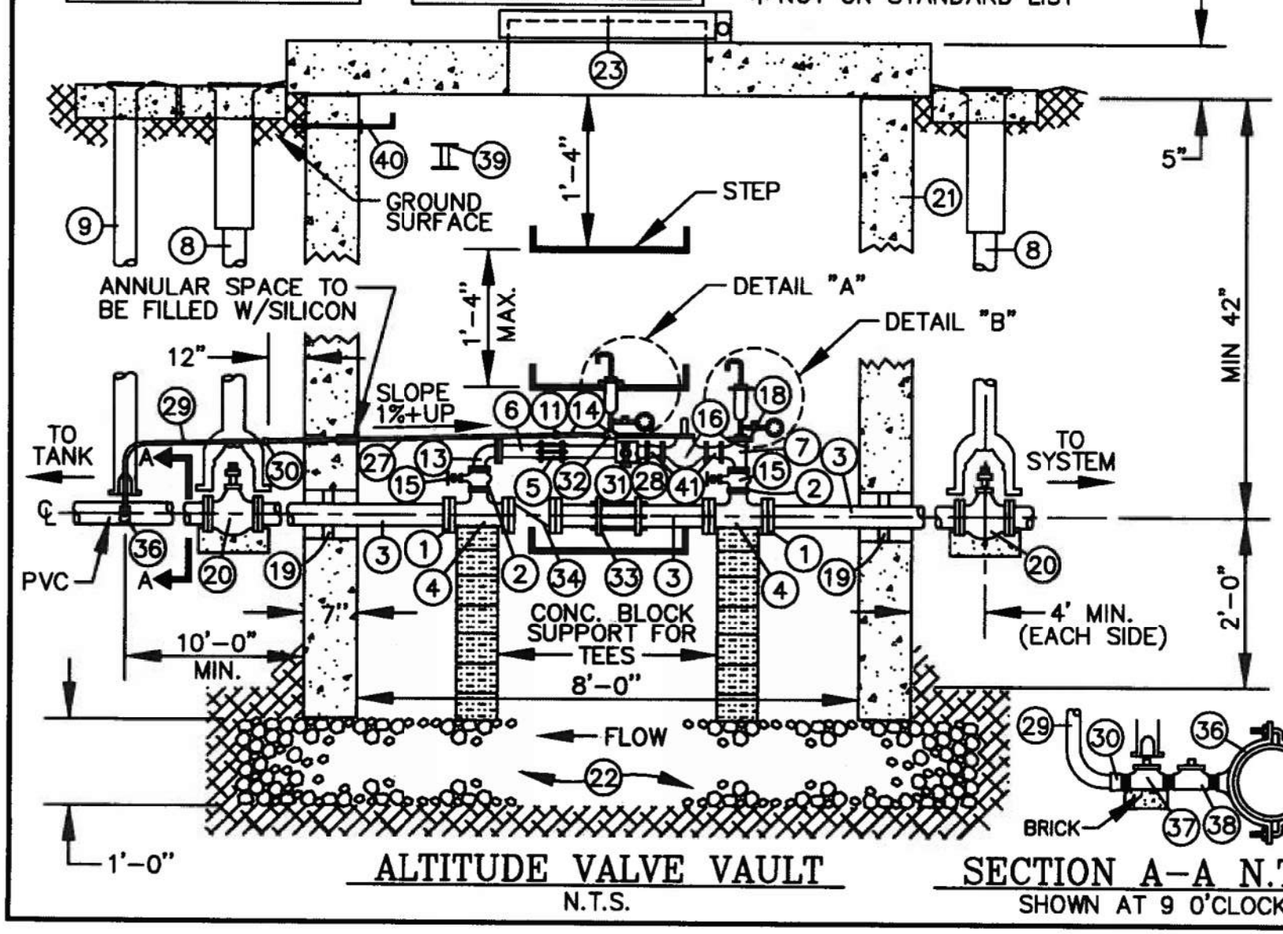
NOTES:
1. SENSING LINE TO TAP INTO MAINLINE A MIN. OF 10 FT. TOWARDS TANK FROM THE VAULT
2. SENSING LINE SHOULD BE TAPPED AT 9 OR 3 O'CLOCK
3. ALTITUDE VAULT TO BE A MAX. OF 30 FT. FROM TANK
4. CONTINUE SAME SIZE PIPING AS MAINLINE THROUGH THE VAULT. BRANCH FOR ALTITUDE VALVE IS 2". (see note 5)
5. ALTITUDE VALVE SIZE MAY NEED TO BE LARGER DEPENDING ON HEAD LOSSES THRU VALVE. MAX. 200 GPM FOR 2" DESIGN AVERAGE 100 GPM. FOR 4" ALTITUDE VALVE, USE D.I. PIPE & FITTINGS.
6. SEE DETAIL W-31 FOR VAULT LOCATION.
7. NOTE: ORDER THE APPROPRIATE BOLT AND GASKET KITS FOR FLANGED FITTINGS.



DETAIL "A"



DETAIL "B"



ALTITUDE VALVE VAULT
N.T.S.

SECTION A-A N.T.S.
SHOWN AT 9 O'CLOCK

ITEM	QUAN.	DESCRIPTION
* 1	3	MAINLINE SIZE "EZ" FLANGE
2	2	4" FLANGE BY 2" THREADED
		REDUCER
* 3	3	PIPE, D.I., ML SIZE, FLANGED x
		PLAIN END (SPECIAL ORDER)
4	2	TEE, ML SIZE, FLANGED x ML
		SIZE, FLANGED x 4" FLANGED
5	1	2" DRESSER COUPLING, D.I.
* 6	3	2" G.I. FIELD CUT
7	1	2" TEE, THREADED
8	2	VALVE BOX, G.V., 5 1/4" W/LID
9	1	CURB STOP BOX AND
		STATIONARY ROD
10	2	VALVE, BRASS STOP COCK,
		1/4" + 2 EA. 1/4" G.I. NIPPLE
11	1	1" UNION, G.I.
12	1	BUSHING, 2"x 3/4"
13	1	ELBOW, 90°, 2" G.I., THREADED
14	1	G.I., NIPPLE 1"
15	2	G.V., 2" W/WHEEL THREADED

* NOT ON STANDARD LIST

*16	1	ALTITUDE VALVE, 2" FLANGE, CLA-VAL
		#210G-XX CLASS 125, 75 PSI MAX.
		WITH COMPANION FLANGES, POSITION
		INDICATOR, CLOSE-SPEED CONTROL
17	2	ARV, 3/4" INLET & 3/8" OUTLET
18	1	2" G.I. CLOSE NIPPLE
*19	2	APPROVED GASKET, CAST IN PLACE
*20	2	G.V., MJ x MJ, SAME SIZE AS MAINLINE
*21	1	VAULT, PRECAST 8' L. x 6' W. x
		5 1/2' D. INSIDE
*22	80 cu.ft.	GRAVEL, SIZE 3/4" TO 1 1/2"
*23	1	SHALLOW WELL MANHOLE FRAME &
		COVER, ADJACENT TO WALL W/STEPS
24	2	3/8" ø PIPE, COPPER, W/ 3/8"
		COPPER ADAPTER MIPT
25	4	NIPPLE, 3/4"x CLOSE, GALVANIZED
26	2	TEE, 3/4"x 3/4"x 1/4", GALVANIZED
27	Lg.	1" G.I. PIPE WITH G.I. COUPLING
28	1	2"x 3/4" G.I., TEE
29	Lg.	PIPE, 1" PE, 200 PSI SDR 7
30	2	INSTATITE, 1" BRONZE, MIPT
31	1	HOSE BIBB, 3/4" W/VACUUM BREAKER
32	1	TEE, 1"x 3/4", G.I.
33	1	MAINLINE SIZE DRESSER COUPLING
*34	1	CHECK VALVE, CLA-VAL 501, 125
		CLASS, WAFER
35	2	1 EA. PRESSURE GAUGE, 0-30 PSI,
		1 EA. FOR CLOSED VALVE CONDITION
*36	1	SADDLE, SAME SIZE AS MAINLINE x
		1" FIPT, BRONZE
37	1	1" CURB STOP, FIPT x FIPT
38	1	CORPORATION STOP, 1" FIPT x MIPT,
		WITH 1" BRASS NIPPLE
39	1	2" STEEL SPOOL, FLANGED, SAME
		LENGTH AS ALTITUDE VALVE (9 3/8")
40	1	1/2" DIA. x 12" LONG BOLT & BEND
		90° AT END, W/NUT & 2 WASHERS
41	2	4"x 2" FLANGED REDUCERS

*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 G.I.

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

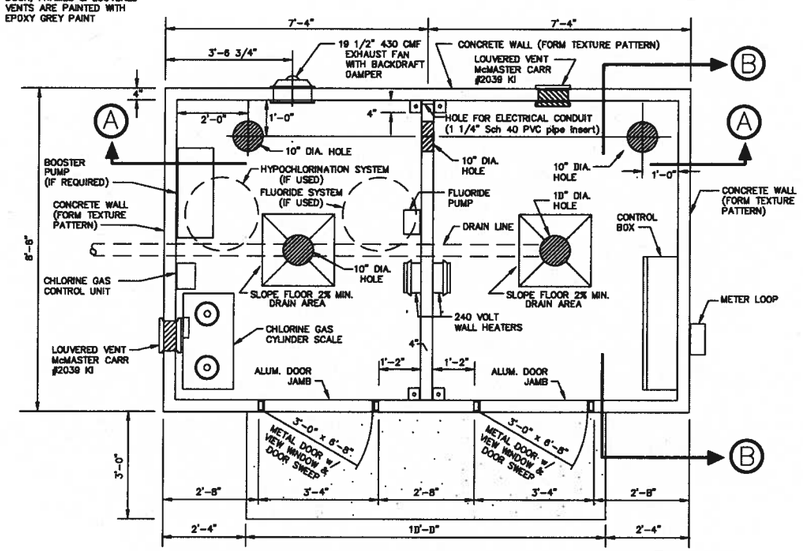
NAVAJO NATION,

STANDARD DRAWING NO. W-28
ALTITUDE VALVE

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

DRAWN BY: B.T. DATE: 10/94	CHECKED BY: B.M. DATE: 10/94	APPR. BY: DATE:	AUTOCAD DRAWING

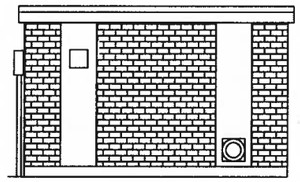
NOTE: DOOR, FRAMES & LOUVERED VENTS ARE PAINTED WITH EPOXY GREY PAINT



NOTE: THE OWNER SHALL CONSTRUCT A 4" THICK X 19'-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.

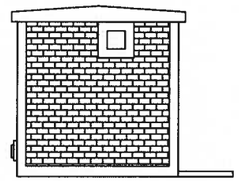
PLAN VIEW OF PUMPHOUSE w/ CHLORINATOR ROOM ON LEFT SIDE

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



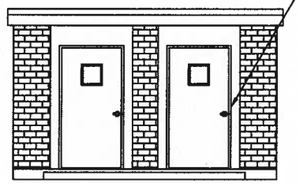
REAR ELEVATION

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



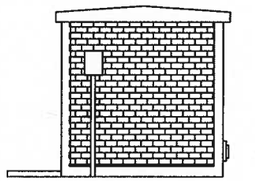
LEFT SIDE ELEVATION

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



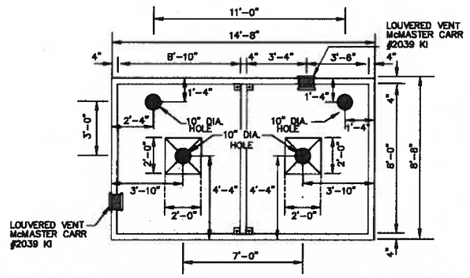
FRONT ELEVATION

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



RIGHT SIDE ELEVATION

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



BASE SLAB PLAN w/ CHLORINATOR LEFT SIDE

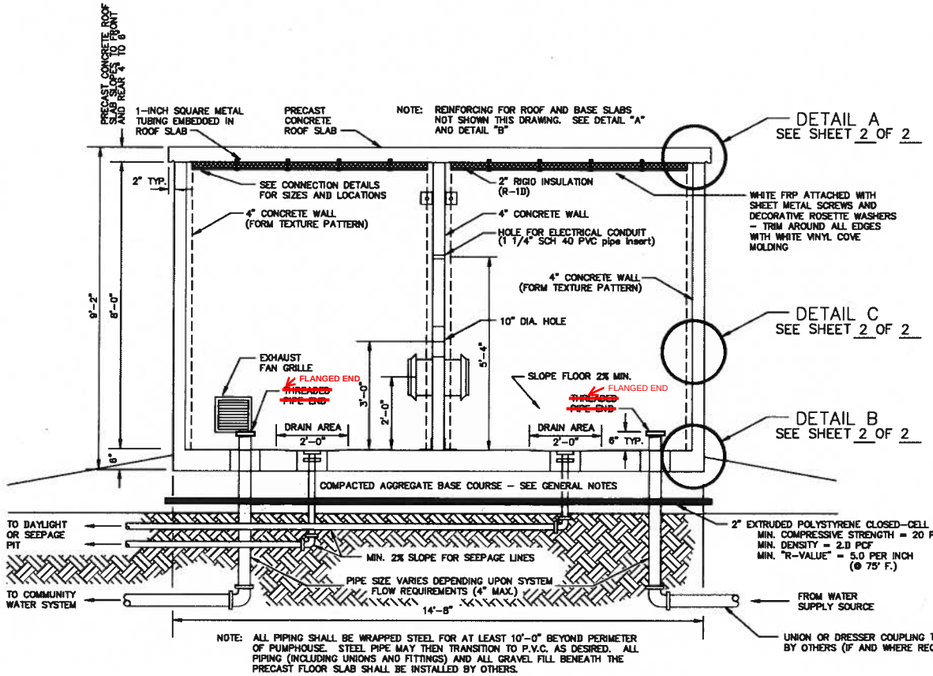
SCALE: 1/4" = 1'-0"

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"	28-55
NO.4	0-10
NO.8	0-5

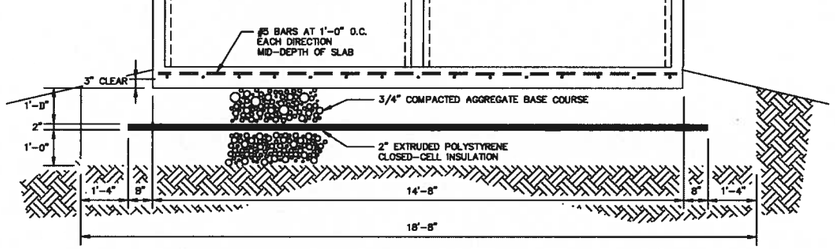
6. SITE DRAINAGE OF SURFACE MOISTURE SHALL PROVIDE A POSITIVE SLOPE OF FINISH GRADE AWAY FROM ALL SIDES OF THE BUILDING PERIMETER.
7. IT IS RECOMMENDED THAT SITE-CAST CONCRETE BE MADE WITH TYPE II (ALKALI RESISTIVE) CEMENT AND SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI WITHIN 28 DAYS. THE MIX DESIGN SHOULD INCLUDE 5% (±1%) 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.

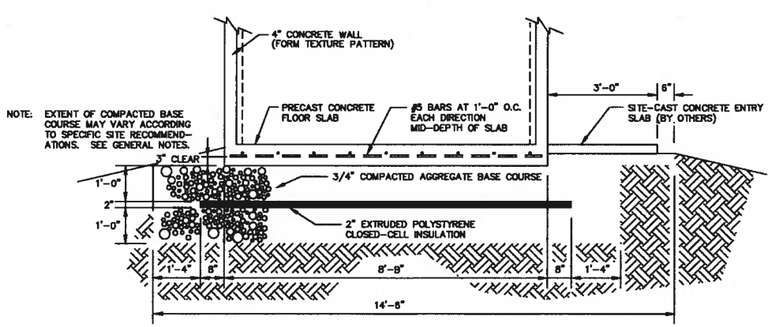
LONGITUDINAL SECTION OF PUMPHOUSE

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



SECTION A–A – LONGITUDINAL

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



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

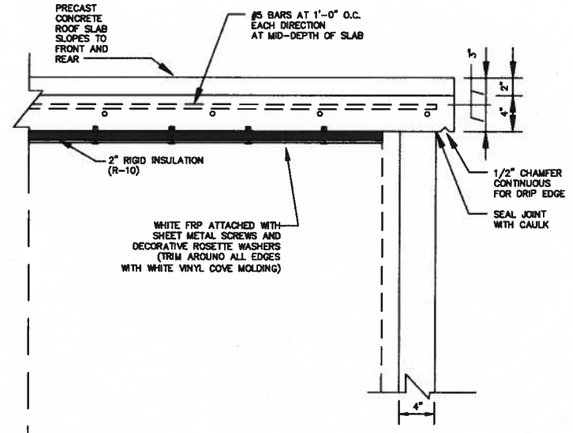
W-29

DRAWING 1 OF 2

PUBLIC LAW 86-121

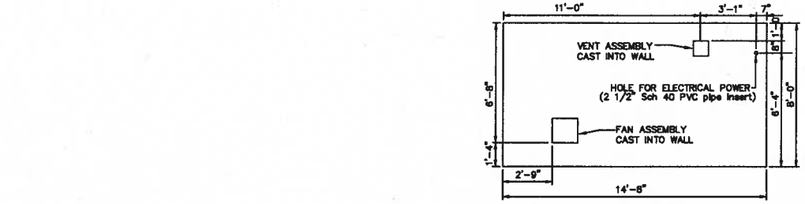
OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA INDIAN HEALTH SERVICE

DRAWN BY: G.L.G. DATE: 11-17-89	REVISED BY: H.J. DATE: 11-06-96	SHEET OF TOTAL SHEETS



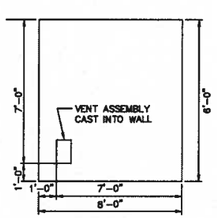
ROOF CONNECTION
DETAIL A

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



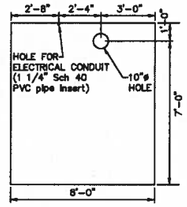
REAR WALL

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



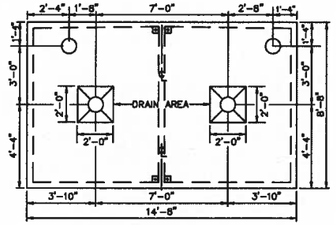
LEFT WALL

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



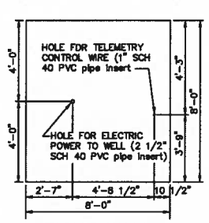
INTERIOR WALL

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



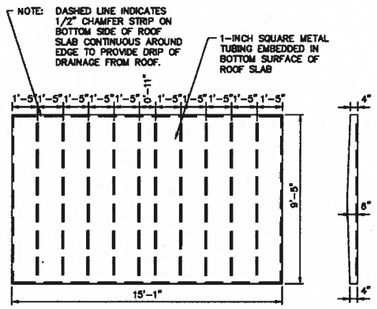
BASE (FLOOR) SLAB

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



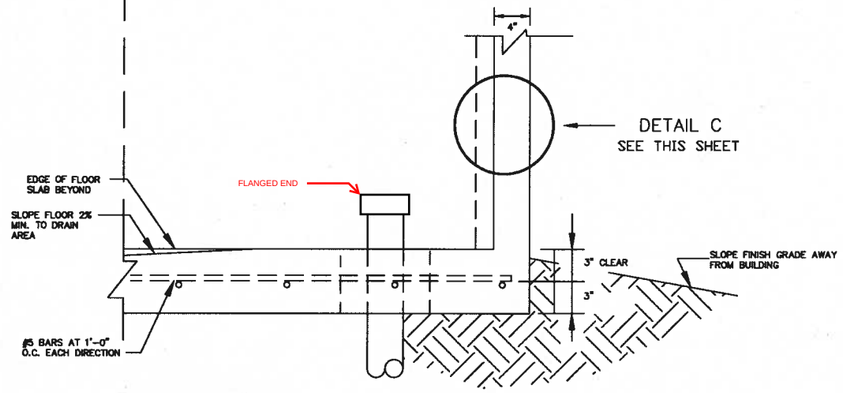
RIGHT WALL

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



ROOF SLAB

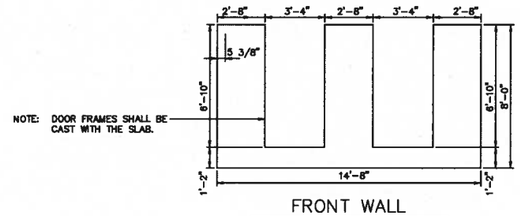
SCALE : 1/4" = 1'-0"



NOTE: REBAR AT LIFT POINTS ARE #5 REBAR, 12" SEPARATION CENTERED ON LIFT POINTS REBARS ARE CENTERED THE ENTIRE LENGTH AND WIDTH (BOTH DIRECTIONS OF EACH LIFT POINTS)

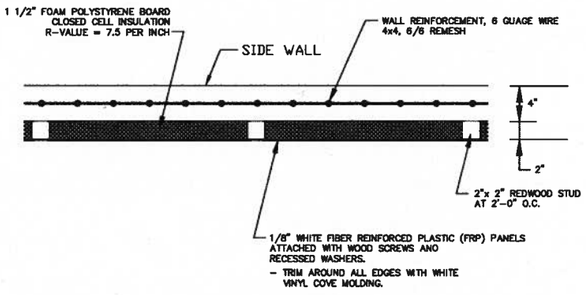
FLOOR CONNECTION
DETAIL B

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



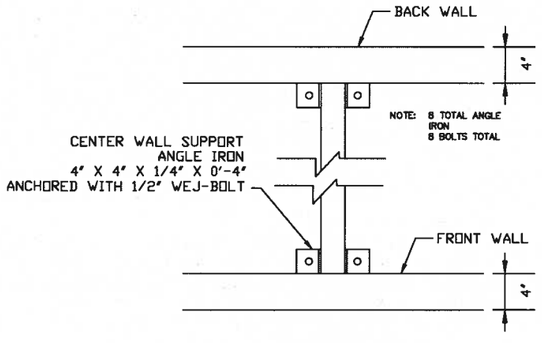
FRONT WALL

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

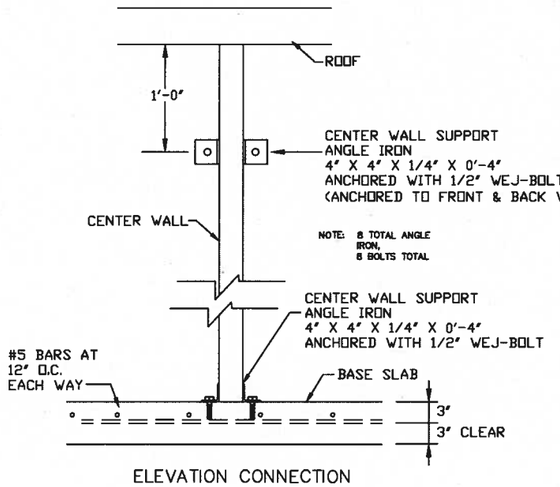


WALL PANEL
DETAIL C

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



PLAN CONNECTION
ANGLE IRON
AT CENTER WALL



ELEVATION CONNECTION
ANGLE IRON
AT CENTER WALL

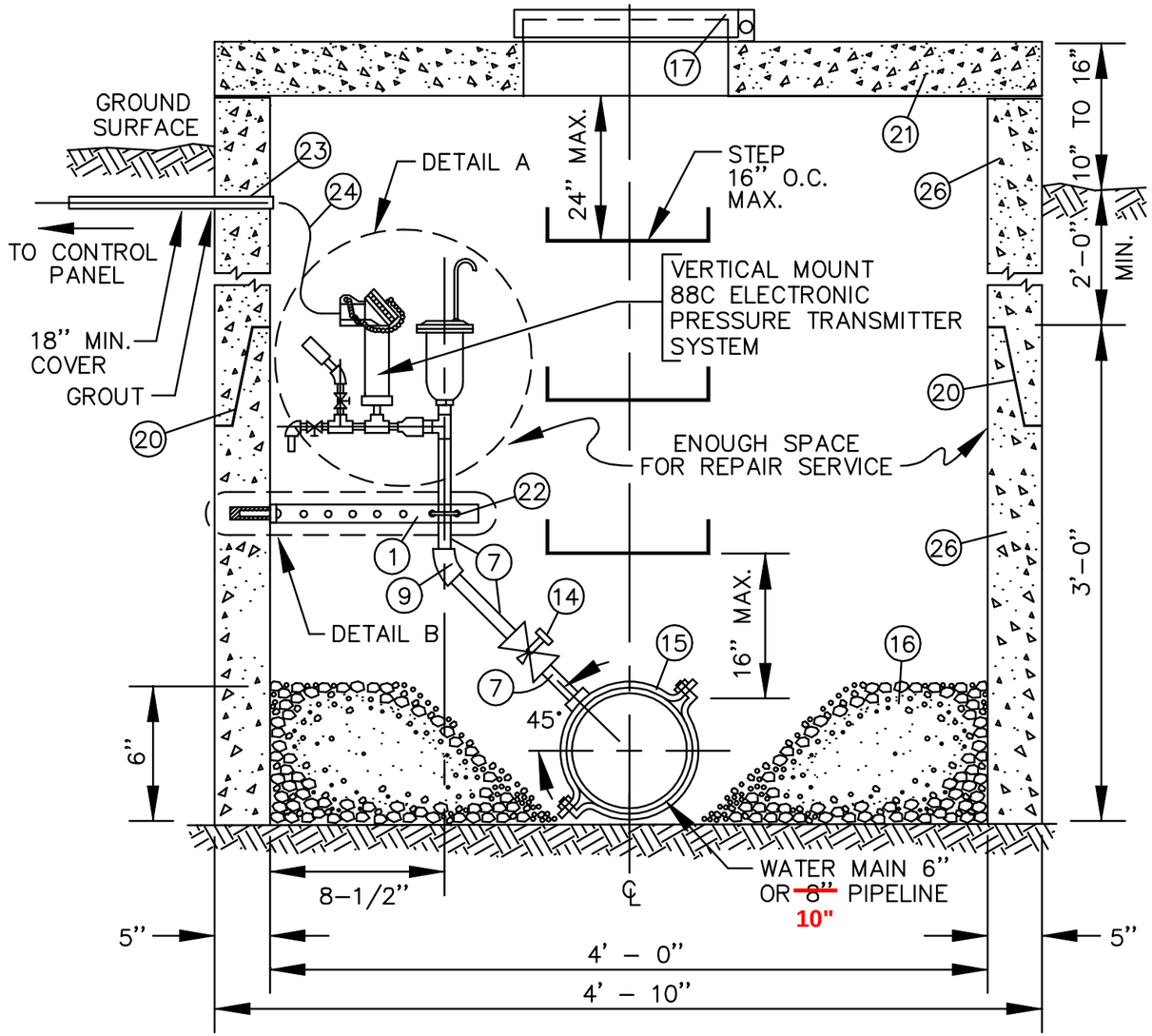
1	10/00	TITLE BLOCK CHANGE	W.S.
REVISION	DATE	DESCRIPTION	BY

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

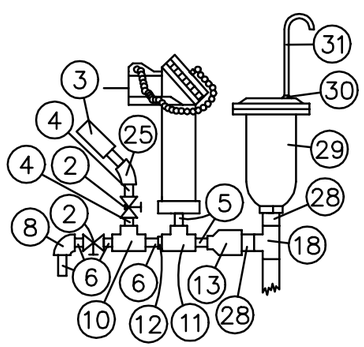


PROFILE VIEW: TANK VAULT ELECTRONIC TRANSMITTER PIPING SYSTEM

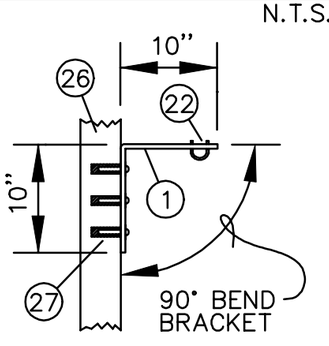
N.T.S.

ITEM	QUAN.	DESCRIPTION
1	1	BRACKET, SHELF 1 1/2"W. X 20"L. X 1/4" THK.
2	2	VALVE, PRESSURE COCK 1/4" IPT
3	1	GAUGE, PRESSURE 0-30 1/4" IPT
4	2	NIPPLES, 1/4" X CLOSE, G.I.
5	2	NIPPLES, 1/2" X CLOSE, G.I.
6	4	NIPPLES, 1/4" X 1 1/2"L.
7	*	NIPPLES, 1" G.I. PIPE
8	1	ELBOW, 90°, 1/4"
9	1	ELBOW, 45°, 1" G.I.
10	1	TEE, 1/4" X 1/4" X 1/4"
11	1	TEE, 1/2" X 1/2" X 1/2" G.I.
12	1	BUSHING, 1/2" X 1/4" G.I.
13	1	REDUCER, BELL, 1/2" X 1" G.I.
14	1	VALVE, GATE 1" BRONZE
15	1	SADDLE, BRONZE DOUBLE STRAPPED OR
		BANDED, 1" FIPT
16	6.3 cu.ft.	GRAVEL, CRUSH ROCK
17	1	MANHOLE COVER HINGE TYPE
18	1	TEE, 1" X 1" X 1", G.I.
19	1	CEMENT, NON-SHRINK, 50 LBS. BAG
20	2	SEAL MANHOLE JOINTS W/BITUMASTIC OR
		RAM-NEK GASKET
21	1	PRECAST MANHOLE 58" O.D. FLAT TOP
22	1	U-BOLT W/NUT, 1" X 1/4"
23	*	PVC, CONDUIT, 3/4"
24	*	WIRE
25	1	ELBOW, 45°, 1/4" G.I.
26	2	PRECAST MANHOLE, 48" I.D.
27	4±	NAILS, RED DEVIL W/LEAD
28	2	NIPPLES, 1" X CLOSE, G.I.
29	1	ARV, 1" IN X 1/2" OUT, (CRISPIN MODEL AR10)
30	1	ADAPTER, 1/2" MIPT X 1/2" COMP.
31	1	3/8" I.D. COPPER PIPE, 12"

* AS NEEDED



DETAIL A



DETAIL B

NOTES:

1. KEEP 88C ELECTRONIC TRANSDUCER 2' MIN. BELOW GROUND SURFACE.
2. GROUT ALL HOLES WITH NON-SHRINK CEMENT.
3. LOCATE VAULT WHERE PRESSURE IS SENSED FROM EITHER TANK.

REVISION	DATE	BRIEF	BY
1	7/99	STANDARDIZED	B.M.

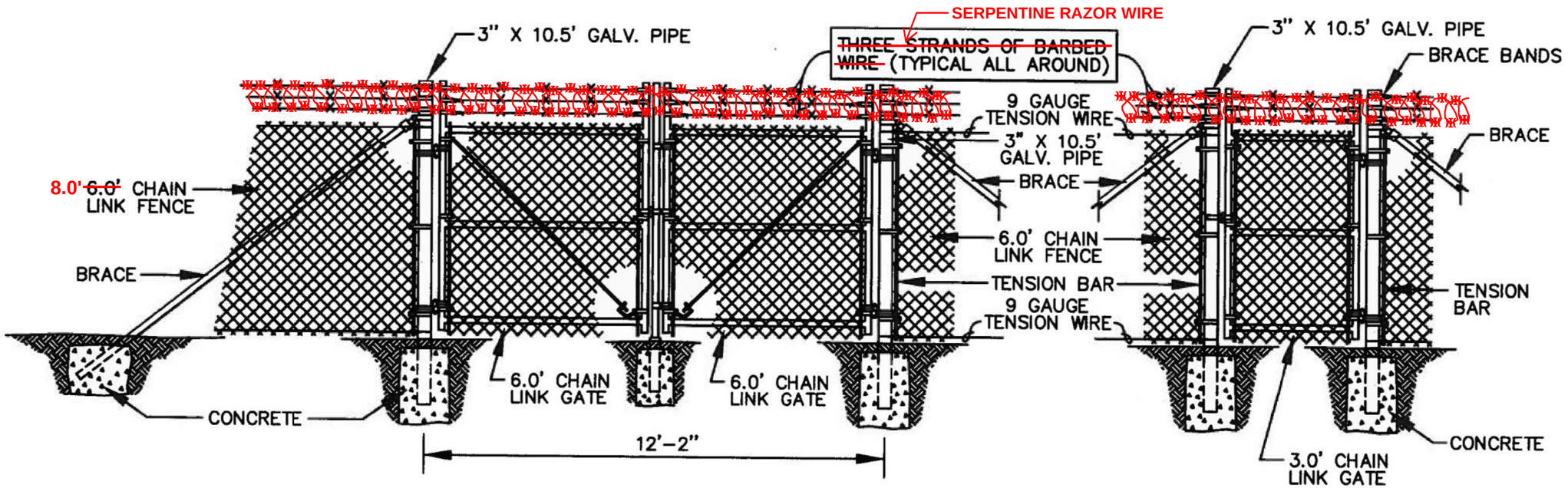
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

NAVAJO NATION,

STANDARD DRAWING NO. W-32 TANK VAULT ELECTRONIC TRANSMITTER PIPING SYSTEM

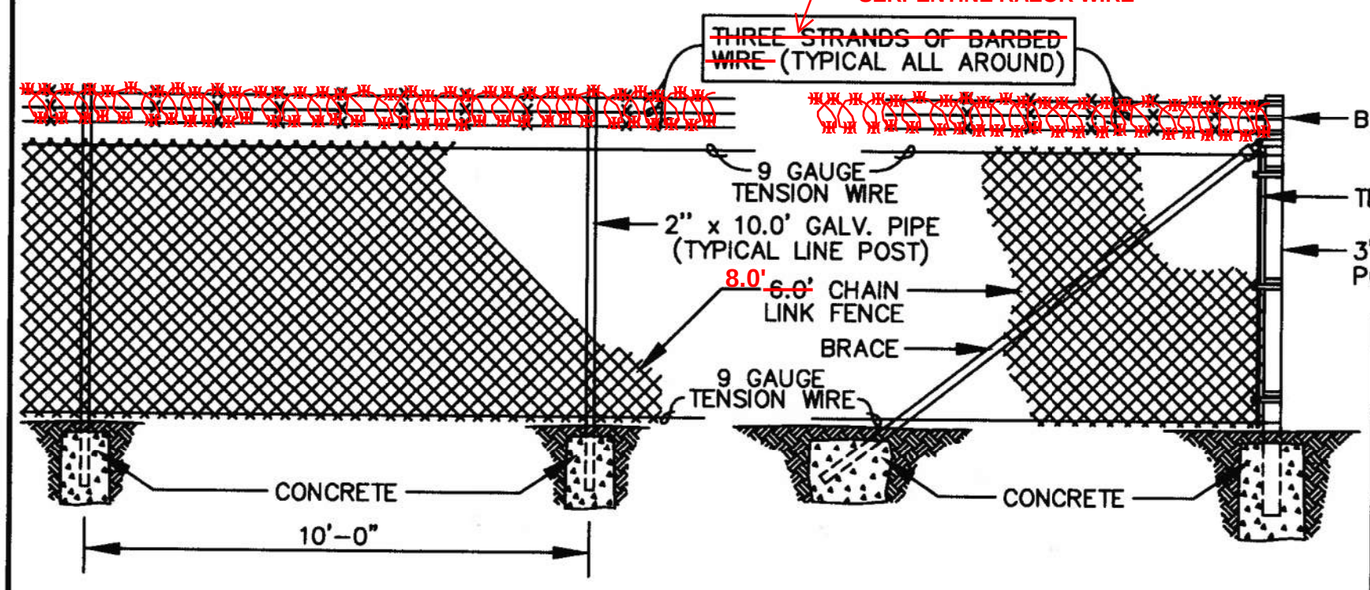
OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

DRAWN BY: L.S. DATE: 12/92	CHECKED BY: P.S. DATE: 12/92	APPR. BY: P.S. DATE: 12/92	AUTOCAD DRAWING



DOUBLE GATE DETAIL
NOT TO SCALE

SINGLE GATE DETAIL
NOT TO SCALE



LINE POST DETAIL
NOT TO SCALE

CORNER POST DETAIL
NOT TO SCALE

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

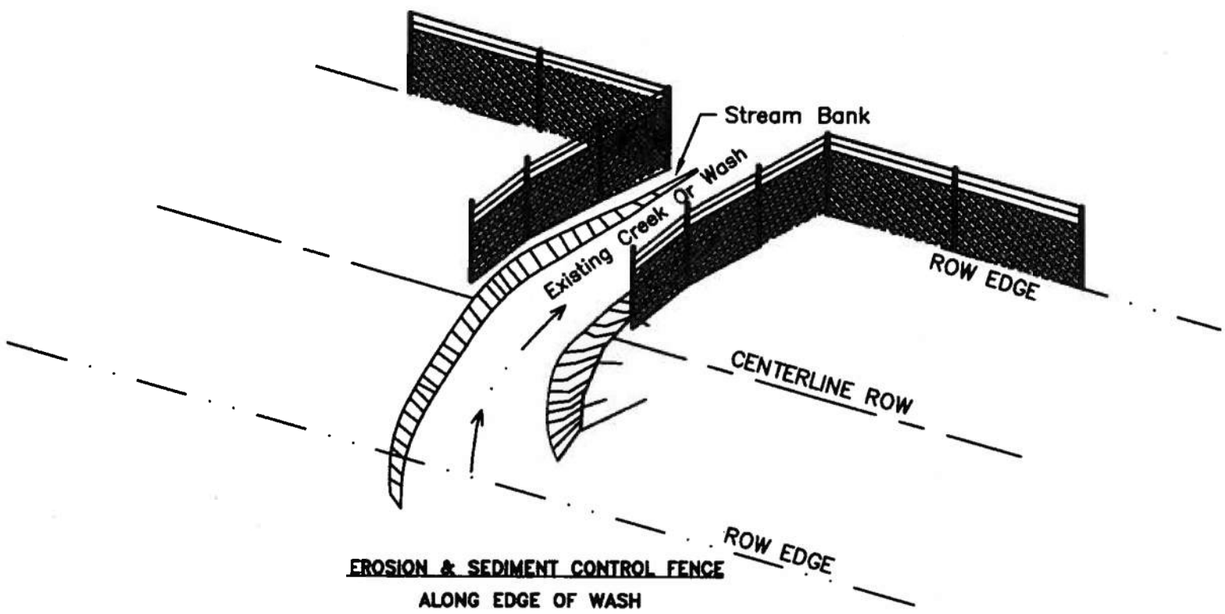
NAVAJO NATION,

STANDARD DRAWING NO. W-34
FENCE DETAIL FOR STORAGE TANK & PUMPHOUSE

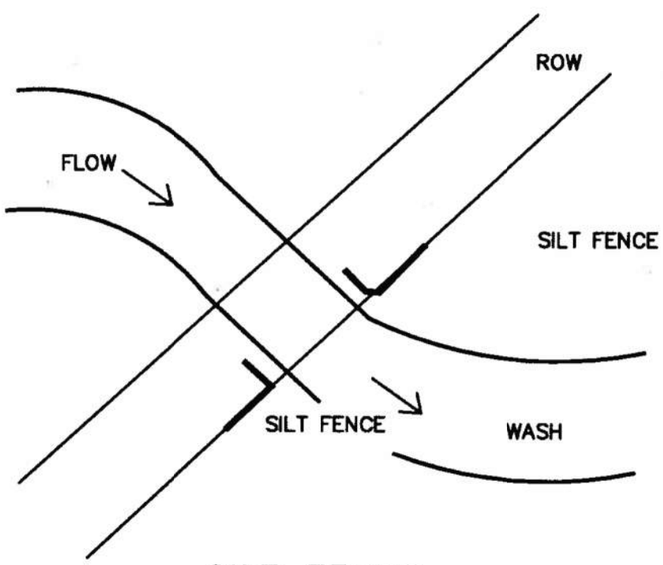
OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

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

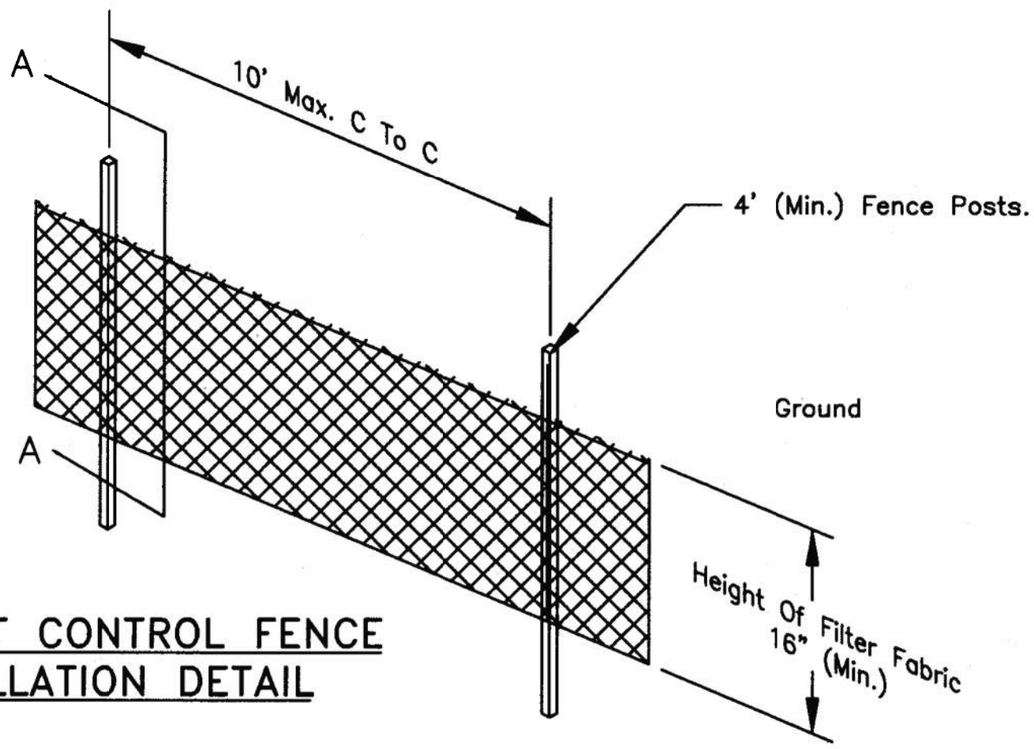
NAVAJO NATION

STANDARD DRAWING NO. W-39
SILT FENCE
DRAWING 1 OF 2

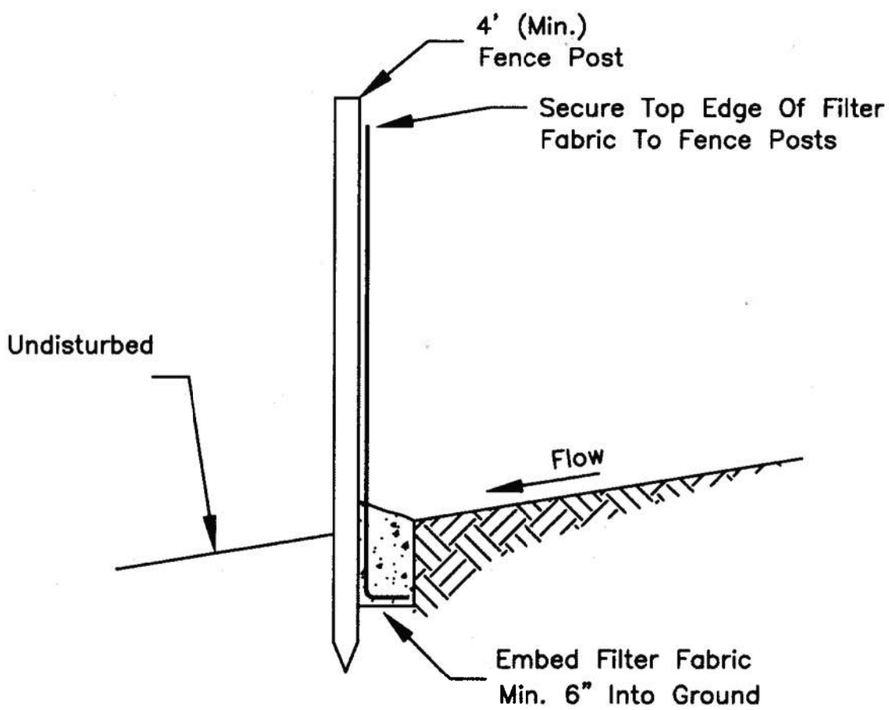
PUBLIC LAW 86-121

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

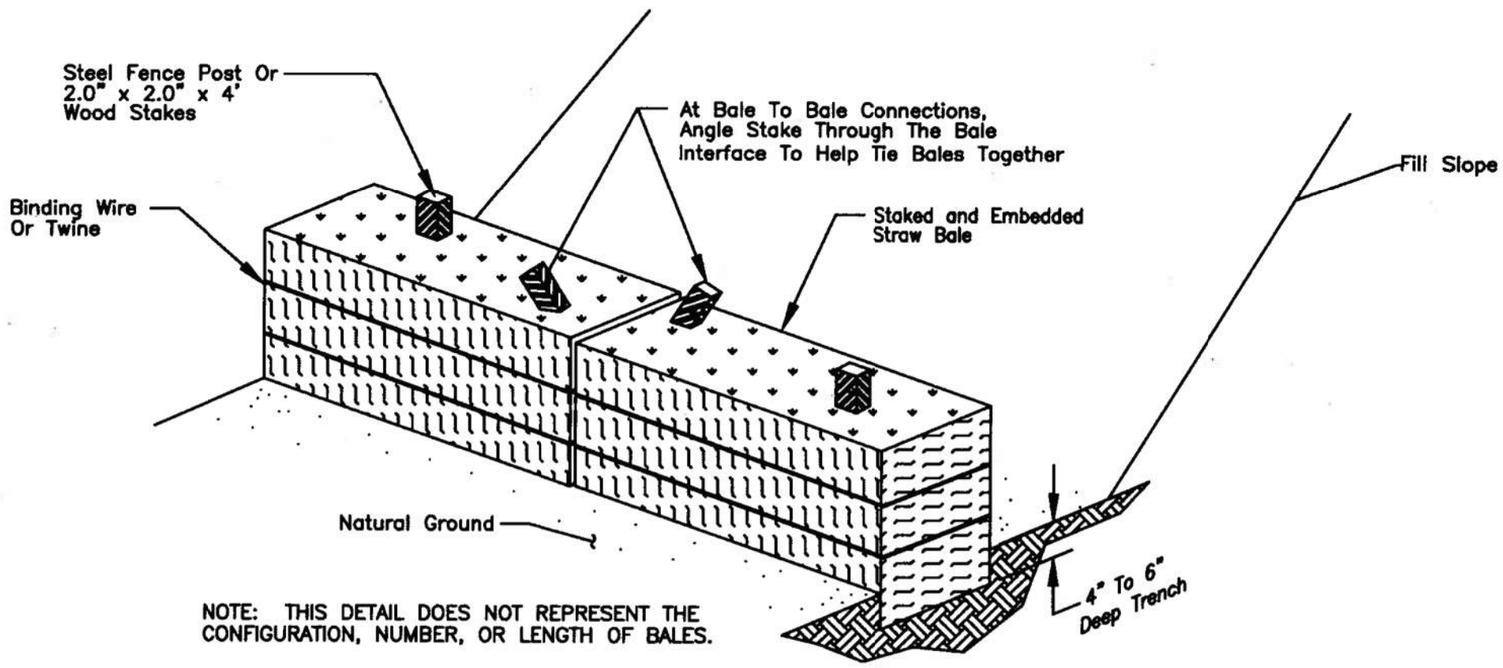
STANDARD DRAWING NO. W-39
SILT FENCE
DRAWING 2 OF 2

PUBLIC LAW 86-121

OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA OFFICE, WINDOW ROCK, ARIZONA

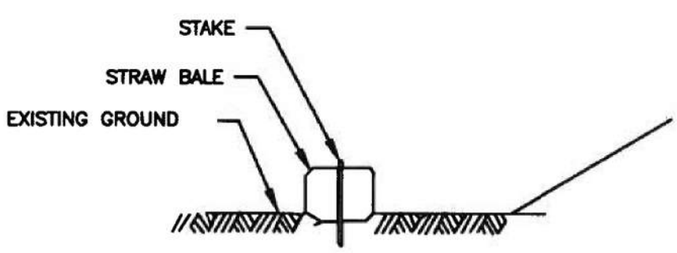
DRAWN BY: TL DATE: 9/01	CHECKED BY: RC DATE: 9/01	APPR. BY: DH DATE: 9/01	AUTOCAD DRAWING

STRAW BALE DETAILS
(For Check Dams to Retain Water and Sediment)

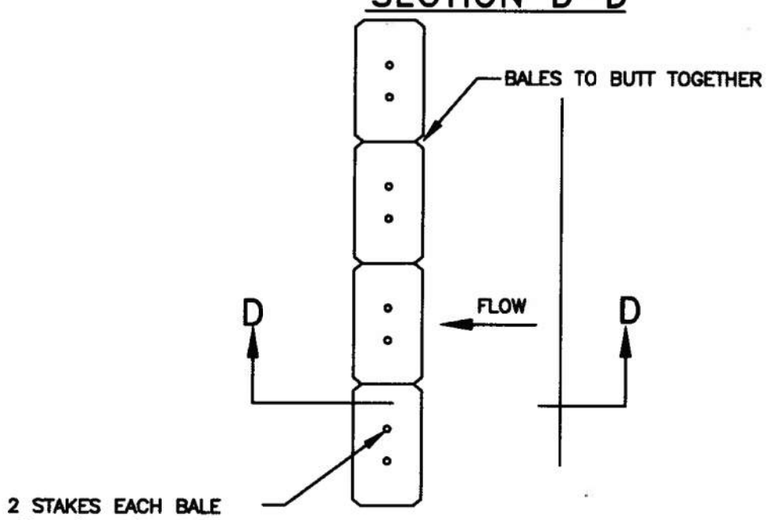


NOTE: THIS DETAIL DOES NOT REPRESENT THE CONFIGURATION, NUMBER, OR LENGTH OF BALES.

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	APPROVED DRAWING

NAVAJO TRIBAL UTILITY AUTHORITY
CONTROL PANEL LAYOUT

SCHEDULE OF DRAWINGS			
PAGE	FILENAME	TITLE	NOTES
1	DC_CV	COVERSHEET	SHEDULE OF DRAWINGS
2	DC_DIO	DISCRETE I/O	WIRING
3	DC_AIO	ANALOG I/O	WIRING
4	DC_PWR	POWER DISTRIBUTION	WIRING
5	DC_BP	BACKPLANE LAYOUT	BP W/ BOM
6	DC_CBL	COMM CABLES PINOUT	WIRING

SOLAR TANK CONTROL PANEL

NO.	DATE	DESCRIPTION	BY

NAVAJO TRIBAL UTILITY AUTHORITY

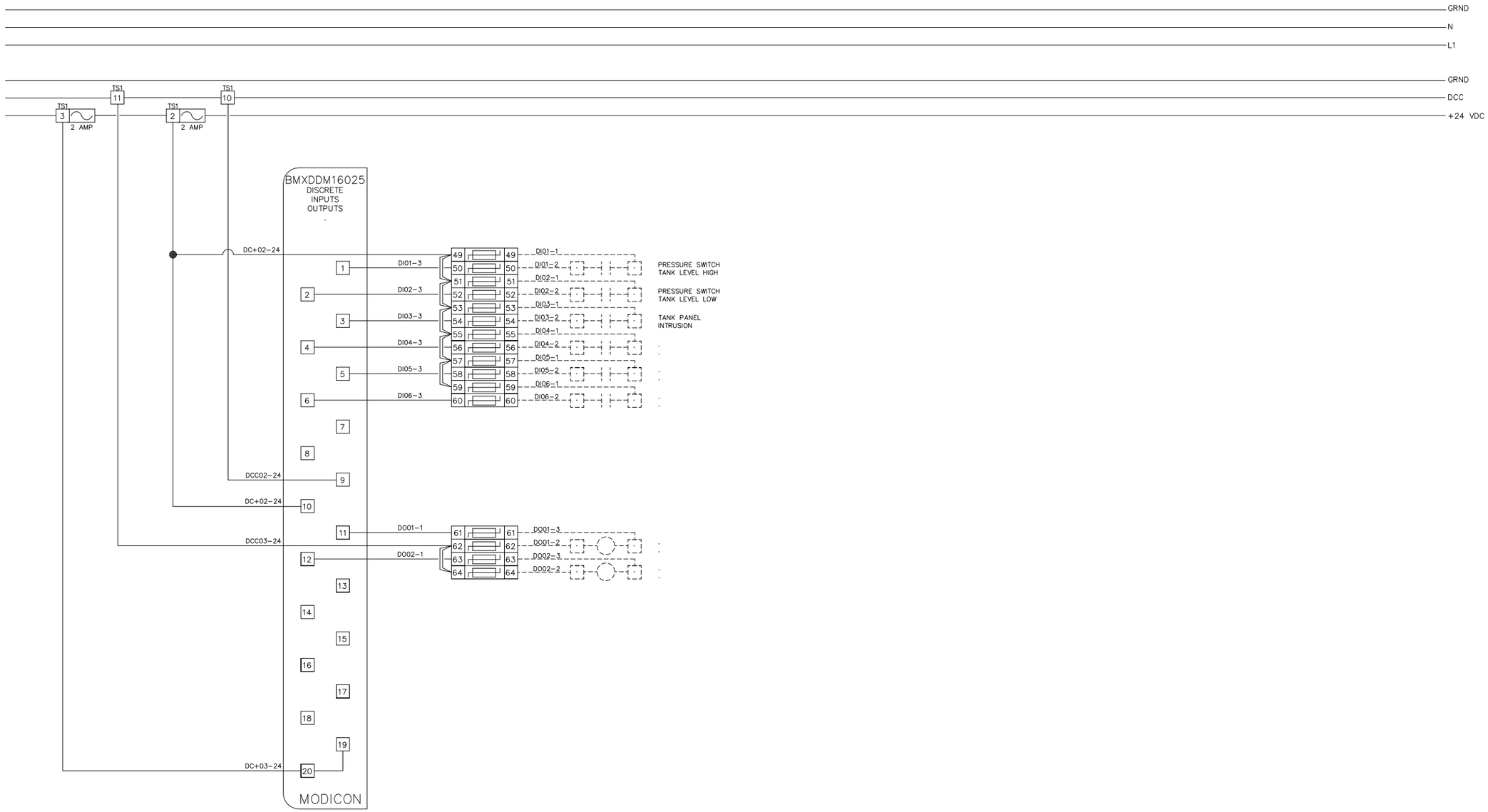
SCALE: NONE	REVISIONS	BY	DATE
DATE: .			
DR'N: CKD.			
AP'VD.			

TITLE: DC TANK 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	3/19	DWG UPDATES	NTUA

NAVAJO TRIBAL UTILITY AUTHORITY

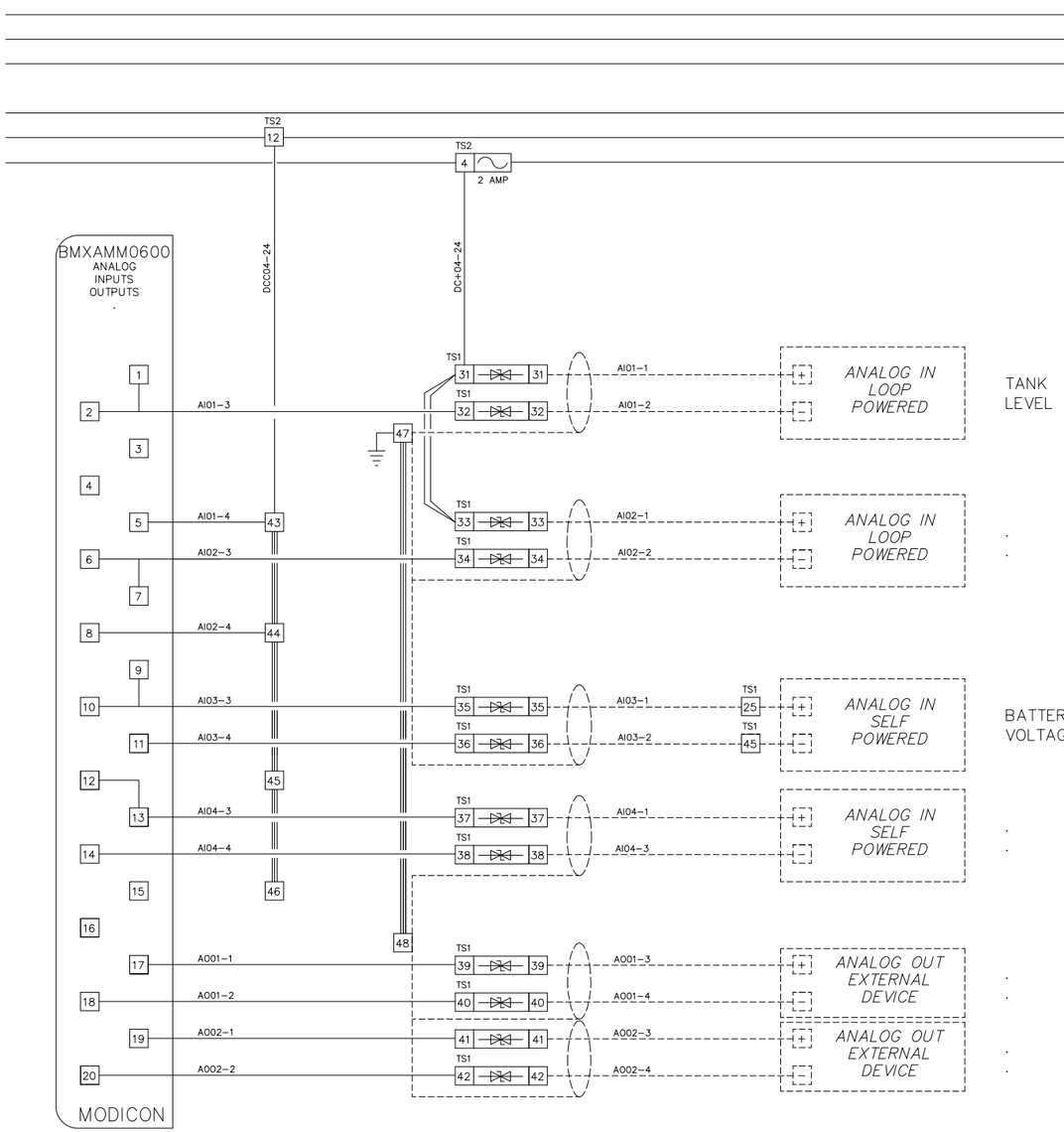
SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .	.		

TITLE DC TANK CONTROL PANEL
DISCRETE I/O

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	3/19	DWG UPDATES	NTUA

NAVAJO TRIBAL UTILITY AUTHORITY

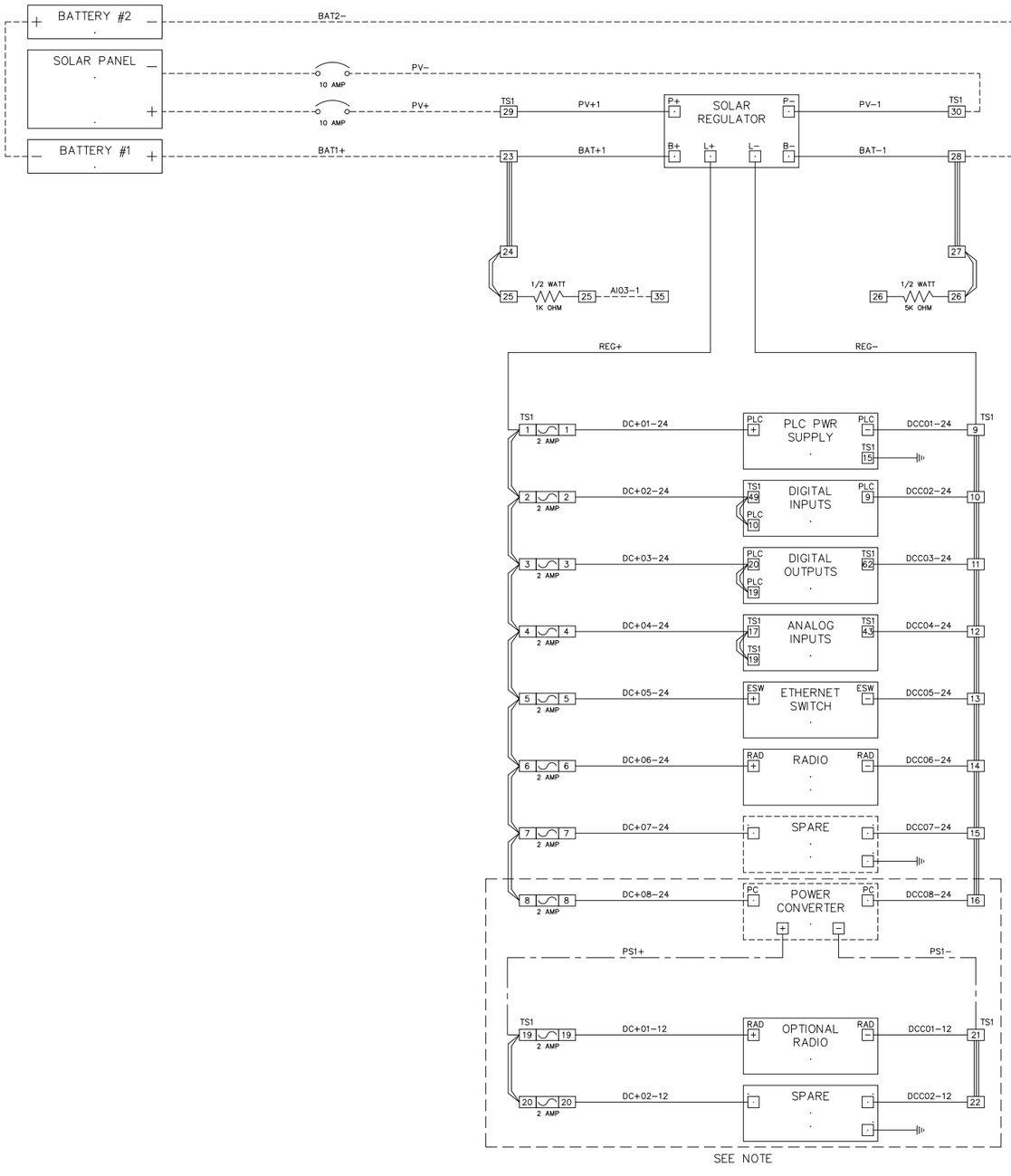
SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .			

TITLE: DC TANK CONTROL PANEL
ANALOG I/O

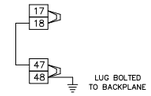
W.O.#

SHEET 3 OF 6

DC DISTRIBUTION



GRND



NOTE: SEE OPTIONS BELOW IF ADDITIONAL RADIO IS REQUIRED, IMPLEMENT ONE OF THE TWO OPTIONS BELOW. OTHERWISE, THIS AREA CAN BE LEFT VACANT FOR ANY FUTURE POWER REQUIREMENTS:

OPTION #1; WHEN INSTALLING A 24 VDC RADIO, RADIO SHALL BE WIRED DIRECTLY TO TERMINALS 7 & 14 ON TS1.
OPTION #2; WHEN INSTALLING A 12–13.8 VDC RADIO, PROVIDE DC/DC CONVERTER POWERED BY TERMINALS 7 & 14 ON TS1, THEN WIRE RADIO DIRECTLY TO THE DC/DC CONVERTER.

LEGEND

Field Terminations ----------

Panel Wiring ——————

Optional Wiring — - — - —

NO.	DATE	DESCRIPTION	BY
01	3/19	DWG UPDATES	NTUA

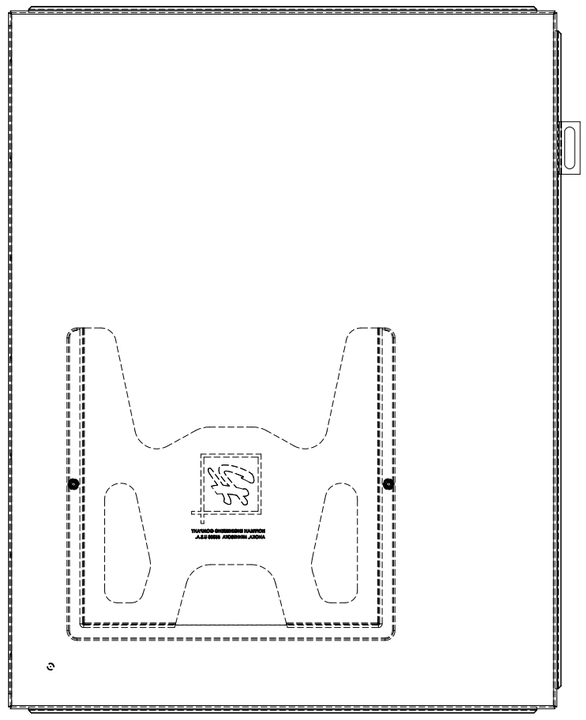
NAVAJO TRIBAL UTILITY AUTHORITY

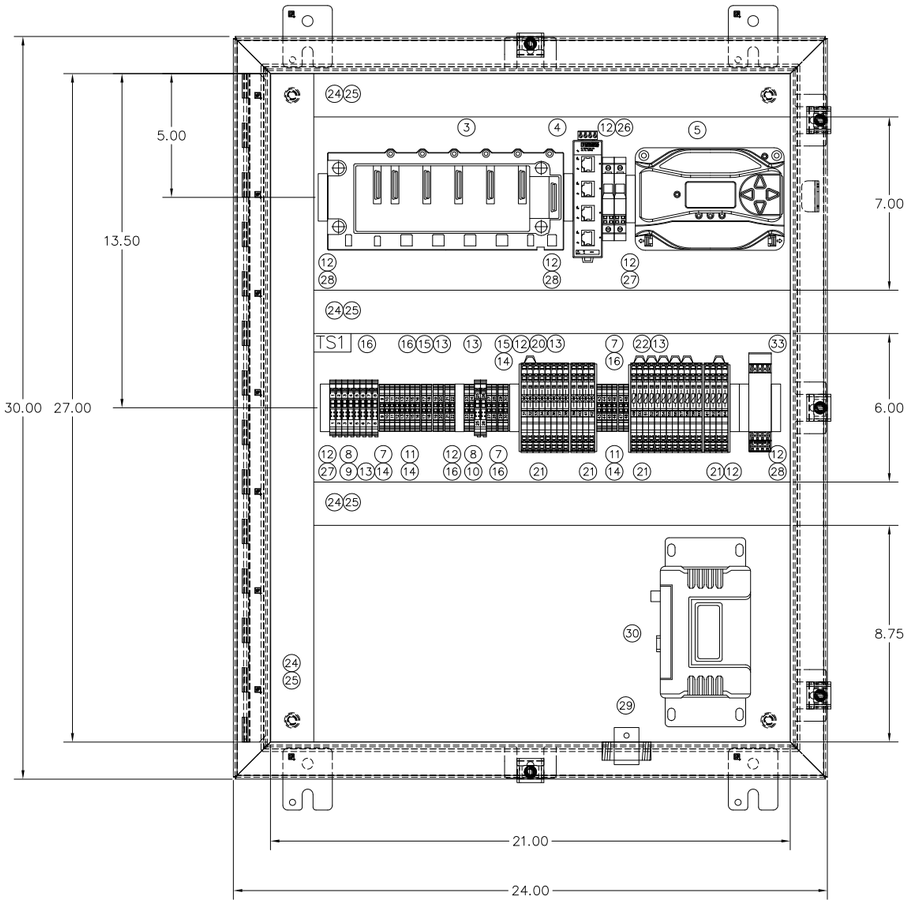
SCALE:		REVISIONS	BY	DATE
DATE:				
DR'N.	CK'D.			
AP'VD.				

TITLE: DC TANK CONTROL PANEL
POWER DISTRIBUTION

W.O.#

SHEET 4 OF 6





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	SCHNEIDER ELECTRIC
3a	1	BMXXBP0400	4–SLOT RACK MODULE	SCHNEIDER ELECTRIC
3b	1	BMXCPS3020	POWER SUPPLY MODULE	SCHNEIDER ELECTRIC
3c	1	BMXP342020	CPU PROCESSOR MODULE	SCHNEIDER ELECTRIC
3d	1	BMXDDM16025	DIGITAL INPUT/OUTPUT MODULE	SCHNEIDER ELECTRIC
3e	1	BMXAMM0600	ANALOG INPUT/OUTPUT MODULE	SCHNEIDER ELECTRIC
3f	2	BMXFTB2010	REMOVABLE CONNECTION BLOCK – SCREW CLAMP	SCHNEIDER ELECTRIC
3g*	1	BMXNOM0200	SERIAL LINK MODULE	SCHNEIDER ELECTRIC
4	1	FL SWITCH SFN 5TX	INDUSTRIAL ETHERNET SWITCH	PHOENIX CONTACT
5	1	PS–30M (GEN3)	SOLAR CHARGE CONTROLLER	MORNING STAR
6	.	.	.	.
7	17	UT2,5	UT2,5 TERMINALS	PHOENIX CONTACT
8	10	UT4TG	FUSE TERMINAL BASE	PHOENIX CONTACT
9	7	P–FU5X20LED24	FUSE PLUG	PHOENIX CONTACT
10	2	P–CO #3036796	COMPONENT CONNECTOR	PHOENIX CONTACT
11	4	UT2,5PE	GROUNDING TERMINAL	PHOENIX CONTACT
12	10	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	8	D–UT2,5/10	END COVER	PHOENIX CONTACT
16	8	ATP–UT	PARTITION PLATES	PHOENIX CONTACT
17	2	.	.	.
18	2	.	.	.
19	2	.	.	.
20	8	TTC–6–TVSD–C–24DC–UT–I	SURGE PROTECTION #2906831	PHOENIX CONTACT
21	1	TTC–6–LCP #2908729	END COVER	PHOENIX CONTACT
22	16	TTC–6–MOV–C–24DC–UT–I	SURGE PROTECTION #2906837	PHOENIX CONTACT
23	.	.	.	.
24	AN	F2X4LG6	TYPE F NARROW SLOT WIRING DUCT	PANDUIT
25	AN	C2LG6	WIRING DUCT COVER	PANDUIT
26	2	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	1	CAT6	CABLE – PLC TO HMI	BELDEN
32*	1	.	CABLE – PLC TO MODEM (TO LENGTH)	.
33*	1	MINI–PS–12–24 DC/5–15/2	DC/DC CONVERTER	PHOENIX CONTACT

AN – As needed
3* – BOM – To include items 3a–3g.
3g* – Include in the event item 33* is required.
32* – Include (1) additional in the event item 33* is required.
33* – Include in the event a 13.8 VDC radio is required.

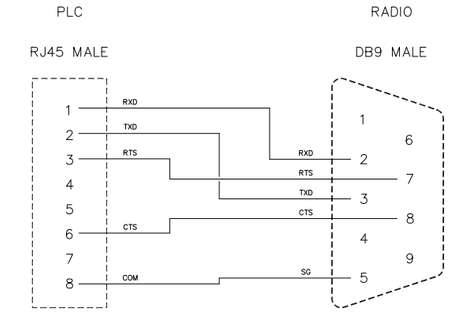
NO.	DATE	DESCRIPTION	BY
01	3/19	DWG UPDATES	NTUA

NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DR'N. . CKD. .	.	.	.
APV'D. .			

TITLE: DC TANK CONTROL PANEL
BACKPLANE

W.O.#



A CABLE DIAGRAM: PLC TO RADIO

NO.	DATE	DESCRIPTION	BY
01	3/19	DWG UPDATES	NTUA

NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DR'N. . CKD. .	.	.	.
APV'D. .			

TITLE DC TANK CONTROL PANEL
CABLE PINOUT

W.O.#

SHEET 6 OF 6

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

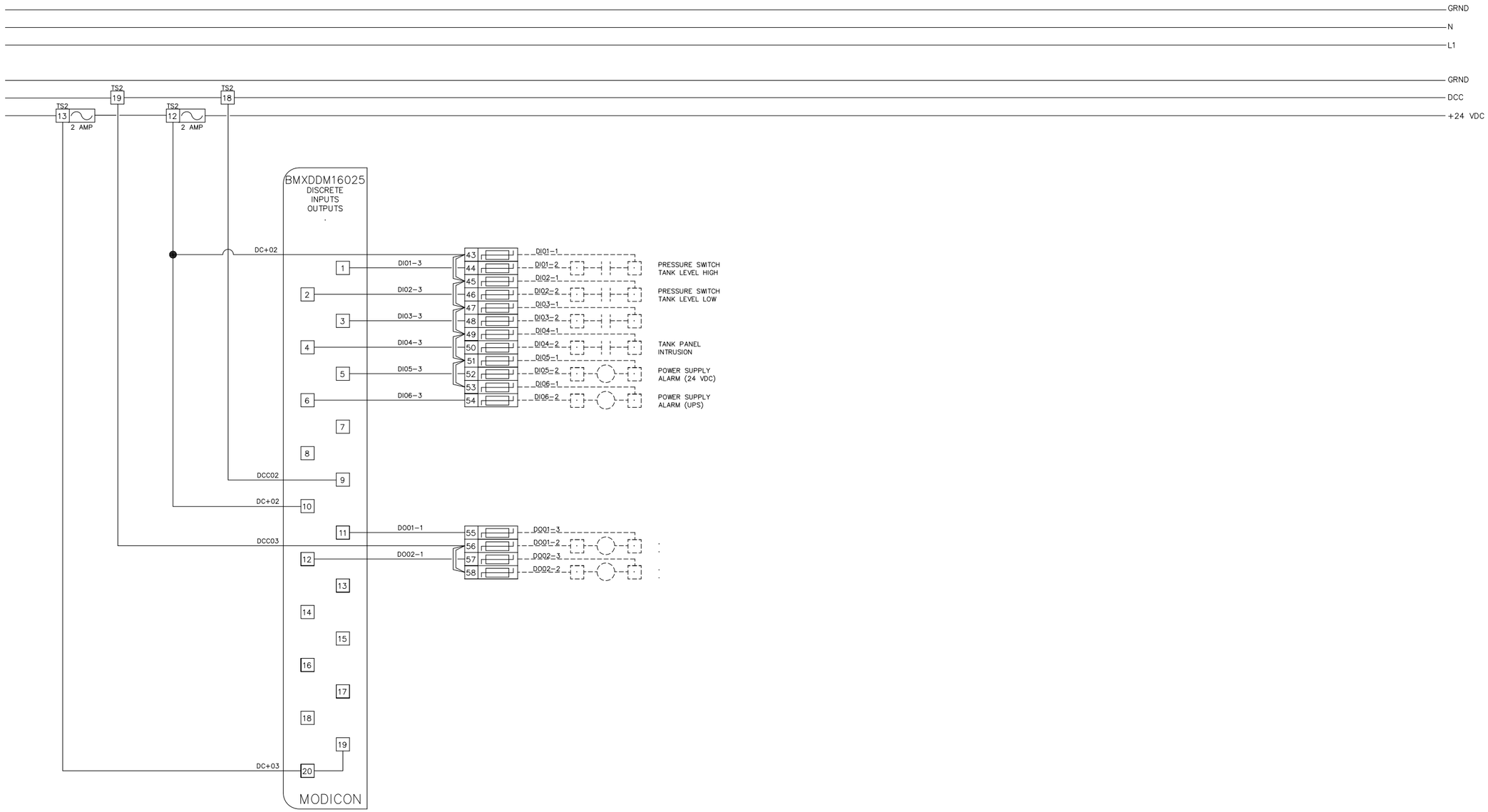
SCALE: NONE	REVISIONS	BY	DATE
DATE:			
DR'N: CKD.			
AP'VD.			

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

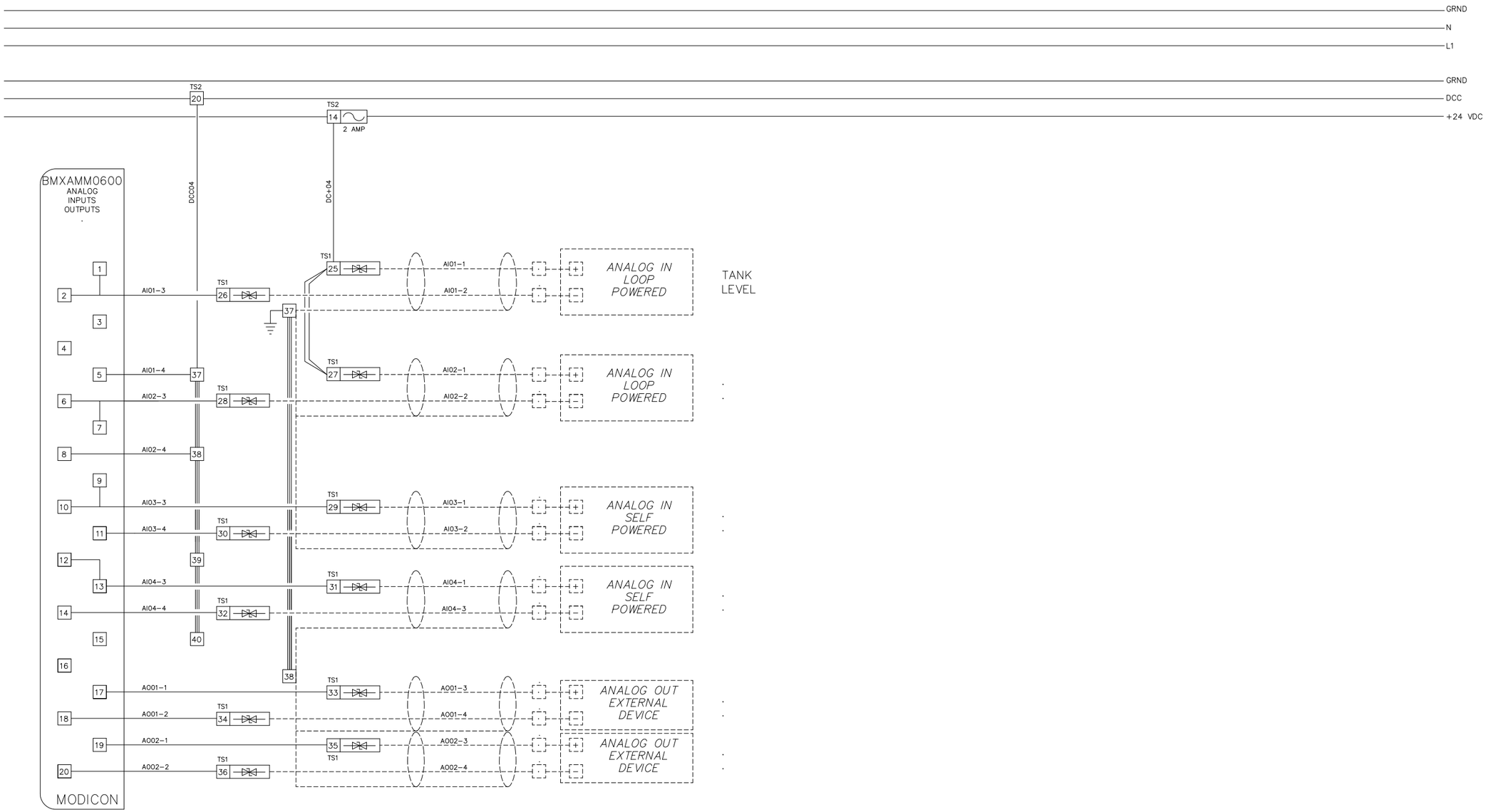
NAVAJO TRIBAL UTILITY AUTHORITY

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

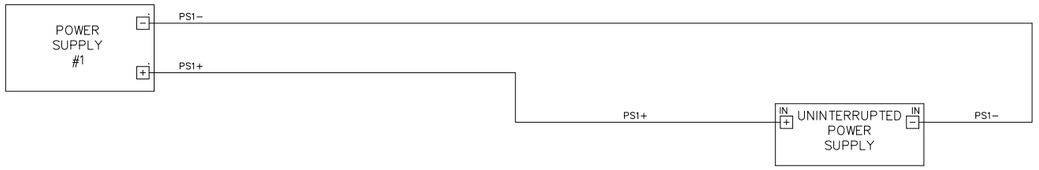
SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .			

TITLE: AC TANK CONTROL PANEL
ANALOG I/O

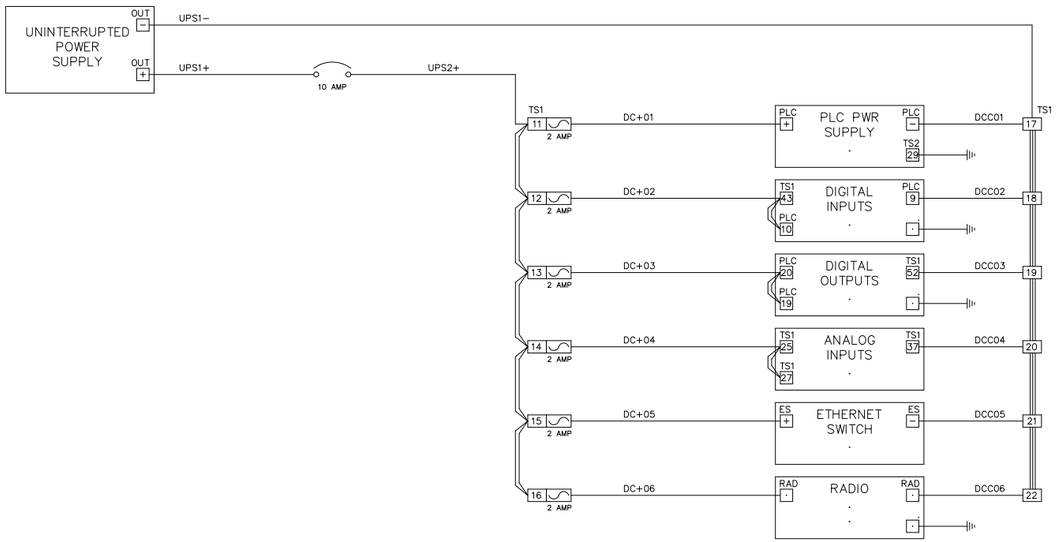
W.O.#

SHEET 3 OF 6

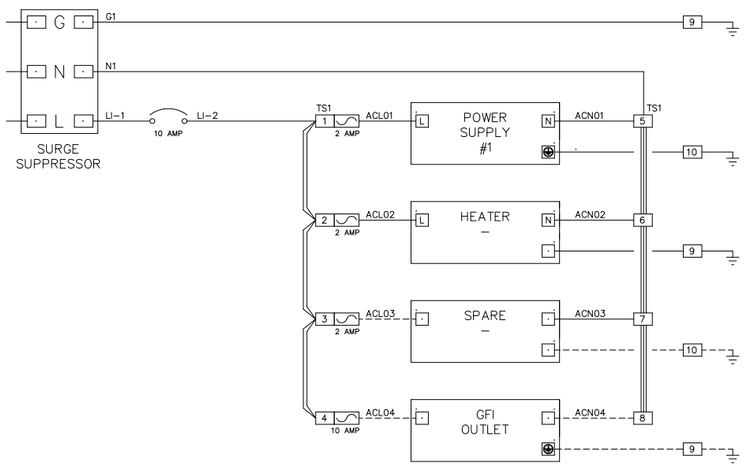
24VDC DISTRIBUTION



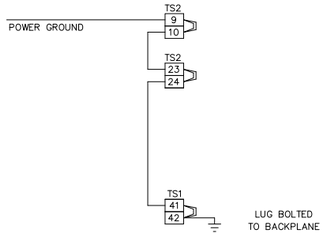
24VDC DISTRIBUTION (UPS)



120VAC DISTRIBUTION



GRND



LEGEND

Field Terminations ----------

Panel Wiring _____

NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

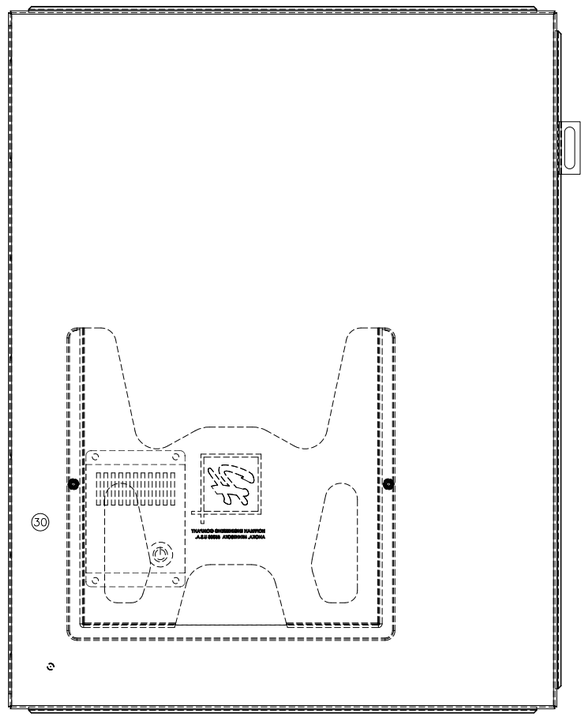
NAVAJO TRIBAL UTILITY AUTHORITY

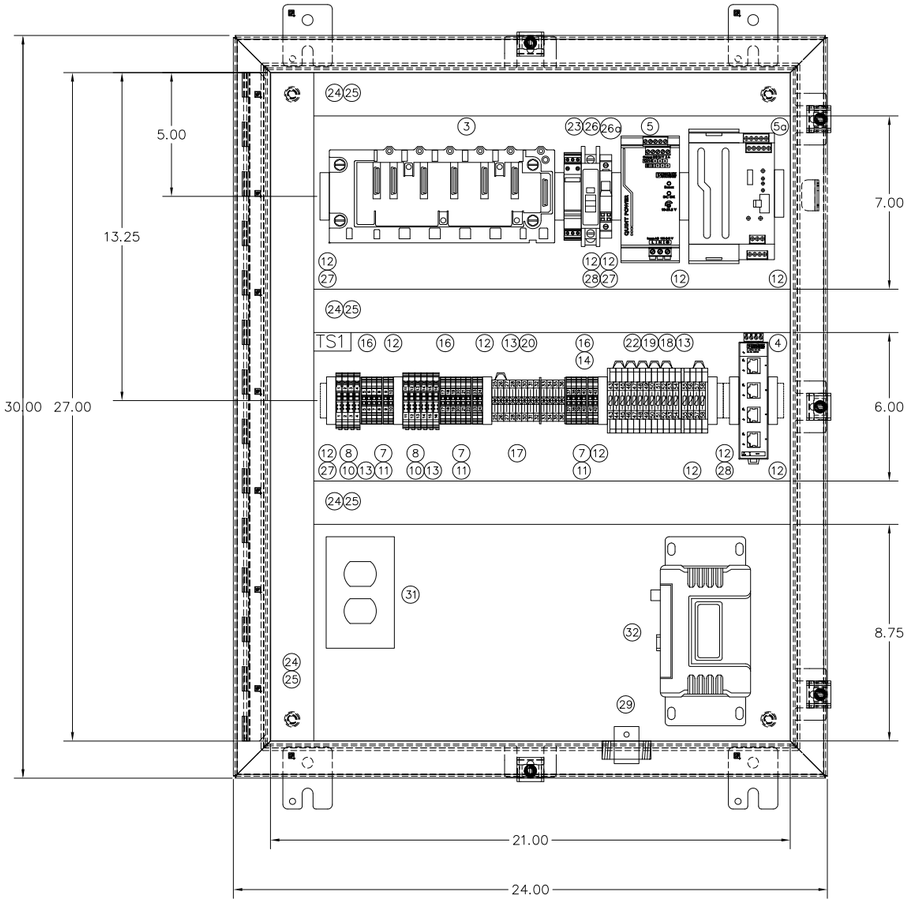
SCALE: .	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APV'D. .			

TITLE AC TANK CONTROL PANEL
POWER DISTRIBUTION

W.O.#

SHEET 4 OF 6





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.

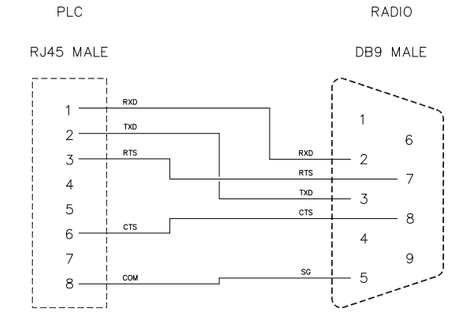
NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

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

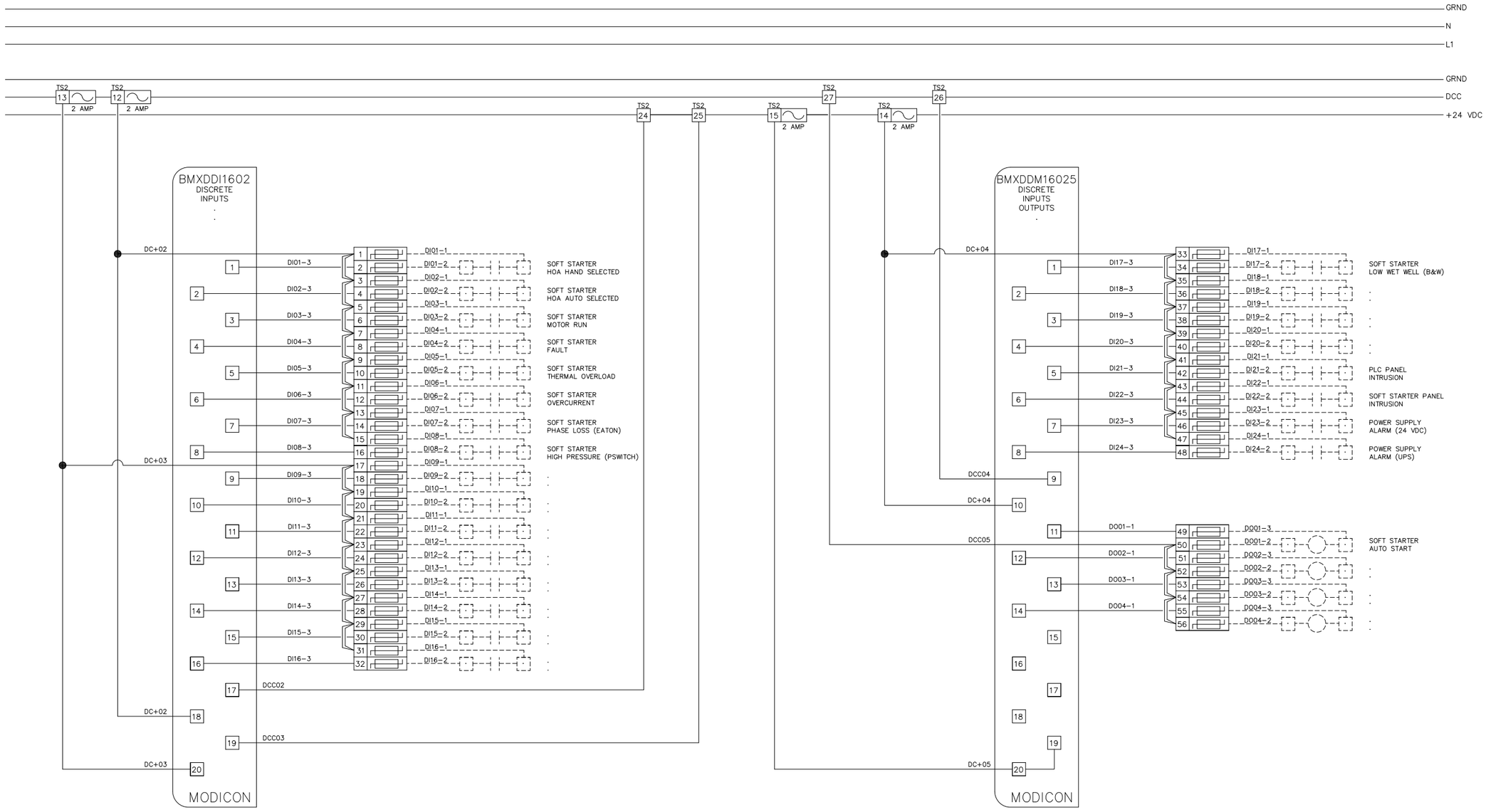
SCALE: NONE	REVISIONS	BY	DATE
DATE:			
DR'N: CKD:			
APV'D:			

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

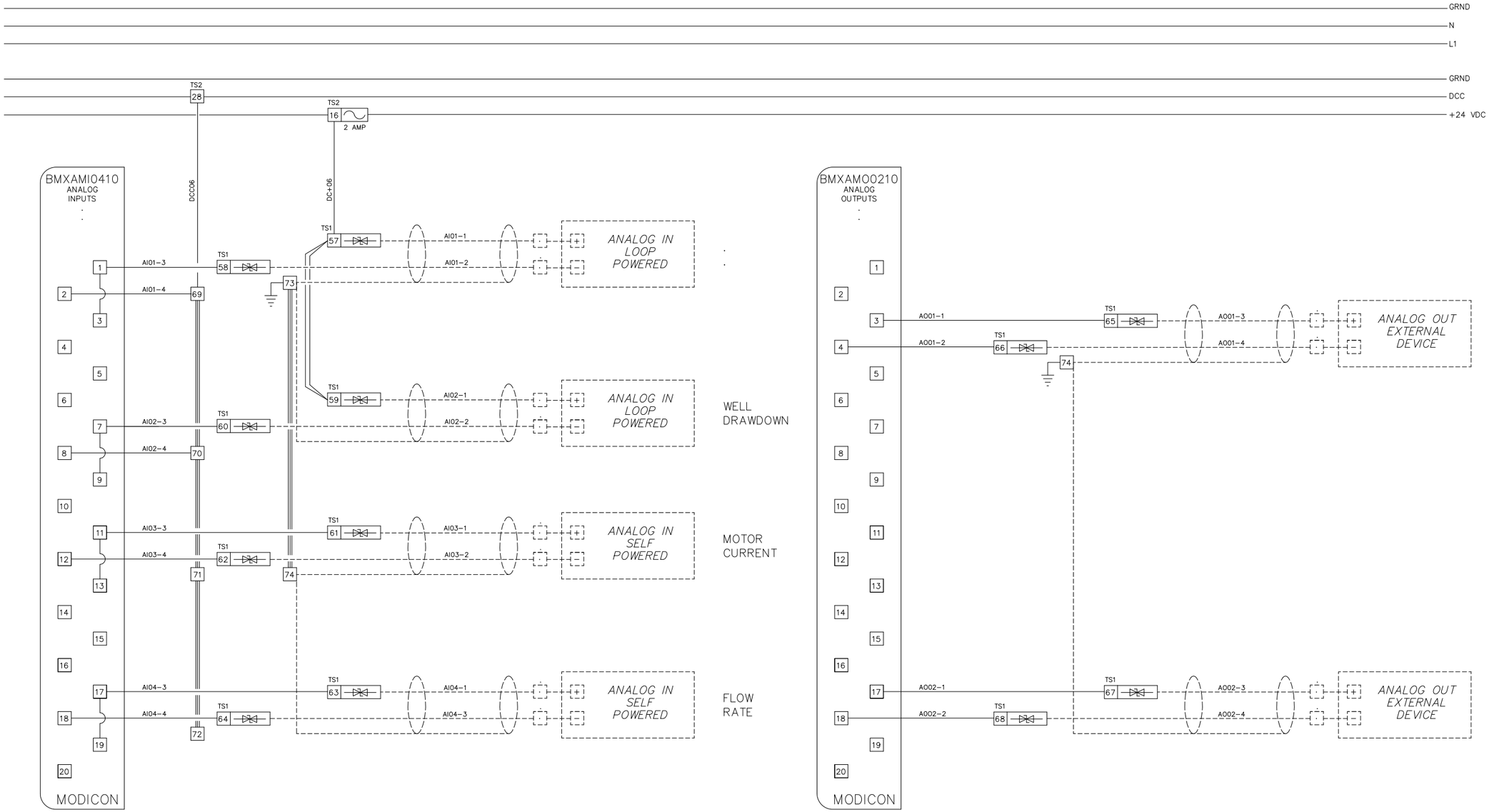
SCALE:	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .			

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

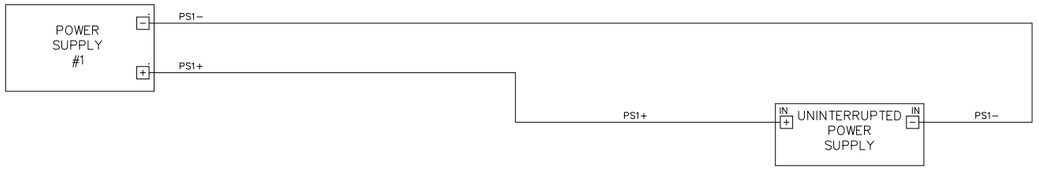
NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN: . CKD: .	.	.	.
APVD: .			

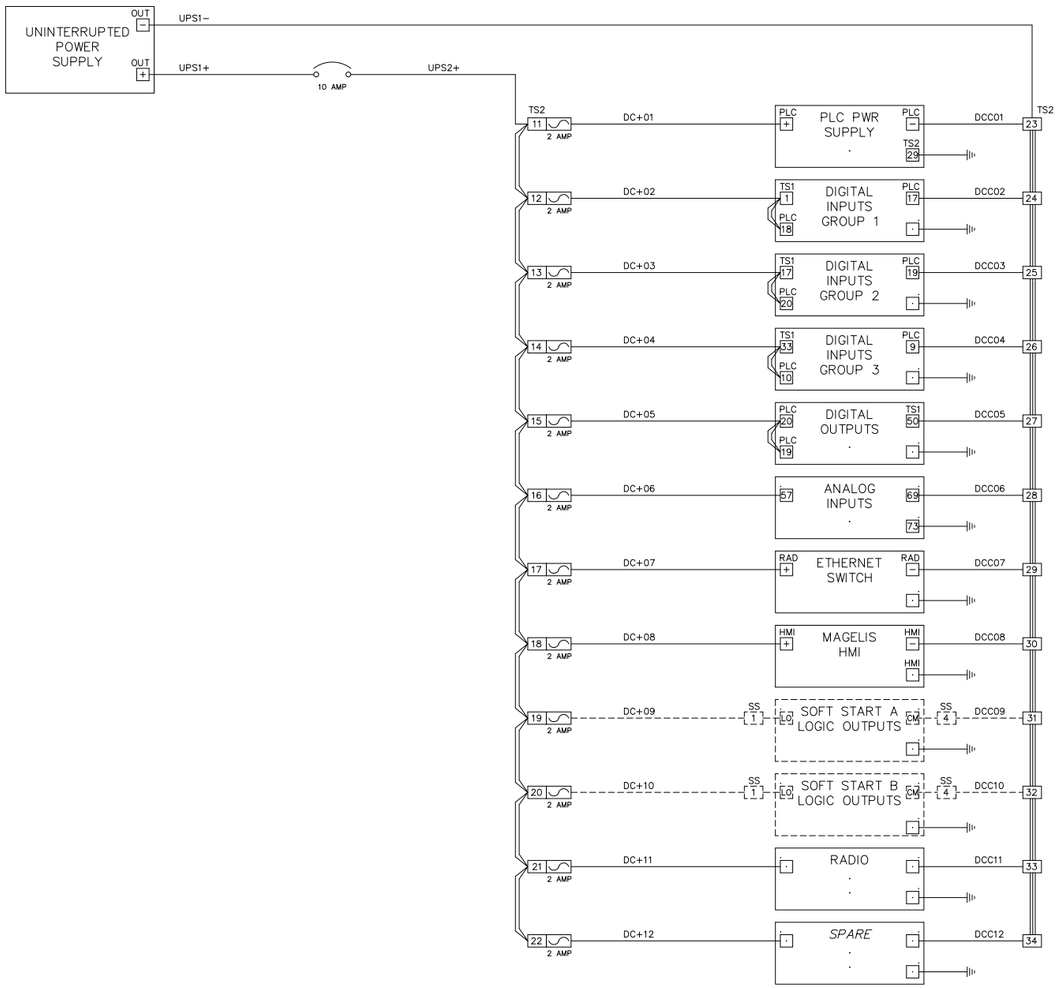
TITLE: PLC CONTROL PANEL
ANALOG I/O
(SIMPLEX WELL WITH SOFT STARTER)

W.O.#

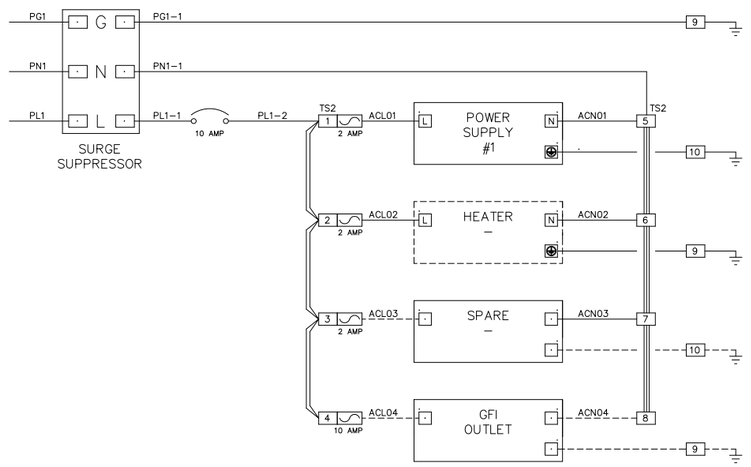
24VDC DISTRIBUTION



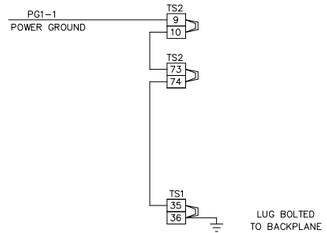
24VDC DISTRIBUTION (UPS)



120VAC DISTRIBUTION



GRND



LEGEND

Field Terminations ----------

Panel Wiring _____

NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

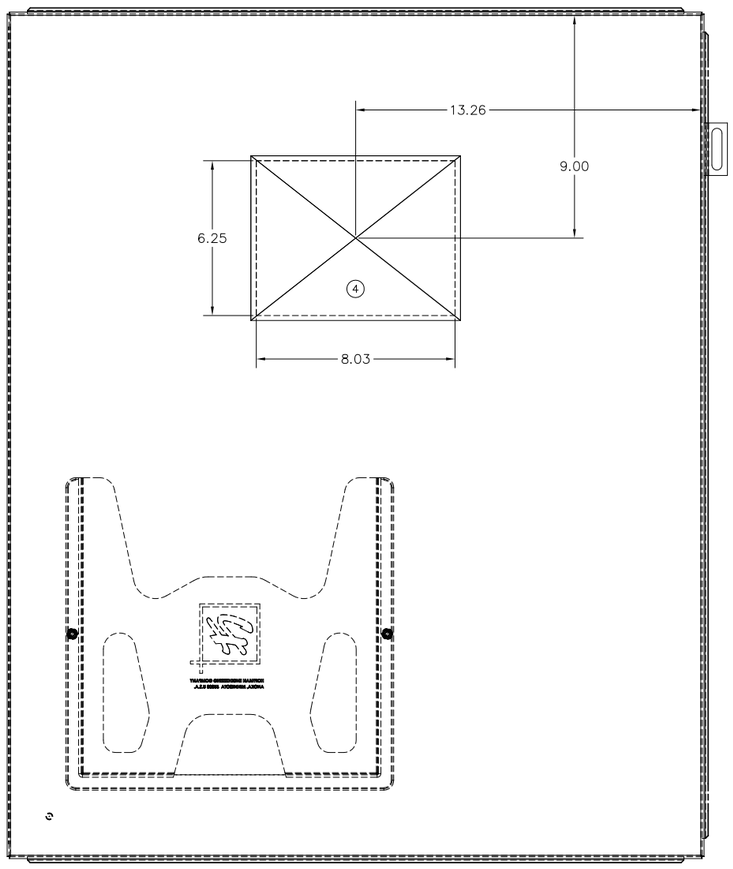
NAVAJO TRIBAL UTILITY AUTHORITY

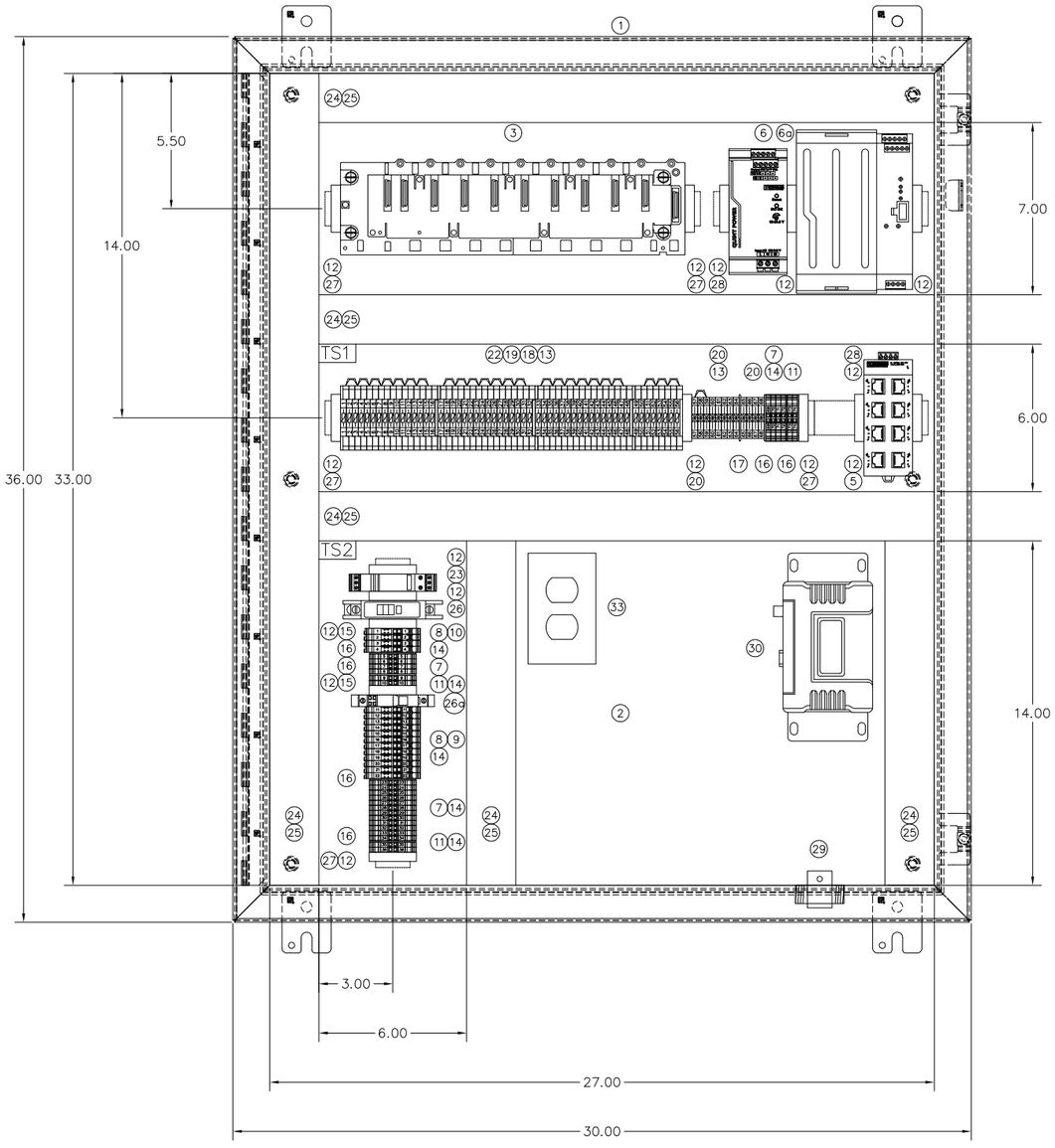
SCALE: .	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .			

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.

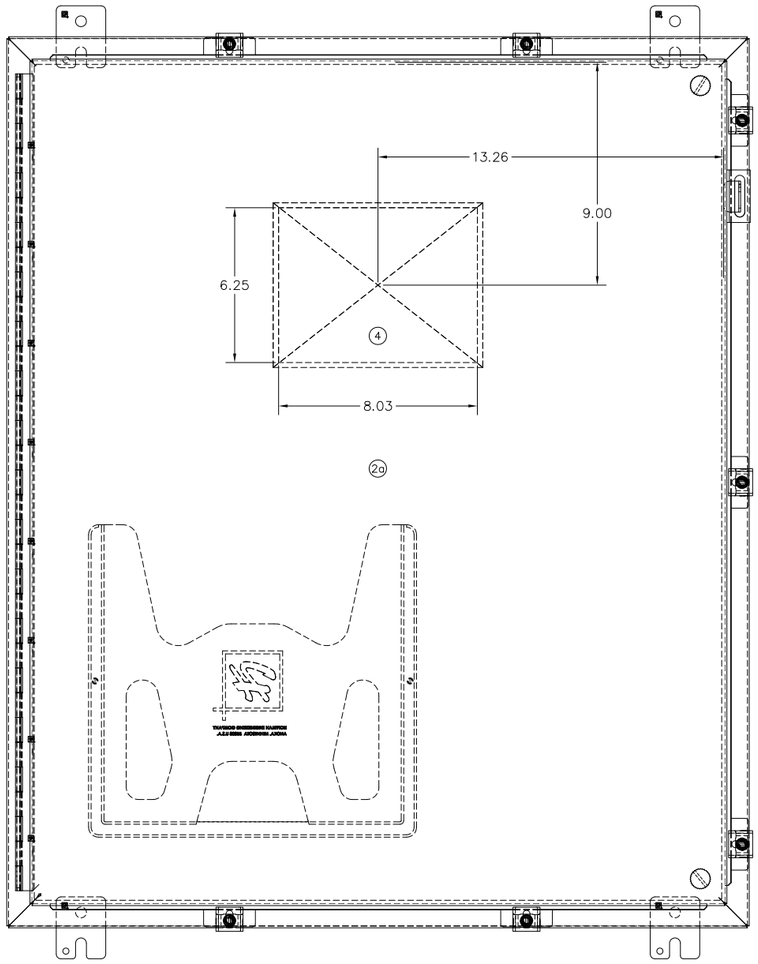
NO.	DATE	DESCRIPTION	BY
01	12/16	DWG UPDATES	NTUA

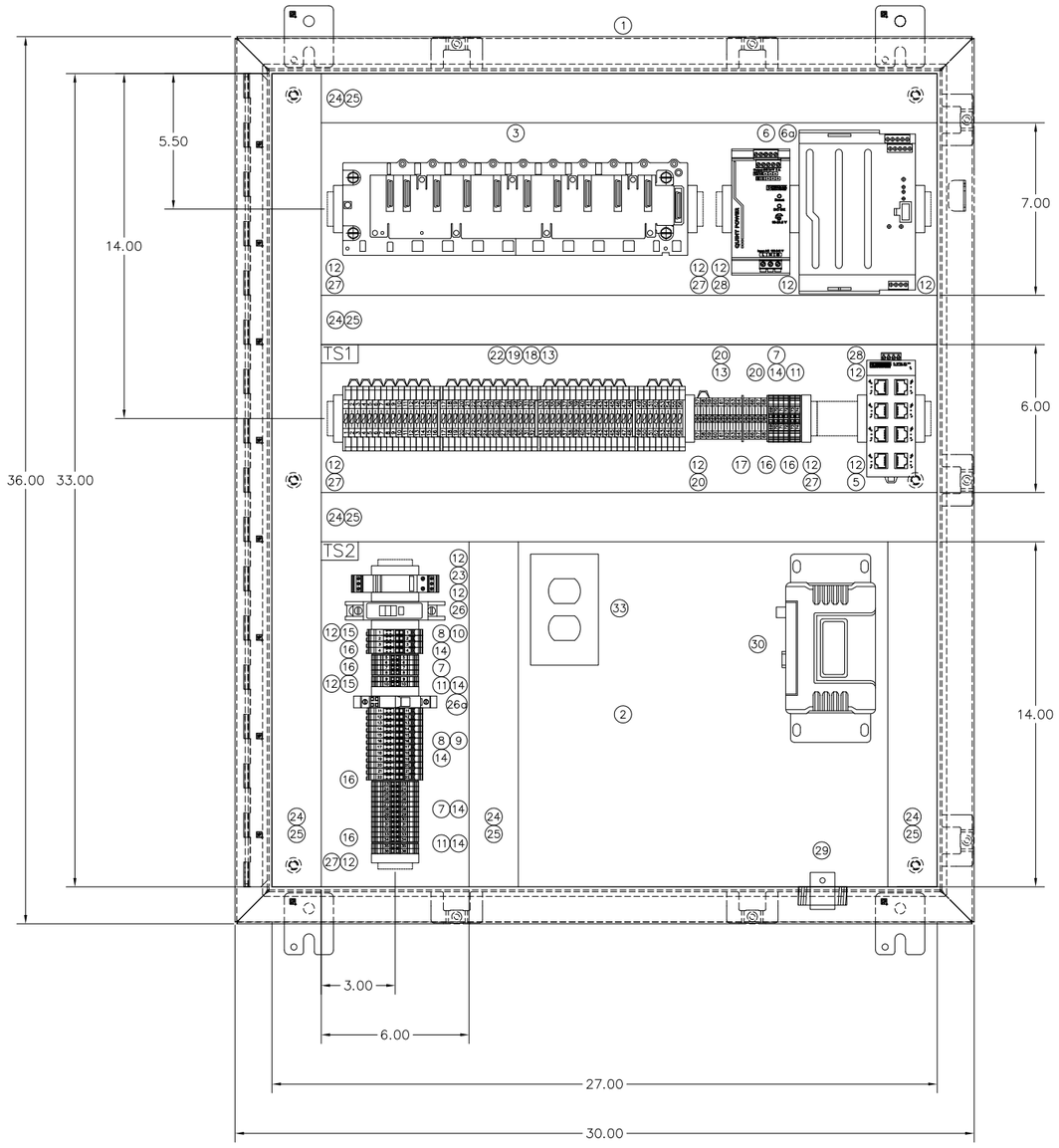
NAVAJO TRIBAL UTILITY AUTHORITY

SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .			

TITLE: PLC CONTROL PANEL
BACKPLANE

W.O.#





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 GRAPHIIC 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

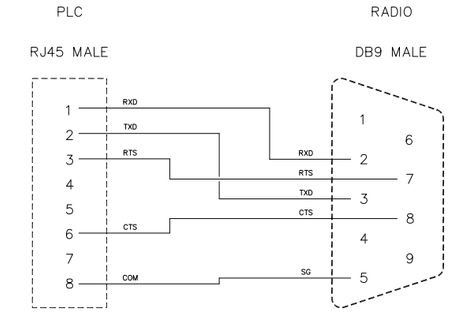
NAVAJO TRIBAL UTILITY AUTHORITY

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

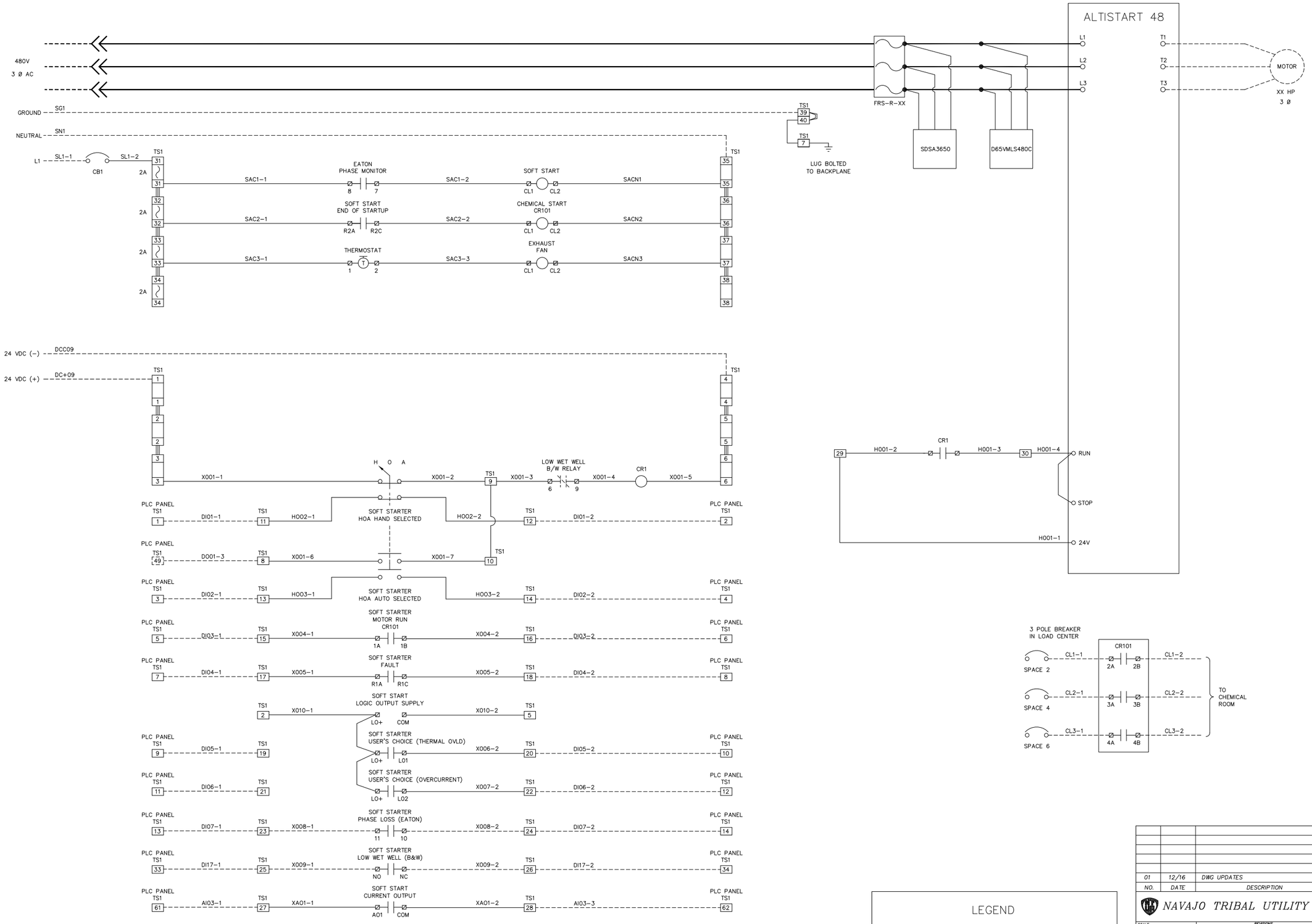
NAVAJO TRIBAL UTILITY AUTHORITY

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

DATE:

DRN. CKD.

APV'D.

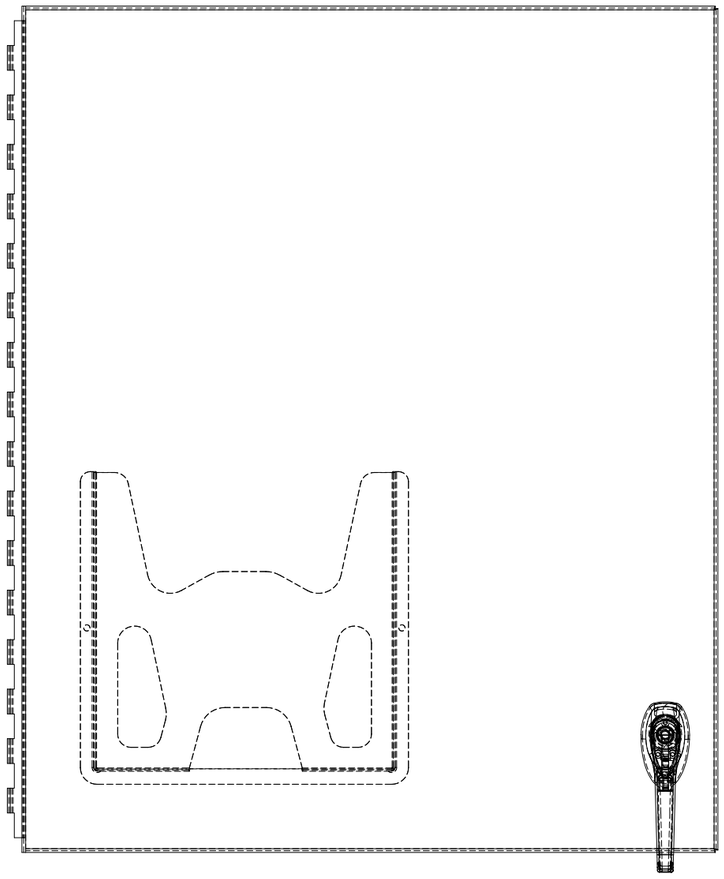
REVISIONS	BY	DATE

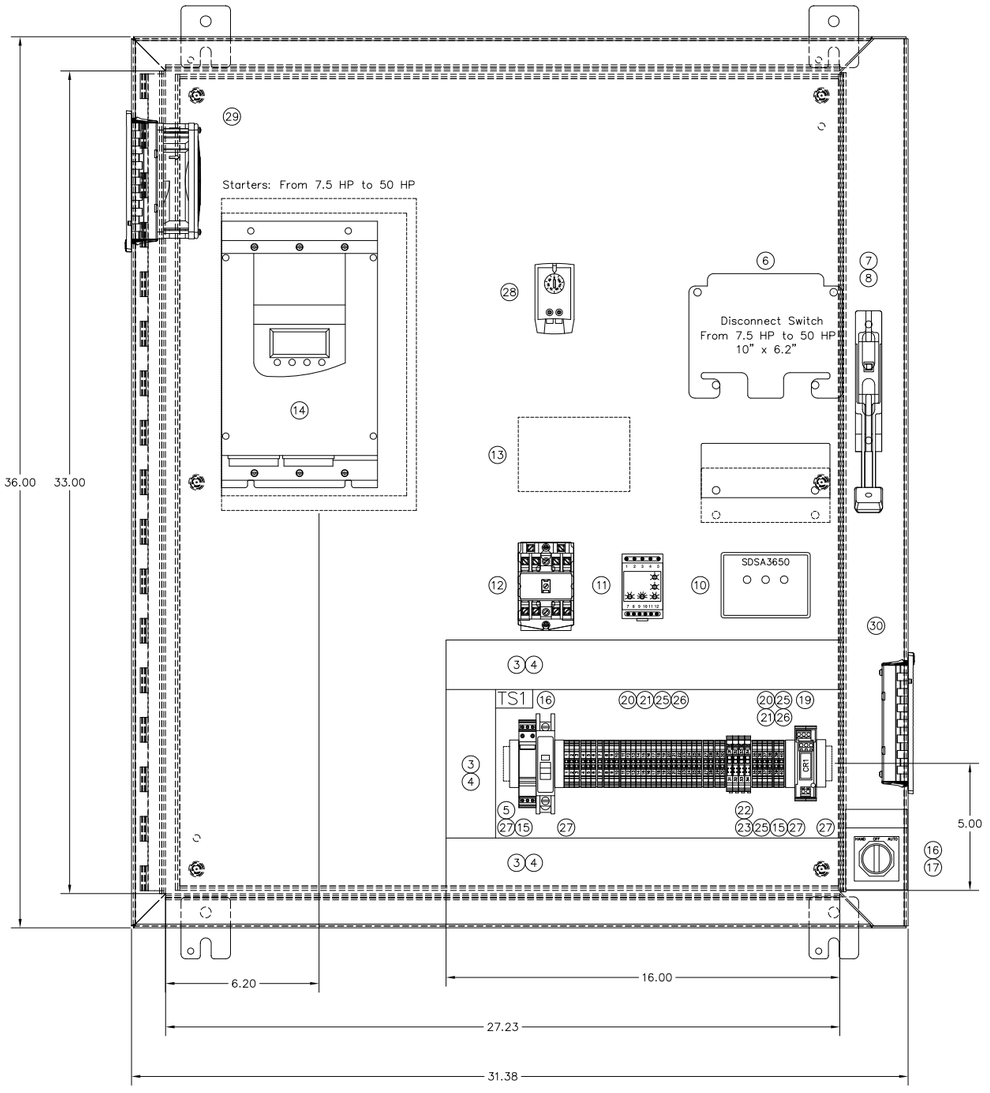
TITLE: 3 PHASE – SOFT START PUMP PANEL

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

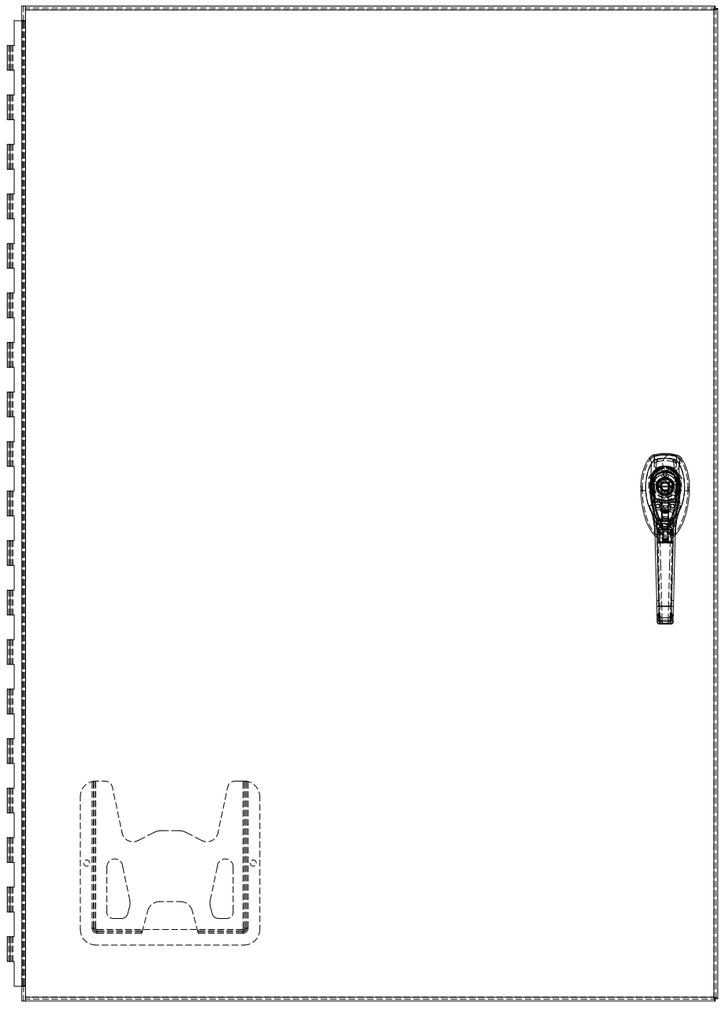
NAVAJO TRIBAL UTILITY AUTHORITY

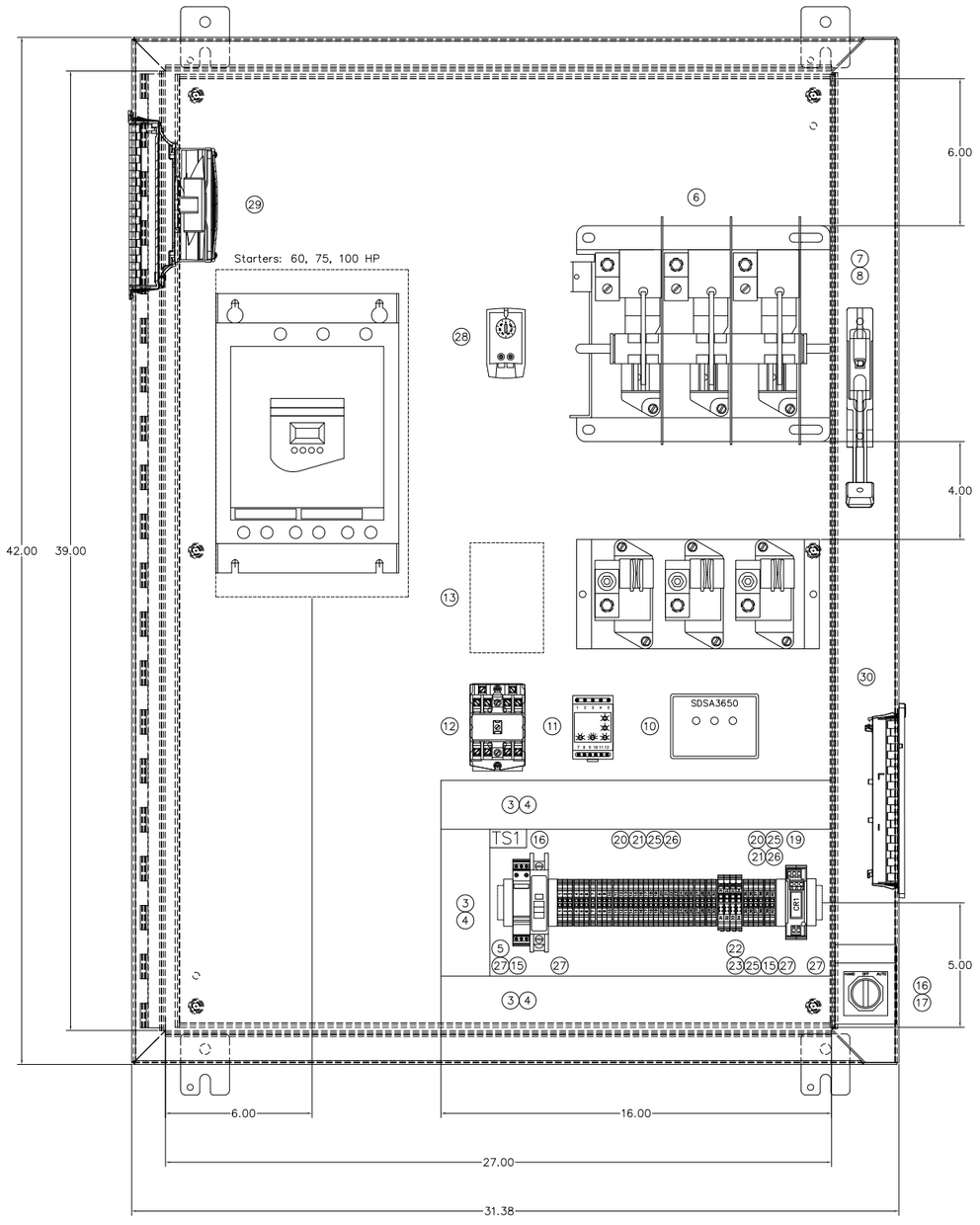
SCALE: NONE	REVISIONS	BY	DATE
DATE: .	.	.	.
DRN. . CKD. .	.	.	.
APVD. .			

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.			
APVD.			

TITLE: 3 PHASE – SOFT START PUMP PANEL
60, 75, 100 HP APPLICATIONS

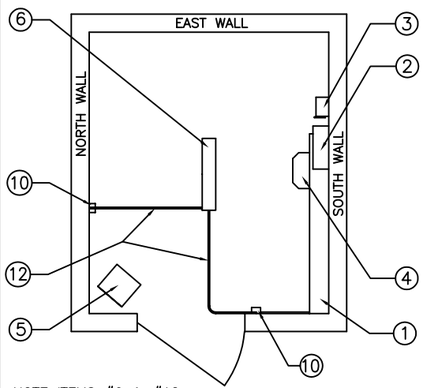
BACKPLANE

W.O.#

SHEET 3 OF 3

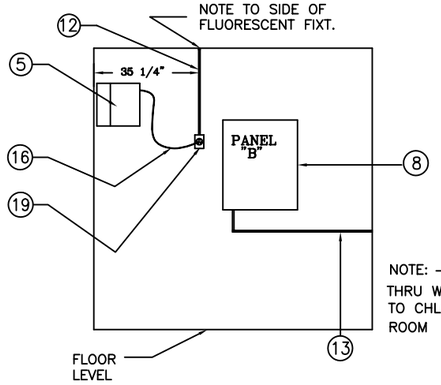
CONTROL ROOM

FLOOR PLAN

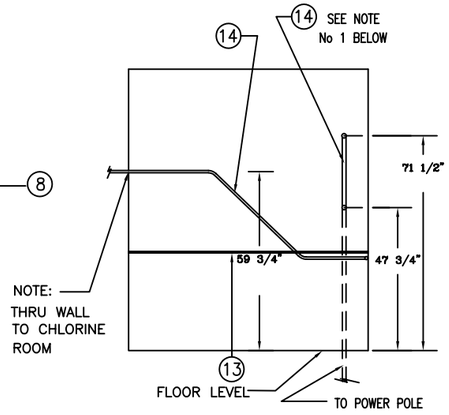


NOTE ITEMS #6 & #12
ARE ON CELLING

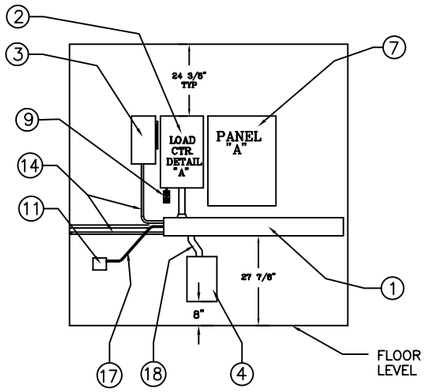
NORTH WALL



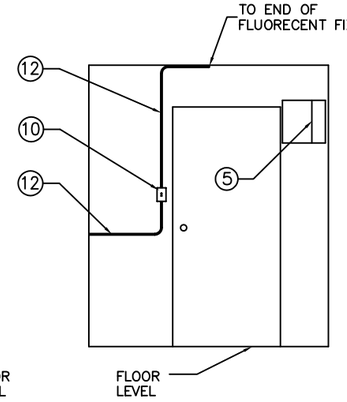
EAST WALL



SOUTH WALL



WEST WALL



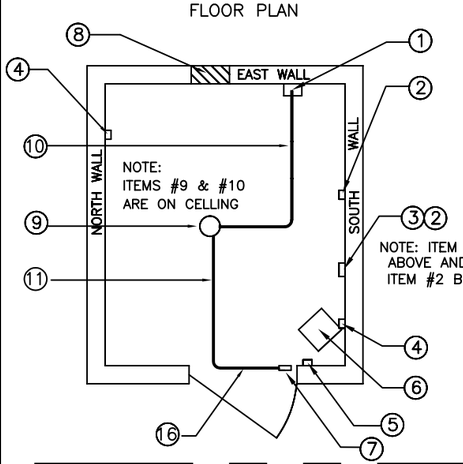
NOTE: 1.
ITEM No 14, w/3-#2 THHN AND 1-#2 GRND. (CABLES PULLED FROM POWER POLE).
CABLES ARE STUBBED OUT AND ARE TO BE TERMINATED IN THE PUMP PANELS

BILL OF MATERIAL — CONTROL ROOM

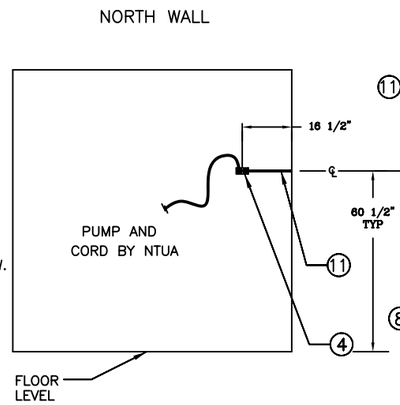
ITEM	DESCRIPTION	QTY.	BRAND, MODEL, SIZE
1	GUTTER	1	6 x 60" x 6-3/8
2	LOAD CENTER W/100 AMP MAIN BREAKER	1	SQUARE D Q 016W 100 RB 22-1/8 x 14-3/8 x 5-1/4
3	DISC SW W/HANDLE W/FRS-30R FUSES	1	SQUARE D H 361 NRB 15-1/8 x 6-3/8 x 4-1/4
4	TRANSFORMER	1	ACME # T253517-3S 15 x 12 x 12 15KVA, 3PH, 460/240-120 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

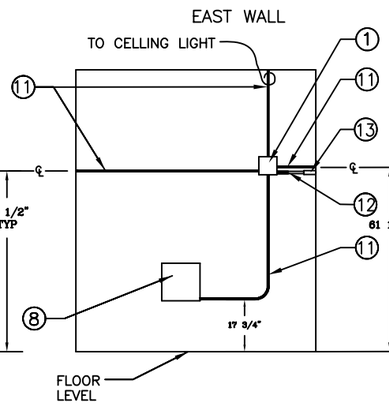
FLOOR PLAN



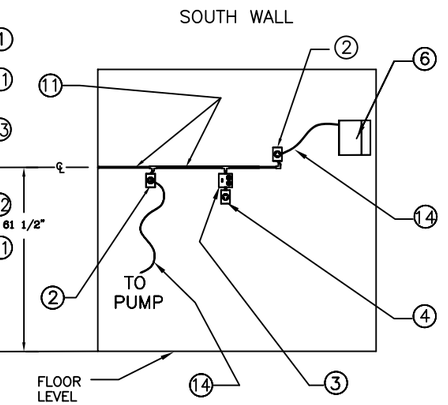
NORTH WALL



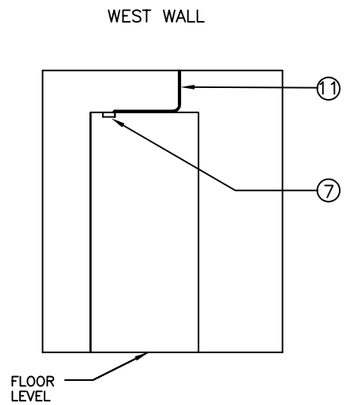
EAST WALL



SOUTH WALL



WEST WALL

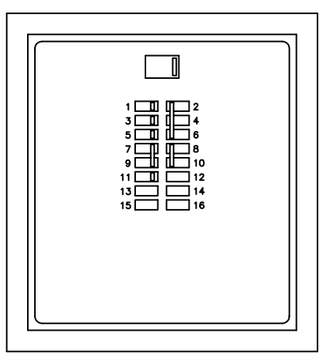


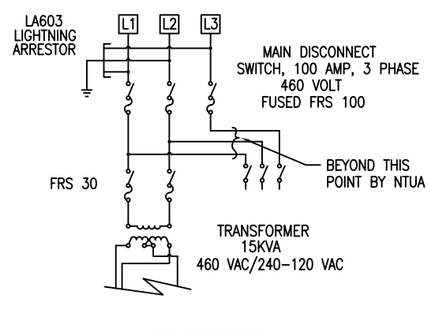
BILL OF MATERIAL — CHLORINE ROOM

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

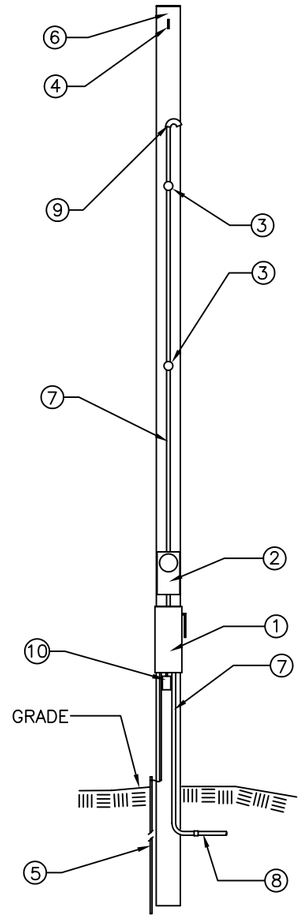
REVISION	DATE	DESCRIPTION	BY

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
INDIAN HEALTH SERVICE
NAVAJO NATION

PUMP HOUSE LAYOUT

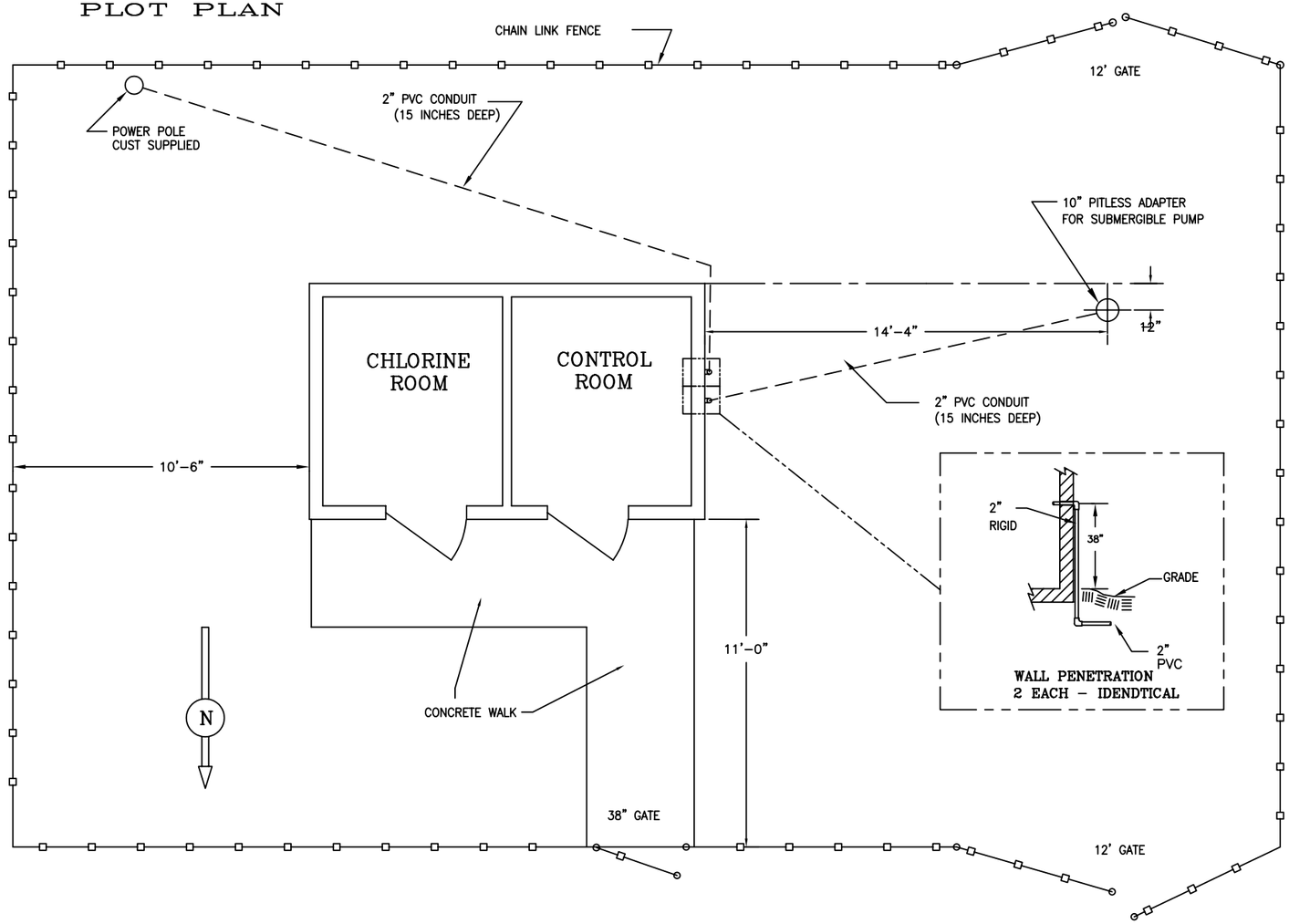
PUBLIC LAW 86-121
OFFICE OF ENVIRONMENTAL HEALTH AND ENGINEERING
NAVAJO AREA INDIAN HEALTH SERVICE

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

PUBLIC LAW 86-121
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