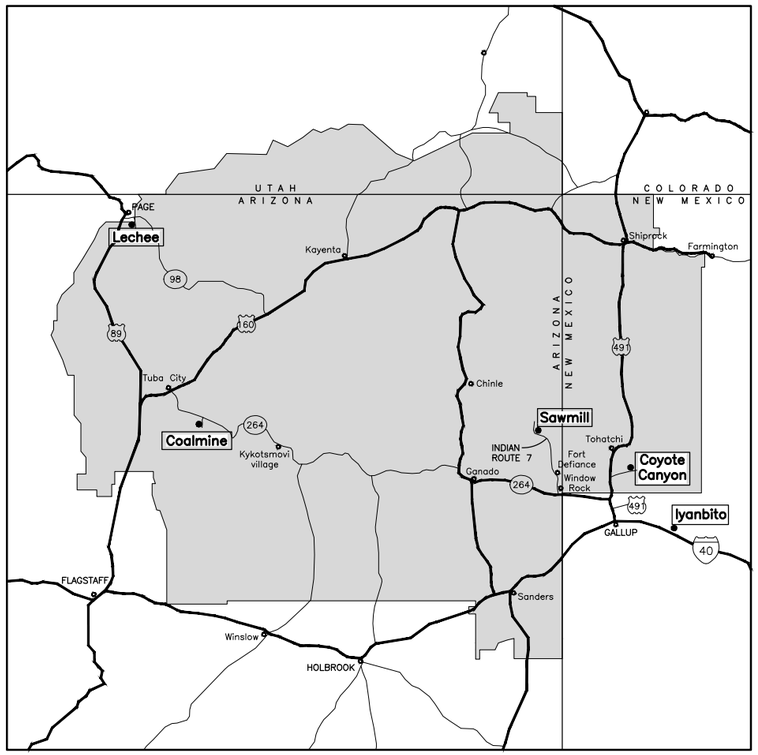


LOCATION MAP

Not to Scale

DESIGN AND CONSTRUCTION OF IYANBITO LIFT STATION FACILITIES

NAVAJO TRIBAL UTILITY AUTHORITY

100% FOR CONSTRUCTION

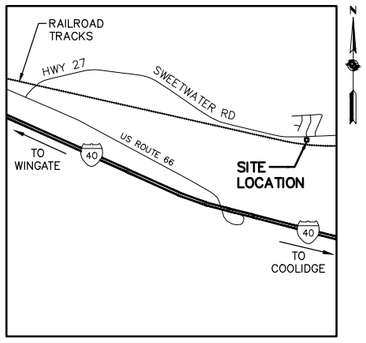
NOVEMBER 20, 2025

APPROVAL

ENGINEERING AND TECHNICAL SERVICES DIVISION — DATE 12-02-2025

CIVIL ENGINEER — DATE

DRAWING INDEX



IYANBITO

SITE LATITUDE: 35°29'54"N
LONGITUDE: 108°28'88"W

VICINITY MAPS

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
DESIGN AND CONSTRUCTION OF IYANBITO LIFT STATION FACILITIES

COVER SHEET AND VICINITY MAPS

NCS ENGINEERS EST. 1998
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

Registered Professional Engineer
28112
RAMESH NARASIMHAN
Date Signed 12/02/2025
ARIZONA, U.S.A.

EXPIRATION DATE: 09/30/27

Drawn by:	KWB
Design by:	LAH
Approved by:	RN
Date	11/20/25
Project No.	----
Sheet No.	G-01

GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL CONFORM TO THE DRAWINGS AND SPECIFICATIONS AS WELL AS NAVAJO NATION STANDARD DETAILS, SPECIFICATIONS, AND REGULATIONS. ALL WORK AND MATERIALS NOT IN CONFORMANCE WITH THESE STANDARDS ARE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTORS EXPENSE.

2. CONTRACTOR SHALL OBTAIN AND PAY FOR ANY PERMITS REQUIRED UNLESS OTHERWISE INDICATED. THE CONTRACTOR IS ADVISED THAT AN EXCAVATIONS AND DIRT MOVING PERMIT MAY BE REQUIRED BY THE NAVAJO NATION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THIS PERMIT, IF NECESSARY, AND COMPLY WITH ITS REQUIREMENTS. CONTRACTOR TO PROVIDE APPROPRIATE DUST CONTROL MEASURES DURING CONSTRUCTION. NTUA AND ENGINEER WILL OBTAIN NAVAJO NATION ENVIRONMENTAL PROTECTION AGENCY CONSTRUCTION PERMIT.

3. NOT USED

4. EXISTING PIPING, ELECTRICAL, AND UTILITIES ARE BASED ON EXISTING RECORDS AND FIELD OBSERVATIONS BY NTUA AND ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING LOCATIONS OF ALL EXISTING PIPING, ELECTRICAL, AND UTILITIES AND AVOIDING DAMAGE TO THE SAME. PRIOR TO ANY CONSTRUCTION ACTIVITY, THE CONTRACTOR SHALL CONTACT NTUA AT (928)729-5721 AND THE NTUA PROJECT MANAGER. CONTRACTOR SHALL CONFIRM LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION AND SHALL BE RESPONSIBLE FOR:

   a. DAMAGE WORK TO SUCH UTILITIES CAUSED AS A RESULT OF THE WORK.

   b. DAMAGES TO EXISTING WALKS, WALLS, CURBS, DRIVES, TREES, LANDSCAPING, AND PAVING.

5. CONTRACTOR SHALL POTHOLE EXISTING UTILITIES AHEAD OF CONSTRUCTION, TO ALLOW FOR ANY NECESSARY ADJUSTMENT IN GRADE LINE AND TO VERIFY PIPE TYPES FOR ORDERING PROPER TRANSITION, AND/OR TIE-IN FITTINGS WHICH MAY BE REQUIRED.

6. CONTRACTOR IS RESPONSIBLE FOR REVIEWING ALL PLANS FOR DEMOLITION ITEMS.

7. ALL UTILITIES SHALL BE PROTECTED FROM DAMAGE AS A RESULT OF THE WORK. THE CONTRACTOR SHALL RELOCATE, REPAIR OR REPLACE AT HIS EXPENSE, ANY AFFECTED UTILITIES TO THE SATISFACTION OF NTUA.

8. PROVIDE TEMPORARY THRUST RESTRAINT FOR EXISTING PIPING WHENEVER THE WORK REQUIRES. CONTRACTOR SHALL REPLACE OR RESTORE THE EXISTING RESTRAINT SYSTEM TO LIKE-NEW CONDITION.

9. CONTRACTOR SHALL PROTECT THE ADJACENT PROPERTY AND IMPROVEMENTS THERETO FROM ANY DAMAGE DURING CONSTRUCTION. ANY DAMAGE TO ADJACENT PROPERTY OR IMPROVEMENTS MUST BE REPAIRED OR REPLACED TO THE PROPERTY OWNER'S SATISFACTION, AT THE CONTRACTOR'S EXPENSE.

10. DIMENSIONS AND ELEVATIONS FOR EQUIPMENT INSTALLATION TO BE VERIFIED BASED UPON EQUIPMENT MANUFACTURER SELECTED.

11. ALL, DIMENSIONS AND ELEVATIONS SHALL BE FIELD VERIFIED.

12. EXISTING EQUIPMENT TO BE REMOVED AND SALVAGED SHALL BE MARKED BY ENGINEER OR OWNER PRIOR TO WORK, UNLESS OTHERWISE NOTED ON THE CONTRACT DOCUMENTS.

13. ALTHOUGH SUCH WORK MAY NOT BE SPECIFICALLY INDICATED, FURNISH AND INSTALL SUPPLEMENTARY OR MISCELLANEOUS ITEMS, APPURTENANCES AND DEVICES INCIDENTAL TO, OR NECESSARY FOR A SOUND, SECURE AND COMPLETE INSTALLATION.

14. THE CONTRACTOR SHALL ADJUST ALL EXISTING MANHOLES, VALVE BOXES, CLEANOUTS, BLIND FLANGED PIPING, AND FIRE HYDRANTS WITHIN WORK LIMITS REQUIRED TO MATCH ACTUAL FINAL GRADE.

15. GOVERNING BUILDING CODES:
    2009 INTERNATIONAL BUILDING CODE
    2011 NATIONAL ELECTRICAL CODE

16. CONTRACTOR TO MAINTAIN ACCESS FOR EMERGENCY RESPONSE VEHICLES DURING CONSTRUCTION.

17. CONTRACTOR SHALL COORDINATE WORK SCHEDULES WITH NTUA, CREWS TO PREVENT ANY CONFLICTING WORK CONDITIONS. LOCATIONS OF TEMPORARY FACILITIES, PARKING AND WORK WITHIN ANY RIGHT-OF-WAY, ETC. SHALL BE COORDINATED WITH THE NTUA.

18. CONTRACTOR SHALL PROVIDE TEMPORARY SAFETY AND SECURITY FENCING AND SITE IMPROVEMENTS AS NEEDED AT NO EXTRA COST.

19. CONSTRUCTION DEBRIS SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF AT LEAST WEEKLY BY THE CONTRACTOR. KEEP SITE AREA CLEAN.

20. EXCAVATED SOIL IS TO BE USED TO FILL IN LOW SPOTS PRIOR TO BEING HAULED OFF SITE. CONTRACTOR SHALL ESTABLISH A SUITABLE STAGING AREA FOR STORAGE OF EXCAVATED SOIL.

21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY AT THE SITE WHILE CONSTRUCTION IS IN PROGRESS. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE PUBLIC FROM ANY HAZARDS ARISING FROM CONSTRUCTION OPERATIONS AND PROTECTING EXISTING AND NEW IMPROVEMENTS FROM DAMAGE DUE TO ACCIDENT OR VANDALISM.

22. THESE LIFT STATION SITES ARE ACTIVE. CONTRACTOR TO MAINTAIN ACCESS TO LIFT STATION FACILITIES FOR MAINTAINING OPERATIONS DURING CONSTRUCTION. IF THE WORK REQUIRES INTERRUPTION OF EXISTING ACCESS TO OPERATING FACILITIES, THE CONTRACTOR SHALL PROVIDE TEMPORARY ACCESS (APPROVED BY NTUA) TO THESE FACILITIES. LIFT STATIONS ARE CRITICAL TO NTUA OPERATIONS AND A SHUT DOWN WILL NOT BE PERMITTED WITHOUT AN APPROVED MOPO PLAN.

23. WHERE GROUND SURFACE IS DISTURBED, FINISH GRADE WITH UNIFORM SLOPE.

24. PROPERTY LINES AND DIMENSIONS WHERE SHOWN ARE BASED ON NTUA AND NAVAJO NATION RECORDS.

25. MAINTAIN, RELOCATE, OR REPLACE EXISTING SURVEY MONUMENTS, CONTROL POINTS, AND STAKES WHICH ARE DISTURBED OR DESTROYED. PERFORM THE WORK TO PRODUCE THE SAME LEVEL OF ACCURACY AS THE ORIGINAL MONUMENT(S) IN A TIMELY MANNER, AND AT THE CONTRACTOR'S EXPENSE.

26. NOT USED.

27. NOT USED.

28. UNLESS SHOWN ON THE DRAWINGS, ALL DISTURBED AREAS NOT RECEIVING A HARD SURFACE OR GRAVEL SURFACE SHALL BE GRADED SMOOTH AND COMPACTED AS SPECIFIED.

29. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION CONTROL DEVICES DURING CONSTRUCTION. EROSION CONTROL DEVICES, SILT FENCING, RUNOFF CONTAINMENT BERMS, AND STRAW BALES ARE THE MINIMUM REQUIRED.

30. CONTRACTOR SHALL TAKE ALL OTHER MEASURES TO POSITIVELY PRECLUDE EROSION MATERIALS FROM LEAVING THE SITE.

31. WHERE WATERLINES, RECLAIMED WATERLINES OR SANITARY SEWER LINES (NEW OR EXISTING) CROSS OVER OR UNDER EACH OTHER WITHIN THE RIGHT OF WAY, PIPE LINE ENCASEMENTS SHALL BE PROVIDED AS NECESSARY IN ACCORDANCE WITH NAVAJO NATION REQUIREMENTS.

32. WHERE ALUMINUM IS TO BE EMBEDDED IN CONCRETE, THE ALUMINUM SHALL FIRST BE COATED WITH COAL TAR EPOXY.

33. BACKFILLING OF PIPING AND STRUCTURES SHALL NOT BE STARTED UNTIL INSTALLATION IS APPROVED BY THE OWNER.

34. UNLESS OTHERWISE NOTED, ALL PVC INSTALLED ABOVE GROUND SHALL BE PAINTED WITH UV PROTECTIVE COATING.

ABBREVIATION DESCRIPTION

ABBREVIATION	DESCRIPTION
/	PER
o	DEGREES
ø	DIAMETER
"	INCHES OR SECONDS
'	FEET OR MINUTES
=	EQUALS
%	PERCENT
#	NUMBER OR POUND
@	AT
&	AND
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AB	AGGREGATE BASE
ABAN	ABANDON
ABC	AGGREGATE BASE COURSE
AC	ASPHALT CONCRETE, ASBESTOS CEMENT
ACB	ASPHALT CONCRETE BASE
ACI	AMERICAN CONCRETE INSTITUTE
ACP	ASBESTOS CEMENT PIPE
ACPA	AMERICAN CONCRETE PIPE ASSOCIATION
ADDL	ADDITIONAL
ADOT	ARIZONA DEPARTMENT OF TRANSPORTATION
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISH GRADE
AGC	ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.
AGG	AGGREGATE
AIEE	AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALT	ALTERNATE
ALUM	ALUMINUM
AMB	AMBIENT
AMPS	AMPERES
ANB	ANCHOR BOLT
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATE OR APPROXIMATELY
APWA	AMERICAN PUBLIC WORKS ASSOCIATION
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASP	ASPHALTIC PAVEMENT
ASPH	ASPHALT
ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS
AVG	AVERAGE
AWSC	AMERICAN WELDING SOCIETY CODE
BC	BRASS CAP
BCR	BEGINNING OF CURB RETURN
BE	BASE ELEVATION
BEG	BEGINNING
BF	BLIND FLANGE
BFV	BUTTERFLY VALVE
BHP	BRAKE HORSEPOWER
BLD	BLIND
BLDG	BUILDING
BM	BENCHMARK OR BEAM
BOC	BEGINNING OF CURVE
BOF	BOTTOM OF FOOTING
BOT	BOTTOM
BOW	BOTTOM OF WALL
BRG	BEARING
BST	BITUMINOUS SURFACE TREATMENT
BTB	BITUMINOUS TREATED BASE
BTWN	BETWEEN
BUSH	BUSHING
BVC	BEGINNING OF VERTICAL CURVE
BV	BALL VALVE
C	CONDUIT
CB	CATCH BASIN
CBF&C	CATCH BASIN FRAME & COVER
CC OR C/C	CENTER TO CENTER
CEM	CEMENT
CF	CURB FACE
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CI	CAST IRON
CIPP	CAST-IN-PLACE CONCRETE PIPE
CISP	CAST IRON SOIL PIPE
CJ	CONSTRUCTION JOINT
CL	CENTERLINE
CLR	CLEAR OR CLEARANCE
CM	CENTIMETER
CMP	CORRUGATED METAL PIPE
CMU	CEMENT MASONRY UNIT
CO	CLEAN OUT
CODP	CLEAN OUT DECK PLATE
COEF	COEFFICIENT
COL	COLUMN
COMP	COMPRESSION
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUATION
CORP	CORPORATION
CP	CONTROL PANEL
CPLG	COUPLING
CTB	CEMENT TREATED BASE
CTR'D	CENTERED
CTW	COMBINED TREATED WATER
CU	CUBIC
CV	CHECK VALVE
DBL	DOUBLE
DCS	DISTRIBUTED CONTROL SYSTEM
DEG	DEGREE
DG	DECOMPOSED GRANITE
DI	DUCTILE IRON
DIA	DIAMETER
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DISCH	DISCHARGE
DJ	DISMANTLING JOINT
DIV	DIVISION
DL	DRAIN LINE
DR	DRIVE
DRWG	DRAWING
DTL	DETAIL
DTS	DETAILS
DV	DRAIN VALVE
DWL	DOWEL
DWY	DRIVEWAY
ELEC	ELECTRIC
E	EAST
EA	EACH
EASE	EASEMENT
EC	END OF CURVE
ECC	ECCENTRIC
ECR	END OF CURB RETURN
EDB	ELECTRIC DUCT BANK
EF	EACH FACE
EG	EXISTING GRADE
EJ	EXPANSION JOINT
EL	ELEVATION
EMBED	EMBEDMENT
EMER	EMERGENCY
EMH	ELECTRICAL MANHOLE
EOP	EDGE OF PAVEMENT
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
ETC	ET CETERA
EVC	END OF VERTICAL CURVE
EWS	EYEWASH STATION
EXIST	EXISTING
F & C	FRAME & COVER
F	FAHRENHEIT
FB	FIELD BOOK
FC	FLEXIBLE CONNECTOR
FCA	FLANGED COUPLING ADAPTER
FDL	FLOOR DRAIN LINE
FDN	FOUNDATION
FE	FLOW ELEMENT
FF	FINISHED FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FIN	FINISHED
FL	FLOW LINE
FL EL	FLOOR ELEVATION
FLG	FLANGE
FLGD	FLANGED
FLTR	FILTER
FM	FLOW METER, FORCE MAIN
FND	FOUND
FOC	FACE OF CONCRETE
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FRB	FLOOR REINFORCED BOTTOM
FRP	FIBERGLASS REINFORCED POLYVINYL
FRT	FLOOR REINFORCED TOP
FS	FLOW SWITCH
FSS	FEDERAL SPECIFICATIONS AND STANDARDS
FT	FOOT OR FEET
FTG	FOOTING
FNTP	FEMALE NATIONAL PIPE THREAD
G	GUTTER
GA	GAGE
GAL	GALLON
GALV	GALVANIZED
GB	GRADE BREAK
GL	GROUND LINE
GPM	GALLONS PER MINUTE
GR	GRADE
GRV	GROOVED
GSN	GENERAL STRUCTURAL NOTES
H	HIGH OR HEIGHT
H2O	WATER
HC	HOUSE CONNECTION
HCP	HORIZONTAL CONTROL POINT
HD	HEAD
HDWL	HEADWALL
HEX	HEXAGONAL
HG	HIGH
HORIZ	HORIZONTAL
HSS	HOLLOW STRUCTURAL SHAPE
HT	HEIGHT
HTR	HEATER
HWY	HIGHWAY
HZ	HERTZ
I	MOMENT OF INTERTIA
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
IHS	INDIAN HEALTH SERVICE
IMC	INTERNATIONAL MECHANICAL CODE
IN	INCH
INA	INSTRUMENT AIR
INSUL	INSULATION
INV	INVERT
IP	IRON PIPE
IPS	IRON PIPE SIZE
IR	INNER RADIUS
IRRIG	IRRIGATION
IV	ISOLATION VALVE
JB	JUNCTION BOX
JCT	JUNCTION
JS	JUNCTION STRUCTURE
JT	JOINT
KSI	KIPS PER SQUARE INCH
L	LENGTH
LB	POUND
LF	LINEAR FEET/FOOT
LI	LEVEL INDICATOR
LIN	LINEAR
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LOC	LOCATION
LONG	LONGITUDINAL
LP	LOW POINT
LS	LEVEL SENSOR
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH HIGH
LSL	LEVEL SWITCH LOW
LT	LEVEL TRANSMITTER
LW	LONG WAY
M	MAP OR MAPS
MAX	MAXIMUM
MAG	MARICOPA ASSOCIATION OF GOVERMENTS
MCC	MOTOR CONTROL CENTER
MCJ	MASONRY CONTROL JOINT
MEAS	MEASURED
MECH	MECHANICAL
MG	MILLION GALLON
MFR	MANUFACTURER
MID	MIDDLE
MIN	MINUTES OR MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
ML	MONUMENT LINE
MM	MILLIMETER
MOPO	MAINTENANCE OF PLANT OPERATION
MON	MONOLITHIC OR MONUMENT
MPH	MILES PER HOUR
MTD	MOUNTED
MVC	MID POINT VERTICAL CURVE
MJxPE	MECHANICAL JOINT x PLAIN END
N	NORTH
NBS	NATIONAL BUREAU OF STANDARDS
NC	NORMALLY CLOSED
NE	NORTHEAST
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NPT	NATIONAL PIPE THREAD
NSC	NATIONAL SAFETY COUNCIL
NTS	NOT TO SCALE
NTUA	NAVAJO TRIBAL UTILITY AUTHORITY
NW	NORTHWEST
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OVERFLOW
OHE	OVERHEAD ELECTRIC POWER LINES
OPNG	OPENING
OR	OUTER RADIUS
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OZ	OUNCES
P	PRESSURE GAUGE
P&TP	POWER AND TELEPHONE POLE
PB	PULL BOX
PC	POINT OF CURVATURE
PCC	PORTLAND CEMENT CONCRETE
PDL	PROCESS DRAIN LINE
PI	POINT OF INTERSECTION
PL	PROPERTY LINE OR PLATE
PLC	PROGRAMMABLE LOGIC CONTROL
POS	POINT OF SPIRAL
PP	POWER POLE
PPM	PARTS PER MILLION
PRC	POINT OF REVERSE CURVE
PRES	PRESSURE
PREFAB	PREFABRICATED
PROD	PRODUCED
PROP	PROPERTY
PRD	PRESSURE RELIEF DRAIN
PSF	POUNDS PER SQUARE FOOT
PSH	PRESSURE SWITCH HIGH
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAGE
PT	POINT OF TANGENT
PV	PLUG VALVE
PVC	POLY VINYL CHLORIDE
PVMT	PAVEMENT
Q	RATE OF FLOW
R	RADIUS
R/W	RIGHT-OF-WAY
RC	REINFORCED CONCRETE
RD	ROAD
RDWY	ROADWAY
RED	REDUCER OR REDUCING
REINF	REINFORCED, REINFORCING, REINFORCEMENT
REQ'D	REQUIRED
RF	ROOF
RFB	RIGHT FACE OF BEAM
RGRCP	RUBBER GASKETED REINFORCED CONCRETE PIPE
RMJ	RESTRAINED MECHANICAL JOINT
RO	ROOF OPENING OR ROUGH OPENING
ROW	RIGHT OF WAY
RPM	REVOLUTIONS PER MINUTE
RT	RIGHT
RTB	REMOTE TERMINAL BOARD
S	SOUTH OR SLOPE OR SECTION MODULES
SAN	SANITARY
SAS	SANITARY SEWER
SC	SPIRAL TO CURVE
SCADA	SUPERVISORY CONTROL & DATA ACQUISITION
SCH	SCHEDULE
SD	STORM DRAIN
SDL	SADDLE
SE	SOUTHEAST
SEC	SECONDS
SECT	SECTION
SHP	SOLIDS HANDLING PUMP
SHT	SHEET
SIM	SIMILAR
SPEC	SPECIFICATIONS
SP'G	SPACING
SPL	SAMPLE LINE
SPR	SPARE LINE
SQ	SQUARE
SQ FT YD	SQUARE FOOT YARD
SSD	SANITARY SEWER DRAIN
SST	STAINLESS STEEL
ST	STREET
STA	STATION
STD	STANDARD
STL	STEEL
STR GR	STRUCTURAL GRADE
STRUCT	STRUCTURE OR STRUCTURAL
SV-#	SOLENOID VALVE AND NUMBER (#=NUMBER)
SW	SOUTHWEST
T/	TOP OF
T	TANGENT DISTANCE
T&B	TOP AND BOTTOM
TBM	TEMPORARY BENCHMARK
TBOC	TOP BACK OF CURB
TEL	TELEPHONE
TEMP	TEMPERATURE OR TEMPORARY
TH	TEST HOLE
THK	THICK
THRU	THROUGH
TMH	TELEPHONE MANHOLE
TNK	TANK
TOC	TOP OF CURB
TOF	TOP OF FOOTING
TOG	TOP OF GRATING
TOP	TOP OF PAVEMENT
TOT	TOTAL
TOS	TOP OF SLAB
TOW	TOP OF WALL
TP	TELEPHONE POLE
TRANS	TRANSITION
TYP	TYPICAL
UL	UNDERWRITERS' LABORATORIES INC.
UON & UNO	UNLESS OTHERWISE NOTED
V	VOLTS
VAC	VACUUM
VB	VALVE BOX
VC	VERTICAL CURVE
VEL	VELOCITY
VERT	VERTICAL
VES	VESSEL
VFD	VARIABLE FREQUENCY DRIVE
VG	VALLEY GUTTER
W/	WITH
W/O	WITHOUT
W	WEST
WD	WIDE
WI	WROUGHT IRON
WS	WATER SURFACE
WT	WEIGHT
YD	YARD

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
DESIGN AND CONSTRUCTION OF IYANBITO LIFT STATION FACILITIES

GENERAL NOTES, ABBREVIATIONS, AND DRAWING INDEX

NCS ENGINEERS EST. 1998
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

Registered Professional Engineer
28112
RAMESH NARASIMHAN
State Registered
ARIZONA, U.S.A.
EXPIRATION DATE: 09/30/27

Drawn by:	KWB
Design by:	LAH
Approved by:	RN
Date	11/20/25
Project No.	----
Sheet No.	G-02

GENERAL SITE NOTES:

1. SOURCE OF TOPOGRAPHY SHOWN ON THE CIVIL PLANS IS A BASE MAP PREPARED BY ENGINEER USING A CLOTH TAPE, AUGUST 2020. VERTICAL ELEVATIONS NOT OBTAINED. EXISTING CONDITIONS MAY VARY FROM THOSE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND ADJUST WORK PLAN ACCORDINGLY PRIOR TO BEGINNING CONSTRUCTION.
2. EXISTING TOPOGRAPHY, STRUCTURES, AND SITE FEATURES ARE SHOWN SCREENED AND/OR LIGHT–LINED. NEW FINISH GRADE, STRUCTURES, AND SITE FEATURES ARE SHOWN HEAVY–LINED.
3. HORIZONTAL DATUM: NOT USED
   VERTICAL DATUM: NOT USED

GENERAL YARD PIPING AND UTILITIES NOTES:

1. EXISTING UNDERGROUND UTILITIES OBTAINED FROM AS–BUILTS AND DRAWINGS PROVIDED BY NTUA, FIELD OBSERVATIONS BY NTUA AND ENGINEER, AND FROM FIELD MEASUREMENTS. CONTRACTOR SHALL FIELD VERIFY DEPTH AND LOCATION PRIOR TO EXCAVATION. PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
2. EXISTING PIPING AND EQUIPMENT ARE SHOWN SCREENED AND/OR LIGHT–LINED. NEW PIPING AND EQUIPMENT ARE SHOWN HEAVY–LINED.
3. UNLESS OTHERWISE SHOWN, ALL PIPING SHALL HAVE A MINIMUM OF 4' COVER.
4. ALL PIPES SHALL HAVE A CONSTANT SLOPE BETWEEN INVERT ELEVATIONS UNLESS A FITTING IS SHOWN.
5. RESTORE DIRT AND/OR GRAVEL ROADS TO CONDITIONS THAT EXISTED BEFORE START OF CONSTRUCTION.

YARD PIPING LEGEND

- 8" RWI 1 — PIPING. SEE PIPE TAG DESCRIPTION ON THIS SHT
- HIDDEN PIPING THROUGH WALLS AND UNDER SLABS
- PIPING ≧ 24"ø WHEN DRAWING SCALE IS 1" = 20'; 12"ø WHEN DRAWING SCALE IS 1" = 10'
- FLEXIBLE COUPLING
- 90° ELBOW DOWN
- CONCENTRIC REDUCER
- CAP OR PLUG
- CLEANOUT

CIVIL LEGEND

- 155 — CONTOUR LINE
- 3:1 — EMBANKMENT AND SLOPE
- DRAINAGEWAY OR DITCH
- CB — CATCH BASIN
- DI — DROP INLET
- MANHOLE OR VAULT
- TREE
- BRUSH/TREE LINE
- STRUCTURE, BUILDING OR FACILITY
- DEMOLISH OR REMOVE
- GRAVEL OR ABC SURFACING
- CONCRETE
- RIP RAP
- CURB
- CURB AND GUTTER
- SINGLE SWING GATE
- DOUBLE SWING GATE
- CANTILEVERED GATE
- GUARD RAIL
- CULVERT
- PL — PROPERTY LINE
- BUILDING, ROAD, ETC.
- CENTER LINE
- EASEMENT
- STAGING OR WORK AREA LIMITS
- N 1000.00 / E 1000.00 — STRUCTURE, BUILDING OR FACILITY LOCATION POINT – COORDINATES

- SANITARY VALVE, FORCEMAIN OR GRAVITY SEWER
- VEGETATION
- UTILITY, WATER VALVE
- IRRIG VALVE — IRRIGATION VALVE
- STORM DRAIN MANHOLE
- PROPERTY CORNER PIN
- LIGHT
- ELECTRIC BOX
- W — WATER LINE
- SAS — SANITARY SEWER LINE
- G — UNDERGROUND GAS LINE
- TV — UNDERGROUND CABLE TV LINE
- R/W — RIGHT OF WAY
- D — WELL PUMPOUT DRAIN LINE
- UGE — UNDERGROUND ELECTRICAL LINE
- OHE — OVERHEAD ELECTRIC LINE
- UGT — UNDERGROUND TELEPHONE LINE
- FM — SANITARY FORCEMAIN
- PR — PROPANE GAS LINE
- BRASS CAP
- FIRE HYDRANT
- SS — SANITARY SEWER MANHOLE
- SAFETY POST (NEW BOLLARD)
- T — TELEPHONE RISER
- GUY WIRE
- VALVE PIT
- WATERLINE MARKER
- UTILITY, WATER MANHOLE
- WATER FAUCET
- WM — WATER METER
- UTILITY, WATER WELL
- SCB — SPRINKLER CONTROL BOX
- GAS — GASLINE MARKER
- GAS VALVE
- GM — GAS METER
- INDICATES FLOW DIRECTION

- TEL — UNDERGROUND TELEPHONE MARKER
- oV — VENT PIPE
- POWER POLE
- EXTERIOR FLOOD LIGHT
- P — POWER PEDESTAL
- ELECTRIC BOX
- TEMPORARY BENCHMARK
- EXISTING DIRT ROAD
- SITE CONTROL POINT
- T — TELEPHONE MANHOLE
- TR — ELECTRICAL TRANSFORMER
- TSL — TRAFFIC SIGNAL LIGHT
- EM — ELECTRIC METER
- TV — CABLE TV MARKER
- EXISTING BOLLARD
- TRAFFIC SIGN
- TRAIL
- SANITARY CLEANOUT
- MB — MAIL BOX
- EXISTING FENCE
- CHAINLINK FENCE
- BLOCK WALL
- NG / ##.## — NATURAL GROUND
- TB / ##.## — TOP OF BANK
- FL ## — FLOW LINE
- BC / ##.## — BACK OF CURB
- BW / ##.## — BACK OF WALK
- ER ## — EDGE OF PAVED ROAD
- EDR ## — EDGE DIRT ROAD SPOT ELEVATION
- ## — GROUND SPOT ELEVATION
- FG ## — FINISH GRADE

SYMBOLS

ELBOWS / FLANGED: DOWN, PLAN, UP
ELBOWS / WELDED: DOWN, PLAN, UP
REDUCERS / FLANGED
REDUCERS / WELDED
TEES / FLANGED: DOWN, PLAN, UP
TEES / WELDED: DOWN, PLAN, UP

VALVES / FLANGED
- BUTTERFLY
- CHECK
- GATE
- PLUG
- BALL VALVE

MECHANICAL JOINT
- END FITTINGS

90 DEGREE BENDS / PVC: DOWN, PLAN, UP
TEES / PVC: DOWN, PLAN, UP

- RESTRAINED EXPANSION JOINT (BELLOWS TYPE)
- DISMANTLING JOINT WITH RESTRAINING RODS
- FLANGED COUPLING ADAPTER WITH RESTRAINTS
- DIAPHRAGM VALVE, PROFILE
- PRESSURE SUSTAINING VALVE, PROFILE
- DIAPHRAGM VALVE, PLAN
- M — MAGNETIC FLOW METER
- PRESSURE RELIEF VALVE
- AIR RELIEF VALVE
- B — SAFETY POST (BOLLARD)
- SAMPLE TAP
- PSL — PRESSURE SWITCH LOW
- PSH — PRESSURE SWITCH HIGH
- FS — FLOW SWITCH
- P — PRESSURE GAUGE

GENERAL SYMBOLS

- OBJECT LINE, EXISTING
- OBJECT LINES, NEW OR RELOCATED
- FUTURE
- CENTER LINE
- HIDDEN LINE
- SURFACE BREAK LINE
- MATCH LINE
- BASE LINE OR DATUM LINE
- ø — DIAMETER OR ROUND
- EXISTING OBJECT TO BE REMOVED
- WATER SURFACE
- EARTH
- CONCRETE

MARKERS

- SECTION INDICATOR (CUT / FND)
- DETAIL INDICATOR (CUT / FND)
- SECTION CUT (CUT / FND)
- DETAIL (CUT / FND) SCALE DETAIL TITLE
- SECTION (CUT / FND) SCALE SECTION TITLE
- TYP # — TYPICAL DETAIL

(SECTIONS ARE LETTERED, DETAILS ARE NUMBERED)

EQUIPMENT TAG

RWI 1A
- EQUIPMENT TAG OR PIPE SYSTEM
- EQUIPMENT OR VALVE NUMBER

PIPE TAG

12" RWI 1
- PIPE SIZE
- PIPING SYSTEM
- PIPE MATERIAL

PIPE MATERIAL

1 – DUCTILE IRON
2 – STEEL
3 – C–900 PVC
4 – SCHEDULE 80 PVC
5 – SDR 35 PVC SEWER PIPE
6 – COPPER
7 – STAINLESS STEEL
8 – SCH 80 BLACK STEEL
9 – CAST IRON
10 – PVC–SEWER PIPE

SHEET CATEGORY

G – GENERAL
C – CIVIL
M – MECHANICAL PROCESS
E – ELECTRICAL
I – INSTRUMENTATION

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
DESIGN AND CONSTRUCTION OF IYANBITO LIFT STATION FACILITIES

GENERAL SITE NOTES, SYMBOLS AND CIVIL LEGEND

NCS ENGINEERS est. 1994
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

Registered Professional Engineer — 28112 — RAMESH NARASIMHAN — Date Signed — ARIZONA, U.S.A.
EXPIRATION DATE: 09/30/27

Drawn by:	KWB
Design by:	LAH
Approved by:	RN
Date	11/20/25
Project No.	----
Sheet No.	G–03

Dec 01, 2025 – 3:26pm
Z:_Storage\cad1 projects\for greg b\ntua lift stations – (4) sites\CAD\IYANBITO\G–03.dwg

GENERAL STRUCTURAL NOTES

(IN CASE OF CONFLICT WITH DRAWINGS STRICTER REQUIREMENTS SHALL GOVERN.)

GENERAL REQUIREMENTS

CODE: SEE GENERAL NOTES

LOADS:

LIVE LOADS:

CONCRETE WALKWAYS	300 PSF
STAIRS	300 PSF
STAIR TREADS	300 LB POINT LOAD
PLATFORMS (GRATING, CHECKERED PLATE)	300 PSF

WIND: 90 MPH BASIC WIND. EXPOSURE "C". IMPORTANCE FACTOR 1.15

SEISMIC: SITE CLASS: AS THE LIMITED GEOTECHNICAL INVESTIGATION DID NOT INCLUDE IDENTIFICATION OF SEISMIC FACTORS, USE SITE CLASS E FOR IYANBITO. FOR OTHER SITES USE D. IMPORTANCE FACTOR = 1.25

SNOW: IMPORTANCE FACTOR 1.10

EARTHWORK AND FOUNDATION

1. FOUNDATION DESIGN IS BASED ON THE FOLLOWING SOIL BEARING CAPACITIES:
   BEARING – ALL DEPTHS 1,000 PSF
2. DESIGN LATERAL AT-REST PRESSURES:
   NOT APPLICABLE
3. PLACE FOUNDATION CONCRETE ONLY ON SUBGRADE PREPARED PER RECOMMENDATIONS OF THE DRAWINGS AND SPECIFICATIONS. VERIFY THE SUITABILITY OF THE BEARING MATERIAL WITH THE ENGINEER. BEFORE PLACING FOUNDATIONS. ENGINEERED FILL SHALL MEET THE REQUIREMENT STATED IN THE DRAWINGS AND SPECIFICATIONS.
4. PLACE DOWELS AND ANCHOR BOLTS BFORE POURING CONRETE. USE TEMPLATES TO ENSURE PROPER PLACEMENT.

REINFORCED CONCRETE:

1. CONCRETE SHALL HAVE MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,500 PSI FOR STRUCTURES, FOUNDATIONS, AND SLABS ONGRADE UNLESS NOTED OTHERWISE ON DRAWINGS. ASTM C 150 TYPE II LOW ALKALI CEMENT. AIR CONTENT SHALL BE 5.5% PLUS OR MINUS 1%.
2. ALL CONCRETE CONSTRUCTION, INCLUDING BENDING OF BARS, SHALL COMPLY WITH CURRENT ACI "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (CURRENT ACI 318).
3. UNLESS SHOWN OTHERWISE, MINIMUM REINFORCEMENT OF CONCRETE WALLS OR SLABS SHALL BE:
   LESS THAN 10" THICKNESS – USE #5 @ 12" EW. SEE DRAWINGS FOR LOCATION OF REINFORCEMENT. MORE THAN 10" THICK – USE #5 @ 12" EW EF.
4. ALL WALL REINFORCEMENT AT CORNERS OR JUNCTIONS OF WALLS SHALL BE CONTINUOUS. LAPPED, OR TERMINATED IN AN ACI STANDARD 90 DEGREE HOOK. LAP SPLICES SHALL CONFORM WITH NOTE 12.
5. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, ALL HORIZONTAL AND VERTICAL BARS SHALL BE DOWELED. DOWELS LAP AND MATCH LARGER DIAMETER BAR.
6. ALL SLABS, BEAMS, AND COLUMN REINFORCING BARS SHALL HAVE A MINIMUM EXTENSION OR ANCHORAGE INTO SUPPORTS IN ACCORDANCE WITH ACI 318.
7. STIRRUP SUPPORT BARS SHALL BE PROVIDED BETWEEN ENDS OF TOP BARS AS REQUIRED.
8. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, CONCRETE COVER FOR #11 AND SMALLER REINF BARS SHALL BE AS FOLLOWS:
   A. SLABS AND JOISTS:
      FORMED CONCRETE SURFACES FOR DRY CONDITIONS.....3/4"
      FORMED CONCRETE SURFACES EXPOSED TO EARTH, WATER, OR WEATHER, OR LOCATED OVER WATER
      #5 BARS AND SMALLER.....1 1/2"
      #6 BARS AND LARGER.....2"
   B. BEAMS AND COLUMNS:
      FORMED CONCRETE SURFACES FOR DRY CONDITIONS
      STIRRUPS, SPIRALS, AND TIES.....2"
      PRINCIPAL REINFORCEMENT.....2 1/2"
      FORMED CONCRETE SURFACES EXPOSED TO EARTH, WATER, OR WEATHER, OR BEAMS LOCATED OVER WATER
      STIRRUPS AND TIES.....2"
      PRINCIPAL REINFORCEMENT.....2 1/2"
   C. WALLS:
      FORMED CONCRETE SURFACES FOR DRY CONDITIONS....3/4"
      FORMED CONCRETE SURFACES EXPOSED TO EARTH, WATER, OR WEATHER.....2"
   D. FOOTINGS AND BASE SLABS AND FOUNDATIONS FOR SHADE CANOPIES, GENERATORS, AND FUEL TANKS FOR GENERATORS:
      FORMED VERTICAL CONCRETE SURFACES.....2"
      AT UNFORMED SURFACES AND BOTTOMS IN CONTACT WITH EARTH OR CONCRETE WORK MATS.....3"
      TOP OF FOOTINGS.....SAME AS SLABS
   E. REINFORCEMENT SHALL BE PLACED WITHIN A TOLERANCE OF ±1/4" OF POSITION SPECIFIED.
9. KEYWAYS AND WATERSTOPS SHALL END 3" BELOW THE TOP OF WALLS, UNLESS THERE IS A SLAB ON TOP OF THE WALL, IN WHICH CASE IT SHALL END AT THE BOTTOM OF THE SLAB. IN JOINTS WHERE WATERSTOP TERMINATES AT ADJOINING SLAB OR WALL, WATERSTOP SHALL BE EMBEDDED IN ADJOINING SLAB OR WALL A MINIMUM OF 6".
10. WATERSTOP SHALL BE PLACED IN ALL CONSTRUCTION, CONTRACTION, AND EXPANSION JOINTS IN ALL WATER BEARING SLABS AND WALLS UNLESS OTHERWISE INDICATED ON THE DRAWINGS, AND IN ALL WALLS AND SLABS SUBJECTED TO EARTH BACKFILL. WATERSTOP IN THE WALLS SHALL BE CARRIED INTO SLABS AND SHALL BE SPLICED WITH THE WATERSTOP IN THE SLABS.
11. NO BACKFILL SHALL BE PLACED AGAINST WALLS UNTIL CONCRETE HAS REACHED THE SPECIFIED STRENGTH AND THE CONNECTING SLABS AND BEAMS HAVE BEEN CAST AND HAVE REACHED THE SPECIFIED STRENGTH.
12. LAP SPLICES:
   A. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, THE LENGTH OF THE LAP SPLICE SHALL BE CLASS "A" WHEN NO MORE THAN 1/2 THE BARS ARE LAP SPLICED WITHIN THE TABULATED LENGTH AND CLASS "B" WHEN MORE THAN 1/2 THE BARS ARE LAP SPLICED WITHIN THE TABULATED LENGTH.
   B. VALUES TABULATED BELOW FOR SPLICES ARE APPLICABLE ONLY WHEN THE COVER IS EQUAL TO ONE BAR DIAMETER OR MORE.
   C. WHEN MULTIPLE BARS ARE SPLICED AT THE SAME SECTION, THE CLEAR BAR SPACING IS THE MINIMUM CLEAR DISTANCE BETWEEN THE BARS OUTSIDE THE SPLICE LENGTH MINUS ONE BAR DIAMETER.
   D. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, THE BARS AT A LAP SPLICE SHALL BE IN CONTACT WITH EACH OTHER.
   E. FOLLOWING TABULATED VALUES ARE CALCULATED FOR:
      Fy = 60,000 PSI
      Fc = 4,000 PSI
   F. TOP BARS ARE ALL HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.
   G. HORIZONTAL BARS IN CIRCULAR WALLS OF HYDRAULIC STRUCTURES SHALL BE SPLICED WITH CLASS "B" TOP BAR LAP SPLICES WITH THE SPLICES IN EACH LAYER OF REINFORCEMENT STAGGERED ONE SPLICE LENGTH.
   H. WHERE HORIZONTAL BARS IN WALL CORNERS OR JUNCTIONS ARE LAPPED, LARGER BAR DIAMETER GOVERNS THE LENGTH ON DOWEL SEGMENTS.

REINFORCING BAR LAP SPLICE

BAR #	MINIMUM CLEAR BAR SPACING (BAR DIA)	LAP SPLICE LENGTH (INCHES)			
		TOP BARS		OTHER BARS	
		CLASS "A"	CLASS "B"	CLASS "A"	CLASS "B"
REQUIREMENT FOR WALLS AND SLABS *					
#4	MORE THAN 2	18	24	14	18
#5	MORE THAN 2	23	30	18	23
#6	MORE THAN 2	31	40	23	31
	5	28	36	21	28
#7	MORE THAN 2	42	54	32	42
	5	33	43	26	33
#8	MORE THAN 2	54	71	42	54
	5	43	56	33	43
#9	MORE THAN 2	69	89	53	69
	5	55	71	42	55
#10	MORE THAN 2	88	114	67	88
	5	70	91	54	70
#11	MORE THAN 2	108	140	83	108
	5	86	112	66	86

* FOR INNER LAYER OF REINFORCEMENT IN WALLS AND SLABS, THE LAP SPLICE LENGTH OF #9, #10, AND #11 BARS MAY BE REDUCED BY 25 PERCENT IF CLEAR SPACING IS THREE BAR DIAMETERS OR MORE.

13. REFER TO MECHANICAL PROCESS SHEETS FOR CONCRETE WALL AND SLAB PENETRATIONS. ADDITIONAL REINFORCING SHALL BE PROVIDED AT CONCRETE WALL AND SLAB PENETRATIONS PER (TYP 310)

    INCLUDE IN REINFORCING SHOP DRAWINGS REINFORCING DETAILS FOR CONCRETE WALL AND SLAB PENETRATIONS THAT ARE 6 INCH AND LARGER IN DIAMETER.

14. IN CASE ANY CONSTRUCTION JOINT IS REQUIRED FOR WALLS OF STRUCTURE, CONTRACTOR MAY PROPOSE LOCATION FOR REVIEW AND APPROVAL BY ENGINEER OF RECORD PRIOR TO CONSTRUCTION.
15. CONCRETE MIX DESIGNS SHALL BE SUBMITTED FOR ALL CONCRETE USED. CONCRETE MIX DESIGNS SHALL BE FURNISHED BY EITHER THE CONCRETE SUPPLIER OR AN INDEPENDENT TESTING LABORATORY, BASED ON THE CONCRETE SUPPLIER'S CURRENT PRODUCTION FACILITIES RECORD OF STRENGTH TESTS. THESE TESTS SHALL BE EVALUATED AND MIX DESIGNS PROPORTIONED TO MEET THE REQUIREMENTS BASED ON THE STANDARD DEVIATIONS AS OUTLINED IN ACI 318-89, SECTION 5.2. RESULTS OF CONCRETE CYLINDER COMPRESSION BREAK TESTS FOR PROPOSED DESIGN MIX SHALL BE INCLUDED IN THE SUBMITTAL. POZZOLAN "F" (FLY-ASH) SHALL BE USED PROVIDED THE CEMENT CONTENT OF THE ORIGINAL MIX WITHOUT FLY-ASH IS NOT REDUCED BY MORE THAN 20% BY WEIGHT AND THE FLY-ASH ADDED DOES NOT EXCEED 1.3 POUNDS FOR EACH POUND OF CEMENT REMOVED. OTHER ADMIXTURES MAY BE USED; HOWEVER, THEY SHALL NOT BE CONSIDERED AS REPLACING ANY PART OF THE CEMENT CONTENT FOR THE SPECIFIED CONCRETE STRENGTH. NO ALUMINUM CONDUITS OR PIPES SHALL BE EMBEDDED IN OR ATTACHED TO THE CONCRETE. COLD WEATHER AND HOT WEATHER CONCRETING SHALL BE PLACED ACCORDING TO RECOMMENDED PRACTICES IN ACI 306 AND ACI 305, RESPECTIVELY.

    REINFORCING STEEL:
    ALL REINFORCING STEEL FOR THE PROJECT SHALL BE DEFORMED BARS AND SHALL CONFORM TO THE FOLLOWING ASTM STANDARD DESIGNATIONS:

    #4 BAR AND LARGER IN CONCRETE.....A-615 GRADE 60
    MASONRY REINFORCING.....A-615 GRADE 60

    CHAIRS AND SUPPORT BARS SHALL BE PROVIDED IN ACCORDANCE WITH ACI STANDARDS. REINFORCEMENT SHALL BE DETAILED TO MEET ACI 315 STANDARDS. SHOP DRAWINGS SHALL BE SUBMITTED SHOWING ALL REINFORCEMENT TO BE PLACED. SHOP DRAWINGS SHALL INCLUDE PLAN AND ELEVATIONS PERTAINING TO BAR LOCATION AND PLACEMENT WITHIN FOUNDATIONS, SLABS, BEAMS, COLUMNS AND WALLS.

METALS

1. STRUCTURAL STEEL: STRUCTURAL STEEL SHALL BE ASTM A 36 GRADE. BOLTS A 307. TUBE STEEL AND PIPE STEEL SHALL BE ASTM A 500 GRADE B, FY = 46 KSI FOR TUBE STEEL AND 42 KSI FOR PIPE STEEL AND WELDABLE PER AWS D1.4. LATEST AISC AND AWS CODES APPLY. FABRICATOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW BEFORE FABRICATION. MINIMUM EMBEDMENT OF ALL HORIZONTAL BOLTS IN GROUT OR CONCRETE SHALL BE 6" WITH 3" HOOK. VERTICAL BOLTS SHALL HAVE 10" EMBEDMENT WITH HEAVY HEX NUT AT EMBEDDED END, UNO.
2. WELDING: ALL CONSTRUCTION AND TESTING SHALL BE PER AWS CODES AND RECOMMENDATIONS. WELDING SHALL BE DONE IN SHOP UNLESS SHOWN OTHERWISE ON PLANS. FIELD WELDS SHALL BE APPROVED BY THE ENGINEER. ALL WELDING SHALL BE BY WELDERS HOLDING CURRENT VALID CERTIFICATES ISSUED BY AN ACCEPTED TESTING AGENCY AND HAVING EXPERIENCE IN THE TYPE OF WELD CALLED FOR.
3. ALUMINUM: ALUMINUM FOR THIS PROJECT SHALL BE OF TYPE 6063. ALUMINUM TO BE CAST INTO CONCRETE SHALL RECEIVE COATING OF COAL TAR EPOXY OR SIMILAR.
4. STAINLESS STEEL: STAINLESS STEEL SHALL BE 316 GRADE UNLESS NOTED OTHERWISE.

PRECAST WETWELL FLAT TOP SLAB:

1. DESIGN LOADINGS: 1,500 POUND POINT LOAD AT CENTER OF SLAB OR 150 PSF, WHICHEVER RESULTS IN THE HIGHER LOADING CONDITION.

SUPPLEMENTARY NOTES:

1. PROVIDE TEMPORARY BRACING, SHORING, GUYING OR OTHER MEANS TO AVOID EXCESSIVE STRESSES AND TO HOLD STRUCTURAL ELEMENTS IN PLACE DURING CONSTRUCTION.
2. ANY MEMBERS REQUIRED TO SUPPORT EQUIPMENT FROM THE FRAMING SHOWN SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR.
3. FOR CONNECTIONS SEE DETAILS. IF NOT SHOWN OR NOTED, MINIMUM CONNECTIONS TO BE INCLUDED IN BID SHALL BE TWO 5/8" DIA. BOLTS OR 3/16" FILLET WELD 4" LONG USING 1/4" CONNECTION MATERIAL AND DETAILED TO MINIMIZE BENDING IN CONNECTION. PROCEED AFTER CLARIFICATION THROUGH SHOP DRAWING SUBMITTAL.
4. ANY ENGINEERING DESIGN PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW SHALL BE BY A STRUCTURAL ENGINEER REGISTERED IN ARIZONA WITH CONTINUOUS FIVE YEARS EXPERIENCE IN THE TYPE OF DESIGN SUBMITTED.
5. UNLESS NOTED OTHERWISE, DETAILS ON STRUCTURAL DRAWINGS ARE TYPICAL AS INDICATED BY CUTS, REFERENCES OR TITLES.
6. IN CASE OF CONFLICTS, MORE COSTLY REQUIREMENTS GOVERN FOR BIDDING. SUBMIT CLARIFICATION REQUEST PRIOR TO PROCEEDING WITH WORK.
7. VERIFY ALL DIMENSIONS WITH OTHER DISCIPLINE DRAWINGS.
8. CONTRACTOR SHALL ESTABLISH AND VERIFY IN THE FIELD ALL EXISTING CONDITIONS AFFECTING NEW CONSTRUCTION.
9. DO NOT SCALE DRAWINGS. IN CASE OF ANY CONFLICT VERIFY WITH ENGINEER PRIOR TO CONSTRUCTION.
10. "TYP" INDICATES DETAIL OCCURS MORE THAN ONCE. CONTRACTOR SHALL DETAIL ALL SUCH OCCURRENCES ON SHOP DRAWINGS SUBMITTALS.
11. SHOP DRAWINGS INVOLVING STRUCTURAL CALCULATIONS SHALL BE STAMPED AND SIGNED BY CIVIL OR STRUCTURAL ENGINEER REGISTERED IN THE STATE OF ARIZONA.
12. A. SPECIAL INSPECTION IS REQUIRED PER CODE FOR ALL STRUCTURAL REINFORCED CONCRETE WORK.
    B. SPECIAL INSPECTION IS ALSO REQUIRED FOR FIELD WELDING, AND INSTALLATION OF EPOXY BOLTS.
    C. PER BUILDING CODES CH. 17 NOTE: SPECIAL INSPECTIONS DO NOT PRECLUDE ANY NTUA INSPECTIONS.

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
DESIGN AND CONSTRUCTION OF IYANBITO LIFT STATION FACILITIES

GENERAL STRUCTURAL NOTES

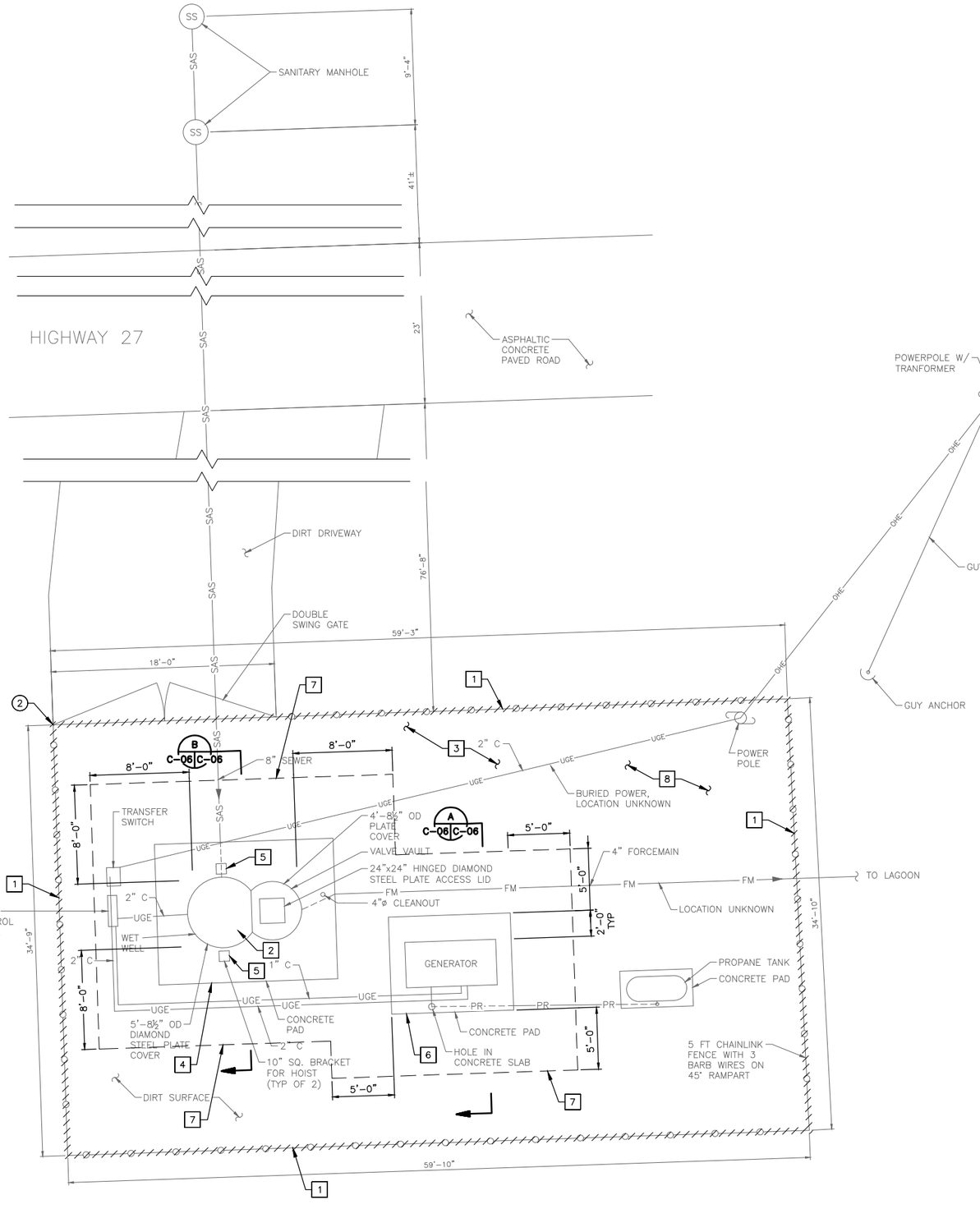
NCS ENGINEERS EST. 1998
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

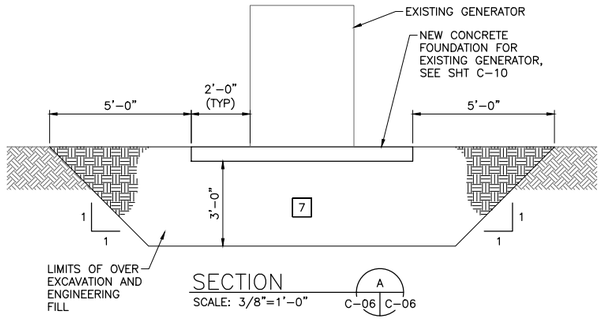
Registered Professional Engineer
CERTIFICATE NO.
28112
RAMESH NARASIMHAN
State Registered
ARIZONA, U.S.A.

EXPIRATION DATE: 09/30/27

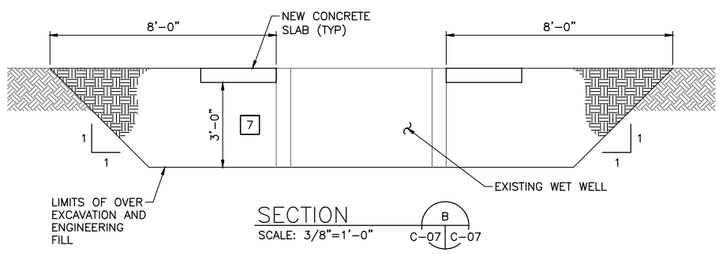
Drawn by:	KWB
Design by:	LAH
Approved by:	RN
Date	11/20/25
Project No.	----
Sheet No.	G-04

Dec 01, 2025 - 3:26pm
Z:_Storage\cad projects\for greg b\ntua lift stations - (4) sites\CAD\IYANBITO\G-04.dwg





NOTE:
SCARIFY SUBGRADE TO 10" DEPTH AND RECOMPACT TO 95%. SEE GEOTECHNICAL EVALUATION REPORT FOR OPTIMUM MOISTURE RECOMMENDATIONS.



NOTE:
SCARIFY SUBGRADE TO 10" DEPTH AND RECOMPACT TO 95%. SEE GEOTECHNICAL EVALUATION REPORT FOR OPTIMUM MOISTURE RECOMMENDATIONS.

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

REMOVALS NOTES

1	REMOVE CHAINLINK FENCE INCLUDING POSTS, FABRIC, BARBED WIRE, AND DISPOSE OF.
2	FOR REMOVALS SEE SHT M-06
3	ADD ALTERNATE A1: REMOVE 4 INCHES OF SOIL WITHIN FENCED AREA AND DISPOSE OF.
4	REMOVE CONCRETE SLAB AND DISPOSE OF. THICKNESS UNKNOWN. UNKNOWN IF SLAB CONTAINS REBAR.
5	REMOVE HOIST BRACKET AND DISPOSE OF.
6	DISCONNECT WIRING AND PIPING AND PICKUP GENERATOR AND TEMPORARILY STORE ON SITE. REMOVE CONCRETE FOUNDATION. THICKNESS UNKNOWN, UNKNOWN IF FOUNDATION CONTAINS REBAR.
7	LIMITS OF OVER-EXCAVATION. REMOVE EXISTING SOIL TO 3 FT BELOW NEW FOUNDATION/SLAB. PLACE SOIL IN LIFTS NOT TO EXCEED 10 INCHES. COMPACT TO 95% PER ASTM D1557. ON SITE SOILS MAY BE RE-USED AS FILL. OVER EXCAVATION AND PLACEMENT OF FILL SHALL BE CONDUCTED IN ACCORDANCE WITH GEOTECHNICAL EVALUATION REPORT FOR IYANBITO LIFT STATION BY WESTERN TECHNOLOGIES INC. DATED NOVEMBER 3, 2020. THE REPORT MAY BE OBTAINED FROM NTUA OR ENGINEER.
8	REMOVE WEEDS AND DISPOSE OF. PROVIDE PRE-EMERGENT HERBICIDE.

GENERAL NOTES

1. POTHOLE EXISTING BURIED PIPING AND ELECTRICAL BEFORE BEGINNING ANY EXCAVATION OR TRENCHING FOR PIPE INSTALLATION.
2. POTHOLE AND DETERMINE DEPTH, LOCATION, AND PIPE MATERIAL FOR EXISTING BURIED PIPING BEFORE ORDERING PIPE MATERIALS AND BEGINNING TRENCHING.
3. SEE ELECTRICAL SHEETS FOR ELECTRICAL ITEM REMOVALS.
4. PROPERTY BOUNDARIES NOT AVAILABLE AND NOT SHOWN.
5. SUPPORT BURIED PIPING AND ELECTRICAL AS NEEDED FOR OVER-EXCAVATION AND BACKFILLING.

No.	Revision Note	Date	Drawn	Check

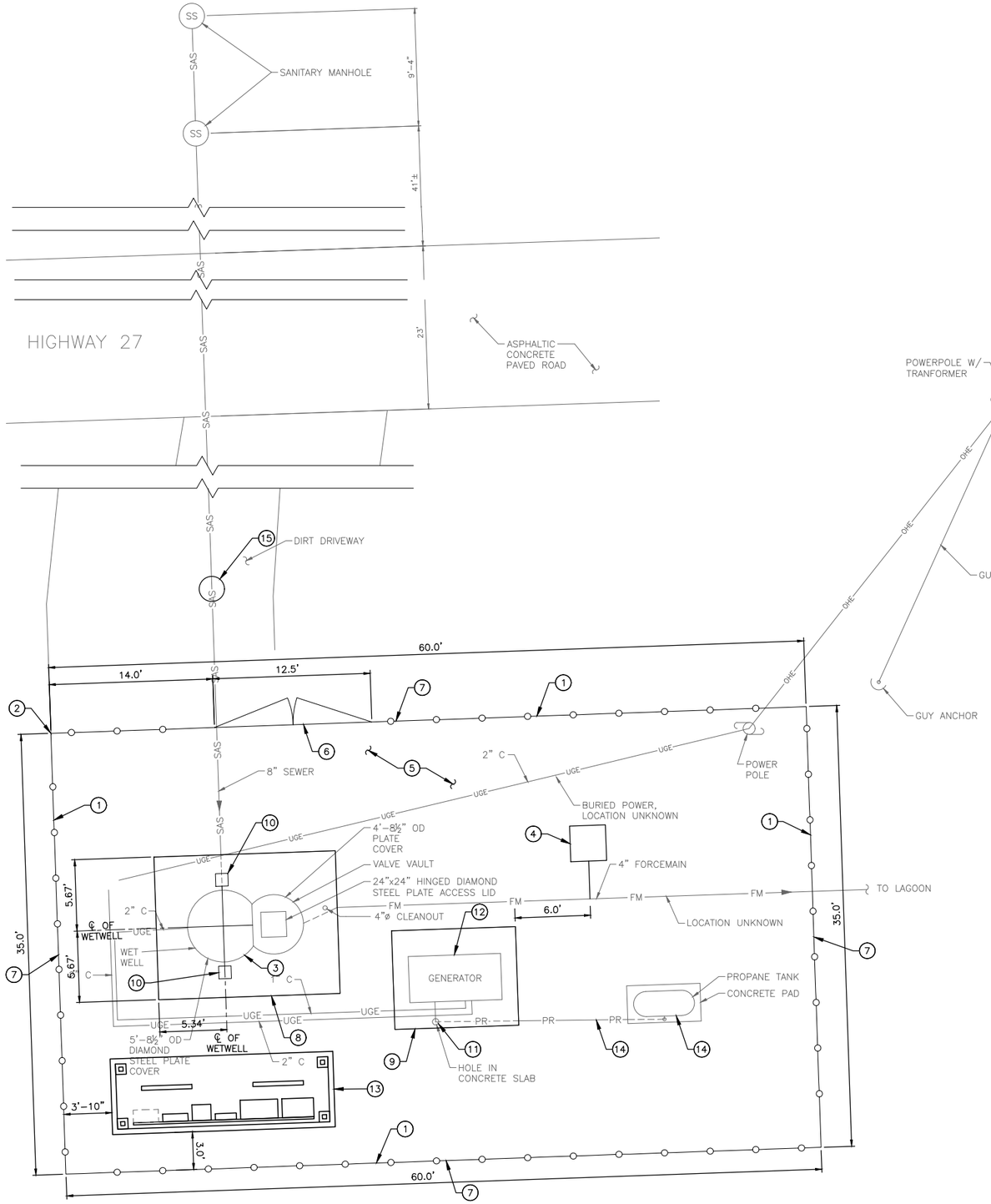
NAVAJO TRIBAL UTILITY AUTHORITY
DESIGN AND CONSTRUCTION OF IYANBITO LIFT STATION FACILITIES

IYANBITO SITE DEMOLITION PLAN

NCS ENGINEERS EST. 1998
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

Registered Professional Engineer
23112
RAMESH NARASIMHAN
Date Signed 11/20/25
ARIZONA, U.S.A.
EXPIRATION DATE: 09/30/27

Drawn by:	KWB
Design by:	LAH
Approved by:	RN
Date	11/20/25
Project No.	----
Sheet No.	C-06



CONSTRUCTION NOTES	
1	6 FT CHAINLINK FENCE WITH 3 BARBED WIRES. SEE FENCE DETAIL AND SPECIFICATIONS ON SHT C–11.
2	HOLD THIS CORNER WHEN REPLACING FENCE.
3	FOR MODIFICATIONS, SEE SHT M–06.
4	PUMP AROUND PORT. SEE DETAIL ON SHEET C–10.
5	ADD ALTERNATE A1: 4 INCH COMPACTED DEPTH OF 3/4" AGGREGATE BASE COURSE PER MAG 702 WITHIN FENCED AREA. COMPACT TO 95% PER ASTM D1557.
6	DOUBLE SWING GATE, 6 FT CHAINLINK FENCE WITH 3 BARBED WIRES. SEE SHT C–11.
7	SIGN. SEE DETAIL ON SHT C–10. ATTACH TO FENCE W/ NON–CORRODING HARDWARE.
8	CONCRETE SLAB ON GRADE. SEE DETAIL ON SHT C–10.
9	CONCRETE FOUNDATION FOR GENERATOR. SEE DETAIL ON SHT C–10. RESET GENERATOR AND CONNECT ELECTRICAL AND PROPANE GAS PIPING.
10	BRACKET FOR PORTABLE HOIST.
11	HOLE IN FOUNDATION FOR PROPANE GAS PIPING.
12	EXISTING GENERATOR. SEE SPECIFICATIONS ON SHEET M–01.
13	SHADE CANOPY. SEE SHT C–08. OVER EXCAVATE TO A DEPTH OF 3 FT BELOW FOUNDATION AND PLACE ENGINEERED FILL PER GEOTECHNICAL REPORT. OVER–EXCAVATION SHALL EXTEND TO 3 FT OUTSIDE THE FOUNDATION.
14	EXISTING PROPANE TANK AND PROPANE PIPING. SEE SPECIFICATIONS ON SHT M–01.
15	INSTALL 10' MANHOLE FOR PUMP AROUND. FIELD VERIFY. SEE DETAILS ON SHEET C–11

GENERAL NOTES

1. POTHOLE EXISTING BURIED PIPING AND ELECTRICAL BEFORE BEGINNING ANY EXCAVATION OR TRENCHING FOR PIPE INSTALLATION.
2. POTHOLE AND DETERMINE DEPTH, LOCATION, AND PIPE MATERIAL FOR EXISTING BURIED PIPING BEFORE ORDERING PIPE MATERIALS AND BEGINNING TRENCHING.
3. FOR NEW ELECTRICAL, SEE ELECTRICAL SHEETS.
4. PROPERTY BOUNDARIES NOT AVAILABLE AND NOT SHOWN.

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

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
DESIGN AND CONSTRUCTION OF IYANBITO LIFT STATION FACILITIES

IYANBITO SITE IMPROVEMENTS PLAN

NCS ENGINEERS EST. 1998
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

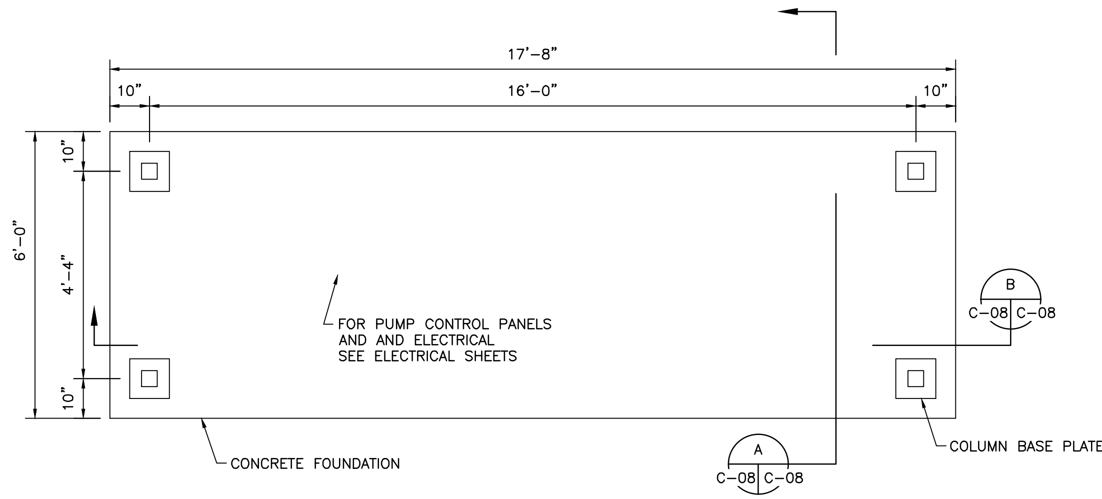
Registered Professional Engineer
28112
RAMESH NARASIMHAN
Date Signed 11/20/25
ARIZONA, U.S.A.
EXPIRATION DATE: 09/30/27

Drawn by:	KWB
Design by:	LAH
Approved by:	RN
Date	11/20/25
Project No.	----
Sheet No.	C–07

Dec 01, 2025 - 3:26pm
Z:_Storage\cad\projects\(or greg b\ntua lift stations - (4) sites\CAD\IYANBITO\C-07 - IYANBITO.dwg

NOTES:

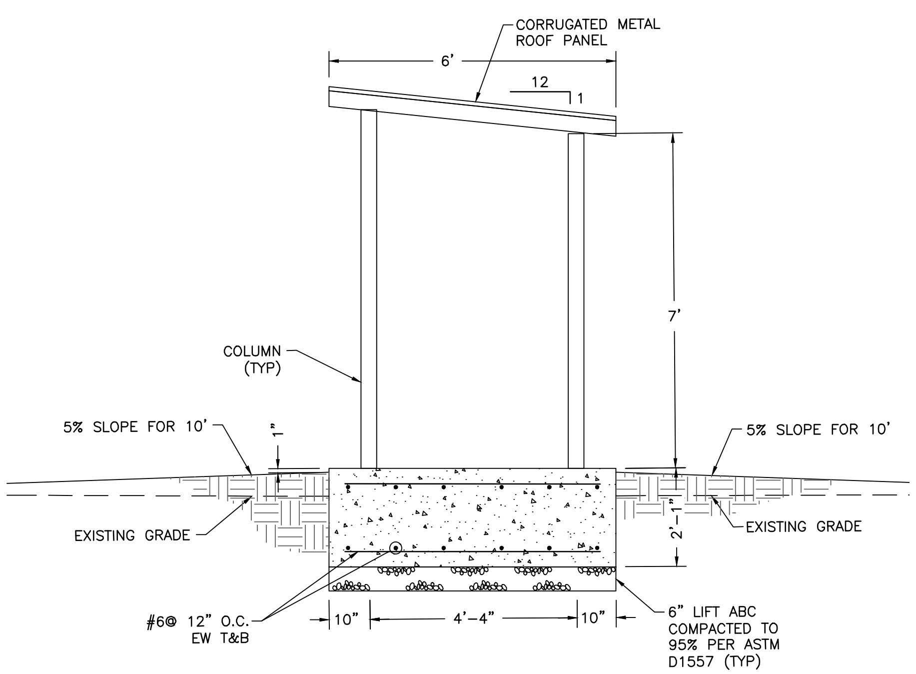
1. SHADE CANOPIES STRUCTURAL DESIGN AND ANCHORAGE SYSTEM TO FOUNDATION SHALL BE BY ALUMA-LINE (PHOENIX, AZ) INC OR APPROVED EQUAL. SHADE CANOPY MANUFACTURER SHALL DESIGN AND PROVIDE SHOP DRAWING FOR CANOPIES. DESIGN CALCULATION AND SHOP DRAWINGS SHALL BE SEALED BY AN ARIZONA LICENSED PROFESSIONAL ENGINEER.
2. CORRUGATED STEEL ROOF PANELS SHALL BE BY MBCI OR APPROVED EQUAL. COATING SHALL BE SIGNATURE 200 FACTORY APPLIED AND BAKED-ON OVER GALVALUME. COLOR WILL BE SELECTED BY NTUA.
3. FASTENERS SHALL BE NON-CORRODING MATERIAL.
4. EPOXY ANCHOR BOLTS DESIGN BY ALUMA-LINE'S STRUCTURAL DESIGNER.
5. SEE SHT G-04 FOR GENERAL STRUCTURAL NOTES. THE SCADA ANTENNA POLE SHALL BE MOUNTED ON THE SHADE CANOPY. SEE DETAIL ON SHT E-22.



SHADE CANOPY SECTIONAL PLAN

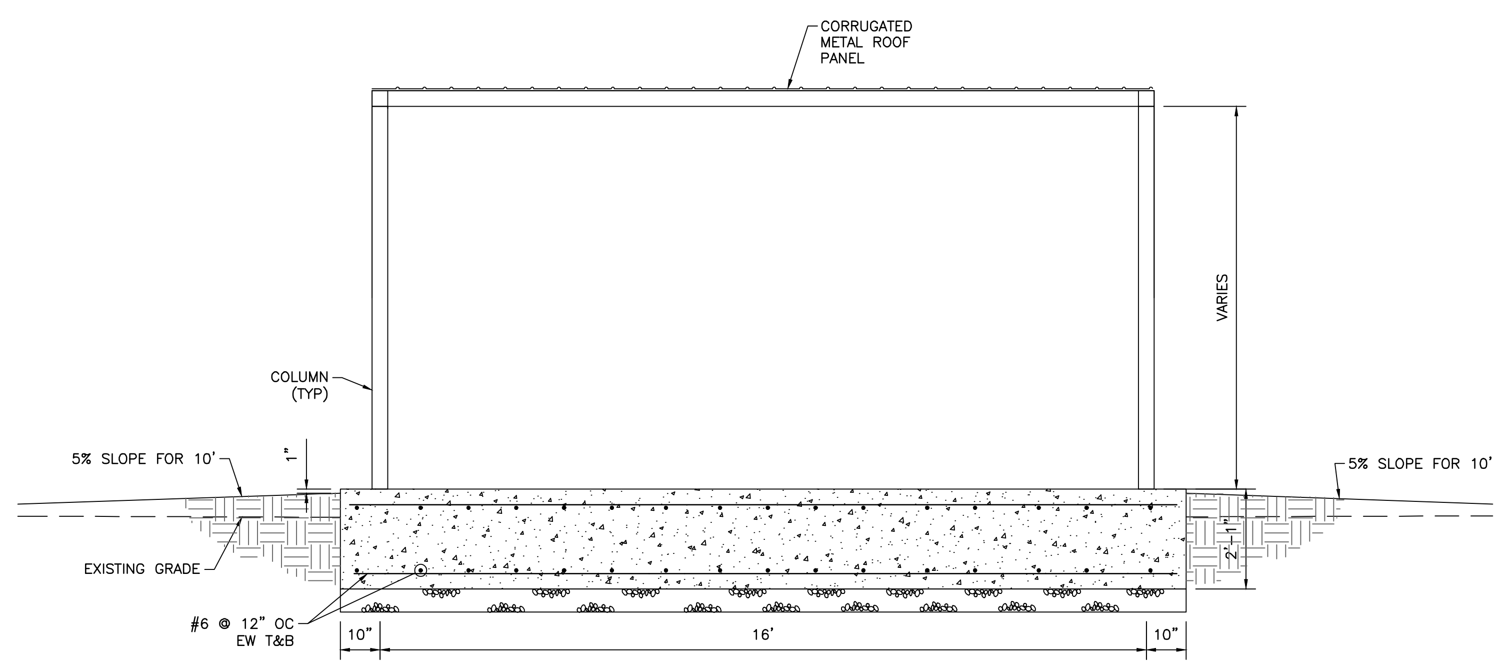
SCALE: 1/2"=1'-0"

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



SECTION A C-08 C-08

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



SECTION B C-08 C-08

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

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
DESIGN AND CONSTRUCTION OF IYANBITO LIFT STATION FACILITIES

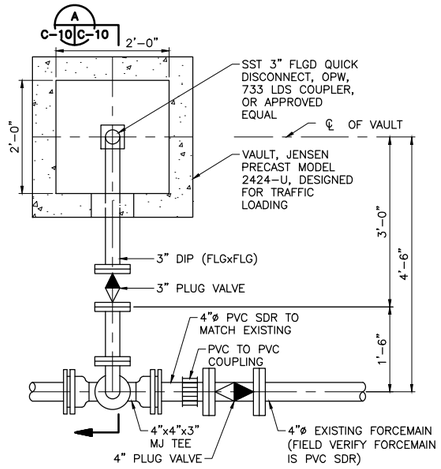
SHADE CANOPY PLAN AND SECTIONS

NCS ENGINEERS EST. 1998
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

Registered Professional Engineer CERTIFICATE NO. 28812 RAMESH NARASIMHAN ARIZONA, U.S.A.

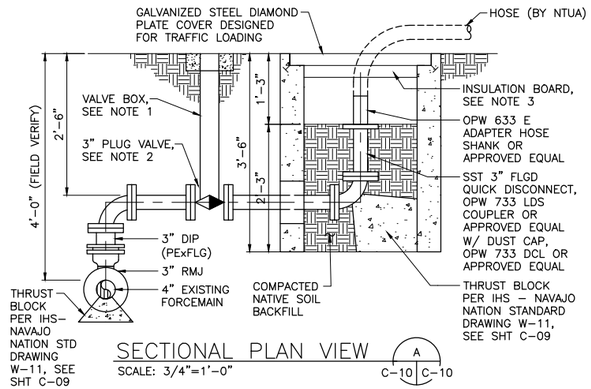
EXPIRATION DATE: 09/30/27

Drawn by: KWB
Design by: LAH
Approved by: RN
Date 11/20/25
Project No. ----
Sheet No. C-08



SECTIONAL PLAN VIEW

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



SECTIONAL PLAN VIEW

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

A C-10 C-10

NOTES:

1. VALVE BOX, SIMILAR TO IHS – NAVAJO NATION DETAIL STD DWG W-16, SEE SHT C-09. INDICATE "SEWER" ON VALVE BOX COVER. VALVE BOX SHALL BE 5¼" NOMINAL SHAFT DIAMETER, TYLER 6850 SERIES.
2. 3" ECCENTRIC PLUG VALVE W/ T-WRENCH AND EXTENDED NUT, DEZURIK OR APPROVED EQUAL.
3. 4" POLYISOCYANURATE INSULATION W/ THERMAL RESISTANCE R-6. ATTACH W/ ADHESIVE TO UNDERSIDE OF COVER BY COVER MANUFACTURER.
4. TRENCH BACKFILL SHALL BE COMPACTED TO 90% PER ASTM D1557.

PUMP-AROUND PORT DETAIL

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

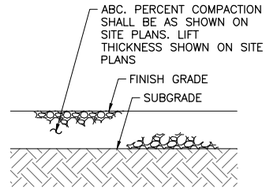
0' 1' 2'

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

NOTE:
LETTERS TO BE REFLECTIVE WHITE ON A TAN BACKGROUND. COATED PREMIUM GRADE ALUMINUM, 0.08" THICKNESS. SIGN SHALL BE INSTALLED IN A CLEARLY VISIBLE LOCATION NEAR CENTER OF OUTSIDE FENCE EACH SIDE OF LIFTSTATION.

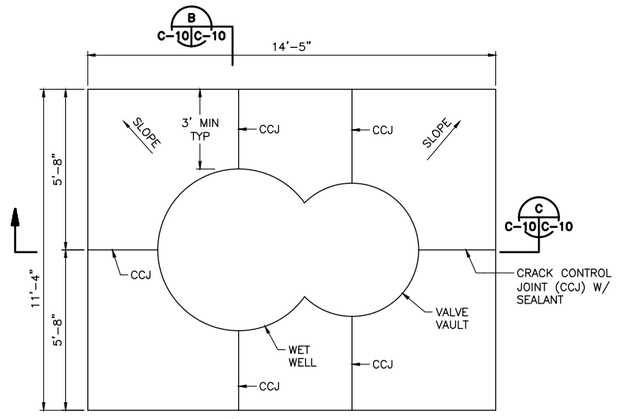
LIFT STATION PERIMETER FENCE SIGN DETAIL

SCALE: NTS



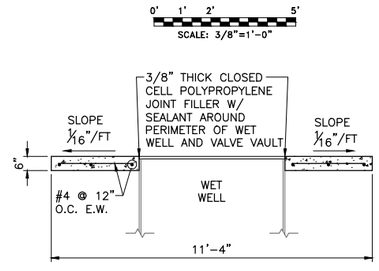
ABC SURFACING DETAIL

SCALE: NTS



IYANBITO LIFT STATION REPLACEMENT FOUNDATION PLAN

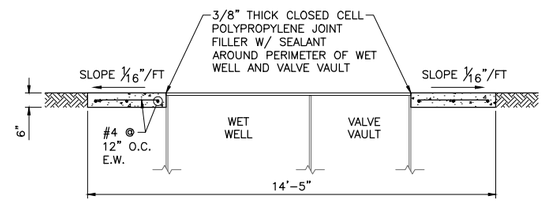
SCALE: 3/8"=1'-0"



SECTION

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

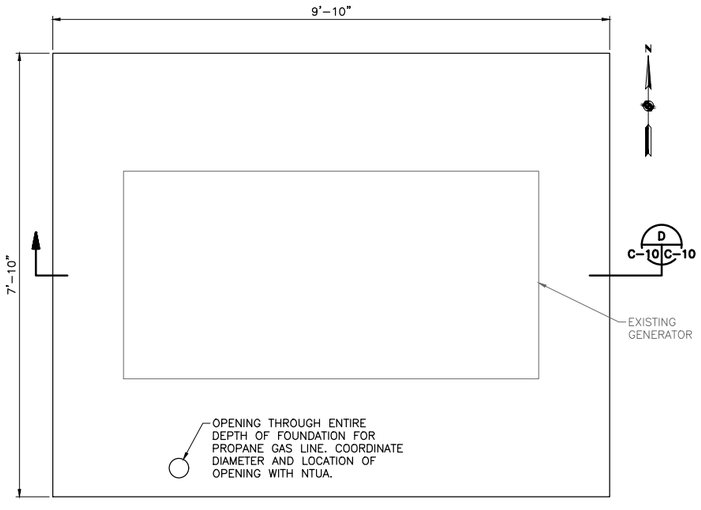
B C-10 C-10



SECTION

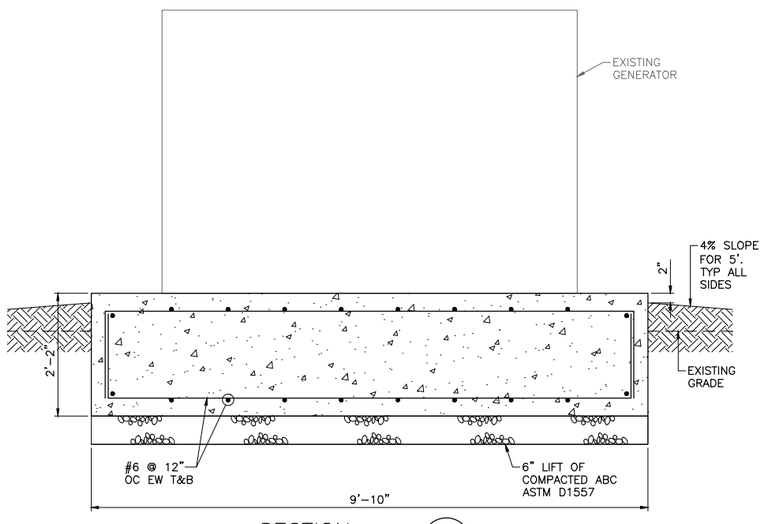
SCALE: 3/8"=1'-0"

C C-10 C-10



IYANBITO – GENERATOR REPLACEMENT FOUNDATION PLAN

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



SECTION

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

D C-10 C-10

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
DESIGN AND CONSTRUCTION OF IYANBITO LIFT STATION FACILITIES

PUMP-AROUND PORT AND CIVIL DETAILS

NCS ENGINEERS EST. 1998
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

Registered Professional Engineer (Civil) 28112 RAMESH NARASIMHAN Date Signed 11/20/2025 ARIZONA, U.S.A.

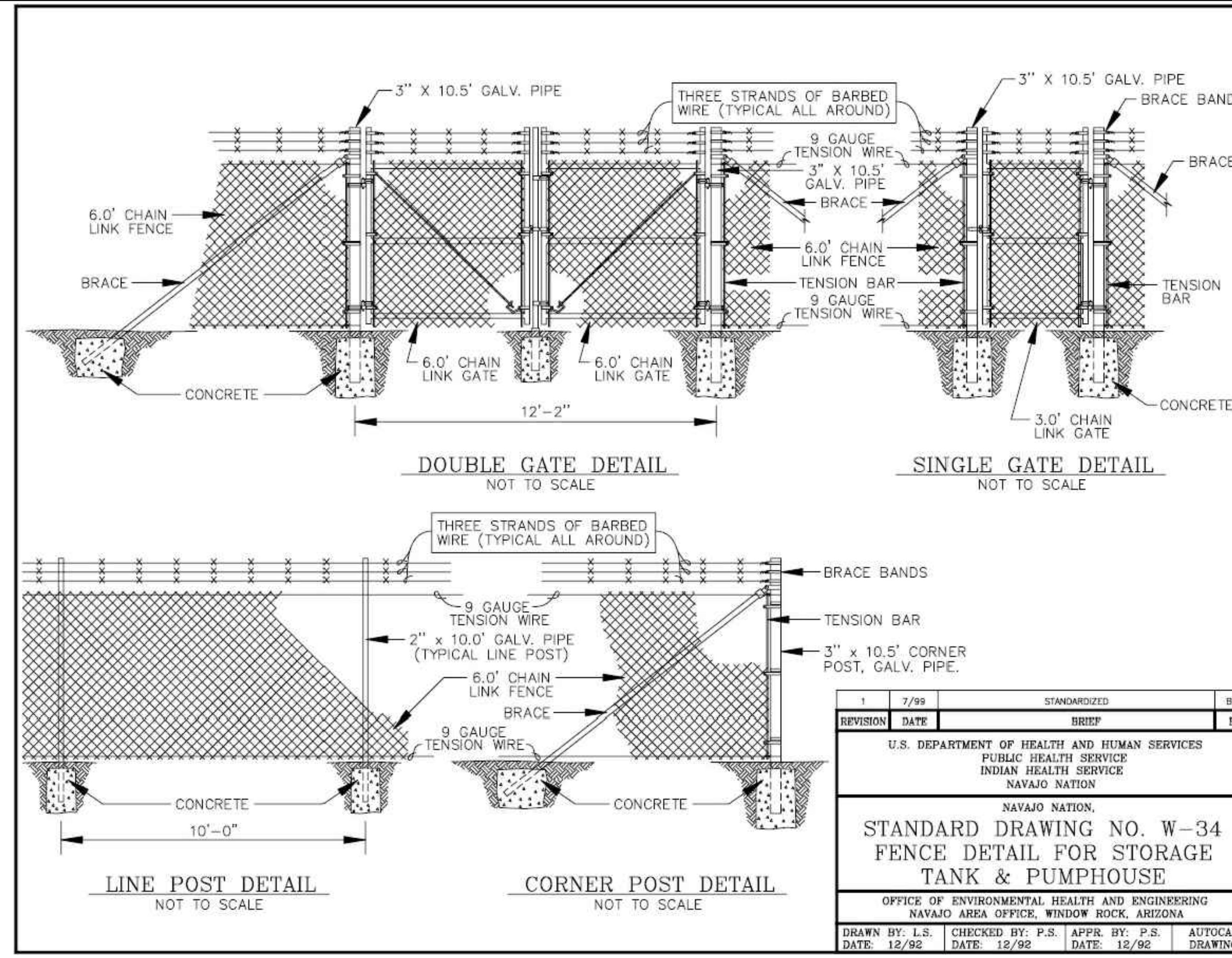
EXPIRATION DATE: 09/30/27

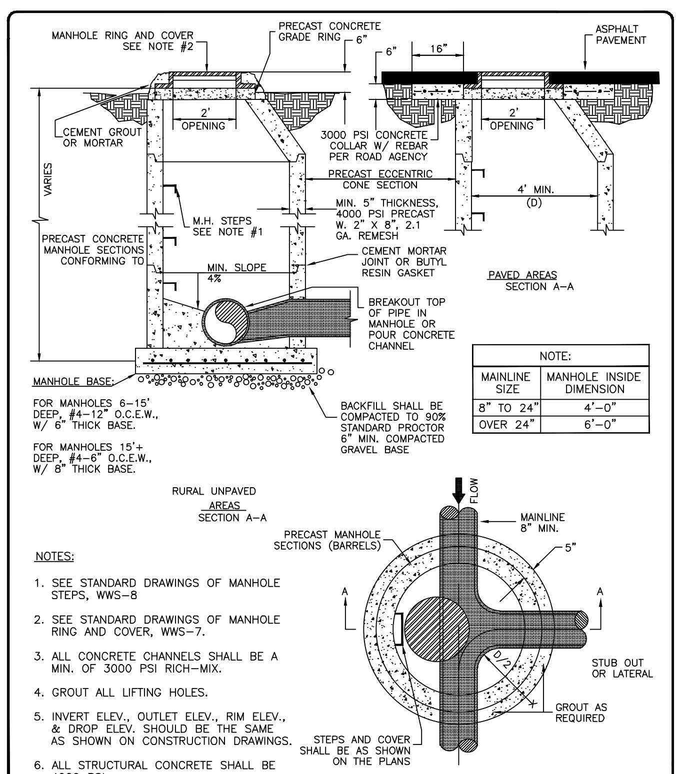
Drawn by:	KWB
Design by:	LAH
Approved by:	RN
Date	11/20/25
Project No.	----
Sheet No.	C-10

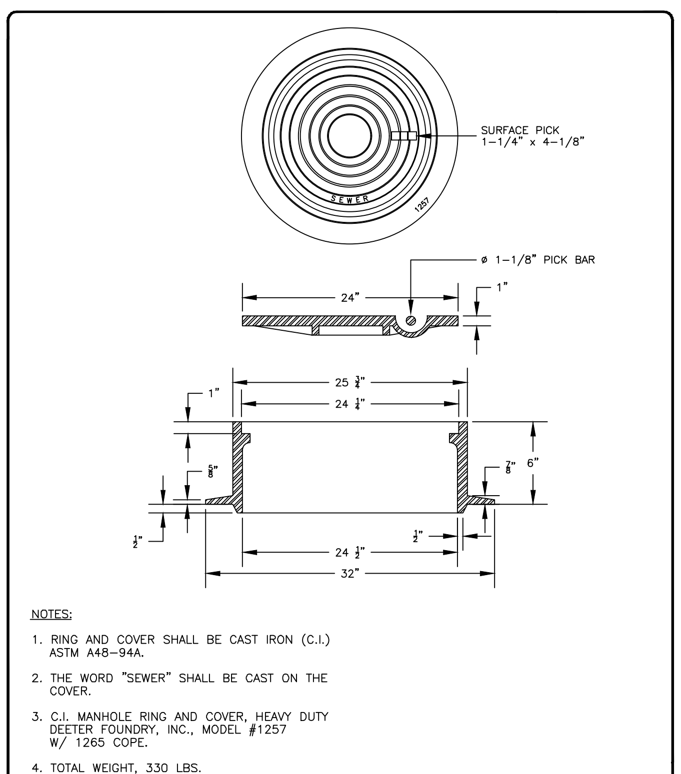
Dec 01, 2025 - 3:26pm
Z:_Storage\cad1 projects\for greg b\ntua lift stations - (4) sites\CAD\IYANBITO\C-10.dwg

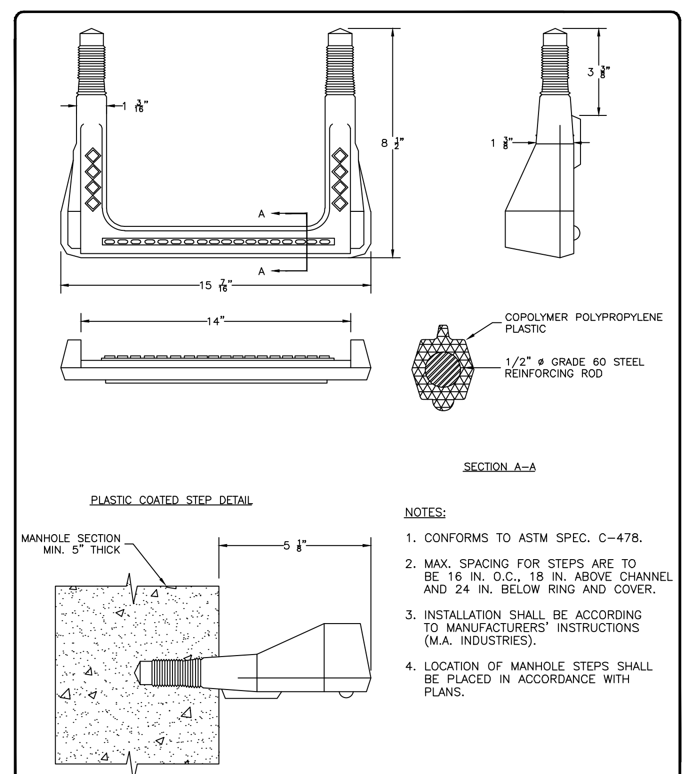
CIVIL SITEWORK SPECIFICATIONS:

1. MATERIALS TESTING:
   a. SOILS: PROVIDE COMPACTION TESTING FOR:
      i. FOR TRENCHES: MINIMUM OF ONE EVERY OTHER 8 INCH LIFT, AND ONE EVERY 50 LINEAL FEET.
      ii. UNDER STRUCTURES, FOUNDATIONS, AND SLABS: MINIMUM OF ONE EVERY 8 INCH LIFT, AND ONE EVERY 400 SQUARE FEET.
      iii. PREPARE AND PROVIDE MOISTURE DENSITY CURVE FOR EACH TYPE OF SOIL PLACED.
   b. AGGREGATE BASE COURSE: PROVIDE COMPACTION TESTING MINIMUM ONE EVERY 30 CUBIC YARDS. PREPARE AND PROVIDE MOISTURE DENSITY CURVE FOR AGGREGATE BASE COURSE.
   c. CAST–IN–PLACE CONCRETE:
      i. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH ASTM C 31, ASTM C 39, AND ASTM C 172.
      ii. NOT LESS THAN THREE CYLINDER SPECIMENS, 6 INCH DIAMETER BY 12 INCH LONG SHALL BE TESTED FOR EACH DAY'S PLACEMENT AT EACH SITE. ONE CYLINDER SHALL BE BROKEN AT 7 DAYS AND TWO AT 28 DAYS.
      iii. TEST SLUMP OF CONCRETE USING SLUMP CONE IN ACCORDANCE WITH ASTM C143.
      iv. TEST AIR ENTRAINMENT IN CONCRETE IN ACCORDANCE WITH ASM C173.
      v. CONCRETE IS EXPECTED TO REACH OR EXCEED THE CONCRETE COMPRESSIVE STRENGTH SPECIFIED IN THE GENERAL STRUCTURAL NOTES. NO INDIVIDUAL STRENGTH TEST (AVERAGE OF TWO CYLINDERS) SHALL FALL BELOW THE SPECIFIED COMPRESSIVE STRENGTH BY MORE THAN 300 POUNDS PER SQUARE INCH.
   d. PROMPTLY PROVIDE TEST REPORTS TO NTUA AND ENGINEER ELECTRONICALLY.
2. CHAIN LINK FENCE:
   a. SEE INDIAN HEALTH SERVICE, NAVAJO NATION, STANDARD DRAWING NO. W–34 ON SHT C–11. DELETE TOP TENSION WIRE AND PROVIDE TOP RAIL.
   b. CHAIN LINK FABRIC SHALL BE 2–INCH MESH 9 GAUGE, AND HAVE 75,000 PSI TENSILE STRENGTH.. FABRIC SHALL HAVE CLASS 2 ZINC COATING, HOT DIPPED GALVANIZED AFTER FABRICATION, AND CONFORM WITH ASTM A392.
   c. PIPE FOR POSTS, TOP RAIL, AND BRACES SHALL BE ASTM A53, SCHEDULE 40 STEEL PIPE. POSTS, RAILS, BRACES, AND FRAMES SHALL BE HOT DIP GALVANIZED PER ASTM A53, A123, OR A153, WHICHEVER IS APPLICABLE. GALVANIZING SHALL BE APPLIED AT LEAST 2.0 OUNCES OF ZINC PER SQUARE FOOT OF SURFACE.
   d. BRACES SHALL BE 1 5/8 INCH OUTSIDE DIAMETER WEIGHING 2.27 POUNDS PER FOOT.
   e. TOP RAILS SHALL BE 1.90 INCH OUTSIDE DIAMETER WEIGHING 2.72 POUNDS PER FOOT.
   f. GALVANIZED RAMPART SHALL INCLUDE THREE LINES OF GALVANIZED BARBED WIRE.
   g. TRUSS RODS SHALL BE FABRICATED ON 3/8 INCH DIAMETER STEEL RODS AND SHALL HAVE TURNBUCKLES OR SIMILAR MEANS OF ADJUSTMENT. FITTINGS AND TRUSS RODS SHALL BE HOT–DIP GALVANIZED IRON OR STEEL WITH A MINIMUM COATING OF 2.0 OUNCES OF ZINC PER SQUARE FOOT OF SURFACE IN ACCORDANCE WITH ASTM A123 OR A153, WHICHEVER IS APPLICABLE.
   h. CONCRETE SHALL HAVE MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2,500 PSI
   i. DOUBLE SWING GATES SHALL COMPLY WITH ASTM F900. GATE SHALL BE MANUFACTURED OF GALVANIZED MATERIALS. PROVIDE CENTER POST AND HASP FOR A PADLOCK.
   j. INSTALL CHAIN LINK FENCE IN ACCORDANCE WITH ASTM F567.









NAVAJO TRIBAL UTILITY AUTHORITY — STANDARD PRECAST SEWER MANHOLE DETAIL — DWG. NO. WWS-4

NAVAJO TRIBAL UTILITY AUTHORITY — STANDARD MANHOLE RING AND COVER — DWG. NO. WWS-5

NAVAJO TRIBAL UTILITY AUTHORITY — MANHOLE STEPS — DWG. NO. WWS-6

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
DESIGN AND CONSTRUCTION OF IYANBITO LIFT STATION FACILITIES

CIVIL DETAILS AND SPECIFICATIONS

NCS ENGINEERS
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

RAMESH NARASIMHAN 28112 — EXPIRATION DATE: 09/30/27

Drawn by: KWB
Design by: LAH
Approved by: RN
Date 11/20/25
Project No. ----
Sheet No. C-11

Dec 01, 2025 – 3:26pm
Z:_Storage\cad1 projects\for greg b\ntua lift stations – (4) sites\CAD\IYANBITO\C-11.dwg

Pump Schedule							
Site	**Design Capacity (gpm)**	**Design Head (ft)**	**Shut off Head (ft)**	**Pump Configuration**	**Max Pump Speed (rpm)**	**Nameplate driver horsepower**	**Drive Type**
Iyanbito	125	70	70	Submersible	1800	5 HP, 208V, three phase, explosion proof	Variable speed

EQUIPMENT AND MATERIALS SPECIFICATIONS

DUCTILE IRON PIPE AND FITTINGS:

PIPE SHALL BE IN ACCORDANCE WITH ANSI/AWWA C-151/A21.51.

FITTINGS SHALL BE IN ACCORDANCE WITH AWWA C-153/ANSI A21.53, AND AWWA C-115/ANSI A21.15 FOR FLANGED PIPE AND AWWA C-111/ANSI A21.11 FOR MECHANICAL JOINT PIPE.

FOR PUMP-AROUND PORT SYSTEM: FITTINGS SHALL HAVE FUSION BONDED EPOXY INTERIOR COATING PER AWWA C116/ANSI A21.16. PIPE SHALL HAVE CERAMIC AMINE CURED NOVALAC EPOXY INTERIOR COATING, 40 MILS.

MEGA-LUG OR APPROVED EQUAL FOR RESTRAINING JOINTS.

BURIED PIPING SHALL BE PROVIDED WITH POLYETHYLENE ENCASEMENT PER ASTM A674.

PVC PRESSURE PIPE:

PIPE SHALL BE IN ACCORDANCE WITH AWWA C-900. WHERE APPLICABLE, PIPE SHALL MATCH THE SDR OF EXISTING PIPE IT IS CONNECTING TO.

PVC GRAVITY SEWER PIPE:

PIPE SHALL BE SDR 35 IN ACCORDANCE WITH ASTM D-3024.

STAINLESS STEEL PIPE AND MISCELLANEOUS SUPPORTS:

PIPE SHALL BE SCHEDULE 40 IN ACCORDANCE WITH ANSI 36.19.

MISCELLANEOUS SUPPORT BRACKETS SHALL BE IN ACCORDANCE WITH ASTM A-276.

FASTENERS SHALL BE IN ACCORDANCE WITH ASTM A320: BOLTS GRADE L7, NUTS A194 GRADE 7 AND WASHERS F436.

STEEL PIPE:

PIPE SHALL BE SCHEDULE 40 IN ACCORDANCE WITH AWWA C-200/ASTM A53 AND AWWA C-206.

PLUG VALVES:

VALVES SHALL BE DEZURIK BULLETIN 12.00-1C OR APPROVED EQUAL; IN ACCORDANCE WITH AWWA C-517 AND C-111. CLASS 150 FLANGES SHALL BE IN ACCORDANCE WITH ANSI B16.5 VALVES SHALL BE FOR BURIED SERVICE WITH NUT OPERATOR.

ALUMINUM ACCESS HATCHES:

HATCHES SHALL BE HALLIDAY SERIES SERIES S, ALL STANDARD FEATURES WITH FALL THROUGH PROTECTION GRATING OR APPROVED EQUAL. HATCH DIMENSIONS SHALL BE AS SHOWN ON THE DRAWINGS. FOR FALL THROUGH PROTECTION PROVIDE HASP FOR NTUA TO UTILIZE PADLOCK.

PORTABLE PUMP LIFTING HOISTS:

HOISTS SHALL BE HALLIDAY SERIES DB WITH ALL STANDARD FEATURES OR APPROVED EQUAL. HOIST CAPACITY SHALL BE 1,330 LBS MINIMUM WITH THE DAVIT ARM EXTENDED PERPENDICULAR TO THE MAST, PARALLEL TO TOP OF WET WELL. PROVIDE HOISTS AS SHOWN FOR EACH LIFT STATION SITE (5 TOTAL).

POLYURETHANE COATINGS FOR WET WELLS:

COATING FOR INTERIOR OF LIFT STATIONS: REMOVE SEWERAGE FROM WETWELLS, CLEAN SURFACES, AND PREPARE SURFACES FOR COATING. SURFACE PREPARATION SHALL BE PER COATING MANUFACTURER'S RECOMMENDATIONS AND SHALL INCLUDE AT MINIMUM, ABRASIVE BLAST AND HIGH PRESSURE CLEANING. INCLUDE IN BID A MORTAR REPAIR OF TWO SQUARE FEET FOR EACH WETWELL TO RECEIVE COATING. PROVIDE ZEBRON PRIME (MIST) COAT AT 3 TO 5 WET MILS. PROVIDE TOP COAT OF ZEBRON SERIES 386 100% POLYURETHANE COATING AT MINIMUM OF 125 MILS. COATING SHALL BE APPLIED PER MANUFACTURER'S RECOMMENDATIONS. NTUA WILL SELECT THE COLOR OF THE TOP COAT.

PIPE PRESSURE TEST:

FOR PUMP-AROUND SYSTEM: BEFORE BACKFILLING THE PIPING, THE PIPING SYSTEM SHALL BE EXPOSED TO SYSTEM PRESSURE (THE PRESSURE IN THE FORCEMAIN). CONDUCT VISUAL EXAMINATION TO CONFIRM THERE IS NO LEAKAGE. FOR DISCHARGE PIPE REPLACEMENT IN WETWELL; CONDUCT VISUAL EXAMINATION TO CONFIRM THERE IS NO LEAKAGE.

COMBINATION AIR VALVE:
COMBINATION AIR VALVE SHALL BE SINGLE BODY STYLE AND SPECIFICALLY MANUFACTURED FOR WASTEWATER APPLICATIONS. THE BODY AND COVER OF THE VALVE SHALL BE CONSTRUCTED OF HEAVY-DUTY CAST IRON. BOLTS, NIPPLES, PLUGS SHALL BE TYPE 316 STAINLESS STEEL. FLOAT SHALL BE STAINLESS STEEL. VALVE SHALL BE DESIGNED FOR NO SPILLS AND NO SPURTS. STATIC PRESSURE IN THE PIPELINE AT LOCATION OF PROPOSED VALVE IS APPROXIMATE 22 PSI, PROVIDE APPROPRIATE SEAT. PROVIDE BACKFLUSHING ATTACHMENT. EXTERIOR PAINT SHALL BE SELECTED FOR A DAMP VAULT APPLICATION.

COMBINATION AIR VALVE SHALL BE VALMATIC VMC-301A OR APPROVED EQUAL.

PAINTING:

FOR FERROUS METALS, PRIMED OR UNPRIMED, SUCH AS BUT NOT LIMITED TO WETWELL VENT PIPES, ANTENNA POLE. PAINT MANUFACTURER SHALL BE SHERWIN-WILLIAMS OR APPROVED EQUAL.

PRIMER: ALKYD METAL PRIMER, ONE COAT, 1.3-1.5 DRY MILS.

GLOSS FINISH: URETHANE ALKYD GLOSS ENAMEL, TWO COATS, 2.0-2.2 DRY MILS.

EXISTING GENERATOR AT SAWMILL AND IYANBITO SITES:

RETAIN GENERATOR MANUFACTURER OR MANUFACTURER'S REPRESENTATIVE TO CONDUCT FIELD INSPECTION, CHECK-OUT, AND EVALUATION OF GENERATOR SYSTEM. PREPARE AND SUBMIT BRIEF WRITTEN REPORT WITH SUMMARY OF FIELD OBSERVATIONS AND EVALUATION, AND RECOMMENDATIONS FOR EQUIPMENT REPAIRS AND REPLACEMENTS FOR RETURNING GENERATORS TO OPERATING ORDER. STARTUP THE GENERATORS AND PROVIDE MINIMUM OF ONE HOUR OF ON-SITE TRAINING OF NTUA STAFF AT EACH SITE. EQUIPMENT REPAIRS AND REPLACEMENTS IF ANY, WILL BE AUTHORIZED BY CHANGE ORDER.

EQUIPMENT COATINGS:

ALL PUMPS, FITTINGS, PIPING ETC. SUPPLIED BY PUMP SYSTEM PACKAGE VENDOR SHALL HAVE MANUFACTURER'S STANDARD EPOXY INTERIOR AND EXTERIOR COATING. COATING SHALL BE DESIGNED FOR WASTEWATER APPLICATION.

RADAR LEVEL SENSOR:

SENSOR SHALL BE MICRO PILOT FMR20, 80MM WITH FLOOD PROTECTION TUBE AND PIVOT-TYPE MOUNTING ARM PART NO. 919790-002, BY EDRESS-HOUSER OR APPROVED EQUAL.

PROPANE TANKS

FOR LECHEE:

FURNISH AND INSTALL 250 GALLON PROPANE TANK MEETING ASME CODE. FILL TANK FOR TROUBLESHOOTING AND STARTUP PURPOSES OF GENERATOR. REFILL TANK AS NEEDED FOR THE TROUBLESHOOTING AND STARTUP PHASES. PRIOR TO TURNOVER, FILL TANK TO ITS CAPACITY. PROPANE TANK INSTALLATION (INCLUDING BUT NOT LIMITED TO, FUEL LINES, REGULATORS, ETC.) SHALL MEET CURRENT CODES.

FOR EXISTING PROPANE TANKS (TO REMAIN AND BE REUSED) AT SAWMILL AND IYANBITO:

FILL TANKS FOR TROUBLESHOOTING AND STARTUP PURPOSES OF GENERATORS. REFILL TANKS AS NEEDED FOR STARTUP PHASE. INSPECT AND (IF NECESSARY) BRING PROPANE TANK, FUEL LINES, REGULATORS, ETC. UP TO CURRENT CODE. PRIOR TO TURNOVER, FILL TANK TO ITS CAPACITY.

SPECIAL NOTES:

1. PUMP AROUND FOR LIFT STATION OUTAGES: CONTRACTOR SHALL PROVIDE ALL PUMPING EQUIPMENT, HOSES, FUEL AND ACCESSORIES REQUIRED TO PROVIDE CONTINUOUS AND RELIABLE PUMP AROUND OPERATIONS DURING ALL TIMES THE LIFT STATION(S) MUST BE TAKEN OUT OF SERVICE IN ORDER TO PERFORM THE WORK OF THIS CONTRACT. CONTRACTOR SHALL PROVIDE 24 HOUR SUPERVISION/MONITORING OF THE ALL PUMP AROUND OPERATIONS.
2. CONTRACTOR SHALL PROVIDE O&M MANUALS FOR ALL NEW OPERATING EQUIPMENT. 3 HARD COPIES AND 1 DIGITAL COPY FOR EACH LIFT STATION SITE.
3. CONTRACTOR SHALL PROVIDE A MINIMUM OF 4 HOURS PERSONNEL TRAINING ON ALL NEW OPERATING EQUIPMENT.

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
DESIGN AND CONSTRUCTION OF IYANBITO LIFT STATION FACILITIES

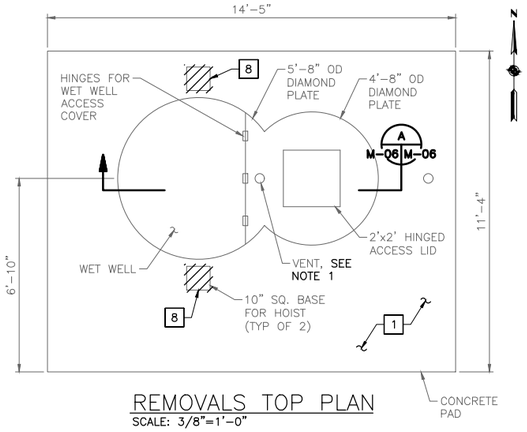
EQUIPMENT SCHEDULES AND SPECIFICATIONS

NCS ENGINEERS
EST. 1998
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

Registered Professional Engineer (Civil)
28112
RAMESH NARASIMHAN
Date Signed 11/20/2025
ARIZONA, U.S.A.

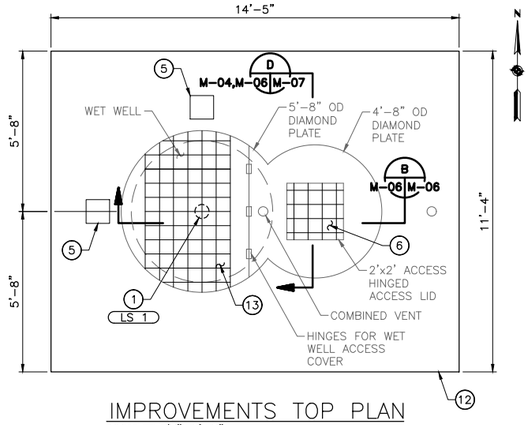
EXPIRATION DATE: 09/30/27

Drawn by:	KWB
Design by:	LAH
Approved by:	RN
Date	11/20/25
Project No.	----
Sheet No.	M-01

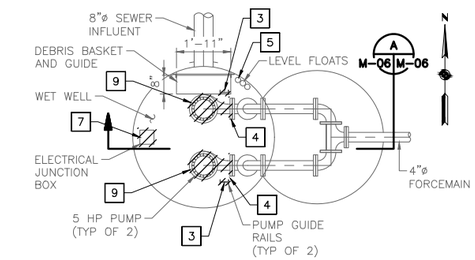


REMOVALS TOP PLAN
SCALE: 3/8"=1'-0"

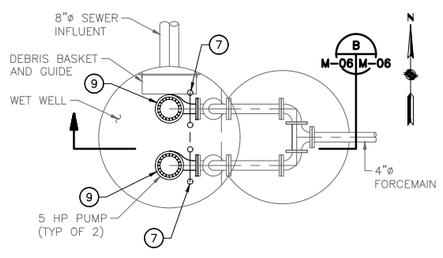
NOTES:
1. NTUA TO RESTORE THE VENT.



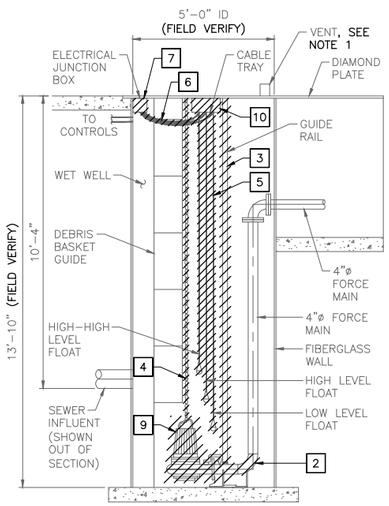
IMPROVEMENTS TOP PLAN
SCALE: 3/8"=1'-0"



REMOVALS SECTIONAL PLAN
SCALE: 3/8"=1'-0"

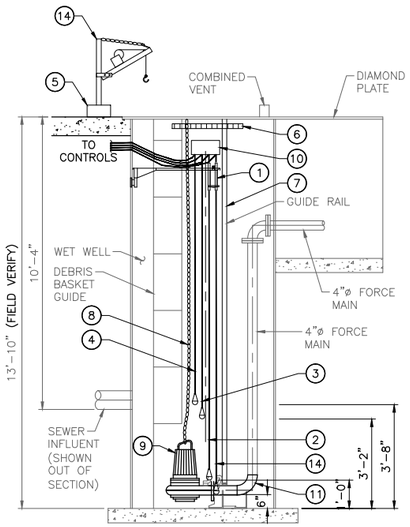


IMPROVEMENTS SECTIONAL PLAN
SCALE: 3/8"=1'-0"



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

A
M-06 M-06



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

B
M-06 M-06

NOTE:
FLOAT LEVELS INDICATED ARE INITIAL SETTINGS. FLOAT LEVELS SHOULD BE ADJUSTED PER FIELD OPERATING CONDITIONS DURING START UP ACTIVITIES.

0' 1' 2' 5'
SCALE: 3/8"=1'-0"

REMOVALS NOTES	
1	REMOVE CONCRETE SLAB.
2	REMOVE DISCHARGE ELBOW.
3	REMOVE PUMP GUIDE RAIL
4	REMOVE PUMP LIFTING CHAIN.
5	REMOVE LEVEL FLOATS.
6	REMOVE LEVEL FLOAT CABLES.
7	REMOVE ELECTRICAL JUNCTION BOX.
8	SALVAGE HOIST BASES.
9	REMOVE 5 HP PUMPS.
10	REMOVE CABLE HOLDER.

CONSTRUCTION NOTES	
1	RADAR LEVEL SENSOR. MOUNT LEVEL SENSOR ON WALL OF FIBERGLASS WET WELL. OF RMOUNTIN DETIAL, SEE SHT M-07.
2	LOW LEVEL FLOAT.
3	HIGH LEVEL FLOAT.
4	HIGH HIGH LEVEL FLOAT.
5	HOIST BRACKET FOR (PORTABLE) PUMP LIFTING HOIST.
6	FALL PROTECTION GRATING, SERIES X RETRO-GRATING BY HALLIDAY PRODUCTS W/ HASP FOR PADLOCK. CONTRACTOR SHALL PROVIDE ACCURATE DIMENSIONS FOR EXISTING HATCH OPENING TO HALLIDAY FOR THE FABRICATION OF UNDER-LID MOUNTING TYPE OF FALL PROTECTION GRATING.
7	PUMP GUIDE RAIL. 2" DIAMETER STAINLESS STEEL WITH TOP BRACKETS.
8	STAINLESS STEEL LIFTING CHAIN.
9	5 HP SOLIDS HANDLING PUMPS.
10	CABLE HOLDER.
11	DISCHARGE ELBOW.
12	REPLACE CONCRETE SLAB. SEE SHT C-06.
13	FALL PROTECTION GRATING, SERIES X RETRO-GRATING BY HALLIDAY PRODUCTS W/ HASP FOR PADLOCK. CONTRACTOR SHALL PROVIDE ACCURATE DIMENSIONS FOR EXISTING WET WELL INTERIOR DIMENSIONS OPENING TO HALLIDAY FOR THE FABRICATION OF WALL MOUNTING TYPE OF FALL PROTECTION GRATING.
14	HOIST BRACKET FOR (PORTABLE) PUMP LIFTING HOIST

GENERAL NOTES
1. FOR ELECTRICAL, SEE ELECTRICAL SHEETS. 2. WHEN INSTALLING EQUIPMENT AND MATERIALS IN WET WELL. MAINTAIN SPACE FOR RADAR LEVEL SENSOR BEAM DIAMETER.

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
DESIGN AND CONSTRUCTION OF IYANBITO LIFT STATION FACILITIES

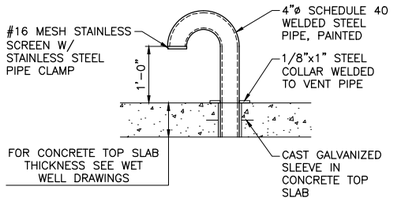
IYANBITO WETWELL REMOVALS AND IMPROVEMENTS

NCS ENGINEERS EST. 1994
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

Registered Professional Engineer
28112
RAMESH NARASIMHAN
State Registration
ARIZONA, U.S.A.
EXPIRATION DATE: 09/30/27

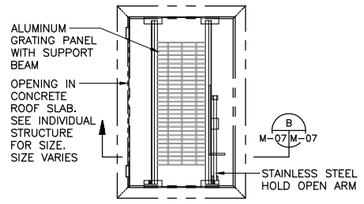
Drawn by:	KWB
Design by:	LAH
Approved by:	RN
Date	11/20/25
Project No.	----
Sheet No.	M-06

Dec 01, 2025 - 3:26pm
Z:_Storage\cad projects\for greg b\ntua lift stations - (4) sites\CAD\IYANBITO\M-06.dwg



WET WELL VENT DETAIL

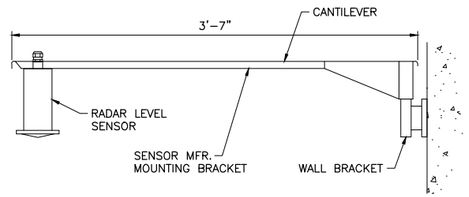
SCALE: 3/4"=1'-0"



FALL PROTECTION GRATING DETAIL 2

SCALE: NTS

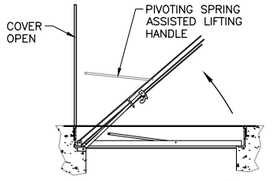
M-07 | M-07



RADAR LEVEL SENSOR MOUNTING DETAIL

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

NOTES:
1. WET WELL WALLS FOR COYOTE CANYON, COALMINE AND LECHEE ARE PRECAST CONCRETE. WET WELL WALLS FOR SAWMILL AND IYANBITO ARE FIBERGLASS. USE STAINLESS STEEL ANCHORS OR CONNECTORS AS APPROPRIATE.
2. MOUNTING SYSTEM SHALL BE FABRICATED FROM STAINLESS STEEL.

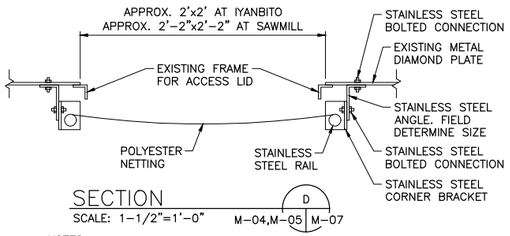


SECTION

SCALE: NTS

B
M-07 | M-07

NOTES:
1. THE GRATING SHALL BE OF ALUMINUM 1" (MIN.) BAR CONSTRUCTION.
2. T-316 STAINLESS STEEL HARDWARE SHALL BE USED.
3. THE GRATING SHALL HAVE MINIMUM 100 LBS. PER SQ. FT. LOAD RATING.
4. MFR: PROTECTIVE GRATING BY HALLIDAY PRODUCTS OR APPROVED EQUAL.
5. PROVIDE HASP FOR PADLOCK ON FALL PROTECTION GRATING.



SECTION

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

D
M-04,M-05 | M-07

NOTES:
1. FALL THROUGH PROTECTION SYSTEM, SAFE APPROACH, HATCH 120S, OR APPROVED EQUAL.
2. PROVIDE STAINLESS FRAMING AND BOLTS AS NEEDED TO SUPPORT FALL THROUGH PROTECTION SYSTEM FROM VALVE VAULT TOP PLATE.
3. FIELD DETERMINE ALL DIMENSIONS.
4. HINGED VALVE VAULT ACCESS LID NOT SHOWN FOR CLARITY.

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
DESIGN AND CONSTRUCTION OF IYANBITO LIFT STATION FACILITIES

MISCELLANEOUS DETAILS

NCS ENGINEERS EST. 1998
202 EAST EARLL DRIVE, STE 110
PHOENIX, AZ 85012
(602) 629-0206

Registered Professional Engineer
28112
RAMESH NARASIMHAN
State Standard
ARIZONA, U.S.A.

EXPIRATION DATE: 09/30/27

Drawn by:	KWB
Design by:	LAH
Approved by:	RN
Date	11/20/25
Project No.	
Sheet No.	M-07

SCHEMATIC DIAGRAM SYMBOLS

- CR — CONTROL RELAY
- HAND / AUTO / XO — 2 POSITION SELECTOR SWITCH POSITION LEGEND: X=CLOSED O=OPEN
- TD — TIME DELAY RELAY
- HAND / OFF / AUTO / XOO — 3 POSITION SELECTOR SWITCH HAND – OFF – AUTO POSITION LEGEND: X=CLOSED O=OPEN
- AR — ALARM RELAY
- NORMALLY CLOSED PUSH BUTTON
- ETM — ELAPSED TIME METER
- LOCKOUT STOP PUSH BUTTON
- M — MOTOR STARTER OR CONTACTOR COIL
- NORMALLY OPEN PUSH BUTTON
- PC — PHOTO CELL
- EMERGENCY STOP PUSH BUTTON (MAINTAINED)
- R — BEACON ALARM LIGHT LETTER INDICATES COLOR R=RED, A=AMBER, B=BLUE, G=GREEN
- AMPS — DISCONNECT SWITCH SHOWN WITH RATING AND NUMBER OF POLES
- R — PILOT LIGHT LETTER INDICATES COLOR R=RED, A=AMBER, B=BLUE, G=GREEN
- LIMIT OR POSITION SWITCH
- OUTPUT DV/DT FILTER
- PSH — PRESSURE SWITCH HIGH
- HEATING ELEMENT
- PSL — PRESSURE SWITCH LOW
- TRANSFORMER
- FLOW SWITCH
- CT — CURRENT TRANSFORMER
- LEVEL FLOAT SWITCH
- GROUND CONNECTION
- T / ICTO — TIMER RELAY CONTACT INSTANTANEOUS CLOSE TIME DELAY OPEN
- GENERATOR
- T / NOTC — TIMER RELAY CONTACT NORMALLY OPEN TIME DELAY CLOSE
- HORN
- TEMPERATURE SWITCH
- 5 — FULL VOLTAGE NON–REVERSING (FVNR) MOTOR STARTER OR CONTACTOR NUMBER DESIGNATES NEMA SIZE
- FUSE
- NORMALLY OPEN CONTACT
- AMPS — FUSEHOLDER OR FUSEBLOCK
- NORMALLY CLOSED CONTACT
- THERMAL OVERLOAD RELAY
- DI — RTU OR PLC CONTACT
- TERMINAL BLOCK
- DEVICE LOCATED AT REMOTE LOCATION
- CONDUIT SEALOFF

POWER SINGLE LINE DIAGRAM SYMBOLS

- JUNCTION BOX WITH POWER DISTRIBUTION BLOCK OR LUGS
- AMPS / POLES — CIRCUIT BREAKER, SHOWN WITH TRIP RATING AND NUMBER OF POLES
- CONDUIT SEALOFF
- AMPS MCP / POLES — MOTOR CIRCUIT PROTECTOR WITH TRIP RATING AND NUMBER OF POLES
- LTC CONNECTION
- AMPS / POLES — DISCONNECT SWITCH SHOWN WITH RATING AND NUMBER OF POLES
- MC CONNECTION
- MMR — MOTOR MANAGEMENT RELAY
- BOND TO METALLIC WATER PIPE
- SPD — SURGE PROTECTIVE DEVICE
- SSS — SOLID STATE STARTER
- UM — UTILITY METER
- VFD — VARIABLE FREQUENCY DRIVE
- HP — MOTOR, NUMBER DESIGNATES NEMA HORSEPOWER SIZE
- HF — HARMONIC FILTER
- FUSE
- EOL — ELECTRONIC OVERLOAD RELAY
- AMPS — FUSEHOLDER OR FUSEBLOCK
- GROUND CONNECTION
- TRANSFORMER
- GENERATOR
- CONTACTOR

SITE PLAN SYMBOLS

- TELEPHONE OUTLET
- FIELD DEVICE
- $ — SINGLE POLE SWITCH
- GROUND ROD
- $3 — 3 WAY SWITCH
- DUPLEX RECEPTACLE
- $4 — 4–WAY SWITCH
- ANTENNA MAST
- $M — MANUAL MOTOR STARTER
- CONDUIT SEALOFF
- SPECIAL PURPOSE OR WELDING OUTLET
- DISCONNECT SWITCH
- S — SMOKE DETECTOR
- M — MOTOR
- T — THERMOSTAT
- CONDUIT TURN UP
- CONDUIT TURN DOWN

CIRCUIT SCHEDULE LEGEND

AAA–BC
- AAA — SEQUENCE NUMBER
- B — TYPE C=CONTROL P=POWER
- C — DEVICE SERVED

ELECTRICAL ABBREVIATIONS

A	AMPERE
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AI	ANALOG INPUT
AIC	AMPS INTERRUPTING CAPACITY
AO	ANALOG OUTPUT
AS	AIR SUPPLY
ATS	AUTOMATIC TRANSFER SWITCH
BC	BYPASS CONTACTOR
C	CONDUIT
CB	CIRCUIT BREAKER
CCW	COUNTER CLOCKWISE
CL2	CHLORINE
CON	CONTACTOR
CPB	CONTROL PULLBOX
CU	COPPER, BARE
CV	CONTROL VALVE
CW	CLOCKWISE
DCS	DISTRIBUTED CONTROL SYSTEM
DI	DISCRETE INPUT
DO	DISCRETE OUTPUT
DP	DISTRIBUTION PANEL
DV/DT	DIFFERENTIAL VOLTAGE/TIME
DWG	DRAWING
ETM	ELAPSED TIME METER
EOL	ELECTRONIC OVERLOAD
EXIST	EXISTING
FA	FOUL AIR
FC	FAIL CLOSED
FE	FLOW ELEMENT
FLA	FULL LOAD AMPS
FS	FLOW SWITCH
FVNR	FULL VOLTAGE NON–REVERSING
FW	FINISHED WATER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GND	GROUND
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRS	GALVANIZED RIGID STEEL
H, HI	HIGH
H2S	HYDROGEN SULFIDE
HMI	HUMAN MACHINE INTERFACE
HOA	HAND–OFF–AUTO
HOR	HAND–OFF–REMOTE
I	CURRENT
IC	INSTRUMENTATION CABLE
ICR	INTERMITTENT CYCLE REACTOR
IO	INPUT/OUTPUT
ISC	SHORT CIRCUIT CURRENT
JB	JUNCTION BOX
L, LO	LOW
LAN	LOCAL AREA NETWORK
LC	LOOP CONTROLLER
LCL	LEVEL CONTROL, LOW
LCP	LOCAL CONTROL PANEL
LOS	LOCK–OUT–STOP
LOR	LOCAL/OFF/REMOTE
LS	LEVEL (i.e.. FLOAT) SWITCH
LTC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT
M	MOTOR
MA	MANUAL/AUTO
mA	MILLIAMP
MAX	MAXIMUM
MC	MANUFACTURER'S CABLE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MFR(S)	MANUFACTURER(S)
MGD	MILLION GALLONS PER DAY
MGL	MILLIGRAMS PER LITER
MH	MANHOLE
MIN	MINIMUM
MOV	MOTOR OPERATED VALVE
MMR	MOTOR MANAGEMENT RELAY
MTU	MASTER TELEMETRY UNIT
NEC	NATIONAL ELECTRICAL CODE
NECA	NATIONAL ELECTRICAL CONTRACTOR ASSOCIATION
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NIC	NOT IN CONTRACT
NOTC	NORMALLY OPEN TIMED CLOSED
NPW	NON–POTABLE WATER
NS	NITROGEN SUPPLY
NTS	NOT TO SCALE
NTU	TURBIDITY
OF	OVERFLOW
OIT	OPERATOR INTERFACE TERMINAL
OL	OVERLOAD
OLR	OVERLOAD RELAY
OO	ON/OFF (MAINTAINED)
OR	OFF–REMOTE
OSC	OPEN/STOP/CLOSE
P	PHASE
PB	PULL BOX
PCP	PROCESS CONTROL PANEL
PCV	PRESSURE CONTROL VALVE
PFR	PHASE/POWER FAILURE RELAY
PI	PULSE INPUT
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLI	PLANT INFLUENT
PMP	PUMP
PNL	PANEL
PO	PULSE OUTPUT
PPB	POWER PULLBOX
PPG	POUNDS PER GALLON
PPH	POUNDS PER HOUR
PPM	PARTS PER MILLION
PR	PAIR
PRES	PRESSURE
PS	PRESSURE SWITCH
PSH	PRESSURE SWITCH, HIGH
PSI	POUNDS PER SQUARE INCH
PV	PROCESS VARIABLE
RAS	RETURN ACTIVATED SLUDGE
RW	RAW WATER
RF	RADIO FREQUENCY
RIO	REMOTE INPUT OUTPUT
RS	RAW SEWAGE
RSP	RAW SEWAGE PUMP
RST	RESET
RTD	RESISTANCE TEMPERATURE DETECTOR
RTU	REMOTE TELEMETRY UNIT
RWT	REFLECTED WAVE TRAP
SCA	SHORT CIRCUIT AMPS
SCCR	SHORT CIRCUIT CURRENT RATING
SEQ	SERVICE ENTRANCE EQUIPMENT
SES	SERVICE ENTRANCE SECTION
SLC	SINGLE LOOP CONTROLLER
SLOS	START–LOCK–OUT–STOP
SMC	SUBMERSIBLE MANUFACTURER CABLE
SO2	SULFUR DIOXIDE
SP	SET POINT
SPC	SPARE CONDUIT
SPR	SPARE
SS	START/STOP
SSS	SOLID STATE STARTER (SOFT START)
ST	SHUNT TRIP
TC	TELEPHONE CABLE
TS	TEMPERATURE SWITCH
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES
UM	UTILITY METER
UNO	UNLESS NOTED OTHERWISE
V	VOLT
VFD	VARIABLE FREQUENCY DRIVE
W	WATT, WIRE
WAS	WASTE ACTIVATED SLUDGE
WP	WEATHERPROOF
XFMR	TRANSFORMER
XMR	TRANSFORMER
XMTR	TRANSMITTER
ZS	POSITION (i.e.. LIMIT) SWITCH

ELECTRICAL LINETYPES

- EXPOSED CONDUIT
- EXISTING EXPOSED CONDUIT
- UNDERGROUND CONDUIT
- EXISTING UNDERGROUND CONDUIT
- BARE COPPER GROUND CONDUCTOR
- EXISTING OR FUTURE
- NEW ELECTRICAL EQUIPMENT
- DEMOLITION
- DETAIL VIEW OR MATCHING
- CAPPED CONDUIT STUB OUT
- PXXX / CXXX — GROUPED CONDUIT AND CIRCUIT IDENTIFICATION TAGS. REFER TO THE POWER SINGLE–LINE, SCHEMATIC CONNECTION DIAGRAMS AND CIRCUIT SCHEDULE FOR CONDUIT SIZES AND CONTENTS.

  P=POWER
  C=CONTROL

GENERAL NOTES

1. THE COMPLETED INSTALLATION SHALL COMPLY WITH LATEST REVISION OF APPLICABLE FEDERAL, STATE, AND LOCAL CODES, ORDINANCES, AND REGULATIONS. THE CONTRACTOR SHALL OBTAIN NECESSARY PERMITS AND INSPECTIONS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION. ALL WORK SHALL BE COMPLETED IN A NEAT, WORKMANLIKE MANNER IN ACCORDANCE WITH THE LATEST NECA STANDARDS OF INSTALLATION UNDER COMPETENT SUPERVISION. INSTALL GROUNDING PER NEC.
2. VISIT THE SITE PRIOR TO BIDDING TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND OTHER FACTORS, WHICH MAY AFFECT THE EXECUTION OF THE WORK. INCLUDE ALL RELATED COSTS IN THE INITIAL BID PROPOSAL.
3. THE CONTRACTOR SHALL COORDINATE WORK WITH THE UTILITIES PROVIDING SERVICES ON THIS PROJECT, AND SHALL COMPLY WITH ALL THEIR INSTALLATION REQUIREMENTS.
4. ALL MATERIALS SHALL BE NEW AND OF THE BEST QUALITY, MANUFACTURED IN ACCORDANCE WITH THE LATEST REVISION OF NEMA, ANSI, UL, OR OTHER APPLICABLE STANDARDS. THE USE OF MANUFACTURERS' NAMES, MODELS, AND NUMBERS IS INTENDED TO ESTABLISH STYLE, QUALITY, APPEARANCE, USEFULNESS, AND BID PRICE.
5. PROTECT ALL ELECTRICAL MATERIAL AND EQUIPMENT INSTALLED AGAINST DAMAGE BY OTHER TRADES, WEATHER CONDITIONS, OR ANY OTHER PREVENTABLE CAUSES. EQUIPMENT DAMAGED DURING SHIPPING OR CONSTRUCTION, PRIOR TO ACCEPTANCE BY THE ENGINEER OR THE OWNER, WILL BE REJECTED AS DEFECTIVE.
6. LEAVE THE SITE CLEAN. REMOVE ALL DEBRIS, EMPTY CARTONS, TOOLS, CONDUIT, WIRE SCRAPS AND ALL MISCELLANEOUS SPARE EQUIPMENT AND MATERIALS USED IN THE WORK DURING CONSTRUCTION. ALL COMPONENTS SHALL BE FREE OF DUST, GRIT AND FOREIGN MATERIALS, LEFT AS NEW BEFORE FINAL ACCEPTANCE OF WORK. DAMAGED PAINT AND FINISHES SHALL BE TOUCHED UP OR REPAINTED WITH MATCHING COLOR PAINT AND FINISH.
7. CIRCUIT CONDUCTORS #6 AWG OR SMALLER SHALL BE THWN STRANDED COPPER. #4 AWG THROUGH #2 AWG SHALL BE XHHW STRANDED COPPER. #1 AWG OR LARGER SHALL BE XHHW–2 STRANDED COPPER. MINIMUM POWER CONDUCTOR SIZE SHALL BE #12 AWG WITH #12 AWG GROUND.
8. UNDERGROUND CONDUITS SHALL BE SCHEDULE 40 PVC. MINIMUM CONDUIT DEPTH SHALL BE 24 INCHES. MINIMUM UNDERGROUND CONDUIT SIZE SHALL BE 1 INCH.
9. CONDUITS SHALL BE MARKED AT EACH END WITH MATCHING NUMBERED BRASS TAGS. SPARE CONDUITS SHALL HAVE A PULL STRING INSTALLED, SECURED, AND CAPPED.
10. EXPOSED CONDUITS SHALL BE PVC COATED GALVANIZED RIGID STEEL (GRS). MINIMUM SIZE 3/4 INCH, UNLESS OTHERWISE NOTED ON THE PLANS.
11. SAFETY SWITCHES, ELECTRICAL DISTRIBUTION EQUIPMENT, CONTROL PANELS, AND OTHER ELECTRICAL DEVICES SHALL BE UL LISTED, AND RATED FOR HEAVY DUTY SERVICE.
12. WIRING DEVICES SHALL BE SPECIFICATION GRADE.
13. THE CONTRACTOR IS RESPONSIBLE FOR MANAGING, SCHEDULING, DOCUMENTING, AND PERFORMING THE WORK SO THAT A COMPLETE ELECTRICAL, INSTRUMENTATION AND CONTROL SYSTEM FOR THE FACILITY IS PROVIDED. ACCURATE SHOP AND RECORD DRAWINGS, AND O&M MANUALS SHALL BE SUBMITTED PRIOR TO FINAL ACCEPTANCE OF THE WORK.
14. TYPICAL DETAILS SHALL APPLY IN ALL CASES, WHETHER SPECIFICALLYREFERRED TO OR NOT.

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
IYANBITO LIFT STATION DESIGN ADDITION

ELECTRICAL NOTES, SYMBOLS, AND LEGEND

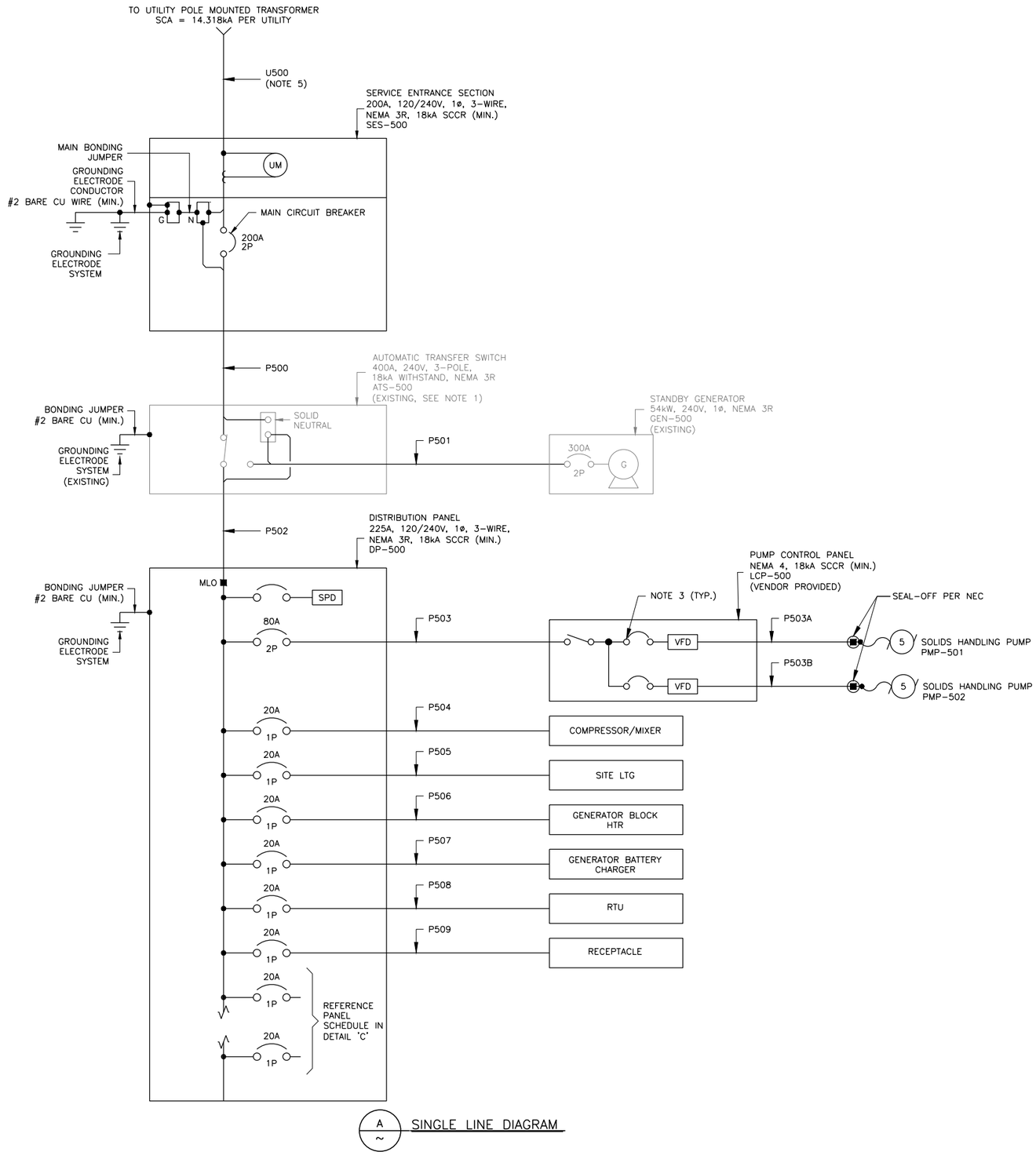
NCS ENGINEERS

Registered Professional Engineer (Electrical) — 74459 — AARON G. ARMENTA — Date Signed — ARIZONA, U.S.A.

EXPIRATION DATE: 12/31/27

Drawn by:	ML
Design by:	GAR
Approved by:	AGA
Date	11/12/25
Project No.	2498
Sheet No.	E–01

Nov 12, 2025 – 4:33pm
X:_2400's\N2498 NTUA_Iyanbito Lift Station Design Additions\100 – E&I Design_CAD Files\D2498.25_E01.dwg



A SINGLE LINE DIAGRAM

NOTES:

1. CONTRACTOR SHALL REUSE AND RELOCATE ATS-500. PROVIDE NEW CONDUIT AND CABLE CONNECTIONS TO ATS FROM SES-500 AND GEN-500. FOR RELOCATION INFORMATION SEE DWG E-04.
2. ALL SHORT CIRCUIT INTERRUPTING AND PROTECTING DEVICES SHALL HAVE A SHORT CIRCUIT INTERRUPTING RATING EQUAL TO OR GREATER THAN THE AVAILABLE SHORT CIRCUIT ON THE BUS
3. UNSIZED OVERCURRENT PROTECTIVE DEVICES SHALL BE SIZED PER ASSOCIATED EQUIPMENT MANUFACTURER'S RECOMMENDATIONS
4. ALL OVERCURRENT PROTECTIVE DEVICES SHALL BE PROPERLY COORDINATED SO AS ENSURE LOCALIZATION OF OVERCURRENT CONDITIONS TO THE CIRCUIT OR EQUIPMENT AFFECTED
5. CONTRACTOR SHALL FURNISH AND INSTALL MATERIAL AS DEFINED IN NTUA UNDERGROUND CONSTRUCTION STANDARDS. THIS INCLUDES, BUT IS NOT LIMITED TO, FURNISHING AND INSTALLING CONDUIT RISER, SECONDARY UNDERGROUND CONDUITS, SECONDARY SERVICE CONDUCTORS, AND SECONDARY SERVICE GROUNDING. THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF RISER POLE FITTINGS AND HARDWARE, AND RISER POLE GROUNDING. CONTRACTOR SHALL SUBMIT ALL MATERIAL TO NTUA FOR APPROVAL PRIOR TO PURCHASE OR INSTALLATION.

CALLOUT NO.	NO. SETS	CONDUIT SIZE	CIRCUIT CONDUCTORS	CIRCUIT NO.'s
U500	1	2"	2 - #3/0, #3/0 NEUT, #6 GND	SES500-P1
P500	1	2"	2 - #3/0, #3/0 NEUT, #6 GND	ATS500P1
P501	1	2 1/2"	2 - 350 MCM, 350 MCM NEUT, #4 GND	GEN500-P1
P502	1	2 1/2"	2 - 350 MCM, 350 MCM NEUT, #4 GND	DP500-P1
P503	1	2"	2 - #4, #4 NEUT, #8 GND	LCP500-P1
P503A	1	1"	3 - #12, #12 GND	PMP501-P1
P503B	1	1"	3 - #12, #12 GND	PMP502-P1
P504	1	1"	1 - #12, #12 NEUT, #12 GND	COM500-P1
P505	1	1"	1 - #12, #12 NEUT, #12 GND	LTG500-P1
P506	1	1"	1 - #12, #12 NEUT, #12 GND	GENBLK500-P1
P507	1	1"	1 - #12, #12 NEUT, #12 GND	GENCHR500-P1
P508	1	1"	1 - #12, #12 NEUT, #12 GND	RTU500-P1
P509	1	1"	1 - #12, #12 NEUT, #12 GND	RCP500-P1

B CALLOUT SCHEDULE

PANEL TAG No. DP-500 — **NEMA TYPE/MOUNTING** 3R/SURFACE
LOCATION ELECTRICAL EQUIPMENT PAD — **MAIN DEVICE** MLO
BUS AMPACITY 225A — **AIC RATING** 18k (MIN)
VOLTS, PHASE, WIRE 240 V/1-PHASE/3-WIRE — **FED FROM** ATS-500
REMARKS — **ACCESSORIES** SPD

LOAD VA PHASE A	LOAD VA PHASE B	LOAD DESCRIPTION	WIRE SIZE	DEMAND	BKR	BKR. NO.		BKR	DEMAND	WIRE SIZE	LOAD DESCRIPTION	LOAD VA PHASE A	LOAD VA PHASE B
200		SITE LTG	#12	1.25	20/1	1	2	20/1	1.25	#12	RTU-500	200	
	1500	GEN-500 BLOCK HTR	#12	1.25	20/1	3	4	80/2	1.00	#2	LCP-500		7560
600		GEN-500 BATTERY CHARGER	#12	1.25	20/1	5	6		1.00	#2		7560	
	180	RECEPTACLE	#12	1.00	20/1	7	8	30/2			SPARE		0
300		COMPRESSOR/MIXER	#12	1.25	20/1	9	10				SPARE	0	
	0	SPARE			20/1	11	12	20/1			SPARE		0
0		SPARE			20/1	13	14	20/1			SPARE	0	
	0	SPARE			20/1	15	16	20/1			SPARE		0
0		SPACE				17	18				SPACE	0	
	0	SPACE				19	20				SPACE		0
1100	1680	CONNECTED VA									CONNECTED VA	7760	7560
1375	2055	DEMAND VA									DEMAND VA	7810	7560

* - Each branch circuit shall have an equipment grounding conductor sized per N.E.C. Article 250

	VA	AMPS
TOTAL PANEL CONNECTED LOAD	18100	75.42
TOTAL PANEL DEMAND LOAD	18800	78.33
PANEL DEMAND FACTOR	104%	

SITE LOAD CALC

TOTAL CONNECTED VA - PER PHASE	8860	9240
TOTAL DEMAND VA - PER PHASE	9185	9615
TOTAL DEMAND PHASE AMPS	76.5	80.1

C DP-500 PANEL SCHEDULE

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
IYANBITO LIFT STATION DESIGN ADDITION

SINGLE LINE DIAGRAM

NCS ENGINEERS

Registered Professional Engineer (Electrical)
74459
AARON G. ARMENTA
Date Signed 11/12/25
ARIZONA, U.S.A.

EXPIRATION DATE: 12/31/27

Drawn by: ML
Design by: GAR
Approved by: AGA
Date 11/12/25
Project No. 2498
Sheet No. E-02

Nov 12, 2025 - 4:33pm
X:\2400's\N2498 NTUA_Iyanbito Lift Station Design Additions\100 - E&I Design_CAD Files\D2498.25_E02.dwg

SHEET NO.	CIRCUIT	CONDUCTORS
E-05	ANT500-C1	1 - ANTENNA CABLE
E-05	LCP500-C1	36 - #14, #14 GND
E-05	LCP500-C2	1 - CAT6 CABLE
E-05	LCP500-C3	1 - CAT6 CABLE
E-05	LIT501-C2	1 - IC, #14 GND
E-05	ATS500-C1	4 - #14, #14 GND
E-05	GEN500-C1	6 - #14, #14 GND
E-05	TSH501-C1	2 - #14, #14 GND
E-05	YS501-C1	2 - #14, #14 GND
E-05	TSH502-C1	2 - #14, #14 GND
E-05	YS502-C1	2 - #14, #14 GND
E-05	LSLL501-C1	2 - #14, #14 GND
E-05	LSL501-C1	2 - #14, #14 GND
E-05	LSH501-C1	2 - #14, #14 GND
E-05	LSHH501-C1	2 - #14, #14 GND
E-05	LIT501-C1	1 - IC, #14 GND
E-05	GEN500-C2	2 - #14, #14 GND

A ~ CIRCUIT SCHEDULE

LIGHTING FIXTURE SCHEDULE

SYMBOL	DESCRIPTION	MOUNTING	MANUFACTURER	LAMPS	REMARKS
	120V, 4', ENCLOSED AND GASKETED LED FIXTURE.	SURFACE OR SUSPENDED	COLUMBIA LIGHTING LXEM SERIES OR EQUAL	3.5K LUMEN OUTPUT (MIN.), 4000K COLOR TEMP.	50° C RATED, DAMP LOCATIONS, UL LISTED

B ~ LIGHTING FIXTURE SCHEDULE

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
IYANBITO LIFT STATION DESIGN ADDITION

ELECTRICAL SCHEDULES

NCS ENGINEERS

Registered Professional Engineer (Electrical)
74459
AARON G. ARMENTA
Date Signed
ARIZONA, U.S.A.

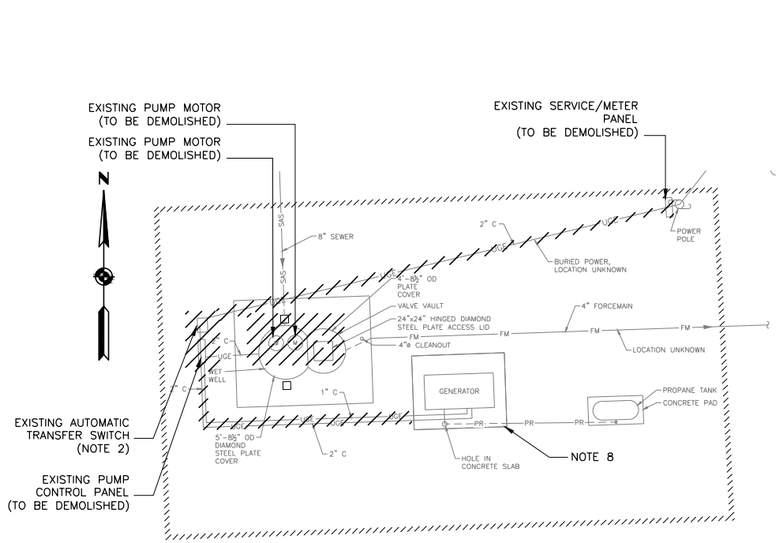
EXPIRATION DATE: 12/31/27

Drawn by:	ML
Design by:	GAR
Approved by:	AGA
Date	11/12/25
Project No.	2498
Sheet No.	E-03

Nov 12, 2025 - 4:34pm
X:\2400's\N2498 NTUA_Iyanbito Lift Station Design Additions\100 - E&I Design_CAD Files\D2498.25_E03.dwg

NOTES:

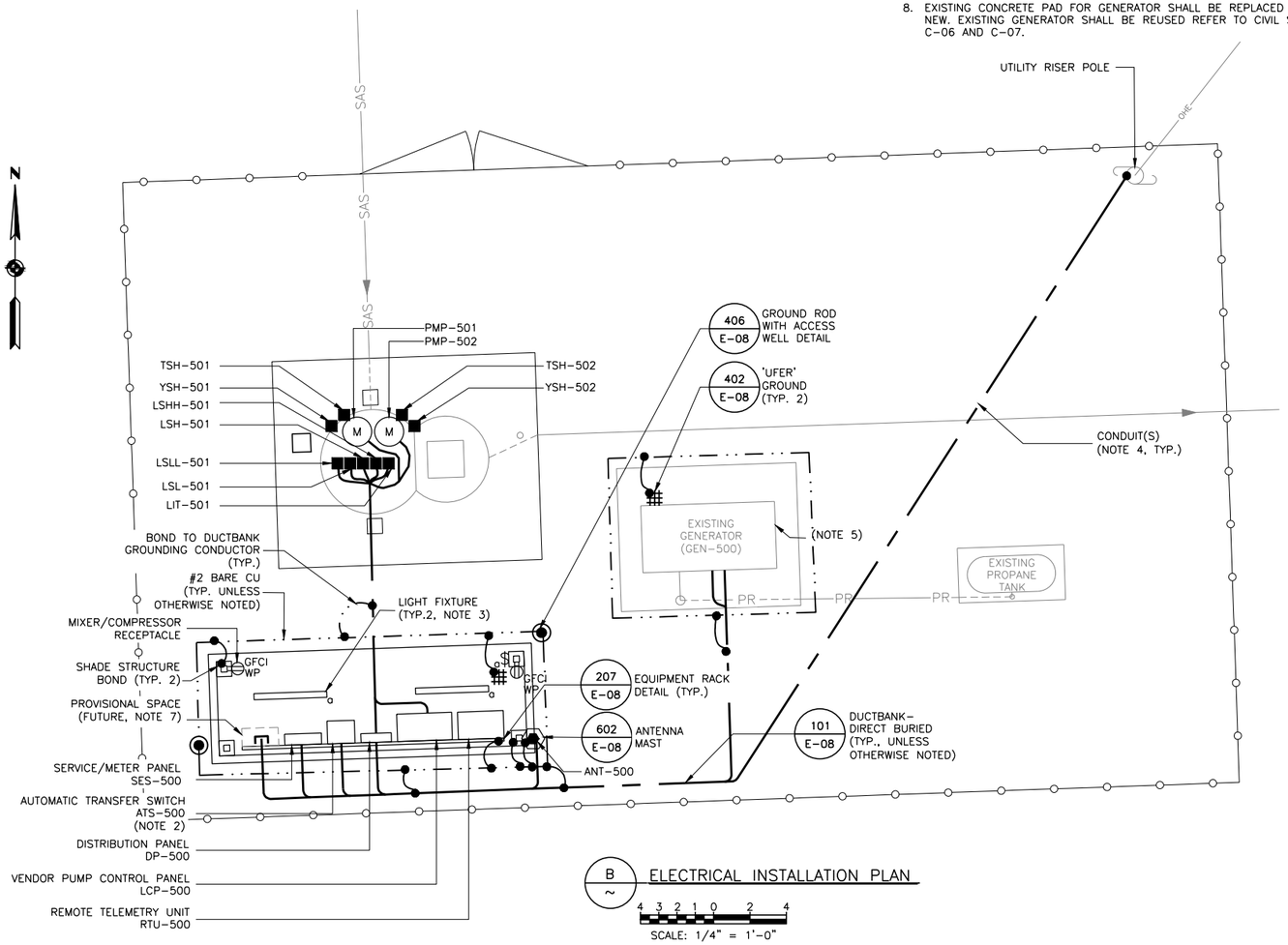
1. DEMOLISHED EQUIPMENT INCLUDING WIRE AND CONDUIT SHALL BE EITHER RETURNED TO OWNER OR PROPERLY DISPOSED OF AS DIRECTED BY OWNER.
2. CONTRACTOR SHALL REUSE AND RELOCATE EXISTING AUTOMATIC TRANSFER SWITCH TO LOCATION SHOWN ON DRAWING.
3. REFER TO FIXTURE SCHEDULE ON SHEET E-03 FOR FIXTURE REQUIREMENTS.
4. REFER TO CONDUIT BLOCK DIAGRAM ON SHEET E-07 FOR SYSTEM CONDUIT INFORMATION/REQUIREMENTS (I.E. TO/FROM INFO, SIZES, TAG#'S, CONTENTS ETC.).
5. CONTRACTOR SHALL ENSURE PROPER FUNCTIONALITY OF EXISTING GENERATOR VIA NECESSARY INSPECTION AND REPAIR.
6. ALL INSTALLATIONS WITHIN WETWELL SHALL BE CLASS 1, DIVISION 1 COMPLIANT AND SHALL COMPLY WITH ALL REQUIREMENTS FOR CLASSIFIED AREAS AS DEFINED IN ARTICLE 500 OF THE NATIONAL ELECTRICAL CODE.
7. PROVIDE 1" CONDUIT STUB UP, CAPPED AND FLUSH AT FINISHED FLOOR LEVEL FOR FUTURE USE BY OWNER. CONDUIT SHALL BE ROUTED FROM DP-500 TO FUTURE EQUIPMENT PROVISIONAL SPACE AS INDICATED ON DRAWING.
8. EXISTING CONCRETE PAD FOR GENERATOR SHALL BE REPLACED WITH NEW. EXISTING GENERATOR SHALL BE REUSED REFER TO CIVIL SHEETS C-06 AND C-07.



A ~ ELECTRICAL DEMOLITION PLAN (NOTE 1)

8 4 0 4 8

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



B ~ ELECTRICAL INSTALLATION PLAN

4 3 2 1 0 2 4

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

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
NYANBITO LIFT STATION DESIGN ADDITION

ELECTRICAL DEMOLITION AND INSTALLATION PLANS

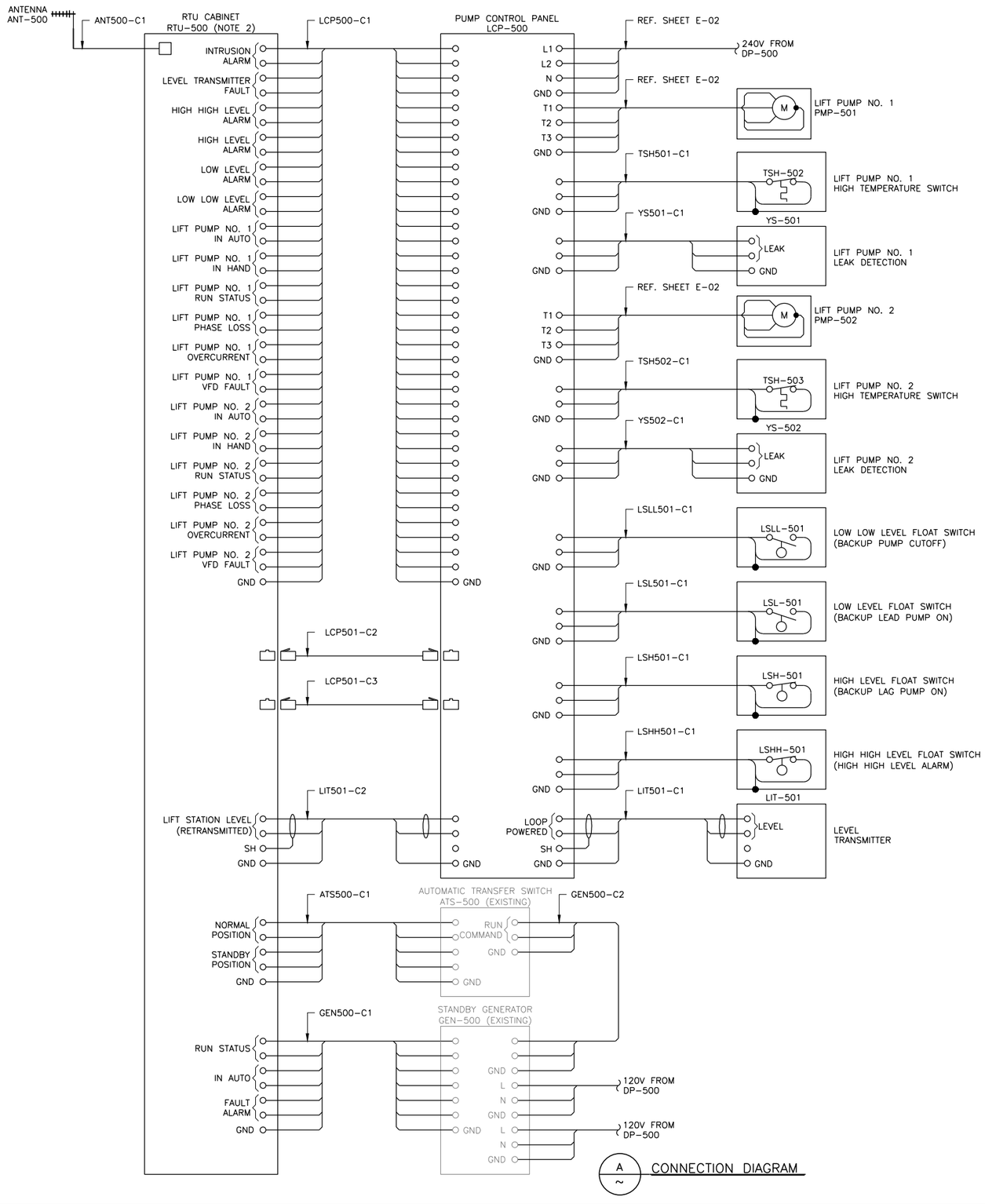
NCS ENGINEERS

Registered Professional Engineer (Electrical)
74459
AARON G. ARMENTA
Date Signed
ARIZONA, U.S.A.

EXPIRATION DATE: 12/31/27

Drawn by:	ML
Design by:	GAR
Approved by:	AGA
Date	11/12/25
Project No.	2498
Sheet No.	E-04

Nov 13, 2025 - 10:33am
X:\2400's\2498 NTUA_Iyanbito Lift Station Design Additions\100 - E&I Design_CAD Files\[2498.25_E04.dwg



A CONNECTION DIAGRAM

NOTES:

1. REFERENCE E-03 FOR CIRCUIT SCHEDULE.
2. CONTRACTOR SHALL UTILIZE NTUA STANDARD PUMP STATION PLC CONTROL PANEL DESIGN AS A TEMPLATE TO DEVELOP DESIGN FOR NEW RTU CABINET. ENSURE RTU IS EQUIPPED WITH ANALOG OUTPUT CARD.

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
IYANBITO LIFT STATION DESIGN ADDITION

SCHEMATIC/CONNECTION DIAGRAMS

NCS ENGINEERS

Professional Engineer (Inactive)
74459
AARON G. ARMENTA
Date Signed 11/12/2025
ARIZONA, U.S.A.

EXPIRATION DATE: 12/31/27

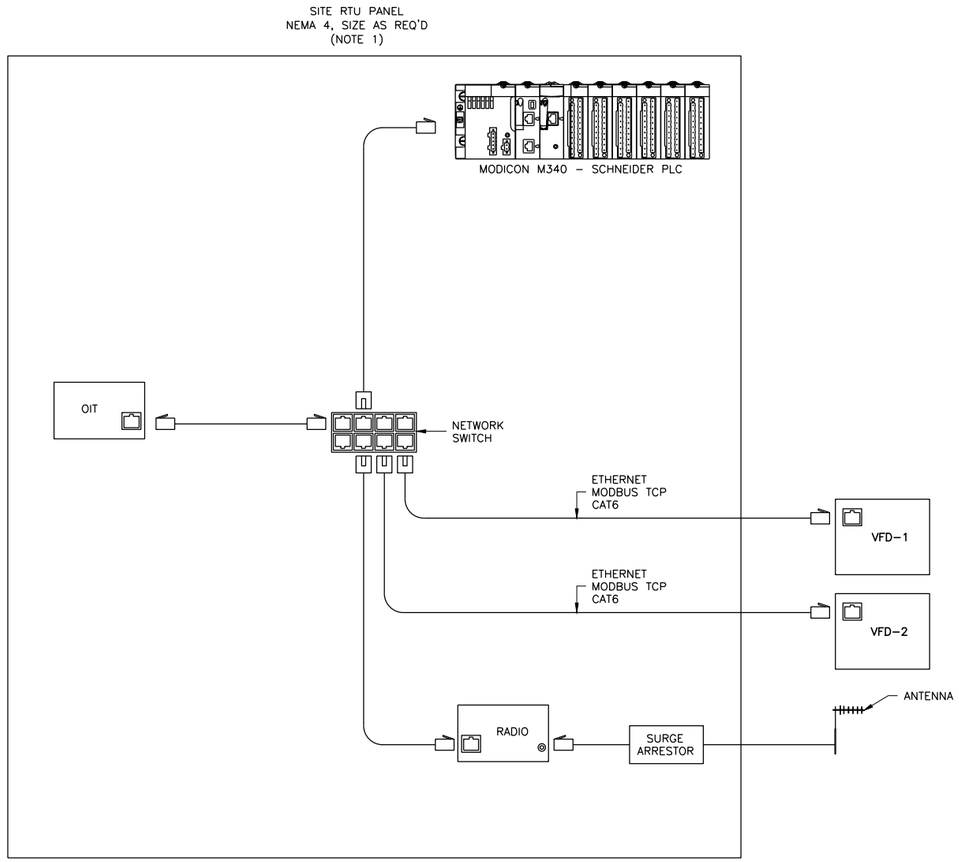
Drawn by:	ML
Design by:	GAR
Approved by:	AGA
Date	11/12/25
Project No.	2498
Sheet No.	E-05

NOTES:

1. CONTRACTOR SHALL DEVELOP DESIGN/SHOP DRAWINGS FOR RTU PANEL. CONTRACTOR SHALL UTILIZE NTUA RTU STANDARD AND FORMAT. PLC AND SCADA PROGRAMMING SHALL BE BY OWNER UNLESS OTHERWISE SPECIFIED.
2. PANEL SHALL INCLUDE A UPS SIZED IN ACCORDANCE WITH NTUA RTU PANEL STANDARDS

LEGEND:

ETHERNET — COMM. STANDARD
ETHERNET/IP — PROTOCOL
CAT 6 — MEDIA TYPE



A ~ SYSTEM COMMUNICATION DIAGRAM
NETWORK

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
IYANBITO LIFT STATION DESIGN ADDITION

RTU COMMUNICATIONS DIAGRAM

NCS ENGINEERS

Registered Professional Engineer (Electrical)
74459
AARON G. ARMENTA
Date Signed 11/12/25
ARIZONA, U.S.A.

EXPIRATION DATE: 12/31/27

Drawn by: ML
Design by: GAR
Approved by: AGA
Date: 11/12/25
Project No.: 2498
Sheet No.: E-06

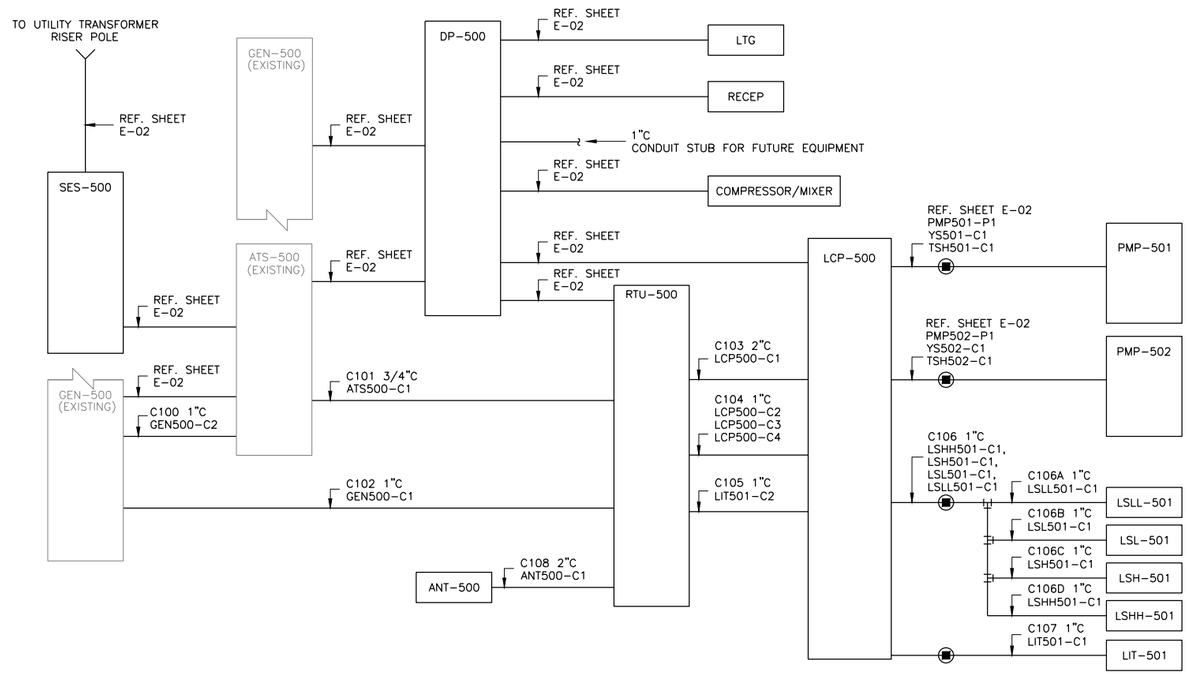
Nov 12, 2025 – 4:34pm
X:\2400's\2498 NTUA_Iyanbito Lift Station Design Additions\100 – E&I Design_CAD Files\2498.25_E06.dwg

NOTES:

1. REFERENCE E-03 FOR CIRCUIT SCHEDULE.
2. CONTRACTOR SHALL UTILIZE NTUA STANDARD PUMP STATION PLC CONTROL PANEL DESIGN AS A TEMPLATE TO DEVELOP DESIGN FOR NEW RTU CABINET. ENSURE RTU IS EQUIPPED WITH ANALOG OUTPUT CARD.

LEGEND:

C100 1" ← CONDUIT NUMBER & SIZE
LP100-4 ← CIRCUIT NUMBER(S)



A CONDUIT BLOCK DIAGRAM

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
IYANBITO LIFT STATION DESIGN ADDITION

CONDUIT BLOCK DIAGRAM

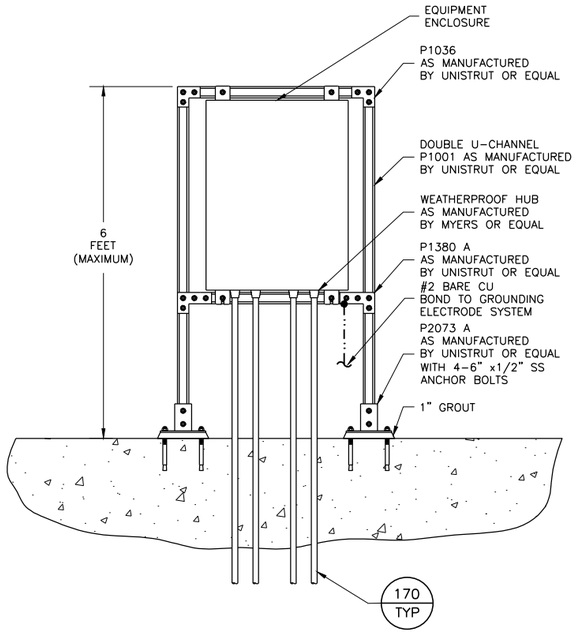
NCS ENGINEERS

Registered Professional Engineer (Civil Only)
74459
AARON G. ARMENTA
Date Signed 11/12/25
ARIZONA, U.S.A.

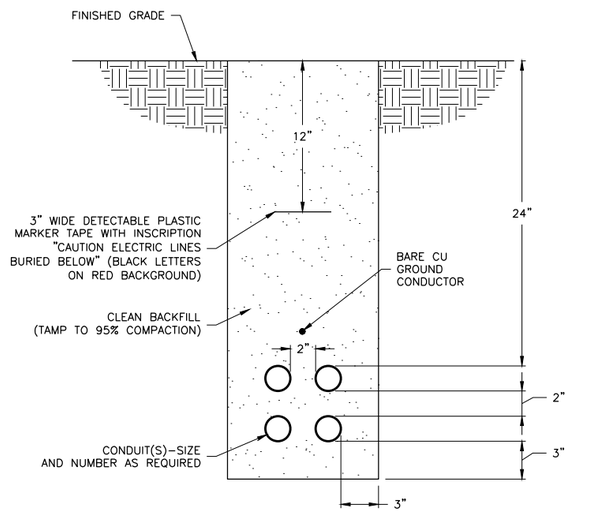
EXPIRATION DATE: 12/31/27

Drawn by:	ML
Design by:	GAR
Approved by:	AGA
Date	11/12/25
Project No.	2498
Sheet No.	E-07

Nov 12, 2025 - 4:35pm
X:\2400's\N2498 NTUA_Iyanbito Lift Station Design Additions\100 - E&I Design_CAD Files\D2498.25_E07.dwg



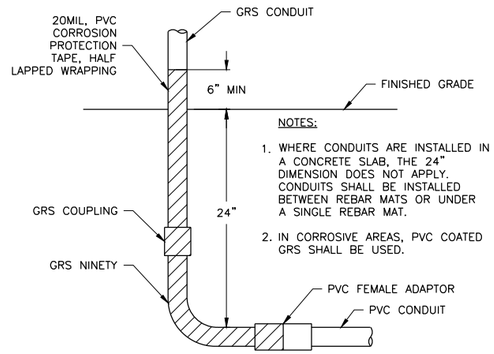
207 TYP — EQUIPMENT RACK DETAIL – NON-CLASSIFIED AREAS
NOT TO SCALE



NOTES:

1. GROUND CONDUCTOR SHALL RUN CONTINUOUSLY THROUGH MANHOLES AND SHALL CONTINUE FROM DUCTBANK INTO SWITCHGEAR OR BUILDING GROUNDING SYSTEM AND SHALL BE BONDED TO EACH RIGID METAL CONDUIT. SIZE TO BE #2 (MIN.) UNLESS OTHERWISE INDICATED ON PLANS.
2. ALL DIMENSIONS ARE MINIMUM.

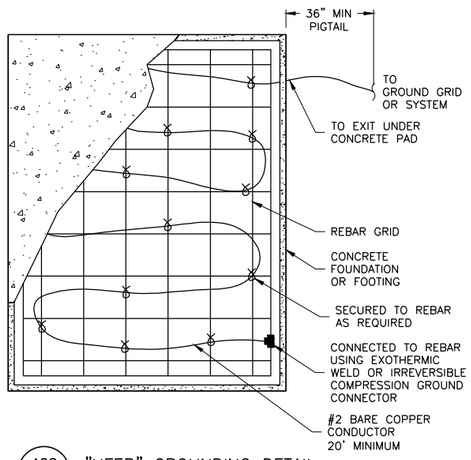
101 TYP — DUCTBANK – DIRECT BURIED
NOT TO SCALE



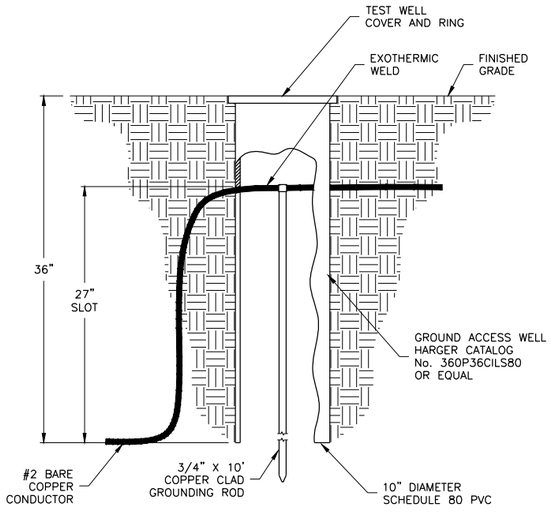
NOTES:

1. WHERE CONDUITS ARE INSTALLED IN A CONCRETE SLAB, THE 24" DIMENSION DOES NOT APPLY. CONDUITS SHALL BE INSTALLED BETWEEN REBAR MATS OR UNDER A SINGLE REBAR MAT.
2. IN CORROSIVE AREAS, PVC COATED GRS SHALL BE USED.

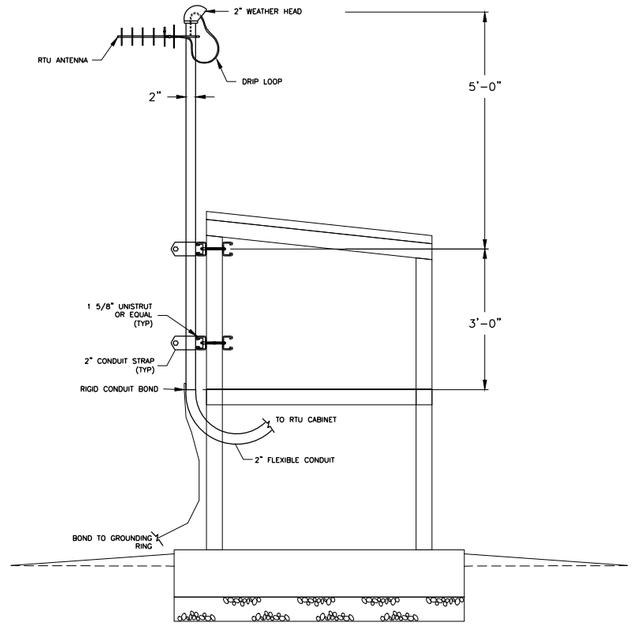
170 TYP — GRS STUB UP DETAIL
NOT TO SCALE



402 TYP — "UFER" GROUNDING DETAIL
NOT TO SCALE



406 TYP — GROUND ROD WITH TEST ACCESS WELL
NOT TO SCALE



602 TYP — ANTENNA POLE MOUNTING
NOT TO SCALE

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
IYANBITO LIFT STATION DESIGN ADDITION

ELECTRICAL DETAILS SHEET

NCS ENGINEERS

Registered Professional Engineer (Inactive)
74459
AARON G. ARMENTA
Date Signed 11/12/25
ARIZONA, U.S.A.
EXPIRATION DATE: 12/31/27

Drawn by:	ML
Design by:	GAR
Approved by:	AGA
Date	11/12/25
Project No.	2498
Sheet No.	E-08

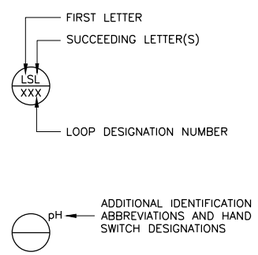
ISA INSTRUMENT IDENTIFICATION TABLE

FIRST LETTERS			SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYZER		ALARM		AUTO
B	BURNER, COMBUSTION				
C	CONDUCTIVITY			CONTROL	CLOSED
D	DENSITY	DIFFERENTIAL			
E	VOLTAGE		ELEMENT		
F	FLOW	RATIO			
G	GAUGE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHED.	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOTION				MIDDLE
N	INTRUSION				NORMAL
O	TORQUE		ORIFICE, RESTRICTION		OPEN
P	PRESSURE		POINT CONNECTION		STOP
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD, OR PRINT		RUN OR REMOTE
S	SPEED, FREQUENCY	SAFETY		SWITCH	START
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, LOUVER	
W	WEIGHT		WELL		
X	MOTOR	X-AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE, OR PRESENCE	Y-AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION	Z-AXIS		DRIVER, ACTUATOR, FINAL CONTROL ELEMENT	

P&ID ABBREVIATIONS

A	AMPERE	KW	KILOWATT	PRES	PRESSURE
AE	ANALYZER ELEMENT	L	LOW	PS	PRESSURE SWITCH
AFD	ADJUSTABLE FREQUENCY DRIVE	LAN	LOCAL AREA NETWORK	PSI	POUNDS PER SQUARE INCH
AI	ANALOG INPUT	LC	LOOP CONTROLLER	PV	PROCESS VARIABLE
AIT	ANALYZER INDICATING TRANSMITTER	LCP	LOCAL CONTROL PANEL	PVC	POLYVINYL CHLORIDE
AIC	AMPS INTERRUPTING CAPACITY	LI	LEVEL INDICATE	RAS	RETURN ACTIVATED SLUDGE
ARV	AIR RELIEF VALVE	LOS	LOCK-OFF-STOP	RAW	RAW WATER
AO	ANALOG OUTPUT	LR	LOCAL/REMOTE	REM	REMOTE
AS	AIR SUPPLY	LS	LEVEL (i.e.. FLOAT) SWITCH	RF	RADIO FREQUENCY
ATS	AUTOMATIC TRANSFER SWITCH	LSL	LEVEL SWITCH (LOW)	RIO	REMOTE INPUT OUTPUT
AUTO	AUTOMATIC	LSLL	LEVEL SWITCH (LOW LOW)	RS	RAW SEWAGE
CB	CIRCUIT BREAKER	LSHH	LEVEL SWITCH (HIGH HIGH)	RSP	RAW SEWAGE PUMP
CL2	CHLORINE	LT	LEVEL TRANSMITTER	RST	RESET
CON	CONTACTOR	M	MOTOR	RTD	RESISTANCE TEMPERATURE DETECTOR
CU	COPPER	MA	MANUAL/AUTO	RTU	REMOTE TELEMETRY UNIT
CV	CONTROL VALVE	mA	MILLIAMP	RUNf	RUN (FAST SPEED)
DCS	DISTRIBUTED CONTROL SYSTEM	MC	MANUFACTURE CABLE	RUNs	RUN (SLOW SPEED)
DI	DISCRETE INPUT	MCC	MOTOR CONTROL CENTER	SB	SLUDGE BLANKET
DO	DISSOLVED OXYGEN, DISCRETE OUTPUT	MCP	MOTOR CIRCUIT PROTECTOR	SEQ	SERVICE ENTRANCE EQUIPMENT
DP	DIFFERENTIAL PRESSURE	MFR(S)	MANUFACTURER(S)	SES	SERVICE ENTRANCE SECTION
DWG	DRAWING	MGD	MILLION GALLONS PER DAY	SLC	SINGLE LOOP CONTROLLER
EGO	EMERGENCY GAS OFF	MGL	MILLIGRAMS PER LITER	SLOS	START-LOCK-OFF-STOP
ETM	ELAPSED TIME METER	MH	MANHOLE	SO2	SULFUR DIOXIDE
ETMf	ELAPSED TIME METER (FAST SPEED)	MLR	MIXED LIQUOR RETURN	SOV	SOLENOID OPERATED VALVE
ETMs	ELAPSED TIME METER (SLOW SPEED)	MO	MOISTURE	SP	SET POINT
EOL	ELECTRONIC OVERLOAD	MOD	MODULATED	SPD	SPEED
EXIST	EXISTING	MTU	MASTER TELEMETRY UNIT	SPR	SPARE
FA	FOUL AIR	NPW	NON-POTABLE WATER	SS	START/STOP (MAINTAINED)
FC	FAIL CLOSED	NS	NITROGEN SUPPLY	SSS	SOLID STATE STARTER (SOFT START)
FE	FINAL EFFLUENT	NTU	TURBIDITY	STR	MOTOR STARTER
FIT	FLOW INDICATING TRANSMITTER	O/C	OPEN / CLOSE	TAH	TEMPERATURE ALARM HIGH
FR	FORWARD-REVERSE	OCA	OPEN-CLOSE-AUTO	T/M	TEMPERATURE AND/OR MOISTURE
FS	FLOAT SWITCH	OCR	OPEN-CLOSE-REMOTE	TEMP	TEMPERATURE
FVNR	FULL VOLTAGE NON-REVERSING	OIT	OPERATOR INTERFACE TERMINAL	TIT	TEMPERATURE INDICATING TRANSMITTER
FW	FINISHED WATER	OL	OVERLOAD	TSH	TEMPERATURE SWITCH HIGH
GND	GROUND	OO	ON/OFF (MAINTAINED)	TSS	TOTAL SUSPENDED SOLIDS
GAL	GALLONS	OOA	ON-OFF-AUTO	UG	UNDERGROUND
GPD	GALLONS PER DAY	OOR	ON-OFF-REMOTE	UPS	UNINTERRUPTIBLE POWER SUPPLY
GPH	GALLONS PER HOUR	OSC	OPEN-STOP-CLOSE	USD	UP/STOP/DOWN
GPM	GALLONS PER MINUTE	PAH	PRESSURE ALARM HIGH	VAC	VOLTAGE ALTERNATING CURRENT
H, HI	HIGH	PER	PERMISSIVE	VDC	VOLTAGE DIRECT CURRENT
H2S	HYDROGEN SULFIDE	pH	POWER OF HYDROGEN	VFD	VARIABLE FREQUENCY DRIVE
HMI	HUMAN MACHINE INTERFACE	PIT	PRESSURE INDICATING TRANSMITTER	W	WATER
HOA	HAND-OFF-AUTO	PLC	PROGRAMMABLE LOGIC CONTROLLER	WAS	WASTE ACTIVATED SLUDGE
I	CURRENT	PNL	PANEL	WW	WASTEWATER
IO	INPUT/OUTPUT	PO	PULSE OUTPUT	XMTR	TRANSMITTER
IOE	INTERNAL-OFF-EXTERNAL	POS	POSITION	YA	EVENT ALARM
ISA	INTERNATIONAL SOCIETY OF AUTOMATION	POT	POTENTIOMETER	YC	EVENT CONTROL
		PPG	POUNDS PER GALLON	YCR	EVENT CONTROL REMOTE
JB	JUNCTION BOX	PPH	POUNDS PER HOUR	YI	EVENT INDICATION
JI	POWER INDICATE	PPM	PARTS PER MILLION	YIA	EVENT INDICATING ALARM
JIN	POWER INDICATE NORMAL	PR	PAIR	ZS	POSITION (i.e. LIMIT) SWITCH

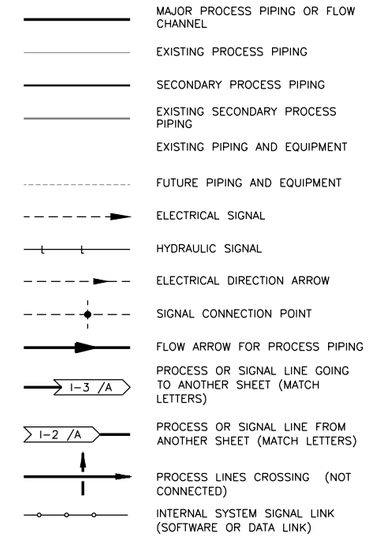
TAG NUMBERS AND DESIGNATIONS



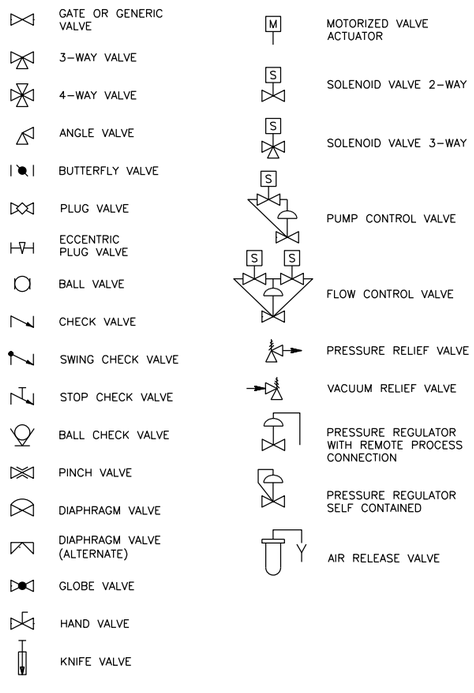
HAND SWITCH DESIGNATIONS

ES	EMERGENCY STOP
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HORA	HAND-OFF-REMOTE-AUTO
JOA	JOG-OFF-AUTO
LOR	LOCAL-OFF-REMOTE
LR	LOCAL-REMOTE
OC	OPEN-CLOSE
OO	ON-OFF
S/S	START STOP PUSH BUTTONS

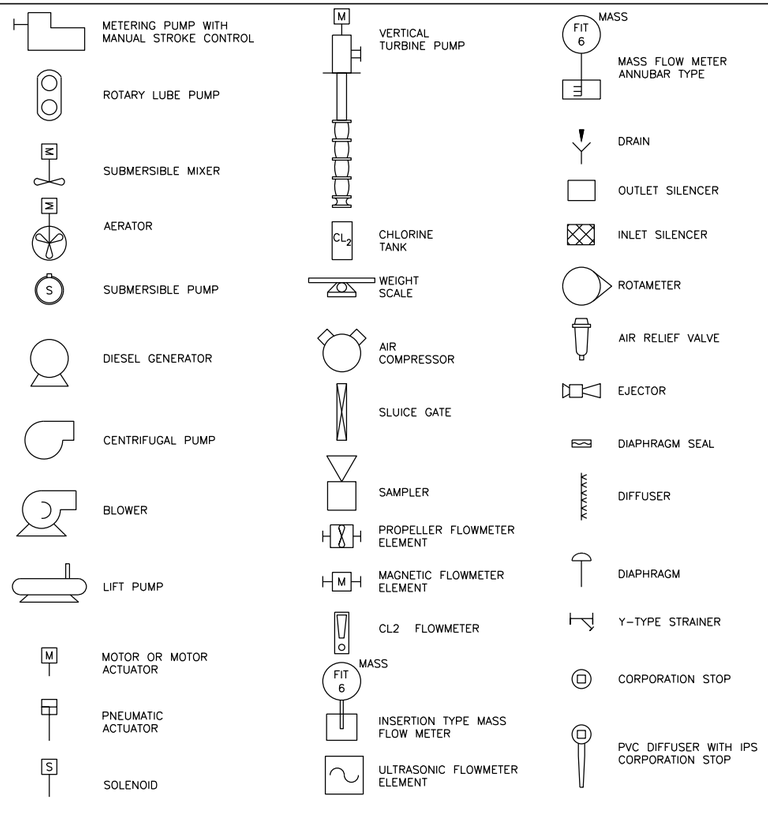
LINE SYMBOLS



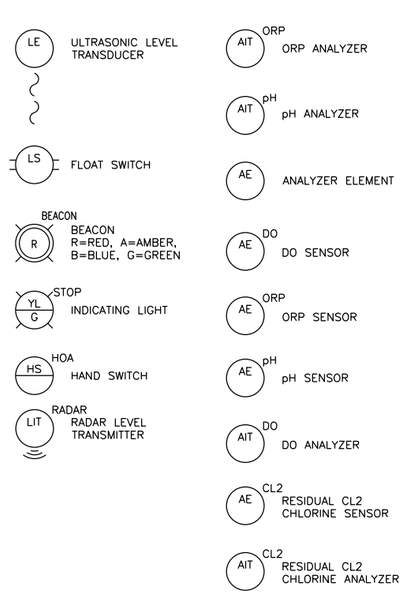
P&ID VALVE SYMBOLS



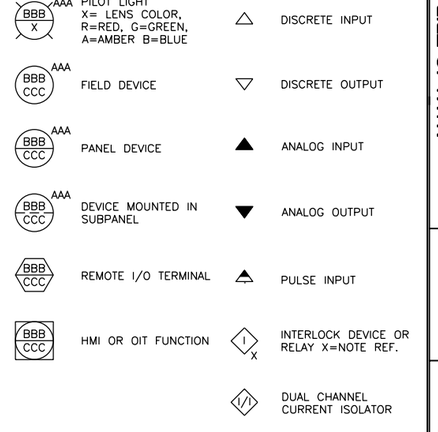
P&ID EQUIPMENT AND PROCESS SYMBOLS



SENSING, INDICATION, AND CONTROL SYMBOLS



P&ID INTERFACE SYMBOLS



NOTE:

REFER TO ISA INSTRUMENT IDENTIFICATION TABLE FOR DEFINITION OF LETTERS BBB INSIDE THE BUBBLES. CCC REPRESENTS LOOP ID (IF USED). SEE ABBREVIATIONS LIST FOR SUPERSCRIPT AAA.

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
IYANBITO LIFT STATION DESIGN ADDITION

P&ID NOTES, SYMBOLS AND LEGEND

NCS ENGINEERS

Professional Engineer (Electrical) — 74459 AARON G. ARMENTA — Date Signed 11/12/25 — ARIZONA, U.S.A.

EXPIRATION DATE: 12/31/27

Drawn by:	ML
Design by:	GAR
Approved by:	AGA
Date	11/12/25
Project No.	2498
Sheet No.	I-01

Nov 12, 2025 - 4:35pm
X:\2400's\N2498 NTUA_Iyanbito Lift Station Design Additions\100 - Edi Design_CAD Files\D2498.25_I01.dwg

SCADA

RTU

NOTE 1

LS PUMP CONTROL PANEL INTRUSION ALARM — ZA 501
LIFT STATION LEVEL INDICATION — LI 501 (AI)
LIFT STATION LEVEL TRANSMITTER FAULT — YA 501
LIFT STATION HIGH HIGH LEVEL ALARM — LAHH 501
LIFT STATION HIGH LEVEL ALARM — LAH 501
LIFT STATION LOW LEVEL ALARM — LAL 501
LIFT STATION LOW LOW LEVEL ALARM — LALL 501
LIFT STATION LIFT PUMP NO. 1 IN AUTO — YIA 501
LIFT STATION LIFT PUMP NO. 1 IN HAND — YI 501
LIFT STATION LIFT PUMP NO. 1 RUN STATUS — YIR 501
LIFT STATION LIFT PUMP NO. 1 PHASE LOSS — YA 501A
LIFT STATION LIFT PUMP NO. 1 OVERCURRENT — YA 501B
LIFT STATION LIFT PUMP NO. 1 VFD FAULT — YA 501C
LIFT STATION LIFT PUMP NO. 2 IN AUTO — YIA 502
LIFT STATION LIFT PUMP NO. 2 IN HAND — YI 502
LIFT STATION LIFT PUMP NO. 2 RUN STATUS — YIR 502
LIFT STATION LIFT PUMP NO. 2 PHASE LOSS — YA 502A
LIFT STATION LIFT PUMP NO. 2 OVERCURRENT — YA 502B
LIFT STATION LIFT PUMP NO. 2 VFD FAULT — YA 502C

PROVISION I/O POINTS
PROVISION I/O POINTS
PROVISION I/O POINTS

NETWORK SWITCH
OIT
RADIO
ANTENNA
ETHERNET (MODBUS TCP) — TO VFD 1
ETHERNET (MODBUS TCP) — TO VFD 2

ATS IN NORMAL (UTILITY) POSITION — JIN 504
ATS IN STANDBY (GENERATOR) POSITION — JI 504

NOTE 2

STANDBY GENERATOR RUN STATUS — YIR 505
STANDBY GENERATOR IN AUTO — YIA 505
STANDBY GENERATOR FAULT ALARM — YA 505

24VDC POWER SUPPLY FAILURE ALARM — JA 500
RTU CABINET INTRUSION ALARM — ZA 500
JY 500
ZS 500

UPS FAULT ALARM — YA 500
UPS

240VAC

ZS 501

HS 501 HOAL / YL G RUN / YLA R LEAK / YLA R FAIL / KI 501 PUMP 1
HS 502 HOAL / YL G RUN / YLA R LEAK / YLA R FAIL / KI 502 PUMP 2

PUMP MONITOR RELAY FROM MANUFACTURER (TYP.)

XY 501 — VFD 1
XY 502 — VFD 2

LIFT STATION PUMP CONTROL PANEL (VENDOR PROVIDED) LCP-500

INTRINSICALLY SAFE BARRIER (TYP.)

AUTOMATIC TRANSFER SWITCH ATS-500 (EXISTING)

RUN COMMAND

GENERATOR CONTROL PANEL

STANDBY GENERATOR GEN-500 (EXISTING)

FUEL STORAGE TANK (EXISTING)

LOOP-POWERED
NOTE 3
LIT 501 — RADAR

HIGH HIGH LEVEL ALARM FLOAT — LSHH 501
BACKUP LAG PUMP ON FLOAT — LSH 501
BACKUP LEAD PUMP ON FLOAT — LSL 501
BACKUP PUMP CUTOFF FLOAT — LSLL 501

INFLUENT

TSH 501 / YS 501 LEAK — LIFT PUMP NO. 1 PMP-501
TSH 502 / YS 502 LEAK — LIFT PUMP NO. 2 PMP-502

EFFLUENT

MIXER
LIFT STATION WETWELL

120VAC
GFCI
AIR COMPRESSOR CMP-500

NOTES:

1. LEVEL TRANSMITTER FAULT SHALL BE MONITORED IF AVAILABLE FROM LEVEL TRANSMITTER.
2. EXISTING GENERATOR AND ASSOCIATED ATS SHALL BE RE-UTILIZED. STATUSES AND ALARMS SHOWN ON THIS P&ID THAT ARE AVAILABLE FOR MONITORING IN ASSOCIATION WITH EXISTING GENERATOR AND ASSOCIATED ATS SHALL BE MONITORED.
3. RADAR LEVEL TRANSMITTER SHALL BE EQUIPPED WITH BOTH FRONT AND REAR THREADS TO ALLOW WALL OR CEILING MOUNTING AND SHALL BE INTRINSICALLY SAFE. SUITABLE TO BE INSTALLED WITHIN A CLASS I, DIV I HAZARDOUS AREA.

No.	Revision Note	Date	Drawn	Check

NAVAJO TRIBAL UTILITY AUTHORITY
IYANBITO LIFT STATION DESIGN ADDITION

P&ID

NCS ENGINEERS

Registered Professional Engineer (Civil)
74459
AARON G. ARMENTA
Date Signed
ARIZONA, U.S.A.

EXPIRATION DATE: 12/31/27

Drawn by:	ML
Design by:	GAR
Approved by:	AGA
Date	11/12/25
Project No.	2498
Sheet No.	I-02

Nov 12, 2025 - 4:35pm
X:\2400's\N2498 NTUA_Iyanbito Lift Station Design Additions\100 - E&I Design_CAD Files\D2498.25_I02.dwg