NAVAJO TRIBAL UTILITY AUTHORITY

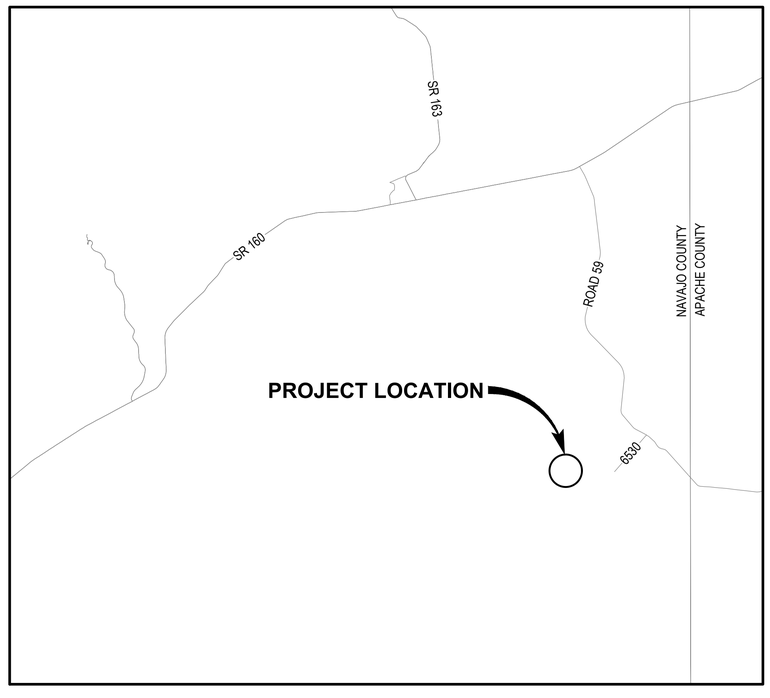
BOOSTER PUMP STATION YELLOWHAIR

90% SUBMITTAL

PROJECT NO: W232520UT
APRIL 2024

consor
986 WEST 9000 SOUTH
WEST JORDAN, UTAH 84008

VICINITY MAP
NOT TO SCALE



LOCATION MAP
SCALE: 1" = 20000'

PRELIMINARY NOT FOR CONSTRUCTION

811
Know what's **below.**
Call before you dig.

Drawing Path and Name: A:_V-W\Projects\UT\NTUA\2023\W232520UT.0012 CADD\12-S Sheets\B-1 Yellowhair\W232520UT_B-1_G-000.dwg, Plotted Date: April 3, 2024 1:43 PM By: Jared Cloud

SHEET INDEX

DWG NAME	DESCRIPTION
GENERAL	
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C-301	SECTIONS
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C-502	DETAILS
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S-001	PUMP STATION BUILDING AND GENERAL STRUCTURAL NOTES
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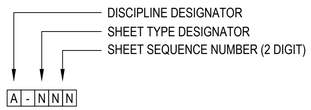
E-002	LEGENDS AND SYMBOLS - II
E-005	DETAILS SHEET-I
E-006	DETAILS SHEET-II
E-010	DIAGRAMS
E-011	SCHEDULES AND CALCULATIONS
E-030	SCHEMATIC - RTU
E-060	SCHEMATIC - VFD
E-100	SITE PLAN POWER AND CONTROLS
E-101	ENLARGED PLAN POWER AND CONTROLS
E-102	SITE PLAN LIGHTING AND GROUNDING
E-103	ENLARGED PLAN LIGHTING AND GROUNDING
INSTRUMENTATION	
I-001	LEGENDS AND SYMBOLS - I
I-002	LEGENDS AND SYMBOLS - II
I-003	NETWORK DIAGRAM
I-010	BOOSTER STATION
I-011	SUPPORT EQUIPMENT

SHEET INDEX DESIGNATIONS



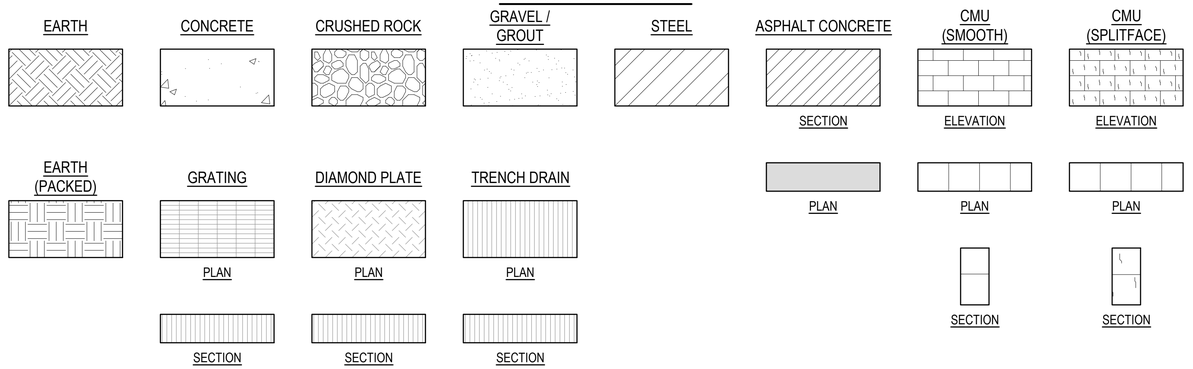
DISCIPLINE DESIGNATORS

G	GENERAL
C	CIVIL
L	LANDSCAPE
A	ARCHITECTURAL
S	STRUCTURAL
D	PROCESS
P	PLUMBING
M	MECHANICAL (HVAC)
F	FIRE PROTECTION
E	ELECTRICAL
I	INSTRUMENTATION AND P&IDS

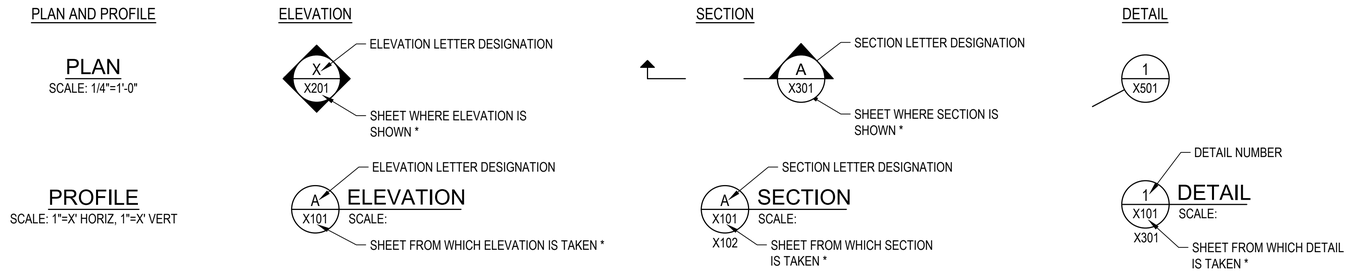
SHEET TYPE DESIGNATORS

0	GENERAL
1	PLANS
2	ELEVATIONS
3	SECTIONS
4	LARGE SCALE VIEWS
5	DETAILS
6	SCHEDULES AND DIAGRAMS
7	USER DEFINED
8	USER DEFINED
9	3D REPRESENTATION

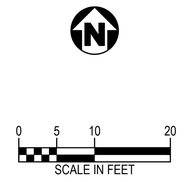
HATCH PATTERNS



VIEW TITLE DESIGNATIONS



NORTH ARROW AND SCALE BAR



* NOTE: IF PLAN AND SECTION FOR DETAIL CALL-OUT AND DETAIL ARE SHOWN ON THE SAME DRAWING, DRAWING NUMBER IS REPLACED WITH A DASH.

consor

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY — UTILITIES FOR THE NAVAJO NATION

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:

GENERAL
YELLOWHAIR

SHEET INDEX AND LEGEND

Designed By: AMB	CONSOR Project No.: W232520UT
Drawn By: RB	Issued On: APRIL 2024
Checked By: JY	Drawing No.: G-001
Approved By: NN	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: A:_V-W\Projects\UT\NTUA\2023\w232520ut.00\12 CADD\12-5 sheets\b-1 yellowhair\W232520UT_B-1_G-001.dwg, Plotted Date: April 5, 2024 10:08 AM By: Ryan Ball

@	AT
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS
AB	ANCHOR BOLT
ABAN(D)	ABANDON(ED)
ABS	ACRYLONITRILE BUTADIENE STYRENE
ABV	ABOVE / ALCOHOL BY VOLUME
AC	ASPHALTIC CONCRETE
ACP	ASPHALTIC CONCRETE PAVING
ADJ	ADJUSTABLE
ADJC	ADJACENT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHR	ANCHOR
AL	ALUMINUM
ALT	ALTERNATE
AMP	AMPERE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATE
APPVD	APPROVED
APWA	AMERICAN PUBLIC WORKS ASSOCIATION
ARCH	ARCHITECTURAL
ARV	AIR RELEASE VALVE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASR	AQUIFER STORAGE & RECOVERY
ASSN	ASSOCIATION
ASSY	ASSEMBLY
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS
ATM	ATMOSPHERE
AUTO	AUTOMATIC
AUX	AUXILIARY
AVE	AVENUE
AVG	AVERAGE
AWWA	AMERICAN WATER WORKS ASSOCIATION
B&S	BELL & SPIGOT
BC	BOLT CIRCLE
BD	BOARD
BETW	BETWEEN
BF	BOTH FACE
BFD	BACKFLOW PREVENTION DEVICE
BFILL	BACKFILL
BFV	BUTTERFLY VALVE
BHP	BRAKE HORSEPOWER
BKGD	BACKGROUND
BLDG	BUILDING
BLK	BLOCK
BLVD	BOULEVARD
BM	BENCHMARK / BEAM
BMP	BEST MANAGEMENT PRACTICES
BO	BLOW-OFF
BOC	BACK OF CURB
BS	BOTH SIDES
BSMT	BASEMENT
BTF	BOTTOM FACE
BTU	BRITISH THERMAL UNIT
BV	BALL VALVE
BW	BOTH WAYS
C	CELSIUS
C TO C	CENTER TO CENTER
CARV	COMBINATION AIR RELEASE VALVE
CATV	CABLE TELEVISION
CB	CATCH BASIN
CCP	CONCRETE CYLINDER PIPE
CCW	COUNTER CLOCKWISE
CDOT	COLORADO DEPARTMENT OF TRANSPORTATION
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CHAN	CHANNEL
CHEM	CHEMICAL
CHFR	CHAMFER
CHKV	CHECK VALVE
CI	CAST IRON
CIP	CAST IRON PIPE
CIPC	CAST IN PLACE CONCRETE
CISP	CAST IRON SOIL PIPE
CJ	CONSTRUCTION JOINT
CL OR C/L	CENTER LINE
CL2	CHLORINE
CLG	CEILING
CLJ	CONTROL JOINT
CLR	CLEAR
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CND	CONDUIT
CO	CLEANOUT
COL	COLUMN
COMB	COMBINATION
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS / CONTINUATION
CONTR	CONTRACT(OR)
COORD	COORDINATE
COP	COPPER
CORP	CORPORATION
CORR	CORRUGATED
CP	CONTROL POINT
CPLG	COUPLING
CPVC	CHLORINATED POLYVINYL CHLORIDE
CR	CRUSHED ROCK
CS	COMBINED SEWER
CSP	CONCRETE SEWER PIPE
CT	COURT
CTR	CENTER
CU	CUBIC
CULV	CULVERT
CV	CONTROL VALVE
CW	CLOCKWISE / COLD WATER
CY	CUBIC YARDS
CYL	CYLINDER LOCK
D	DRAIN
DC	DIRECT CURRENT
DEFL	DEFLECTION
DEQ	DEPARTMENT OF ENVIRONMENTAL QUALITY
DET	DETAIL
DI	DUCTILE IRON
DIA	DIAMETER
DIM	DIMENSION
DIR	DIRECTION
DIST	DISTANCE
DN	DOWN
DR	DRIVE
DS	DOWNSPOUT
DWG	DRAWING
DWL	DOWEL
DWV	DRAIN WASTE AND VENT
DWY	DRIVEWAY
E / ELEC	ELECTRICAL
EA	EACH
ECC	ECCENTRIC
EF	EACH FACE
EL	ELEVATION
ELB	ELBOW
ENCL	ENCLOSURE
EOP	EDGE OF PAVEMENT
EQ	EQUAL
EQL SP	EQUALLY SPACED
EQUIP	EQUIPMENT
ESMT	EASEMENT
EW	EACH WAY
EXC	EXCAVATE
EXIST	EXISTING
EXP	EXPANSION
EXP BT	EXPANSION BOLT
EXP JT	EXPANSION JOINT
EXT	EXTERIOR
F	FAHRENHEIT
F TO F	FACE TO FACE
FAB	FABRICATE
FB	FLAT BAR
FCA	FLANGED COUPLING ADAPTER
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FDN	FOUNDATION
FEXT	FIRE EXTINGUISHER
FF	FINISHED FLOOR / FAR FACE
FGL	FIBERGLASS
FH	FIRE HYDRANT
FIN	FINISH(ED)
FIPT	FEMALE IRON PIPE THREAD
FITG	FITTING
FL	FLOOR LINE
FLEX	FLEXIBLE
FLG	FLANGE
FLL	FLOW LINE
FLR	FLOOR
FM	FORCE MAIN
FO	FIBER OPTIC
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUDS
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FEET / FOOT
FTG	FOOTING
FUT	FUTURE
FXTR	FIXTURE
G	GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GROOVED COUPLING
GFA	GROOVED FLANGE ADAPTER
GI	GALVANIZED IRON
GIP	GALVANIZED IRON PIPE
GJ	GRIP JOINT
GL	GLASS
GLV	GLOBE VALVE
GND	GROUND
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GPS	GALLONS PER SECOND
GR	GRADE
GR LN	GRADE LINE
GRTG	GRATING
GV	GATE VALVE
GRVL	GRAVEL
GYP	GYPSUM
HB	HOSE BIBB
HC	HOLLOW CORE
HDPE	HIGH DENSITY POLYETHYLENE
HDR	HEADER
HDWE	HARDWARE
HGR	HANGER
HGT	HEIGHT
HH	HANDHOLD
HM	HOLLOW METAL
HMAC	HOT MIX ASPHALT CONCRETE
HNDRL	HANDRAIL
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HORIZ	HORIZONTAL
HP	HIGH PRESSURE / HORSEPOWER
HPG	HIGH PRESSURE GAS
HPT	HIGH POINT
HR	HOUR
HSB	HIGH STRENGTH BOLT
HV	HOSE VALVE
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HWL	HIGH WATER LINE
HWY	HIGHWAY
HYD	HYDRANT
HYDR	HYDRAULIC
I&C	INSTRUMENTATION & CONTROL
IAW	IN ACCORDANCE WITH
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IF	INSIDE FACE
IMPVT	IMPROVEMENT
IN	INCH
INCC	INCLUDE(D)(ING)
INFL	INFLUENT
INJ	INJECTION
INSTL	INSTALLATION
INSUL	INSULATION
INTER	INTERCEPTOR
INTR	INTERIOR
INV	INVERT
IP	IRON PIPE
IPT	IRON PIPE THREAD
IR	IRON ROD
IRRIG	IRRIGATION
JT	JOINT
JUNC	JUNCTION
KPL	KICK PLATE
KVA	KILOVOLT AMPERE
KW	KILOWATT
KWY	KEYWAY
L	LENGTH
LAB	LABORATORY
LAV	LAVATORY
LB	POUND
LF	LINEAR FOOT
LIN	LINEAL
LN	LANE
LOC	LOCATION
LONG	LONGITUDINAL
LP	LOW PRESSURE
LPT	LOW POINT
LRG	LARGE
LS	LONG SLEEVE / LUMP SUM
LT	LEFT
LVL	LEVEL
LWL	LOW WATER LINE
MAN	MANUAL
MAT	MATERIAL
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MCP	MASTER CONTROL PANEL
MECH	MECHANICAL
MET	METAL
MFR	MANUFACTURER
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MIN	MINIMUM
MIPT	MALE IRON PIPE THREAD
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MON	MONUMENT / MONOLITHIC
MOT	MOTOR
MP	MILEPOST
MSL	MEAN SEAL LEVEL
MTD	MOUNTED
NA	NOT APPLICABLE
NAVD	NORTH AMERICAN VERTICAL DATUM
NC	NORMALLY CLOSED
NF	NEAR FACE
NIC	NOT IN CONTRACT
NO / NO.	NORMALLY OPEN / NUMBER
NOM	NOMINAL
NORM	NORMAL
NRS	NON-RISING STEM
NTS	NOT TO SCALE
O TO O	OUT TO OUT
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OVERFLOW / OUTSIDE FACE
OPNG	OPENING
OPP	OPPOSITE
ORIG	ORIGINAL
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OVHD	OVERHEAD
P&ID	PROCESS & INSTRUMENTATION DIAGRAM
PC	POINT OF CURVE
PCC	POINT OF COMPOUND CURVE
PCVC	POINT OF CURVATURE ON VERTICAL CURVE
PE	PLAIN END
PERF	PERFORATED
PERM	PERMANENT
PERP	PERPENDICULAR
PG	PRESSURE GAUGE
PH	PIPE HANGER
PI	POINT OF INTERSECTION
PIVC	POINT OF INTERSECTION ON VERTICAL CURVE
PL OR P/L	PROPERTY LINE / PLATE / PLASTIC
PLBG	PLUMBING
PNL	PANEL
POC	POINT OF CURVATURE
POLY	POLYETHYLENE
PP	POWER POLE / PURPLE PIPE
PRC	POINT OF REVERSE CURVATURE
PRCST	PRECAST
PREP	PREPARATION
PRESS	PRESSURE
PRKG	PARKING
PROP	PROPERTY
PRV	PRESSURE REDUCING VALVE
PS	PUMP STATION
PSIG	POUNDS PER SQUARE INCH GAUGE
PSL	PIPE SLEEVE
PSPT	PIPE SUPPORT
PT	POINT OF TANGENCY
PTVC	POINT OF TANGENCY ON VERTICAL CURVE
PTW	PUMP TO WASTE
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	POTABLE WATER
PWR	POWER
QTY	QUANTITY
RAD	RADIUS
RC	REINFORCED CONCRETE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD / ROOF DRAIN
RDCR	REDUCER
REF	REFERENCE
REINF	REINFORCE(D)(ING)(MENT)
REQ'D	REQUIRED
RESTR	RESTRAINED
RFCA	RESTRAINED FLANGE COUPLING ADAPTER
RM	ROOM
RND	ROUND
RO	ROUGH OPENING
R/W	RIGHT-OF-WAY
RPBPD	REDUCED PRESSURE BACKFLOW PREVENTION DEVICE
RPM	REVOLUTIONS PER MINUTE
RR	RAILROAD
RST	REINFORCED STEEL
RT	RIGHT
SALV	SALVAGE
SAN	SANITARY
SC	SOLID CORE
SCHED	SCHEDULE
SD	STORM DRAIN
SDL	SADDLE
SDR	STANDARD DIMENSION RATIO
SECT	SECTION
SHLDR	SHOULDER
SHT	SHEET
SIM	SIMILAR
SLP	SLOPE
SLV	SLEEVE
SOLN	SOLUTION
SP	SOIL PIPE / SEWER PIPE
SPCL	SPECIAL
SPEC(S)	SPECIFICATION(S)
SPG	SPACING
SPL	SPOOL
SPRT	SUPPORT
SQ	SQUARE
SQ FT	SQUARE FOOT
SQ IN	SQUARE INCH
SQ YD	SQUARE YARD
SS	SANITARY SEWER
SST	STAINLESS STEEL
ST	STREET
STA	STATION
STD	STANDARD
STL	STEEL
STOR	STORAGE
STR	STRAIGHT
STRUCT	STRUCTURE / STRUCTURAL
SUBMG	SUBMERGED
SUCT	SUCTION
SV	SOLENOID VALVE
S/W	SIDEWALK
SWD	SIDEWATER DEPTH
SWGR	SWITCH GEAR
SYMM	SYMMETRICAL
SYS	SYSTEM
T OR TEL	TELEPHONE
T&B	TOP & BOTTOM
TAN	TANGENCY
TB	THRUST BLOCK
TBM	TEMPORARY BENCHMARK
TC	TOP OF CONCRETE / TOP OF CURB
TCE	TEMPORARY CONSTRUCTION EASEMENT
TDH	TOTAL DYNAMIC HEAD
TEMP	TEMPERATURE / TEMPORARY
T&G	TONGUE & GROOVE
THK	THICK / THICKNESS
THRD	THREAD (ED)
THRU	THROUGH
TP	TEST PIT / TOP OF PAVEMENT / TURNING POINT / TRANSTRANSITION
TSP	TRI-SODIUM PHOSPHATE
TST	TOP OF STEEL
TW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UN	UNION
UON	UNLESS OTHERWISE NOTED
USGS	UNITED STATES GEOLOGIC SURVEY
V	VENT / VOLT
VAC	VACUUM
VB	VACUUM BREAKER
VBOX	VALVE BOX
VC	VERTICAL CURVE
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VCP	VITRIFIED CLAY PIPE
VTR	VENT THROUGH ROOF
W	WATER
W/	WITH
W/IN	WITHIN
W/O	WITHOUT
W/W	WALL TO WALL
WD	WOOD
WF	WIDE FLANGE
WH	WATER HEATER
WI	WROUGHT IRON
WM	WATER METER
WP	WORKING POINT / WATERPROOFING
WS	WATER SERVICE
WT	WEIGHT
WTP	WATER TREATMENT PLANT
WTRT	WATERTIGHT
WWF	WELDED WIRE FABRIC
WWTF	WASTEWATER TREATMENT FACILITY
WWTP	WASTEWATER TREATMENT PLANT
X SECT	CROSS SECTION
XFMR	TRANSFORMER
YD	YARD DRAIN / YARD
YH	YARD HYDRANT
YR	YEAR
ZN	ZINC

consor

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner:

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:

GENERAL
YELLOWHAIR

ABBREVIATIONS

Designed By:	AMB
Drawn By:	RB
Checked By:	JY
Approved By:	NN
CONSOR Project No.:	W232520UT
Issued On:	APRIL 2024
Drawing No.:	G-002

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: A:_V-W\Projects\UTN\TUA\2023\W232520UT.00\12 CADD\12-S Sheets\B-1 Yellowhair\W232520UT_B-1_G-002.dwg, Plotted Date: April 3, 2024 1:43 PM By: Jared Cloud

GENERAL NOTES

1. ALL CONSTRUCTION OPERATIONS ARE TO BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE STATE STATUES AND OSHA REGULATIONS.
2. ALL WORK SHALL COMPLY WITH THE CURRENT LOCAL AGENCY STANDARDS AND REQUIREMENTS.
3. THE CONTRACTOR SHALL SCHEDULE WORK IN SUCH A MANNER AS TO AVOID UNNECESSARY INCONVENIENCE TO THE OWNER OR THE PUBLIC.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL SURVEY MONUMENTS AND CORNER MARKERS. SURVEY MONUMENTS AND PROPERTY CORNER MARKERS DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE REESTABLISHED BY A REGISTERED PROFESSIONAL SURVEYOR LICENSED IN THE STATE IN WHICH THE WORK IS BEING PERFORMED.
5. CONTRACTOR SHALL MAINTAIN THE JOB SITE IN A SAFE, NEAT, AND WORKMANLIKE MANNER AT ALL TIMES. JOB SITE SAFETY SHALL NOT BE COMPROMISED.
6. DIMENSIONS TO STRUCTURES, REFERENCED PIPING, PAVING, AND OTHER IMPROVEMENTS ARE APPROXIMATE. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND CONDITIONS 14 DAYS IN ADVANCE OF THE CONSTRUCTION PROGRESS.
7. STRUCTURES SUCH AS CURBS AND GUTTERS, CONCRETE AND ASPHALT DRIVES AND WALKWAYS, PAVING BRICKS, FENCING, RETAINING WALLS, SIGNS, POSTS, MARKERS, ETC., CROSSED BY A UTILITY THAT ARE NOT INDICATED IN THE PLANS SHALL BE RESTORED BY THE CONTRACTOR TO PRECONSTRUCTION CONDITIONS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING ROADS, BUILDINGS, OR OTHER STRUCTURES RESULTING FROM THE CONTRACTOR'S CONSTRUCTION ACTIVITIES. REPAIRS SHALL BE MADE TO PRECONSTRUCTION CONDITIONS.
9. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL APPLICABLE PERMITS REQUIRED TO PERFORM THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING STAGING AREAS REQUIRED TO PERFORM THE WORK.
11. THE CONTRACTOR SHALL MAINTAIN DRIVEWAY ACCESS TO ALL ADJOINING PROPERTIES ACCESSIBLE TO THE PUBLIC AND EMERGENCY VEHICLES. DESIGNS FOR MAINTAINING ACCESS WILL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE CONTROLLING AGENCY FOR THE REVIEW AND APPROVAL.
12. CONTRACTOR SHALL COMPLY WITH THE TRENCH PLATE REQUIREMENTS OF THE GOVERNING JURISDICTION. IF TRENCH PLATE REQUIREMENTS ARE NOT SPECIFIED, THE CONTRACTOR SHALL APPLY SKID RESISTANT COATING ON THE TRENCH PLATES AND COLD MIX ASPHALT CONCRETE TO THE EDGES. THE TRENCH PLATES SHALL BE NOTCHED INTO THE ASPHALT CONCRETE OR TRAVELED SURFACE TO PREVENT SLIPPAGE AND ROCKING UNDER TRAFFIC.
13. THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, COUNTY, AND LOCAL LAWS AND ORDINANCES RELATING TO THE SAFETY AND CHARACTER OF WORK, EQUIPMENT, AND PERSONNEL. THIS INCLUDES, BUT IS NOT LIMITED TO SHEETING, SHORING, BRACING, VENTILATION, CONFORMANCE WITH TRAFFIC CONTROL AND MAINTENANCE OF BARRICADES AND WARNING DEVICES.
14. CONTRACTOR SHALL KEEP COMPLETE AND ACCURATE RECORD DRAWINGS OF THE WORK, UTILITY POTHOLE DATA, AND EXISTING CONDITIONS THAT HAVE CHANGED OR ARE DIFFERENT THAN SHOWN ON THE PLANS. UPON COMPLETION OF THE WORK, THE CONTRACTORS RECORD DRAWINGS SHALL BE SUBMITTED TO THE OWNER.
15. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL STORM DRAIN PIPES, STORM WATER FEATURES, OR DRAINAGE FACILITIES FROM DAMAGE DURING ALL STAGES OF CONSTRUCTION.
16. ALL EXISTING PAVEMENT MARKINGS AND SIGNAGE DISTURBED DURING CONSTRUCTION SHALL BE REPLACED BY CONTRACTOR AT NO EXPENSE TO OWNER.
17. CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING THE WATER FOR ALL PROJECT-RELATED ACTIVITIES INCLUDING BUT NOT LIMITED TO CONSTRUCTION, DUST CONTROL, TESTING, AND DISINFECTION. THE CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH OWNER TO TAP EXISTING MAINS AND BRINGING WATER TO THE SITE.
18. CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPMENT OF A CONSTRUCTION STORMWATER POLLUTION PREVENTION PROGRAM. CONTRACTOR IS RESPONSIBLE FOR OBTAINING THE CONSTRUCTION PERMIT AND COMPLYING WITH ALL ASPECTS OF THE PERMIT.
19. LIMITED POWER IS CURRENTLY AVAILABLE AT THE SITE. CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE OWNER AND PROVIDING ALL ADDITIONAL POWER NEEDED FOR CONSTRUCTION.
20. THE CONTRACTOR SHALL RESTORE THE SITE GRADING AND DRAINAGE TO PRECONSTRUCTION CONDITIONS.

GENERAL PIPELINE NOTES:

1. ALL OPEN TRENCHES, WORK AREA, AND SHAFTS SHALL BE SLOPED OR HAVE A SHORING SYSTEM IN ACCORDANCE WITH OSHA, STATE, AND LOCAL REQUIREMENTS.
2. SCHEDULE TIE-INS IN ACCORDANCE WITH THE SEQUENCING REQUIREMENTS OF THE CONTRACT. SCHEDULE AND COORDINATE TIE-INS AROUND THE OWNER'S OPERATIONAL REQUIREMENT AND LIMITATION.
3. THE CONTRACTOR IS RESPONSIBLE FOR ARRANGING FOR REQUIRED INSPECTION. THE PRESENCE OR ABSENCE OF THE INSPECTOR WILL NOT RELIEVE THE CONTRACTOR OF FULL RESPONSIBILITY FOR THE PROPER PERFORMANCE OF THE WORK.

OPERATION OF SYSTEM:

1. OPERATION OF VALVES AND ANY OTHER COMPONENTS OF THE PUBLIC WATER SYSTEM SHALL ONLY BE PERFORMED BY THE WATER SYSTEM OWNER.

EXISTING UTILITY NOTES:

1. UTILITY LOCATIONS SHOWN ON PLANS ARE CONSIDERED APPROXIMATE ONLY. NO ELEVATIONS ARE SHOWN, AND NO INFORMATION WAS AVAILABLE DURING THE DESIGN PERIOD.
2. THE CONTRACTOR SHALL VERIFY LOCATION AND DEPTHS OF EXISTING UTILITIES BY CONTACTING ALL UTILITIES, AGENCIES, AND SUBSURFACE UTILITY LOCATING SERVICES (811). IN ADVANCE OF EXCAVATION, CONTRACTOR SHALL USE ALL EXISTING UTILITIES AND STRUCTURES ADJACENT TO THE WORK AREA, WHETHER INDICATED ON THE DRAWINGS OR NOT. SURVEY AND ACCURATELY RECORD THE LOCATIONS AND ELEVATIONS OF THE UTILITY CROSSINGS ON THE RECORD DRAWINGS. PREPARE AND SUBMIT THE UTILITY FIELD SURVEY INFORMATION TO THE OWNER FOR REVIEW ON A MONTHLY BASIS DURING THE COURSE OF CONSTRUCTION. SUBMITTAL SHALL INCLUDE UTILITIES SURVEYED THAT MONTH AND ASSOCIATED VERTICAL ELEVATIONS AND HORIZONTAL LOCATIONS (NORTHING AND EASTING COORDINATES) AND A LIST OF UTILITIES SURVEYED TO DATE. ALL COMPILED IN MICROSOFT EXCEL SPREADSHEET FORMAT. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE UTILITY AGENCY THE PROTECTION, REMOVAL, RECONSTRUCTION, AND/OR RECONNECTION OF EXISTING FACILITIES AS REQUIRED TO COMPLETE THE WORK. CONTRACTOR SHALL NOTIFY CONSTRUCTION MANAGER IMMEDIATELY OF ANY POTENTIAL UTILITY CONFLICTS.
3. SUPPORT ALL EXISTING UTILITIES AT CROSSING LOCATIONS. PROTECT EXISTING UTILITIES RUNNING PARALLEL TO CONSTRUCTED TRENCHES FROM DAMAGE CAUSED BY THE REMOVAL OF ADJACENT MATERIALS.
4. SOME UTILITY SERVICES MAY NOT BE SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL TAKE NECESSARY MEASURES TO LOCATE AND PROTECT SERVICE DURING CONSTRUCTION.
5. PRIOR TO CONSTRUCTION OF ANY NEW PIPELINE THAT TIES INTO AN EXISTING UTILITY, EXPOSE AND VERIFY LOCATION AND ELEVATION OF THE TIE-IN POINT. CONFIRM THE EXISTING PIPE MATERIAL AND ANY OTHER INFORMATION REQUIRED BY THE DRAWINGS. SURVEY AND ACCURATELY RECORD THE LOCATION AND ELEVATION OF THE TIE-IN POINT ON THE RECORD DRAWINGS.
6. BEFORE CONSTRUCTION IS STARTED, CONTRACTOR SHALL COORDINATE WITH THE OWNER OF EACH UTILITY AND DEFINE THE REQUIREMENTS AND METHODS TO ACCOMMODATE THE PROTECTION, TEMPORARY SUPPORT, ADJUSTMENT, OR RELOCATION OF ANY UTILITIES AFFECTED BY THE PROPOSED WORK.
7. CONTRACTOR IS RESPONSIBLE FOR COSTS INCURRED AS A RESULT OF UTILITY RELOCATIONS PERFORMED FOR THE CONTRACTOR'S CONVENIENCE.

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:

GENERAL
YELLOWHAIR

GENERAL NOTES

Designed By: AMB	CONSOR Project No.: W232520UT
Drawn By: RB	Issued On: APRIL 2024
Checked By: JY	Drawing No.: G-003
Approved By: NN	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: A:_V-W\Projects\UTN\TUA\2023\W232520UT.0012 CADD\12-5 Sheets\B-1 Yellowhair\W232520UT_B-1_G-003.dwg, Plotted Date: April 3, 2024 1:44 PM By: Jared Cloud

TOPOGRAPHIC LEGEND

	EXISTING	PROPOSED
WATERLINE	10"W	12"DI W
ELECTRICITY (UNDERGROUND)	E	E
OVERHEAD UTILITY	OVHD	OVHD
GAS	4"G	4"G
TELEPHONE/TELEMETRY	T	T
CABLE TELEVISION	COM	COM
COMMUNICATION	CATV	CATV
FIBER OPTIC	FO	FO
SANITARY SEWER LINE	8"SS	8"SS
SANITARY SEWER FORCE MAIN	6"SSFM	6"FM
STORM DRAIN	8"SD	8"SD
DRAIN	D	D
CULVERT	18"SD	18"SD
ABANDONED PIPE	10"W (ABAND)	
DRAINAGE DITCH		
BARBWIRE FENCE	X X X	X X X
CHAIN LINK FENCE		
TEMPORARY SILT FENCE		
GUARDRAIL		
ROCK WALL		
TREE/BUSH LINE		
CENTERLINE		
RIGHT-OF-WAY	R/W	
PROPERTY LINE		
EASEMENT		
EDGE OF PAVEMENT/AC		
EDGE OF GRAVEL		
CURB		
SIDEWALK	S/W	S/W
STRUCTURE OR FACILITY		
CONTOUR MINOR		
CONTOUR MAJOR	200	200

	EXISTING	PROPOSED
MANHOLE	SS SD W C T	
CLEAN-OUT		
CATCH BASIN/FIELD INLET		
THRUST BLOCK		
VALVE		
AIR INJECTION ASSEMBLY		
BLOW-OFF ASSEMBLY (PERMANENT)		
BLOW-OFF ASSEMBLY (TEMPORARY)		
AIR RELEASE ASSEMBLY		
FIRE HYDRANT ASSEMBLY		
WATER METER		
PULL BOX/JUNCTION BOX		
UTILITY POLE		
GUY WIRE		
LIGHT POST		
STREET LIGHT		
MAILBOX		
SIGN		
TREE DECIDUOUS		
TREE CONIFEROUS		
TREE TO BE REMOVED		
SURFACE ELEVATION	+ 176.63	+ 176.63
WETLAND		
BENCHMARK		
IRON ROD		
MONUMENT		
BORE		
TEST PIT		
BOLLARD		

SCHEMATIC	
	WELDED JOINT
	FLANGED JOINT
	GROOVED END JOINT
	MECHANICAL JOINT
	PUSH-ON JOINT (RUBBER GASKET)
	FLANGED COUPLING ADAPTER
	DOUBLE BALL FLEXIBLE EXTENSION COUPLING
	FLEXIBLE COUPLING W/ THRUST RING
	90° BEND UP
	90° BEND DOWN
	TEE UP
	TEE DOWN
	LATERAL UP
	LATERAL DOWN
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	UNION
	BLIND FLANGE
	CAP
	LONG SLEEVE
	FLEXIBLE COUPLING
	FITTING (45°)

SCHEMATIC	
	BUTTERFLY VALVE
	GATE VALVE
	GLOBE VALVE
	BALL VALVE
	BALANCING VALVE
	PLUG VALVE (TOP)
	PLUG VALVE (SIDE)
	3-WAY PLUG VALVE
	CHECK VALVE
	SWING CHECK VALVE
	DOUBLE CHECK ASSEMBLY
	BALL SWING CHECK
	SILENT CHECK VALVE
	PRESSURE REDUCING VALVE
	ALTITUDE CONTROL VALVE
	SOLENOID VALVE
	RELIEF VALVE
	NEEDLE VALVE
	HOSE VALVE
	REDUCED PRESSURE BACKFLOW PREVENTER W/ GATE VALVES
	HOSE BIBB

MISCELLANEOUS PIPING SYMBOLS

	STRAINER
	SIGHT GLASS
	PRESSURE GAUGE W/ COCK
	PRESSURE SWITCH W/ COCK
M	METER
SP	SLIP-ON JOINT PIPE
R	RESTRAINED JOINT PIPE

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:

CIVIL
YELLOWHAIR

LEGEND AND SYMBOLS

Designed By:	AMB
Drawn By:	RB
Checked By:	JY
Approved By:	NN
CONSOR Project No.:	W232520UT
Issued On:	APRIL 2024
Drawing No.:	C-001

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: A:_V-W\Projects\UTN\TUA\2023\W232520UT.00\12 CADD\12-S Sheets\B-1 Yellowhair\W232520UT_B-1_C-001.dwg, Plotted Date: April 3, 2024 1:44 PM By: Jared Cloud

PLAN
SCALE: 1" = 10'

GENERAL NOTES

1. CONTRACTOR TO LOCATE AND VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION
2. CONTRACTOR SHALL USE CAUTION AROUND OVERHEAD UTILITIES AND POLES
3. CONTRACTOR TO PROTECT IN PLACE EXISTING SITE FEATURES TO REMAIN.
4. SEE SHEET S-101 FOR NEW BUILDING STRUCTURAL, AND D-101 FOR PROCESS PIPING IN THE BUILDING.

KEY NOTES

(1) PROPOSED BOOSTER STATION BUILDING, SEE STRUCTURAL PLANS
(2) INSTALL 6 FT CHAIN LINK FENCE WITH 2 FT OF BARBED WIRE ON TOP
(3) INSTALL 12' DOUBLE SWING GATE
(5) REMOVE EXISTING FENCE
(12) INSTALL NEW OVERHEAD ELECTRIC LINE.

SURVEY NOTES

1. ARIZONA STATE PLANE COORDINATE SYSTEM 1983, CENTRAL ZONE, INTERNATIONAL FEET.

SURVEY CONTROL POINTS

PT NO.	DESCRIPTION	NORTHING	EASTING
1	SW CORNER BLDG	N2008591.04	E727530.56
2	SE CORNER BLDG	N2008594.65	E727544.86
3	BLDG CORNER	N2008603.14	E727542.72
4	BLDG CORNER	N2008603.81	E727545.39
5	NE CORNER BLDG	N2008618.03	E727541.79
6	NW CORNER BLDG	N2008613.74	E727524.83
10	FENCE	N2008587.08	E727546.49
11	FENCE	N2008592.29	E727545.17
12	FENCE	N2008585.36	E727518.33
13	FENCE	N2008611.54	E727511.72
14	FENCE	N2008620.21	E727545.28
15	FENCE	N2008607.99	E727548.37
16	FENCE	N2008611.59	E727562.34
20	GRAVEL EDGE	N2008565.13	E727489.89
21	GRAVEL EDGE	N2008579.25	E727489.53
22	GRAVEL EDGE	N2008590.64	E727509.64
23	GRAVEL EDGE	N2008592.39	E727516.56
24	GRAVEL EDGE	N2008604.03	E727513.62
25	GRAVEL EDGE	N2008601.88	E727505.13
26	GRAVEL EDGE	N2008579.01	E727464.78
27	GRAVEL EDGE	N2008577.68	E727453.13

consor

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

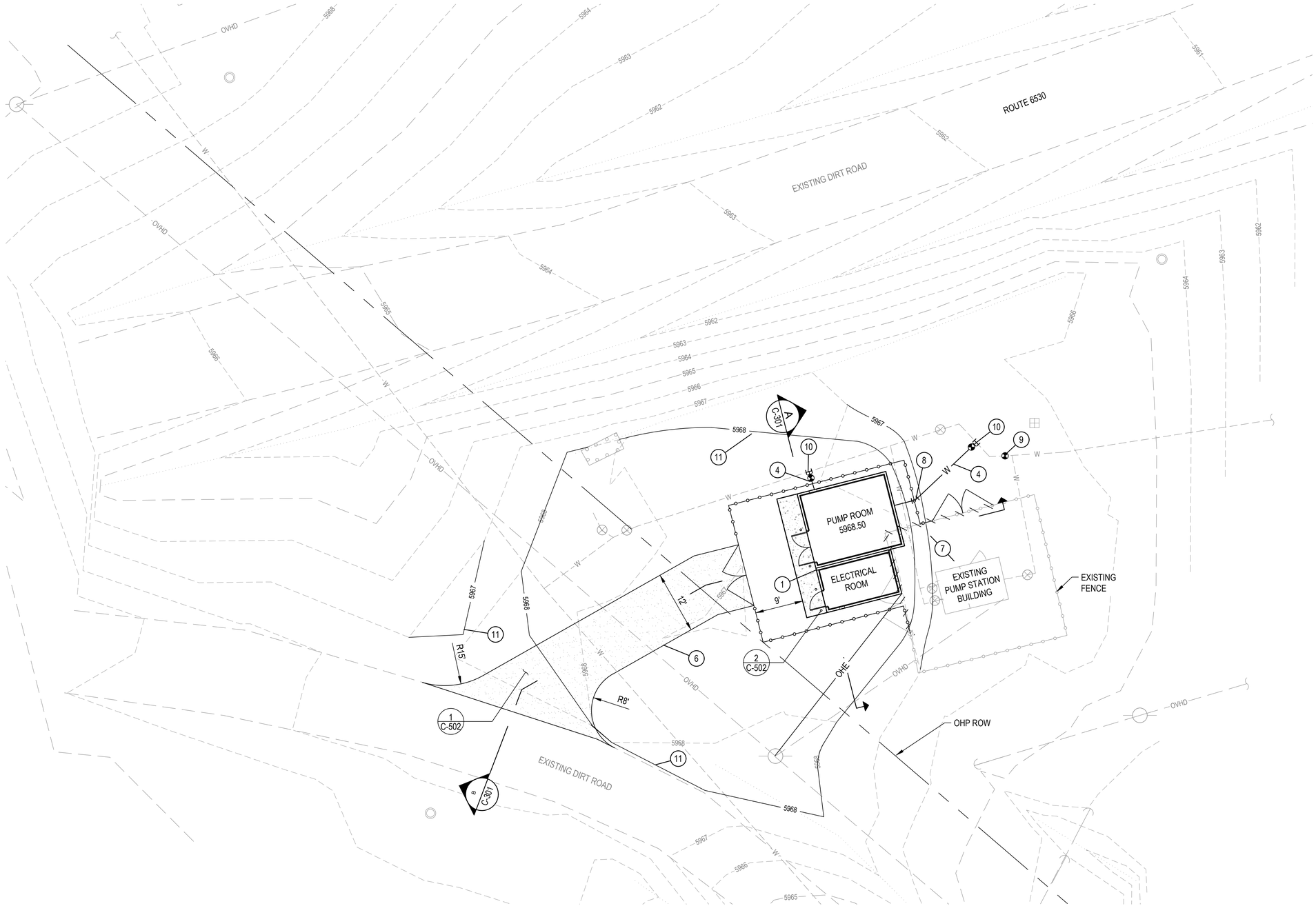
Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY — UTILITIES FOR THE NAVAJO NATION

Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:
CIVIL
YELLOWHAIR
OVERALL SITE PLAN AND SURVEY CONTROL

Designed By: AMB	CONSOR Project No.: W232520UT
Drawn By: JB, RB	Issued On: APRIL 2024
Checked By: JY	Drawing No.: C-100
Approved By: NN	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: A:_V-W\Projects\UT\NTUA\2023\W232520UT.00\12 CADD\12-S Sheets\B-1 Yellowhair\W232520UT_B-1_C-100.dwg, Plotted Date: April 3, 2024 4:34 PM By: Ryan Ball



PLAN
SCALE: 1" = 10'

GENERAL NOTES

1. CONTRACTOR TO LOCATE AND VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION
2. CONTRACTOR SHALL USE CAUTION AROUND OVERHEAD UTILITIES AND POLES
3. CONTRACTOR TO PROTECT IN PLACE EXISTING SITE FEATURES TO REMAIN.
4. SEE SHEET S-101 FOR NEW BUILDING STRUCTURAL, AND D-101 FOR PROCESS PIPING IN THE BUILDING.
5. ALL SITE WATER PIPING SHALL BE DUCTILE IRON CLASS 52. ALL JOINTS, FITTINGS AND VALVES SHALL BE RESTRAINED JOINT, UNLESS OTHERWISE NOTED. ACTUAL PIPE ALIGNMENT AND DEPTH SHALL BE ADJUSTED IN THE FIELD TO AVOID CONFLICT WITH OTHER UTILITIES, ALL LOCATING ADJUSTMENTS SHALL BE APPROVED BY THE ENGINEER.
6. ALL BURIED PIPELINES SHALL MAINTAIN 36 INCHES COVER UNLESS OTHERWISE NOTED. AT UTILITY CROSSINGS, NEW PIPE SHALL BE ROUTED UNDER EXISTING, AND FITTING AS REQUIRED, COORDINATE WITH ENGINEER PRIOR TO PLACEMENT.
7. CONTRACTOR SHALL PROVIDE AND INSTALL SLEEVES AND SPOOLS AS NEEDED TO FACILITATE CONNECTIONS TO EXISTING AND NEW YARD PIPING. LONG SLEEVES SHALL BE INSTALLED WITHIN 5-FEET OF NEW STRUCTURE.

KEY NOTES

1. PROPOSED BOOSTER STATION BUILDING, SEE STRUCTURAL PLANS
4. CONSTRUCT NEW WATERLINE
6. CONSTRUCT GRAVEL ROAD FOR ACCESS
7. CLEAR AND GRUB SITE, INSTALL 3/4" GRAVEL WITH GEOTEXTILE FABRIC WITHIN FENCED AREA.
8. (1) 4" MJ 22.5° BEND
9. (1) 4" MJ GATE VALVE
10. (1) 4" MJ TEE, (1) 4" MJ GATE VALVE
11. CONSTRUCT GRADING

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

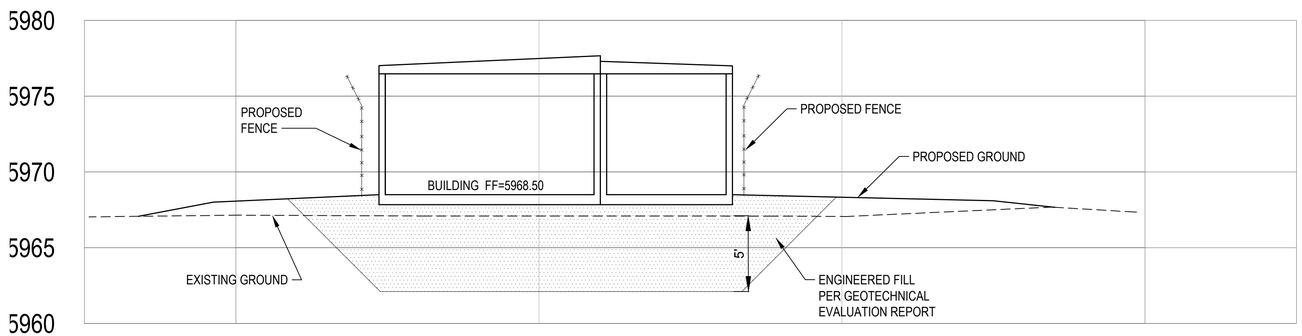
Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY — UTILITIES FOR THE NAVAJO NATION

Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

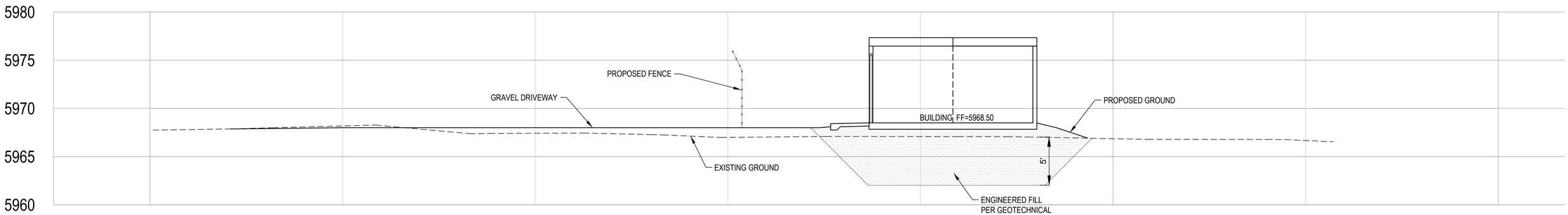
Drawing Title:
CIVIL
YELLOWHAIR
SURFACING, GRADING AND YARD PIPING PLAN

Designed By: AB	CONSOR Project No.: W232520UT
Drawn By: RB, JC	Issued On: APRIL 2024
Checked By: AB	Drawing No.: C-110
Approved By: NN	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: A:_V-W\Projects\UTN\TUA\2023\W232520UT.00\12 CADD\12-5 Sheets\B-1 Yellowhair\W232520UT_B-1_C-110.dwg, Plotted Date: April 3, 2024 4:36 PM By: Ryan Ball



A / C-110 SECTION
SCALE: 1"=5' HOR; 1"=5' VERT



B / C-110 SECTION
SCALE: 1"=5' HOR; 1"=5' VERT

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner:

NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:

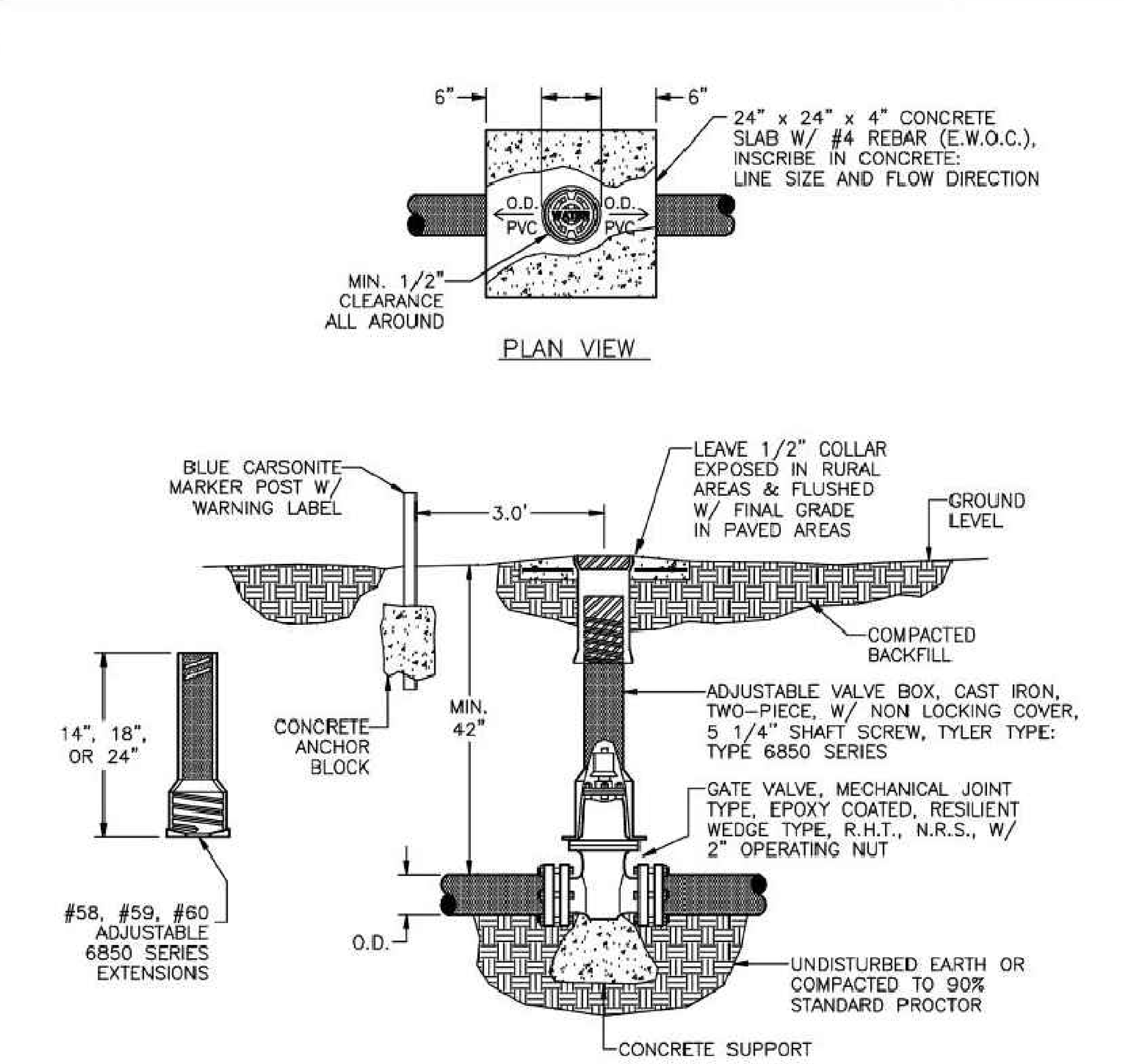
CIVIL
YELLOWHAIR

SECTIONS

Designed By: AMB	CONSOR Project No.: W232520UT
Drawn By: RB	Issued On: APRIL 2024
Checked By: JY	Drawing No.: C-301
Approved By: NN	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: A:_V-W\Projects\UTWTUA\2023\W232520UT.00\12 CADD\12-5 Sheets\B-1 Yellowhair\W232520UT_B-1_C-301.dwg, Plotted Date: April 3, 2024 1:47 PM By: Jared Cloud

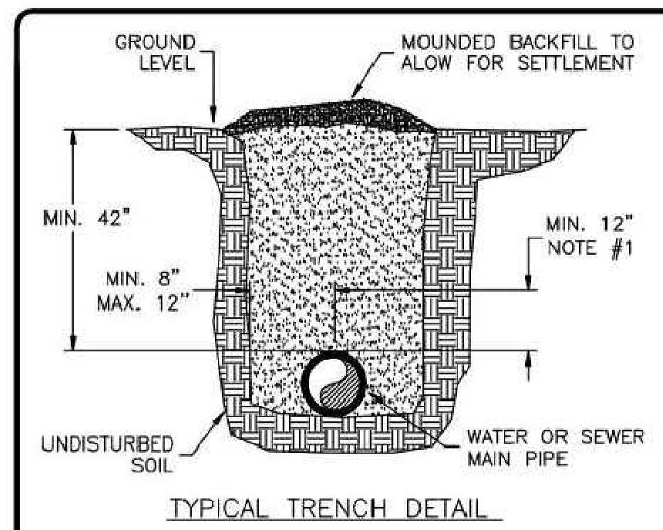
1	2	3	4	5	6	7



NOTES:

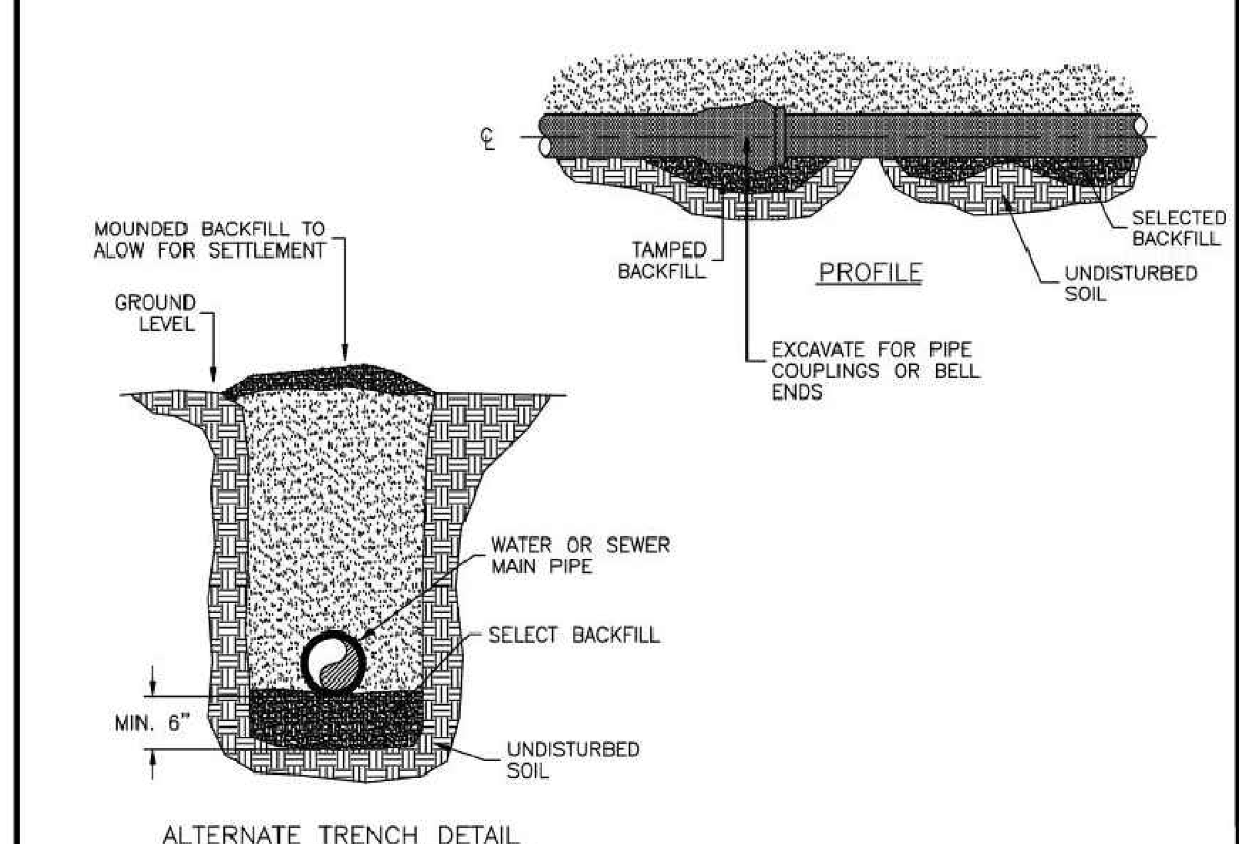
1. IF APPROPRIATE, USE SERIES 2000 PV MEGALUG GLANDS FOR SDR-21, PVC TO SECURE GATE VALVE(S) TO OTHER FITTINGS/PIPE, USE OTHER MEGALUGS FOR DIFFERENT OUTSIDE DIAMETER PIPE/TYPE.
2. DO NOT COVER JOINTS AND BOLTS WITH CONCRETE.
3. SEE WS-13 FOR APPROPRIATE LOCATION OF MARKER POST.

NAVAJO TRIBAL UTILITY AUTHORITY — WATER MAIN VALVE INSTALLATION (DWG. NO. WS-14.DWG)

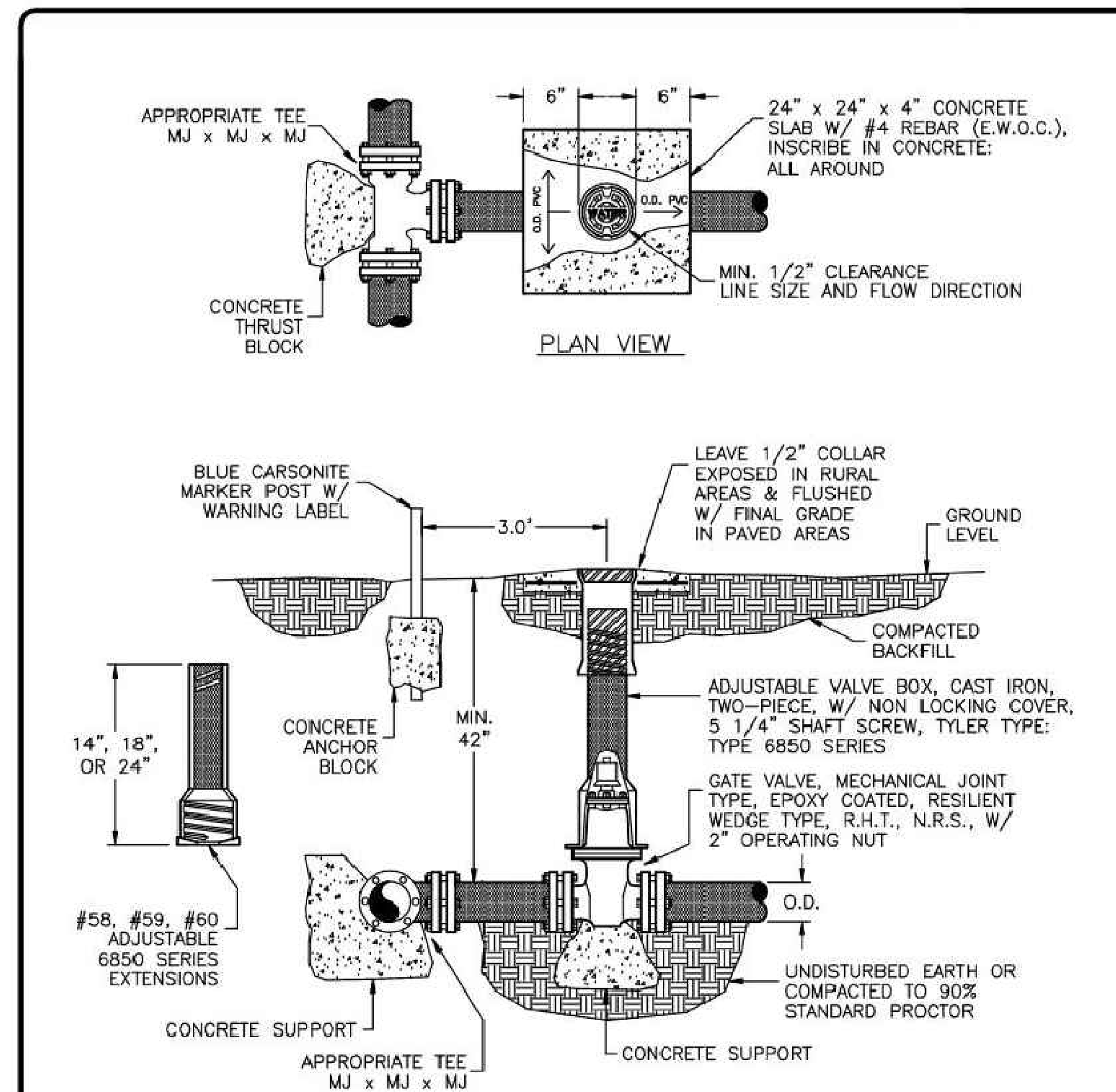


NOTES:

1. HAND COMPACTED IN 6" LIFTS FROM BOTTOM OF TRENCH TO 12" ABOVE PIPE CROWN.
2. OPEN CUT OR PAVED OR GRAVEL ROADS (IF REQUIRED), BACK FILL MINIMUM COMPACTION 95% OPTIMUM DENSITY IN LIFTS.
3. REPAVING AND REGRAVELING WILL BE DONE TO ROAD OWNER'S REQUIREMENTS.
4. KEEP LOWER 5' OF TRENCH WALL VERTICAL IF POSSIBLE. UPPER PART OF THE TRENCH WILL VARY IN WIDTH TO COMPENSATE FOR UNSTABLE SOIL. APPLICABLE O.S.H.A. REQUIREMENTS SHALL BE MET.



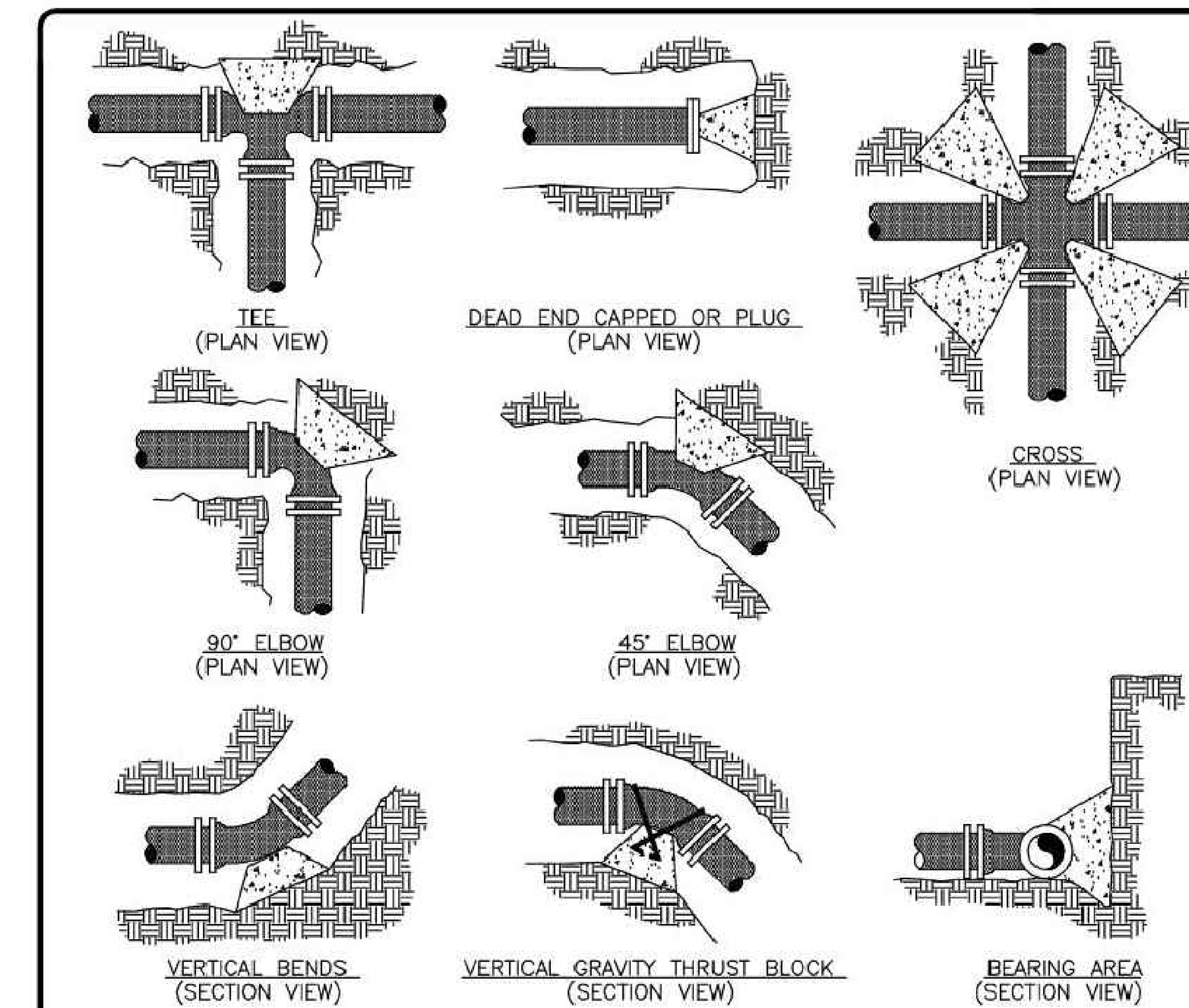
NAVAJO TRIBAL UTILITY AUTHORITY — TRENCH DETAIL



NOTES:

1. IF APPROPRIATE, USE SERIES 2000 PV MEGALUG GLANDS FOR SDR-21, PVC TO SECURE GATE VALVE(S) TO OTHER FITTINGS/PIPE, USE OTHER MEGALUGS FOR DIFFERENT OUTSIDE DIAMETER PIPE/TYPE.
2. DO NOT COVER JOINTS AND BOLTS WITH CONCRETE.
3. SEE WS-13 FOR APPROPRIATE LOCATION OF MARKER POST.

NAVAJO TRIBAL UTILITY AUTHORITY — WATER MAIN TAP W/GATE VALVE



MINIMUM BEARING AREAS IN SQUARE FEET				
PIPE SIZE	TEE & PLUG	90° ELBOW	45° OR 22 1/2° ELBOW	CROSS
2"	0.5	0.5	0.5	0.5
4"	1.5	2.0	1.5	1.0
6"	3.0	4.5	2.5	2.0
8"	5.0	7.5	4.0	4.0
10"	8.0	11.0	6.5	5.5
12"	11.0	15.5	9.0	8.0
14"	15.0	21.0	12.0	10.5
16"	19.0	27.0	15.5	13.5
18"	24.0	34.0	19.0	17.0

NOTES:

1. DO NOT COVER GASKETED JOINTS AND NUTS/BOLTS.

SHEET 1 OF 2

NAVAJO TRIBAL UTILITY AUTHORITY — GRAVITY/THRUST BLOCK DETAILS (DESIGNED BY: NTUA; DRAWN BY: NTUA; APPROVED BY: NTUA; DATE: 04/08; SCALE: NTS; ACAD FILENAME: Water Standard; DWG. NO. WS-19.DWG; REVISIONS: 01 04/08 Revised L.H.)

GRAVITY THRUST BLOCK

(ALSO TO BE USED IN UNSTABLE TRENCH CONDITIONS)

RESULTANT THRUST IN POUNDS OF FITTINGS AT 100 PSI WATER PRESSURE

TOTAL POUNDS					
PIPE SIZE	DEAD END	90° ELBOW	45° ELBOW	22 1/2° ELBOW	11 1/4° ELBOW
3"	1,232	1,742	943	481	241
4"	1,810	2,559	1,385	706	355
6"	3,739	5,288	2,862	1,459	733
8"	6,433	9,097	4,923	2,510	1,261
10"	9,677	13,685	7,406	3,776	1,897
12"	13,685	19,353	10,474	5,340	2,683
14"	18,385	26,001	14,072	7,174	3,604
16"	23,799	33,628	18,199	9,278	4,661
18"	29,865	42,235	22,858	11,653	5,855
20"	36,644	51,822	28,046	14,298	7,183
24"	52,279	73,934	40,013	20,398	10,249
30"	80,425	113,738	61,554	31,380	15,766
36"	115,209	162,931	88,177	44,952	22,585
42"	155,528	219,950	119,036	60,684	30,489
48"	202,683	286,637	155,127	79,083	39,733
54"	260,214	367,999	199,160	101,531	51,011
60"	298,121	421,606	228,172	116,321	58,442
64"	338,707	479,004	259,235	132,157	66,398

NOTES:

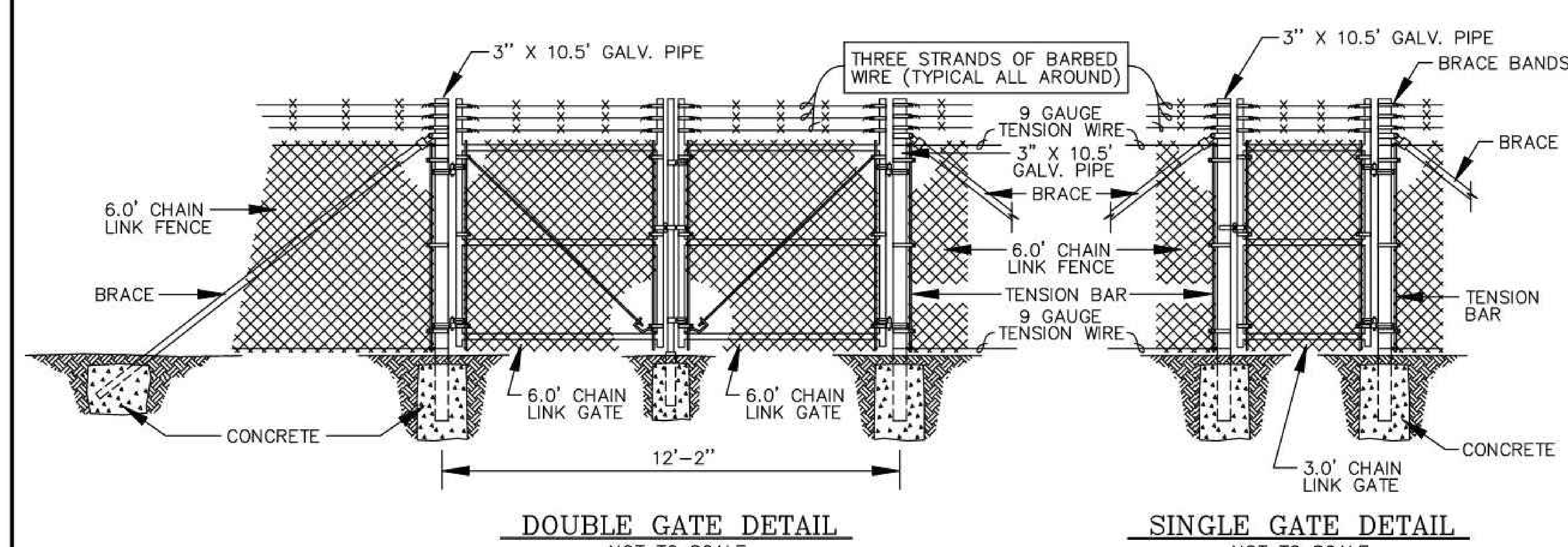
1. THE THRUST (IN TOTAL POUNDS) IN THE CHART IS BASED ON DUCTILE IRON OUTSIDE DIAMETER PIPE DIMENSION. SURGES SHOULD BE CONSIDERED AT TWICE THE NORMAL OPERATING PRESSURE. THE VOLUME OF THE GRAVITY THRUST BLOCK IS BASED ON CONCRETE AT 150 LBS./FT3.
2. TO OBTAIN VOLUME OF CONCRETE REQUIRED, USE:
   VOLUME OF CONRETE(FT3)= THRUST(LBS.) x SYSTEM PRESSURE(PSI)/100 PSI // 150 LBS./FT3.

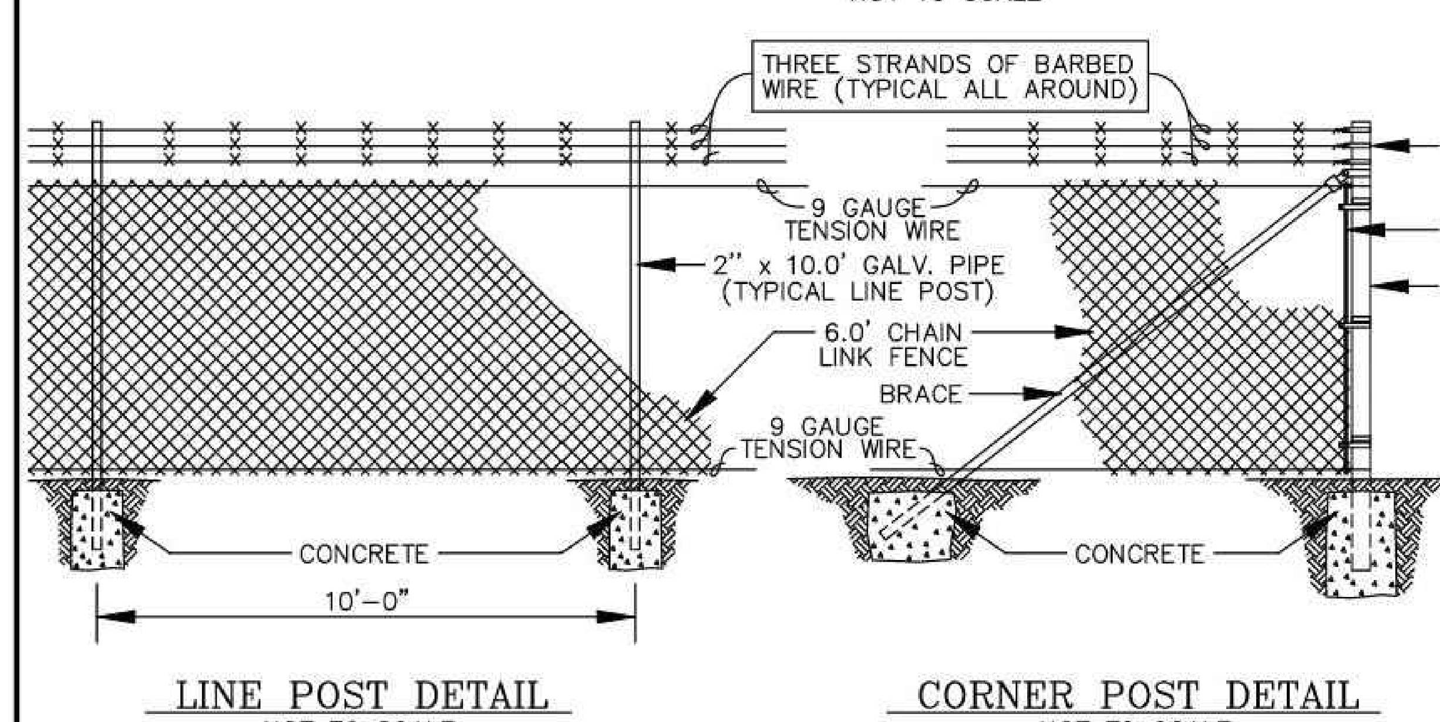
   E.G.: CALCULATE THE VOLUME OF THE GRAVITY THRUST BLOCK FOR AN 8" x 45° BEND AT AN OPERATING PRESSURE OF 80 PSI.

   ANSWER: 4923 LBS. x 160 PSI/100 PSI DIVIDED BY 150 LBS./CUBIC FT. = 52.5 CUBIC FEET OR 2 CUBIC YARDS.

SHEET 2 OF 2

NAVAJO TRIBAL UTILITY AUTHORITY — GRAVITY/THRUST BLOCK CHART





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

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

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

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

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

consor

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner:

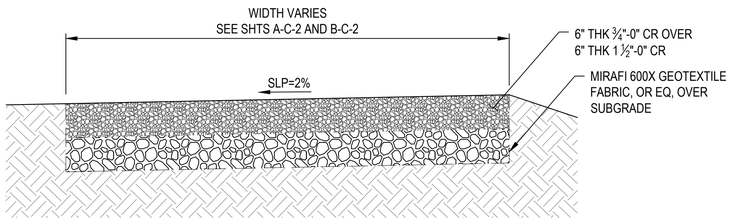
Project Title: NAVAJO TRIBAL UTILITY AUTHORITY BOOSTER PUMP STATION

Drawing Title: CIVIL YELLOWHAIR STANDARD DETAILS

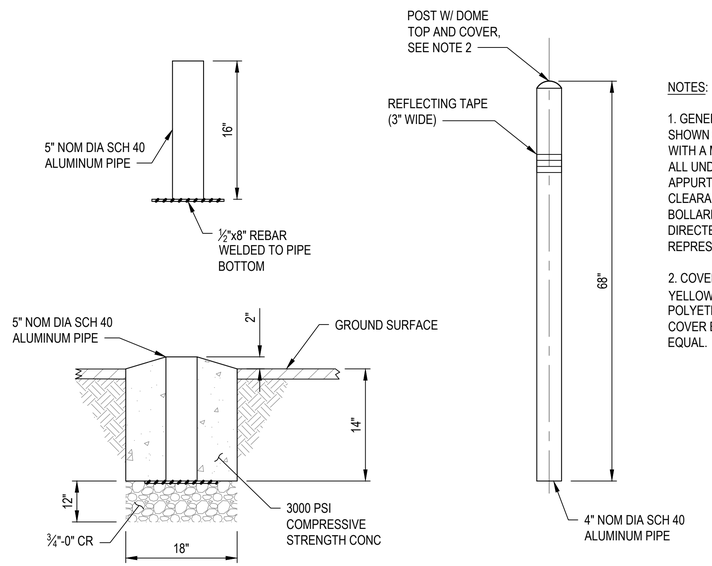
Designed By: AMB
Drawn By: RB
Checked By: JY
Approved By: NN

CONSOR Project No.: W232520UT
Issued On: APRIL 2024
Drawing No.: C-501

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE



1 TYPICAL GRAVEL DRIVEWAY SECTION
SCALE: NTS



2 4" REMOVABLE BOLLARD
SCALE: NTS

NOTES:

1. GENERAL LOCATION OF BOLLARDS SHOWN ON PLANS. LOCATE BOLLARDS WITH A MINIMUM 3' CLEARANCE FROM ALL UNDERGROUND PIPING AND APPURTENANCES AND A MINIMUM 2' CLEARANCE FROM ALL STRUCTURES. BOLLARD LOCATIONS SHALL BE AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

2. COVER ALUMINUM PIPE WITH YELLOW ⅛" THICK HIGH DENSITY POLYETHYLENE DOME TOP BOLLARD COVER BY POST GUARD OR APPROVED EQUAL.

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner:

NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:

CIVIL
YELLOWHAIR

DETAILS

Designed By: AMB	CONSOR Project No.: W232520UT
Drawn By: RB	Issued On: APRIL 2024
Checked By: JY	Drawing No.: C-502
Approved By: NN	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: A:_V-W\Projects\UT\NTUA\2023\w232520ut.00\12 CADD\12-5 sheets\b-1 yellowhair\W232520UT_B-1_C-502.dwg, Plotted Date: April 5, 2024 10:23 AM By: Ryan Ball

GENERAL STRUCTURAL NOTES (GSN)

DIVISION 01: GENERAL REQUIREMENTS

DESIGN DATA

CODES:	LOADS:	IBC 2021; ASCE 7-16
	CONCRETE:	ACI 318-19
	STRUCTURAL STEEL:	AISC Steel Construction Manual, 15th Ed
	CONSTRUCTION:	APWA Manual of Standard Specifications (Latest Edition)

SOIL DESIGN VALUES:

BORROW MATERIAL UNIT WEIGHT:	135 PCF (SANDY GRAVEL)
ALLOWABE SOIL BEARING:	1,500 PSF
ACTIVE LATERAL PRESSURE (E.F.P. METHOD):	33 PSF WITH 0.31q SURCHARGE
AT-REST LATERAL PRESSURE (E.F.P. METHOD):	51 PSF WITH 0.47q SURCHARGE
PASSIVE PRESSURE:	350 PSF
COEFF OF SLIDING FRICTION:	0.25

SEISMIC DESIGN CRITERIA (FROM GEOTECHNICAL INVESTIGATION):

SITE CLASS:	C
SITE COEFFICIENT (Fa):	1.3
SITE COEFFICIENT (Fv):	1.5
MSRA at 0.2 SEC PERIOD (Ss):	0.194g
MSRS at 1.0 SEC PERIOD (S1):	0.056g
SRA at 0.2 SEC PERIOD (S_{MS}):	0.252g
SRA at 1.0 SEC PERIOD(S_{M1}):	0.084g
DSRA at 0.2 SEC PERIOD (S_{DS}):	0.168g
DSRA at 1.0 SEC PERIOD (S_{D1}):	0.056g

GENERAL NOTES TO CONTRACTOR

1. CONSTRUCTION SHALL CONFORM TO THE PROJECT SPECIFICATIONS AND APPLICABLE SECTIONS OF THE MANUAL OF STANDARD SPECIFICATIONS (LATEST EDITION), WITH ADDENDA AS PUBLISHED BY THE UTAH CHAPTER OF THE AMERICAN PUBLIC WORKS ASSOCIATION (APWA).
2. ANY CHANGES TO THE STRUCTURE OR THESE DRAWINGS SHALL BE SUBMITTED BY THE CONTRACTOR IN WRITING FOR ENGINEER REVIEW AND APPROVAL 7 DAYS PRIOR TO BEGINNING THE WORK.
3. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR CONFLICTS BETWEEN THE CONSTRUCTION DRAWINGS AND GENERAL STRUCTURAL NOTES BEFORE PROCEEDING WITH THE WORK.
4. THE CONTRACTOR SHALL VERIFY ALL EXISTING UNDERGROUND SERVICES THAT INTERFERE WITH THIS WORK. EXISTING UNDERGROUND SERVICES SHALL NOT BE DISTURBED OR REMOVED WITHOUT THE APPROVAL OF THE OWNER OR HIS REPRESENTATIVE, UNLESS NOTED ON THE DRAWINGS.
5. THE REMOVAL, CUTTING, DRILLING, ETC., OF EXISTING CONSTRUCTION SHALL BE PERFORMED WITH GREAT CARE IN ORDER NOT TO JEOPARDIZE THE STRUCTURAL INTEGRITY OF THE EXISTING CONSTRUCTION.
6. THE CONTRACT STRUCTURAL DRAWINGS REPRESENT THE FINISHED STRUCTURE, BUT DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE MEANS, METHODS AND TECHNIQUES OF CONSTRUCTION, AND THE ASSOCIATED SAFETY PRECAUTIONS, ARE THE RESPONSIBILITIES OF THE CONTRACTOR.
7. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT BUILDING ELEMENTS AND OTHER STRUCTURES DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING AND SHORING FOR LOADS IMPOSED DURING CONSTRUCTION, INCLUDING CONSTRUCTION EQUIPMENT.
8. NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT.
9. OPTIONS ARE FOR THE CONTRACTOR'S CONVENIENCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL THE CHANGES NECESSARY TO IMPLEMENT THE OPTION, AND SHALL COORDINATE ALL DETAILS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF ADDITIONAL DESIGN OR REVIEW WORK BY THE ENGINEER DUE TO SELECTION OF AN OPTION BY THE CONTRACTOR, OR DUE TO ERRORS OR OMISSIONS IN CONSTRUCTION BY THE CONTRACTOR.

SUBMITTALS

1. SHOP DRAWINGS:
   - CONCRETE REINFORCING STEEL
   - CONCRETE MIX DESIGN
   - CONCRETE REINFORCING STEEL
   - PRECAST CONCRETE PUMP STATION BUILDING
2. MIX DESIGN / TEST REPORTS
   - CAST-IN-PLACE CONCRETE

SHOP DRAWINGS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW PRIOR TO COMPONENT FABRICATION. ALL SHOP DRAWINGS SHALL BE REVIEWED AND STAMPED BY THE GENERAL CONTRACTOR PRIOR TO SUBMISSION TO THE ENGINEER.

MIX DESIGNS AND/OR SPECIFICATIONS:
CONCRETE MIX DESIGNS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW A MINIMUM OF ONE WEEK PRIOR TO THE FIRST FIELD DELIVERY.

DIVISION 03: CONCRETE (Cast-in-Place)

CAST-IN-PLACE CONCRETE
CAST-IN-PLACE PORTIONS OF THE WORK SHALL COMPLY WITH ALL APPLICABLE PORTION OF APWA DIVISION 03, AND AS NOTED BELOW:

CONCRETE FORMING:	PER APWA 03 11 00
CONCRETE PLACEMENT:	PER APWA 03 30 10
CONCRETE FINISHING:	PER APWA 03 35 00
CONCRETE CURING:	PER APWA 03 39 00
CONCRETE:	PER APWA 03 20 14, CLASS 3000
REINFORCING:	PER APWA 03 20 00, ASTM A615 (S1) GRADE 60
CONCRETE TESTS:	PER APWA 03 30 05

WELDING: PER AWS D1.4. NO WELDING OR GAS CUTTING OF GRADE 60 BARS IS PERMITTED, EXCEPT WITH PRIOR APPROVAL FROM ENGINEER.

BAR LAP:	48 BAR DIAMETERS, U.O.N.
BAR FABRICATION AND PLACING:	PER CONCRETE REINFORCING STEEL INSTITUTE (CRSI) MANUAL OF STANDARD PRACTICE (LATEST EDITION)

REINFORCING IN CONCRETE PLACED AGAINST EARTH WITHOUT FORMS IS TO BE SUPPORTED BY CONCRETE BLOCKS, APPROVED NON-METALLIC CHAIRS, OR ANOTHER METHOD APPROVED BY THE ENGINEER.

CHAMFER ALL EXPOSED CORNERS 3/4" EXCEPT WHERE NOTED OTHERWISE.

CONCRETE PROTECTION COVER OF REINFORCING STEEL SHALL BE 2" EXCEPT WHERE NOTED OTHERWISE.

CONCRETE FINISHES

WALLS:	UNFINISHED PLYWOOD FORM FACED (NOT EXPOSED) B-GRADE FINISHED PLYWOOD FORM FACED (EXPOSED)
SLABS:	MEDIUM BROOM

GROUT
GROUT SHALL BE HIGH STRENGTH, NON-SHRINK, NON-METALLIC EQUIVALENT TO 'MASTER BUILDERS' MASTERFLOW 713, INSTALLED PER THE MFRG'S RECOMMENDATIONS.

DIVISION 05: METALS

MATERIALS
PLATES AND BARS: PER ASTM A36 (Fy = 36 KSI)
STANDARD STEEL PIPE: PER ASTM A53, GRADE B (Fy = 35 KSI)
HSS SECTIONS SHALL COMPLY WITH ASTM A500, GRADE B (Fy = 46 KSI).

FABRICATION AND ERECTION
FABRICATION AND ERECTION OF STEEL SHAPES AND PLATES SHALL CONFORM TO AISC MANUAL OF STEEL CONSTRUCTION. DETAILING OF STEEL SHAPES SHALL BE PER AISC STRUCTURAL STEEL DETAILING. COPES, BLOCKS, & CUTS: ALL RE-ENTRANT CORNERS SHALL BE SHAPED, NOTCH-FREE, TO A RADIUS OF AT LEAST 1/2".

PAINTING OF METAL SURFACES
PRIME ALL STEEL FABRICATIONS WITH ONE SHOP COAT PRIMER OVER CLEAN METAL.

WHERE METAL IS GALVANIZED, PREPARE SURFACE WITH HIGH PERFORMANCE ACRYLIC BONDING PRIMER - 'DUNN-EDWARDS' ULTRASHIELD OR APPROVED EQUAL.

FINISH PAINT STEEL FABRICATIONS WITH TWO SHOP COATS OF ALKYD ENAMEL FINISH OVER PRIMER, COLOR AS SELECTED BY THE OWNER. FIELD TOUCH-UP AS REQUIRED.

NO PAINT WHERE STRUCTURAL STEEL IS TO BE PERMANENTLY IN CONTACT WITH CONCRETE.

APPLICATION OF PRIMER AND FINISH PAINT SHALL BE PER THE PAINT MANUFACTURER'S RECOMMENDATIONS.

GENERAL WELDING
FIELD WELDING IS NOT ALLOWED U.O.N.
ALL WELDS SHALL BE PERFORMED IN THE SHOP BY CERTIFIED WELDERS U.O.N.

DIVISION 31: EARTHWORK

1. EARTHWORK, INCLUDING BUT NOT LIMITED TO BACKFILL MATERIAL AND COMPACTION, AND SITE PREPARATION FOR THE PRECAST CONCRETE STRUCTURES SHALL BE PERFORMED PER THE RECOMMENDATIONS IN THE FOLLOWING:

   'APPLIED GEOTECH' GEOTECHNICAL EVALUATION, DATED FEBRUARY 22, 2024 AND ANY ADDENDUM TO THE EVALUATION.
2. RETAINING WALL BACKFILL MATERIAL, CLEAN GRAVEL, AND COMPACTION SHALL BE PER THE GEOTECHNICAL INVESTIGATION RECOMMENDATIONS OR WITH APPLICABLE MODIFICATIONS FROM APWA 31 05 13 AS APPROVED BY THE ENGINEER.
3. ALL WORK SHALL BE REVIEWED BY A SOILS ENGINEER REGISTERED IN THE STATE OF ARIZONA.
4. COMPACT BACKFILL IN 8" LIFTS MAXIMUM EXCEPT WHERE NOTED OTHERWISE.
5. ONLY HAND OPERATED COMPACTION EQUIPMENT SHALL BE USED WITHIN 36" OF THE BURIED STRUCTURES.

Consultant:

90% SUBMITTAL

Engineer's Seal:
PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:
STRUCTURAL
YELLOWHAIR
PUMP STATION BUILDING
GENERAL STRUCTURAL NOTES

Designed By:	JVB
Drawn By:	JVB
Checked By:	RB
Approved By:	NN

CONSOR Project No.: W232520UT
Issued On: APRIL 2024
Drawing No.: S-001
0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\jberghan\OneDrive - Consor Engineers, LLC\Documents\Job Files (PEC)\UTAH\W232520UT NTUA Booster Pump Station Improvements\dwg\W232520UT Yellowhair S-001 (GSN).dwg, Plotted Date: March 18, 2024 9:55 AM By: John Berghan

GENERAL STRUCTURAL NOTES (GSN)

DIVISION 03 40: PRECAST CONCRETE
BOOSTER PUMP STATION (BPS) BUILDING

PRECAST MANUFACTURER REQUIREMENTS FOR PUMP STATION BUILDING:

1. COMPLETE REQUIREMENTS SHALL BE AS OUTLINED IN THE SPECIFICATION SECTION 03 41 10 WHICH ARE INCLUDED AND HEREBY MADE A PART OF THESE CONTRACT DOCUMENTS.
2. PROVIDE COMPLETE SHOP DRAWINGS CONFORMING TO THE INSIDE CLEAR DIMENSIONS OF THE CAST-IN-PLACE STRUCTURES. THIS SHALL INCLUDE REINFORCING, EMBEDS, AND LIFTING REQUIREMENTS.
3. PROVIDE THE SUBGRADE PREPARATION PER DIVISION 31 - EARTHWORK THAT WILL BE REQUIRED FOR THE PROPER INSTALLATION OF THE PRECAST STRUCTURE.
4. PROVIDE SEALED STRUCTURAL CALCULATIONS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF ARIZONA. STRUCTURAL CALCULATIONS SHALL INCLUDE BOTH LIFTING AND IN-PLACE LOADS ON THE STRUCTURE.
5. DESIGN SHALL BE IN ACCORDANCE WITH THE LATEST:

   PRECAST CONCRETE INSTITUTE (PCI) MANUAL OF STANDARD PRACTICE.
   CONCRETE REINFORCING INSTITUTE, MANUAL OF STANDARD PRACTICE.
6. ADDITIONAL DESIGN REQUIREMENTS (INCLUDING BUT NOT LIMITED TO SEISMIC AND WIND LOADS).
7. CASTING KEYED JOINTS SHOWN ON THE DRAWINGS ARE TO BE WATERTIGHT AND SHALL BE SEALED ON THE EXTERIOR AND INTERIOR SURFACE. THE PRECAST SUPPLIER SHALL PROVIDE EMBEDS AND FIELD INSTALLATION COMPONENTS AS REQUIRED TO PREVENT THE JOINTS FROM SEPARATING. THE PRECAST SUPPLIER SHALL SUBMIT THE PROPOSED JOINT DETAIL INCLUDING JOINT SEALANT TO THE ENGINEEER FOR REVIEW AND APPROVAL PRIOR TO CASTING.
8. SUBBASE PREPARATION, BEDDING, AND LEVELING COURSE SHALL BE IN ACCORDANCE WITH ASTM C1675-11.
9. DESIGN SHALL CONFORM TO GOVERNING AGENCY STANDARDS AND REQUIREMENTS.
10. CONCRETE: 28-DAY COMPRESSIVE STRENGTH 4,000 PSI (MIN).
11. STEEL REINFORCING: ASTM A-615, GRADE 60.
12. WWF: ASTM A1064, Fy = 70 KSI.
13. CEMENT: ASTM C858.
14. JOINT SEALANT: DOW CORNING 790 SILICONE SEALANT OR APPROVED EQUAL.

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

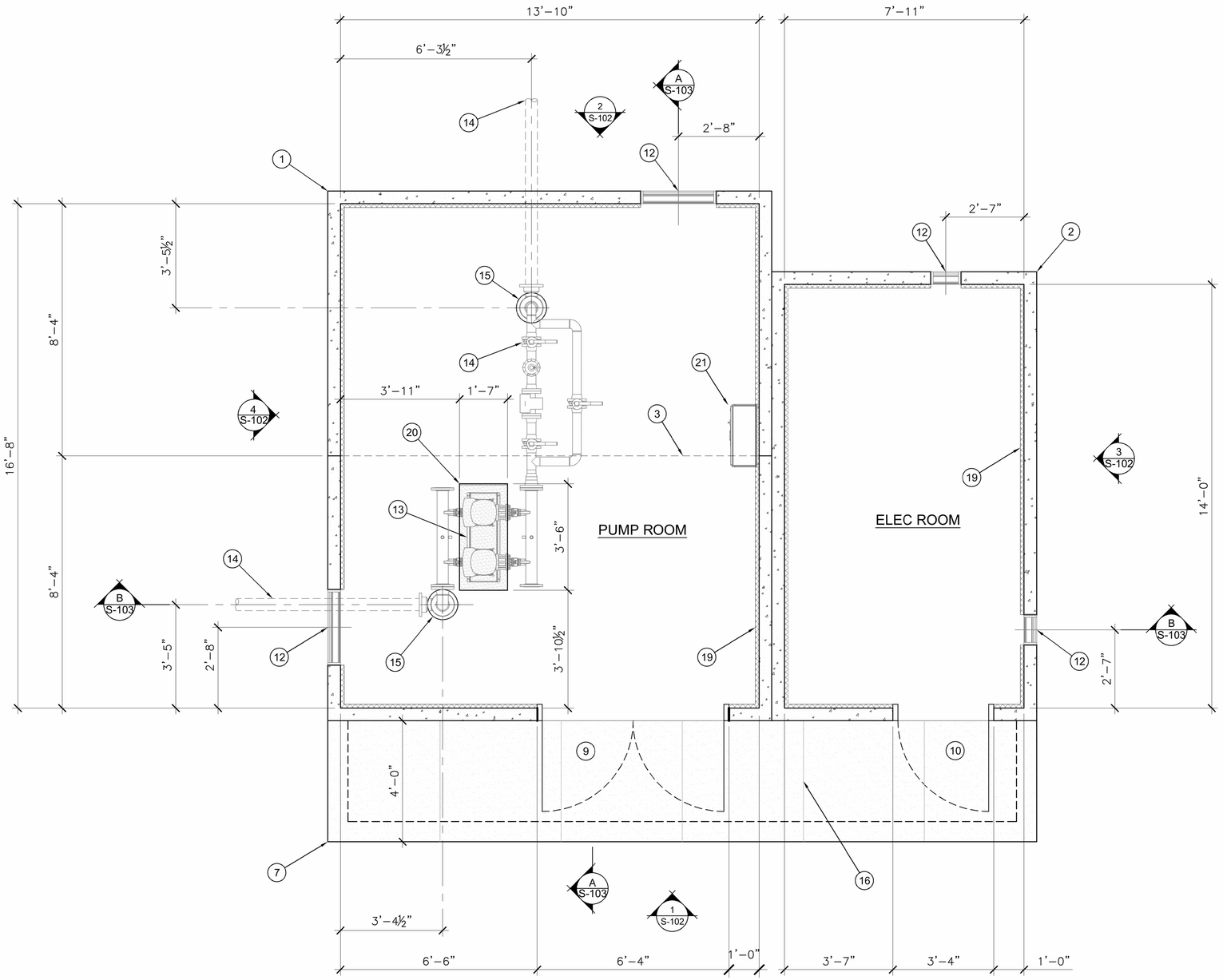
Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

Project Title: NAVAJO TRIBAL UTILITY AUTHORITY BOOSTER PUMP STATION

Drawing Title: STRUCTURAL YELLOWHAIR PUMP STATION BUILDING GENERAL STRUCTURAL NOTES

Designed By: JVB	CONSOR Project No.: W232520UT
Drawn By: JVB	Issued On: APRIL 2024
Checked By: RB	Drawing No.: S-002
Approved By: NN	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\jberghian\OneDrive - Consor Engineers, LLC\Documents\Job Files (PEC)\UTAH\W232520UT NTUA Booster Pump Station Improvements\dwg\W232520UT Yellowhair S-002 (GSN).dwg, Plotted Date: March 18, 2024 10:01 AM By: John Berghian



PUMP STATION PLAN VIEW

(BUILDING DIMENSIONS ARE TO THE INTERIOR OF PRECAST CONCRETE WALLS)

GENERAL NOTES

1. CONTRACTOR TO LOCATE AND VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION AND PLACEMENT OF PRECAST STRUCTURES.
2. CONTRACTOR TO PROTECT IN PLACE EXISTING SITE FEATURES TO REMAIN.
3. CONTRACTOR TO VERIFY ALL PROPOSED UTILITIES PRIOR TO PLACEMENT OF PRECAST STRUCTURES TO ALIGN ALL OPENINGS IN THE STRUCTURES WITH THE PROPOSED UTILITY STUB OUTS.
4. CONTRACTOR SHALL USE CAUTION AROUND OVERHEAD UTILITIES,POLES AND EXISTING SITE FEATURES AND VERIFY CLEARANCES WITH THE CRANE OUTRIGGERS AND PICK HEIGHT.
5. CONTRACTOR TO USE OUTRIGGER CRANE PADS AS REQUIRED.
6. SEE SHEETS S-001 AND S-002 (GSN) FOR GENERAL STRUCTURAL NOTES.
7. SEE PROJECT SPECIFICATIONS FOR REQUIREMENTS FOR PRECAST CONCRETE STRUCTURES.

KEY NOTES

1. PRECAST CONCRETE MODULAR PUMP STATION BUILDING - PAINT PER G.S.N.
2. PRECAST CONCRETE ELECTRICAL ROOM BUILDING - PAINT PER G.S.N.
3. MODULE CASTING JOINT LINE
7. CONCRETE SIDEWALK WITH PERIMETER TURNDOWN
9. DOUBLE 3' x 7' HOLLOW METAL DOOR AND FRAME
10. SINGLE 3' x 7' HOLLOW METAL DOOR AND FRAME
12. LOUVER - SEE MECHANICAL PLANS
13. BOOSTER PUMP SKID - SEE PROCESS PLANS
14. PIPING - SEE PROCESS PLANS
15. 12" DIA OPENING IN FLOOR SLAB FOR PIPING
16. TOOLED CONTROL JOINT - LOCATIONS AS SHOWN
19. FRP WALL PANELS OVER RIGID INSULATION
20. CONCRETE HOUSEKEEPING PAD
21. PUMP CONTROL PANEL

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

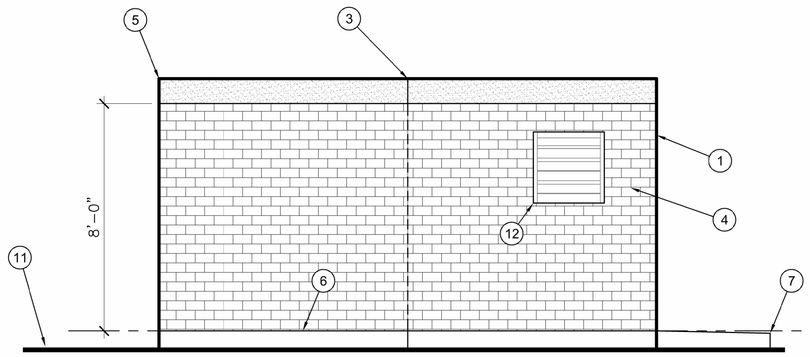
Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

Project Title: NAVAJO TRIBAL UTILITY AUTHORITY BOOSTER PUMP STATION

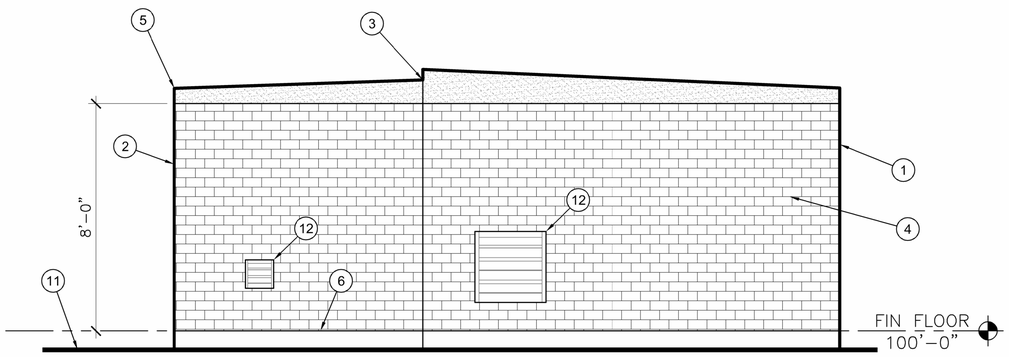
Drawing Title: STRUCTURAL YELLOWHAIR BOOSTER PUMP STATION PLAN VIEW

Designed By: JVB	CONSOR Project No.: W232520UT
Drawn By: JVB	Issued On: APRIL 2024
Checked By: RB	Drawing No.: S-101
Approved By: NN	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

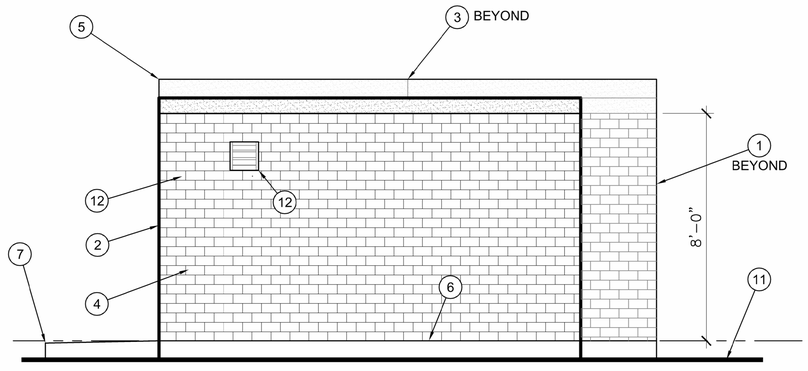
Drawing Path and Name: C:\Users\jberghian\OneDrive - Consor Engineers, LLC\Documents\Job Files (PEC)\UTAH\W232520UT NTUA Booster Pump Station Improvements\dwg\W232520UT Yellowhair S-101 (Plan).dwg, Plotted Date: March 23, 2024 11:12 AM By: John Berghian



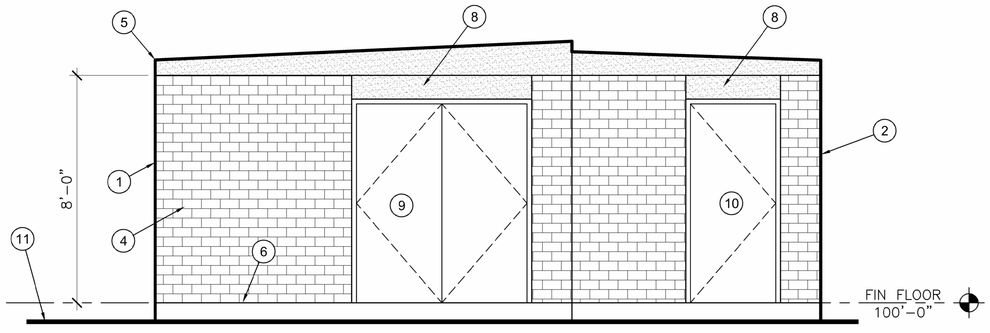
ELEVATION 4



ELEVATION 2



ELEVATION 3



ELEVATION 1

NOTE:
ASSUMED FINISHED FLOOR ELEVATION = 100'-0"
SEE GRADING PLAN FOR ACTUAL ELEVATION.

GENERAL NOTES

1. CONTRACTOR TO LOCATE AND VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION AND PLACEMENT OF PRECAST STRUCTURES.
2. CONTRACTOR TO PROTECT IN PLACE EXISTING SITE FEATURES TO REMAIN.
3. CONTRACTOR TO VERIFY ALL PROPOSED UTILITIES PRIOR TO PLACEMENT OF PRECAST STRUCTURES TO ALIGN ALL OPENINGS IN THE STRUCTURES WITH THE PROPOSED UTILITY STUB OUTS.
4. CONTRACTOR SHALL USE CAUTION AROUND OVERHEAD UTILITIES,POLES AND EXISTING SITE FEATURES AND VERIFY CLEARANCES WITH THE CRANE OUTRIGGERS AND PICK HEIGHT.
5. CONTRACTOR TO USE OUTRIGGER CRANE PADS AS REQUIRED.
6. SEE SHEETS S-001 AND S-002 (GSN) FOR GENERAL STRUCTURAL NOTES.
7. SEE PROJECT SPECIFICATIONS FOR REQUIREMENTS FOR PRECAST CONCRETE STRUCTURES.

KEY NOTES

1. PRECAST CONCRETE MODULAR PUMP STATION BUILDING - PAINT PER G.S.N.
2. PRECAST CONCRETE ELECTRICAL ROOM BUILDING - PAINT PER G.S.N.
3. MODULE CASTING JOINT LINE
4. PRECAST CONCRETE WALLS WITH EXTERIOR WITH SLUMP BLOCK EXTERIOR TYPE FINISH
5. PRECAST CONCRETE ROOF STRUCTURE
6. PRECAST CONCRETE FLOOR SLAB INTEGRALLY CAST WITH WALLS
7. CONCRETE SIDEWALK WITH PERIMETER TURNDOWN
8. PRECAST CONCRETE DOOR TRANSOM INTEGRALLY CAST WITH WALLS
9. DOUBLE 3' x 7' HOLLOW METAL DOOR AND FRAME
10. SINGLE 3' x 7' HOLLOW METAL DOOR AND FRAME
11. FINISHED GRADE
12. LOUVER - SEE MECHANICAL PLANS

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner:

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

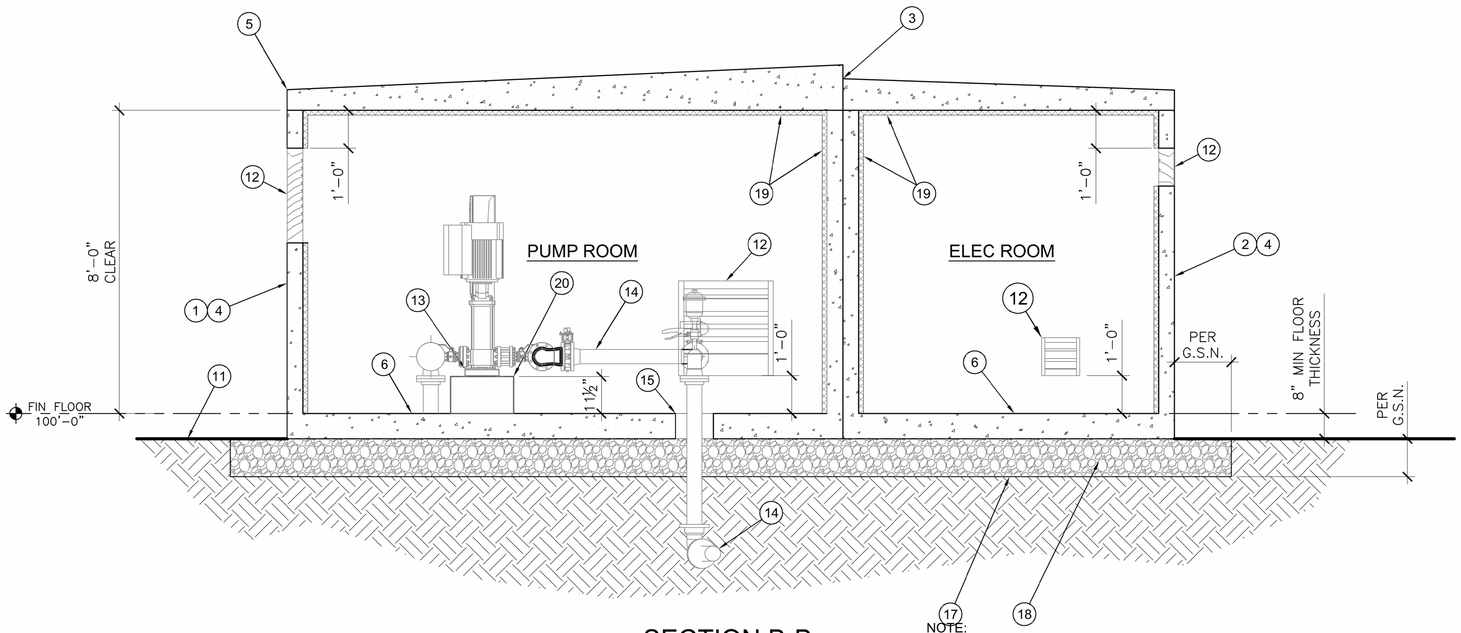
Drawing Title:

STRUCTURAL
YELLOWHAIR

BOOSTER PUMP STATION
ELEVATIONS

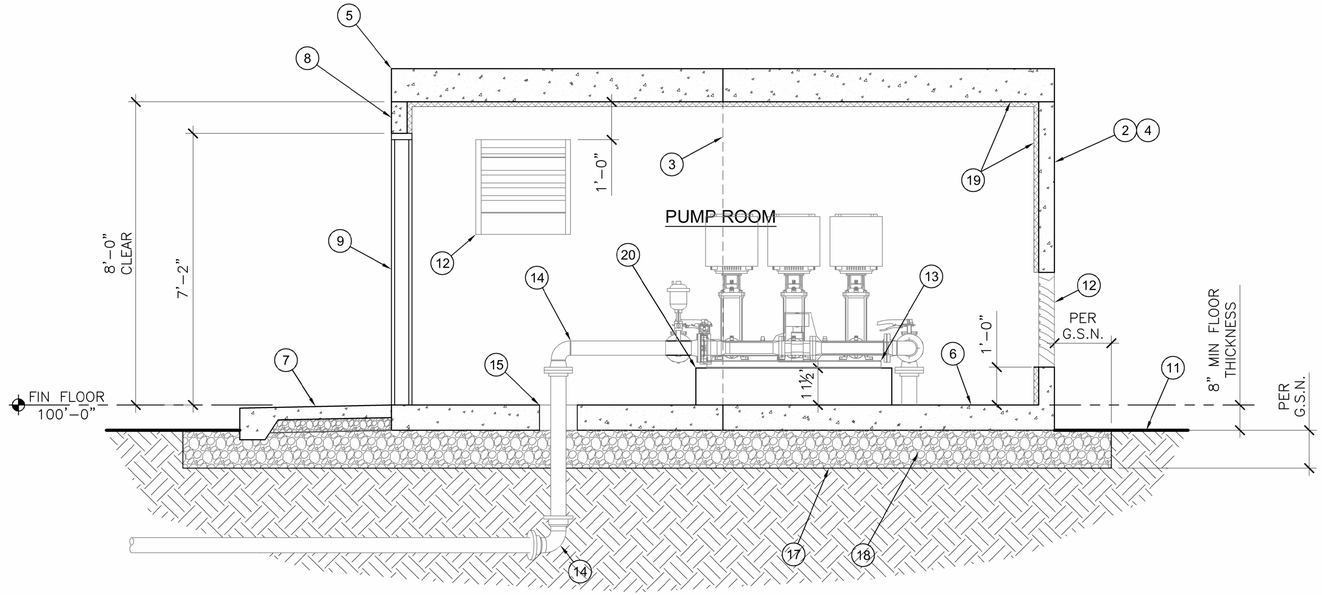
Designed By: JVB	CONSOR Project No.: W232520UT
Drawn By: JVB	Issued On: APRIL 2024
Checked By: RB	Drawing No.: S-102
Approved By: NN	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\jberghain\OneDrive - Consor Engineers, LLC\Documents\Job Files (PEC)\UTAH\W232520UT NTUA Booster Pump Station Improvements\dwg\W232520UT Yellowhair S-102 (Elevations).dwg, Plotted Date: March 23, 2024 11:18 AM By: John Berghan



SECTION B-B

NOTE:
ASSUMED FINISHED FLOOR ELEVATION = 100'-0"
SEE GRADING PLAN FOR ACTUAL ELEVATION.



SECTION A-A

NOTE:
ASSUMED FINISHED FLOOR ELEVATION = 100'-0"
SEE GRADING PLAN FOR ACTUAL ELEVATION.

GENERAL NOTES

1. CONTRACTOR TO LOCATE AND VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION AND PLACEMENT OF PRECAST STRUCTURES.
2. CONTRACTOR TO PROTECT IN PLACE EXISTING SITE FEATURES TO REMAIN.
3. CONTRACTOR TO VERIFY ALL PROPOSED UTILITIES PRIOR TO PLACEMENT OF PRECAST STRUCTURES TO ALIGN ALL OPENINGS IN THE STRUCTURES WITH THE PROPOSED UTILITY STUB OUTS.
4. CONTRACTOR SHALL USE CAUTION AROUND OVERHEAD UTILITIES,POLES AND EXISTING SITE FEATURES AND VERIFY CLEARANCES WITH THE CRANE OUTRIGGERS AND PICK HEIGHT.
5. CONTRACTOR TO USE OUTRIGGER CRANE PADS AS REQUIRED.
6. SEE SHEETS S-001 AND S-002 (GSN) FOR GENERAL STRUCTURAL NOTES.
7. SEE PROJECT SPECIFICATIONS FOR REQUIREMENTS FOR PRECAST CONCRETE STRUCTURES.

KEY NOTES

1. PRECAST CONCRETE MODULAR PUMP STATION BUILDING - PAINT PER G.S.N.
2. PRECAST CONCRETE ELECTRICAL ROOM BUILDING - PAINT PER G.S.N.
3. MODULE CASTING JOINT LINE
4. PRECAST CONCRETE WALLS WITH EXTERIOR WITH SLUMP BLOCK EXTERIOR TYPE FINISH
5. PRECAST CONCRETE ROOF STRUCTURE
6. PRECAST CONCRETE FLOOR SLAB INTEGRALLY CAST WITH WALLS
7. CONCRETE SIDEWALK WITH PERIMETER TURNDOWN
8. PRECAST CONCRETE DOOR TRANSOM INTEGRALLY CAST WITH WALLS
9. DOUBLE 3' x 7' HOLLOW METAL DOOR AND FRAME
11. FINISHED GRADE
12. LOUVER - SEE MECHANICAL PLANS
13. BOOSTER PUMP SKID - SEE PROCESS PLANS
14. PIPING - SEE PROCESS PLANS
15. 12" DIA OPENING IN FLOOR SLAB FOR PIPING
17. SUBGRADE PREPARATION PER G.S.N.
18. COMPACTED AB PAD PER G.S.N.
19. FRP WALL PANELS OVER RIGID INSULATION
20. CONCRETE HOUSEKEEPING PAD
21. PUMP CONTROL PANEL

consor

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:
STRUCTURAL
YELLOWHAIR
PUMP STATION BUILDING
CROSS SECTIONS

Designed By: JVB	CONSOR Project No.: W232520UT
Drawn By: JVB	Issued On: APRIL 2024
Checked By: RB	Drawing No.: S-103
Approved By: NN	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\jberghian\OneDrive - Consor Engineers, LLC\Documents\Job Files (PEC)\UTAH\W232520UT NTUA Booster Pump Station Improvements\dwg\W232520UT Yellowhair S-103 (Cross Sections).dwg, Plotted Date: March 23, 2024 11:15 AM By: John Berghian

PIPE SYMBOLS

DESCRIPTION	SYMBOL
PROPOSED	
HIDDEN	
BELOW GRADE	
EXISTING	
EXISTING HIDDEN	
DEMOLISH	
FUTURE	
CENTERLINE	
PIPE CUT	
PIPE BREAK	
PIPE BREAK (SINGLE LINE)	

PIPE JOINTS

DESCRIPTION	SYMBOL
FLANGED	
MECHANICAL JOINT	
GROOVED	
PVC	
STEEL	
PUSH-ON	
TAP	
SERVICE SADDLE	

PIPE FITTINGS

DESCRIPTION	SYMBOL
90° ELBOW	
45° ELBOW	
22.5° ELBOW	
11.25° ELBOW	
BASE ELBOW	
TEE	
CROSS	
LATERAL	
REDUCER (CONCENTRIC)	
REDUCER (ECCENTRIC)	
REDUCING 90° ELBOW	
EXPANSION JOINT (RESTRAINED)	
EXPANSION JOINT (UNRESTRAINED)	
DISMANTLING JOINT	
FLANGE COUPLING ADAPTER (FCA)	
RESTRAINED FLANGE COUPLING ADAPTER (RFCA)	
FLANGED x FLARED	

VALVE SYMBOLS

DESCRIPTION	PLAN	SECTION	SINGLE LINE
BALL VALVE			
BUTTERFLY VALVE			
BUTTERFLY VALVE (WAFER / LUGGED)			
CHECK VALVE (SWING)			
CHECK VALVE (BALL)			
DIAPHRAGM VALVE			
GATE VALVE			
GLOBE VALVE			
KNIFE GATE VALVE			
PINCH VALVE			
PLUG VALVE			

VALVE SYMBOLS

DESCRIPTION	PLAN	SECTION	SINGLE LINE
PRESSURE REDUCING VALVE (STRAIGHT)			
PRESSURE REDUCING VALVE (ANGLED)			
BACK PRESSURE REGULATOR VALVE (STRAIGHT)			
PRESSURE GAUGE			
AIR VALVE (COMBINATION)			
AIR VALVE (AIR RELEASE)			
AIR VALVE (AIR/VACUUM)			
FLOW METER			M

GENERIC PIPING NOTES:

1. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.

2. SIZE OF FITTINGS SHOWN ON DRAWINGS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.

3. LOCATION AND NUMBER OF PIPE HANGERS AND PIPE SUPPORTS SHOWN IS ONLY APPROXIMATE. CONTRACTOR SHALL DESIGN SUPPORTS AS SPECIFIED.

4. ALL JOINTS SHALL BE WATERTIGHT. WALL PIPES SHALL BE USED WHEREVER PIPING PASSES FROM A STRUCTURE TO A BACKFILL.

5. ALL FLEXIBLE CONNECTORS AND COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST PROTECTION AS SPECIFIED, UNLESS OTHERWISE NOTED. THRUST PROTECTION SHALL BE ADEQUATE FOR TEST PRESSURES SPECIFIED.

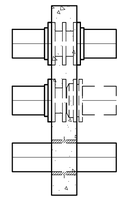
6. SYMBOLS, LEGENDS AND PIPE USE IDENTIFICATIONS SHOWN SHALL BE FOLLOWED THROUGHOUT THE DRAWINGS, WHEREVER APPLICABLE. NOT ALL OF THE VARIOUS COMPONENTS ARE NECESSARILY USED IN THE PROJECT.

7. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT FLANGED, WELDED OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION AS SPECIFIED, UNLESS OTHERWISE NOTED.

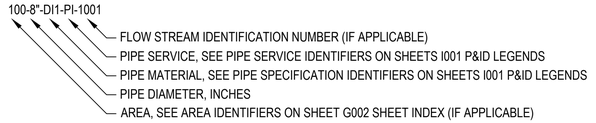
8. NUMBER AND LOCATION OF UNIONS SHOWN ON DRAWINGS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.

9. WHERE A GROOVED END COUPLING IS SHOWN, IT SHALL BE THE RIGID JOINT TYPE, UNLESS OTHERWISE SPECIFIED. WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE JOINED TO THE COUPLING ADAPTER.

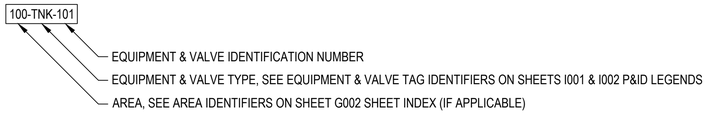
PIPE PENTRATIONS



PIPE TAG



EQUIPMENT & VALVE TAG



GENERAL NOTES:

1. THIS IS A STANDARD LEGEND, NOT ALL OF THE INFORMATION MAY BE USED ON THIS PROJECT.

2. ONLY FLANGED END CONNECTIONS ARE SHOWN HERE. OTHER FITTING PATTERNS ARE SHOWN SIMILARLY ON THE CONSTRUCTION DRAWINGS. ALSO SEE PIPING SPECIFICATIONS.

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY — UTILITIES FOR THE NAVAJO NATION

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:

PROCESS
YELLOWHAIR

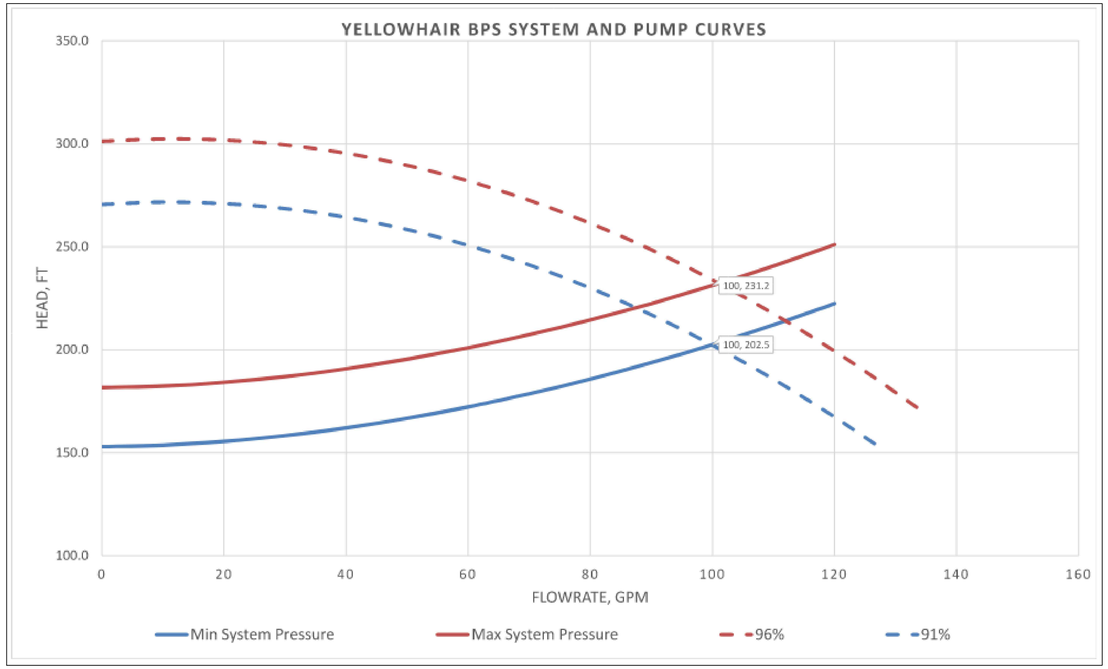
LEGEND AND NOTES

Designed By:	AMB
Drawn By:	JLC
Checked By:	AMB
Approved By:	----
CONSOR Project No.:	W232520UT
Issued On:	APRIL 2024
Drawing No.:	D-001

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: A:_V-W\Projects\UT\NTUA\2023\W232520UT.00\12 CADD\12-5 Sheets\B-1 Yellowhair\W232520UT_B-1_D-001.dwg, Plotted Date: April 3, 2024 1:49 PM By: Jared Cloud

DESIGN CRITERIA	
IDENTIFICATION :	
LOCATION	YELLOWHAIR BPS
PUMP LABEL(S)	PUMP NO. 1, PUMP NO. 2
QUANTITY	PACKAGE PUMP SKID (2 PUMPS)
PERFORMANCE REQUIREMENTS AT FULL PUMP SPEED:	
MAXIMUM SHUTOFF HEAD (FT)	350
MINIMUM SHUTOFF HEAD (FT)	250
DESIGN FLOW CAPACITY:	
DUTY PT. 1	100 GPM @ 231 FT TDH
DUTY PT. 2	100 GPM @ 202 FT TDH
MINIMUM BOWL EFFICIENCY:	
DUTY PT. 1	72%
DUTY PT. 2	71%
MAXIMUM PUMP SPEED (RPM)	1800
MINIMUM MOTOR SIZE (HP)	10
OPERATING CONDITIONS:	
DUTY	CONTINUOUS
DRIVE	VARIABLE SPEED
AMBIENT ENVIRONMENT	INDOOR
AMBIENT TEMPERATURE	33° - 104° F
FLUID SERVICE	POTABLE WATER
FLUID TEMPERATURE	33° - 75° F
FLUID PH RANGE	6.0 TO 8.5
FLUID SPECIFIC GRAVITY	1
FLUID VISCOSITY (ABSOLUTE) (CENTIPOISES AT 60° F)	1.12
PUMP STATION FLOOR ELEVATION	APPROX. 255 FT
MAXIMUM NPSHR AT DUTY POINTS	11 FT
PUMP DIMENSIONS:	
SUCTION MANIFOLD DIAMETER (IN)	4
SUCTION FLANGE RATING (AWWA)	CLASS D FLANGE
DISCHARGE MANIFOLD DIAMETER (IN)	4
DISCHARGE MANIFOLD RATING (AWWA)	CLASS D FLANGE
ELECTRICAL:	
VOLTAGE/PHASE	480V/3PHASE
CURRENT	24 AMPS
PUMP MANUFACTURER/BASE MODEL:	
GRUNDFOS	CRE 15-5



Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner:

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

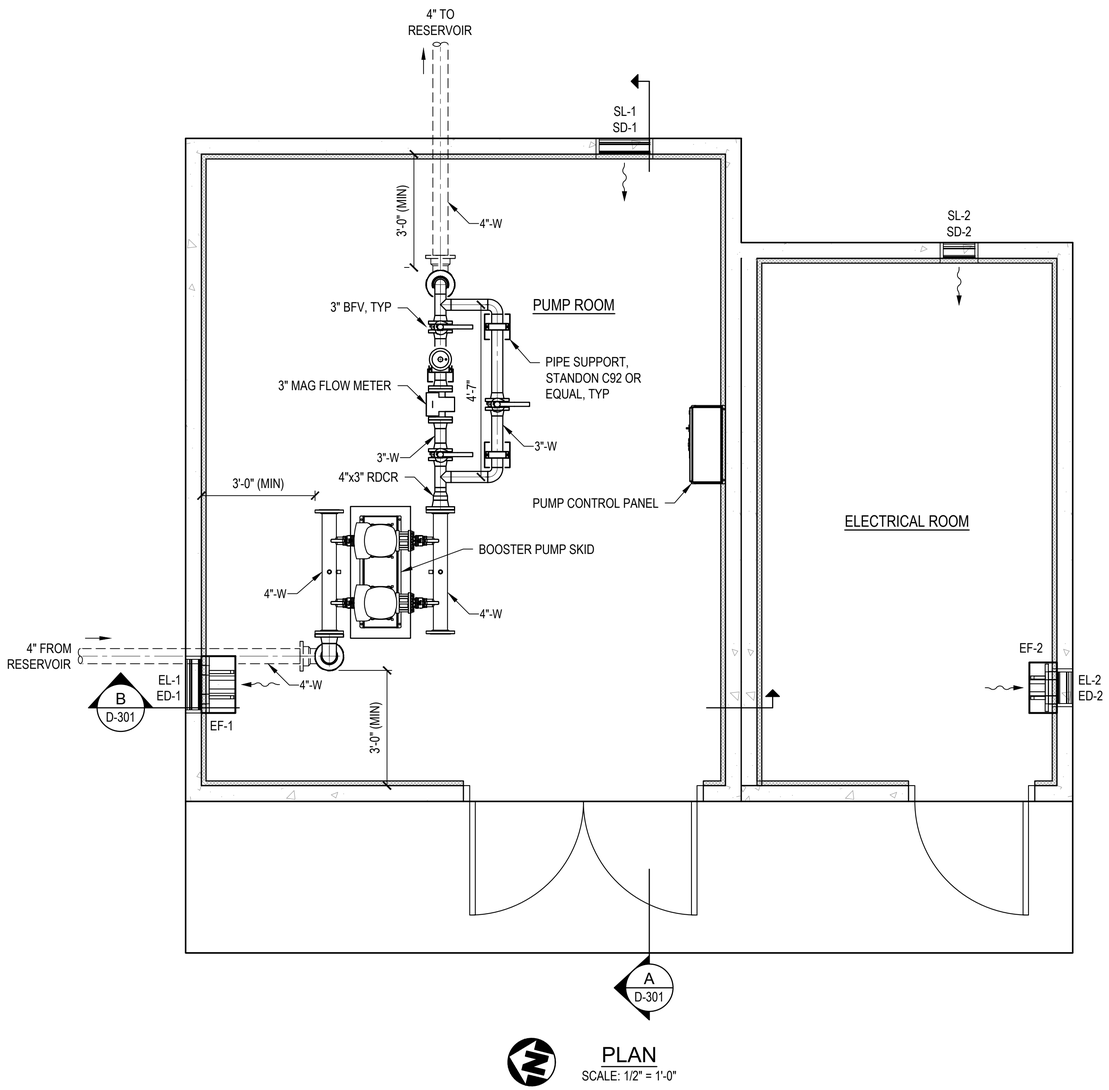
Drawing Title:

PROCESS
YELLOWHAIR

PUMP/SYSTEM CURVES AND DESIGN PARAMETERS

Designed By: AMB	CONSOR Project No.: W232520UT
Drawn By: JLC	Issued On: APRIL 2024
Checked By: AMB	Drawing No.: D-010
Approved By: NN	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: A:_V-W\Projects\UT\NTUA\2023\W232520UT.00\12 CADD\12-5 Sheets\B-1 Yellowhair\W232520UT_B-1_D-010.dwg, Plotted Date: April 3, 2024 1:49 PM By: Jared Cloud



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

NOTES:

1. ALL PIPING SHALL BE RESTRAINED, MATERIAL, DIAMETER AND PIPE ENDS AS SHOWN TO CONNECT WITH RESPECTIVE FITTINGS AND VALVES, SPOOL LENGTHS AS REQUIRED.

2. SPECIAL HANGERS AND SUPPORTS ARE SHOWN IN SOME LOCATIONS. CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE LOCATION AND NUMBER OF ALL ADDITIONAL SUPPORTS TO PROPERLY SUPPORT PIPING, VALVES AND EQUIPMENT CONNECTIONS PREVENTING DEFLECTION AND STRESSES.

3. INSTALL FLANGE INSULATING KITS (ISOLATION JOINT) ON ALL MAG METER FLANGES. SEE DETAIL WS-19 AND WS 19A, SHEET C-501.

4. THRUST BLOCKS NOT SHOWN FOR CLARITY. INSTALL THRUST BLOCKS ON ALL BENDS UNDER BUILDING PER NTUA STANDARD DETAIL, SHT C-501.

5. SEE SHEET D-110 FOR HVAC SCHEDULES.

6. SEE SPECIFICATIONS FOR PIPE COATINGS.

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Project Title:

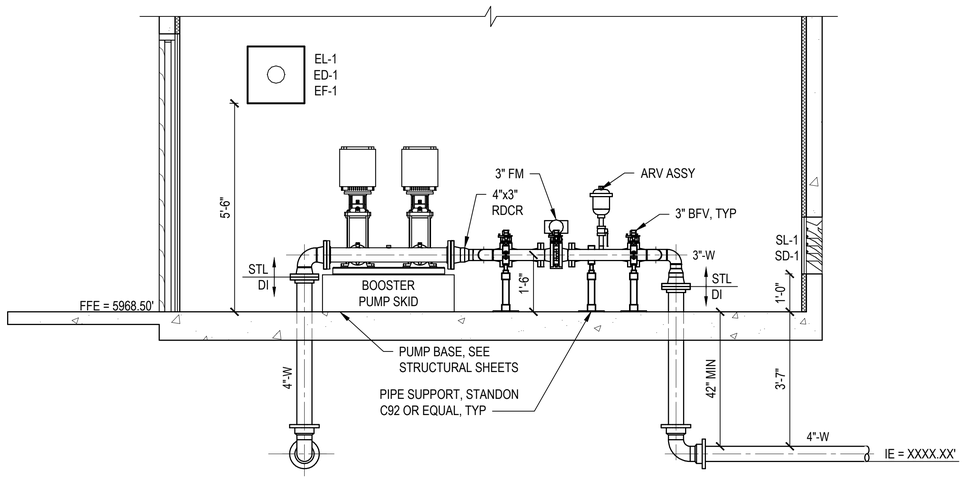
Drawing Title:

PROCESS
YELLOWHAIR

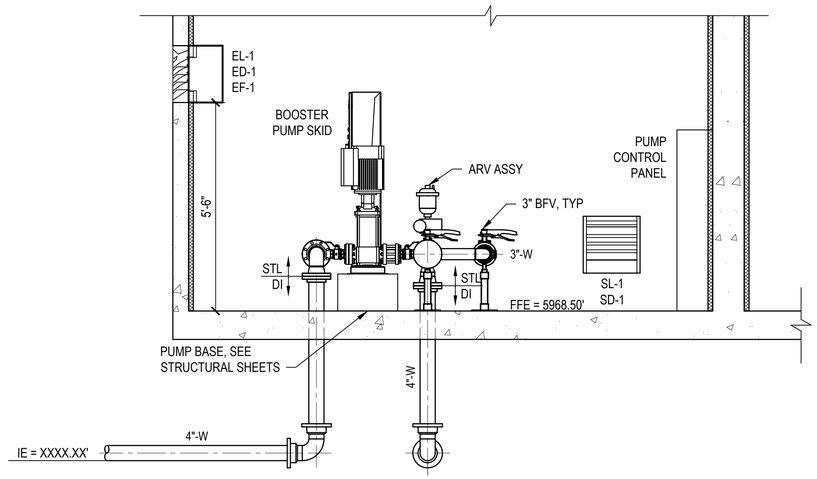
PUMP STATION PLAN AND HVAC

Designed By: AMB	CONSOR Project No.: W232520UT
Drawn By: JLC	Issued On: APRIL 2024
Checked By: AMB	Drawing No.: D-100
Approved By: ----	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: A:_V-W\Projects\UT\NTUA\2023\W232520UT.00\12 CADD\12-5 Sheets\B-1 Yellowhair\W232520UT_B-1_D-100_D301.dwg, Plotted Date: April 3, 2024 1:50 PM By: Jared Cloud



A D-100 SECTION
SCALE: 1/2" = 1'-0"



B D-100 SECTION
SCALE: 1/2" = 1'-0"

FANS

NO.	SERVICE	CAPACITY (CFM)	SP. IN WG	HP	V/C/P	CONTROL	MANUFACTURE/MODEL
EF-1	PUMP ROOM	700	0.35	1/12	120/60/1	T-1	GREENHECK/S1-12-432G
EF-2	ELECTRICAL ROOM	200	0.3	1/20	120/60/1	T-2	GREENHECK/S1-10-428P

LOUVERS

NO.	TYPE	SIZE	MANUFACTURER & MODEL
SL-1	FIXED DRAINABLE BLADE	18" X 18"	GREENHECK, ESD-435
EL-1	FIXED DRAINABLE BLADE	18" X 18"	GREENHECK, ESD-435
SL-2	FIXED DRAINABLE BLADE	12" X 12"	GREENHECK, ESD-435
EL-2	FIXED DRAINABLE BLADE	12" X 12"	GREENHECK, ESD-435

DAMPERS

NO.	TYPE	SIZE	MANUFACTURER & MODEL
SD-1	GRAVITY/BACK DRAFT	18" X 18"	GREENHECK EM30
ED-1	GRAVITY/BACK DRAFT	18" X 18"	GREENHECK EM30
SD-2	GRAVITY/BACK DRAFT	12" X 12"	GREENHECK EM30
ED-2	GRAVITY/BACK DRAFT	12" X 12"	GREENHECK EM30

THERMOSTATS

NO.	CONTROLS	COMMENTS
T-1	EF-1	COOLING SET POINTS
T-2	EF-2	COOLING SET POINTS

UNIT HEATERS

NO.	LOCATION	TYPE	SIZE	V/f	CONTROL	MANUFACTURER/MODEL
UH-1	PUMP ROOM	UNIT HEATER	3KW	480/3	INTEGRAL	REZNER EUH 3
UH-2	ELECTRICAL ROOM	UNIT HEATER	3KW	480/3	INTEGRAL	REZNER EUH 3

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner:

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:

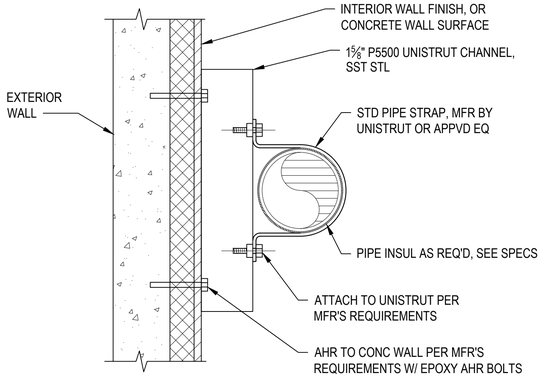
PROCESS
YELLOWHAIR

SECTIONS AND HVAC SCHEDULES

Designed By:	AMB
Drawn By:	JLC
Checked By:	AMB
Approved By:	----
CONSOR Project No.:	W232520UT
Issued On:	APRIL 2024
Drawing No.:	D-301

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: A:_V-WProjects\UT\NTUA\2023\W232520UT.00\12 CADD\12-S Sheets\B-1 Yellowhair\W232520UT_B-1_D-100_D301.dwg, Plotted Date: April 3, 2024 1:50 PM By: Jared Cloud

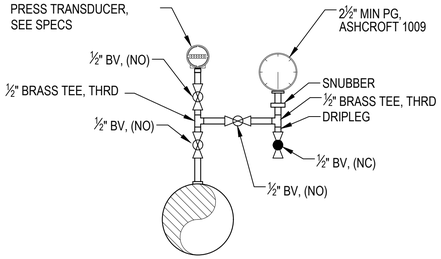


NOTES:

1. ORIENT UNISTRUT CHANNEL VERTICALLY OR HORIZONTALLY DEPENDING ON APPLICATION.

2. AT A MINIMUM, SUPPORT PIPE HORIZONTALLY EVERY 6 FEET AND VERTICALLY AT EVERY 10 FEET, UNLESS SHOWN OTHERWISE.

1 - PIPE EQUIPMENT SUPPORT
SCALE: NTS

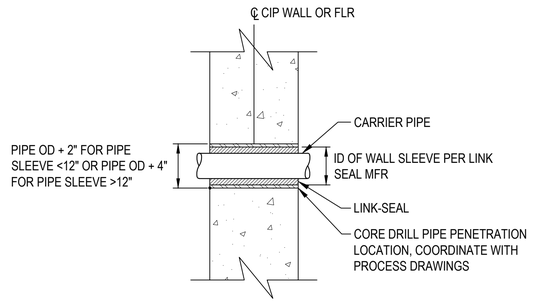


NOTES:

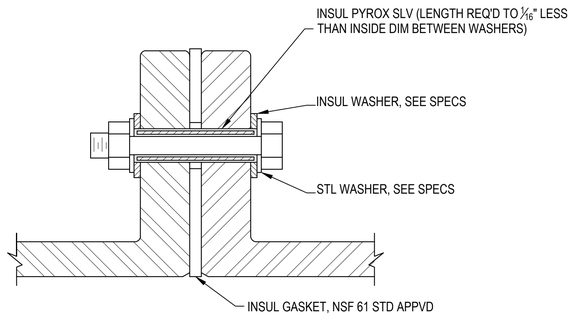
1. INSTALL PRESSURE TRANSDUCER AND PRESSURE GAUGE ASSEMBLY AS SHOWN ON 2"x½" BRONZE TEE.

2. ALL ½" PIPE SHALL BE COPPER.

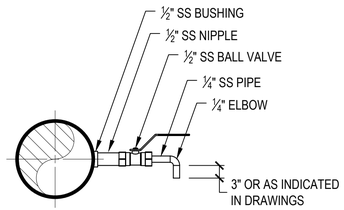
2 - PRESSURE TRANSDUCER AND PRESSURE GAUGE ASSEMBLY
SCALE: NTS



3 - PIPE PENETRATION
SCALE: NTS



4 - FLANGE INSULATING JOINT ASSEMBLY
SCALE: NTS



5 - SAMPLE TAP
SCALE: NTS

Consultant:

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:
PROCESS
YELLOWHAIR
DETAILS

Designed By: AMB	CONSOR Project No.: W232520UT
Drawn By: JLC	Issued On: APRIL 2024
Checked By: AMB	Drawing No.: D-501
Approved By: ----	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: A:_V-W\Projects\UT\NTUA\2023\W232520UT.00\12 CADD\12-5 Sheets\B-1 Yellowhair\W232520UT_B-1_D-501.dwg, Plotted Date: April 3, 2024 1:51 PM By: Jared Cloud

ABBREVIATIONS

A	AMP(S), AMPERE(S)	HP	HORSEPOWER	PVC	POLYVINYL CHLORIDE
AC	ALTERNATING CURRENT	HTR	HEATER	PWR	POWER
AFF	ABOVE FINISHED FLOOR	HV	HIGH VOLTAGE	I/O	INPUT/OUTPUT
AIC	AMPS INTERRUPTING CAPACITY, SYMM.	HVAC	HEATING, VENTILATION, AND AIR CONDITIONING	IPB	INSTRUMENT PULLBOX
AL	ALUMINUM	HZ	HERTZ (CYCLES PER SECOND)	J, JB	JUNCTION BOX
ARCH	ARCHITECT(URAL)	ICOM	INTERCOM	KCMIL	1000 CIRCULAR MIL
ASYM	ASYMMETRICAL	IMC	INTERMEDIATE METAL CONDUIT	KV	KILOVOLT
AUTO	AUTOMATIC	INTLK	INTERLOCK	KVA	KILOVOLT-AMPERE
AUX	AUXILIARY	KW	KILOWATT	KVAR	KILOVOLT-AMPERE REACTIVE
AWG	AMERICAN WIRE GAUGE	KWH	KILOWATT-HOUR	RCPT	RECEPTACLE
BLDG	BUILDING	LCP	LOCAL CONTROL PANEL	REF	REFERENCE
C	CONDUCTOR, CONDUIT	LHH	LOW VOLTAGE HANDHOLE	REQD	REQUIRED
CB	CIRCUIT BREAKER	LMH	LOW VOLTAGE MANHOLE	RMS	ROOT MEAN SQUARE
CKT	CIRCUIT	LP	LEGEND PLATE	RNG	RUNNING
CND	CONDUIT	LTG	LIGHTING	RTD	RESISTANCE TEMPERATURE DETECTOR
CNTL	CONTROL	LV	LOW VOLTAGE	RTU	REMOTE TERMINAL UNIT
CONC	CONCRETE	M	METER	SA	SURGE ARRESTOR
CPT	CONTROL POWER TRANSFORMER	MBS	MANUAL BYPASS SWITCH	SCR	SILICON CONTROLLED RECTIFIER
CT	CURRENT TRANSFORMER	MCC	MOTOR CONTROL CENTER	SD	SMOKE DETECTOR
CU	COPPER	MCP	MOTOR CIRCUIT PROTECTOR	SEC	SECONDARY
DB	DUCT BANK, DIRECT BURIAL	MECH	MECHANICAL	SEL	SELECTOR
DC	DIRECT CURRENT	MFR	MANUFACTURE(R)	SES	SERVICE ENTRANCE SECTION
DCU	DISTRIBUTED CONTROL UNIT	MH	MANHOLE	SHH	SIGNAL HANDHOLE
DET	DETAIL	MISC	MISCELLANEOUS	SPEC	SPECIFICATION
DISC	DISCONNECT	MMH	MEDIUM VOLTAGE MANHOLE	SR	SINGLE RATIO
DP	DISTRIBUTION PANEL	MOV	MOTOR OPERATED VALVES	ST	SHORT TIME
DWG	DRAWING	MPC	MINI POWER CENTER	SSS	SOLID STATE STARTER
EL	ELEVATION	MR	MULTI RATIO	SUB	SUBSTATION
ELEC	ELECTRIC(AL)	MTS	MANUAL TRANSFER SWITCH	SW	SWITCH
EMER	EMERGENCY	MV	MEDIUM VOLTAGE	SWBD	SWITCHBOARD
EMH	ELECTRICAL MANHOLE	MVMC	MEDIUM VOLTAGE MOTOR CONTROL	SWGR	SWITCHGEAR
EMT	ELETRICAL METALLIC TUBING	N/A	NOT APPLICABLE	SYS	SYSTEM
ENCL	ENCLOSURE/ENCLOSED	N.C.	NORMALLY CLOSED	TB	TERMINAL BOX, TERMINAL BLOCK
EPB	ELECTRICAL PULLBOX	NEUT,N	NEUTRAL	TEL	TELEPHONE
EQUIP	EQUIPMENT	NF	NON-FUSED	TEMP	TEMPERATURE
(E)	EXISTING	N.O.	NORMALLY OPEN	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
FDR	FEEDER	NO.	NUMBER	TYP	TYPICAL
FLA	FULL LOAD AMPS	NP	NAMEPLATE	U/G	UNDERGROUND
FLEX	FLEXIBLE CONDUIT	NTS	NOT TO SCALE	UON	UNLESS OTHERWISE NOTED
F.O.	FAIL OPEN	OC	ON CENTER	V	VOLT
FO	FIBER OPTIC	OH	OVERHEAD	VA	VOLT-AMPERE
FUT	FUTURE	P	POLE, PHASE	VAR	VOLT-AMPERE REACTIVE
GDR	GROUNDING RESISTOR	PB	PUSH-BUTTON, PULLBOX	VC	VACUUM CONTRACTOR
GEC	GROUND ELECTRODE CONDUCTOR	PF	POWER FACTOR	XFMR	TRANSFORMER
GF	GROUND FAULT	PH	PHASE	XMTR	TRANSMITTER
GFI	GROUND FAULT INTERRUPTER	PLC	PROGRAMMABLE LOGIC CONTROLLER	W	WATT, WIRE, WIDE
GND, G	GROUND	PNL	PANEL	W/O	WITHOUT
GRS	GALVANIZED RIGID STEEL	PMP	PUMP	WP	WEATHERPROOF
HGT	HEIGHT	PRI	PRIMARY	WW	WIREWAY
HH	HANDHOLE	PT	POTENTIAL TRANSFORMER	XP	EXPLOSION PROOF
				Z	IMPEDANCE

SYMBOLS:

CIRCUIT AND RACEWAYS:

- RACEWAY OR WIRING SYSTEM ABOVE FLOOR LEVEL BELOW CEILING, EXPOSED UON.
- RACEWAY OR WIRING SYSTEM IN OR UNDER FLOOR, OR CONCEALED IN OR BEHIND STRUCTURE OR EQUIPMENT, OR CONDUIT ROUTED BELOW GRADE IN CONCRETE ENCASEMENT.
- OHE — OHE — OVERHEAD POWER LINE
- RACEWAY OR WIRING SYSTEM TURNED TOWARD THE VIEWER (UP ON PLAN DRAWINGS)
- RACEWAY OR WIRING SYSTEM TURNED AWAY FROM THE VIEWER (DOWN ON PLAN DRAWINGS)
- CONDUIT STUB AND CAP

CIRCUIT IDENTIFICATION:

CYY-XXX — CONDUIT AND CABLE TRAY I.D. DESIGNATOR

YY — AREA NUMBER

XXX — ID NUMBER

CIRCUIT HOME RUN

AA — FEEDER INDENTIFICATION

CABLE, CONDUIT AND TRAY IDENTIFICATION	
MYY-XXX	MEDIUM VOLTAGE POWER
PYY-XXX	LOW VOLTAGE POWER
CYY-XXX	CONTROL
FYY-XXX	FIBER OPTIC
NYY-XXX	NETWORK COMMUNICATIONS
ZYY-XXX	SPARE
CTYY-XXX	CABLE TRAY SECTION
CBYY-XXX	CABLE BUS

EXAMPLE 1:
P101-1: 3-2/0, #6GND, 2"C
FOR CIRCUIT P101: THREE 2/0 CONDUCTORS, ONE NO. 6 AWG GROUND WIRE IN A 2" CONDUIT

EXAMPLE 2:
SES-2: 2[3-1/0, #6GND, 1 1/2" C]
FOR SES-2: TWO PARALLEL RUNGS OF THREE 1/0 CONDUCTORS, ONE NO. 6 AWG GROUND IN 1 1/2" CONDUIT

EXAMPLE 3:
C111: 2-1 PR #16S, 1"C
FOR CONTROL CIRCUIT: TWO SIGNAL CABLES OF #16 AWG TWISTED SHIELDED PAIR IN 1" C.

WIRING DEVICES:

SWITCHES:

$ — SINGLE POLE SWITCH.

$ $ — GANGED SWITCHES--IN COMMON BOX, WITH COMMON WALL PLATE

SWITCH SUPERSCRIPT MODIFIER. LOWER CASE LETTER. INDICATES LUMINAIRE CONTROLLED--a,b,c,etc. MAY BE COMBINED WITH CIRCUIT NUMBER. EXAMPLE: 1a, 4b, etc.

SWITCH SUBSCRIPT MODIFIER. UPPER CASE LETTER OR #:

2 = DOUBLE POLE
3 = THREE WAY
4 = FOUR WAY
K = KEY OPERATED
M = HORSEPOWER RATED MANUAL STARTER
F = FLUSH MOUNTED (DEMOLITION DRAWINGS ONLY)
WP = WEATHERPROOF

RECEPTACLES:

PNL-## GF/WP — 20 AMP SIMPLEX RECEPTACLE

PNL-## GF/WP — 20 AMP DUPLEX RECEPTACLE

PNL-## GF/WP — 20 AMP QUADPLEX RECEPTACLE

RECEPTACLE MODIFIERS:

3 = BRANCH CIRCUIT NUMBER
GF = GROUND FAULT CIRCUIT INTERRUPTER
F = FLUSH MOUNTED (DEMOLITION DRAWINGS ONLY)
WP = WEATHERPROOF

GROUNDING:

- GROUND CONNECTION
- GROUNDING CONDUCTOR
- LIGHTNING CONDUCTOR
- GROUND ROD, 3/4" x 10'-0", COPPERCLAD (UNLESS OTHERWISE NOTED)
- GROUND ROD AND WELL
- AIR TERMINAL (LIGHTNING ROD)
- XX — AIR TERMINAL DETAIL CALLOUT
- GROUNDING COIL

DISTRIBUTION EQUIPMENT:

GENERAL: APPROXIMATE SHAPE AND SCALE REPRESENTED WHERE POSSIBLE HOWEVER EXACT SIZE AND NUMBER OF SECTIONS IS ESTIMATED

BP 0131 — EQUIPMENT DESIGNATOR

TYP - ### — EQUIPMENT ID NUMBER; EQUIPMENT TYPE DESIGNATOR

EQUIPMENT TYPE DESIGNATOR	
ATL	ACROSS THE LINE STARTER
ATS	AUTOMATIC TRANSFER SWITCH
BP	BOOSTER PUMP
CJB	CONTROL JUNCTION BOX
DSC	DISCONNECT SWITCH
GEN	GENERATOR
JB	JUNCTION BOX
MCC	MOTOR CONTROL CENTER
MPC	MINI POWER CENTER
PLC	PROGRAMMABLE LOGIC CONTROLLER
PMP	PUMP
PNL	PANELBOARD
RTU	REMOTE TERMINAL UNIT
RVSS	REDUCED VOLTAGE SOFT STARTER
SES	SERVICE ENTRANCE SECTION
SWBD	SWITCHBOARD
SV	SOLENOID VALVE
TB	TERMINAL BOX
VA	VALVE ACTUATOR
VFD	VARIABLE FREQUENCY DRIVE
XFMR	TRANSFORMER

JB100 — JUNCTION BOX WITH EQUIPMENT DESIGNATOR IDENTIFIER; EQUIPMENT NUMBER (EXAMPLE)

PNL 1200 — WALL-MOUNTED DISTRIBUTION ASSEMBLY, SUCH AS PANELBOARD, MOTOR CONTROL CENTER, OR TERMINAL CABINET; EQUIPMENT NUMBER (EXAMPLE)

MCC 1100 — FLOOR-STANDING DISTRIBUTION ASSEMBLY, SUCH AS A SWITCHBOARD, TRANSFORMER, OR MOTOR CONTROL CENTER; EQUIPMENT NUMBER (EXAMPLE)

MOTOR AND EQUIPMENT:

- M — MOTOR
- 100A — DISCONNECT, NON-FUSED. 30A, 3 POLE UON. 100A, 3P RATING INDICATED
- F — FUSED DISCONNECT: CLASS R FUSES UON.
- ■ — FIELD INSTRUMENT

LIGHTING CONTROL AND CIRCUITING:

NOTE: CONTRACTOR SHALL PROVIDE ALL CONDUIT AND CONDUCTORS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.

PC — PHOTOELECTRIC CONTROL UNIT

LUMINARIES:

NOTE: LUMINAIRE SHAPES AND SCALE ARE REPRESENTED WHERE POSSIBLE. THE EXAMPLES SHOWN BELOW ARE TYPICAL APPLICATIONS.

- POLE MOUNTED METAL HALIDE LIGHT
- DOUBLE POLE MOUNTED METAL HALIDE LIGHT
- PENDANT/SURFACE MOUNTED TUBE LIGHTING.
- EXIT LIGHT
- WALL SCONCE

EXAMPLE:

A — LETTER INDICATES TYPE OF FIXTURE IN LUMINAIRE SCHEDULE

SHADING INDICATES BATTERY BACKUP

12b — NUMBER INDICATES CIRCUIT NUMBER; LETTER INDICATES SWITCH

INSTRUMENT DETAIL CALLOUTS:

X / SHT — DETAIL CALLOUT REFERENCE BUBBLE
X = DETAIL IDENTIFIER
SHT = DRAWING NUMBER WHERE DETAIL IS LOCATED

XX / SHT — SECTION CALLOUT REFERENCE BUBBLE
XX = SECTION IDENTIFIER
SHT = DRAWING NUMBER WHERE DETAIL IS LOCATED

ANSI / IEEE DEVICE FUNCTION

XX

ID#:	DISCRIPTION:
52	AC CIRCUIT BREAKER
51	AC INVERSE TIME OVERCURRENT RELAY
50	INSTANTANEOUS OVERCURRENT RELAY
50	GROUND INSTANTANEOUS OVERCURRENT RELAY
86	LOCKOUT RELAY
46	PHASE BALANCE CURRENT
25	SYNCHRONIZATION CHECK DEVICE
27	UNDER VOLTAGE RELAY
59	OVER VOLTAGE RELAY
81U	UNDER FREQUENCY RELAY
81O	OVER FREQUENCY RELAY
67	AC DIRECTIONAL OVER CURRENT RELAY
62	TIME DELAY RELAY
74	ALARM RELAY
MTR	MULTI-FUNCTIONAL METER
BCS	BREAKER CONTROL SWITCH
52a	BREAKER CLOSED STATUS
52b	BREAKER OPEN STATUS

GENERAL NOTES:

1. THE GENERAL ABBREVIATIONS ARE NOT TO BE CONFUSED WITH EQUIPMENT NUMBERING PREFIXES LISTED ON GENERAL DRAWINGS OR OTHER CONTRACT DOCUMENTS.

Consultant: CANFIELD engineering & integration (480) 588-8021, WWW.CANFIELDENG.COM

90% SUBMITTAL

Engineer's Seal: **PRELIMINARY NOT FOR CONSTRUCTION**

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY — UTILITIES FOR THE NAVAJO NATION

Project Title: NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title: ELECTRICAL
YELLOWHAIR

LEGEND & SYMBOLS
SHEET - I

Designed By:	RPO
Drawn By:	RPO
Checked By:	MAB
Approved By:	MAB
CONSOR Project No.:	W23250UT
Issued On:	APRIL 2024
Drawing No.:	E001

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

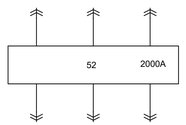
Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\230073 CON - NTUA YELLOWHAIR\E001.dwg, Plotted Date: April 3, 2024 12:01 PM By: Ryan Oliver

POWER DIAGRAMS

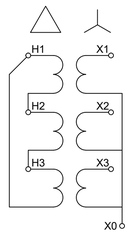
SINGLE LINE:

- INCOMING POWER SUPPLY
- CABLE TERMINATION. STRESS CONES WITH SHIELDED CABLES.
- STAB OR PULL-APART CONNECTION.
- XXXA — AIR CIRCUIT BREAKER; TRIP SETTING AND SOLID STATE TRIP FEATURES SHOWN:
  - L = LONG DELAY
  - S = SHORT DELAY
  - I = INSTANTANEOUS
  - G = GROUND FAULT
- 1200 / 52 — POWER CIRCUIT BREAKER (AIR, VACUUM, OR GAS) FRAME AND TRIP SETTING AND OPTIONAL I.D. SHOWN
- DISCONNECT OR ISOLATING SWITCH
- FUSED SWITCH
- P / S — XFMR# KVA/KVA KV/KV 5.0% — POWER TRANSFORMER. DESIGNATION, SIZE, PRIMARY AND SECONDARY VOLTAGES, IMPEDANCE AND WINDING CONFIGURATION SHOWN.
- △ WINDING CONFIGURATION: DELTA
- WYE (GROUNDED)
- PT / VA — POTENTIAL TRANSFORMER PRIMARY AND SECONDARY VOLTAGES AND WINDINGS SHOWN.
- CPT / VA — CONTROL POWER TRANSFORMER RATING SHOWN.
- 100/5 / 3 — CURRENT TRANSFORMER: RATIO, QUANTITIES SHOWN.
- M — METER
- P-XXX — PANELBOARD
- MPC-XXX — MINI POWER CENTER
- 1.5kW — HEATING ELEMENT
- POWER TRANSFER SWITCH
- 1 — AIR BREAK CONTACTOR, FVNR U.O.N. NEMA SIZE 1 INDICATED
  - FVR = FULL VOLTAGE, REVERSING STARTER
  - RVS = REDUCED VOLTAGE STARTER
  - 2S2W = TWO SPEED, TWO WINDING STARTER
- GROUNDING ELECTRODE
- EOL — ELECTRONIC OVERLOAD
- ATL — ACROSS THE LINE STARTER
- SSS — SOLID STATE STARTER
- VFD — VARIABLE FREQUENCY DRIVE
- SPD — SURGE PROTECTION DEVICE
- POWER FACTOR CORRECTION CAPACITOR. KVAR RATING INDICATED

THREE LINE:

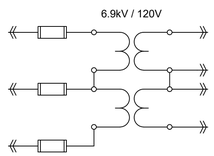


POWER CIRCUIT BREAKER (AIR, VACUUM, OR GAS) FRAME SETTING AND OPTIONAL I.D. SHOWN



POWER TRANSFORMER. DESIGNATION, SIZE, PRIMARY AND SECONDARY VOLTAGES, IMPEDANCE AND WINDING CONFIGURATION SHOWN.

WTS-XFMR-001
15 kVA
13.8kV / 6.9 kV



POTENTIAL TRANSFORMER PRIMARY AND SECONDARY VOLTAGES AND WINDINGS SHOWN.

- CURRENT TRANSFORMER (SINGLE RATIO)
- CURRENT TRANSFORMER (MULTIPLE RATIO)
- ZERO SEQUENCE CURRENT TRANSFORMER (SINGLE RATIO)
- DISCONNECT SWITCH
- SURGE ARRESTOR

CONTROL DIAGRAMS

LINEWORK:

- CONDUCTORS CONNECTED
- CONDUCTORS NOT CONNECTED

MAIN CONTACTS:

- M / SIZE 3 — AIR-BREAK CONTACTOR, NEMA SIZE OPTIONAL.
- M / SIZE 3 — VACUUM CONTACTOR, NEMA SIZE OPTIONAL.

SWITCH OR INTERLOCK CONTACTS:
SHOWN WITH TERMINALS (OPTIONAL)

NORMALLY OPEN (NO)	NORMALLY CLOSED (NC)	
CR1	CR2	CONTROL RELAY CONTACTS WITH NUMERIC PREFIX AND OPTIONAL REF. OR DESCRIPTION.
TD / TC	TD2 / TO	ON DELAY (DELAY ON COIL ENERGIZATION) RELAY CONTACTS WITH NUMERIC PREFIX AND OPTIONAL REF. OR DESCRIPTION. TC = NORMALLY OPEN, TIME CLOSE. TO = NORMALLY CLOSED, TIME OPEN.
TD3 / TO	TD / TC	OFF DELAY (DELAY ON COIL DE-ENERGIZATION) RELAY CONTACTS. TO = NORMALLY OPEN, TIME OPEN. TC = NORMALLY CLOSED, TIME CLOSE.

INDICATORS:

SHOWN WITH LEGEND (OPTIONAL)
X = LENS COLOR

- A = AMBER
- B = BLUE
- G = GREEN
- R = RED

- LT / X — DIRECT CONNECTION
- LT / X — PUSH TO TEST TEST BUS TERMINAL SHOWN WITH TERMINALS (OPTIONAL)
- TEST / X / STATUS — REMOTE TEST TEST BUS TERMINAL SHOWN
  - R = RED
  - W = WHITE
- STATUS / X / DESCRIPTION — BACK-LIT PUSH-BUTTON SHOWN WITH TERMINALS (OPTIONAL) OPTIONAL IDENTIFIER SHOWN EXAMPLE :PUSH-BUTTON HS 1234

COILS:

SHUNT

- CR — RELAY COILS WITH NUMERIC SUFFIX AND OPTIONAL DESCRIPTION OR REF
- TD / ON DELAY / X TO XX SEC — TIME DELAY COIL WITH NUMERIC SUFFIX, DELAY ACTION, AND OPTIONAL TIMING RANGE AND SETTING.

EXAMPLE DESCRIPTIONS

- C = CONTACTOR, LIGHTING OR GENERAL USE
- F = FAST OR FORWARD
- IC = ISOLATION CONTACTOR
- M = MAIN OR LINE
- MO = MOTOR OPERATOR
- R = RUN OR REVERSE
- S = SLOW OR START
- T = TRIP COIL
- 1M = FIRST MAIN OR WYE
- 2M = SECOND MAIN OR DELTA

THERMAL

- OL — OVERLOAD

MISCELLANEOUS:

- MCP — MOTOR CIRCUIT PROTECTOR (MCP)
- CB — CIRCUIT BREAKER, THERMAL-MAGNETIC UNLESS OTHERWISE NOTED
- FU / XA — FUSE WITH SIZE
- DISCONNECT SWITCH
- HP — MOTOR (PHASES AS REQUIRED)
- SOL — SOLENOID
- CAP — POWER FACTOR CORRECTION CAPACITOR
- MOTOR STARTER TERMINATION POINT
- XX — PLC I/O POINTS
  - DO = DIGITAL OUT SIGNAL
  - DI = DIGITAL IN SIGNAL
  - AO = ANALOG OUT SIGNAL
  - AI = ANALOG IN SIGNAL

SWITCHES:
SHOWN WITH LOCATION REFERENCE (OPTIONAL)

NORMALLY OPEN (NO)	NORMALLY CLOSED (NC)	
LS	LS	LIMIT: FREE
LS	LS	LIMIT: HELD
FS	FS	FLOW
TAS	TAS	TEMPERATURE
PS	PS	PRESSURE
FLT	FLT	LEVEL
OS-100	OS-101	FORCE OR TORQUE
PB	PB	MANUAL: MOMENTARY PUSH-BUTTON
PB	PB	MANUAL: MUSHROOM HEAD MAINTAINED PUSH-BUTTON
SS / OX	SS / OX	MANUAL: SELECTOR SWITCH 2 POSITION MAINTAINED SWITCH POSITION X = CLOSED CONTACT O = OPEN CONTACT
SS / XO	SS / OX	MANUAL: SELECTOR SWITCH 2 POSITION RETURN TO RIGHT SWITCH POSITION X = CLOSED CONTACT O = OPEN CONTACT
SS / OOX	SS / XOO	MANUAL: SELECTOR SWITCH 3 POSITION SWITCH POSITION X = CLOSED CONTACT O = OPEN CONTACT
		AUXILARY CONTACT

Consultant: CANFIELD engineering & integration (480) 588-8021, WWW.CANFIELDENG.COM

90% SUBMITTAL

Engineer's Seal: **PRELIMINARY NOT FOR CONSTRUCTION**

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY — UTILITIES FOR THE NAVAJO NATION

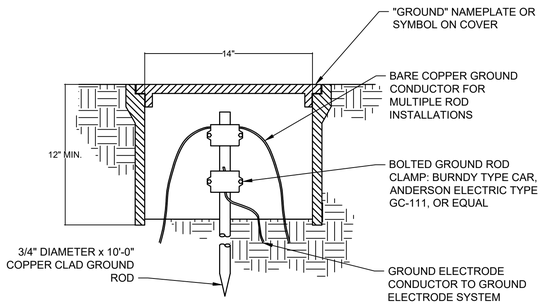
Project Title: NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title: ELECTRICAL YELLOWHAIR
LEGEND & SYMBOLS SHEET - II

Designed By:	RPO
Drawn By:	RPO
Checked By:	MAB
Approved By:	MAB
CONSOR Project No.:	W23250UT
Issued On:	APRIL 2024
Drawing No.:	E002

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

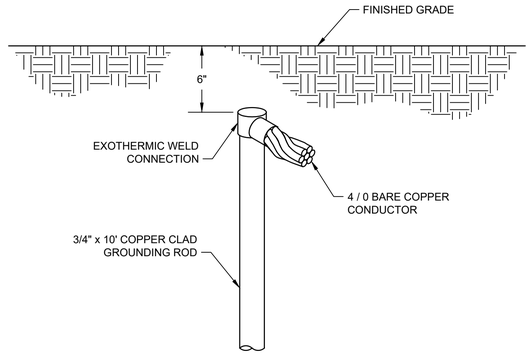
Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\23073 CON - NTUA Four BPS Elec. Eng\8.0 Design\23073 CON - NTUA YELLOWHAIR\E002.dwg, Plotted Date: April 3, 2024 12:01 PM By: Ryan Oliver



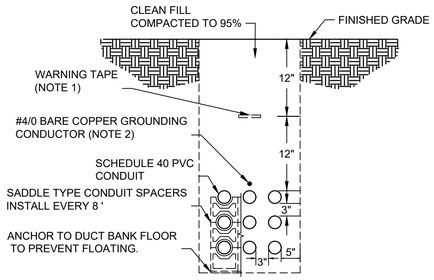
NOTES:

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

A TYP GROUND ROD TEST WELL DETAIL



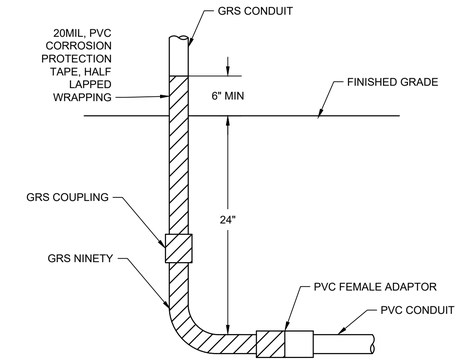
B TYP EXOTHERMIC GROUND ROD CONNECTION DETAIL



NOTES:

1. 3" WIDE DETECTABLE PLASTIC WARNING TAPE WITH INSCRIPTION "CAUTION ELECTRIC LINES BURIED BELOW"
2. BOND BARE COPPER GROUNDING CONDUCTOR TO EACH BUILDING OR STRUCTURE GROUNDING ELECTRODE SYSTEM.
3. PROVIDE A MINIMUM OF 12" OF SEPARATION BETWEEN 480VAC CONDUCTORS AND INSTRUMENTATION OR COMMUNICATIONS CABLES.
4. NUMBER OF CONDUITS SHOW IS FOR REFERENCE ONLY, COORDINATE DUCT BANK ARRANGEMENT WITH SITE PLAN, LINE DIAGRAMS, CONDUIT SCHEDULES, AND SECTIONS

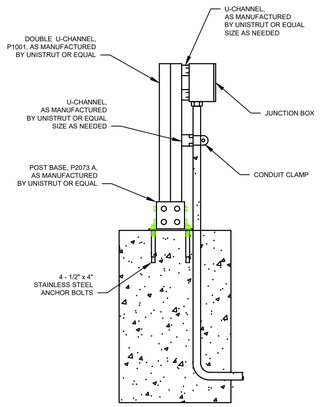
C TYP DUCT BANK DETAIL



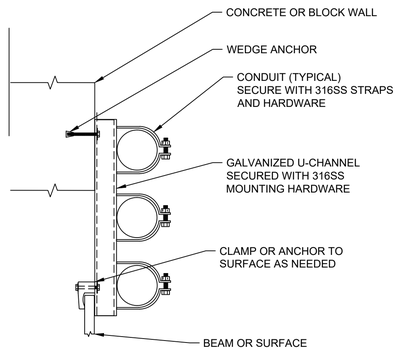
NOTES:

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.

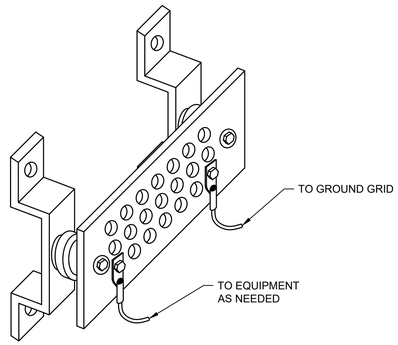
D TYP GRS STUB UP DETAIL



E TYP JUNCTION BOX MOUNTING DETAIL



F TYP CONDUIT ON SURFACE DETAIL



NOTES:

1. GROUND BAR SHALL BE STORM COPPER COMPONENTS, CO. PART NUMBER SCGB-8 OR EQUAL.

G TYP GROUND PLATE DETAIL

Consultant:
CANFIELD engineering & integration
(480) 588-8021, WWW.CANFIELDENG.COM

90% SUBMITTAL

Engineer's Seal:
PRELIMINARY NOT FOR CONSTRUCTION

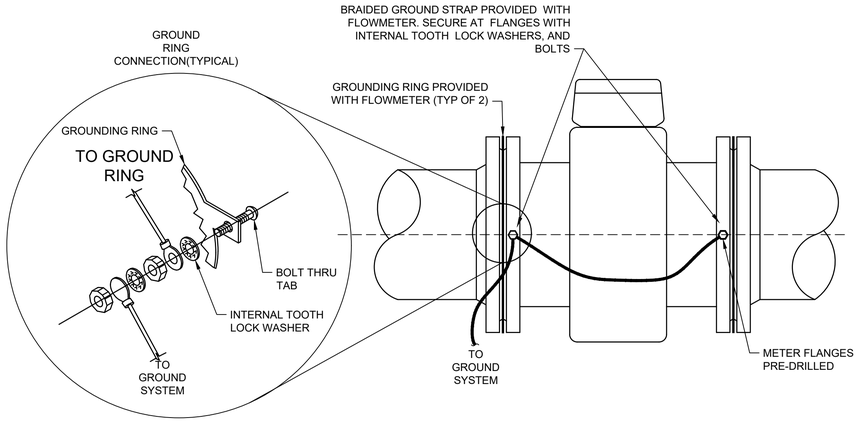
Client / Owner:
NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

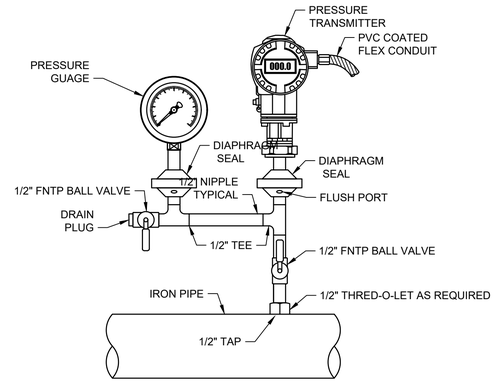
Drawing Title:
ELECTRICAL
YELLOWHAIR
DETAILS
SHEET - I

Designed By: RPO	CONSOR Project No.: W23250UT
Drawn By: RPO	Issued On: APRIL 2024
Checked By: MAB	Drawing No.: E005
Approved By: MAB	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\Public\Dropbox (CE)\Projects\2023\230073 CON - NTUA Four BPS Elec. Engr\8.0 Design\230073 CON - NTUA YELLOWHAIR\E005.dwg, Plotted Date: April 3, 2024 12:01 PM By: Ryan Oliver

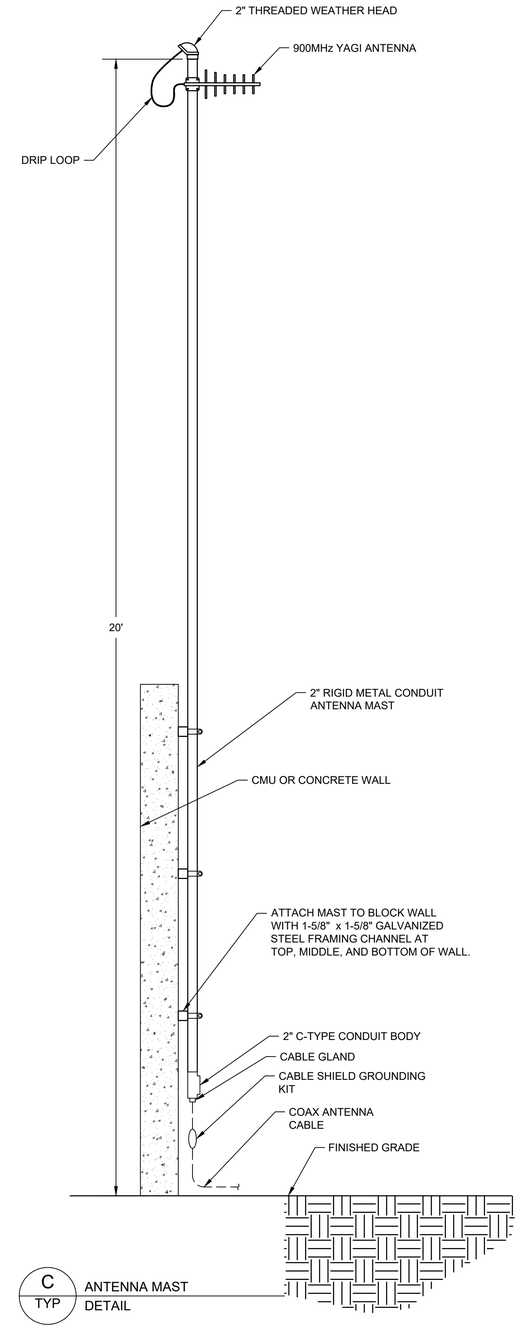


A TYP — FLOWMETER GROUNDING DETAIL



NOTES:
1. PROVIDE 1/2" NIPPLES AS REQUIRED.
2. PROVIDE 316 STAINLESS STEEL FITTINGS AND VALVES UNLESS OTHERWISE NOTED.

B TYP — PRESSURE TRANSMITTER MOUNTING DETAIL



C TYP — ANTENNA MAST DETAIL

Consultant:
CANFIELD engineering & integration
(480) 588-8021, WWW.CANFIELDENG.COM

90% SUBMITTAL

Engineer's Seal:
PRELIMINARY NOT FOR CONSTRUCTION

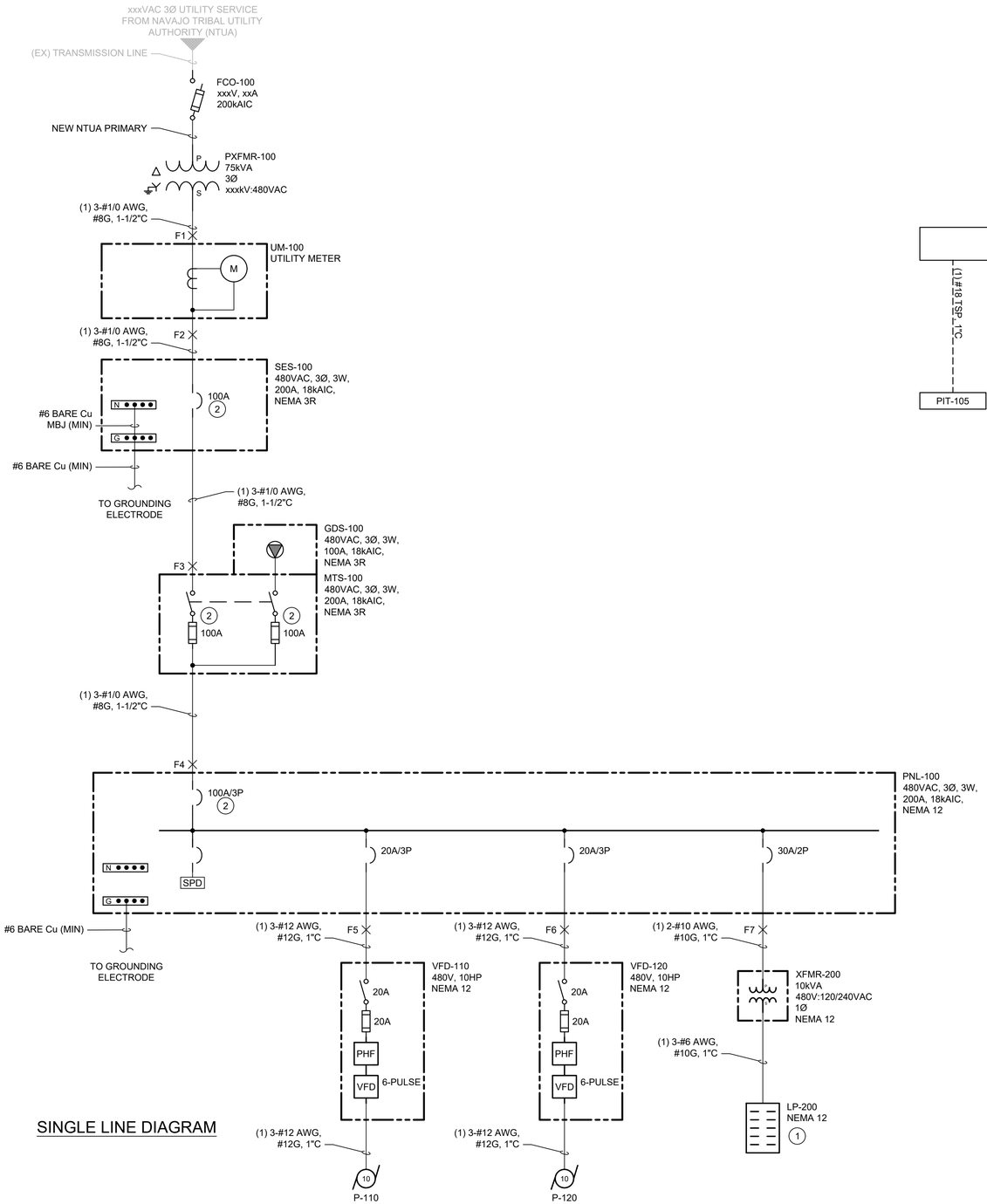
Client / Owner:
NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

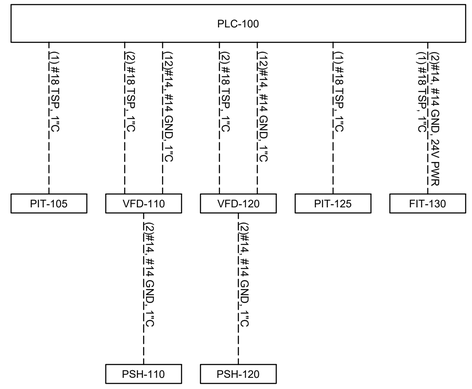
Drawing Title:
ELECTRICAL
YELLOWHAIR
DETAILS
SHEET - II

Designed By: RPO	CONSOR Project No.: W23250UT
Drawn By: RPO	Issued On: APRIL 2024
Checked By: MAB	Drawing No.: E006
Approved By: MAB	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\Public\Dropbox (CE)\Projects\2023\23007\3 CON - NTUA Four BPS Elec. Eng\8.0 Design\23007\3 CON - NTUA YELLOWHAIR\E006.dwg, Plotted Date: April 3, 2024 12:01 PM By: Ryan Oliver



SINGLE LINE DIAGRAM



CONDUIT BLOCK DIAGRAM

GENERAL NOTES:

A. 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.

KEY NOTES:

(1) SEE PANEL SCHEDULE FOR MORE INFORMATION.

(2) BREAKERS WITH VOLTAGE 480 AND ABOVE SHALL BE 100% RATED.

Consultant:
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90% SUBMITTAL

Engineer's Seal:
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Client / Owner:
NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title:
ELECTRICAL
YELLOWHAIR
DIAGRAMS

Designed By:	RPO
Drawn By:	RPO
Checked By:	MAB
Approved By:	MAB

CONSOR Project No.: W23250UT
Issued On: APRIL 2024
Drawing No.: E010

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\23007\3 CON - NTUA Four BPS Elec. Eng\8.0 Design\23007\3 CON - NTUA YELLOWHAIR\E010.dwg, Plotted Date: April 3, 2024 12:01 PM By: Ryan Oliver

GENERAL NOTES:

A. 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.

LOAD CALCULATIONS

			BUS CALCULATIONS	CONNECTED	ADJUSTED	FUTURE
ID	PNL-100	Notes:	SUBTOTAL (A)	45.6	45.6	
VOLTAGE	480		+25% OF LARGEST MOTOR (A)	3.1	3.1	
PHASE	3		TOTAL AMPS	48.7	48.7	
RATING (A)	100		TOTAL kVA	40.5	40.5	

STATUS	CIRCUIT ID	CIRCUIT DESCRIPTION	SOURCE/LOAD TYPE	MOTOR (HP)	AMPS	kVA	CONNECTED (A)	DUTY CYCLE FACTOR	DEMAND FACTOR	DEMAND LOAD (A)	FUTURE LOAD (A)
NEW	P-110	BOOSTER PUMP 1	MOTOR	10			12.4	100%	100%	12.4	
NEW	P-120	BOOSTER PUMP 2	MOTOR	10			12.4	100%	100%	12.4	
NEW	LP-200	LIGHTING PANEL	AMPS		20.8		20.8	100%	100%	20.8	

SHORT CIRCUIT CALCULATIONS

SOURCE	TO EQUIPMENT	FAULT POINT	AVAILABLE SCA	V (P-P)	COND. SIZE	TYPE	NO. OF RUNS	RUN LENGTH	CONDUIT TYPE	NO. OF COND.	CONSTANT C	CONSTANT f	CONSTANT m	I(sca)
PXFMR-100	UM-001	F1	-	480	1/0	Cu	1	50	PVC	1/C	9,317	-	-	18,042
UM-100	SES-100	F2	18,042	480	1/0	Cu	1	10	PVC	1/C	9,317	0.07	0.93	16,864
SES-100	MTS-100	F3	16,864	480	1/0	Cu	1	10	PVC	1/C	9,317	0.07	0.94	15,830
MTS-100	PNL-100	F4	15,830	480	1/0	Cu	1	10	PVC	1/C	9,317	0.06	0.94	14,915
PNL-100	VFD-110	F5	14,915	480	12	Cu	1	10	PVC	1/C	617	0.87	0.53	7,966
PNL-100	VFD-120	F6	14,915	480	12	Cu	1	10	PVC	1/C	617	0.87	0.53	7,966
PNL-100	XFMR-200	F7	14,915	480	10	Cu	1	10	PVC	1/C	982	0.55	0.65	9,635

LP-200

VOLTS	120/240	VAC	PH	1		FED FROM	XFMR-200	
MAIN BREAKER	60	A	W	3		LOCATION	E-ROOM	
BUS RATING	100	A	AIC RATING	10	kA	MOUNTING	SURFACE	

LOAD DESCRIPTION	BRK	LOAD TYPE	No	VA A	VA B	No	VA A	VA B	No	LOAD TYPE	BRK	LOAD DESCRIPTION
RECEPTACLES	20	NC	1	180		2	75		3	CONT	20	EF-1
LIGHTING	20	CONT	4		180	5		62	6	CONT	20	EF-2
SPARE	20	CONT	7	0		8	3000		9	CONT	35	UH-1
SPARE	20	CONT	10		0	11		1200	12	CONT	20	PLC
SPARE	20	CONT	13	0		14	0		15	CONT	20	SPARE
SPARE	20	CONT	16		0	17		0	18	CONT	20	SPARE
SPACE		CONT	19	0		20	0		21	CONT		SPACE
SPACE		CONT	22		0	23		0	24	CONT		SPACE
SPACE		CONT	25	0		26	0		27	CONT		SPACE
SPACE		CONT	28		0	29		0	30	CONT		SPACE
SPACE		CONT	31	0		32	0		33	CONT		SPACE
SPACE		CONT	34		0	35		0	36	CONT		SPACE
SPACE		CONT	37	0		38	0		39	CONT		SPACE
SPACE		CONT	40		0	41		0	42	CONT		SPACE

	A	B	NOTES:
NON-CONTINUOUS LOADS kVA	0.18	0.00	
CONTINUOUS LOADS kVA	3.84	1.80	
PHASE TOTAL kVA	4.02	1.80	
TOTAL kVA	5.83		
TOTAL AMPS	24.28		

LUMINAIRE SCHEDULE

TYPE OR MARK	DESCRIPTION	MFR	CATALOG NUMBER	MOUNT	LAMP DATA QUAN.	LAMP DATA VA	LAMP DATA TYPE	LAMP DATA LUMENS	VAC	NOTES
A	4' LED STRIP FOR WET LOCATIONS	LITHONIA	FEM L48 3000LM LPAFL MD MVOLT 30K 80CRI	S	4	29	LED	3,032	120	1
B	WALL PACK IP66 WET LOCATIONS	LITHONIA	WPX0 LED ALO SWW2 MVOLT PE DDBXD M2	E (10')	5	13	LED	1,650	120	2

MOUNTING		LAMP TYPE	
R - RECESSED	D - DRYWALL	F	FLUORESCENT
S - SURFACE	G - GRID	CF	COMPACT FLUORESCENT
W - WALL	C - CONDUIT	LED	LIGHT EMITTING DIODE
P - PENDANT	PL(x) - POLE	MH	METAL HALIDE
E - EXTERIOR	(x') - MOUNT HEIGHT	HPS	HIGH PRESSURE SODIUM
		LPS	LOW PRESSURE SODIUM

GENERAL NOTES:

A) REFER TO ELECTRICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.

B) SUBMIT EQUALS FOR APPROVAL.

NOTES:

1) FIXTURES WITH EMERGENCY BATTERY PACKS TO BE FULLY SWITCHABLE UNLESS NOTED AS NIGHT LIGHT (NL). PROVIDE UNSWITCHED HOT FOR CHARGER.

2) FURNISH FIXTURE WITH BUTTON TYPE PHOTOCELL FOR ON/OFF CONTROL.

Consultant: CANFIELD engineering & integration (480) 588-8021, WWW.CANFIELDENG.COM

90% SUBMITTAL

Engineer's Seal: **PRELIMINARY NOT FOR CONSTRUCTION**

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

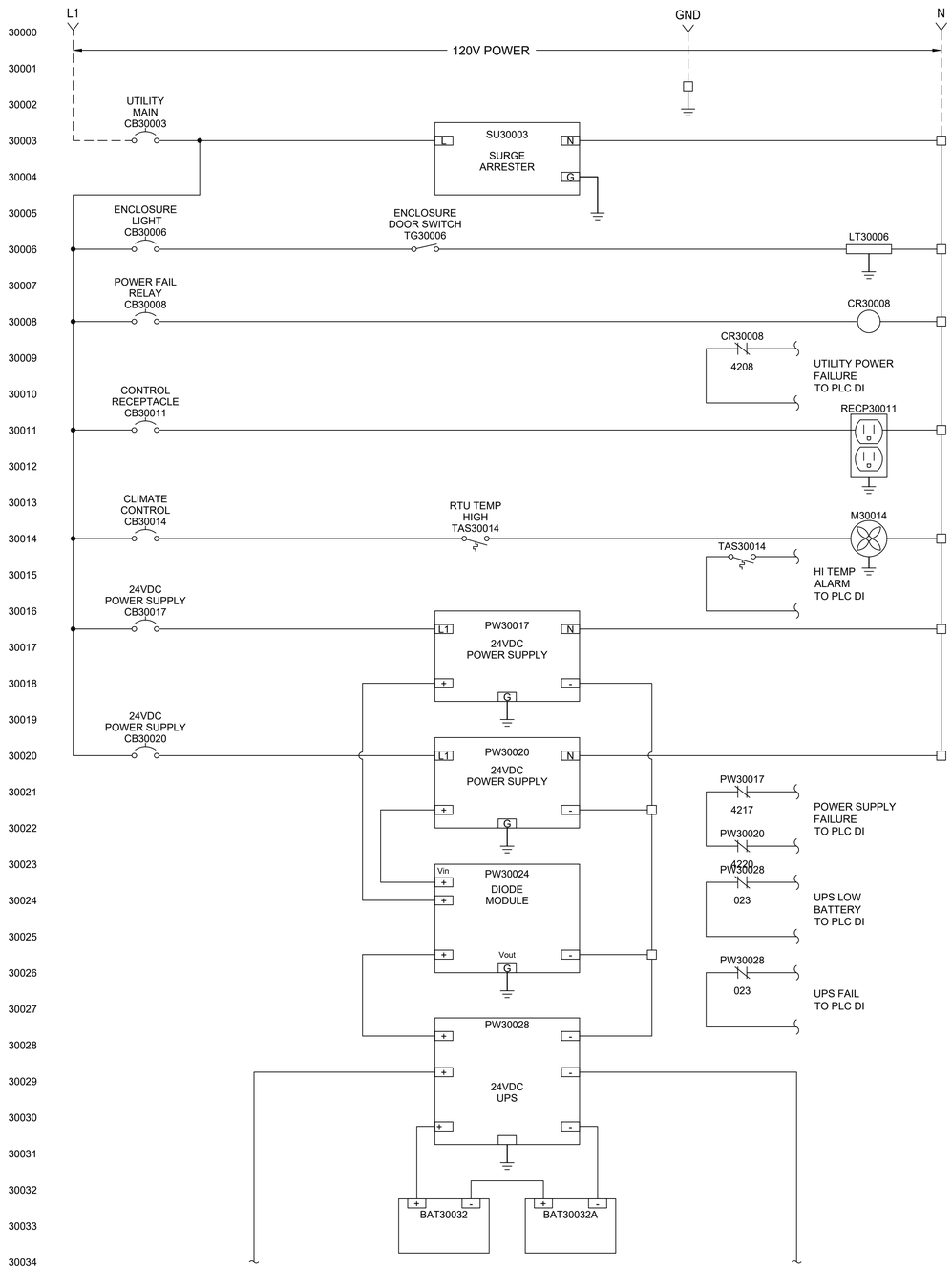
Project Title: NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

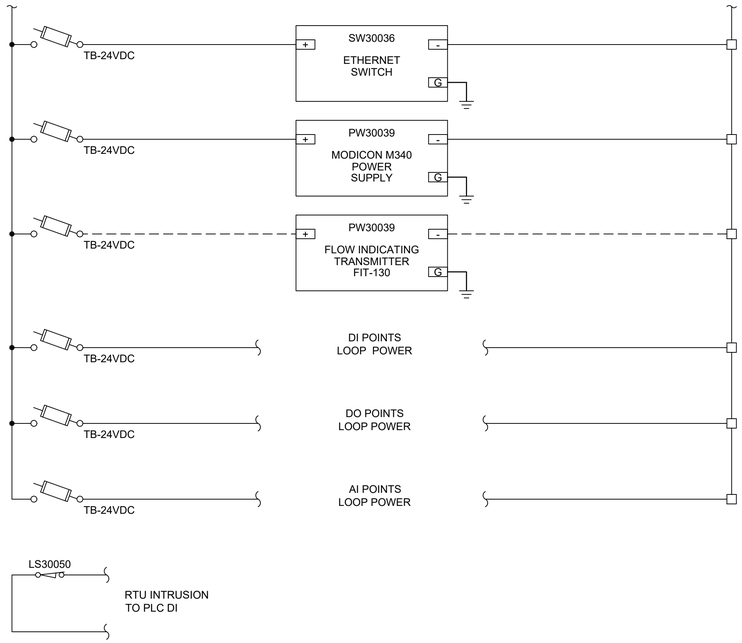
Drawing Title: ELECTRICAL
YELLOWHAIR
SCHEDULES & CALCULATIONS

Designed By:	RPO
Drawn By:	RPO
Checked By:	MAB
Approved By:	MAB

CONSOR Project No.: W23250UT
Issued On: APRIL 2024
Drawing No.: E011
0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\230073 CON - NTUA Four BPS Elec. Eng\8.0 Design\230073 CON - NTUA YELLOWHAIR\E011.dwg, Plotted Date: April 3, 2024 12:01 PM By: Ryan Oliver





GENERAL NOTES:

A. TYPICAL SCHEMATIC DIAGRAMS ARE INTENDED TO REFLECT THE GENERAL CONTROL STRATEGY. ACTUAL CIRCUITRY MAY VARY FOR SPECIFIC EQUIPMENT SUPPLIED. THE NUMBER AND TYPE OF DEVICES SHALL BE FURNISHED AS REQUIRED FOR PROPER OPERATION OF THE EQUIPMENT.

B. CIRCUIT BREAKERS AND FUSES SHALL BE ADEQUATELY SIZED PER APPLICATION.

C. SPARE FUSES AND BREAKERS NOT SHOWN. PROVIDE A MINIMUM OF 20% SPARE PROTECTIVE DEVICES FOR EACH GROUPING.

D. PROVIDE ENOUGH I/O POINTS FOR NEW AND EXISTING I/O PLUS 20%.

E. CONTROL STRATEGY PROVIDED BY OTHERS.

PLC SCHEMATIC

Consultant:
CANFIELD engineering & integration
(480) 588-8021, WWW.CANFIELDENG.COM

90% SUBMITTAL

Engineer's Seal:
PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner:
NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title:
ELECTRICAL
YELLOWHAIR
SCHEMATIC
RTU

Designed By:	RPO
Drawn By:	RPO
Checked By:	MAB
Approved By:	MAB
CONSOR Project No.:	W23250UT
Issued On:	APRIL 2024
Drawing No.:	E030

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

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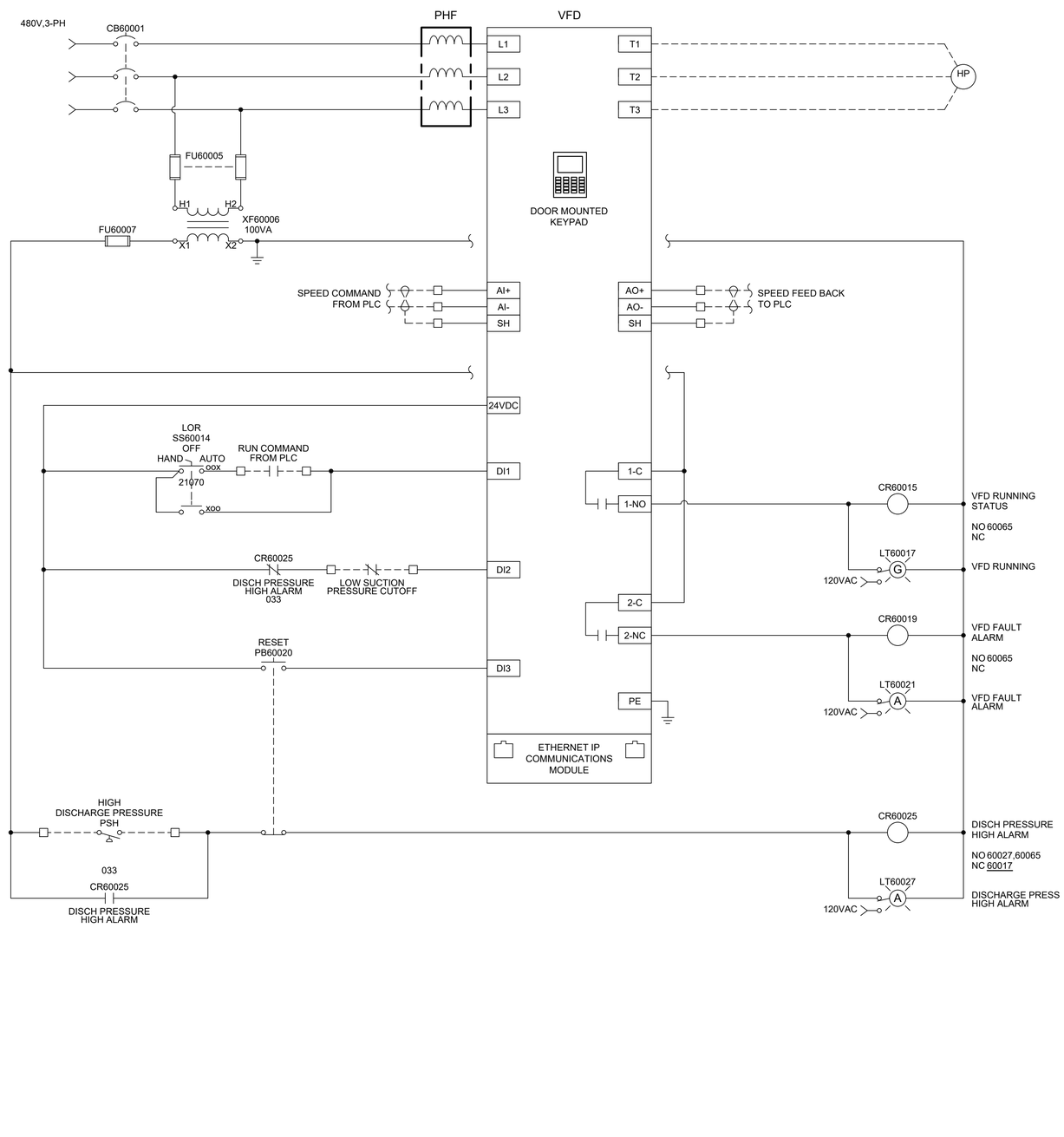


GENERAL NOTES:

A. TYPICAL SCHEMATIC DIAGRAMS ARE INTENDED TO REFLECT THE GENERAL CONTROL STRATEGY. ACTUAL CIRCUITRY MAY VARY FOR SPECIFIC EQUIPMENT SUPPLIED. THE NUMBER AND TYPE OF DEVICES SHALL BE FURNISHED AS REQUIRED FOR PROPER OPERATION OF THE EQUIPMENT.

B. CIRCUIT BREAKERS AND FUSES SHALL BE ADEQUATELY SIZED PER APPLICATION.

C. CONTROL STRATEGY PROVIDED BY OTHERS.

VFD IO CONFIGURATION:

SUPPLIER SHALL PROVIDE A COMPLETE AND OPERATIONAL SYSTEM CAPABLE OF REMOTE OPERATION AS PER CONSTRUCTION DOCS.

1. CONTROL I/O, OVERLOAD VFD STATUSES AND PARAMETERS SHALL BE MADE AVAILABLE TO THE SITE PLC AND SCADA VIA ETHERNET AND HARDWIRE CONNECTION.

2. HAND-OFF-AUTO SELECTOR SWITCH:

2.1. IN HAND MOTOR SHALL START AND RUN. SPEED VIA KEYPAD

2.2. IN OFF MOTOR SHALL NOT RUN.

2.3. IN AUTO MOTOR SHALL START/STOP VIA DISCRETE INPUT (DI1). SPEED VIA 4-20mA ANALOG INPUT.

3. RUN PERMISSIVE INTERLOCKS. WHEN ACTIVATED THE FOLLOWING SIGNALS SHALL PREVENT MOTOR OPERATION. RUN PERMISSIVE INTERLOCK SHALL REMAIN ACTIVE UNTIL PERMISSIVE CONDITION HAS CLEARED AND LOCAL RESET HAS BEEN ACTIVATED.

3.1. VFD FAULT ALARM.

3.2. HIGH DISCHARGE PRESSURE/LOW SUCTION PRESSURE/HIGH TEMPERATURE (DI2)

PROTECTION CONFIGURATION:

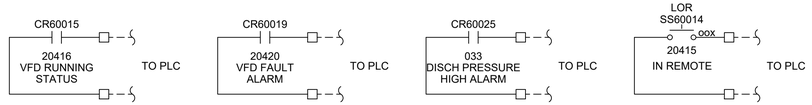
a. AT A MINIMUM PROVIDE THE FOLLOWING PARAMETERS FOR MOTOR PROTECTION ON ALL LOAD TYPES.

a.a. THERMAL OVERLOAD

a.b. PHASE-LOSS

a.c. CURRENT IMBALANCE

a.d. BACKSPIN TIMER 0-30S (PREVENTS EXCESSIVE SPINNING, IMPELLER TO COME TO A CONTROLLED STOP REDUCING WEAR)



VFD SCHEMATIC

90% SUBMITTAL

PRELIMINARY NOT FOR CONSTRUCTION

Consultant: CANFIELD engineering & integration (480) 588-8021, WWW.CANFIELDENG.COM

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

Project Title: NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title: ELECTRICAL
YELLOWHAIR

SCHEMATIC
VFD

Designed By:	RPO
Drawn By:	RPO
Checked By:	MAB
Approved By:	MAB
CONSOR Project No.:	W23250UT
Issued On:	APRIL 2024
Drawing No.:	E060

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

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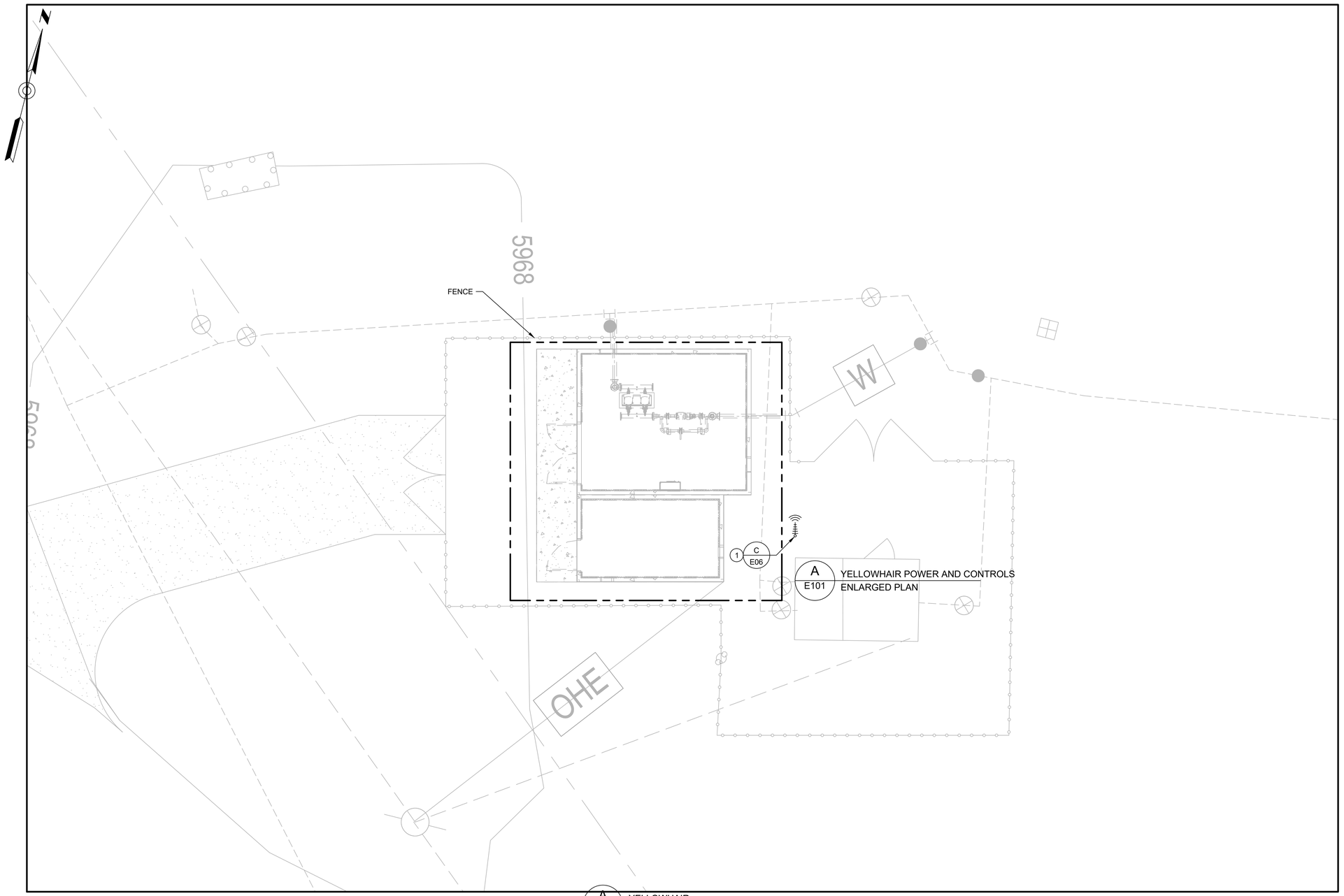
GENERAL NOTES:

A. CONTRACTOR TO COORDINATE WITH OWNER TO VERIFY LOCATION OF NEW EQUIPMENT.



A
-
YELLOWHAIR
POWER AND CONTROLS PLAN

0 4' 8'

SCALE: 3/16" = 1'-0"

consor

Consultant:

CANFIELD engineering & integration
(480) 588-8021, WWW.CANFIELDENG.COM

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner:

NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title:

ELECTRICAL
YELLOWHAIR

SITE PLAN
POWER & CONTROLS

Designed By:	RPO
Drawn By:	RPO
Checked By:	MAB
Approved By:	MAB

CONSOR Project No.: W23250UT
Issued On: APRIL 2024
Drawing No.: E100

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

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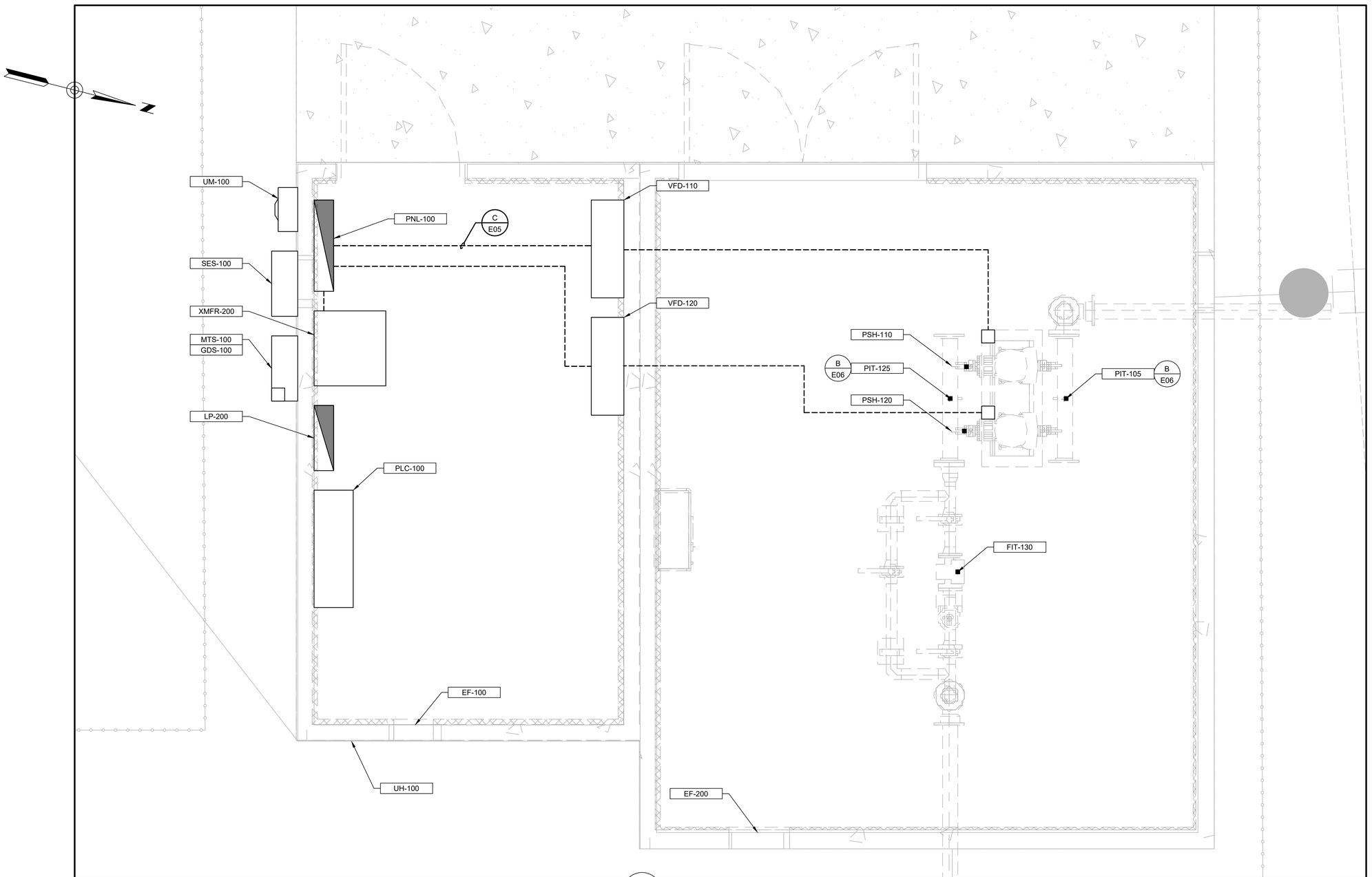
GENERAL NOTES:

A. CONTRACTOR TO COORDINATE WITH OWNER TO VERIFY LOCATION OF NEW EQUIPMENT.

B. 480V CONDUIT ROUTING SHOWN FOR REFERENCE.



A - YELLOWHAIR POWER AND CONTROLS ENLARGED PLAN

0 1' 2'

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

consor

This document, ideas, and designs incorporated herein, are an instrument of professional service, and is not to be used, in whole or in part, for any other project without the written authorization of CONSOR.

Consultant:

CANFIELD engineering & integration
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90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner:

NAVAJO TRIBAL UTILITY AUTHORITY
UTILITIES FOR THE NAVAJO NATION

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title:

ELECTRICAL
YELLOWHAIR

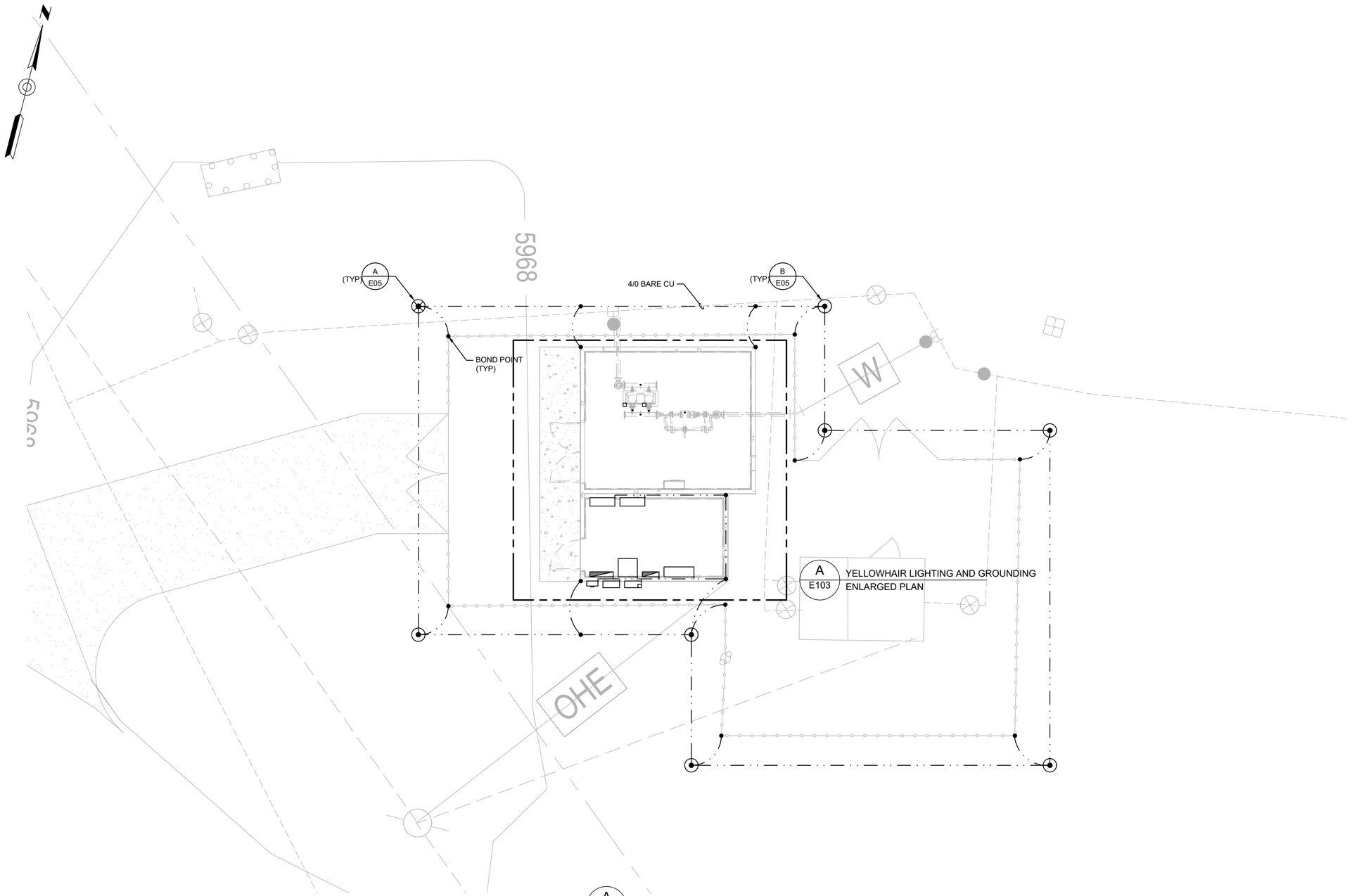
ENLARGED PLAN
POWER & CONTROLS

Designed By: RPO	CONSOR Project No.: W23250UT
Drawn By: RPO	Issued On: APRIL 2024
Checked By: MAB	Drawing No.: E101
Approved By: MAB	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\230073 CON - NTUA Four BPS Elec. Eng\8.0 Design\230073 CON - NTUA YELLOWHAIR\E101.dwg, Plotted Date: April 3, 2024 12:02 PM By: Ryan Oliver

GENERAL NOTES:

A. CONTRACTOR TO COORDINATE WITH OWNER TO VERIFY LOCATION OF NEW EQUIPMENT.



A - YELLOWHAIR POWER AND CONTROLS PLAN

0 4' 8'

SCALE: 3/16" = 1'-0"

Consultant:

CANFIELD engineering & integration
(480) 588-8021, WWW.CANFIELDENG.COM

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner:

NAVAJO TRIBAL UTILITY AUTHORITY
UTILITIES FOR THE NAVAJO NATION

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title:

ELECTRICAL
YELLOWHAIR

SITE PLAN
LIGHTING & GROUNDING

Designed By:	RPO
Drawn By:	RPO
Checked By:	MAB
Approved By:	MAB

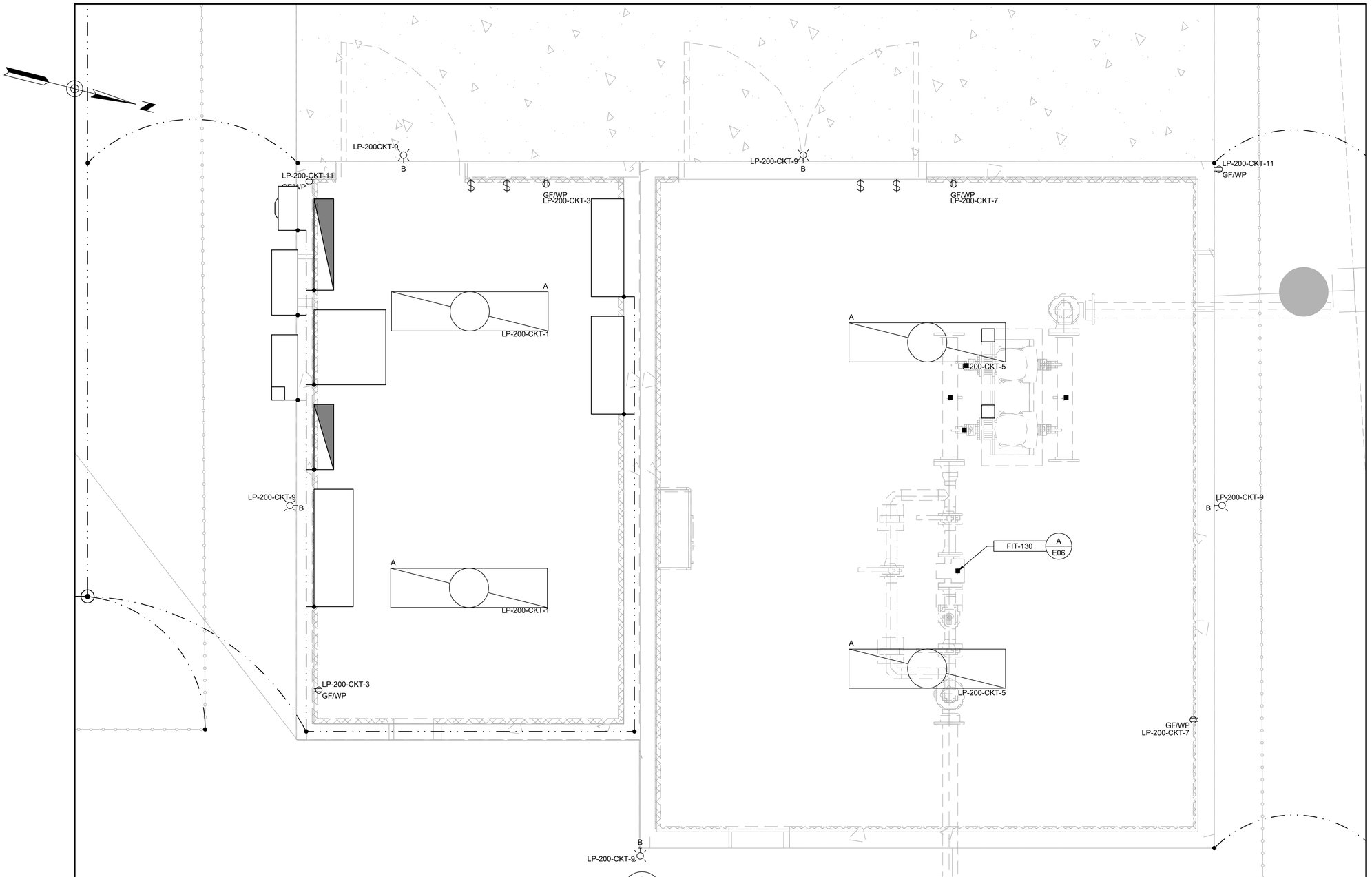
CONSOR Project No.: W23250UT
Issued On: APRIL 2024
Drawing No.: E102

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\230073 CON - NTUA Four BPS Elec. Eng\8.0 Design\230073 CON - NTUA YELLOWHAIR\E102.dwg, Plotted Date: April 3, 2024 12:02 PM By: Ryan Oliver

GENERAL NOTES:

A. CONTRACTOR TO COORDINATE WITH OWNER TO VERIFY LOCATION OF NEW EQUIPMENT.



A - YELLOWHAIR LIGHTING AND GROUNDING ENLARGED PLAN

0 1' 2'

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

Consultant:

CANFIELD engineering & integration
(480) 588-8021, WWW.CANFIELDENG.COM

90% SUBMITTAL

Engineer's Seal:

PRELIMINARY NOT FOR CONSTRUCTION

Client / Owner:

NAVAJO TRIBAL UTILITY AUTHORITY
UTILITIES FOR THE NAVAJO NATION

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title:

ELECTRICAL
YELLOWHAIR

ENLARGED PLAN
LIGHTING & GROUNDING

Designed By: RPO	CONSOR Project No.: W23250UT
Drawn By: RPO	Issued On: APRIL 2024
Checked By: MAB	Drawing No.: E103
Approved By: MAB	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\230073 CON - NTUA Four BPS Elec. Eng\8.0 Design\230073 CON - NTUA YELLOWHAIR\E103.dwg, Plotted Date: April 3, 2024 12:02 PM By: Ryan Oliver

PROCESS AND SIGNAL:

- MAIN PROCESS FLOW (WITH TYPICAL DIRECTION OF FLOW SHOWN)
- SECONDARY PROCESS FLOW
- INSTRUMENT SUPPLY, PROCESS TAPS
- EQUIPMENT BOUNDARY
- EXISTING
- FUTURE
- PNEUMATIC SIGNAL (ANALOG OR DIGITAL)
- ELECTRIC SIGNAL (ANALOG OR DIGITAL)
- MISC, ELECTRICAL
- CAPILLARY TUBE
- ELECTROMAGNETIC OR SONIC SIGNLAL (GUIDED)
- ELECTROMAGNETIC OR SONIC SIGNLAL (UNGUIDED)
- SOFTWARE OR DATA LINK
- MECHANICAL LINK
- HYDRAULIC
- 3W — PROCESS OR INSTRUMENTATION PIPING CONNECTION. NO. 3 WATER SHOWN. SEE DRAWING G2 FOR PIPING SERVICE SYMBOL.
- DATA COMMUNICATION

VALVE AND ACTUATOR SYMBOLS:

N.O. NORMALLY OPEN
N.C. NORMALLY CLOSED

- GATE VALVE (OPEN / CLOSED)
- PLUG VALVE
- BALL VALVE
- GLOBE VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- CONE VALVE
- DIAPHRAGM VALVE
- NEEDLE VALVE
- RELIEF VALVE
- FLOAT VALVE
- BACKFLOW PREFENTER
- BALL CHECK VALVE
- KNIFE VALVE
- GAGE OR ROOT VALVE

F.O. FAIL OPEN
F.C. FAIL CLOSED

- THREE WAY VALVE (W/TYPICAL FAIL POSITION) (F.O.)
- FOUR WAY VALVE
- PRESSURE REDUCING VALVE
- BACK PRESSURE REDUCING VALVE
- SOLENOID OPERATED VALVE
- PISTON OPERATED VALVE
- FLAP GATE
- FLOAT/PROBE (LSX XXX)
- TELESCOPIC VALVE
- AIR RELIEF VALVE

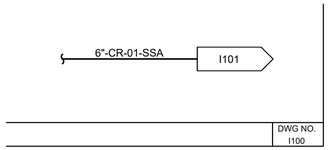
PROCESS DEVICE SYMBOLS:

- STRAINER - STANDARD OR BASKET
- REDUCER OR INCREASER
- DRAIN (D)
- SEPARATOR
- FILTER
- CAP OR PLUG
- BLIND FLANGE
- UNION
- QUICK DISCONNECT COUPLING
- SPRAY NOZZLES
- FINE BUBBLE DIFFUSER
- COARSE BUBBLE DIFFUSER
- TANK
- ROTAMETER
- INJECTOR
- SLIDE GATE (SLG) (NORMALLY OPEN)
- SLIDE GATE (SLG) (NORMALLY CLOSED)
- SLUICE GATE (SG) (NORMALLY OPEN)
- SLUICE GATE (SG) (NORMALLY CLOSED)
- SLIDE PLATE (SP)
- STOP LOG (MME)
- THREADED CAP
- FLEX CONNECTION
- FLEX CONNECTION (STEEL BRAIDED)
- ORIFACE PLATE
- PULSATION DAMPENER
- VENT
- CALIBRATION COLUMN

MISCELLANEOUS MECHANICAL EQUIPMENT SYMBOLS:

- CENTRIFUGAL PUMP
- METERING PUMP
- VERTICAL INLINE PUMP
- STATIC MIXER
- PROGRESSIVE CAVITY PUMP
- ELECTRIC MOTOR
- COMPRESSOR
- DISCONNECT SWITCH
- SUBMERSIBLE WELL PUMP
- MIXER
- TANK
- LIFT PUMP
- DAY TANK
- SUMP PUMP
- ROTARY PUMP
- VARIBLE POSITION MIXER
- AIR LIFT PUMP
- PD BLOWER
- SAND SEPARATOR

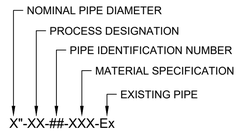
DRAWING CROSS-REFERENCE SYMBOLOGY FOR PROCESS AND SIGNAL LINES:



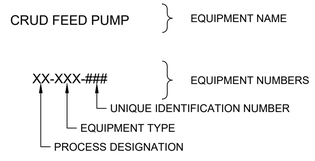
6" CRUD LINE COMES FROM DRAWING I100 AND WILL CONTINUE ON DRAWING I101

6" CRUD LINE COMES FROM DRAWING I100 AND WILL CONTINUE ON DRAWING I101

PROCESS AND INSTRUMENTATION PIPING IDENTIFICATION:



MECHANICAL EQUIPMENT IDENTIFICATION:



Consultant: CANFIELD engineering & integration (480) 588-8021, WWW.CANFIELDENG.COM

90% SUBMITTAL

Engineer's Seal: **PRELIMINARY NOT FOR CONSTRUCTION**

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY — UTILITIES FOR THE NAVAJO NATION

Project Title: NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title: P&ID
YELLOWHAIR

LEGEND & SYMBOLS
SHEET - I

Designed By:	RPO
Drawn By:	RPO
Checked By:	MAB
Approved By:	MAB
CONSOR Project No.:	W23250UT
Issued On:	APRIL 2024
Drawing No.:	I001

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\230073 CON - NTUA Four BPS Elec. Eng\8.0 Design\230073 CON - NTUA YELLOWHAIR\I001.dwg, Plotted Date: April 3, 2024 12:02 PM By: Ryan Oliver

INSTRUMNETATION SYMBOLS:

SPECIAL OR INSTRUMENT FUNCTION DESIGNATIONS:

Σ	ALGEBRAIC ADDITION
±, +, −	BIAS
AVG	AVERAGE
X	MULTIPLY
÷	DIVIDE
	EXTRACT SQUARE ROOT
x^n OR $x^{1/n}$	RAISE TO POWER
(K)	CHARACTERIZE
1:1	BOOST AND ISOLATE
	HIGHEST VALUE SELECTION
	LOWEST VALUE SELECTION
REV	REVERSE
GAF	GAP ACTION FLOATING
S & H	SAMPLE AND HOLD
SRG	SPLIT-RANGING
E/P, I/P (TYPICAL)	FOR INPUT/OUTPUT CONVERTERS USING FOLLOWING SIGNALS:
	E - VOLTS
	H - HYDRAULIC
	I - CURRENT
	O - ELECTROMAGNETIC OR SONIC
	P - PNEUMATIC
	R - RESISTANCE
	A - ANALOG
	D - DIGITAL
% OR P	PROPORTIONAL CONTROL ACTION
∫ OR I	INTEGRAL CONTROL ACTION
d/dt OR D	DERIVATIVE CONTROL ACTION
1 - 0	ON - OFF CONTROL ACTION
△ 1 - 0	DIFFERENTIAL GAP CONTROL ACTION
1:3 , 2:1 (TYPICAL)	GAIN OR ATTENUATE
ES	EMERGENCY STOP
FR	FORWARD - REVERSE
HA	HAND-AUTO SELECTION
HOA	HAND-OFF-AUTO SELECTION
HOR	HAND-OFF-REMOTE SELECTION
JOA	JOG-OFF-AUTO SELECTION
LF	LEAD-FOLLOW SELECTION
LOR	LOCAL-OFF-REMOTE SELECTION
LR	LOCAL-REMOTE SELECTION
OAC	OPEN-AUTO-CLOSE
OC	OPEN-CLOSE
OL	OVERLOAD
OO	ON-OFF SELECTION
SIK	SPEED INDICATION AND COMP. CNTRL.
SS	START-STOP
R	RESET
*V	VENDOR PACKAGE
RCS	REMOTE CONTROL STATION
RDY	READY
RNG	RUNNING
O	OPEN
C	CLOSE

PRIMARY ELEMENT SYMBOLS:

- ORIFICE PLATE
- VENTURI OR FLOW TUBE
- FLUME
- RUPTURE DISC
- CHEMICAL SEAL WITH ISOLATION VALVE PER SPEC SECTION 15050
- CONCENTRIC CHEMICAL SEAL PER SPECIFICATION SECTION 15050
- PROPELLER FLOW METER
- FLOW ELEMENT
- METER (M)
- PRESSURE INDICATOR (PI)
- PILOT TUBE
- VARIABLE AREA FLOW INDICATOR (ROTAMETER)
- CONVEYOR
- ROTAMETER

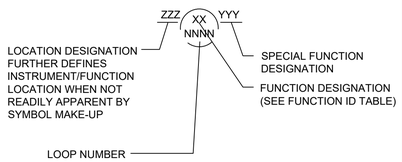
INSTRUMENT AND FUNCTION SYMBOLS:

- INSTRUMENT
- SHARED DISPLAY (GRAPHICAL OPERATOR INTERFACE)
- COMPUTER FUNCTION
- ANALOG INPUT (AI)
- ANALOG OUTPUT (AO)
- DISCRETE INPUT (DI)
- DISCRETE OUTPUT (DO)
- INTERLOCKING OR SEQUENTIAL CONTROL FUNCTION, SEE INTERLOCK NOTES.
- PROGRAMMABLE CONTROLLER

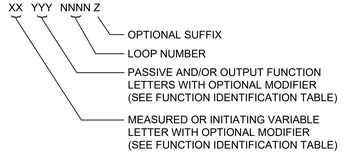
NOTE:
ANY OF THE ABOVE SYMBOLS MAY BE SHOWN WITH HORIZONTAL BAR(S) TO INDICATE PANEL MOUNTING AND/OR OPERATOR ACCESSIBLE

- FACE MOUNTED ON MAIN PANEL OPERATOR ACCESSIBLE
- MOUNTED ON/IN PANEL OPERATOR INACCESSIBLE
- FACE MOUNTED ON FIELD PANEL OPERATOR ACCESSIBLE WITH TYPICAL PANEL NUMBER
- MOUNTED ON/IN FIELD PANEL OPERATOR INACCESSIBLE
- LACK OF HORIZONTAL BARS INDICATES DEVICE LOCATED IN FIELD

INSTRUMENT SYMBOL DESIGNATION:



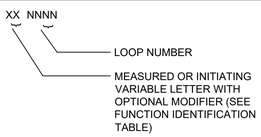
INSTRUMENT TAG NUMBERS:



INSTRUMENT LOCATION DESIGNATIONS:

GDP	GRAPHIC DISPLAY PANEL
MCC	MOTOR CONTROL CENTER
M/S	INDIVIDUAL MOTOR STARTER
MCR	MAIN CONTROL ROOM

INSTRUMENT LOOP IDENTIFICATION:



FUNCTION IDENTIFICATION

	FIRST LETTER(S)		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER (FLAME)			CONTROL	
C	CONDUCTIVITY				
D	DENSITY	DIFFERENTIAL			
E	POTENTIAL (ELEC)		PRIMARY		
F	FLOW RATE	RATIO			
G	FIRE, SMOKE		GLASS		
H	HAND				HIGH
I	CURRENT (ELC)		INDICATE		
J	POWER	SCAN		CONTROL STATION	
K	TIME	TIME RATE CHANGE			
L	LEVEL		PILOT LIGHT		LOW
M	MOISTURE	MOMENTARY			MIDDLE
N	USERS CHOICE				
O	DISSOLVED OXYGEN		ORIFICE		
P	PRESSURE		TEST CONNECTION		
Q	QUANTITY	INTEGRATE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMITER	
U	MULTI VARIABLE		MULTI FUNCTION	MULTI FUNCTION	MULTI FUNCTION
V	VIBRATION			VALVE, DAMPER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED		UNCLASSIFIED	UNCLASSIFIED	
Y	EVENT, STATUS			RELAY, COMPUTE	
Z	POSITION			MISC. ACTUATOR	

MISCELLANEOUS:

- P — PURGE OR FLUSHING DEVICE
- R — RESET FOR LATCH-TYPE OPERATOR
- B — BUBBLER PANEL
- C — CONTROL UNIT
- I — INTERLOCK
- QUICK-CONNECT FITTING
- 3-WAY PNEUMATIC PILOT VALVE
- PISTON OPERATOR W/SOLENOID PILOT
- PISTON OPERATOR W/POSITIONER
- SONIC LEVEL PROBE
- MAGNETIC FLOW PROBE
- SONIC FLOW METER (DOPPLER OR TRANSIT TIME)
- MAGNETIC FLOW METER (M) 0-XXX GPM
- TURBINE FLOW METER
- DENSITY FLOW METER
- BUBBLE LEVEL TUBE
- PILOT TUBE TAP (h)
- AIR SUPPLY
- CAPACITANCE LEVEL PROBE

GENERAL NOTES:

1. PROCESS AND INSTRUMENTATION DIAGRAMS (P&IDs) ARE PROCESS FLOW AND CONTROL GUIDES. THEY DO NOT NECESSARILY REFLECT THE ACTUAL SPACE RELATIONSHIP OR ORIENTATION OF SOME ITEMS. P&IDs ARE NOT TO BE INTERPRETED AS PLUMBING SCHEMATICS.
2. PLANT AREA OR PROCESS UNIT PREFIX MAY BE OMITTED FROM DRAWINGS AND COVERED BY NOTE WHEN ALL INSTRUMENTS ON DRAWINGS HAVE SAME PREFIX.
3. REFERENCE CIVIL/MECHANICAL DRAWINGS/SPECS FOR PIPING, EQUIPMENT DESIGNATIONS AND ABBREVIATIONS.
4. DRAWINGS I001 AND I002 ARE GENERAL IN NATURE. SOME SYMBOLS AND IDENTIFICATIONS SHOWN HEREON MAY NOT BE USED ON THE CONTRACT DRAWINGS.
5. EXISTING EQUIPMENT SHALL BE SCREENED BACK GREY.

Consultant: CANFIELD engineering & integration (480) 588-8021, WWW.CANFIELDENG.COM

90% SUBMITTAL

Engineer's Seal: **PRELIMINARY NOT FOR CONSTRUCTION**

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY — UTILITIES FOR THE NAVAJO NATION

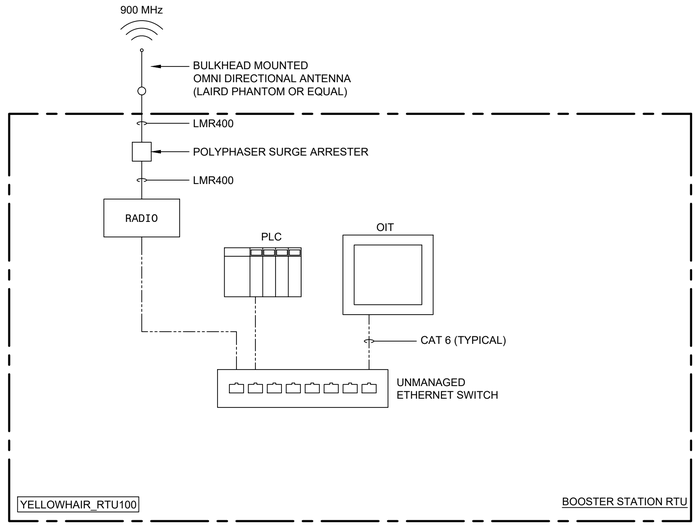
Project Title: NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title: P&ID
YELLOWHAIR
LEGEND & SYMBOLS SHEET - II

Designed By:	RPO
Drawn By:	RPO
Checked By:	MAB
Approved By:	MAB
CONSOR Project No.:	W23250UT
Issued On:	APRIL 2024
Drawing No.:	I002

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\230073 CON - NTUA Four BPS Elec. Eng\8.0 Design\230073 CON - NTUA YELLOWHAIR\I002.dwg, Plotted Date: April 3, 2024 12:02 PM By: Ryan Oliver



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Client / Owner:
NAVAJO TRIBAL UTILITY AUTHORITY

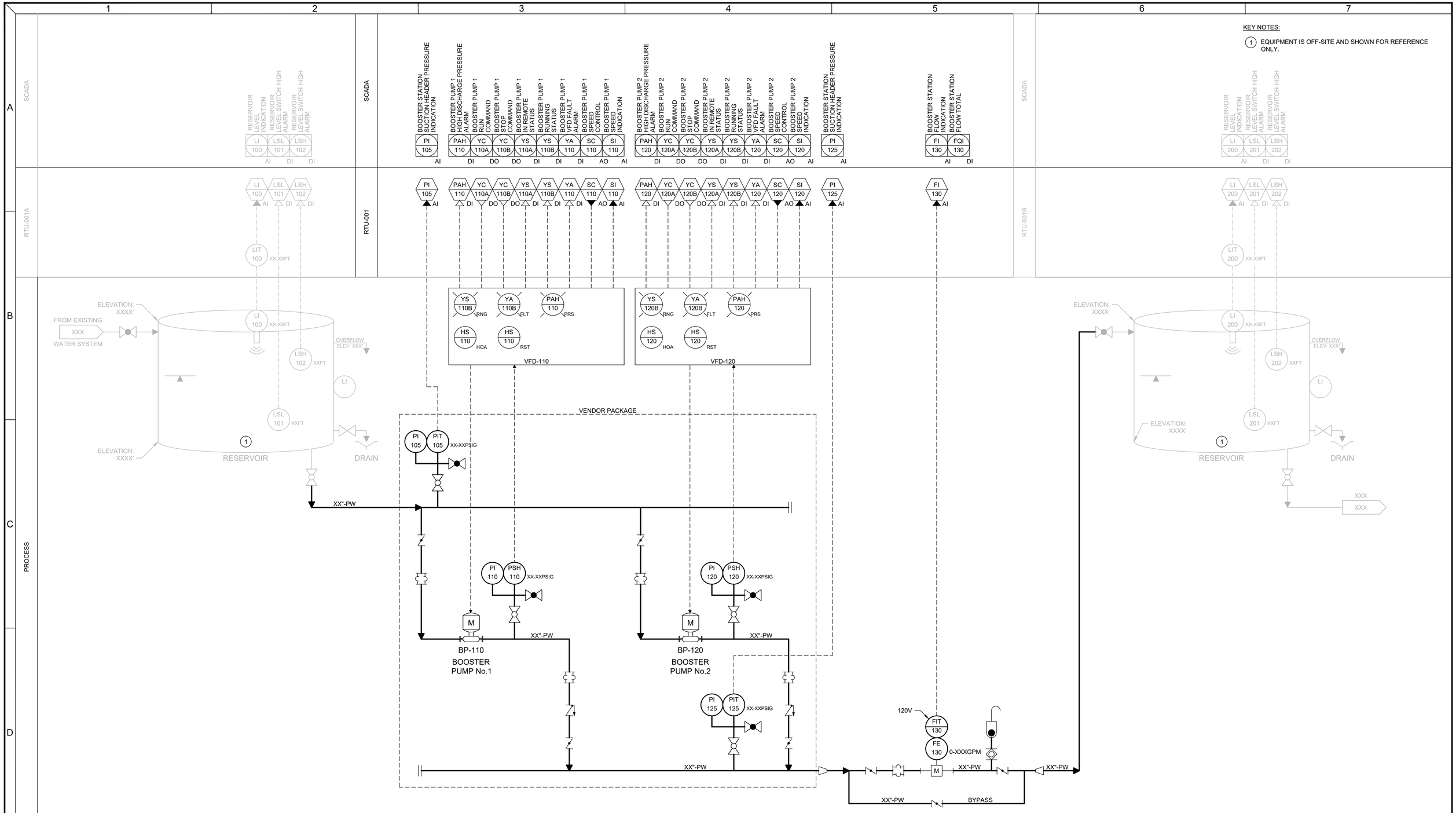
Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title:
P&ID
YELLOWHAIR

NETWORK DIAGRAM

Designed By: RPO	CONSOR Project No.: W23250UT
Drawn By: RPO	Issued On: APRIL 2024
Checked By: MAB	Drawing No.: I003
Approved By: MAB	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\230073 CON - NTUA Four BPS Elec. Eng\8.0 Design\230073 CON - NTUA YELLOWHAIR\I003.dwg, Plotted Date: April 3, 2024 12:02 PM By: Ryan Oliver



consor

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Consultant:

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Client / Owner:

NAVAJO TRIBAL UTILITY AUTHORITY
UTILITIES FOR THE NAVAJO NATION
NTUA

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title:

P&ID
YELLOWHAIR

BOOSTER STATION

Designed By:	RPO
Drawn By:	RPO
Checked By:	MAB
Approved By:	MAB
CONSOR Project No.:	W23250UT
Issued On:	APRIL 2024
Drawing No.:	I010

0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

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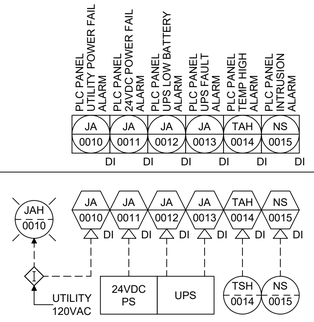

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Engineer's Seal:

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Client / Owner:

NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title:

P&ID
YELLOWHAIR

SUPPORT EQUIPMENT

Designed By: RPO	CONSOR Project No.: W23250UT
Drawn By: RPO	Issued On: APRIL 2024
Checked By: MAB	Drawing No.: I011
Approved By: MAB	0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE

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