# NAVAJO TRIBAL UTILITY AUTHORITY

# BOOSTER PUMP STATION
# COTTONWOOD

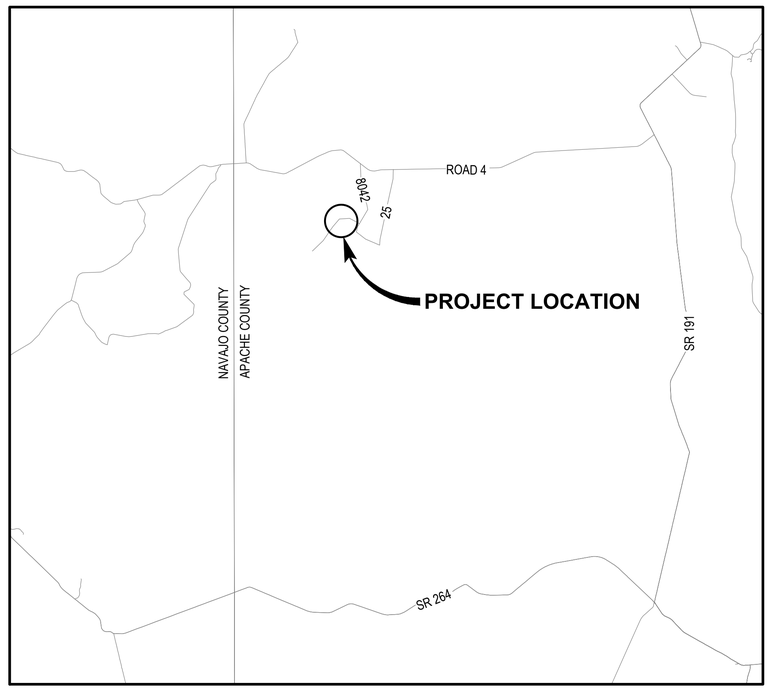
## 90% SUBMITTAL

**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-2 Cottonwood\W232520UT_B-2_G-000.dwg, Plotted Date: April 3, 2024 1:58 PM By: Jared Cloud

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| **GENERAL** | |
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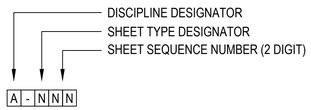
## SHEET INDEX DESIGNATIONS



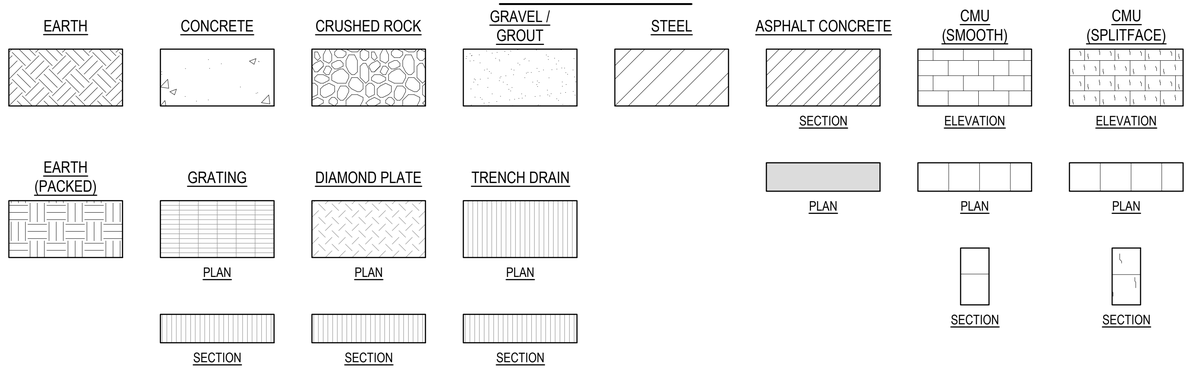

### DISCIPLINE DESIGNATORS

| | |
|---|---|
| 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 |

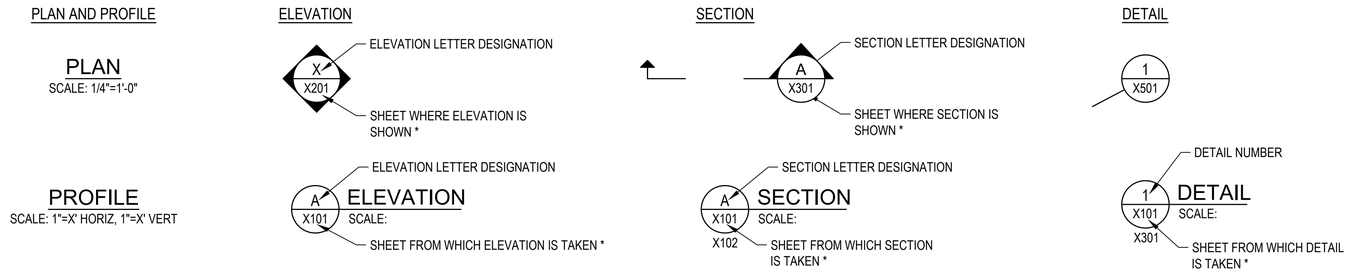
### SHEET TYPE DESIGNATORS

| | |
|---|---|
| 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 |

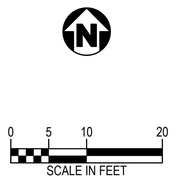
## HATCH PATTERNS




## 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
COTTONWOOD

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\UTWTUA\2023\W232520UT 00\12 CADD\12-S Sheets\B-2 Cottonwood\W232520UT_B-2_G-001.dwg, Plotted Date: April 5, 2024 10:10 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 |
| TRANS | TRANSITION |
| 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:

NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:

GENERAL
COTTONWOOD

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-WProjects\UTN\TUA\2023\W232520UT.00\12 CADD\12-S Sheets\B-2 Cottonwood\W232520UT_B-2_G-002.dwg, Plotted Date: April 3, 2024 1:59 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
COTTONWOOD

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\UTW\TUA\2023\W232520UT.00\12 CADD\12-5 Sheets\B-2 Cottonwood\W232520UT_B-2_G-003.dwg, Plotted Date: April 3, 2024 1:59 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 |
| S | 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:

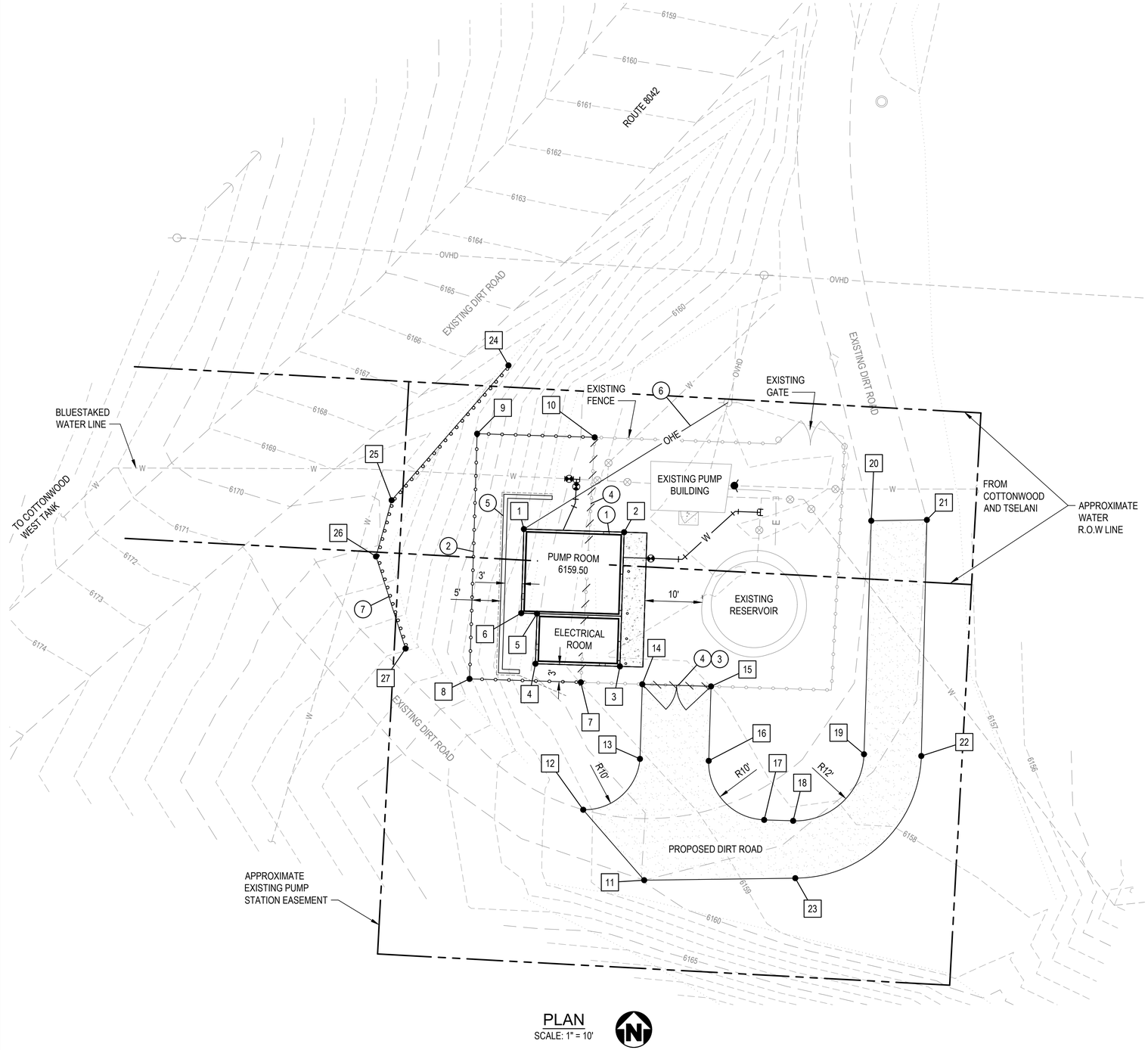
CIVIL
COTTONWOOD

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\12-5 Sheets\B-2 Cottonwood\W232520UT_B-2_C-001.dwg, Plotted Date: April 3, 2024 1:59 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. SEE W-34 ON SHEET C-501.
3. INSTALL 12' DOUBLE SWING GATE. SEE W-34 ON SHEET C-501
4. REMOVE EXISTING FENCE
5. CONSTRUCT RETAINING WALL. SEE DETAIL 3 ON SHEET C-502.
6. INSTALL NEW OVERHEAD ELECTRIC LINE
7. CONSTRUCT GUARD RAIL AS SHOWN ON PLAN IN ACCORDANCE WITH THE ARIZONA DEPARTMENT OF TRANSPORTATION ROADWAY ENGINEERING CONSTRUCTION STANDARDS, DRAWING C-10.03.

## SURVEY NOTES

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

## SURVEY CONTROL POINTS

| PT NO. | DESCRIPTION | NORTHING | EASTING |
|---|---|---|---|
| 1 | NW CORNER BLDG | N1841561.00 | E783780.60 |
| 2 | NE CORNER BLDG | N1841560.46 | E783798.10 |
| 3 | SE CORNER BLDG | N1841537.05 | E783797.37 |
| 4 | SW CORNER BLDG | N1841537.51 | E783782.63 |
| 5 | BLDG CORNER | N1841546.26 | E783782.90 |
| 6 | BLDG CORNER | N1841546.34 | E783780.15 |
| 7 | FENCE | N1841534.26 | E783790.54 |
| 8 | FENCE | N1841534.87 | E783771.12 |
| 9 | FENCE | N1841577.65 | E783772.45 |
| 10 | FENCE | N1841577.01 | E783792.96 |
| 11 | DIRT ROAD EDGE | N1841499.74 | E783801.60 |
| 12 | DIRT ROAD EDGE | N1841512.03 | E783790.96 |
| 13 | DIRT ROAD EDGE | N1841520.91 | E783800.87 |
| 14 | DIRT ROAD EDGE | N1841533.93 | E783801.27 |
| 15 | DIRT ROAD EDGE | N1841533.56 | E783813.27 |
| 16 | DIRT ROAD EDGE | N1841520.57 | E783812.86 |
| 17 | DIRT ROAD EDGE | N1841510.26 | E783822.55 |
| 18 | DIRT ROAD EDGE | N1841510.10 | E783827.60 |
| 19 | DIRT ROAD EDGE | N1841521.72 | E783839.97 |
| 20 | DIRT ROAD EDGE | N1841562.45 | E783841.23 |
| 21 | DIRT ROAD EDGE | N1841562.61 | E783850.94 |
| 22 | DIRT ROAD EDGE | N1841521.41 | E783849.96 |
| 23 | DIRT ROAD EDGE | N1841500.10 | E783827.97 |
| 24 | GUARDRAIL | N1841589.56 | E783777.92 |
| 25 | GUARDRAIL | N1841566.04 | E783757.53 |
| 26 | GUARDRAIL | N1841556.22 | E783754.80 |
| 27 | GUARDRAIL | N1841540.16 | E783759.95 |



Consultant:

**90% SUBMITTAL**

Engineer's Seal:

**PRELIMINARY NOT FOR CONSTRUCTION**

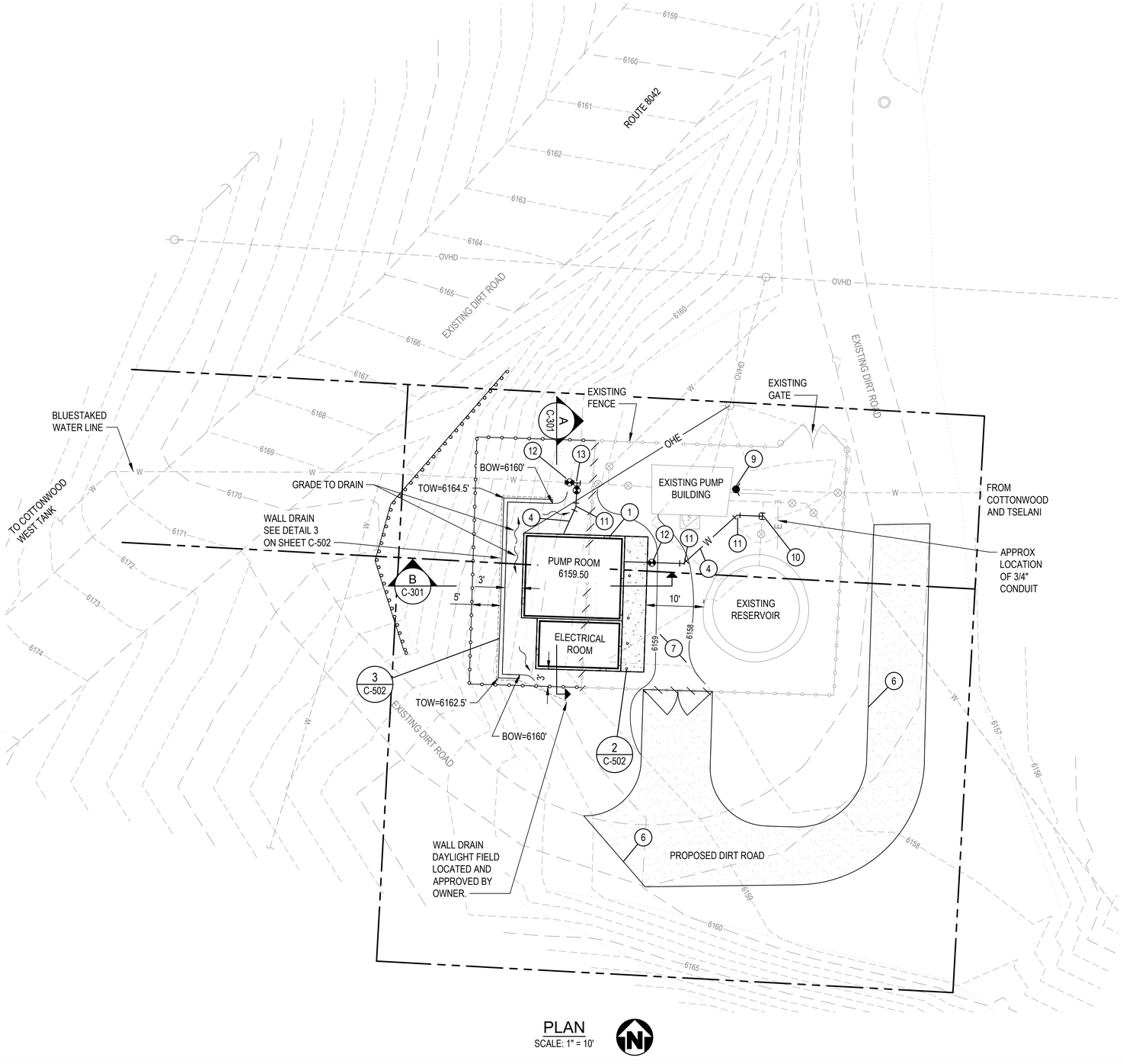
Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:
CIVIL
COTTONWOOD
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 CAD\D12-S Sheets\B-2 Cottonwood\W232520UT_B-2_C-100.dwg, Plotted Date: April 3, 2024 4:41 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, 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) REGRADE DIRT ROAD FOR ACCESS
(7) CLEAR AND GRUB SITE, INSTALL 3/4" GRAVEL WITH GEOTEXTILE FABRIC WITHIN FENCED AREA.
(9) 2-1/8" POST TYPE SINGLE PORT FIRE HYDRANT ASSEMBLY
(10) (1) 6"x4" MJ TEE
(11) (1) 4" MJ 22.5° BEND
(12) (1) 4" MJ GATE VALVE
(13) (1) 4" MJ TEE, (2) 4" MJ GATE VALVE, (1) 4" LS

consor



Consultant:

**90% SUBMITTAL**

Engineer's Seal:

**PRELIMINARY NOT FOR CONSTRUCTION**

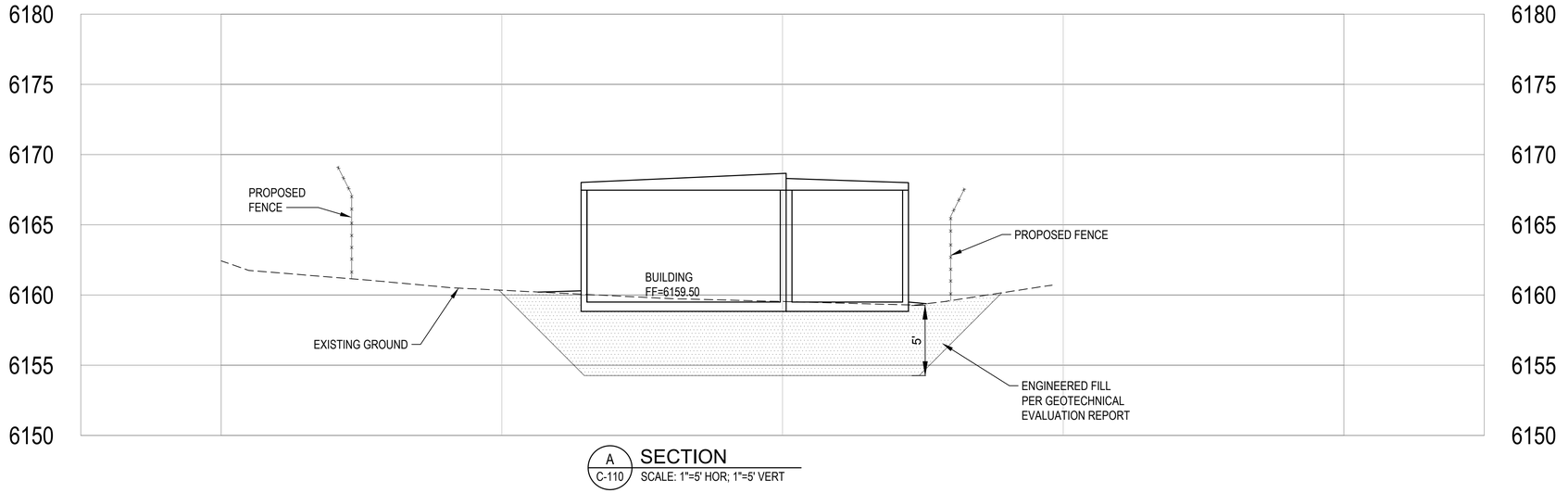
Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

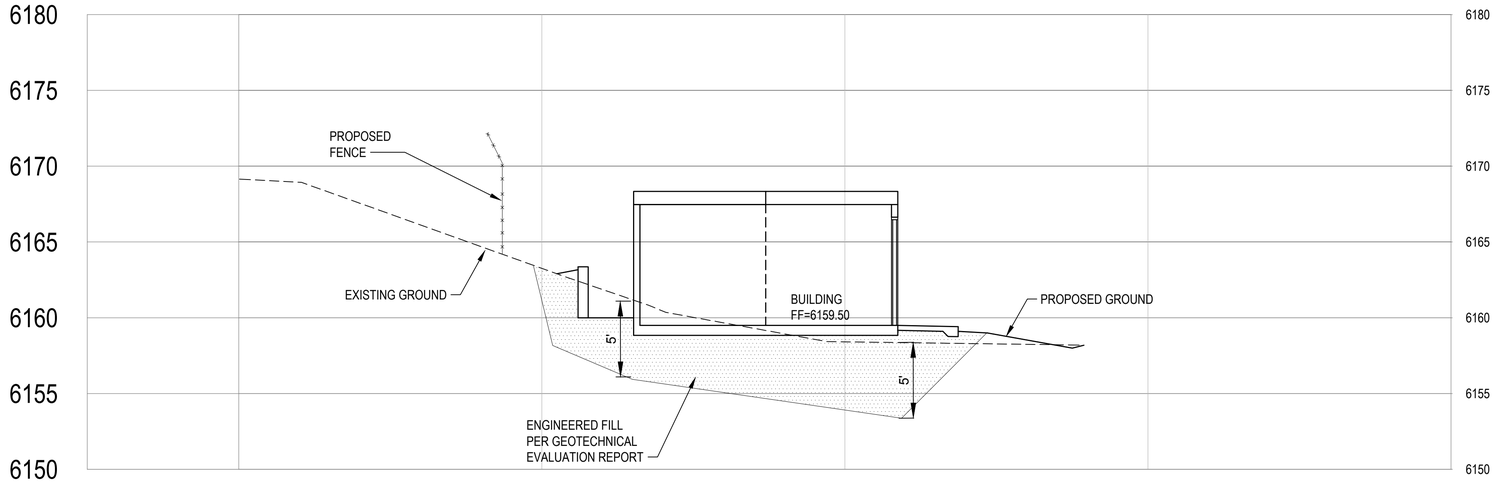
Drawing Title:
CIVIL
COTTONWOOD
SURFACING, GRADING AND YARD PIPING PLAN

| | |
|---|---|
| Designed By: AMB | CONSOR Project No.: W232520UT |
| Drawn By: RB | Issued On: APRIL 2024 |
| Checked By: JY | 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\UT\NTUA\2023\W232520UT.00\12 CAD\D12-S Sheets\B-2 Cottonwood\W232520UT_B-2_C-110.dwg, Plotted Date: April 3, 2024 4:40 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

consor



Consultant:

**90% SUBMITTAL**

Engineer's Seal:

**PRELIMINARY NOT FOR CONSTRUCTION**

Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

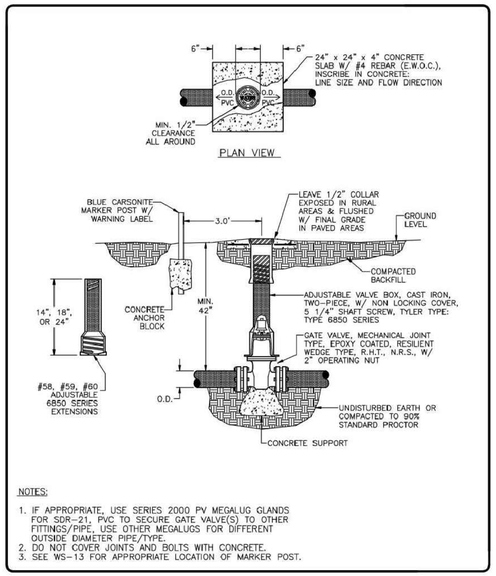
Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:
CIVIL
COTTONWOOD

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\UT\NTUA\2023\W232520UT.00\12 CADD\12-5 Sheets\B-2 Cottonwood\W232520UT_B-2_C-301.dwg, Plotted Date: April 3, 2024 2:03 PM By: Jared Cloud



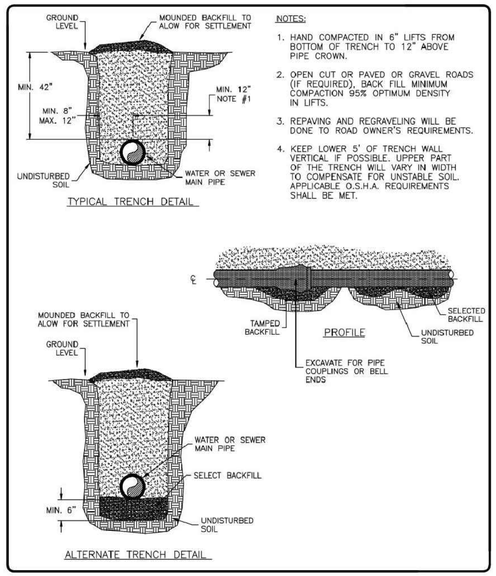

NOTES:

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

| | |
|---|---|
| DESIGNED BY: | NTUA |
| CURVATED BY: | |
| DRAWN BY: | NTUA |
| APPROVED BY: | NTUA |
| DATE: | 04/08 |
| PROJECT NO. | |
| SCALE: | NTS |
| ACAD FILENAME: | Water Standard |
| DWG. NO. | WS-14.DWG |

NAVAJO TRIBAL UTILITY AUTHORITY
an enterprise of the Navajo Nation
WATER MAIN VALVE INSTALLATION
DIV. OF WATER RESOURCES — PT. DEFIANCE, AZ

| REVISIONS | | |
|---|---|---|
| No. | Date | Brief — By |
| 01 | 04/08 | Reviewed — S.R. |
| 02 | | |
| 03 | | |
| 04 | | |
| 05 | | |
| 06 | | |




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.

| | |
|---|---|
| DESIGNED BY: | NTUA |
| CURVATED BY: | |
| DRAWN BY: | NTUA |
| APPROVED BY: | NTUA |
| DATE: | 04/08 |
| PROJECT NO. | |
| SCALE: | NTS |
| ACAD FILENAME: | Water Standard |
| DWG. NO. | WS-15.DWG |

NAVAJO TRIBAL UTILITY AUTHORITY
an enterprise of the Navajo Nation
TRENCH DETAIL
DIV. OF WATER RESOURCES — PT. DEFIANCE, AZ

| REVISIONS | | |
|---|---|---|
| No. | Date | Brief — By |
| 01 | 04/08 | Reviewed — S.R. |
| 02 | | |
| 03 | | |
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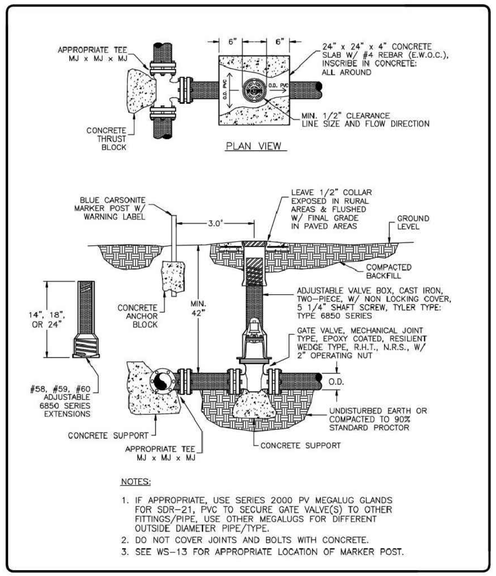


NOTES:

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

| | |
|---|---|
| DESIGNED BY: | NTUA |
| CURVATED BY: | |
| DRAWN BY: | NTUA |
| APPROVED BY: | NTUA |
| DATE: | 04/08 |
| PROJECT NO. | |
| SCALE: | NTS |
| ACAD FILENAME: | Water Standard |
| DWG. NO. | WS-16.DWG |

NAVAJO TRIBAL UTILITY AUTHORITY
an enterprise of the Navajo Nation
WATER MAIN TAP W/GATE VALVE
DIV. OF WATER RESOURCES — PT. DEFIANCE, AZ

| REVISIONS | | |
|---|---|---|
| No. | Date | Brief — By |
| 01 | 04/08 | Reviewed — S.R. |
| 02 | | |
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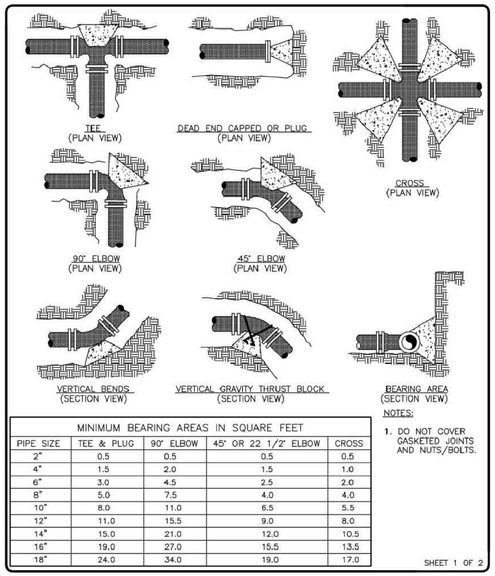


MINIMUM BEARING AREAS IN SQUARE FEET

| 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

| | |
|---|---|
| DESIGNED BY: | NTUA |
| CURVATED BY: | |
| DRAWN BY: | NTUA |
| APPROVED BY: | NTUA |
| DATE: | 04/08 |
| PROJECT NO. | |
| SCALE: | NTS |
| ACAD FILENAME: | Water Standard |
| DWG. NO. | WS-17.DWG |

NAVAJO TRIBAL UTILITY AUTHORITY
an enterprise of the Navajo Nation
GRAVITY/THRUST BLOCK DETAILS
DIV. OF WATER RESOURCES — PT. DEFIANCE, AZ

| REVISIONS | | |
|---|---|---|
| No. | Date | Brief — By |
| 01 | 04/08 | Revised — S.R. |
| 02 | | |
| 03 | | |
| 04 | | |
| 05 | | |
| 06 | | |

GRAVITY THRUST BLOCK
(ALSO TO BE USED IN UNSTABLE TRENCH CONDITIONS)
RESULTANT THRUST IN POUNDS OF FITTINGS AT 100 PSI WATER PRESSURE

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

NOTES:

1. THE THRUST (IN TOTAL POUNDS) IN THE CHART IS BASED ON DUCTILE IRON OUTSIDE DIAMETER PIPE DIMENSION. SURGES SHOULD BE CONSIDERED AT TWICE THE NORMAL OPERATING PRESSURE. THE VOLUME OF THE GRAVITY THRUST BLOCK IS BASED ON CONCRETE AT 150 LBS./FT3.
2. TO OBTAIN VOLUME OF CONCRETE REQUIRED, USE:
   VOLUME OF CONRETE(FT3)= THRUST(LBS.) x SYSTEM PRESSURE(PSI)/100 PSI // 150 LBS./FT3.
   E.G.: CALCULATE THE VOLUME OF THE GRAVITY THRUST BLOCK FOR AN 8" x 45° BEND AT AN OPERATING PRESSURE OF 80 PSI.
   ANSWER: 4923 LBS. x 160 PSI/100 PSI DIVIDED BY 150 LBS./CUBIC FT. = 52.5 CUBIC FEET OR 2 CUBIC YARDS.

SHEET 2 OF 2

| | |
|---|---|
| DESIGNED BY: | NTUA |
| CURVATED BY: | |
| DRAWN BY: | NTUA |
| APPROVED BY: | NTUA |
| DATE: | 04/08 |
| PROJECT NO. | |
| SCALE: | NTS |
| ACAD FILENAME: | Water Standard |
| DWG. NO. | WS-19a.DWG |

NAVAJO TRIBAL UTILITY AUTHORITY
an enterprise of the Navajo Nation
GRAVITY/THRUST BLOCK CHART
DIV. OF WATER RESOURCES — PT. DEFIANCE, AZ

| REVISIONS | | |
|---|---|---|
| No. | Date | Brief — By |
| 01 | 04/08 | Reviewed — S.R. |
| 02 | | |
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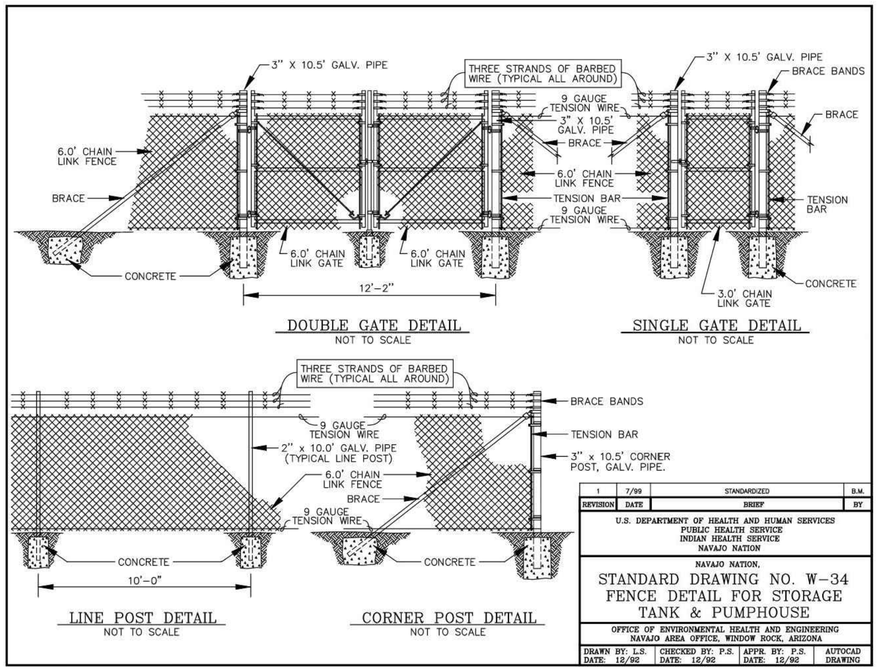


| REVISION | DATE | BRIEF | BY |
|---|---|---|---|
| 1 | 7/99 | STANDARDIZED | B.M. |

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

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

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

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

consor

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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:

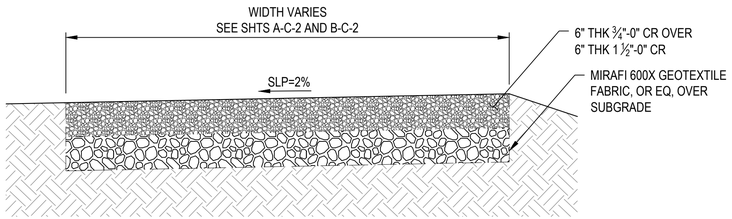
CIVIL
COTTONWOOD

STANDARD DETAILS

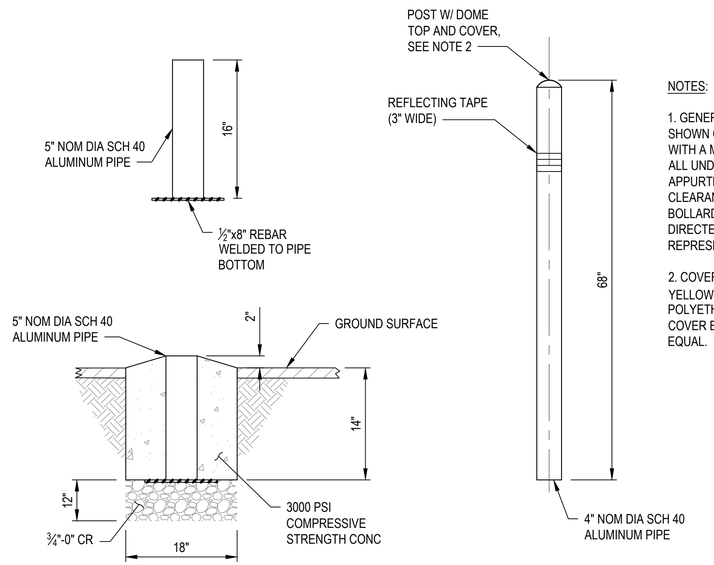
| | |
|---|---|
| Designed By: | AMB |
| Drawn By: | RB |
| Checked By: | JY |
| Approved By: | NN |
| CONSOR Project No.: | W232520UT |
| Issued On: | APRIL 2024 |
| Drawing No.: | C-501 |

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

Drawing Path and Name: A:_V-W\Projects\UT\NTUA\2023\W232520UT.00\12 CADD\12-S Sheets\B-2 Cottonwood\W232520UT_B-2_C-501.dwg, Plotted Date: April 3, 2024 2:03 PM By: Jared Cloud




1 TYPICAL GRAVEL DRIVEWAY SECTION
SCALE: NTS

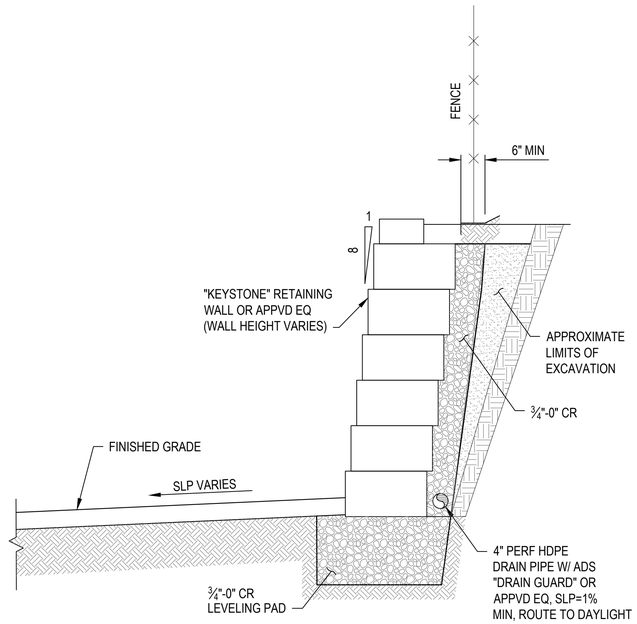



2 4" REMOVABLE BOLLARD
SCALE: NTS

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.




3 STRAIGHT BLOCK RETAINING WALL DETAIL
SCALE: NTS

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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:

**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
COTTONWOOD

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\UTINTUA\2023\W232520UT.00\12 CADD\12-5 Sheets\B-2 Cottonwood\W232520UT_B-2_C-502.dwg, Plotted Date: April 5, 2024 10:19 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): 30 PSF
- PASSIVE PRESSURE: 100 PSF
- COEFF OF SLIDING FRICTION: 0.25

**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:
   - A. CONCRETE REINFORCING STEEL
   - B. CONCRETE MIX DESIGN
   - C. CONCRETE REINFORCING STEEL
   - D. PRECAST CONCRETE PUMP STATION BUILDING
   - E. PRECAST CONCRETE ALTITUDE VAULT
2. MIX DESIGN / TEST REPORTS
   - A. 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.

**JOINT SEALANT**
CONCRETE JOINT SEALANT: SILICONE SEALANT AS MANUFACTURED BY DOW CORNING FOR VERTICAL CONTROL JOINTS IN CONCRETE WALLS OR APPROVED EQUAL. PROVIDE BOND BREAKER OR BACK-UP ROD AS RECOMMENDED BY MANUFACTURER. INSTALL SEALANT AS RECOMMENDED BY MANUFACTURER.

**PREMOLDED EXPANSION JOINT**
'REFLECTIX' WITH TEAR OFF STRIP (OR APPROVED EQUAL), INSTALLED PER MANUFACTER'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 — UTILITIES FOR THE NAVAJO NATION

Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

Drawing Title:
STRUCTURAL
COTTONWOOD
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-001 |
| Approved By: NN | 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 Cottonwood S-001 (GSN).dwg, Plotted Date: March 18, 2024 11:08 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 6,000 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

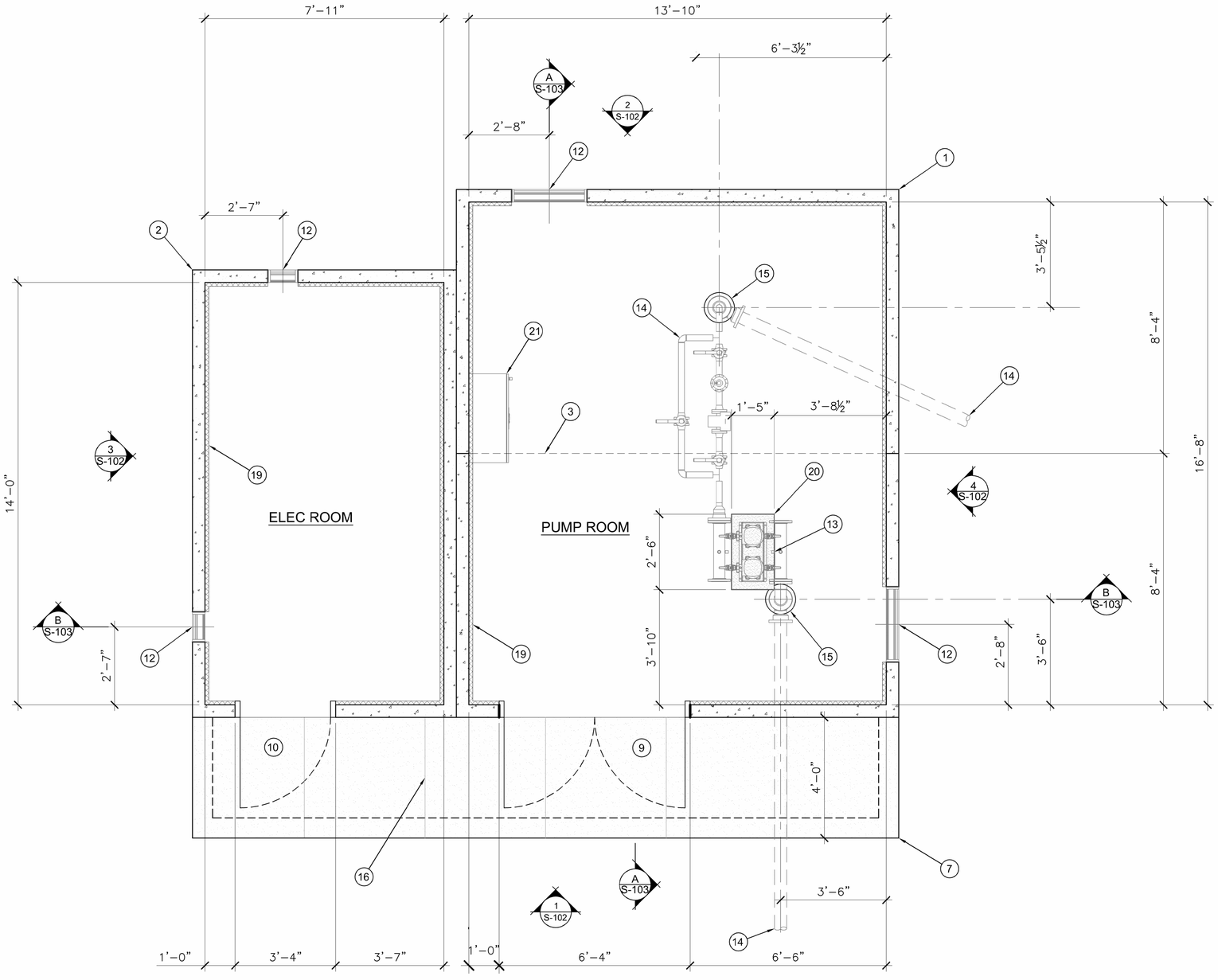
Project Title: NAVAJO TRIBAL UTILITY AUTHORITY BOOSTER PUMP STATION

Drawing Title: STRUCTURAL COTTONWOOD 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-002 |

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 Cottonwood S-002 (GSN).dwg, Plotted Date: March 18, 2024 11:09 AM By: John Berghan




# 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**

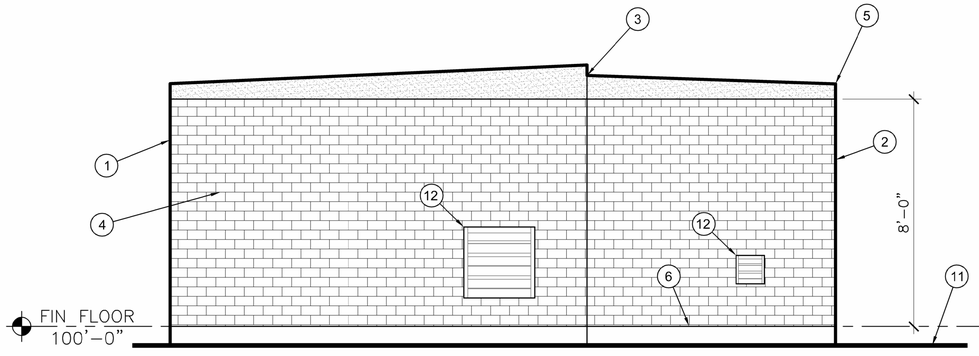
Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

Project Title: NAVAJO TRIBAL UTILITY AUTHORITY BOOSTER PUMP STATION

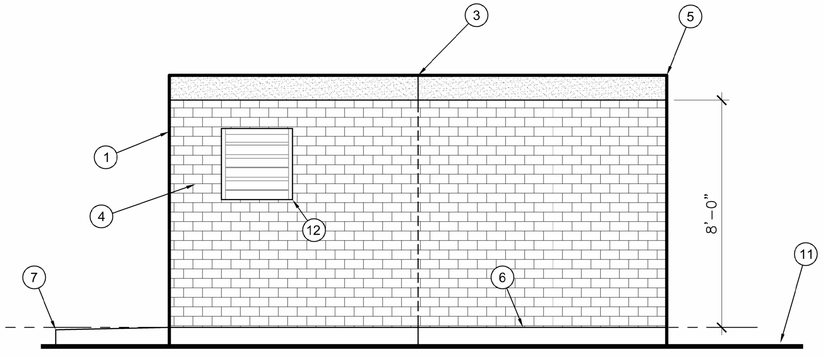
Drawing Title: STRUCTURAL COTTONWOOD BOOSTER PUMP STATION PLAN VIEW

| | |
|---|---|
| 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 |

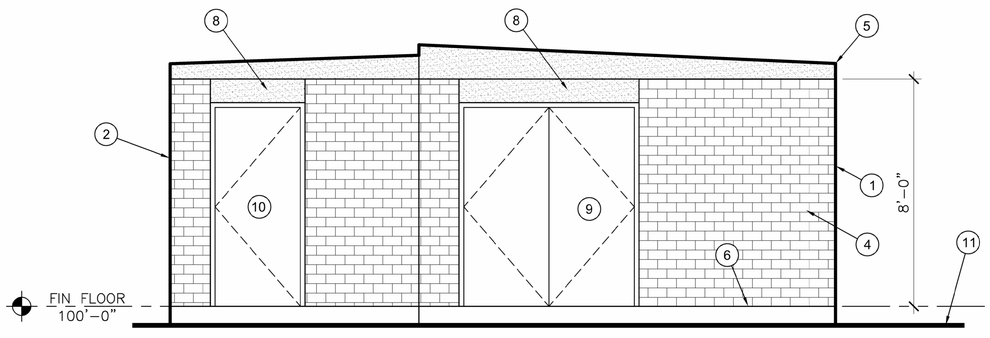
Drawing Path and Name: C:\Users\jberghan\OneDrive - Consor Engineers, LLC\Documents\Job Files (PEC)\UTAH\W232520UT NTUA Booster Pump Station Improvements\dwg\W232520UT Cottonwood S-101 (Plan).dwg, Plotted Date: March 23, 2024 12:11 PM By: John Berghan



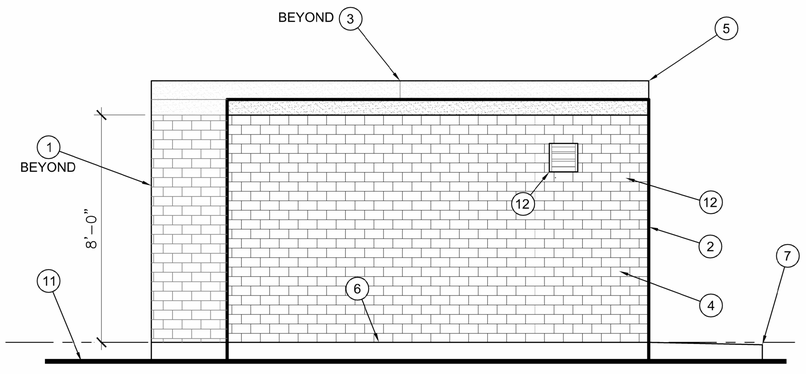

ELEVATION 2




ELEVATION 4




ELEVATION 1




ELEVATION 3

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

consor



Consultant:

**90% SUBMITTAL**

Engineer's Seal:

**PRELIMINARY NOT FOR CONSTRUCTION**

Client / Owner:

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

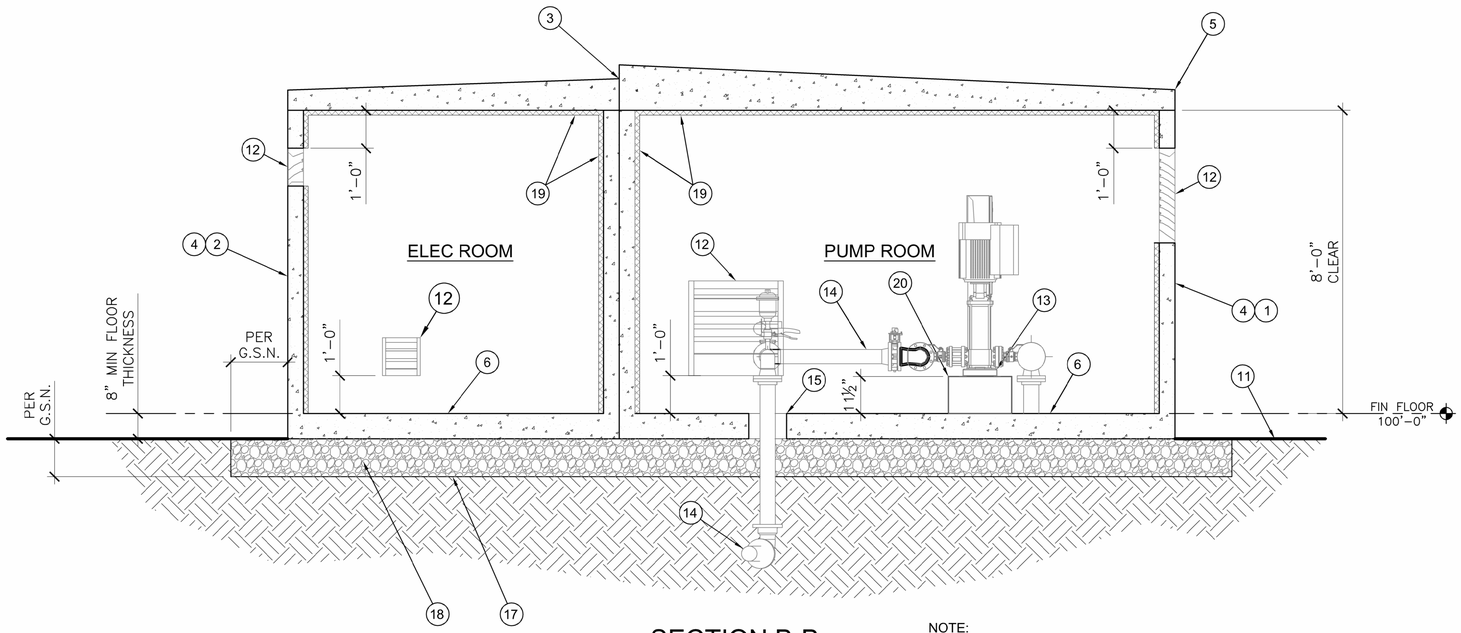
Drawing Title:

STRUCTURAL
COTTONWOOD

BOOSTER PUMP STATION
ELEVATIONS

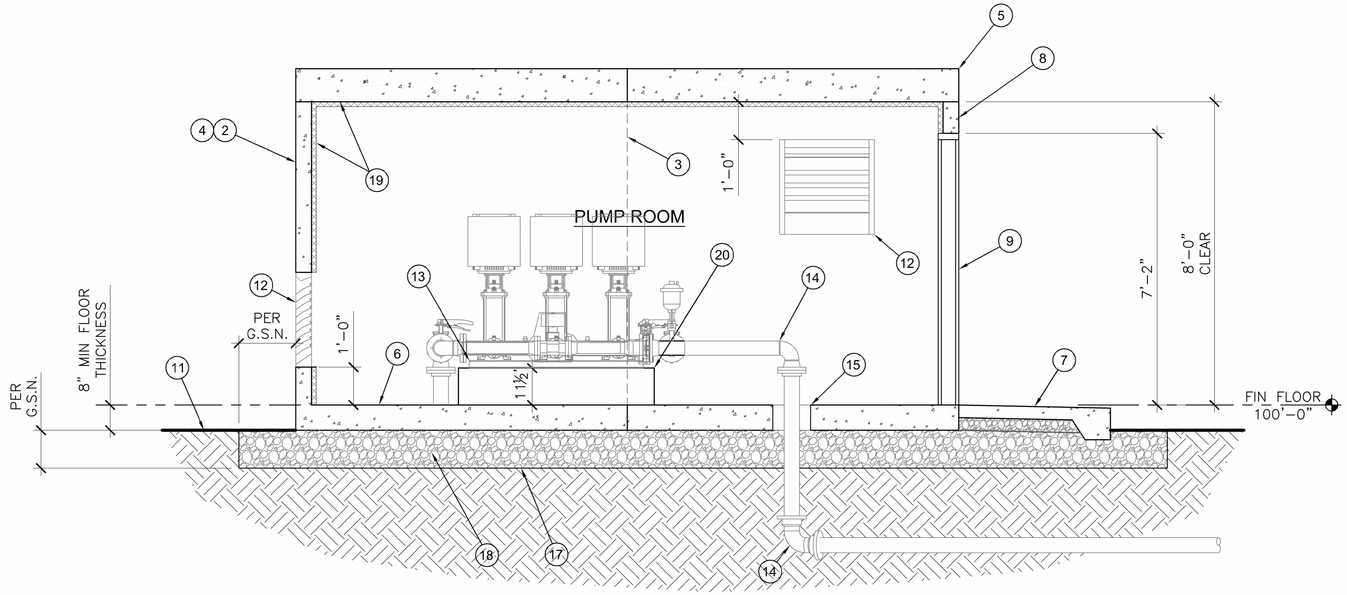
| | |
|---|---|
| Designed By: JVB | CONSOR Project No.: W232520UT |
| Drawn By: JVB | Issued On: APRIL 2024 |
| Checked By: RB | Drawing No.: S-102 |
| Approved By: NN | 0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE |

Drawing Path and Name: C:\Users\jberghian\OneDrive - Consor Engineers, LLC\Documents\Job Files (PEC)\UTAH\W232520UT NTUA Booster Pump Station Improvements\dwg\W232520UT Cottonwood S-102 (Elevations).dwg, Plotted Date: March 23, 2024 12:08 PM By: John Berghian




## 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



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 COTTONWOOD

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 Cottonwood S-103 (Cross Sections).dwg. Plotted Date: March 23, 2024 12:10 PM 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 |

### 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.

### 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.

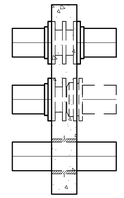
6. SYMBOLS, LEGENDS AND PIPE USE IDENTIFICATIONS SHOWN SHALL BE FOLLOWED THROUGHOUT THE DRAWINGS, WHEREVER APPLICABLE. NOT ALL OF THE VARIOUS COMPONENTS ARE NECESSARILY USED IN THE PROJECT.

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.

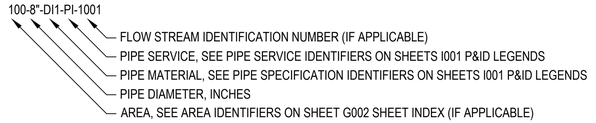
8. NUMBER AND LOCATION OF UNIONS SHOWN ON DRAWINGS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.

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.

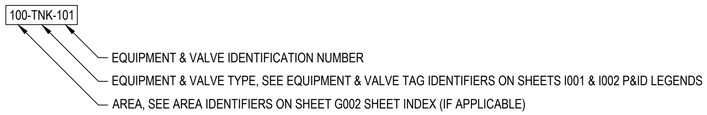
### PIPE PENTRATIONS




### PIPE TAG




### EQUIPMENT & VALVE TAG






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
COTTONWOOD

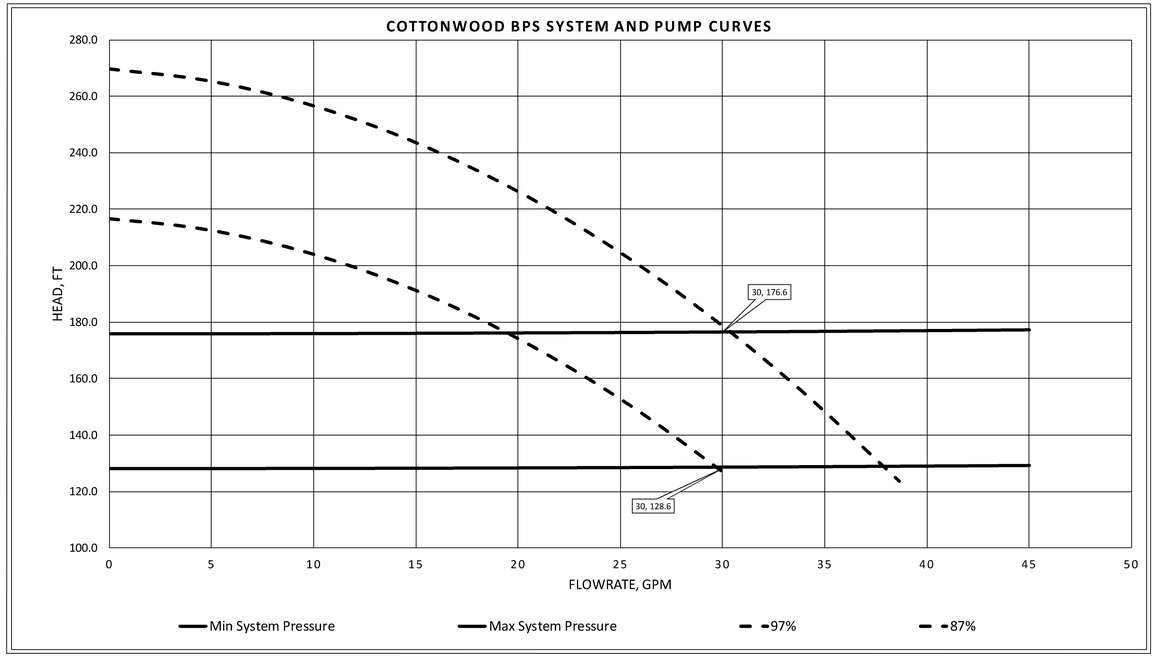
LEGEND AND NOTES

| | |
|---|---|
| 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\UTN\TUA\2023\W232520UT.00\12 CADD\12-5 Sheets\B-2 Cottonwood\W232520UT_B-2_D-001.dwg, Plotted Date: April 3, 2024 2:05 PM By: Jared Cloud

| DESIGN CRITERIA | |
|---|---|
| IDENTIFICATION : | |
| LOCATION | COTTONWOOD 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) | 300 |
| MINIMUM SHUTOFF HEAD (FT) | 250 |
| DESIGN FLOW CAPACITY: | |
| DUTY PT. 1 | 30 GPM @ 177 FT TDH |
| DUTY PT. 2 | 30 GPM @ 129 FT TDH |
| MINIMUM BOWL EFFICIENCY: | |
| DUTY PT. 1 | 64% |
| DUTY PT. 2 | 62% |
| MAXIMUM PUMP SPEED (RPM) | 4000 |
| MINIMUM MOTOR SIZE (HP) | 3 |
| 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 | 9 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 | 3.8 AMPS |
| PUMP MANUFACTURER/BASE MODEL: | |
| GRUNDFOS | CRE 5-9 |






Consultant:

**90% SUBMITTAL**

Engineer's Seal:

**PRELIMINARY NOT FOR CONSTRUCTION**

Client / Owner:

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
BOOSTER PUMP STATION

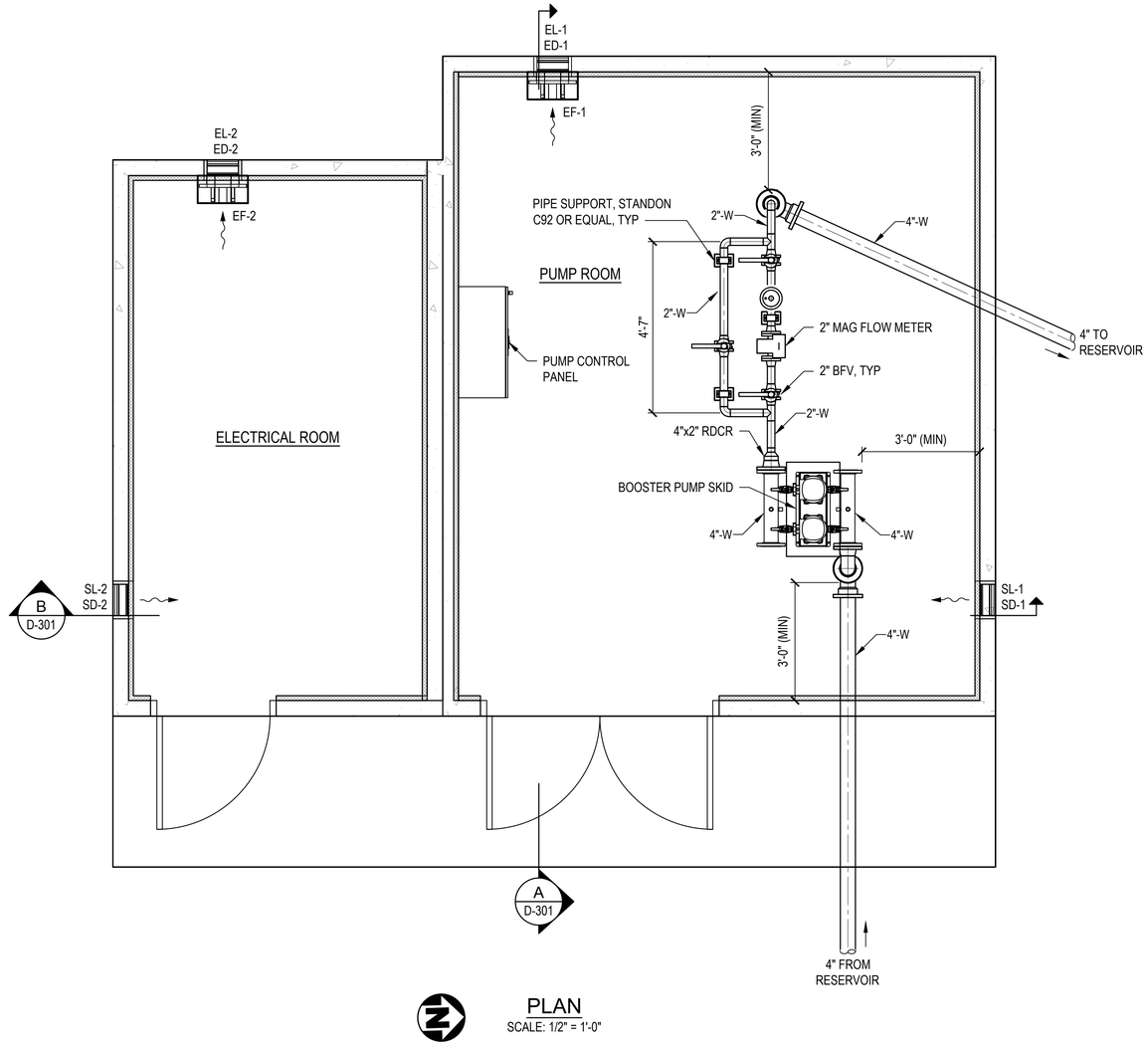
Drawing Title:

PROCESS
COTTONWOOD

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: ---- | 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-2 Cottonwood\W232520UT_B-2_D-010.dwg, Plotted Date: April 3, 2024 2:06 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

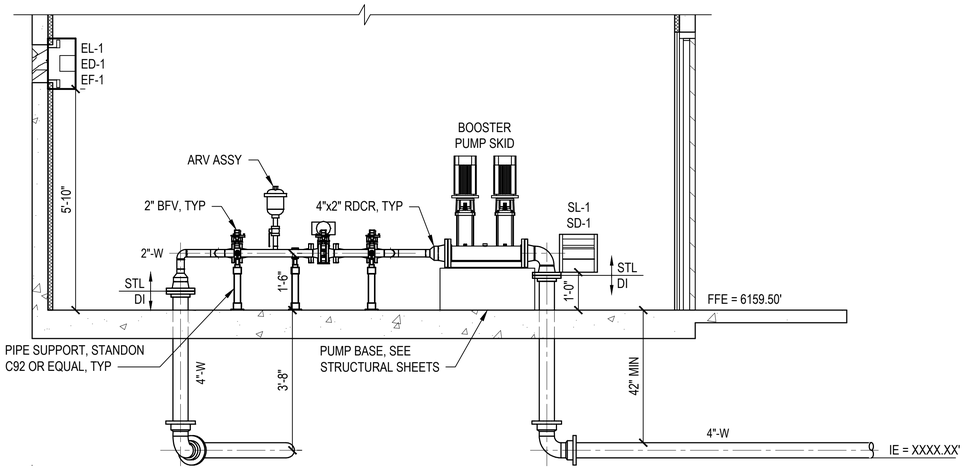
Project Title: NAVAJO TRIBAL UTILITY AUTHORITY BOOSTER PUMP STATION

Drawing Title: PROCESS COTTONWOOD

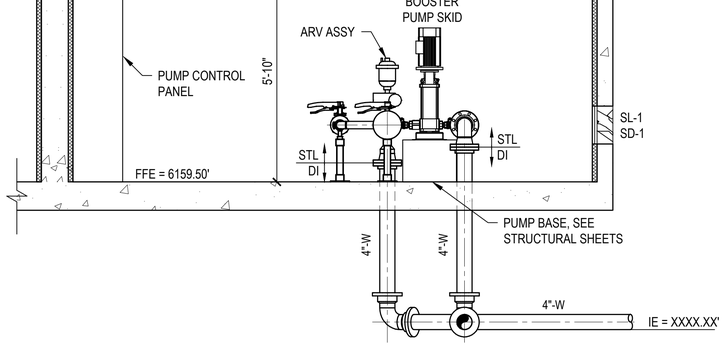
PUMP STATION PLAN AND HVAC

| | |
|---|---|
| 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-2 Cottonwood\W232520UT_B-2_D-100_D301.dwg, Plotted Date: April 3, 2024 2:07 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 | 200 | 0.3 | 1/20 | 120/60/1 | T-1 | GREENHECK/S1-10-428P |
| 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 | 12" X 12" | GREENHECK, ESD-435 |
| EL-1 | FIXED DRAINABLE BLADE | 12" X 12" | 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/BACKDRAFT | 12" X 12" | GREENHECK EM30 |
| ED-1 | GRAVITY/BACKDRAFT | 12" X 12" | GREENHECK EM30 |
| SD-2 | GRAVITY/BACKDRAFT | 12" X 12" | GREENHECK EM30 |
| ED-2 | GRAVITY/BACKDRAFT | 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
COTTONWOOD

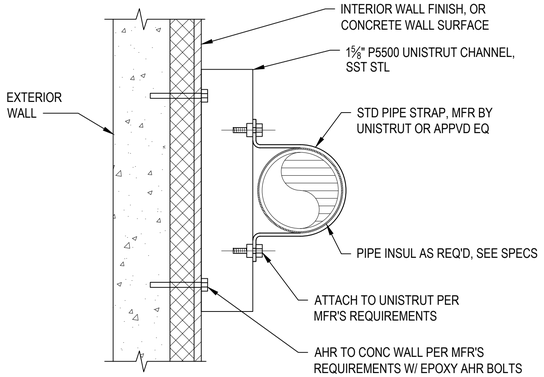
SECTIONS AND HVAC SCHEDULES

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\UTN\TUA\2023\W232520UT.00\12 CADD\12-5 Sheets\B-2 Cottonwood\W232520UT_B-2_D-100_D301.dwg, Plotted Date: April 3, 2024 2:07 PM By: Jared Cloud

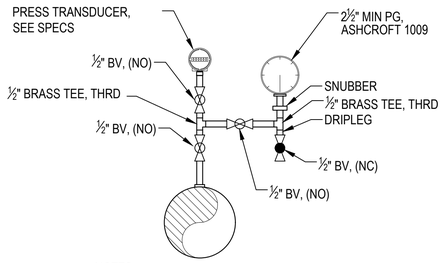



NOTES:

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

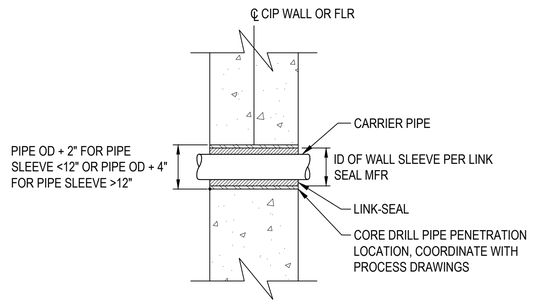



NOTES:

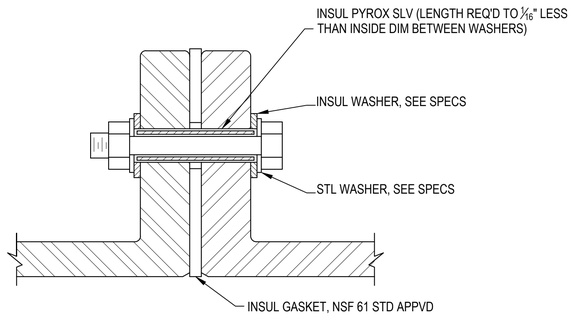
1. INSTALL PRESSURE TRANSDUCER AND PRESSURE GAUGE ASSEMBLY AS SHOWN ON 2"x ½" BRONZE TEE.

2. ALL ½" PIPE SHALL BE COPPER.

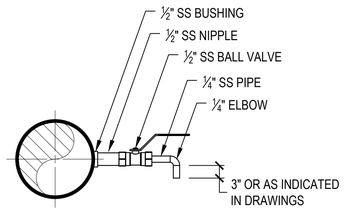
2 - PRESSURE TRANSDUCER AND PRESSURE GAUGE ASSEMBLY
SCALE: NTS




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 COTTONWOOD — 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-2 Cottonwood\W232520UT_B-2_D-501.dwg, Plotted Date: April 3, 2024 2:08 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)

WALL-MOUNTED DISTRIBUTION ASSEMBLY, SUCH AS PANELBOARD, MOTOR CONTROL CENTER, OR TERMINAL CABINET

PNL 1200 — EQUIPMENT NUMBER (EXAMPLE)

FLOOR-STANDING DISTRIBUTION ASSEMBLY, SUCH AS A SWITCHBOARD, TRANSFORMER, OR MOTOR CONTROL CENTER

MCC 1100 — 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 (NTUA)

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

Drawing Title: ELECTRICAL
COTTONWOOD

LEGENDS & SYMBOLS
SHEET - I

| | |
|---|---|
| Designed By: RPO | CONSOR Project No.: W23250UT |
| Drawn By: RPO | Issued On: APRIL 2024 |
| Checked By: MAB | Drawing No.: E001 |
| Approved By: MAB | 0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE |

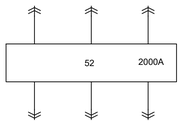
Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\230073 CON - NTUA Four BPS Elec. Eng\8.0 Design\230073 CON - NTUA COTTONWOOD\E001.dwg, Plotted Date: April 3, 2024 11:26 AM By: Ryan Oliver

# POWER DIAGRAMS

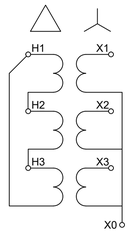
SINGLE LINE:

- 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
- PANELBOARD — P-XXX
- MINI POWER CENTER — MPC-XXX
- 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:

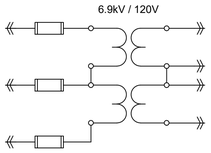



POWER CIRCUIT BREAKER (AIR, VACUUM, OR GAS) FRAME SETTING AND OPTIONAL I.D. SHOWN




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 COTTONWOOD
LEGENDS & 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

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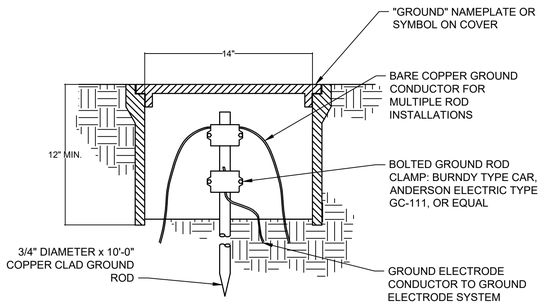
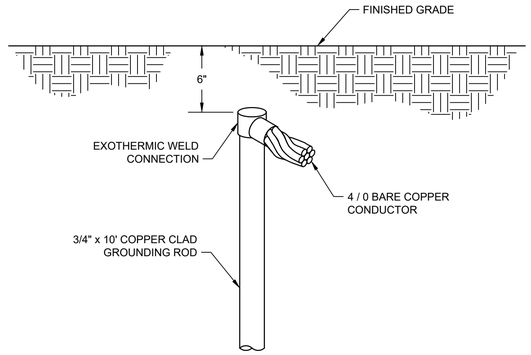


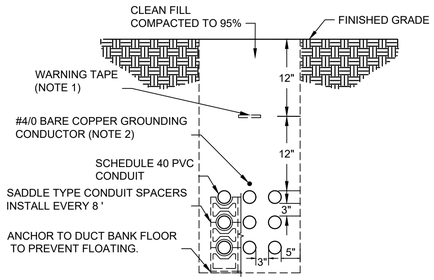

NOTES:

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



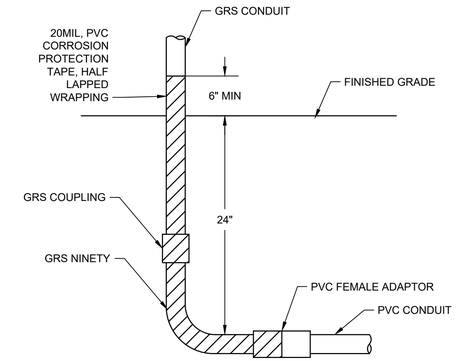

B TYP EXOTHERMIC GROUND ROD CONNECTION DETAIL




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

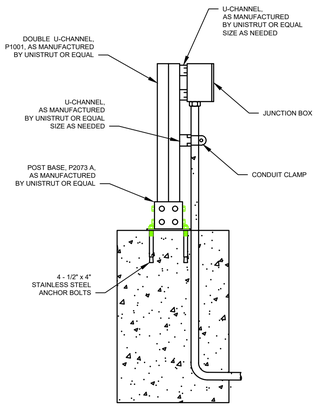
C TYP DUCT BANK DETAIL



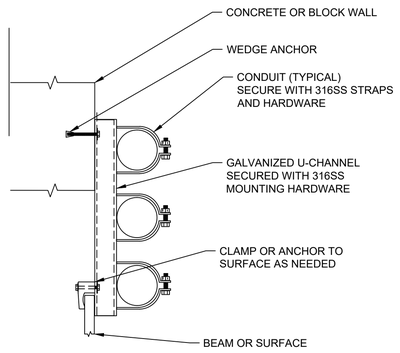

NOTES:

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.

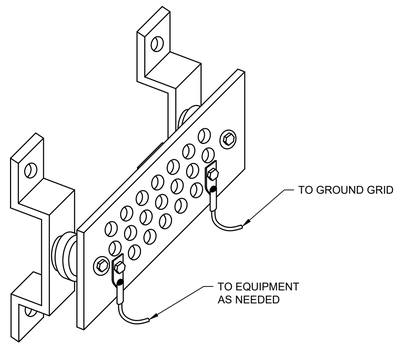
D TYP GRS STUB UP DETAIL




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



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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
COTTONWOOD
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 |

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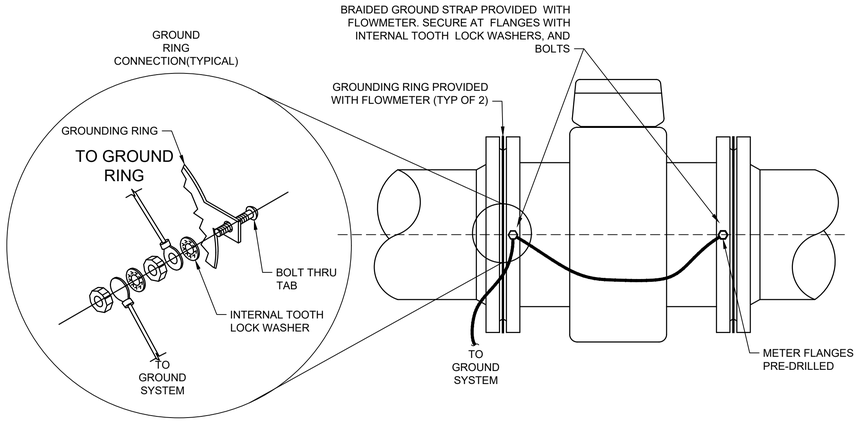
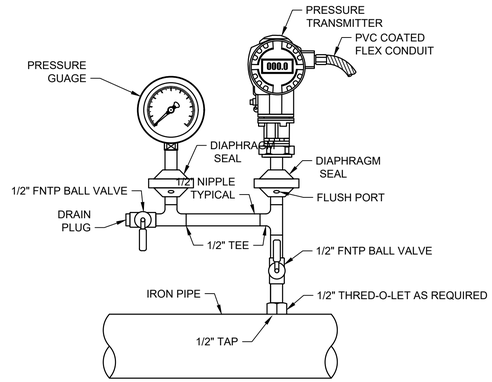
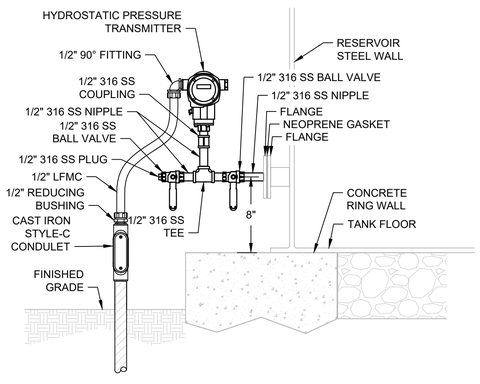



A TYP — FLOWMETER GROUNDING DETAIL




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 — HYDROSTATIC LEVEL TRANSMITTER DETAIL

consor

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

Client / Owner:
NAVAJO TRIBAL UTILITY AUTHORITY

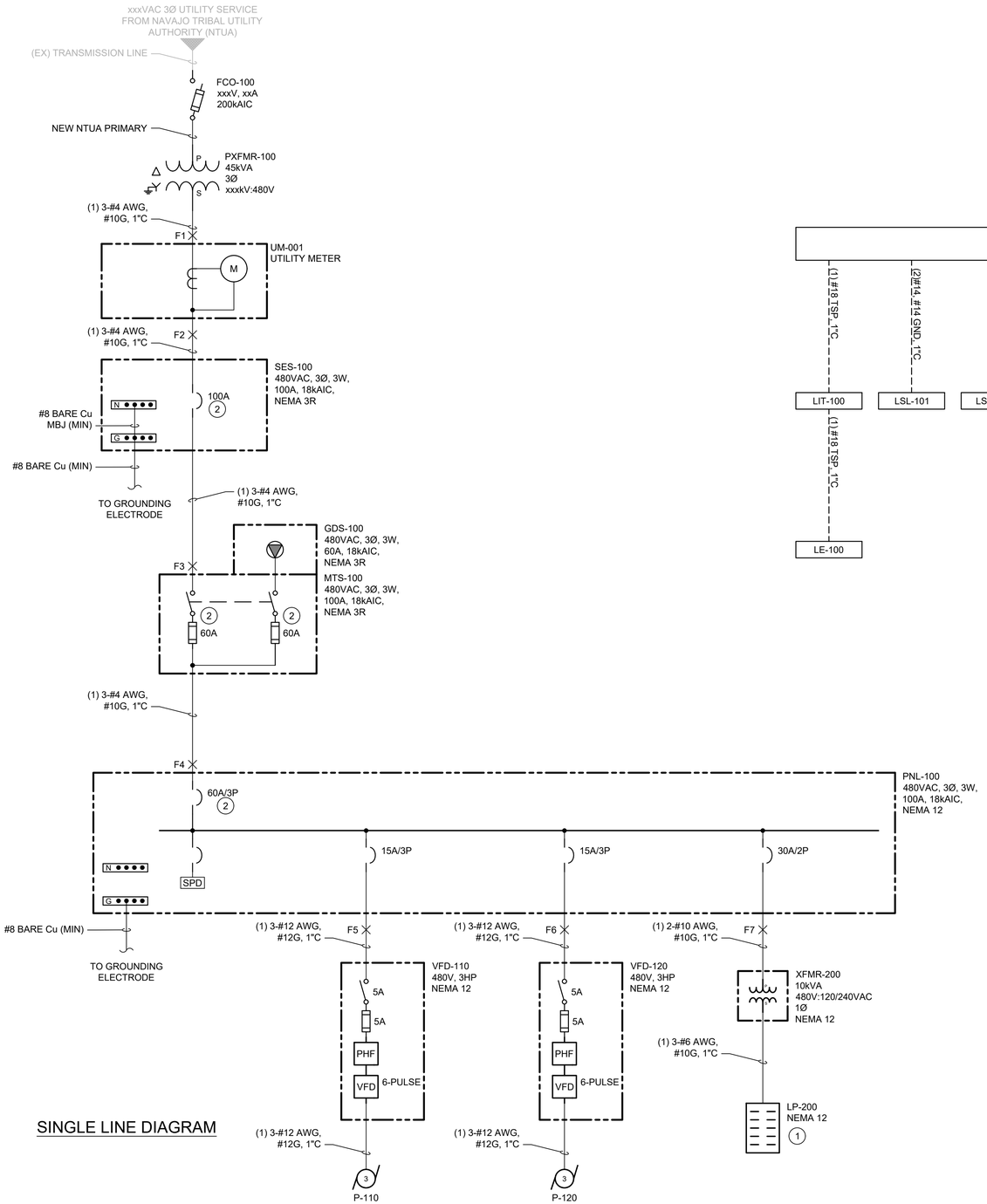
Project Title:
NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title:
ELECTRICAL
COTTONWOOD
DETAILS
SHEET - II

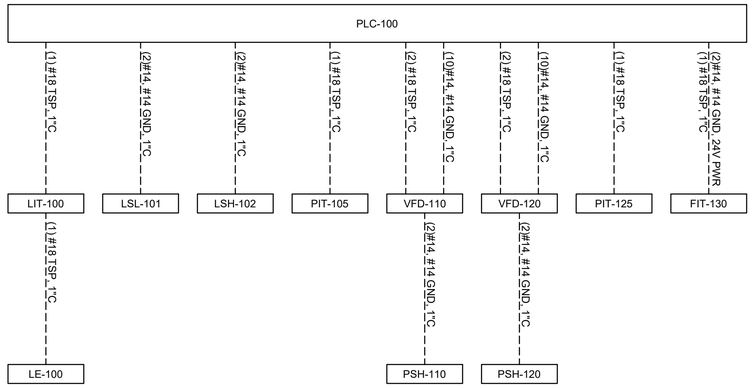
| | |
|---|---|
| Designed By: | RPO |
| Drawn By: | RPO |
| Checked By: | MAB |
| Approved By: | MAB |

CONSOR Project No.: W23250UT
Issued On: APRIL 2024
Drawing No.: E006
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 COTTONWOOD\E006.dwg, Plotted Date: April 3, 2024 11:27 AM 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.



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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
COTTONWOOD
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

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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) | 28.4 | 28.4 | |
| VOLTAGE | 480 | | +25% OF LARGEST MOTOR (A) | 1.0 | 1.0 | |
| PHASE | 3 | | TOTAL AMPS | 29.4 | 29.4 | |
| RATING (A) | 60 | | TOTAL kVA | 24.4 | 24.4 | |

| 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 | 3 | | | 3.8 | 100% | 100% | 3.8 | |
| NEW | P-120 | BOOSTER PUMP 2 | MOTOR | 3 | | | 3.8 | 100% | 100% | 3.8 | |
| 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 | - | - | 10,825 |
| UM-100 | SES-100 | F2 | 10,825 | 480 | 1/0 | Cu | 1 | 10 | PVC | 1/C | 9,317 | 0.04 | 0.96 | 10,389 |
| SES-100 | MTS-100 | F3 | 10,389 | 480 | 1/0 | Cu | 1 | 10 | PVC | 1/C | 9,317 | 0.04 | 0.96 | 9,988 |
| MTS-100 | PNL-100 | F4 | 9,988 | 480 | 1/0 | Cu | 1 | 10 | PVC | 1/C | 9,317 | 0.04 | 0.96 | 9,616 |
| PNL-100 | VFD-110 | F5 | 9,616 | 480 | 12 | Cu | 1 | 10 | PVC | 1/C | 617 | 0.56 | 0.64 | 6,155 |
| PNL-100 | VFD-120 | F6 | 9,616 | 480 | 12 | Cu | 1 | 10 | PVC | 1/C | 617 | 0.56 | 0.64 | 6,155 |
| PNL-100 | XFMR-200 | F7 | 9,616 | 480 | 10 | Cu | 1 | 10 | PVC | 1/C | 982 | 0.35 | 0.74 | 7,105 |

## 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 | | 2 | CONT | 20 | EF-1 |
| LIGHTING | 20 | CONT | 3 | | 180 | 4 | | 62 | 4 | CONT | 20 | EF-2 |
| SPARE | 20 | CONT | 5 | 0 | | 6 | 3000 | | 6 | CONT | 35 | UH-1 |
| SPARE | 20 | CONT | 7 | | 0 | 8 | | 1200 | 8 | CONT | 20 | PLC |
| SPARE | 20 | CONT | 9 | 0 | | 10 | 0 | | 10 | CONT | 20 | SPARE |
| SPARE | 20 | CONT | 11 | | 0 | 12 | | 0 | 12 | CONT | 20 | SPARE |
| SPACE | | CONT | 13 | 0 | | 14 | 0 | | 14 | CONT | | SPACE |
| SPACE | | CONT | 15 | | 0 | 16 | | 0 | 16 | CONT | | SPACE |
| SPACE | | CONT | 17 | 0 | | 18 | 0 | | 18 | CONT | | SPACE |
| SPACE | | CONT | 19 | | 0 | 20 | | 0 | 20 | CONT | | SPACE |
| SPACE | | CONT | 21 | 0 | | 22 | 0 | | 22 | CONT | | SPACE |
| SPACE | | CONT | 23 | | 0 | 24 | | 0 | 24 | CONT | | SPACE |
| SPACE | | CONT | 25 | 0 | | 26 | 0 | | 26 | CONT | | SPACE |
| SPACE | | CONT | 27 | | 0 | 28 | | 0 | 28 | CONT | | SPACE |
| SPACE | | CONT | 29 | 0 | | 30 | 0 | | 30 | CONT | | SPACE |
| SPACE | | CONT | 31 | | 0 | 32 | | 0 | 32 | CONT | | SPACE |
| SPACE | | CONT | 33 | 0 | | 34 | 0 | | 34 | CONT | | SPACE |
| SPACE | | CONT | 35 | | 0 | 36 | | 0 | 36 | CONT | | SPACE |
| SPACE | | CONT | 37 | 0 | | 38 | 0 | | 38 | CONT | | SPACE |
| SPACE | | CONT | 39 | | 0 | 40 | | 0 | 40 | CONT | | SPACE |
| SPACE | | CONT | 41 | 0 | | 42 | 0 | | 42 | CONT | | SPACE |

| | | |
|---|---|---|
| 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 | |

NOTES:

## 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
COTTONWOOD
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

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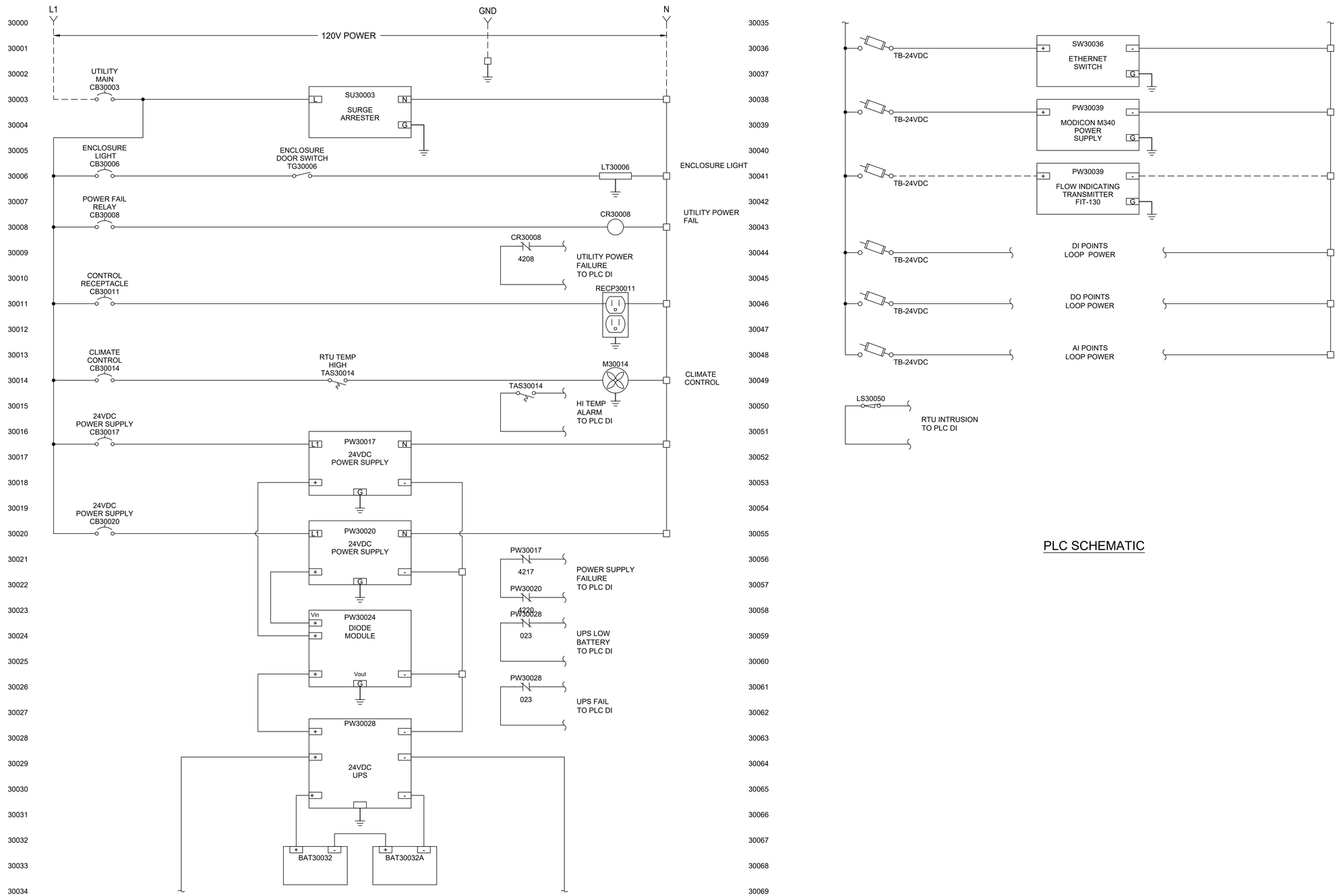


GENERAL NOTES:

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. 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

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Client / Owner: NAVAJO TRIBAL UTILITY AUTHORITY

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

Drawing Title: ELECTRICAL COTTONWOOD
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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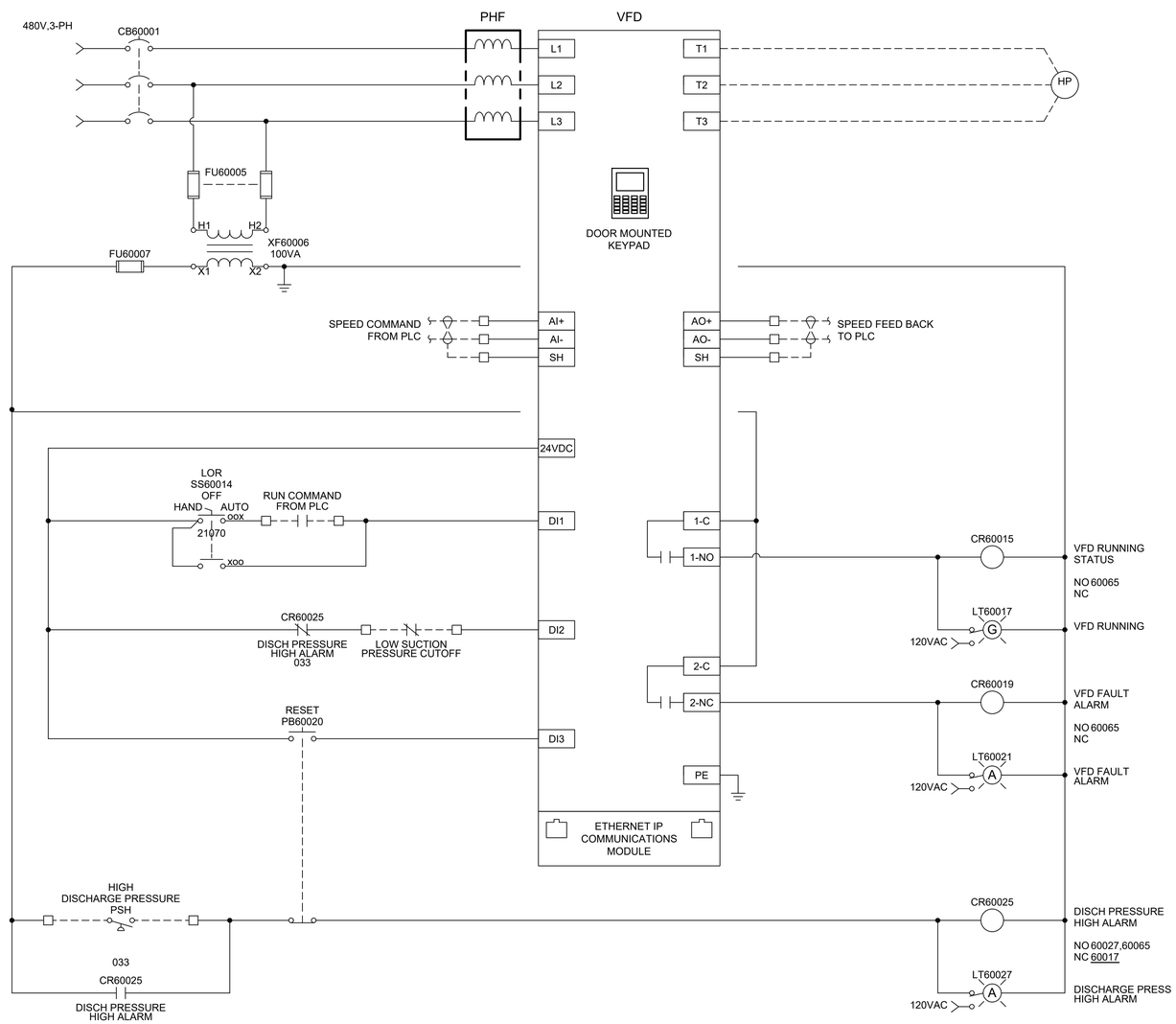



GENERAL NOTES:

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:

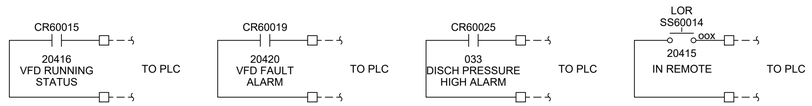
a. AT A MINIMUM PROVIDE THE FOLLOWING PARAMETERS FOR MOTOR PROTECTION ON ALL LOAD TYPES.

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)

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**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 COTTONWOOD
SCHEMATIC VFD

| | |
|---|---|
| Designed By: RPO | CONSOR Project No.: W23250UT |
| Drawn By: RPO | Issued On: APRIL 2024 |
| Checked By: MAB | Drawing No.: E060 |
| Approved By: MAB | 0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE |

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GENERAL NOTES:

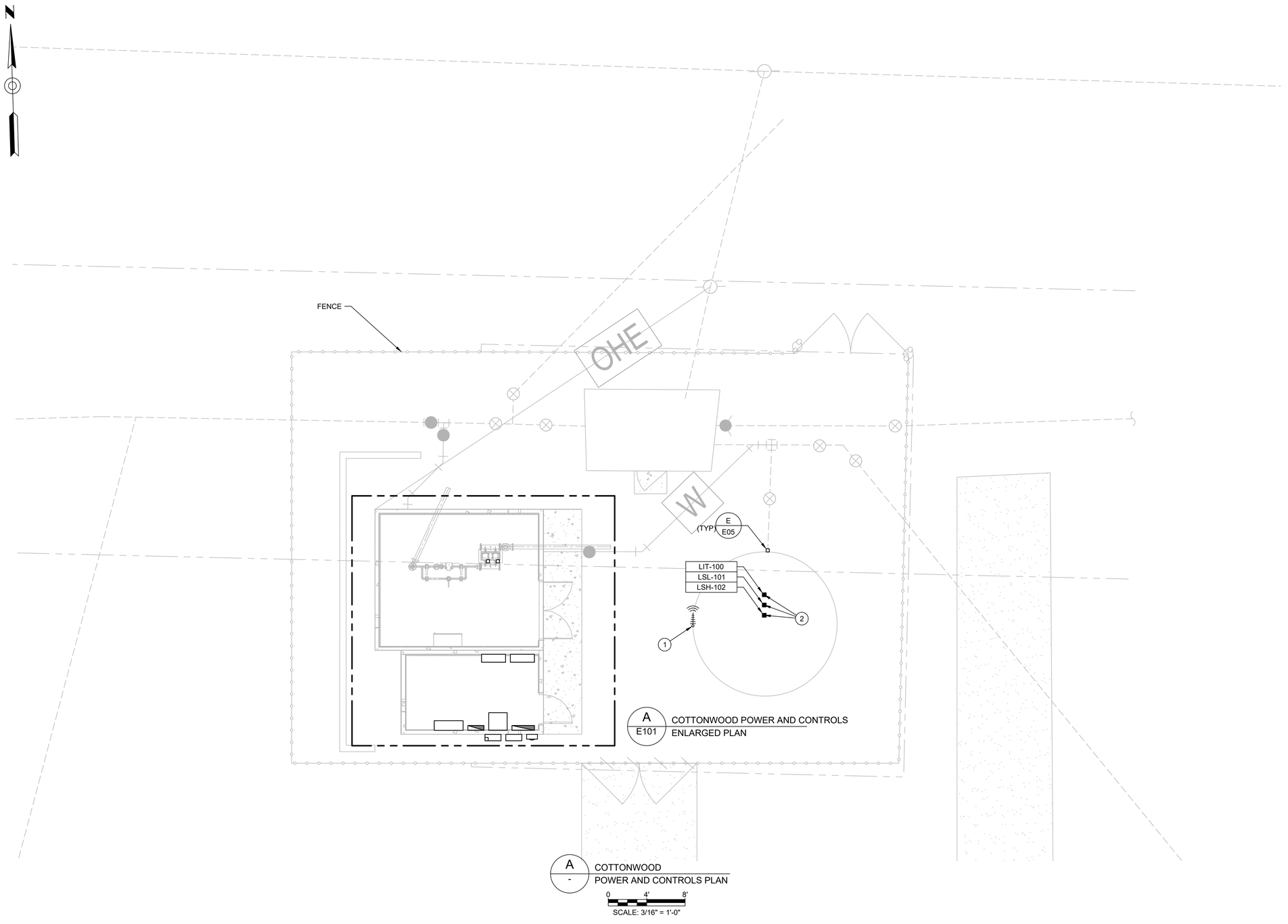
A. CONTRACTOR TO COORDINATE WITH OWNER TO VERIFY LOCATION OF NEW EQUIPMENT.

B. REFER TO CONDUIT BLOCK DIAGRAM FOR CONTROLS CONDUIT ROUTING

C. REFER TO SINGLE LINE DIAGRAM FOR POWER CONDUIT ROUTING.

KEY NOTES:

1. CONTRACTOR TO INSTALL ANTENNA ONTO EXISTING TANK.
2. CONTRACTOR TO VERIFY EXISTING INSTRUMENTS. IF EXISTING INSTRUMENTATION IS NOT FUNCTIONAL, NEW INSTRUMENTS SHALL BE INSTALLED BY CONTRACTOR.




A / E101 COTTONWOOD POWER AND CONTROLS ENLARGED PLAN

A / - COTTONWOOD POWER AND CONTROLS PLAN

0 4' 8'

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

consor

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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
COTTONWOOD

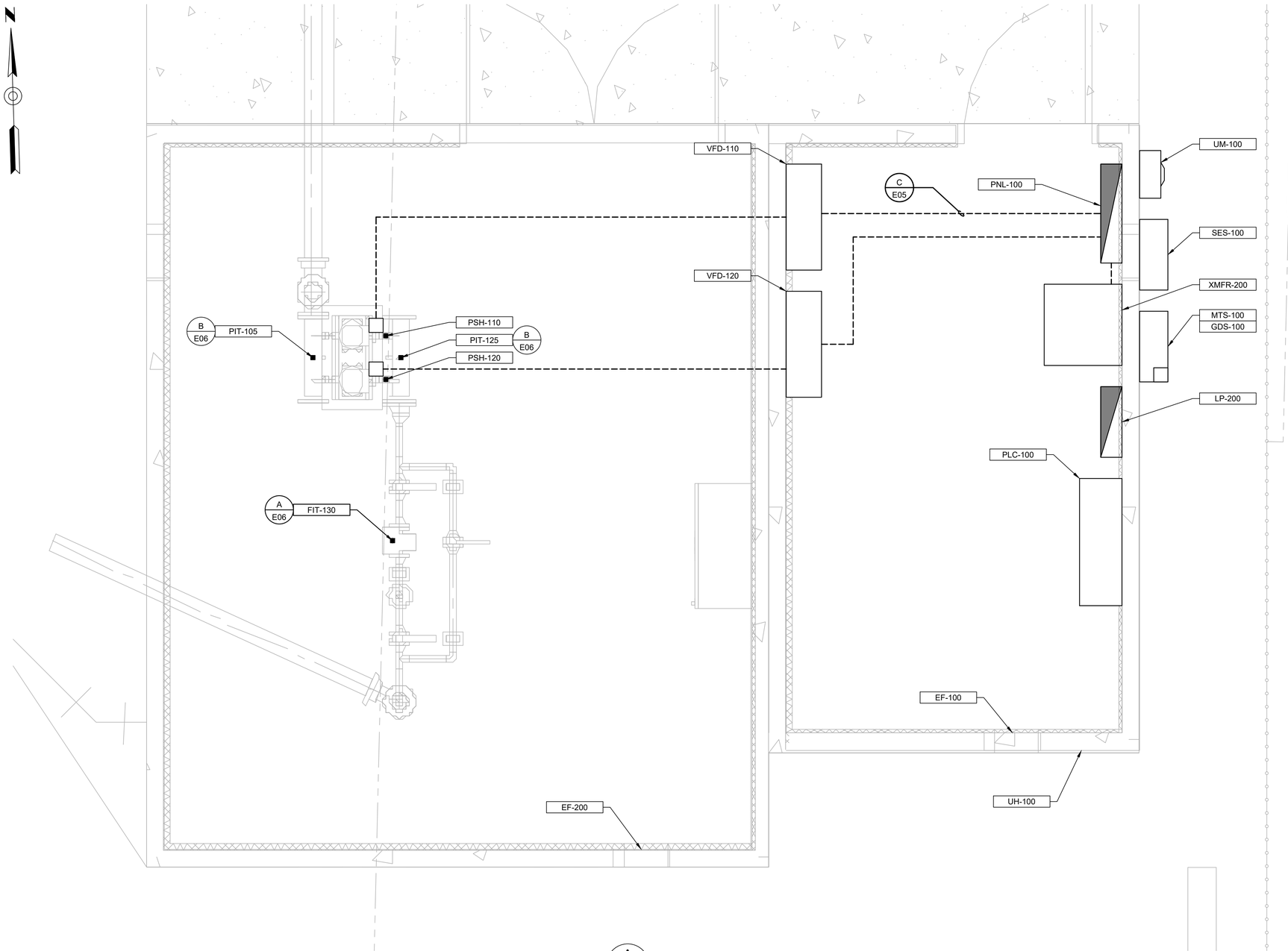
SITE PLAN
POWER & CONTROLS

| | |
|---|---|
| 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

Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\230073 CON - NTUA Four BPS Elec. Eng\8.0 Design\230073 CON - NTUA COTTONWOOD\E100.dwg, Plotted Date: April 3, 2024 11:27 AM By: Ryan Oliver




A COTTONWOOD POWER AND CONTROLS
- ENLARGED PLAN

0 1' 2'

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

GENERAL NOTES:

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

B. REFER TO CONDUIT BLOCK DIAGRAM FOR CONTROLS CONDUIT ROUTING

C. REFER TO SINGLE LINE DIAGRAM FOR POWER CONDUIT ROUTING.



Consultant:
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Client / Owner:
NAVAJO TRIBAL UTILITY AUTHORITY

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

Drawing Title:
ELECTRICAL
COTTONWOOD

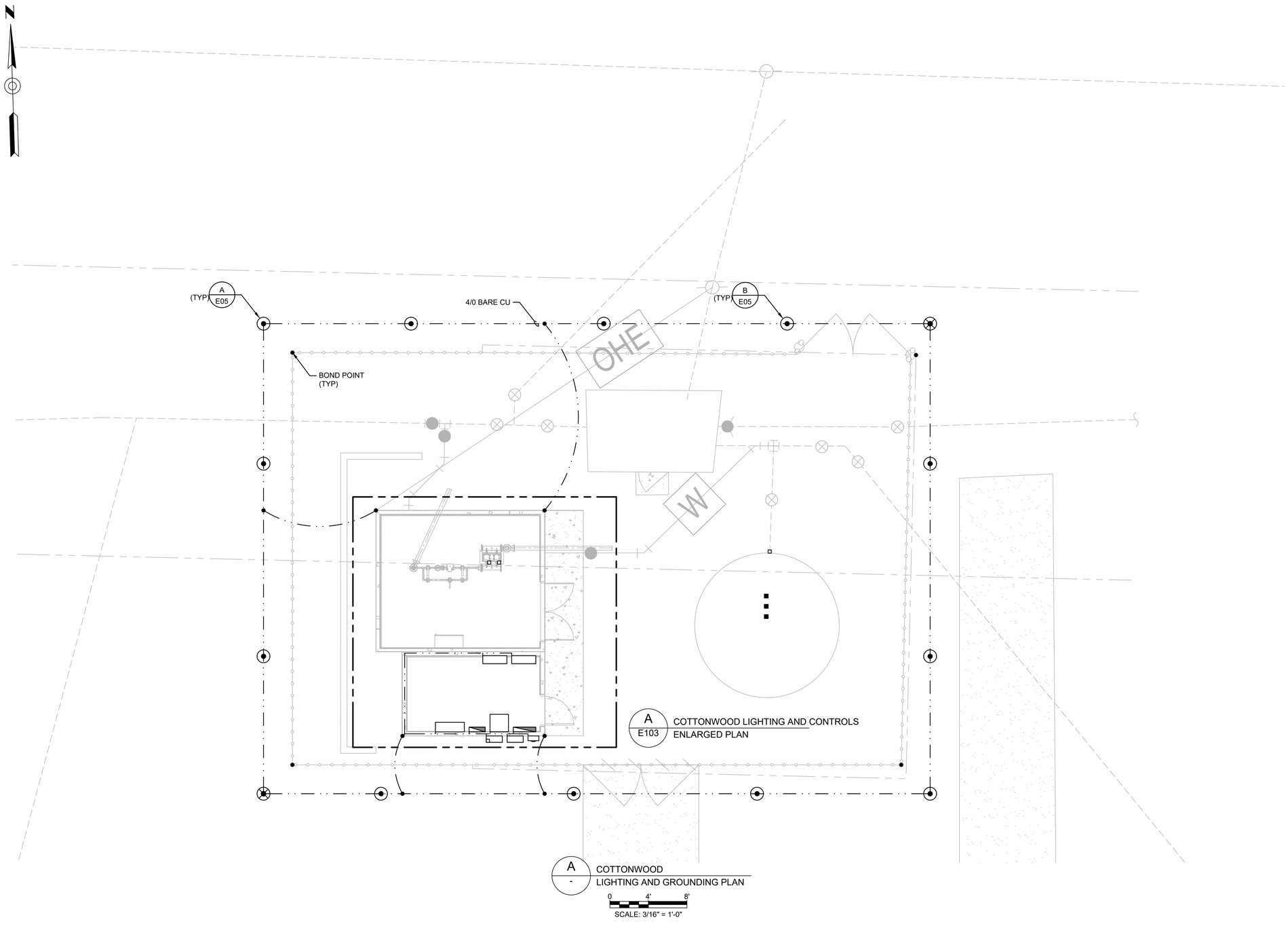
ENLARGED PLAN
POWER & CONTROLS

| | |
|---|---|
| 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 (CE)\Projects\2023\23007\3 CON - NTUA Four BPS Elec. Eng\8.0 Design\230073 CON - NTUA COTTONWOOD\E101.dwg, Plotted Date: April 3, 2024 11:27 AM By: Ryan Oliver

GENERAL NOTES:

A. EXISTING GROUNDING CONDUCTORS MAY EXIST. CONTRACTOR TO INSTALL NEW GROUNDING SYSTEM AS SHOWN ON DRAWINGS.



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Engineer's Seal:

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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:

ELECTRICAL
COTTONWOOD

SITE PLAN
LIGHTING & GROUNDING

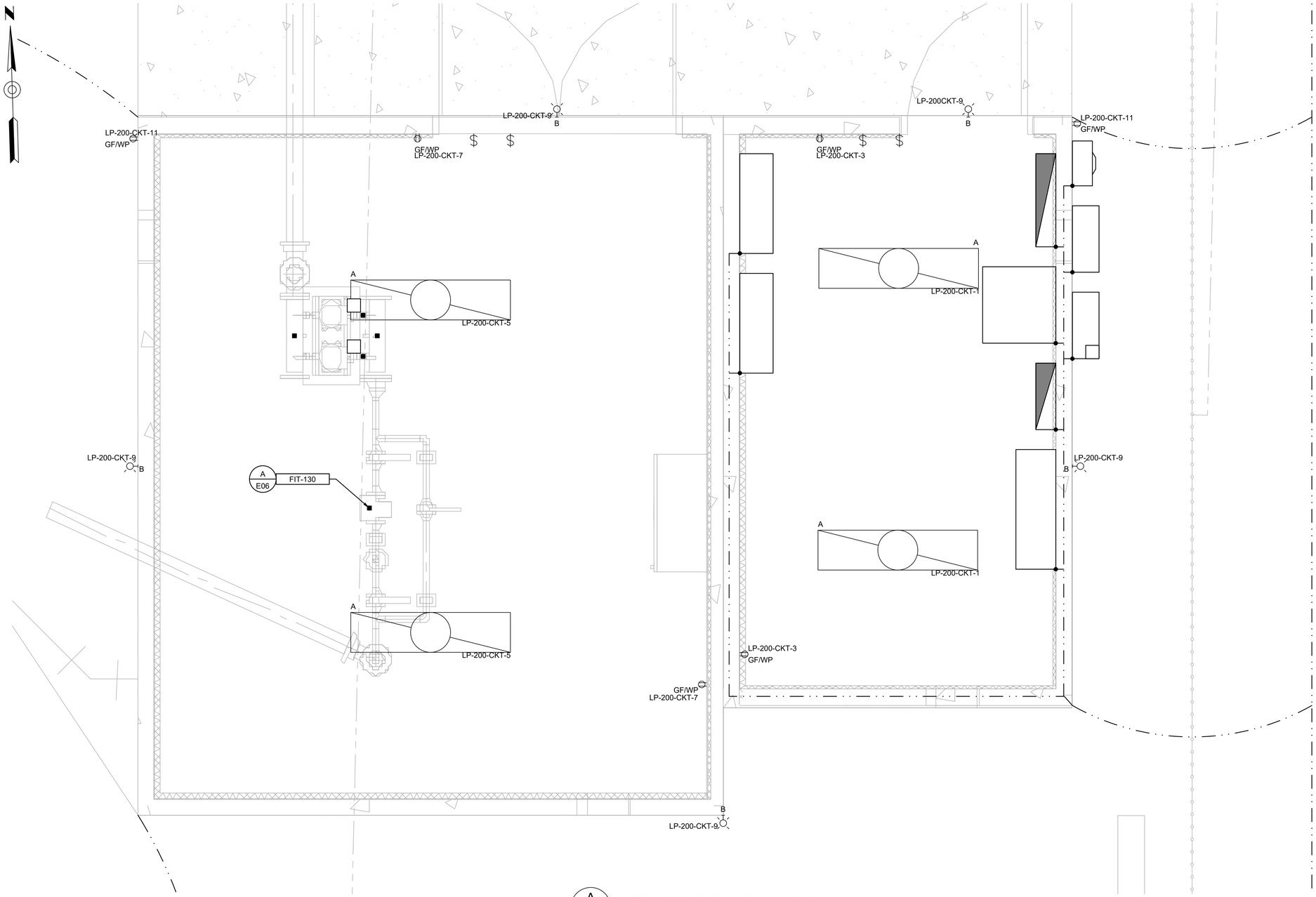
| | |
|---|---|
| Designed By: RPO | CONSOR Project No.: W23250UT |
| Drawn By: RPO | Issued On: APRIL 2024 |
| Checked By: MAB | Drawing No.: E102 |
| Approved By: MAB | 0 1/2 1 IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE |

Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\230073 CON - NTUA Four BPS Elec. Eng\8.0 Design\230073 CON - NTUA COTTONWOOD\E102.dwg, Plotted Date: April 3, 2024 11:27 AM By: Ryan Oliver

GENERAL NOTES:

A. EXISTING GROUNDING CONDUCTORS MAY EXIST. CONTRACTOR TO INSTALL NEW GROUNDING SYSTEM AS SHOWN ON DRAWINGS.

B. ALL NEW EQUIPMENT SHALL BE APART OF A CONTIGUOUS GROUND SYSTEM.




A / - COTTONWOOD LIGHTING AND GROUNDING ENLARGED PLAN

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

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Consultant:

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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:

ELECTRICAL
COTTONWOOD

ENLARGED 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.: | E103 |

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

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## 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

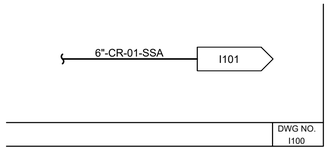
## PROCESS DEVICE SYMBOLS:

- 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

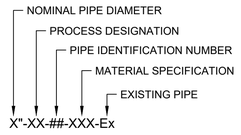
## DRAWING CROSS-REFERENCE SYMBOLOGY FOR PROCESS AND SIGNAL LINES:



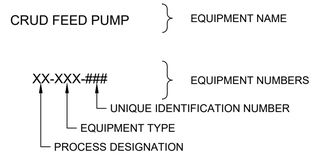

6" CRUD LINE COMES FROM DRAWING I100 AND WILL CONTINUE ON DRAWING I101


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

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

Drawing Title:
P&ID
COTTONWOOD
LEGENDS & 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 (CE)\Projects\2023\230073 CON - NTUA Four BPS Elec. Eng\8.0 Design\230073 CON - NTUA COTTONWOOD\I001.dwg, Plotted Date: April 3, 2024 11:27 AM 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

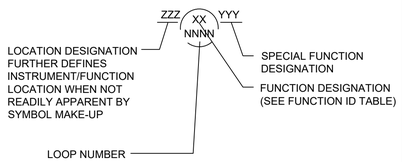
## INSTRUMENT AND FUNCTION SYMBOLS:

- 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

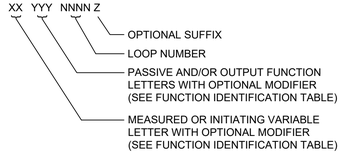
NOTE:
ANY OF THE ABOVE SYMBOLS MAY BE SHOWN WITH HORIZONTAL BAR(S) TO INDICATE PANEL MOUNTING AND/OR OPERATOR ACCESSIBLE

- 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:



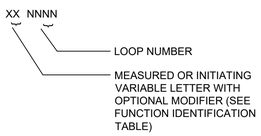

## INSTRUMENT TAG NUMBERS:




## 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:

- PURGE OR FLUSHING DEVICE (P)
- RESET FOR LATCH-TYPE OPERATOR (R)
- BUBBLER PANEL (B)
- CONTROL UNIT (C)
- INTERLOCK (I)
- 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

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

Drawing Title: P&ID
COTTONWOOD

LEGENDS & 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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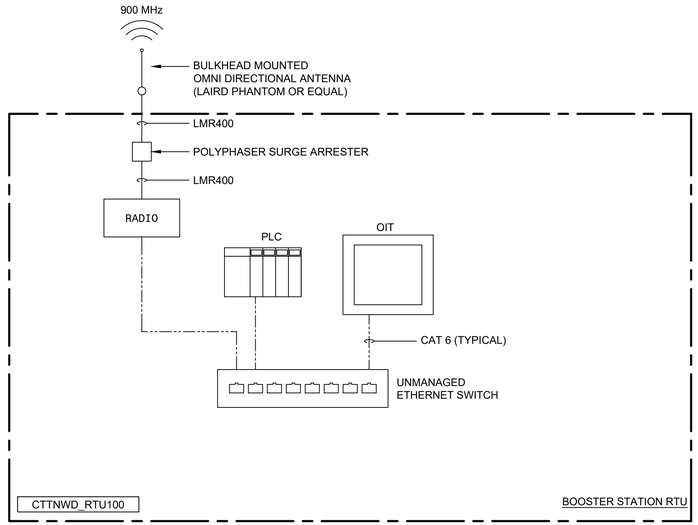




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Client / Owner:

NAVAJO TRIBAL UTILITY AUTHORITY
UTILITIES FOR THE NAVAJO NATION

Project Title:

NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title:

P&ID
COTTONWOOD

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 |

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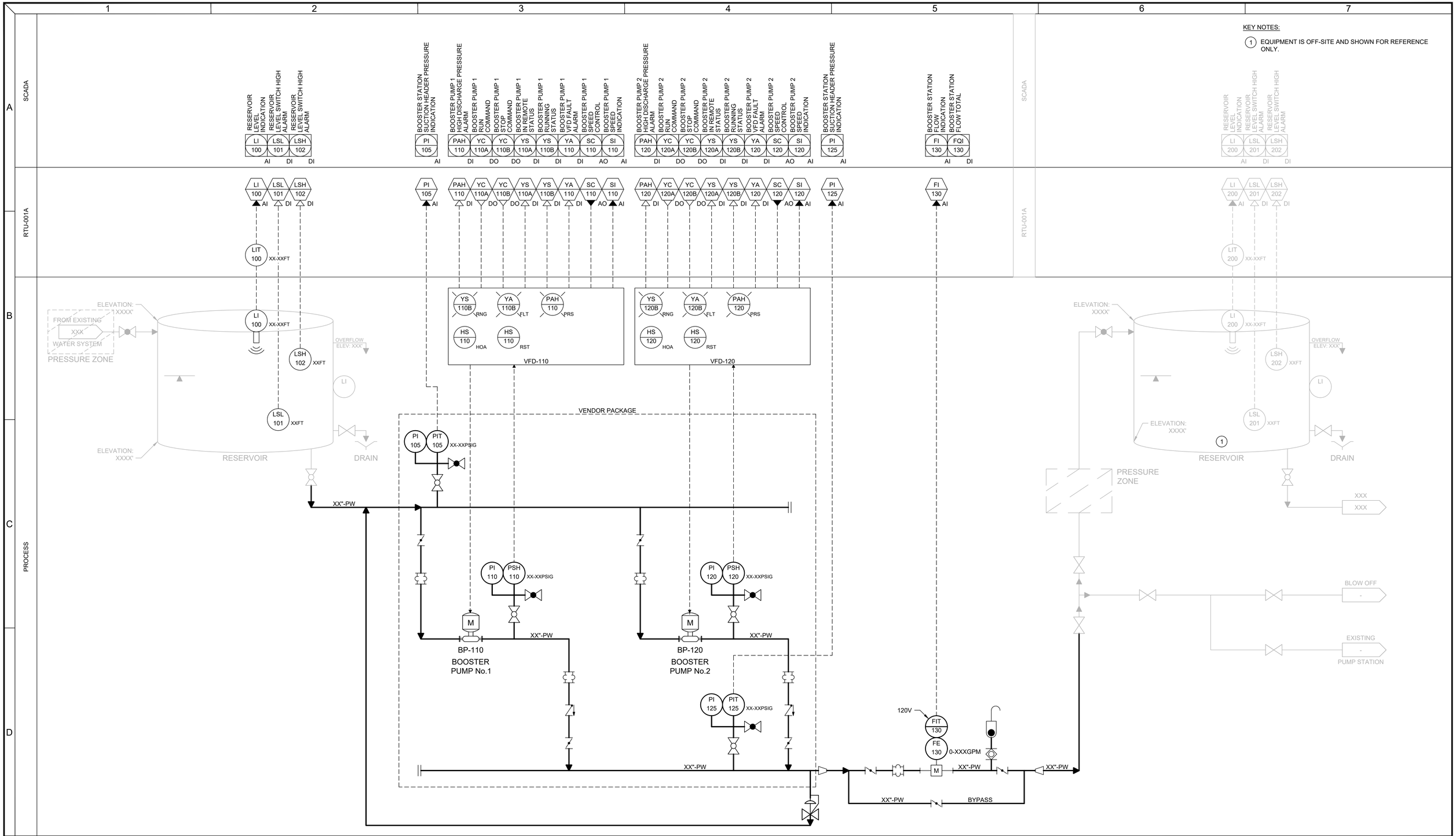


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# 90% SUBMITTAL

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

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

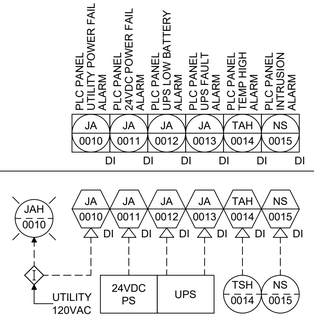
Project Title: NAVAJO TRIBAL UTILITY AUTHORITY
B-1 BOOSTER BUMP STATION

Drawing Title: P&ID
COTTONWOOD
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

Drawing Path and Name: C:\Users\Public\Dropbox (CE)\Projects\2023\230073 CON - NTUA Four BPS Elec. Eng\8.0 Design\230073 CON - NTUA COTTONWOOD\I010.dwg, Plotted Date: April 3, 2024 11:27 AM By: Ryan Oliver




PROCESS



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
COTTONWOOD
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 |

Drawing Path and Name: C:\Users\Public\Dropbox (CEI)\Projects\2023\23073 CON - NTUA Four BPS Elec. Eng\8.0 Design\23073 CON - NTUA COTTONWOOD\I011.dwg. Plotted Date: April 3, 2024 11:28 AM By: Ryan Oliver