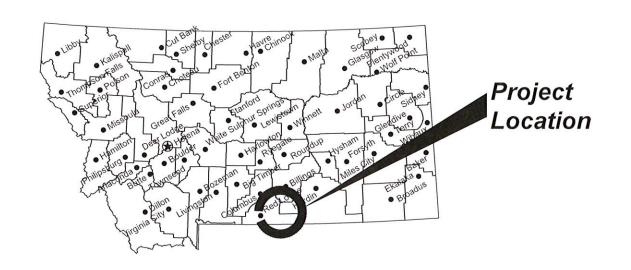
MONTANA FISH, WILDLIFE & PARKS

BLUEWATER SPRINGS TROUT HATCHERY ARTESIAN WELL HEAD DEVELOPMENT

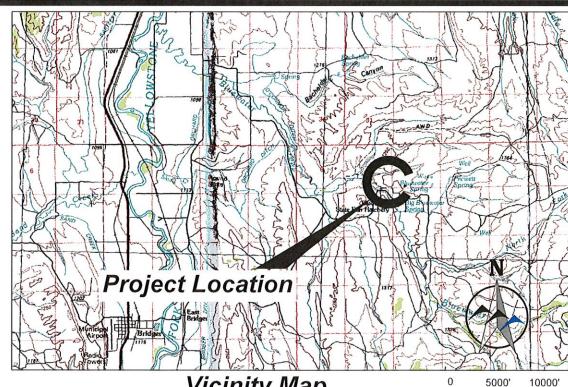
near Bridger, Carbon County, Montana

FWP PROJECT # 7113112



Location Map





Vicinity Map

MONTANA FISH, WILDLIFE AND PARKS **DESIGN AND CONSTRUCTION**

MAILING ADDRESS: PO BOX 200701

PHYSICAL ADDRESS: 1522 9th AVENUE

HELENA, MT 59620-0701

HELENA, MT 59601

TEL 406.841.4000

fwp.mt.gov/Doing Business/Design&Construction

	Sheet List Table
Sheet Number	Sheet Title

EXISTING SITE LAYOUT

WATER LINE PLAN AND PROFILE

FLOOR PLAN A-A' PROFILE VIEW B-B' PROFILE VIEW C-C' PROFILE VIEW HELLAN AUTOMATIC SCREENS NORTH ELEVATION FRAMING

DRAWING INDEX

EAST & WEST FRAMING ELEVATION ROOF FRAMING PLAN DETAILS **DETAILS** ELECTRICAL PLANS

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APPROVED BY: APPROVED BY:

MONTANA FISH, **WILDLIFE & PARKS**

BLUEWATER SPRINGS TROUT HATCHERY

ARTESIAN WELL HEAD DEVELOPMENT - COVER

SOUTH ELEVATION FRAMING

GENERAL CONSTRUCTION NOTES

- UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS, ALL WORK SHALL CONFORM TO MPWSS, LATEST EDITION, DEQ CIRCULARS 1 AND 4, AND THESE PLANS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS REQUIRED AND CONSTRUCTION TESTING FOR CONSTRUCTION ACTIVITIES
- THE CONTRACTOR SHALL RESTORE ALL ROADWAY TO EQUAL OR BETTER CONDITION THAN EXISTED PRIOR TO CONSTRUCTION, AS DETERMINED BY THE OWNER AND THE **ENGINEER**
- THE LOCATION, DEPTH AND SIZE OF EXISTING UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL FIELD VERIFY THE EXISTENCE, LOCATION, DEPTH, SIZE, LINE AND GRADE OF EXISTING UTILITY CONNECTIONS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING FACILITIES DUE TO FAILURE TO LOCATE OR PROVIDE PROPER PROTECTION WHEN LOCATION IS KNOWN.
- ALL BACKFILL FOR UTILITY TRENCHES SHALL BE TYPE "A," UTILIZING TYPE 1 BEDDING, UNLESS DIRECTED OTHERWISE BY ENGINEER. SPECIFIED BEDDING SHALL BE FROM 4" BENEATH THE PIPE TO 6" ABOVE THE TOP OF PIPE (SEE MPWSS STANDARD DRAWING 02221-1). THE COST OF THIS ADDITIONAL BEDDING SHALL BE INCLUDED IN THE UNIT PRICE BID.
- PIPE BEDDING (TYPE 1) AND TRENCH BACKFILL (TYPE B) SHALL BE IN ACCORDANCE WITH MPW STANDARD SPECIFICATION 02221, STANDARD DRAWING 02221-1
- THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST AND EROSION DURING CONSTRUCTION AT CONTRACTOR'S EXPENSE. EROSION SHALL BE CONTROLLED IN ACCORDANCE WITH MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY REGULATIONS.
- ALL PROFILES REPRESENT EXISTING GROUND (DASHED LINE) AND FINISHED GRADE (SOLID LINE) ALONG THE ALIGNMENTS INDICATED ON THE PLANS. ELEVATIONS ARE FINISHED
- ALL DISTURBED AREAS SHALL BE SEEDED BY THE CONTRACTOR USING A SEED MIX APPROVED BY THE OWNER OR THE LOCAL USDA OFFICE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF UTILITY (PHONE/POWER/CATV) INSTALLATION WITH LOCAL UTILITY COMPANIES
- THE CONTRACTOR SHALL NOTIFY ONE CALL @ 1-800-424-5555 FOR ONSITE UTILITY LOCATION. ALL EXISTING UTILITIES SHALL BE MARKED BEFORE DIGGING.
- THE CONTRACTOR SHALL MAINTAIN SERVICE OF ALL EXISTING UTILITIES. IF SAID SERVICE IS DAMAGED, THE CONTRACTOR SHALL IMMEDIATELY REPAIR THE DAMAGE AT THE CONTRACTOR'S EXPENSE
- THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 48 HOURS PRIOR TO BEGINNING ANY WORK.
- ALL UTILITY CONDUITS FOR IRRIGATION, ELECTRICAL, GAS, PHONE, CATV, ETC. SHALL BE BURIED A MINIMUM 24" FROM FINISHED GRADE WITH TYPE A BACKFILL, UTILIZING TYPE 1
- IF THE CONTRACTOR DETERMINES THE NEED TO DISTURB MORE THAN 1.0 ACRE DURING THE CONSTRUCTION OF THE PROJECT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AN MPDES PERMIT AND COMPLYING WITH ALL TERMS OF THE PERMIT. NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK
- QUANTITIES SHOWN IN THESE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ACTUAL QUANTITIES
- 17. ALL WATER PIPING BURIED OR EXPOSED TO BE PAINTED OR MARKED WITH THE COLOR BLUE. BURIED PIPE TO BE LOCATED WITH "WATER" TRACE TAPE.
- ALL BURIED FITTINGS, VALVES, AND APPURTENANCES TO BE ENCASED IN POLYETHYLENE WRAP AND HAVE CATHODIC PROTECTION (PROMAG H-1 20D2), OR BE COMPLETELY
- ALL WATER CONTACT MATERIALS AND CHEMICALS MUST MEET APPROPRIATE ANSI / AWWA OR ANSI / NSF STANDARDS. PROVIDE ALL CHEMICAL AND WATER CONTACT MATERIAL
- SOLDERS AND FLUX CONTAINING MORE THAN 0.2 PERCENT LEAD AND PIPE FITTINGS CONTAINING MORE THAN 8 PERCENT LEAD MUST NOT BE USED ON SERVICE CONNECTIONS.
- CONTRACTOR TO COORDINATE ACCESS ROUTE AND STAGING AREA WITH OWNER
- ALL PROPOSED PIPE AND APPURTENANCES SHALL HAVE A MINIMUM BURY OF 6 FEET AND BE CERTIFIED LEAD-FREE AND DRINKING WATER SAFE.
- ALL 2-INCH HDPE PIPE BENDS SHALL BE INSTALLED WITH A MINIMUM BEND RADIUS OF 30 TIMES THE OUTSIDE PIPE DIAMETER
- MAINTAIN AT LEAST A 10-FOOT OFFSET, EDGE-TO-EDGE FROM EXISTING GRAVITY SANITARY OR STORM SEWER, SEPTIC TANKS, OR SUBSOIL TREATMENT SYSTEM.

APPROVED BY:

APPROVED BY:

26. ENGINEER'S STAMP IS ONLY APPLICABLE TO THE WATERLINE, PIPING AND HYDRAULICS OF THIS PROJECT

DRAWING NOTATION



INDICATES CROSS SECTION LOCATION. "A" REFERS TO THE CROSS SECTION DESIGNATION. "10" REFERS TO THE SHEET NUMBER WHERE THE SECTION IS CUT OR

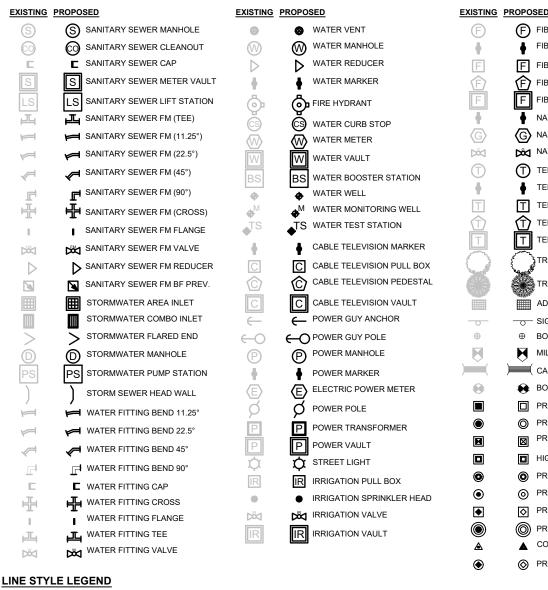


INDICATES DETAIL LOCATION. "1" REFERS TO THE DETAIL DESIGNATION. "12" REFERS TO THE SHEET NUMBER WHERE THE DETAIL IS INDICATED OR

ABRREVIATIONS

BAR BMP BOT BVC CFS CL CMP CONC CP CSP CTR CULV DI DIA EA E.F. EL, ELEV EOV EVC FT	BOTTOM BEGIN VERTICAL CURVE CUBIC FEET PER SECOND CENTERLINE CORRUGATED METAL PIPE CONCRETE OR CONCENTRIC CONTROL POINT CORRUGATED STEEL PIPE CENTER CUBIC FEET CULVERT DUCTILE IRON OR DRAIN INLET DIAMETER EACH EACH FACE ELEVATION EDGE OF PAVEMENT END VERTICAL CURVE FOOT OR FEET	HWY INV LF MH MJ O.C. O.C.E.F. OHP PI POT PS PT PVC PWR RCP RCP RCP RW OR ROW SAN SST STA TBC TYP UG	HIGHWAY INVERT ELEVATION LINEAR FEET MANHOLE MECHANICAL JOINT ON CENTER ON CENTER EACH FACE OVERHEAD POWER POINT OF INTERSECTION POINT ON TANGENT PIPE SUPPORT POINT, POINT OF TANGENCY POLYVINYL CHLORIDE POWER REINFORCED CONCRETE PIPE RIGHT OF WAY SANITARY STAINLESS STEEL STATION TOP BACK OF CURB TYPICAL UNDERGROUND
FT GPM HP	FOOT OR FEET GALLONS PER MINUTE HORSEPOWER	UG WTR	UNDERGROUND WATER

BLOCK LEGEND



PROPOSED

OHT	OHT	— онт — онт —
OHP	OHP	—— OHP ——— OHP ——
-NG	— — — NG— — —	— NG — NG —
-IR	IR	— IR —— IR ——
-FO	— — — FO — — —	— го — го —
-FM	— — — FM— — —	FM FM
0 ——	O	o o
×	X	— x — x —
[] ——	[]	— [1——— [1——
-F	F	— F — F —
OHTV	— — — OHTV — — —	— онту — онту —
-RW	RW	
-ss	ss	— ss —— ss ——
-ST	ST	— st —— st ——
UGP	UGP	—— UGP ——— UGP ——
UGT	UGT	—— UGT ——— UGT ——
UGTV	— — — UGTV — — —	—— UGTV ——— UGTV ——
_w		ww

EXISTING

MAJOR CONTOUR MINOR CONTOUR **OVERHEAD TELEPHONE OVERHEAD POWER**

F FIBER OPTIC MANHOLE

F FIBER OPTIC PULL BOX

F FIBER OPTIC PEDESTAL

FIBER OPTIC VAULT

NATURAL GAS MARKER

(G) NATURAL GAS METER

NATURAL GAS VALVE

T TELEPHONE MANHOLE

♣ TELEPHONE MARKER

T TELEPHONE PULL BOX

TELEPHONE VAULT

TREE (DECIDUOUS)

TREE (CONIFER)

ADA RAMP

BOLLARD

CATTLE GUARD

BORE LOCATION

PROP CORNER ALUMINUM CAP

PROP CORNER CHISELED X

O PROP CORNER BRASS CAP

HIGHWAY ROW MONUMENT

(6) PROP CORNER LEAD & TACK

PROP CORNER PLASTIC CAP

PROP CORNER IRON PIPE

PROP CORNER REBAR

PROP CORNER STONE

▲ CONTROL POINT

MILEPOST

── SIGN

TELEPHONE PEDESTAL

FIBER OPTIC MARKER

NATURAL GAS IRRIGATION LINE FIBER OPTIC **FORCEMAIN** FENCE [CHAIN] FENCE (BARBED) FENCE [PRIVACY] FIRE LINE OVERHEAD TV UNDERGROUND POWER

UNDERGROUND TELEPHONE UNDERGROUND TV WATER

3/17/203 DRAWN BY:

DATE

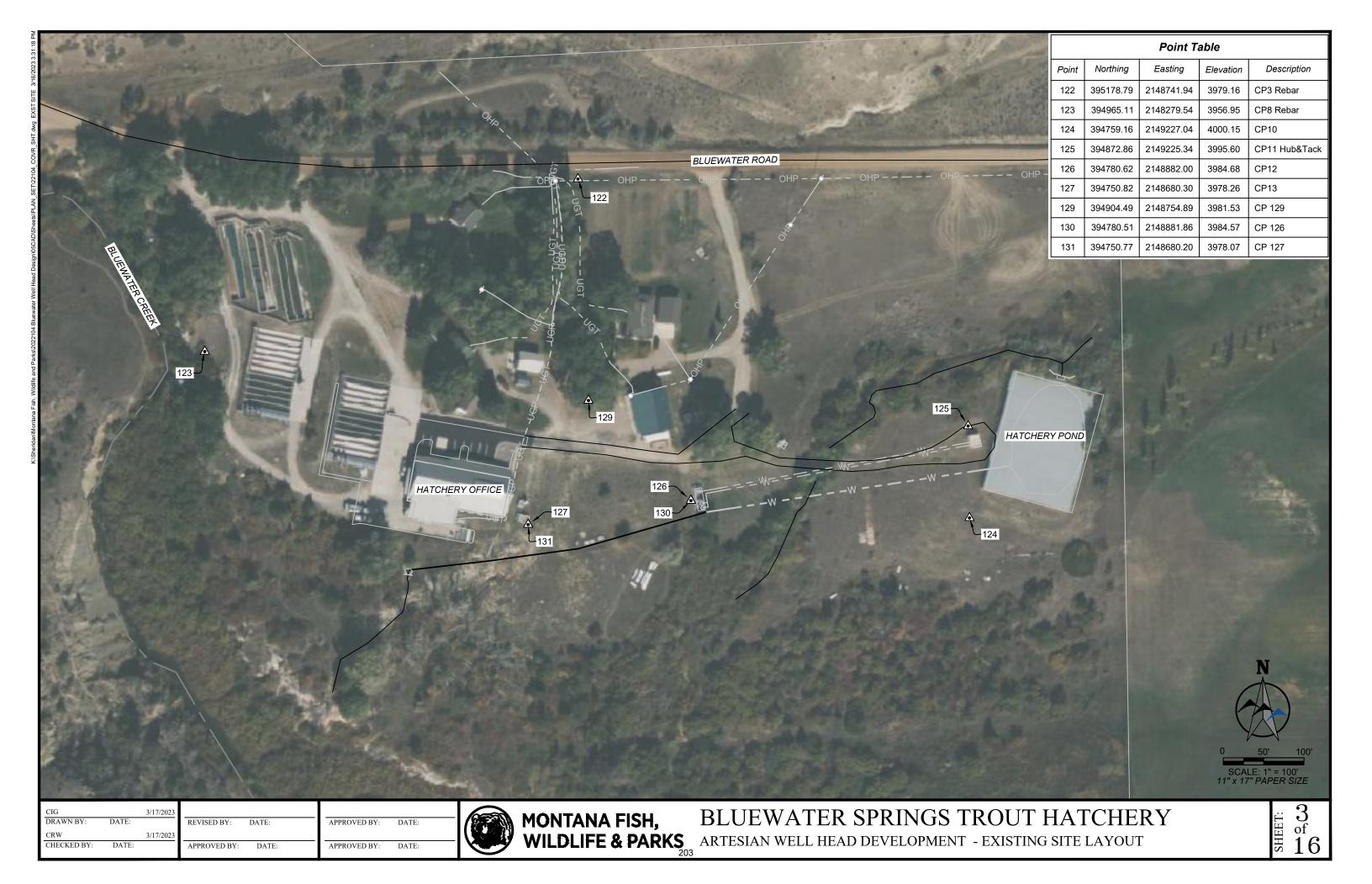
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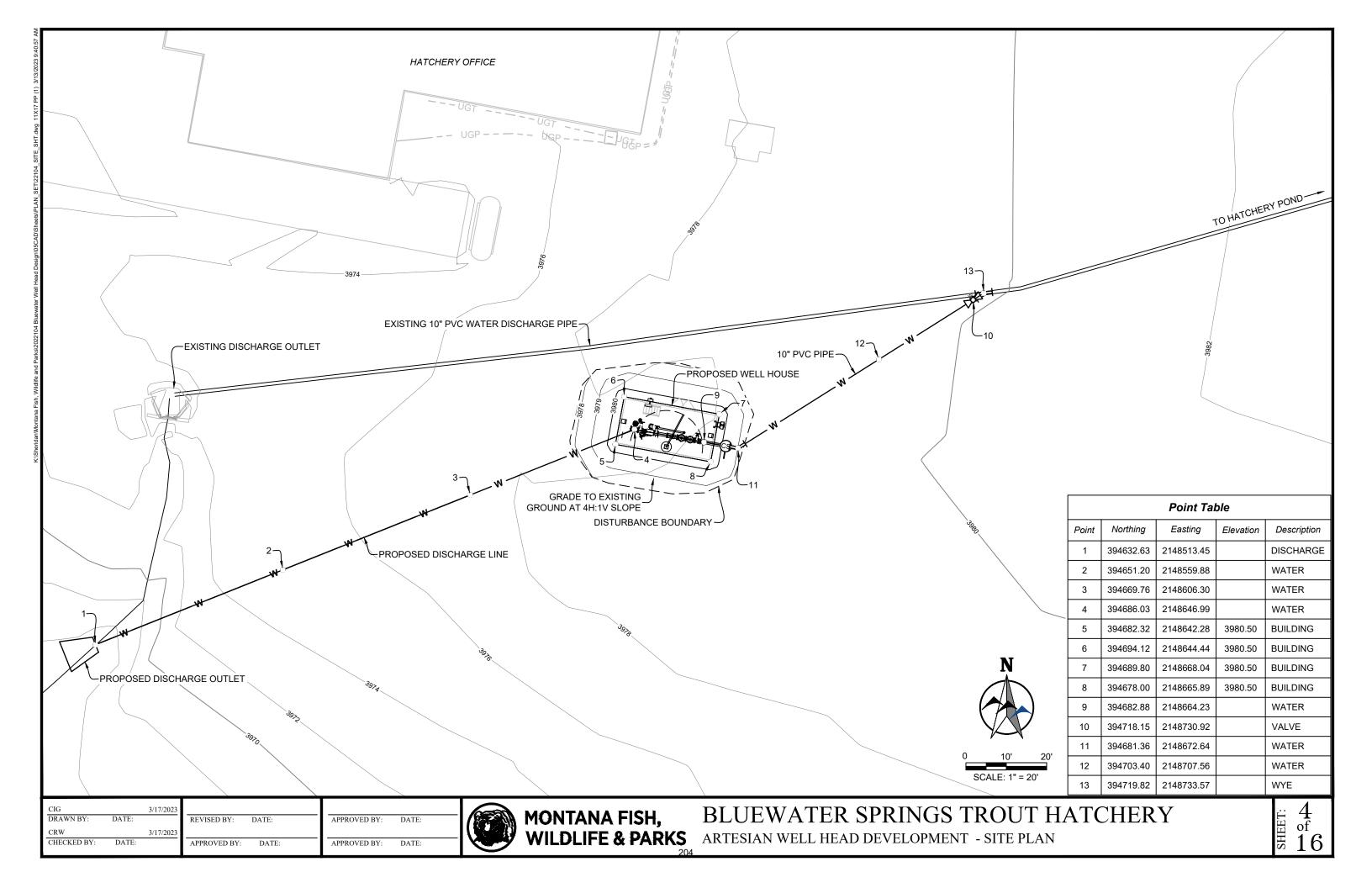
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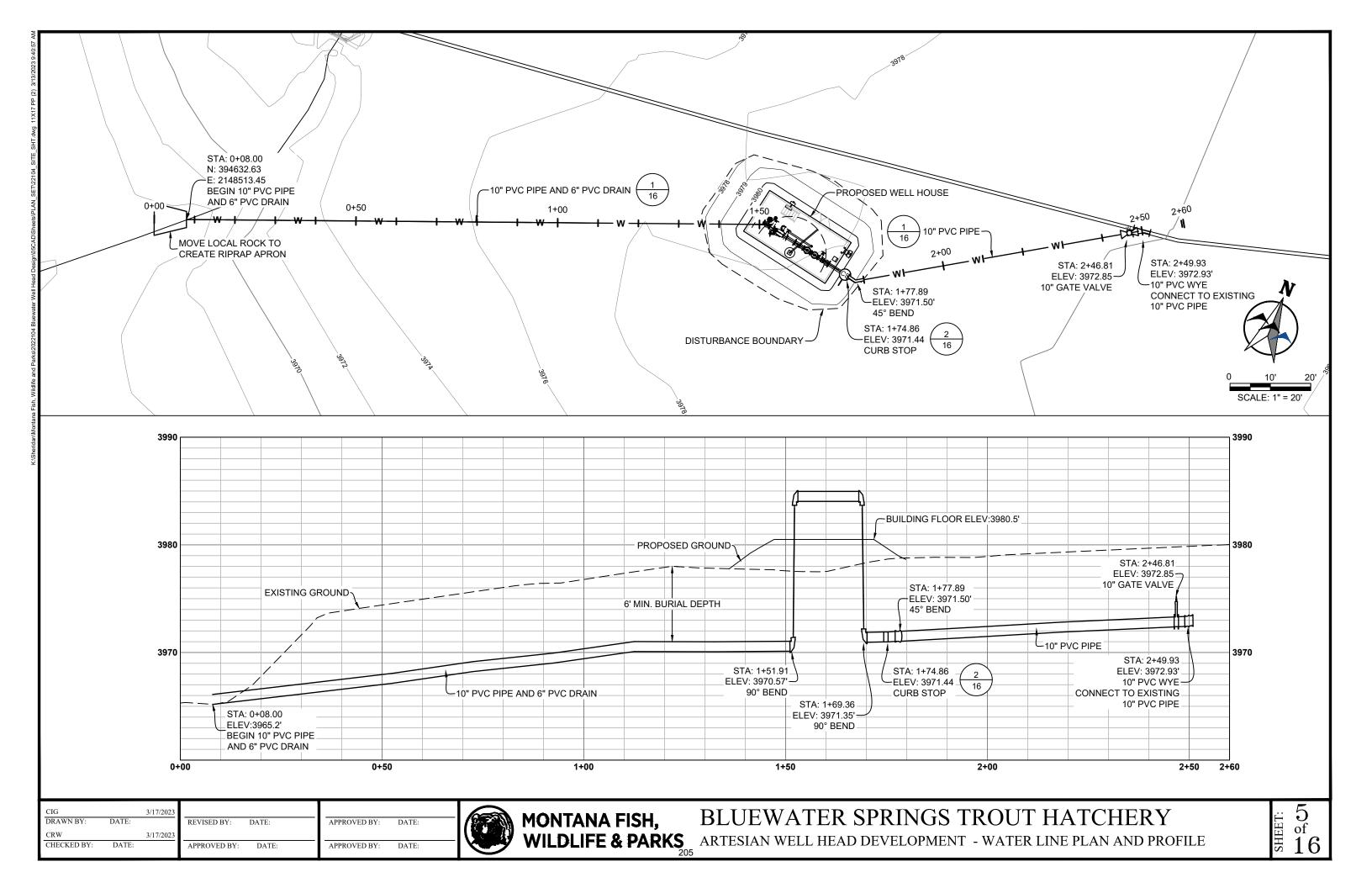
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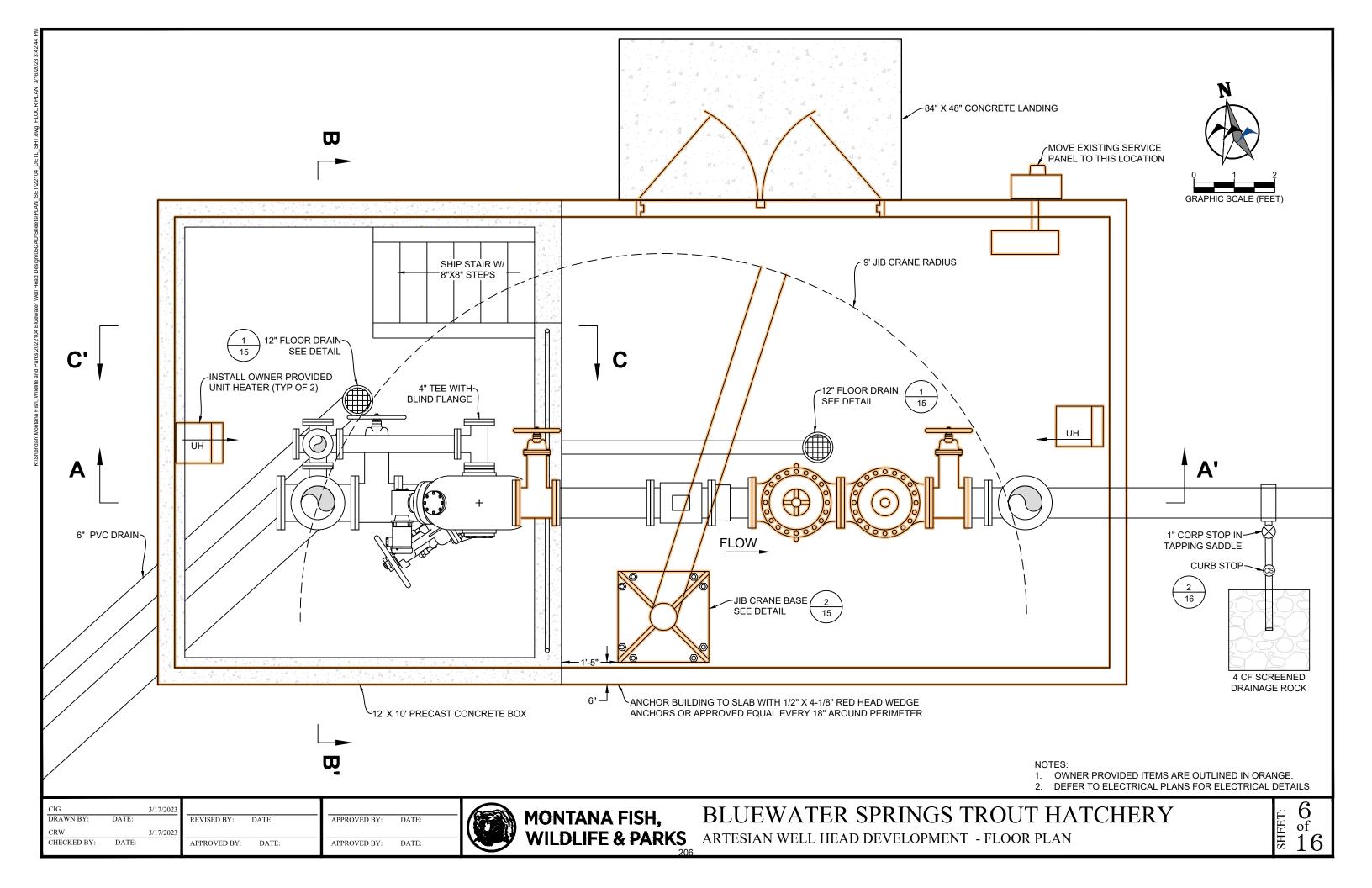
MONTANA FISH,

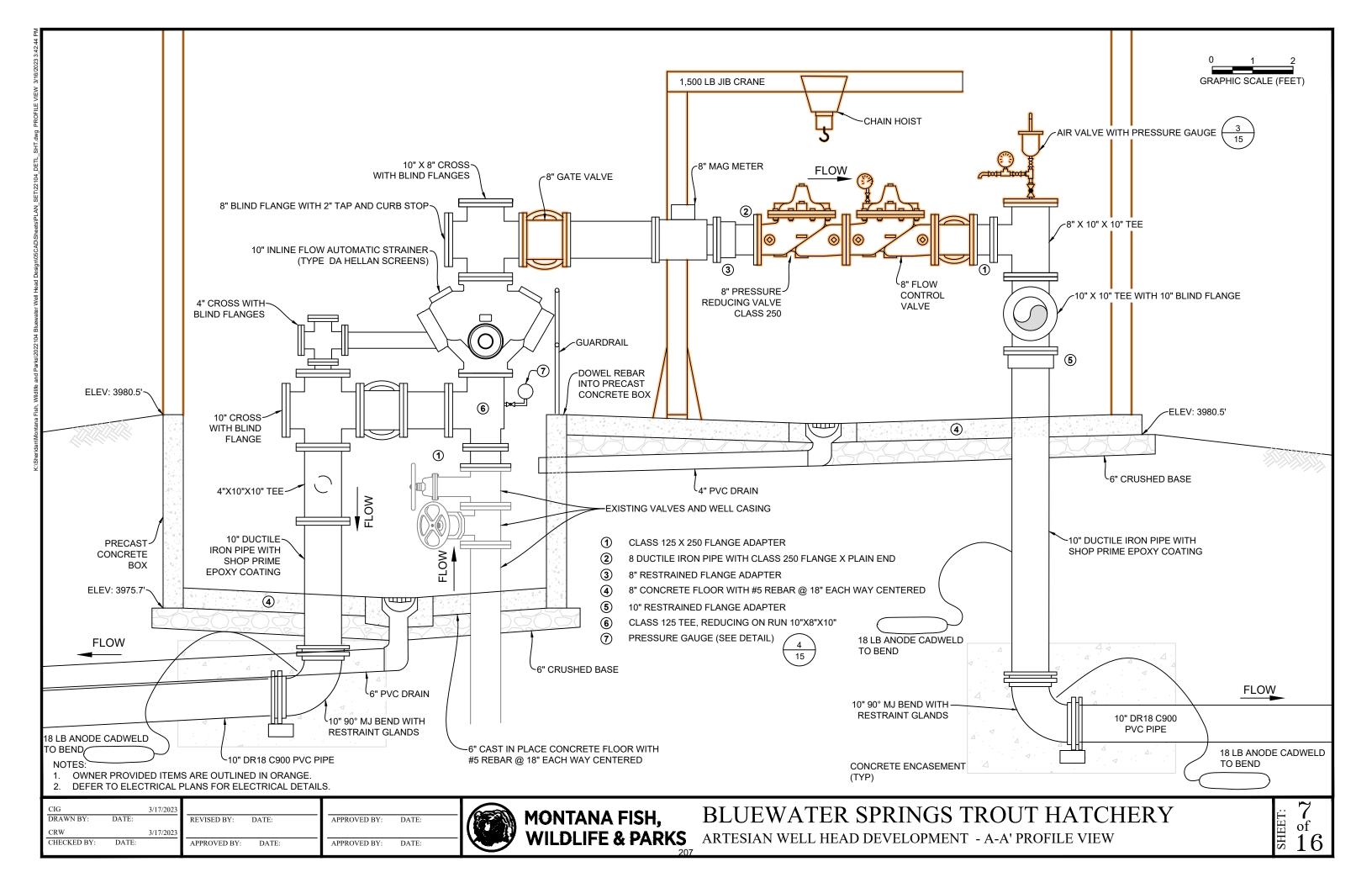
BLUEWATER SPRINGS TROUT HATCHERY

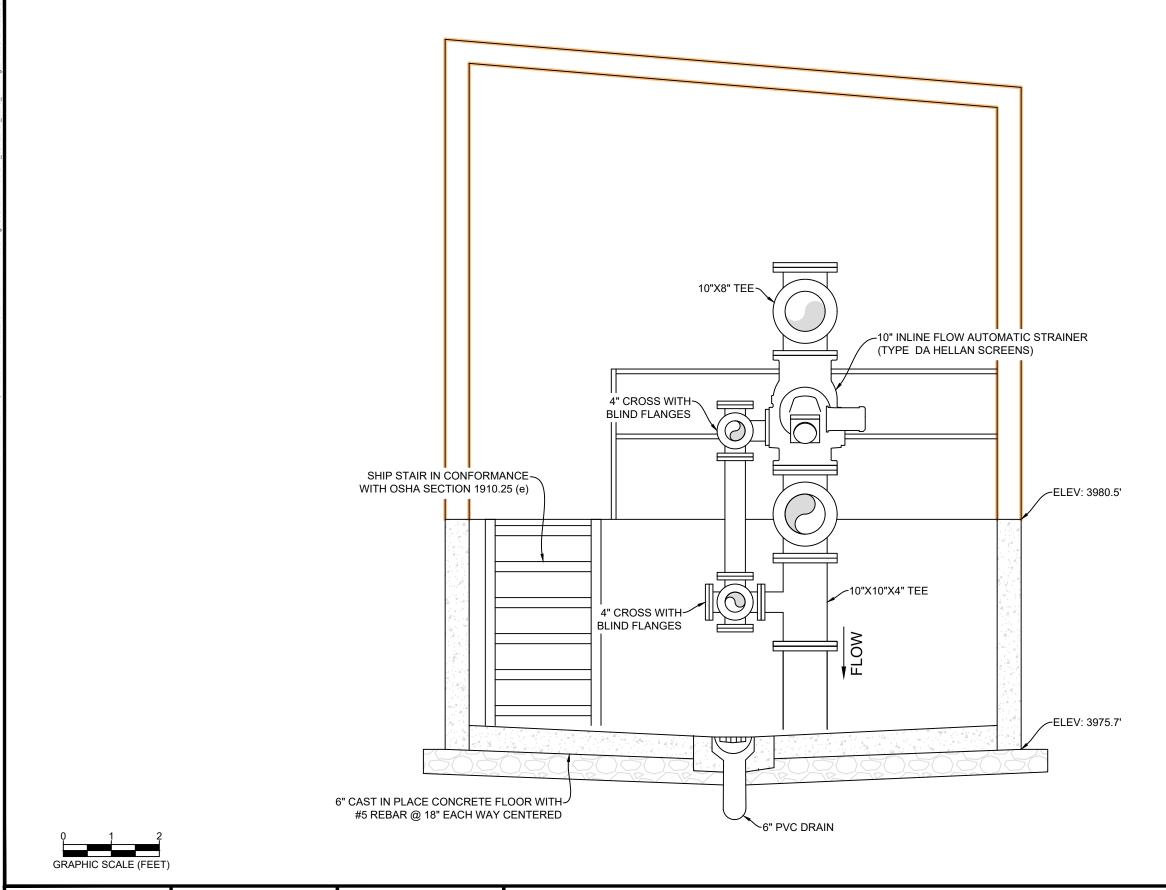












NOTES:

- 1. OWNER PROVIDED ITEMS ARE OUTLINED IN ORANGE.
- 2. DEFER TO ELECTRICAL PLANS FOR ELECTRICAL DETAILS.

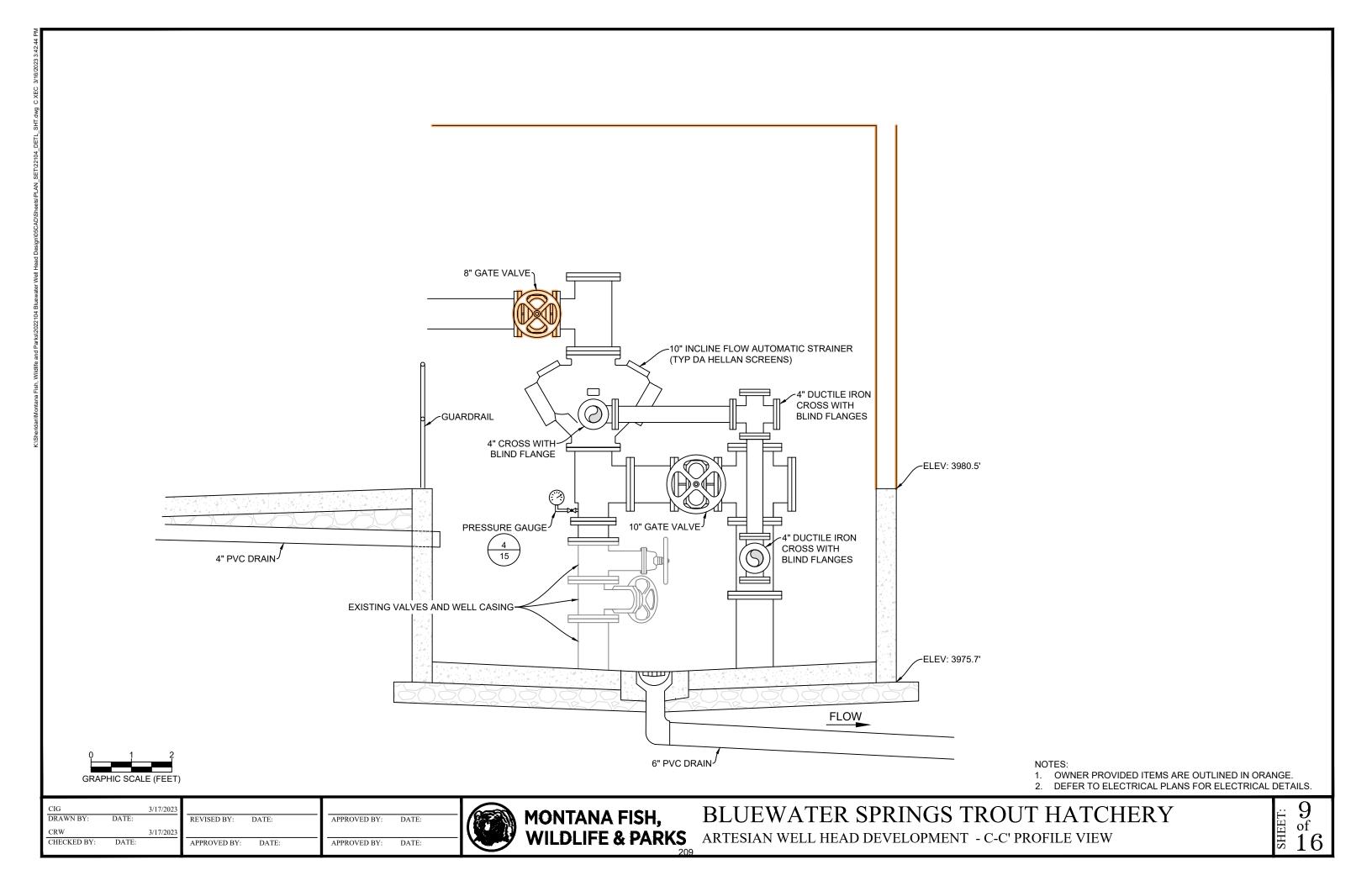
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BLUEWATER SPRINGS TROUT HATCHERY

 $\begin{array}{c} 8 \\ \text{of} \\ 16 \end{array}$

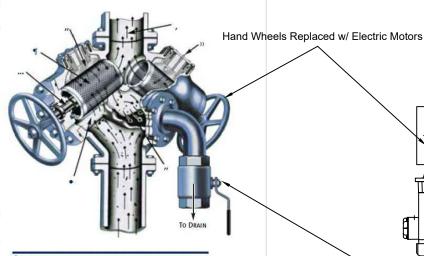


Instead of trapping solids in a basket which then must be removed for frequent clean-outs, the Hellan Strainer removes the solids from fluid without stopping the flow or disassembling the strainer. The sequence of operation is illustrated below.

- ¶ Fluid passes into the strainer and through a screen.
- A deflection rib protects the screen from large objects.
- , The screened fluid flows out of the strainer and into service.
- " Rotating the screen, by either handwheel or motor, moves the outer screen surface against a scraper bar. The scraper bar removes collected debris from the screen's outer surface.
- " Debris moves to the sump area of the strainer where it is removed by periodic flushing.

SPECIAL FEATURES PROVIDE CONVENIENCE AND HIGH PERFORMANCE.

- » External scraper adjustment, if supplied.
- ... O-rings at the screen cover plate and shaft provide a tight seal while allowing operation at low torque.
- % Backwash system is available to remove debris from screen on low pressure applications except 2", 2-1/2" and 3" angle types and 3" D-type.
- Eductor is available at discharge for low-pressure applications.
- ¿ Brush can replace solid scraper on all but 2" and 2-1/2" Angle-type and 2-1/2" and 3" D-type.

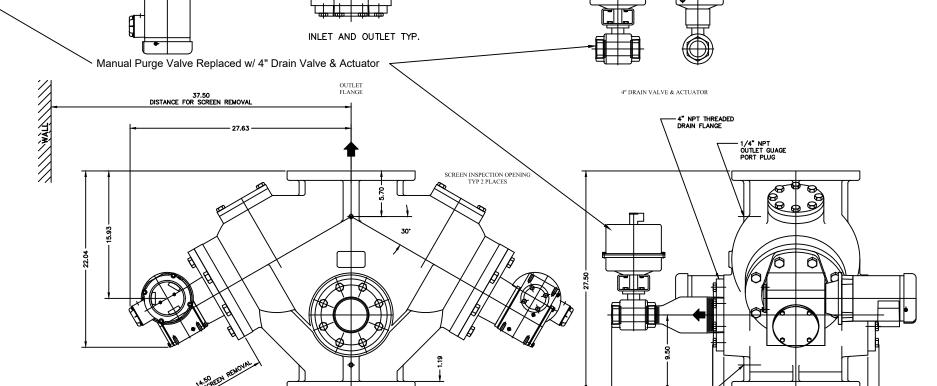


OPERATING FEATURES THAT PROVIDE REAL BENEFITS

- Eliminate downtime for solids removal The Hellan Strainer allows users to eliminate solids and debris from fluids without stopping the flow of the fluid. Processes requiring the fluid continue uninterrupted.
- Employees are not exposed to possible contaminates Debris that may include contaminates and hazardous materials is removed from the fluid flow without disassembly of the strainer. Maintenance personnel and other employees do not come into contact with this debris.
- Minimum labor requirements for solids removal The Hellan Strainer reduces the time required to remove solids from the fluid flow. Manually-operated models require only a periodic turning of the handwheel to remove solids. Labor and cleaning time is usually less than 30 seconds. Labor requirements can be completely eliminated with automatic strainers that can be controlled by timers and/or pressure differential switches.

THE HELLAN° STRAINER COMPANY

CLEVELAND, OHIO USA PHONE (216) 206-4200 • FAX (216) 206-4242



SCREEN DRIVE MOTOR 1/3 HP 1800 RPM 3 PH 60 HZ TYP 2 PLACES

CUSTOMER		4		Clevela	nd Gear Subsidiary or Cleveland, Ohio	Company, F Vesper Corp. 44104 U.S.A.	Inc.		
		ORDER No.		CLEVELAND GEAR CO., INC. CLAIMS PROPRIETARY RIGHTS TO THE DISCUSSED MICHORN. THIS DRAIMING IS ISSUED FOR BIOINEERING IN ONLY AND MAY NOT BE REPRODUCED OR USED FOR MANUEL PURPOSES WITHOUT WRITTEN PERMISSION FROM CLEVELAI		ENGINEERING INFO	RMATION		
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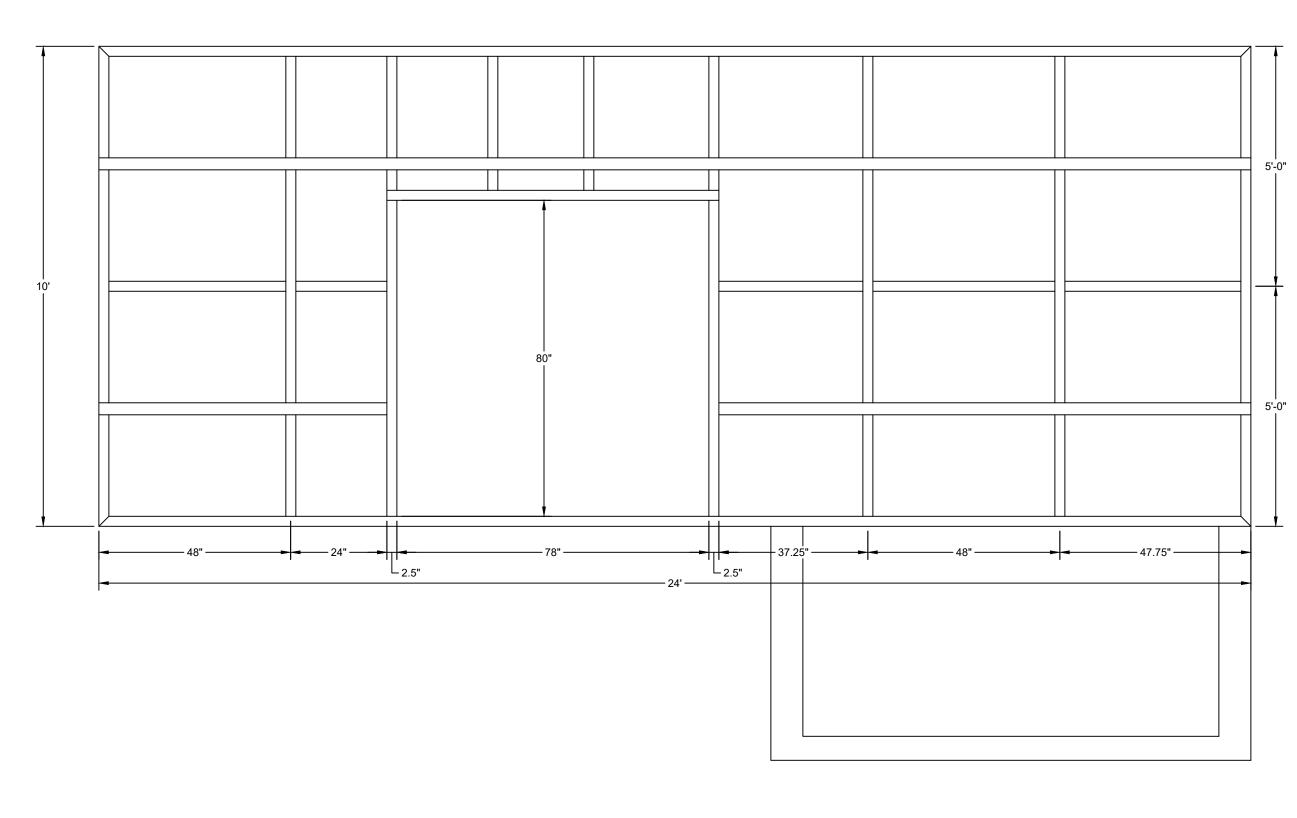
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BLUEWATER SPRINGS TROUT HATCHERY MONTANA FISH, BLUEWATER SPRINGS TROUT HATCHERY ARTESIAN WELL HEAD DEVELOPMENT - HELLAN AUTOMATIC SCREENS

of



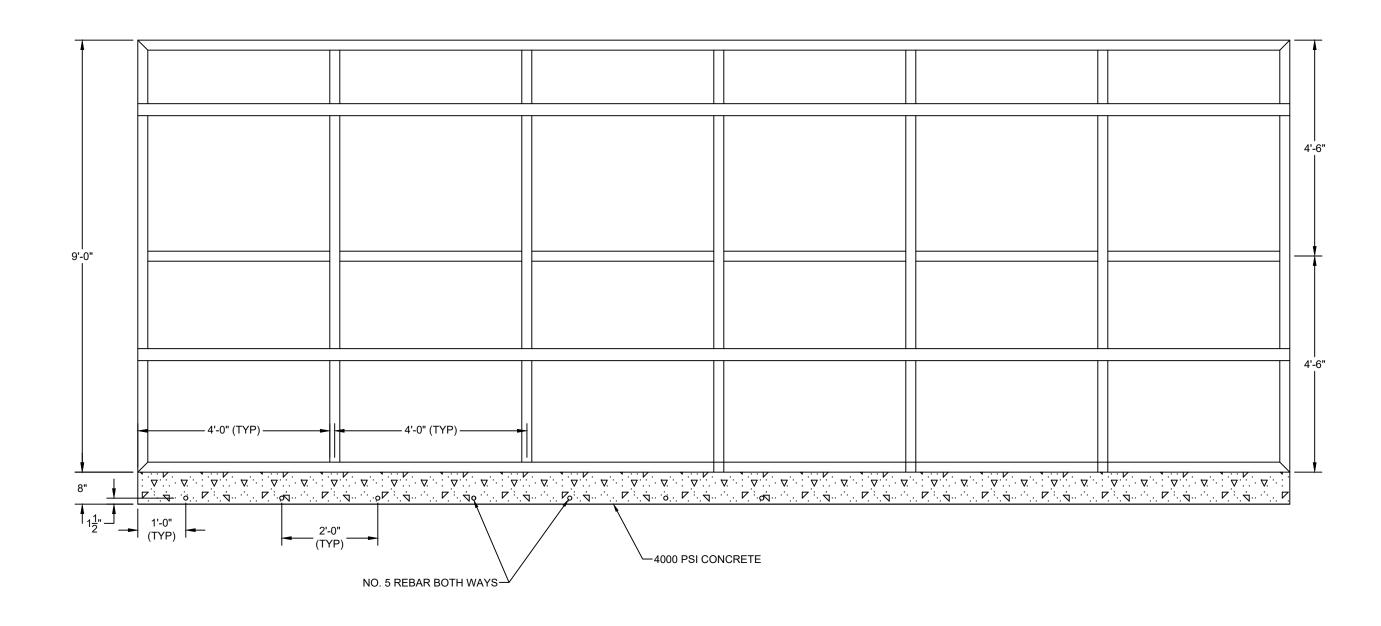
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MONTANA FISH, BLUEWATER SPRINGS INCOLUMN ARTESIAN WELL HEAD DEVELOPMENT - NORTH ELEVATION FRAMING

:: 11 of 16



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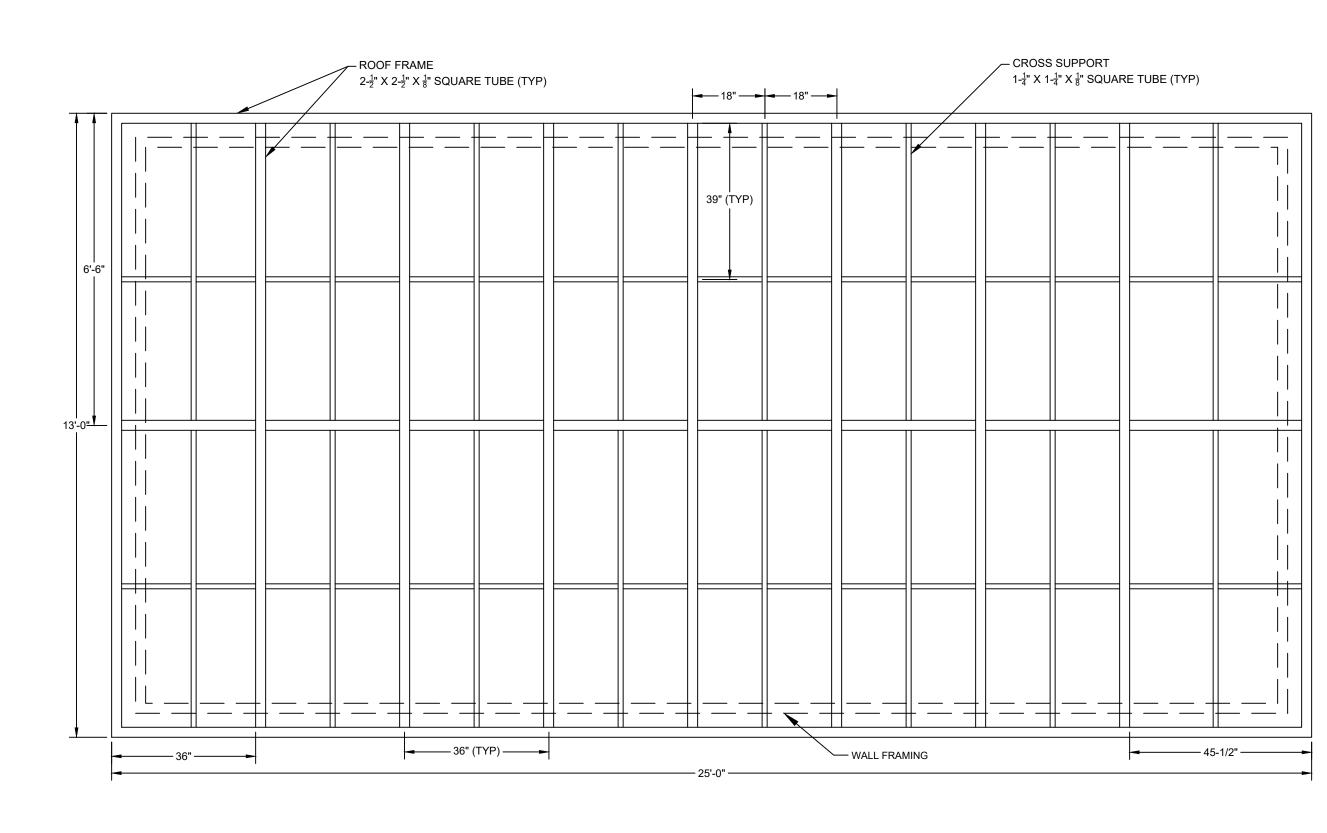
BLUEWATER SPRINGS TROUT HATCHERY MONTANA FISH, BLUEWATER SPRINGS TROUT HATCHERY ARTESIAN WELL HEAD DEVELOPMENT - SOUTH ELEVATION FRAMING

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MONTANA FISH, BLUEWATER SPRINGS INCOLUMN ARTESIAN WELL HEAD DEVELOPMENT - EAST & WEST FRAMING ELEVATION



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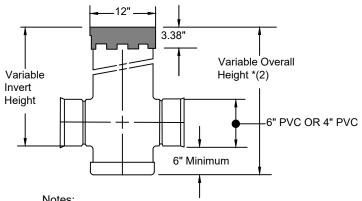
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MONTANA FISH, BLUEWATEK SPRINGS INCO. ARTESIAN WELL HEAD DEVELOPMENT - ROOF FRAMING PLAN BLUEWATER SPRINGS TROUT HATCHERY

 $\begin{array}{c} 14 \\ \text{of} \\ 16 \end{array}$

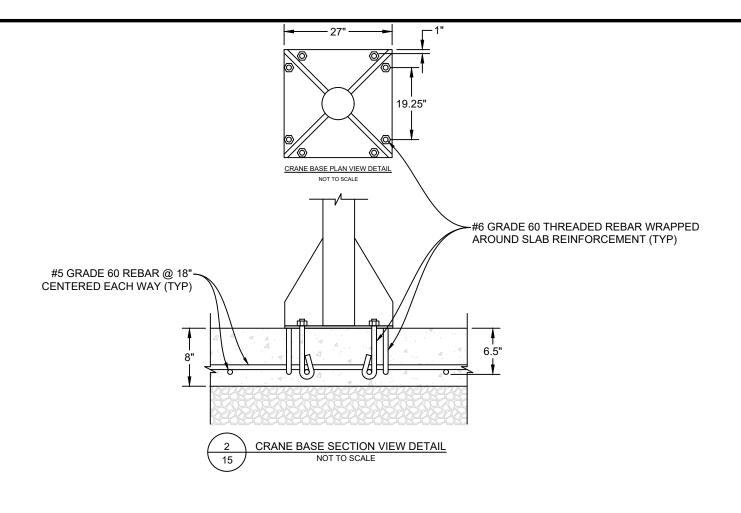
*(1) ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 359°.

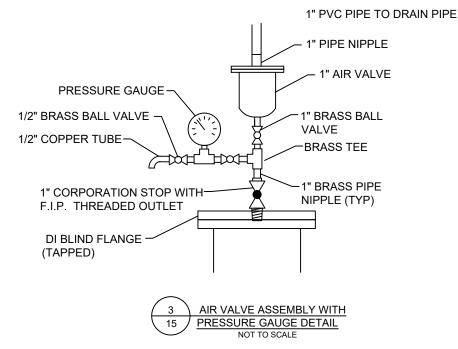


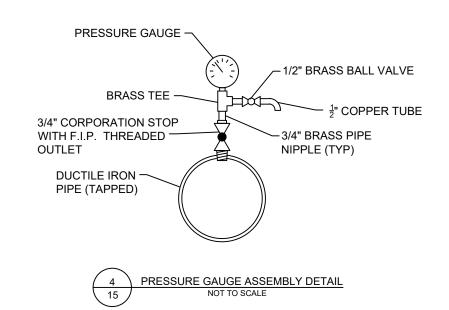
Notes:

- The required angle is 126°
- The maximum recommended overall height 10'
- Nyoplast Supplier: Core & Main, Belgrade, MT -(406) 388-5980





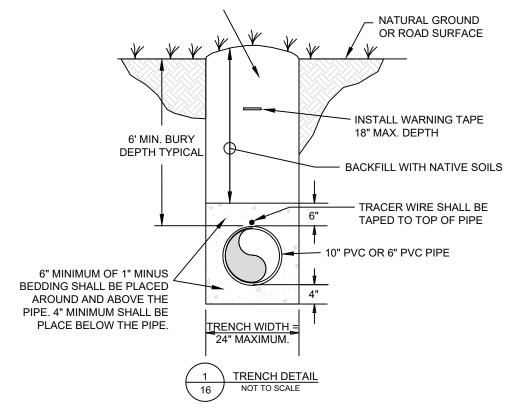


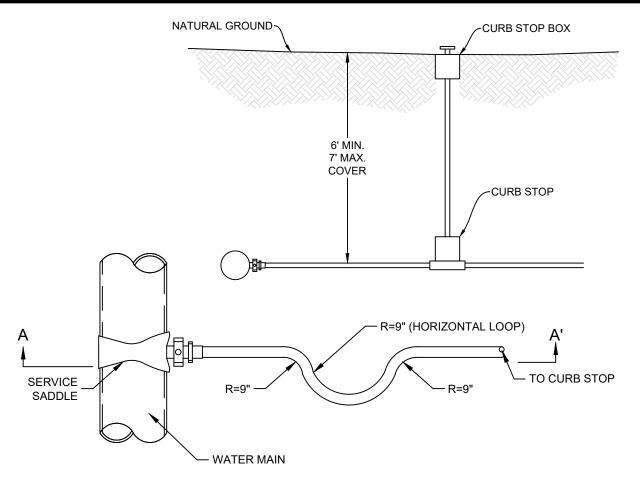


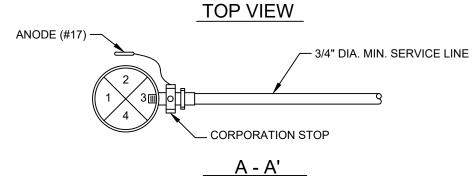
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NOTE:

- SERVICE CLAMPS OR SADDLES SHALL BE USED ON ALL PVC PIPE MAINS. TAPPING SADDLES SHALL BE MUELLER DR2S, FORD FC202, OR EQUIVALENT. ALL SADDLES SHALL HAVE CC TAPERED THREADS.
- MUELLER CURB BOX NO. H-10302-99009-6" WITH 2 1/2" BUSHING 18" EXTENSION, OR 24" EXTENSION, OR EQUAL. TOTAL LENGTH 6 1/2', RANGE 5 1/2' TO 6 1/2'
- 3. PROPERLY INSTALLED CORPORATION STOP SHOWING GOOSENECK IN SERVICE LINE. WATER SERVICE LINES SHALL BE TYPE "K" COPPER
- 4. CORPORATION STOPS SHALL BE CATHODICALLY PROTECTED USING A MINIMUM 17# PACKAGED ANODE. ANODES SHALL BE CONNECTED TO THE STOP BY A THERMITE WELD SPECIFIC FOR THE APPLICATION, OR BY COPPER GROUND ROD CLAMP OR TAPPING SADDLE BOLT, THEN TAR COATED. ALL CORPORATION STOPS SHALL HAVE CC TAPERED THREADS.
- 5. US POLY PIPE COMPRESSION FITTINGS SHALL BE ACCOMPANIED WITH STAINLESS STEEL INSERTS.



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BASIC ELECTRICAL REQUIREMENTS

SUMMARY OF WORK:
FURNISH ALL LABOR AND MATERIALS AND PERFORM ALL OPERATIONS NECESSARY FOR
THE INSTALLATION OF COMPLETE AND OPERATING ELECTRICAL SYSTEMS SUBJECT TO
THE CONDITIONS OF THE CONTRACT. PROVIDE SATISFACTORY OPERATION OF ALL
EQUIPMENT AND CONTROLS TO THE ENGINEER UPON REQUEST.

EXAMINATION OF SITE: CONTRACTOR IS STRONGLY ENCOURAGED TO VISIT THE SITE BEFORE SUBMITTING BID. NO EXTRAS WILL BE ALLOWED FOR LACK OF KNOWLEDGE OF EXISTING CONDITIONS.

COORDINATION:
COORDINATE AND ORDER THE PROGRESS OF WORK TO CONFORM TO THE OWNER'S SCHEDULE AND THE PROGRESS OF THE WORK OF THE OTHER TRADES. SCHEDULE PLAN WORK SO THAT THE DURATION OF THE INTERRUPTIONS ARE KEPT TO A MINIMUM. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND BECAUSE OF THE SMALL SCALE, IT IS NOT POSSIBLE TO INDICATE EVERY REQUIRED OFFSET, FITTING, ETC. VERIFY ALL SPACE REQUIREMENTS, COORDINATE WITH OTHER TRADES, AND INSTALL THE SYSTEMS IN THE SPACE PROVIDED WITHOUT EXTRA CHARGES TO THE OWNER.

VERIFY ALL EQUIPMENT IS READY FOR ELECTRICAL CONNECTIONS, COORDINATE ALL ELECTRICAL CONNECTIONS WITH THE START-UP OF THE EQUIPMENT. THIS CONTRACTOR SHALL PLAN HIS WORK TO PROCEED WITH MINIMUM INTERFERENCE WITH OTHER TRADES AND IT SHALL BE HIS RESPONSIBILITY TO INFORM THE GENERAL CONTRACTOR OF ALL PROVISIONS REQUIRED FOR INSTALLATION OF THE ELECTRICAL WOR

QUALITY ASSURANCE:
PERFORM WORK IN ACCORDANCE WITH GOOD COMMERCIAL PRACTICE. PERFORM WORK IN ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL STANDARDS. THE QUALITY APPEARANCE OF THE RINISHED WORK SHALL BE OF EQUAL IMPORTANCE WITH SELECTRICAL EFFICIENCY. THE ENGINEER MAY REJECT WORK IF WORKMANSHIP AND APPEARANCE ARE NOT SATISFACTORY. INSTALL FOUIPMENT AND MATERIALS IN CCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, UNLESS SPECIFICALLY INDICATED OTHERWISE, OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.

REGULATORY AND CODE REQUIREMENTS:
APPLY FOR AND PAY FOR ALL PERMITS, FEES, LICENSES AND INSPECTIONS FOR THIS DIVISION OF WORK. COMPLY WITH STATE AND LOCAL CODE REQUIREMENTS AND ORDINANCES. COMPLY WITH REQUIREMENTS OF THE UTILITY COMPANIES. IN THE CASE OF DIFFERENCES BETWEEN THESE REQUIREMENTS AND ORDINANCES. THE MOS TRINGENT SHALL GOVERN. CALL FOR INSPECTIONS REQUIRED BY LOCAL BUILDING INSPECTION AUTHORITY.

WORK SHALL MEET THE REQUIREMENTS OF THE PLANS AND SHALL MEET NO LESS THAN HE MINIMUM REQUIREMENTS AND LATEST CODES AND STANDARDS OF THE FOLLOWING: ANSI, NEC, NEMA, NFPA, OSHA, UL, UBC, LOCAL FIRE MARSHAL, AND SERVING UTILITIES.

PLANS AND SPECIFICATIONS GO HAND IN HAND, WHAT IS REQUIRED IN ONE IS REQUIRED IN BOTH, WHERE CONFLICTS BETWEEN THESE SPECIFICATIONS AND PLANS EXIST, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.

RESPONSIBILITY:
BE RESPONSIBLE FOR THE INSTALLATION OF SATISFACTORY AND COMPLETE SYSTEMS IN
ACCORDANCE WITH THE INTENT OF THE DRAWINGS. PROVIDE, AT NO EXTRA COST, ALL
INCIDENTAL ITEMS REQUIRED FOR COMPLETION OF THE WORK, EVEN THOUGH THEY ARE
NOT SPECIFICALLY MENTIONED OR INDICATED ON THE DRAWINGS.

AT ALL TIMES DURING THE PERFORMANCE OF THIS CONTRACTOR, PROPERLY PROTECT WORK FROM DAMAGE AND PROTECT THE OWNER'S PROPERTY FROM INJURY OR LOSS. MAKE GOOD ANY DAMAGE, INJURY, OR LOSS, EXCEPT SUCH AS MAY BE DIRECTLY DOT OT HE ERRORS IN THE PROPOSAL DOCUMENTS OR CAUSED BY REPRESENTATIVES OF THE OWNER. ADEQUATELY PROTECT ADJACENT PROPERTY AS PROVIDED BY LAW AND THE DOCUMENTS. PROVIDE AND MAINTAIN PASSAGEWAYS, GUARD FENCES, LIGHTS, AND OTHER FACILITIES, AS REQUIRED FOR PROTECTION.

WORKMANSHIP:
WORK UNDER THIS CONTRACT SHALL BE PERFORMED BY WORKMEN SKILLED IN THE
PARTICULAR TRADE INCLUDING WORK NECESSARY TO PROPERLY COMPLETE THE
INSTALLATION IN A WORKMANLIKE MANNER TO PRESENT A NEAT AND FINISHED
APPEARANCE.

SHOP DRAWINGS:
SUBMIT SHOP DRAWINGS FOR ALL MATERIALS AND EQUIPMENT SHOWING ANY CHANGES
REQUIRED IN ANY DISTRIBUTION EQUIPMENT, PANELBOARDS, ELECTRICAL WIRING,
SPACE ALLOCATION, ETC.

PROVIDE PRODUCT DATA WITH MANUFACTURER'S CATALOG INFORMATION SHOWING RATINGS, DIMENSIONS, CONFIGURATIONS AND CONSTRUCTION. ALSO PROVIDE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

OPERATION AND MAINTENANCE DATA:
AT THE COMPLETION OF WORK, SUBMIT (3) TYPED AND HARD-BOUND COPIES OF AN OPERATING AND MAINTENANCE MANUAL TO THE ENGINEER FOR APPROSCHEDULING ANY SYSTEM DEMONSTRATION FOR THE OWNER.

WARRANTIES: PROVIDE A WRITTEN WARRANTY TO THE OWNER COVERING THE ENTIRE ELECTRICAL WORK TO BE FREE FROM DEFECTIVE MATERIALS, EQUIPMENT AND WORKMANSHIP FOR A PERIOD OF ONE YEAR AFTER DATE OF ACCEPTANCE.

CLEAN-UP AND CLOSE-OUT: KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL OR RUBBISH CAUSED BY THIS CONTRACTOR'S WORK OR HIS EMPLOYEES.

UPON COMPLETION OF WORK, REMOVE MATERIALS, SCRAPS AND DEBRIS RELATIVE TO THIS CONTRACTOR'S WORK AND LEAVE THE PREMISES, INCLUDING CRAWL SPACES AND CHASES, IN CLEAN AND ORDERLY CONDITION.

CLEAN EXPOSED SURFACES OF DISCONNECT SWITCHES, MOTOR STARTERS, PANELS AND OTHER EXPOSED ITEMS OF GREASE, DIRT OR OTHER FOREIGN MATERIAL. REMOVE RUSSISH AND DESIGN RESULTING FROM THE OPERATIONS OF THIS CONTRACTOR AND LEAVE SPACES CLEAN AND READY FOR USE.

BASIC MATERIALS AND METHODS

MOTORS AND STARTERS: ALL MOTORS, STARTERS AND OTHER ELECTRICAL CONTROL EQUIPMENT SHALL BE LISTED PER THE REQUIREMENTS OF THE NEC.

SEALING:
MAINTAIN ALL CEILING, FLOOR AND WALL PROTECTION RATINGS FOR FIRE AND SMOKE,
SEAL ALL CONDUIT AND ENCLOSURE PENETRATIONS TO COMPLY WITH UL ASSEMBLY
AND BUILDING CODE REQUIREMENTS, ALL SEALANTS AND CONSTRUCTIONS SHALL BE
APPROVED PRIOR TO APPLICATION, ALL OPENINGS SHALL BE SEALED DAILY,

RACEWAYS: RACEWAYS SHALL BE CONCEALED AND APPROVED FOR USE AND LOCATION.

DRY LOCATIONS - GRC, IMC, EMT.

IN SLAB ON GRADE
FLEXIBLE CONDUIT - GALVANIZED STEEL, LIQUIDTIGHT.

JUNCTION AND PULL BOXES: SIZE PER THE NEC.
DRY LOCATIONS - STEEL WITH COVERS.
WET LOCATIONS - CAST ALUMINUM.
UNDERGROUND - CAST METAL OR NONMETALLIC.
IN SLAB ON GRADE - CAST METAL OR NONMETALLIC.

COUPLINGS AND CONNECTORS: INDENTER TYPE CONNECTORS PROHIBITED GRC - THREADED

WIRING DEVICES AND PLATES: ALL RATINGS SHALL MATCH BRANCH CIRCUIT AND LOAD CHARACTERISTICS. VERIFY RECEPTACLES ARE WEATHERPROOF, IN-USE TYPE, AS REQUIRED.

WIRE:
COPPER ONLY WITH THHN/THWN TYPE INSULATION IN RACEWAY. ALUMINUM CONDUCTORS IN
RACEWAY ALLOWED ONLY WITH PRIOR APPROVAL OF THE ENGINEER. UL LISTED LUGS AND
CONNECTORS, NEC APPROVED COLOR CODING. ALL WIRE SHALH AVEA AN INSULATION
VOLTAGE RATING OF 600 VOLTS; AND AN INSULATION TEMPERATURE RATING OF 75 DEGREES C.

WIRE COLORS: BLACK, RED. AND BLUE FOR CIRCUITS AT 120/240V, SINGLE OR THREE PHASE

<u>SUPPORTS AND HANGERS:</u> SUPPORTS AND HANGERS MUST BE UL LISTED AND APPROVED BY LOCAL INSPECTORS.

ANCHORS: HOLLOW MASONRY - TOGGLE BOLT.

SOLID MASONRY - EXPANSION BOLT - MACHINE SCREWS, BOLTS, WELDING,

WOOD - WOOD SCREWS.

GROUNDING:
IN STRICT ACCORDANCE WITH THE NEC AND UTILITY COMPANY REGULATIONS. PROVIDE COPPER EQUIPMENT GROUNDING CONDUCTOR IN ALL RACEWAYS.

PERMANENTLY ATTACH EQUIPMENT AND GROUNDING CONDUCTORS PRIOR TO ENERGIZING

NAMEPLATES:
PROVIDE ON ALL PANELS, DISCONNECTS, CONTROLLERS, AND EQUIPMENT. NAMEPLATES
SHALL HAVE 3/16" HIGH LETTERS ENGRAVED WITH CONTRASTING COLOR FILL, DEVICE PLATE
ENGRAVING SHALL BE 1/8" HIGH LETTERS WITH CONTRASTING COLOR FILL.

DIRECTORY, CIRCUIT BREAKERS, (MULTIPLE-POLE INTERNAL TRIP, BOLT-ON), DEAD FRONT DOOR-IN-DOOR CONSTRUCTION, LOCKING DOORS, ULLISTING, ETC. PROVIDE TYPEWRITTEN PANEL DIRECTORIES IN ALL PANELS AFFECTED BY THE SCOPE OF WORK. FOR PANELBOARDIS WHICH ARE EXISTING, PROVIDE UPDATED AND COMPLETE TYPEWRITTEN DIRECTORY. CIRCUİT BREAKERS SHALL BE COMPATIBLE WITH THE EXISTING PANEL TYPE AND UL LISTED.

ENCLOSED SWITCHES:
UNLESS SPECIFICALLY NOTED OTHERWISE, PROVIDE NEMA KS 1 TYPE GD WITH EXTERNALLY OPERABLE HANDLE INTERLOCKED TO PREVENT OPENING FRONT COVER WITH SWITCH IN THI "ON" POSITION; ENCLOSED LOAD INTERRUPTER KNIFE SWITCH. HANDLE LOCKABLE IN THE "OFF" POSITION.

SWITCH SHALL BE HORSEPOWER RATED FOR AC, AS INDICATED ON THE DRAWINGS. SHORT CIRCUIT CURRENT RATING SHALL BE UL LISTED FOR 10,000 RMS SYMMETRICAL AMPERES MINIMUM, UNLESS NOTED OTHERWISE ON THE PLAN DRAWINGS.

ENCLOSURE SHALL BE NEMA KS 1 TO MEET THE CONDITIONS. FABRICATE THE ENCLOSURE FROM STEEL FINISHED WITH THE MANUFACTURER'S STANDARD GRAY ENAMEL. PROVIDE NEMA 1 FOR INTERIOR DRY LOCATIONS, NEMA 4X FOR INTERIOR WET (CORROSIVE) LOCATIONS, AND NEMA 87 FOR EXTERIOR LOCATIONS. FURNISH SWITCHES WITH ENTIRELY COPPER CURRENT CARRYING PARTS.

EQUIPMENT: SEE PLANS FOR CONNECTION OF EQUIPMENT, INCLUDING PANELS, CONTROLLERS, ETC. PROVIDE FLEXIBLE CONDUIT (WITH EQUIPMENT GROUND CONDUCTOR) CONNECTION AT ALL MOTORS.

ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT LOCATION OF ALL FOLIPMENT ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT LOCATION OF ALL EQUIPMENT REQUIRING ELECTRICAL CONNECTION. ELECTRICAL CONTRACTOR SHALL DRITAIN SUBMITTALS TO COORDINATE DISCONNECT MEANS, SPECIFICATIONS, AND VOLTAGE REQUIREMENT SHORT TO ROUGH-IN. VERIFY REQUIREMENTS FOR ALL EQUIPMENT. IF DISCREPANCES OCCUR, NOTIFY THE ELECTRICAL ENGINEER IMMEDIATELY.

ELECTRICAL CONTRACTOR IS TO REVIEW AND COORDINATE WITH ALL DRAWINGS INCLUDING ELECTIFICAL CONTRACTOR IS TO REVIEW AND COORDINATE WITH ALL DRAWNINGS, INCLUDIMS ALL EQUIPMENT SCHEDULES TO ENSURE THAT ALL CONNECTIONS FOR THE EQUIPMENT ARE PROVIDED. DEVICE LOCATIONS SHALL BE COORDINATED WITH THE APPROPRIATE CONTRACTOR/SUPPLIER PRIOR TO COMMENCEMENT OF WORK OF ELECTRICAL ROUGH-INS.

ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING TO PROVIDE 120V POWER. IF NEEDED, TO ACCOMMODATE ANY LOW VOLTAGE REQUIREMENTS THAT EQUIPMENT MAY HAVE.

INSTALL DISCONNECT SWITCHES, CONTROLLERS, ETC, TO COMPLETE ALL EQUIPMENT WIRING

DRAWINGS AND MEASUREMENTS: CONTRACT DRAWINGS FOR ELECTRICAL WORK ARE IN PART DIAGRAMMATIC, INTENDED TO CONTEXT HE SCOPE OF WORK AND INDICATE GENERAL ARRANGEMENT OF EQUIPMENT, CONDUITS, AND APPROXIMATE SIZES AND LOCATIONS OF EQUIPMENT AND OUTLETS. ELECTRICAL TRADES SHALL FOLLOW THESE DRAWINGS IN LAYING OUT THEIR WORK; CONSULT GENERAL CONSTRUCTION DRAWINGS TO FAMILIARIZE THEMSELVES WITH ALL CONDITIONS AFFECTING THEIR WORK; AND SHALL VERIFY SPACES IN WHICH THEIR WORK WILL BE INSTALLED. COORDINATE WORK WITH OTHER TRADES AS JOB CONDITIONS REASONABLY DESCRIBED.

WHERE JOB CONDITIONS REQUIRE REASONABLE CHANGES IN INDICATED LOCATIONS AND ARRANGEMENT, MAKE SUCH CHANGES WITHOUT EXTRA COST TO OWNER.

THE DRAWINGS ARE $\underline{\text{NOT}}$ INTENDED TO BE SCALED FOR ROUGH-IN MEASUREMENTS AND ARE NOT TO SERVE AS SHOP DRAWINGS.

NO MORE THAN THREE PHASE CONDUCTORS, TWO SWITCH LEGS, ONE NEUTRAL AND ONE GROUND SHALL BE INSTALLED PER RACEWAY UNLESS PRIOR APPROVAL IS OBTAINED FROM THE ENGINEER.

ALL RACEWAYS SHALL BE CONCEALED IN FINISHED SPACES. UNLESS NOTED OTHERWISE. RACEWAYS IN NON-FINISHED SPACES, SUCH AS THE WELL HOUSE ENCLOSURE, SHALL BE PERMITTED TO BE EXPOSED. ALL EXPOSED RACEWAYS SHALL BE ROUTED PLUMB AND SQUARE TO ENCLOSURE SURFACES.

OWNER SUPPLIED EQUIPMENT:
COORDINATE ELECTRICAL CONNECTIONS FOR OWNER-SUPPLIED EQUIPMENT WITH OWNER, MANUFACTURER DATA, AND EQUIPMENT NAMEPLATE INFORMATION.

SUBSTITUTIONS: ALL SUBSTITUTIONS TO BE APPROVED BY OWNER, AND ENGINEER.

<u>INSTALLATION:</u> INSTALL WORK IN ACCORDANCE WITH STATE AND LOCAL STANDARDS.

RACEWAY ROUTING, WHEN SHOWN, IS IN APPROXIMATE LOCATIONS. FIELD COORDINATE ROUTING. CUT CONDUIT SQUARE USING SAW OR PIPE CUTTER; DEBURR CUT ENDS.

INSTALL SUITABLE PULLSTRING OR CORD IN EACH EMPTY RACEWAY. INSTALL SUITABLE CAPS TO PROTECT INSTALLED CONDUIT AGAINST ENTRANCE OF DIRT AND MOISTURE.

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<u>@</u> / @ /	MOTOR CONNECTION	all term	┨╢
	SPECIAL EQUIPMENT CAI		┨╟
6 6	BRANCH CIRCUIT PANELS	3	┨╢
<u> </u>	METER		┨╏
7	NORMALLY CLOSED REL	AY CONTACT	4
+	NORMALLY OPEN RELAY	CONTACT	4 4
-□-	FUSE WITH RATING		4 1
\bigcirc	MOLDED CASE CIRCUIT E	REAKER	┨╏
_ \~_	SWITCH AND FUSE UNIT		.
⊸ ⊸	CONDUIT UP; CONDUIT D	OWN	.l l
φ	DUPLEX OUTLET (SEE NO	TES FOR REQUIREMENTS)]
∯ ^{GFI}	GROUND FAULT CIRCUIT	NTERRUPTER OUTLET	
Ψ ^P	WEATHER PROOF IN USE	OUTLET	1
#	FOURPLEX OUTLET		1
(a)	SPECIAL PURPOSE OUTL	ET/CONNECTION	1 1
0 1	JUNCTION BOX (J-BOX)		1 1
PB	PULL BOX		1
	HORSEPOWER RATED DI	SCONNECT SWITCH	1
ď	FUSED DISCONNECT SWI		1 1
VFD	VARIABLE FREQUENCY D		11
₩.	COMBINATION MOTOR ST		1 1
×	STARTER/CONTACTOR	ARTERIDISCONNECT	11
φ	THERMOSTAT, BY MECH	ANICAL	11
SS		ANICAL	11
	SOFT START		11
TS ES	TAMPER SWITCH; FLOW		-
	FIRE ALARM CONTROL PA		4 1
E	FIRE ALARM MANUAL STA		4 1
	FIRE ALARM HORN/STRO		41
_ X M	FIRE ALARM HORN; FIRE		4 1
(H) (S)	FIRE ALARM HEAT DETEC		4 1
\$ 	FIRE ALARM DUCT SMOK	E DETECTOR	41
△ F/S	FIRE/SMOKE DAMPER		41
⊽	DATA OUTLET		41
	CONDUIT STUB		4 1
□ □	HORN/STROBE FOR ALAR	MS	4
ww.	TRANSFORMER (RISER D	IAGRAM DWG)	4
T	TRANSFORMER (PLAN DV	VG)	IJ I
<u></u> —	GROUND CONNECTION		┚
\sim	CIRCUIT (CONCEALED AS	SPECIFIED)	
			11
-OHP-	OVERHEAD POWER]
-UE-	UNDERGROUND ELECTR	CAL	11
-ELC-	ELECTRICAL DISTRIBUTION	DN .	11
-com-	UNDERGROUND TELECO		11
	HOME RUN TO PANEL N	JMBER OF WIRES INDICATED	11
/	AS FOLLOWS: —## OR	A CIRCUIT WITH NO HASH	
(MARKS IS TWO WIRE PLU	S A GROUND.	
		TH #12 WIRE, UNLESS NOTED	
		G HEIGHTS	
DE	SCRIPTION	HEIGHT	
CONTROL		42"	

OPE SYMBOL INT MARK, SEE PLANS AND SCHEDULES PHASE POLE PHASE POLE PHASE RR DITIONING COUNTER NAL INISHED FLOOR INISHED FLOOR INISHED GRADE ITY HAVING JURISDICTION BREAKER 3 T POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW RECT SWITCH 3	MCB MCC MCP, DDC MDB MDP MFR MH MLO MOOP MT, MTD, MTG NA, N/A NEC NL NO, OD, O.D. P PB PF PH PLC PMR	NOT APPLICABLE NATIONAL ELECTRICAL CODE NIGHT LIGHT NUMBER OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
POLE POLE POLE RE DITIONING COUNTER NAL NINISHED FLOOR INISHED FLOOR INISHED GRADE ITY HAVING JURISDICTION BREAKER 3 5 T	MCP, DDC MDB MDP MFR MH MLO MOCP MT, MTD, MTG NA, NIA NEC NL NO. OD, O.D. P PB PF PH PLC PMR	MECHANICAL CONTROL PANEL; DIRECT DIGITAL MAIN DISTRIBUTION BOARD MAIN DISTRIBUTION PANEL MANUFACTURER MANHOLE OR MOUNTING HEIGHT MAIN LUGS ONLY MINIMUM OVERCURRENT PROTECTION MOUNT, MOUNTED, MOUNTING NOT APPLICABLE NATIONAL ELECTRICAL CODE NIGHT LIGHT NUMBER OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
POLE POLE POLE POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	MDB MDP MFR MH MLO MOCP MT, MTD, MTG NA, NIA NEC NO, OD, OD, P PB PF PH PLC PMR	MAIN DISTRIBUTION BOARD MAIN DISTRIBUTION PANEL MANUFACTURER MANHOLE OR MOUNTING HEIGHT MAIN LUGS ONLY MINIMUM OVERCURRENT PROTECTION MOUNT, MOUNTED, MOUNTING NOT APPLICABLE NATIONAL ELECTRICAL CODE NIGHT LIGHT NUMBER OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
POLE POLE POLE POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	MDP MFR MH MLO MOCP MT, MTD, MTG NA, N/A NEC NL NO, OD, O.D. P PB PF PH PLC PMR	MAIN DISTRIBUTION PANEL MANUFACTURER MANHOLE OR MOUNTING HEIGHT MAIN LUGS ONLY MINIMUM OVERCURRENT PROTECTION MOUNT, MOUNTED, MOUNTING NOT APPLICABLE NATIONAL ELECTRICAL CODE NIGHT LIGHT NUMBER OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
HASE RE DITIONING COUNTER NAL INISHED FLOOR INISHED FLOOR INISHED FLOOR BREAKER G F POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	MFR MH MLO MOCP MT, MTD, MTG NA, N/A NEC NL NO. OD, O.D. P BB PF PH PLC PMR	MANUFACTURER MANHOLE OR MOUNTING HEIGHT MAIN LUGS ONLY MINIMUM OVERCURRENT PROTECTION MOUNT, MOUNTED, MOUNTING NOT APPLICABLE NATIONAL ELECTRICAL CODE NIGHT LIGHT NUMBER OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
RE DITIONING COUNTER NAL INISHED FLOOR INISHED GRADE ITY HAVING JURISDICTION BREAKER 3 T POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	MH MLO MOCP MT, MTD, MTG NA, N/A NEC NL NO. OD, O.D. P PB PF PH PLC PMR	MANHOLE OR MOUNTING HEIGHT MAIN LUGS ONLY MINIMUM OVERCURRENT PROTECTION MOUNT, MOUNTED, MOUNTING NOT APPLICABLE NATIONAL ELECTRICAL CODE NIGHT LIGHT NUMBER OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
DITIONING COUNTER NAL INISHED FLOOR INISHED GRADE ITY HAVING JURISDICTION BREAKER 3 T POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	MLO MOCP MT, MTD, MTG NA, N/A NEC NL NO. OD, O.D. P PB PF PH PLC PMR	MAIN LUGS ONLY MINIMUM OVERCURRENT PROTECTION MOUNT, MOUNTED, MOUNTING NOT APPLICABLE NATIONAL ELECTRICAL CODE NIGHT LIGHT NUMBER OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
COUNTER NAL INISHED FLOOR INISHED GRADE ITY HAVING JURISDICTION BREAKER 3 I POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	MOCP MT, MTD, MTG NA, NIA NEC NL NO. OD, O.D. P PB PF PH PLC PMR	MINIMUM OVERCURRENT PROTECTION MOUNT, MOUNTED, MOUNTING NOT APPLICABLE NATIONAL ELECTRICAL CODE NIGHT LIGHT NUMBER OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
NAL POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HEET SWITCH	MT, MTD, MTG NA, N/A NEC NL NO, OD, O.D. P PB PF PH PLC PMR	MOUNT, MOUNTED, MOUNTING NOT APPLICABLE NATIONAL ELECTRICAL CODE NIGHT LIGHT NUMBER OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
INISHED FLOOR INISHED GRADE ITY HAVING JURISDICTION BREAKER G F POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	NA, N/A NEC NL NO. OD, O.D. P PB PF PH PLC PMR	NOT APPLICABLE NATIONAL ELECTRICAL CODE NIGHT LIGHT NUMBER OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
INISHED GRADE ITY HAVING JURISDICTION BREAKER 3 T POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	NEC NL NO. OD, O.D. P PB PF PH PLC PMR	NATIONAL ELECTRICAL CODE NIGHT LIGHT NUMBER OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
ITY HAVING JURISDICTION BREAKER 3 F POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	NL NO. OD, O.D. P PB PF PH PLC PMR	NIGHT LIGHT NUMBER OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
BREAKER 3 T POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	NO. OD, O.D. P PB PF PH PLC PMR	NUMBER OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
BREAKER 3 FOLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	OD, O.D. P PB PF PH PLC PMR	OUTSIDE DIAMETER POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
FOLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW JECT SWITCH	P PB PF PH PLC PMR	POLE PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	P PB PF PH PLC PMR	PULLBOX POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	PF PH PLC PMR	POWER FACTOR PHASE PROGRAMMABLE LOGIC CONTROLLER
POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW HECT SWITCH	PH PLC PMR	PHASE PROGRAMMABLE LOGIC CONTROLLER
POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW JECT SWITCH	PH PLC PMR	PHASE PROGRAMMABLE LOGIC CONTROLLER
POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW JECT SWITCH	PLC PMR	PROGRAMMABLE LOGIC CONTROLLER
POLE, DOUBLE THROW; DOUBLE POLE SINGLE THROW JECT SWITCH	PMR	
NECT SWITCH	1 1	PER MANUFACTURER'S RECOMMENDATIONS
3	PNL	PANEL
	PWR	POWER
CAL CONTRACTOR	RCP, RCPT	RECEPTACLE(S)
T FAN	RM	ROOM
NCY .	SCH	SCHEDULE
NCY POWER OFF	SQ. FT.	SQUARE FEET
C WATER COOLER	SPST	SINGLE POLE, SINGLE THROW
3	SWBD, SWGR	SWITCHBOARD, SWITCHGEAR
AD AMPS	T.C., TC, TCP	TEMPERATURE CONTROL CONTRACTOR; TEMP. CONTROL
FAULT CIRCUIT INTERRUPTER	TDC	TELEPHONE/DATA CONTRACTOR
)	TGB	TELEPHONE GROUND BAR
F-AUTO	ттв	TELEPHONE TERMINAL BOARD, 4'H x 4'W X 3/4"D
OWER	TYP.	TYPICAL
TPUT	UG	UNDERGROUND
CATION AND/OR INSIDE DIAMETER (REFER TO CONTEXT)	UH	UNIT HEATER
D GROUND	U.N.O., UNO	UNLESS NOTED OTHERWISE
IN BOX	V, VA	VOLT, VOLT-AMPERE
т	w	WALL-MOUNTED DEVICE, WATT
T AMPERE	WG	WIRE GUARD
п	WH	WATER HEATER; G-GAS, E=ELECTRIC
3, LIGHTS	WP	WEATHERPROOF-IN-USE
G PANELBOARD	XFMR	TRANSFORMER
	XP	EXPLOSION-PROOF
IICAL CONTRACTOR	1	
	1	
	1	(NOT ALL SYMBOLS OR ABBREVIATIONS USED)
		,
	ITPUT CATION AND/OR INSIDE DIAMETER (REFER TO CONTEXT) ED GROUND DN BOX I.T I.T AMPERE TI G, LIGHTS G PANELBOARD LTAGE BIGAL CONTRACTOR M CIRCUIT AMPS	CATION AND/OR INSIDE DIAMETER (REFER TO CONTEXT) UH U.N.O., UNO DIA BOX V. VA W U.R.D. TAMPERE WG TT G. LIGHTS G PANELBOARD XFMR XP LTAGE UIGAL CONTRACTOR UH VIR ON TRACTOR V

1,100,11111	OILIOIIIO
DESCRIPTION	HEIGHT
CONTROL	42"
DISCONNECT SWITCH	54" TO HANDLE
CONVENIENCE OUTLET	18" TO CENTER
ALARM HORN	90" A.F.G., UNLESS NOTED OTHERWISE
MANUAL MOTOR STARTER SWITCH	42"
PANELBOARDS, CABINETS (TO TOP)	72"
MOUNTING HEIGHTS TO BOTTOM OF BOX	AND ABOVE FINISHED FLOOR/GRADE, UNLESS

WORK SPACE NOTE

MAINTAIN NEC REQUIRED WORK SPACE AROUND ALL ELECTRICAL EQUIPMENT.
ADVISE OTHER TRADES OF REQUIREMENTS AND COORDINATE WORK TO AVOID AND PREVENT CONFLICTS.

COORDINATION NOTE

IT IS ABSOLUTELY NECESSARY THAT ALL TRADES COORDINATE WITH EACH OTHER AND VERIFY THERE ARE NO CONFLICTS IN THE LOCATIONS OF CONDUITS, ELECTRICAL BOXES, EQUIPMENT AND OTHER ITEMS THROUGHOUT THIS PROJECT BEFORE FINAL PLACEMENT OF MATERIALS.

	ELECTRICAL SHEET INDEX
1	ELECTRICAL REQUIREMENTS AND LEGEND
2	OVERALL ELECTRICAL SITE PLAN
3	ENLARGED WELL HOUSE PLAN & SCHEDULES
4	POWER RISER DIAGRAM
5	ELECTRICAL DETAILS

ELECTRICAL LEGEND

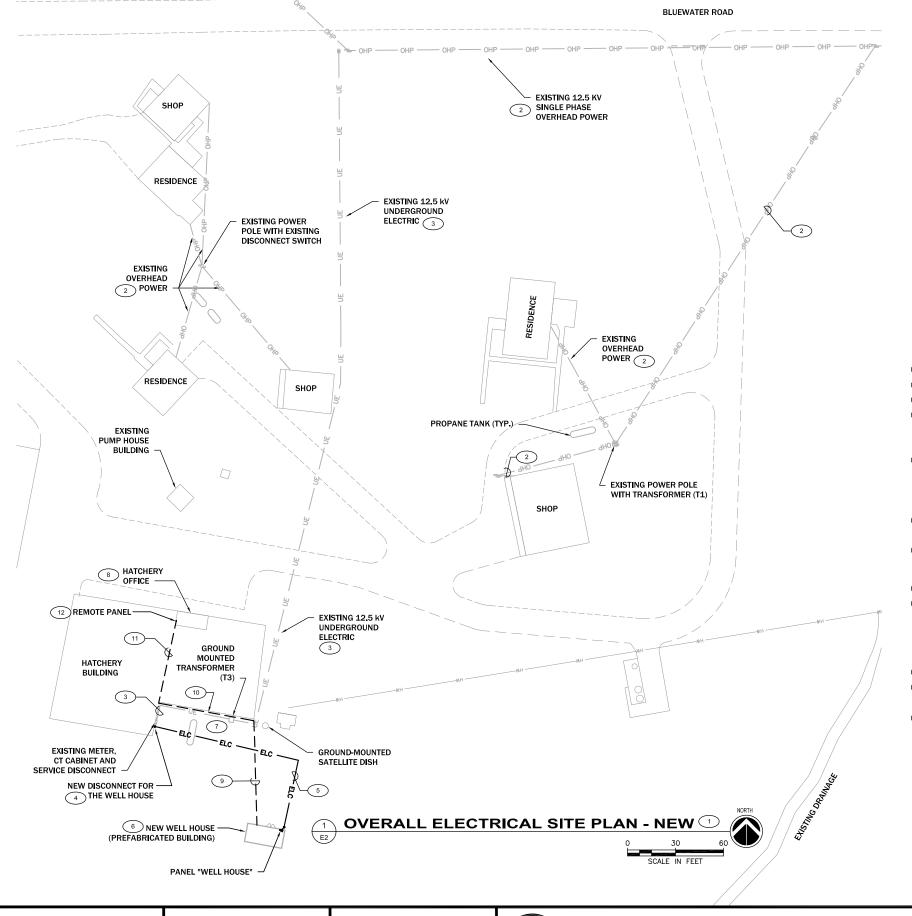
DESCRIPTION

TESIa Engineering, LLC ELECTRICAL ENGINEERING CONSULTANTS

P.O. BOX 504 Vaughn, Montana 59487 Phone (406) 964-8523

TEO 03 15 202 DRAWN BY REVISED BY: TEO 03.15.202 CHECKED BY: DATE APPROVED BY:

APPROVED BY: APPROVED BY: MONTANA FISH, **WILDLIFE & PARKS** Bluewater Springs Trout Hatchery Artesian Well Head Development - Electrical Requirements and Legend 5



GENERAL ELECTRICAL SITE NOTES

- SEE CIVIL SITE PLANS FOR ADDITIONAL SITE INFORMATION AND REQUIREMENTS, COORDINATE SITE WORK WITH OTHER TRADES.
- ELECTRICAL TERMINATION AT SERVICE EQUIPMENT, AND ALL OTHER ELECTRICAL WORK AS INDICATED ON THIS DRAWING TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR AS PART OF THEIR SCOPE OF WORK.
- ALL CONDUITS, FOR ELECTRIC FEEDERS UNDER PAVEMENT AND LANDSCAPED AREAS SHALL BE SCHEDULE 80 PVC, UNLESS NOTED OTHERWISE, RUN ALL CONDUITS 24" MINIMUM BELOW FINISHED GRADE, UNLESS SPECIFICALLY NOTED OTHERWISE. COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC).
- 4. REFER TO ELECTRICAL DETAILS, E5, FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- REPAIR LANDSCAPE AND PARKING AREAS THAT ARE DISTURBED BY THIS SCOPE OF WORK. AREAS SHALL BE RETURNED TO THEIR ORIGINAL CONDITION, UNLESS NOTED OTHERWISE BY PROJECT SCOPE OF WORK. COORDINATE WITH THE GENERAL CONTRACTOR.
- 6. COORDINATE AND LOCATE ALL UTILITIES PRIOR TO ANY EXCAVATION, CALL FOR UTILITY LOCATES AND COORDINATION OF WORK PRIOR TO ALL EXCAVATIONS.
- REFER TO PARTIAL POWER RISER DIAGRAM, E4, FOR ADDITIONAL INFORMATION REGARDING THE SERVICE TO THE WELL HOUSE WHICH IS A PART OF THIS SCOPE OF WORK.
- 8. PROVIDE ADEQUATELY SIZED PULLBOXES FOR POWER, AS NEEDED. STUB UP CONDUIT IN PULLBOX, CAP AND LABEL, AS NEEDED. PULLBOX COVER SHALL READ "ELECTRIC," AS APPROPRIATE. PROVIDE A PULLBOX AFTER (2) 90-DEGREE BENDS OR AN ACCUMULATION OF 120-DEGREES OF TOTAL PATHWAY DEVIATION FROM A STRAIGHT LINE BETWEEN EACH ACCESS POINT. LOCATE PULLBOXES SUCH THAT THERE IS A MAXIMUM OF 400"-0" BETWEEN EACH ACCESS POINT. DO NOT LOCATE IN TRAFFIC AREAS, UNLESS SPECIFICALLY MANUPACTURED TO HANDLE VEHICLE TRAFFIC.
- REVIEW EXACT LOCATION OF PULLBOXES WITH THE CIVIL ENGINEER AND OWNER PRIOR TO START OF EXCAVATION.
 TYPICAL FOR ALL.
- ALL CONDUIT ROUTING SHALL BE FIELD COORDINATED. CAP AND LABEL THE CONDUITS AT BOTH ENDS, AS NEEDED.
 TYPICAL FOR ALL SITE CONDUIT RUNS.
- 11. ELECTRICAL PERMIT SHALL BE OBTAINED FROM THE APPROPRIATE AUTHORITY HAVING JURISDICTION (AHJ) PRIOR TO BEGINNING WORK ON ANY ELECTRICAL WIRING, EQUIPMENT, ETC. ALL ELECTRICAL WIRING TO COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC).
- 12. ALL WIRING SHALL BE STANDARD COPPER FOR POWER, UNLESS NOTED OTHERWISE.

FLAG NOTES THIS SHEET:

- 1 COORDINATE INSTALLATION WITH THE SERVING UTILITY, NORTHWESTERN ENERGY (NWE).
- 2 EXISTING OVERHEAD ELECTRICAL LINES TO REMAIN. (TYPICAL)
- 3 EXISTING UNDERGROUND ELECTRICAL LINES TO REMAIN. (TYPICAL)
- 4 NEW DISCONNECT FOR SERVICE TO THE WELL HOUSE BUILDING, COORDINATE MOUNTING LOCATION ON THE EXTERIOR WALL OF THE HATCHERY BUILDING WITH THE EXISTING CONDITIONS AND LAYOUT OF THE EXISTING DISTRIBUTION EQUIPMENT. NEW DISCONNECT SHALL BE MOUNTED AS CLOSE TO THE EXISTING DISCONNECT AS POSSIBLE TO KEEP THEM GROUPED TOGETHER. PROVIDE LABEL ON THE NEW DISCONNECT TO CLEARLY INDICATE WHAT IT IS FEEDING. REFER ALSO TO TO PARTIAL POWER RISER DIAGRAM, E4, AND PANEL SCHEDULE, E3, FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- PROVIDE 1-1/2°C WITH FEEDER FROM NEW DISCONNECT ON THE EXTERIOR OF THE HATCHERY BUILDING TO THE CAMLOCK CONNECTION SWITCH ON UNISTRUT MOUNT NEAR THE PREFABRICATED WELL HOUSE BUILDING. BUILDING HAS LIFTING HOOKS SO THAT IT MAY BE REMOVED, AS NEEDED, FOR MAINTENANCE ON THE COUPMENT. UNISTRUT MOUNT MUST BE LOCATED SO THAT IT WILL NOT OBSTRUCT REMOVAL OF THE BUILDING. ALSO PROVIDE CONNECTION FROM THE CAMLOCK CONNECTION PANEL WITH INTEGRAL DISCONNECT SWITCH TO THE PANEL INSIDE THE BUILDING. FIELD VERIEY LOCATION OF THE PANEL AT THE PREFABRICATED WELL HOUSE. REFER ALSO TO PARTIAL POWER RISER DIAGRAM, E4, FOR THE FEEDER SIZE AND ADDITIONAL INFORMATION AND REQUIREMENTS.
- (6) ELECTRICAL CONTRACTOR RESPONSIBLE FOR GETTING THE PREFABRICATED BUILDING INSPECTED AND APPROVED BY THE STATE OF MONTANA. THE PREFABRICATED BUILDING INTERIOR ELECTRICAL DEVICES, LIGHTING, WIRING, ETC. MUST BE CERTIFIED PRIOR TO FINAL INSTALLATION.
- 1 IN AREA WHERE NEW UNDERGROUND ELECTRICAL WILL BE INSTALLED NEAR THE EXISTING UNDERGROUND ELECTRICAL, HAND DIG SO AS NOT TO DAMAGE THE EXISTING UNDERGROUND INSTALLATION. CALL FOR UTILITY LOCATES TO VERIFY EXACT LOCATION OF THE EXISTING UNDERGROUND LINES. DAMAGE TO EXISTING LINES WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO REPAIR AND/OR REPLACE.
- 8 APPROXIMATE LOCATION OF THE OFFICE INSIDE THE HATCHERY BUILDING.
- 9 PROVIDE COMMUNICATIONS CONNECTION FOR THE MONITORING SIGNALS TO THE OFFICE INSIDE THE HATCHERY BUILDING. CABLE SHALL BE 2-CONDUCTOR, #22AWG SHIELDED CABLE, PROVIDE A CABLE FOR EACH SIGNAL, VERIFY THE CABLE REQUIREMENT WITH THE SYSTEM SUPPLIER. SIGNALS SHALL INCLUDE, HIGH AND LOW FLOW LEVELS, STRAINER CLEANING CYCLE, AND HIGH PRESSURE ALARM. COORDINATE WITH THE INSTALLER PRIOR TO ROUGH-INS. ROUTE IN CONDUIT FROM THE WELL HOUSE BUILDING TO THE CONDUIT FROM THE WELL HOUSE BUILDING TO THE CONDUIT FROM THE EXET HE EXISTING STRAINER - 10 EXISTING CONDUIT IS BROKEN AT APPROXIMATELY THIS LOCATION. REPAIR CONDUIT SO IT IS CONTINUOUS AND SEALED.
- 11) THE PVC CONDUIT DOES NOT CONTINUE INSIDE THE BUILDING. ELECTRICAL CONTRACTOR TO PROVIDE A 1°C FROM THE POINT OF ENTRY INTO THE HATCHERY TO THE OFFICE AREA. FIELD VERIFY STUB-OUT LOCATION IN THE OFFICE PRIOR TO ROUGH-
- PROVIDE REMOTE ANNUNCIATOR IN THE OFFICE. THE ALARM DIALER SHALL BE AS MANUFACTURED BY SENSAPHONE, MODEL FGD-0800, OR APPROVED EQUIVALENT. FIELD COORDINATE LOCATION IN THE OFFICE WITH THE HATCHERY PERSONNEL. THE ALARM PANEL SHALL HAVE A WALL PLUG IN TRANSFORMER WITH 6',0' CORD TO PLUG INTO THE NEAREST RECEPTACLE. THE ALARM PANEL SHALL BE 8-CHANNEL INPUT WITH BATTERY BACKUP OPERATION; ALLOW FOR CUSTOM ALARM MESSAGES; AND HAVE THE CAPABILITY TO NOTIFY UP TO (4) PEOPLE BY VOICE PHONE CALL. THE TELEPHONE INTERFACE SHALL BE VIA AN RJ11 TELEPHONE JACK (MODULAR CORD TO BE PROVIDED WITH THE ALARM PANEL). THE SUCCESSFUL CONTRACTOR MUST SUBMIT A COMPLETE SHOP DRAWING SUBMITTAL FOR THE REMOTE ANNUNCATOR TO INCLUDE CONNECTION DIAGRAMS; PROGRAMMING; CUSTOMIZATION CAPABILITIES; AND FULL OPERATING INSTRUCTIONS. THE ANNUNCIATOR SHALL BE COMPATIBLE WITH THE STRAINER CONTROL PANEL SYSTEM VIA CONNECTIONS FROM DRY CONTACTS IN THE STRAINER CONTROL PANEL. COORDINATE WITH THE STRAINER SYSTEM INSTALLER AND SYSTEM SUPPLIED FOR CONNECTION REQUIREMENTS. THE ANNUNCIATOR SHALL PROVIDE INFORMATION ON HIGH AND LOW FLOW LEVELS FROM THE FLOWMETER; THE CLEANING CYCLE FROM THE STRAINER CONTROL PANEL AND A HIGH PRESSURE ALARM.



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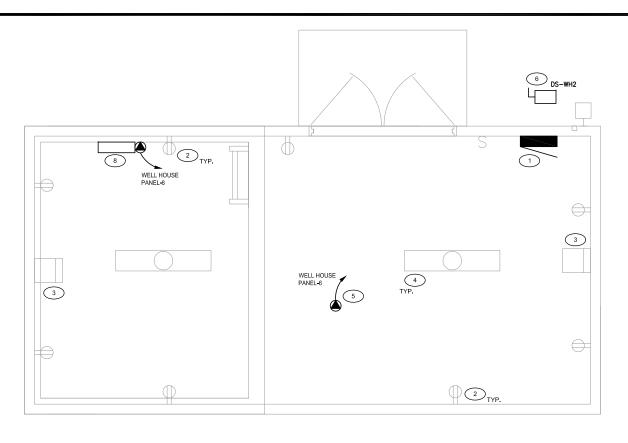
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Bluewater Springs Trout Hatchery
Artesian Well Head Development - Overall Electrical Site Plan





				DISC	ONNE	CT S	CHEDULE			
RM. NO.	DISC CODE	TYPE (GE)	VOLTAGE	PHASE	AMPS	NEMA TYPE	FUSE TYPE (BUSSMAN)	FUSE SIZE	NON- FUSED	REMARKS
EXTERIOR - HATCHERY	DS-WH1	HD	240	1	200	3R	FRN-R	125		NOTES 1,2
EXTERIOR - WELL HOUSE	DS-WH2	-	120/240	1	200	3R	FRN-R	125		NOTES 3,4
NOTES:										
1.	PROVIDE SERVIC	E-ENTRAN	ICE RATED DIS	CONNECTS	WITCH.					
						,	TO THE EXISTING SER'D EQUIPMENT AND DIS		NCE EQUIPI	MENT (METER, CT CABINET, AND
							MANUFACTURED BY P A WITH 125A FUSES; SI			ODEL NO. CCS-02SFSL-2, OR ITCHED NEUTRAL.
***	UNISTRUT-MOUN THE FEEDER LEN							PANEL LOC	CATIONINSI	DE AS POSSIBLE TO MINIMIZE

GENERAL ELECTRICAL NOTES

- 2. WELL HOUSE IS A PREFABRICATED BUILDING ALREADY PURCHASED BY THE OWNER. ENLARGED PLAN IS SHOWN FOR GENERAL LAYOUT ONLY. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS WITH THE BUILDING ON THE SITE.
- 3. REFER TO CIVIL PLANS FOR ADDITIONAL INFORMATION ON THE PIPING AND EQUIPMENT LAYOUT IN THE WELL HOUSE BUILDING
- 4. ALL 240V. SINGLE PHASE AND 120V FEEDERS ARE (2#12.1#12G)1/2", UNLESS SPECIFICALLY NOTED OTHERWISE REFER ALSO TO THE PANEL SCHEDULE(S), THIS SHEET, AND THE PARTIAL POWER RISER DIAGRAMS, E4, FOR ADDITIONAL INFORMATION ON THE FEEDERS.
- 5. COORDINATE ALL DEVICE AND EQUIPMENT LOCATIONS WITH THE OWNER AND/OR SYSTEM SUPPLIER/ INSTALLER.
- 6. ALL MOTORS SHALL HAVE A LOCAL DISCONNECTING MEANS LOCATED AT THE MOTOR, OR A MAXIMUM OF 5'-0"
- FIELD COORDINATE MOUNTING OF ELECTRICAL BOXES, PANELS, DEVICES, ETC. AND ROUTING OF CONDUITS WITH OTHER TRADES.
- 8. REFER ALSO TO ELECTRICAL DETAILS, E5, FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- 9. FIELD COORDINATE ROUTING OF ALL CONDUITS. CONDUIT ROUTING SHALL NOT INTERFERE WITH THE PIPING.
- EQUIPMENT PROVIDED AS PART OF THE WELL HOUSE IS SHOWN IN LIGHT LINE WEIGHT. NEW EQUIPMENT, FEEDERS, ETC. ARE SHOWN IN DARKER LINE WEIGHT.

FLAG NOTES THIS SHEET:

- 1 LOCATION OF THE SERVICE ENTRANCE EQUIPMENT (PANEL) FOR THE PREFABRICATED WELL HOUSE BUILDING. FIELD VERIFY LOCATION WITH THE BUILDING ON SITE. COORDINATE LOCATION WITH THE CIVIL PLANS. PANEL SHALL BE RELOCATED FROM THE EXISTING LOCATION.
- 2 GFI RECEPTACLE LOCATED THROUGHOUT THE BUILDING. (TYPICAL)
- 3 WALL-MOUNTED HEATER. TYPICAL FOR (2) HEATERS.
- 4 LIGHT FIXTURE. TYPICAL FOR (2) FIXTURES IN THE PREFABRICATED BUILDING.
- APPROXIMATE LOCATION OF THE FLOWMETER. FIELD VERIFY EXACT LOCATIONS, COORDINATE EXACT POWER REQUIREMENTS WITH THE SYSTEM INSTALLER. PROVIDE 120V CIRCUIT IN THE PANEL PROVIDED WITH THE BUILDING, AS
- 6 NEW SERVICE ENTRANCE LOCATION FOR THE WELL HOUSE BUILDING. COORDINATE LOCATION FOR THE CAMLOCK NEW SERVICE ENTRANCE LOCATION FOR IT IN WELL FLOORS BUILDING. COORDINATION TO THE CAMBOOK CONNECTION SWITCH WITH INTEGRAL DISCONNECT SWITCH WITH THE PREFABRICATED BUILDING LAYOUT AND PANEL LOCATION ON THE INTERIOR. REFER TO DISCONNECT SCHEDULE, THIS SHEET, FOR SPECIFICATION OF THE CAMBOOK PANEL. ALSO REFER TO PARTIAL POWER RISER DIAGRAM, E4, AND WELL HOUSE EQUIPMENT DETAIL, E5, FOR ADDITIONAL INFORMATION AND REQUIREMENTS FOR THE CAMBOOK CONNECTION PANEL.
- 7 ELECTRICAL CONTRACTOR RESPONSIBLE FOR GETTING THE PREFABRICATED BUILDING INSPECTED AND APPROVED BY THE STATE OF MONTANA. THE PREFABRICATED BUILDING INTERIOR ELECTRICAL INSTALLATION MUST BE CERTIFIED PRIOR TO COMPLETION OF THE PROJECT.
- 8 CONTROL PANEL PROVIDED WITH THE PACKAGED STRAINER SYSTEM. THE CONTROL PANEL WILL CONTAIN INTEGRAL CIRCUIT BREAKERS TO FEED THE LOADS ASSOCIATED WITH THE SYSTEM. PANEL WILL HAVE DRY CONTACTS TO PROVIDE REMOTE HIGH AND LOW LEVEL SIGNALS; STRAINER CLEANING CYCLE NOTIFICATION; AND HIGH PRESSURE ALARM TO THE FACILITY OFFICE. ELECTRICAL CONTRACTOR TO VERIFY AND COORDINATE CONNECTIONS WITH THE SUPPLIER / INSTALLER OF THE SYSTEM. PROVIDE CONNECTION TO CIRCUIT, AS INDICATED.

		PANEL SCH	HEDU	ILE	WEL	L HO	USE F	PANE	L (RE	EFE	REN	CE)			
NAME	WELL HO	USE PANEL								ROOM	NUMBER	PUMP HOUSE			٦
MFGR.	-		AMPS		125	AIC	10,000			PHASE CO	NDUCTORS		1	1	٦
TYPE	LOAD CEN	ITER	MAINS	11	MLO	OCP	125			NEUTRAL (CONDUCTORS			1	
WIDTH	14"		VOLTLL		240	MCA	65			GROUND W	VIRE			6	
DEPTH	3 3/4"		VOLTLN		120	FEED LGTH	30			CONDUITS	SIZE		1-1	1/2"	
MOUNTING	FLUSH		PHASE		1	CONAMPS	65			CONDUITR	RUNS			1	٦
FEED	TOP		WIRES		3	REMARKS				PERCENT V	OLTAGE DRO		0.1	1%	
BREAM	KER			LOAD	CIRCUIT		LOAD		CIRCUIT	LOAD			BREA	AKER	٦
AMPS	POLES	LOAD	VA	CODE	NO.	L1		L2	NO.	CODE	VA	LOAD	POLES	AMPS	
30	2	UNIT HEATER	2500	5	1			5000	2	5	2500	UNIT HEATER	2	30	٦
-	-	-	2500	5	3	5000			4	5	2500	-	-	-	1
20	1	LTS - WELL HOUSE	300	1	5			800	6	5	500	FLOWMETER	1	20	٦
20	1	RCPT - WELL HOUSE	720	2	7	2820			8	5	2100	STRAINER CONTROL PANEL	1	30	٦
20	1	RCPT - WELL HOUSE	720	2	9			720	10			SPARE	1	20	1
20	1	SPARE			11	0			12			SPARE	1	20	٦

PANEL SCHEDULE SHOWN FOR REFERENCE ONLY. PANEL PROVIDED WITH PREFABRICATED BUILDING. CIRCUITS AND LOADS MAY VARY. CIRCUITS DESIGNATED WITH ASTERISKS ARE PART OF THIS SCOPE OF WORK. CIRCUIT DESIGNATED WITH A DOUBLE ASTERISK (**) WILL REQUIRE A NEW CIRCUIT BREAKER COMPATIBLE WITH THE PANEL. FIELD VERIFY CIRCUIT(S) BEING MODIFIED. REFER ALSO TO CIVIL PLANS FOR LOCATIONS OF THE EQUIPMENT REQUIRING 120V CONNECTION.



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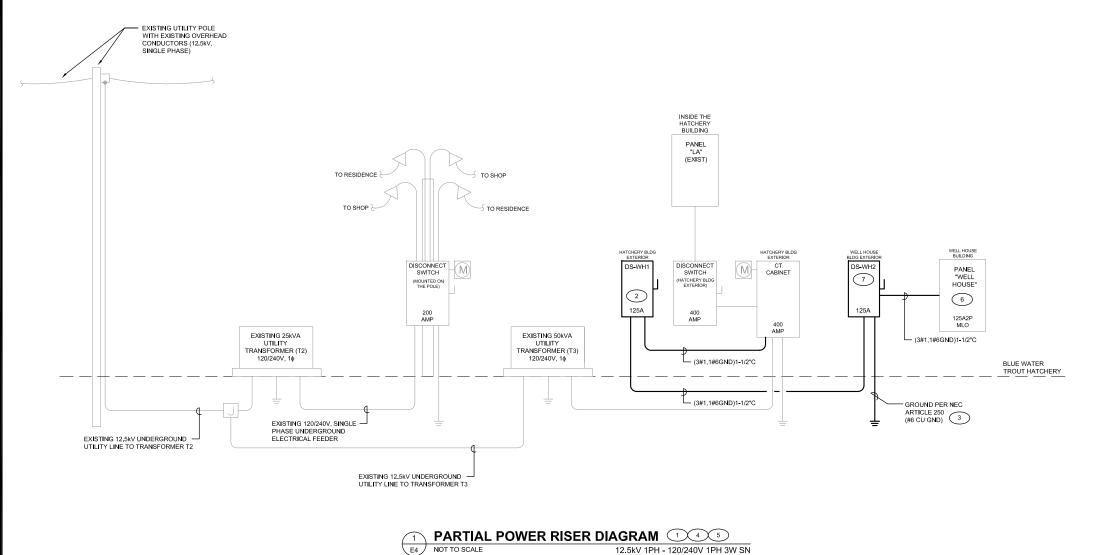
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MONTANA FISH,

MONTANA FISH, Bluewater Springs Trout Hatchery
WILDLIFE & PARKS Artesian Well Head Development - Enlarged Well House Plan & Schedules 5



GENERAL RISER DIAGRAM NOTES:

- COORDINATE ALL ELECTRIC SERVICE REQUIREMENTS WITH THE LOCAL SERVING UTILITY, NORTHWESTERN ENERGY.
- 2. PROVIDE DISCONNECTS, GROUND RODS, ETC. CONFORMING WITH UTILITY COMPANY REGULATIONS AND NEC STANDARDS
- ALL WIRING SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE NATIONAL ELECTRICAL CODE (NEC).
- 4. GROUND IN STRICT ACCORDANCE WITH NEC ARTICLE 250.
- 5. VERIFY LOCATIONS OF ALL UTILITY SERVICE EQUIPMENT AND THE UTILITY REQUIREMENTS PRIOR TO BIDDING.
- ALL CONDUITS NOT SHOWN SIZED ON THE DRAWINGS SHALL BE SIZED TO NOT EXCEED 40% FILL AND SHALL COMPLY WITH NEC REQUIREMENTS.
- 7. SEE FLAG NOTES, THIS SHEET, FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- 3. SERVICE INSTALLATION SHALL BE IN ACCORDANCE WITH NFPA 70 AND UTILITY REQUIREMENTS.
- 9. REFER ALSO TO ELECTRICAL DETAILS, E5, AND ELECTRICAL SCHEDULE(S), E3, FOR ADDITIONAL
- . EXISTING EQUIPMENT IS SHOWN IN LIGHT LINE WEIGHT. NEW EQUIPMENT, FEEDERS, ETC. ARE SHOWN IN
- ELECTRICAL CONTRACTOR SHALL PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN SERVICES TO THE ELECTRICAL INSTALLATION. ALL POWER OUTAGES MUST BE COORDINATED WITH THE OWNER AND APPROVED AT LEAST 72 HOURS PRIOR TO SCHEDULED OUTAGE.

FLAG NOTES - RISER DIAGRAM:

- 1 COORDINATE ALL NEW ELECTRICAL SERVICE REQUIREMENTS WITH UTILITY COMPANY AND OWNER PRIOR TO BID AND ADJUST BID ACCORDINGLY, ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE DISCONNECTS; GROUNDING; AND THE FEEDERS.
- 2 PROVIDE AND INSTALL DISCONNECT SWITCH AT THE MAIN SERVICE ENTRANCE ON THE HATCHERY BUILDING. GROUP THE NEW DISCONNECT WITH THE EXISTING DISCONNECT SO THEY ARE TOGETHER. NEW DISCONNECT FOR THE WELL HOUSE BUILDING TO BE FED FROM THE LUGS IN THE EXISTING CT CAN. COORDINATE CONNECTION WITH THE SERVING UTILITY.
- 3 CONNECT THE GROUND TO ALL AVAILABLE GROUNDING ELECTRODES INCLUDING REBAR AND DRIVEN GROUND ROD. REFER ALSO TO GROUNDING ELECTRODE SYSTEM DETAIL, ES, FOR ADDITIONAL INFORMATION. GROUND RODS MUST HAVE A RESISTANCE TO GROUND OF 25 OHMS OR LESS OR ADDITIONAL RODS SHALL BE ADDED. MINIMUM (2) GROUND RODS SPACED A MINIMUM OF 10°-0° APART.
- 4 REFER ALSO TO OVERALL ELECTRICAL SITE PLAN, E2, FOR ADDITIONAL INFORMATION REGARDING THE INCOMING SERVICE.
- 5 ELECTRICAL CONTRACTOR TO PROVIDE TEMPORARY SERVICE, AS REQUIRED, DURING CONSTRUCTION.
- 6 PANEL "WELL HOUSE" IS PROVIDED WITH THE PREFABRICATED BUILDING. REFER ALSO TO ENLARGED WELL HOUSE PLAN & SCHEDULES, E3, FOR ADDITIONAL INFORMATION ON THE SERVICE AT THE NEW WELL HOUSE.
- 7 PROVIDE CAMLOCK CONNECTION SWITCH WITH INTEGRAL DISCONNECT. REFER TO DISCONNECT SCHEDULE, E3, AND ELECTRICAL DETAILS, E5, FOR SPECIFICATION OF THE CAMLOCK SWITCH. UNISTRUT MOUNT NEAR THE BUILDING. FIELD COORDINATE EXACT LOCATION. REFER ALSO TO WELL HOUSE ELECTRICAL EQUIPMENT DETAIL, E5, FOR ADDITIONAL INFORMATION ON MOUNTING OF THE CAMLOCK PANEL.

LOAD JUSTIFICATION			
MAXIMUM DEMAND LOAD FOR PREVIOUS 12 MONTHS ON METER FOR TRANSFORMER T3 (AUGUST 2022)	5.9 kVA		
MAXIMUM DEMAND LOAD X 1.25 (PER NEC 220.87)	7.4 kVA		
NEW LOAD ADDED FOR THE PREFABRICATED BUILDING	17.8 kVA		
TOTAL LOAD (HATCHERY BUILDING AND NEW WELL HOUSE FED FROM TRANSFORMER T3)	25.2 kVA = 105.0 AMPS		

NOTE: THE EXISTING 50kVA TRANSFORMER IS SUFFICIENT FOR THE EXISTING LOADS IN THE HATCHERY BUILDING AND THE NEW PREFABRICATED WELL HOUSE BUILDING WHICH IS A PART OF THIS SCOPE OF WORK.



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Bluewater Springs Trout Hatchery Artesian Well Head Development - Power Riser Diagram

SECTION 262820 CAMLOCK CONNECTION SWITCH

PART 1 GENERAL

1.01 SUMMARY

A Section Includes Camlock connection switch specifications

1.02 REFERENCES

- A. National Electrical Manufacturers Association:
- 1. NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum).
- B. Underwriters Laboratories, Inc.:
- 1. UL 1773 Standard for Termination Boxes.

1.03 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience
- B. A complete factory assembled unit shall be provided an installed.

1.04 REGULATORY REQUIREMENTS

A. The Camlock connection switch shall be UL labeled as a complete assembly.

1.05 SUBMITTALS

- A. Product Data: Submit wiring device manufacturer's catalog information showing dimensions configurations, front and side elevation view, line and load connection details, conduit entry
- B. Assembly ratings, including short-circuit rating, voltage, enclosure type, and continuous
- C. Manufacturer's installation instructions and connection details.

1.06 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations, sizes, and configurations of equipment

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of the Camlock connection switch that fail in materials or workmanship within specified warranty period.
- 1. Warranty Perjod: 12 months from date of final acceptance

1.08 COORDINATION

- A. Coordinate project with existing conditions.
- B. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections
- C. Determine connection locations and requirements
- D. Sequence rough-in of electrical connections to coordinate with installation of equipment.
- E. Sequence electrical connections to coordinate with start-up of equipment.

PART 2 PRODUCTS

2.01 CAMLOCK CONNECTION SWITCH

- A. Manufacturers:
- 1. Power Assemblies, LLC (basis of design).
- Substitutions: Per the Project Manual.

- 1. Camlock Connection Switches are defined as complete switching units with mail camlocks
- input or female output connectors wired to a switch for quick connection use. 2. In the event the Contractor is furnishing the Camlock Connection Switch, the Contractor shall be responsible for the equipment until it has been installed, inspected, tested, and

accepted in accordance with the requirements of the Project Manual and specifications

1. Voltage and amperage: As indicated on the Drawings

D. Construction:

- All equipment shall be new.
- 2. Camlock Connection Switch enclosure shall be NEMA 3R.:
- a. Unit shall be constructed of carbon steel-coated or aluminum
- b. Wall-mount type enclosure will have mounting holds in back of enclosure for mounting and mounting hardware shall be included.
- c. CAM connectors shall be UL/CSA Listed single-pole and rated at 200A at 600VAC. CAM connectors shall be color-coded to visualize appropriate voltages. CAM connectors shall be provided for each phase in the appropriate configuration to support required amperage and provided for neutral, if required.
- 3. Field (temporary) wiring connections:

E. Enclosure:

- 2. NEMA 3R rated.
- 3. Material: Carbon steel or aluminum
- 4. Finish: ANSI 61 Gray or uncoated aluminum
- F. Standards: UL 1773 Standard for Termination Boxes.

PART 3 EXECUTION

3.01 EXAMINATION

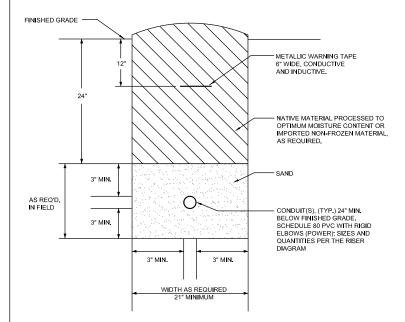
- A. Coordinate project with existing conditions. Notify Engineer, in writing, if unsatisfactory conditions
- B. Install as indicated and in accordance with the manufacturer's recommendations and instructions.
- C. Connect as indicated on the one-line diagram.

3.02 INSTALLATION

- A. Procedures for Installation
- 1. Camlock connection switch shall be installed as shown on the drawings. In addition, the
- a. Meet the requirements of Local Codes, the National Electrical Code, and the National Electrical Contractors Association's "Standard of Installation
- b. Only use copper wire conductors for all field wiring.
- c. All terminations must be torqued according to the label provided

END OF SECTION

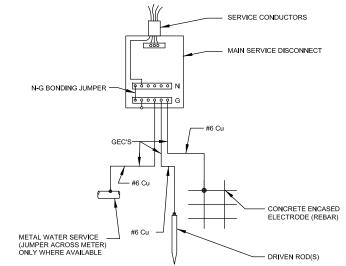




NOTES

- DEPTHS NOTED ARE MINIMUM BURIAL.
- DEPTHS ARE SPECIFIED FROM FINISHED GRADE. WHERE SURROUND GRADE IS NOT DISTURBED THE DEPTHS ARE FROM EXISTING GRADE
- OVER-EXCAVATE TRENCHES AS NECESSARY TO ALLOW FOR:
- (a) SAND BEDDING (b) LOOSE AND SANDY SOILS, OR
- (c) WHERE MORE THAN ONE CABLE WILL BE INSTALLED IN TRENCH AND LAYING OF FIRST CABLE MAY CAUSE TRENCH DAMAGE AND REDUCTION IN DEPTH
- SAND BEDDING SHALL BE FREE OF ORGANIC AND ROCK MATERIALS
- EXCAVATION, BACK FILL AND COMPACTION ARE PART OF THIS CONTRACT, INCLUDING
- WIRING CONSISTS OF INSULATED CONDUCTORS INSTALLED IN DUCTS. CONDUCTOR INSULATION TYPE USE SHALL BE USED FOR LOW VOLTAGE CIRCUITS AND SERVICE ENTRANCE. INSULATION FOR MEDIUM VOLTAGE CIRCUITS SHALL BE EPR. MEDIUM VOLTAGE CIRCUITS SHALL HAVE DRAIN WIRE INSULATION SHIELDING. ALL CONDUCTORS SHALL BE COPPER

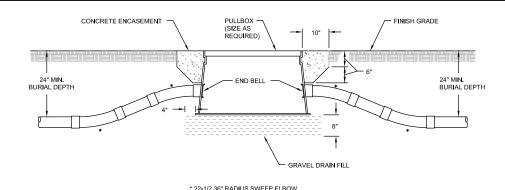






MONTANA FISH,

WILDLIFE & PARKS





DISCONNECT

(1)

(2)

RACK DETAIL FLAG NOTES:

- CAMLOCK CONNECTION SWITCH WITH INTEGRAL DISCONNECT SWITCH FOR THE WELL HOUSE BUILDING ELECTRICAL SERVICE. REFER TO PARTIAL POWER RISER DIAGRAM, E4, FOR ADDITIONAL INFORMATION AND REQUIREMENTS. THIS DETAIL IS APPLICABLE FOR THE DISCONNECT ON THE PREFABRICATED WELL HOUSE BULLDING, REFER ALSO TO SPECIFICATION, THIS SHEET, FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- 2 GROUND RODS MUST HAVE A RESISTANCE TO GROUND OF 25 OHMS OR LESS OR ADDITIONAL RODS SHALL BE ADDED. MINIMUM (2) GROUND RODS SPACED A MINIMUM OF 10'-0" APART.
- 3 ALL CONDUIT AND FITTINGS TO BE GRAY, SCHEDULE 80 PVC CONDUIT.
- PROVIDE POWDER-COATED BRONZE, 3/16" STEEL PLATE, HEIGHT, AS REQUIRED, WELDED TO 4" SQUARE STEEL POSTS WITH CAPS, BURIED 3'-0" BELOW GRADE, ENCASED IN CONCRETE. ALL STEEL SHALL BE POWDER-COATED BRONZED, SIZED AS REQUIRED. COORDINATE LOCATIONS OF THE POSTS, BOARD AND ELECTRICAL AS REQUIRED, COORDINATE LOCATIONS OF THE POSTS, BOARD AND ELECTRIC ITEMS WITH OWNER AND UTILITY. SUBMIT ALL MATERIALS FOR APPROVAL. MOUNT THE CAMLOCK CONNECTION SWITCH WITH INTEGRAL DISCONNECT ON THE PLATE. DIMENSIONS SHALL BE ADEQUATE TO ACCOMMODATE ALL THE EQUIPMENT. USE FLEX CONNECTORS. MOUNTING SHALL BE SUCH THAT IT IS A STURDY, STAND-ALONE RACK THAT CAN WITHSTAND A MINIMUM 60mph WIND WITH GUSTS TO 100mph. DISCONNECT FOR THE ELECTRICAL SERVICE SHALL BE IN AN ACCESSIBLE LOCATION. TYPICAL ELEVATION IS SHOWN. FIELD MODIFY, AS NECESSARY. VERIFY DIMENSIONS OF ALL EQUIPMENT WITH WHAT IS BEING SUPPLIED PRIOR TO FABRICATION OF THE BACKBOARD.
- ALL SCREWS, NUTS, BOLTS, STRAPS, AND SIMILAR CONNECTORS SHALL BE STEEL. PROVIDE NEOPRENE PAD AND/OR FIBER WASHERS BETWEEN DISSIMILAR
- ALL BOXES, FITTINGS AND PIPES TO BE NEMA 3R RATED.
- UNISTRUT MOUNT SHALL BE CLOSE TO THE THE EXTERIOR OF THE BUILDING TO MINIMIZE THE CONNECTION TO THE PANEL INSIDE, BUT NOT INTERFERE WITH THE ABILITY TO REMOVE THE BUILDING FOR EQUIPMENT MAINTENANCE, AS NEEDED. REFER TO THE OVERALL ELECTRICAL SITE PLAN , E2, AND THE ENLARGED WELL REFER TO THE OVERALL ELECTRICAL SITE PLAN, E.2, AND THE ENLARGED WELL HOUSE PLAN & SCHEDULES, ES, FOR ADDITIONAL INFORMATION. USE FLEX CONNECTORS, E.C. TO COORDINATE LOCATION OF THE UNISTRUT MOUNT WITH THE OWNER, AND BUILDING INSTALLER. DISCONNECT FOR THE ELECTRICAL SERVICE SHALL BE IN AN ACCESSIBLE LOCATION. TYPICAL ELEVATION IS SHOWN. FIELD MODIFY, AS NECESSARY. VERIFY DIMENSIONS OF ALL EQUIPMENT PRIOR



FINISHED GRADE



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