

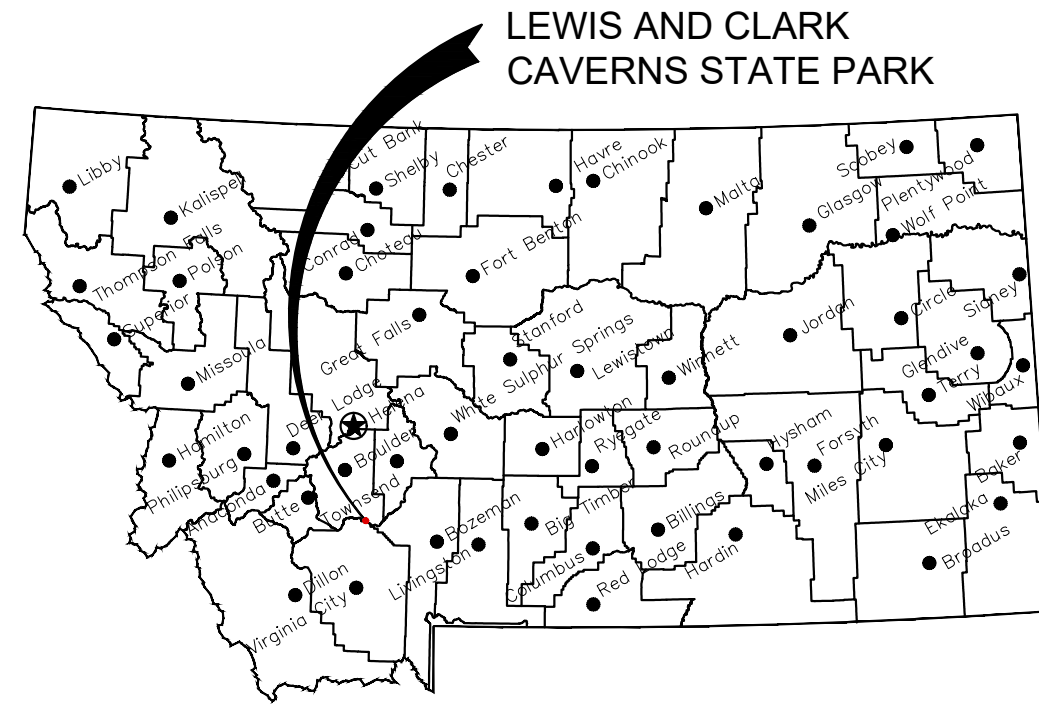
PLANS FOR CONSTRUCTION OF:

LEWIS AND CLARK CAVERNS STATE PARK COMFORT STATION SEPTIC PROJECT

NEAR CARDWELL, MONTANA
FWP #7176303

SHEET INDEX

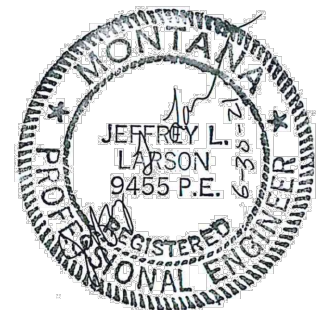
| | |
|----------------------------------|-----|
| TITLE SHEET | T1 |
| OVERALL SITE PLAN | C1 |
| NOTES AND DETAILS | C2 |
| COMFORT STATION PLAN | C3 |
| COMFORT STATION TANK DETAILS | C4 |
| COMFORT STATION PLAN AND PROFILE | C5 |
| RV DUMP STATION PLAN | C6 |
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| RV SUMP STATION DETAILS (2) | C8 |
| RV DUMP STATION TANK DETAILS | C9 |
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| TANK DETAILS (2) | C12 |
| TREATMENT DETAILS | C13 |
| DRAIN FIELD DETAILS | C14 |
| ELECTRICAL DETAILS | E1 |



PROJECT LOCATION MAP



PROJECT VICINITY MAP



| | |
|-------------|----------------|
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**MONTANA FISH,
WILDLIFE & PARKS**

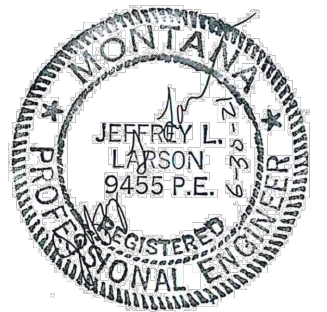
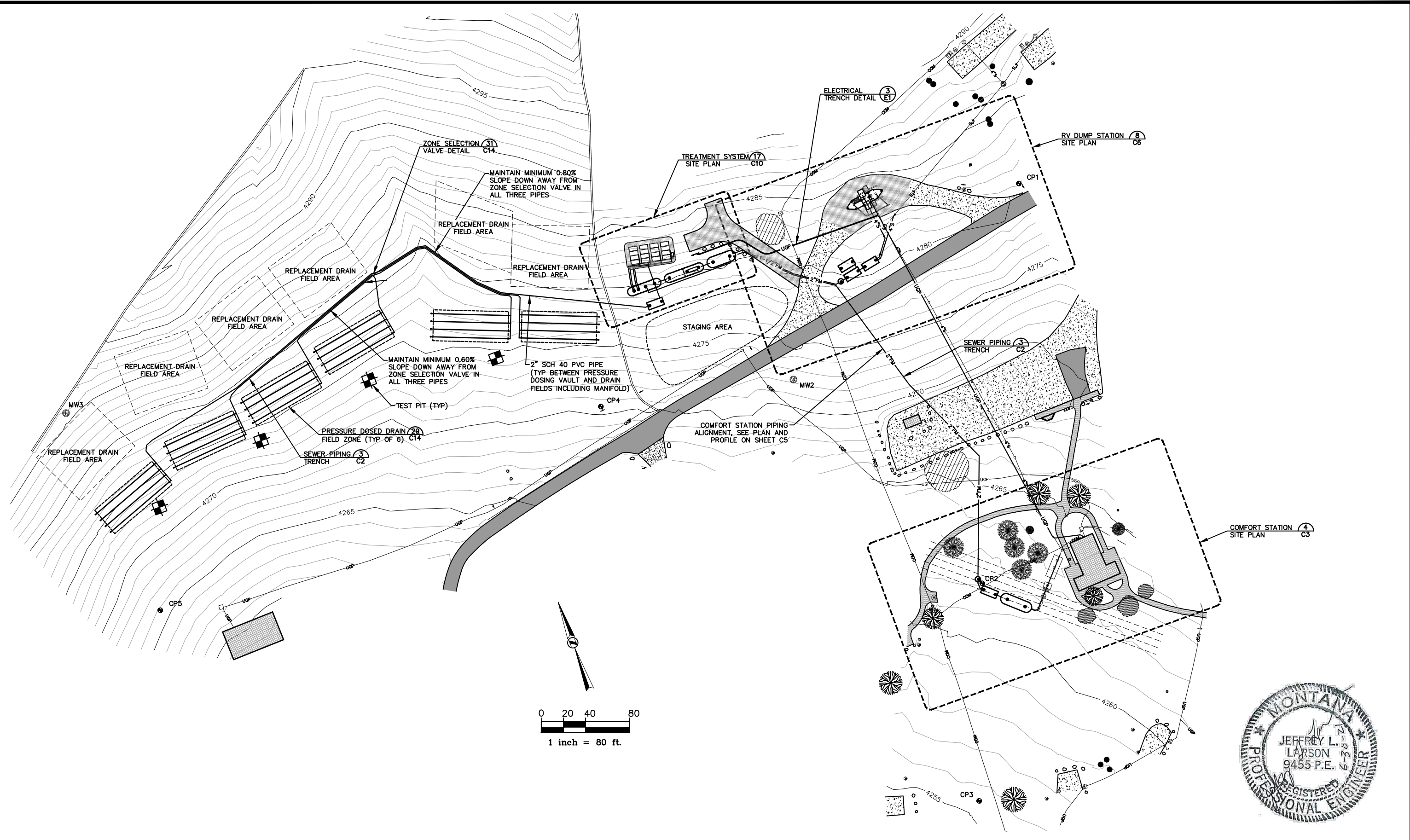
138

TITLE SHEET
LEWIS AND CLARK CAVERNS STATE PARK
COMFORT STATION SEPTIC PROJECT
FWP #7176303



28 ANTLER AVENUE
CLANCY, MT 59634
406-443-6111
jeff@larsonce.com

SHEET: T1



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**MONTANA FISH,
 WILDLIFE & PARKS**

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OVERALL SITE PLAN
 LEWIS AND CLARK CAVERNS STATE PARK
 COMFORT STATION SEPTIC PROJECT
 FWP #7176303



28 ANTLER AVENUE
 CLANCY, MT 59634
 406-443-6111
 jeff@larsonce.com

SHEET: **C1**

CONSTRUCTION NOTES:

- ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH "MONTANA PUBLIC WORKS SPECIFICATIONS", SIXTH EDITION (MPW).
- BEFORE DIGGING, CALL 811 FOR LOCATION OF EXISTING UTILITIES. THE LOCATION OF UTILITIES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND WERE DERIVED PRIMARILY FROM AS-BUILT DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION OF PRIVATE UTILITIES WITHIN THE PROJECT AREA, NOT LOCATED BY UTILITY COMPANIES.
- ALL DISTURBED AREAS AND AREAS DESIGNATED IN THE PLANS FOR SEEDING SHALL BE TOPSOILED, SEEDED, MULCHED, AND FERTILIZED (SEE MPW SEEDING SPECIFICATIONS). SALVAGED TOPSOIL SHALL BE SPREAD EVENLY OVER DISTURBED AREAS. SEED MIX SHALL BE AN APPROVED LAWN MIX OR NATIVE DRYLAND MIX AS APPROPRIATE TO RESTORE THE GRASS TO CURRENT CONDITION:

| PLANT SPECIES | LBS/ACRE |
|-----------------------|----------|
| WESTERN WHEATGRASS | 4.8 LBS |
| STREAMBANK WHEATGRASS | 3.2 LBS |
| HARD FESCUE | 3.2 LBS |
| SLENDER WHEATGRASS | 2.4 LBS |
| GREEN NEEDLEGRASS | 2.4 LBS |
| TOTALS | 16.0 LBS |

- GRAVITY SEWER PIPING SHALL BE 4" SCHEDULE 40 PVC.
- PUMPING EFFLUENT PRESSURE PIPING SHALL BE 1-1/2" OR 2" SCHEDULE 40 PVC.
- CRUSHED BASE COURSE SHALL BE 1" MINUS PER MPW SPECIFICATIONS.
- PLANT MIX SURFACING SHALL BE TYPE-B, WITH ASPHALT CEMENT PG 58-28.
- CONCRETE SHALL BE M-4000 AS DEFINED BY MPW SPECIFICATION 03/310 STRUCTURAL CONCRETE.
- SIDEWALKS SHALL BE CROSS SLOPED AT A MAXIMUM OF 1.8% AND SHALL BE BROOM FINISH.
- ALL REQUIRED COMPACTION TESTING SHALL BE PROVIDED BY AN INDEPENDENT TESTING FIRM AT THE EXPENSE OF THE CONTRACTOR, COMPACTION TESTING FREQUENCIES ARE AS FOLLOWS:

| LOCATION/MATERIAL | # OF TESTS |
|---|------------|
| SUBGRADE (LOOP ROAD CROSSING) | 1 |
| CRUSHED BASE COURSE (LOOP ROAD CROSSING) | 1 |
| ASPHALT (LOOP ROAD CROSSING) | 1 |
| SUBGRADE FOR GRAVEL SURFACING (3 LOCATIONS) | 2 |
| CRUSHED TOP SURFACING (3 LOCATIONS) | 2 |

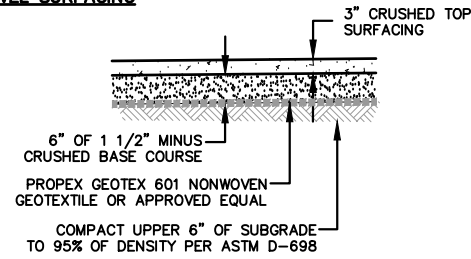
- CRUSHED TOP SURFACING FOR GRAVEL SURFACING SHALL MEET THE FOLLOWING SPECIFICATIONS INCLUDING BINDER OR BLENDING MATERIAL:

| SIEVE SIZE | % PASSING |
|---------------|-----------|
| 3/4" SIEVE | 100% |
| No. 4 SIEVE | 40-80% |
| No. 10 SIEVE | 25-60% |
| No. 200 SIEVE | 8-20% |

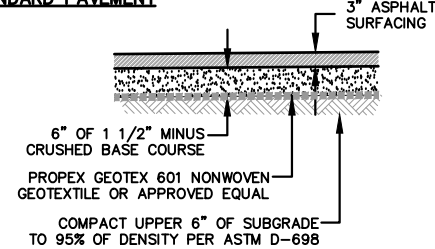
IN ADDITION, THE PORTION PASSING THE NO. 200 SIEVE CANNOT EXCEED 2/3 OF THE PORTION PASSING THE #40 SIEVE; THE MAXIMUM LIQUID LIMIT FOR THE MATERIAL PASSING THE NO. 40 SIEVE SHALL NOT EXCEED 35, WHILE THE PLASTICITY INDEX CAN VARY BETWEEN 3 AND 10; THE WEAR FACTOR SHALL NOT EXCEED 50% AT 500 REVOLUTIONS; AND AT LEAST 20% OF THE AGGREGATE RETAINED ON NO. 4 SIEVE SHALL HAVE A FRACTURED FACE.

- SEPTIC TANKS, CONCRETE VAULTS AND DISTRIBUTION BOX CALLED FOR DEMOLITION SHALL BE PUMPED TO REMOVE ANY REMAINING WASTEWATER. THE TOP OF EACH STRUCTURE SHALL BE REMOVED AND SIDEWALLS BROKEN DOWN TO A MINIMUM DEPTH OF 30" BELOW GROUND SURFACE. THE PORTION OF THE STRUCTURE DEEPER THEN 30" BELOW GROUND SURFACE CAN BE REMOVED OR FILLED WITH COMPACTED SAND OR GRAVEL AT THE CONTRACTORS OPTION. IF LEFT IN PLACE SEVERAL HOLES WILL BE MADE IN THE BOTTOM OF THE STRUCTURE TO ALLOW DRAINAGE. ALL CONCRETE, PLASTIC, WOOD OR METAL DEBRIS SHALL BE DISPOSED OF IN A LICENSED LANDFILL.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND MEETING THE REQUIREMENTS OF A SWPPP PERMIT.
- MAINTAIN A MINIMUM OF 4.0-FEET OF COVER OVER ALL UNDERGROUND PIPING EXCEPT WHERE PROHIBITED BY THE ELEVATION OF EXISTING LINES OR PORTIONS OF THE TREATMENT PIPING THAT CONNECT TO TANK RISERS.
- CONDUCTORS AND CABLES BETWEEN CONTROL PANELS AND PUMPS, FLOATS, FLOWMETERS AND OTHER EQUIPMENT SHALL BE INSTALLED IN CONDUIT AS SPECIFIED FOR ELECTRICAL CONDUCTORS ON SHEET E1 OF THE DRAWINGS.

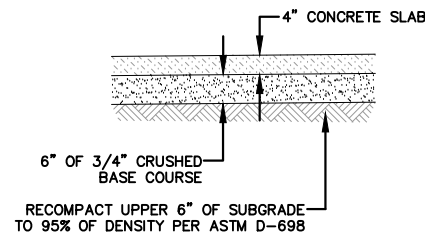
GRAVEL SURFACING



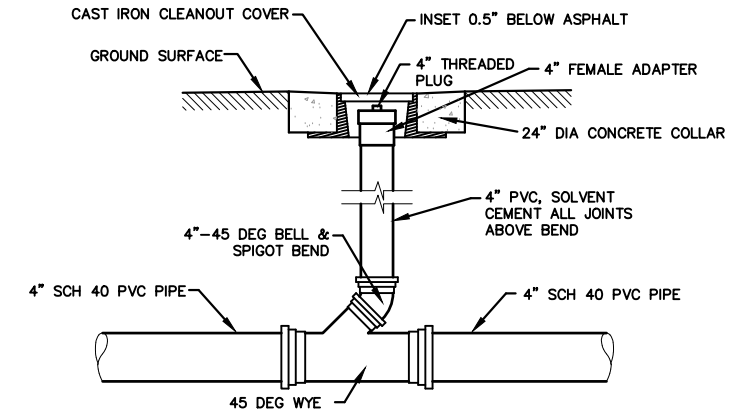
STANDARD PAVEMENT



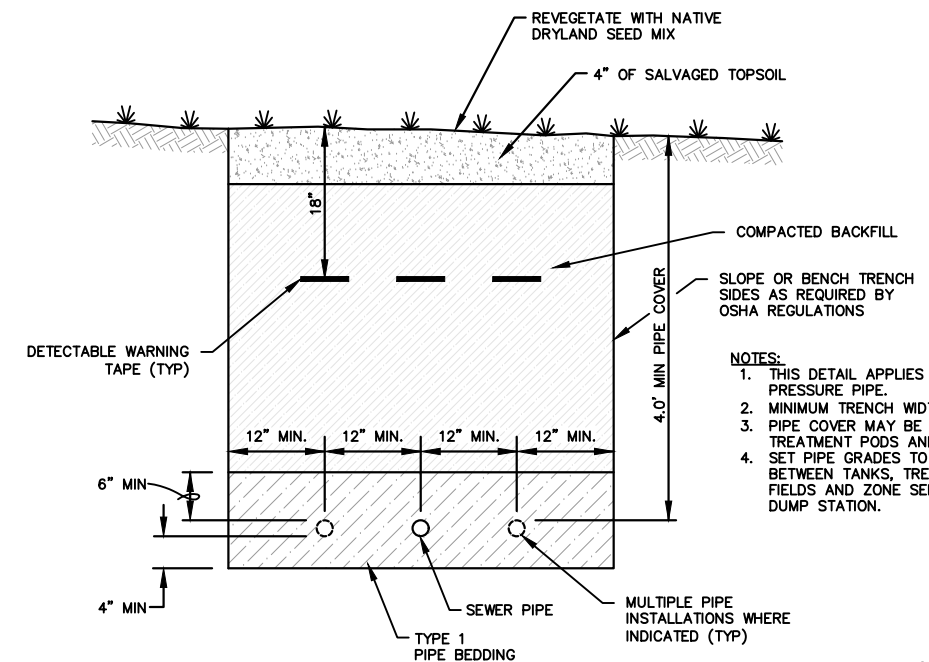
STANDARD SIDEWALK



TYPICAL SECTIONS
NO SCALE C3,C5,C6,C10

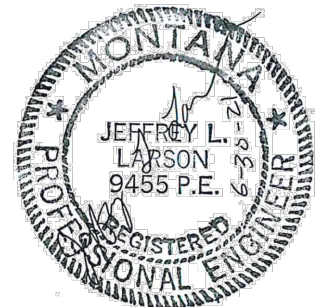


SEWER CLEANOUT
NO SCALE C3,C5,C6



SEWER PIPING TRENCH
NO SCALE C1,C5,C6,C10

- NOTES:**
- THIS DETAIL APPLIES TO BOTH GRAVITY AND PRESSURE PIPE.
 - MINIMUM TRENCH WIDTH IS 30".
 - PIPE COVER MAY BE LESS THAN 4.0' NEAR TREATMENT PODS AND RECIRCULATION TANK.
 - SET PIPE GRADES TO MAINTAIN DRAINAGE BETWEEN TANKS, TREATMENT UNITS, DRAIN FIELDS AND ZONE SELECTION VALVES AND RV DUMP STATION.



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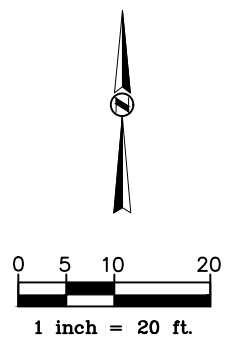
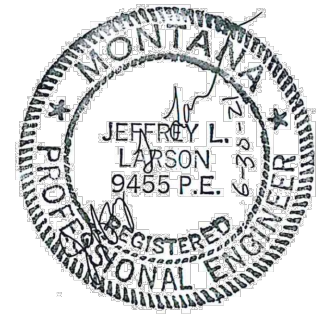


**MONTANA FISH,
WILDLIFE & PARKS**

NOTES AND DETAILS
LEWIS AND CLARK CAVERNS STATE PARK
COMFORT STATION SEPTIC PROJECT
FWP #7176303



28 ANTLER AVENUE
CLANCY, MT 59634
406-443-6111
jeff@larsonce.com



COMFORT STATION PLAN 4
C1

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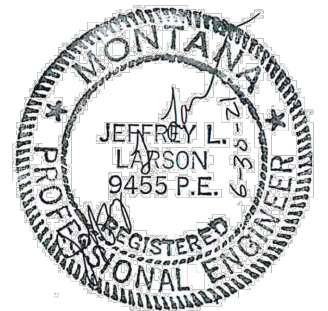
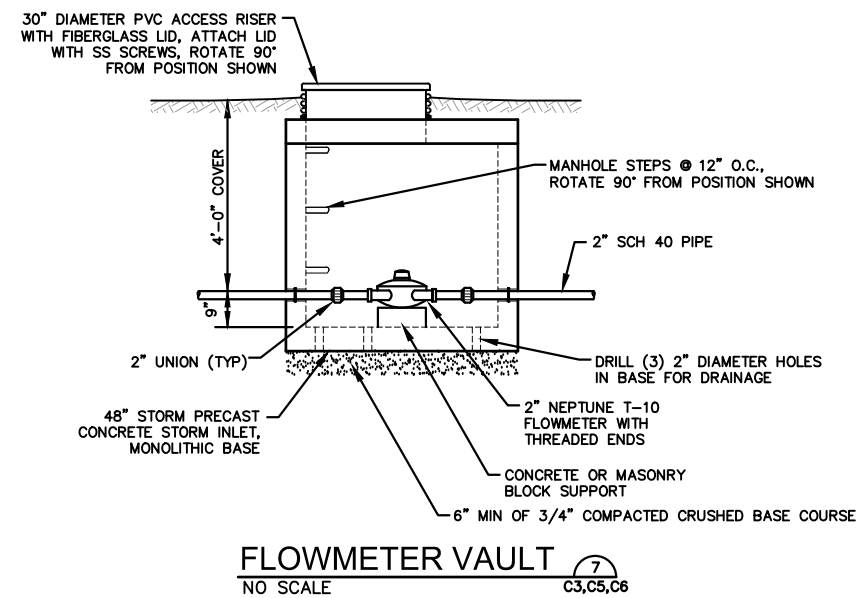
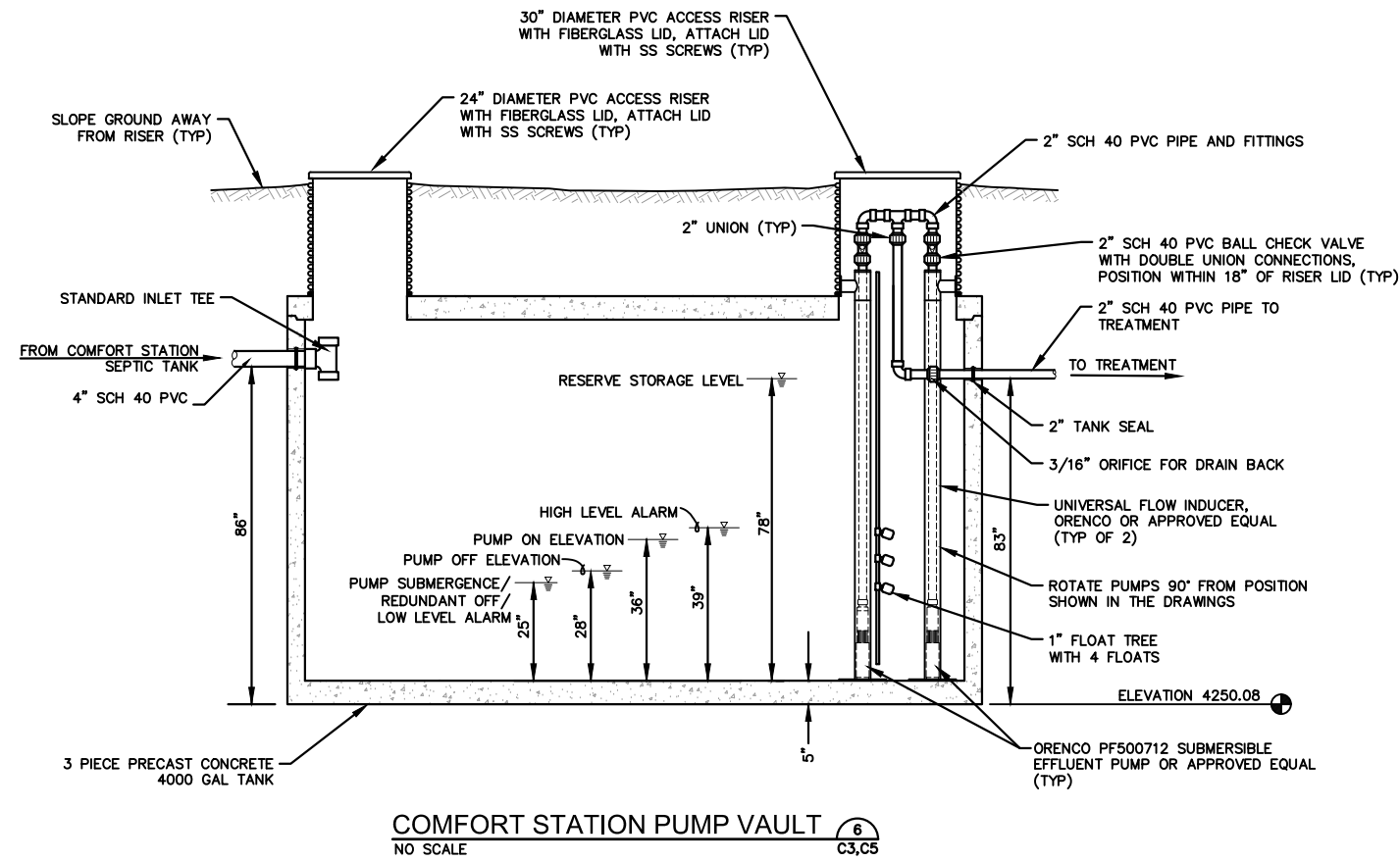
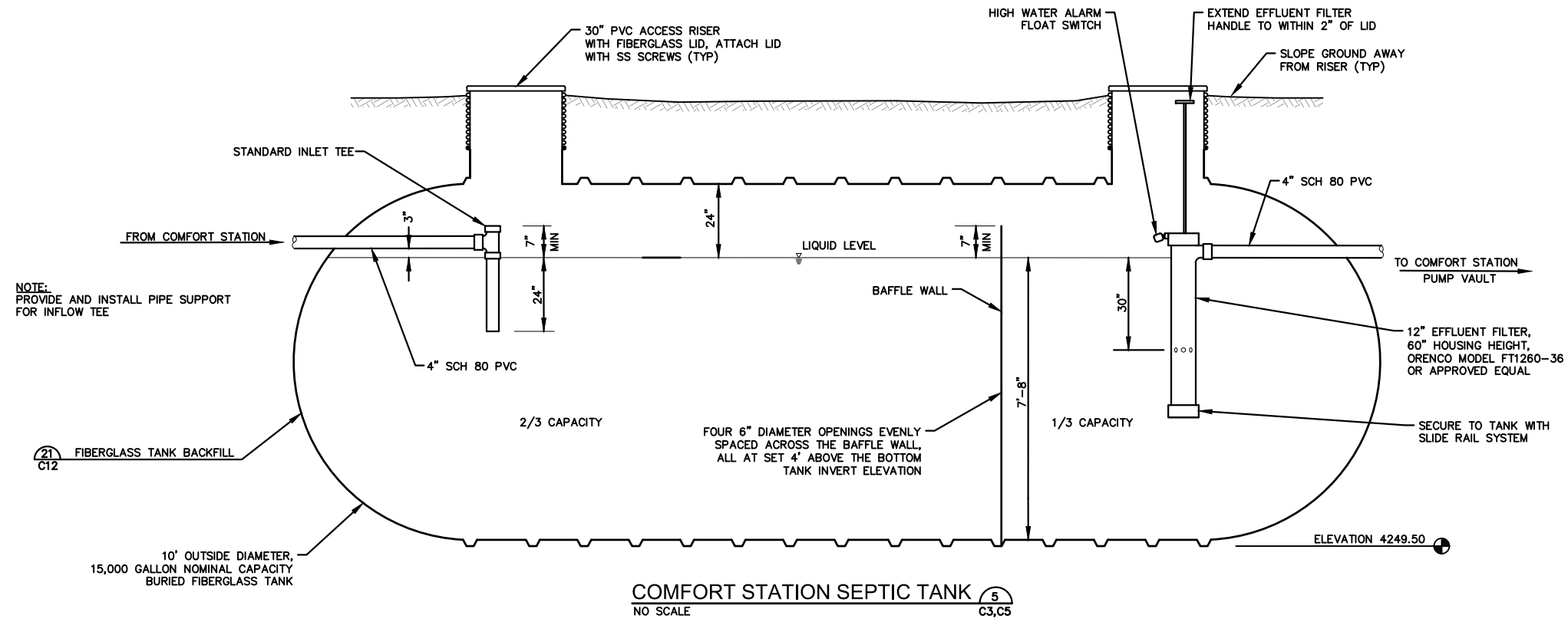


COMFORT STATION PLAN
 LEWIS AND CLARK CAVERNS STATE PARK
 COMFORT STATION SEPTIC PROJECT
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SHEET: **C3**



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**MONTANA FISH,
 WILDLIFE & PARKS**

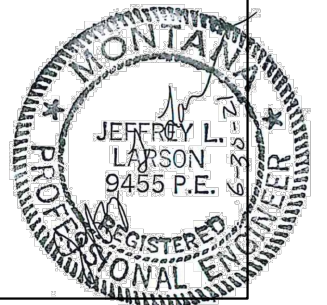
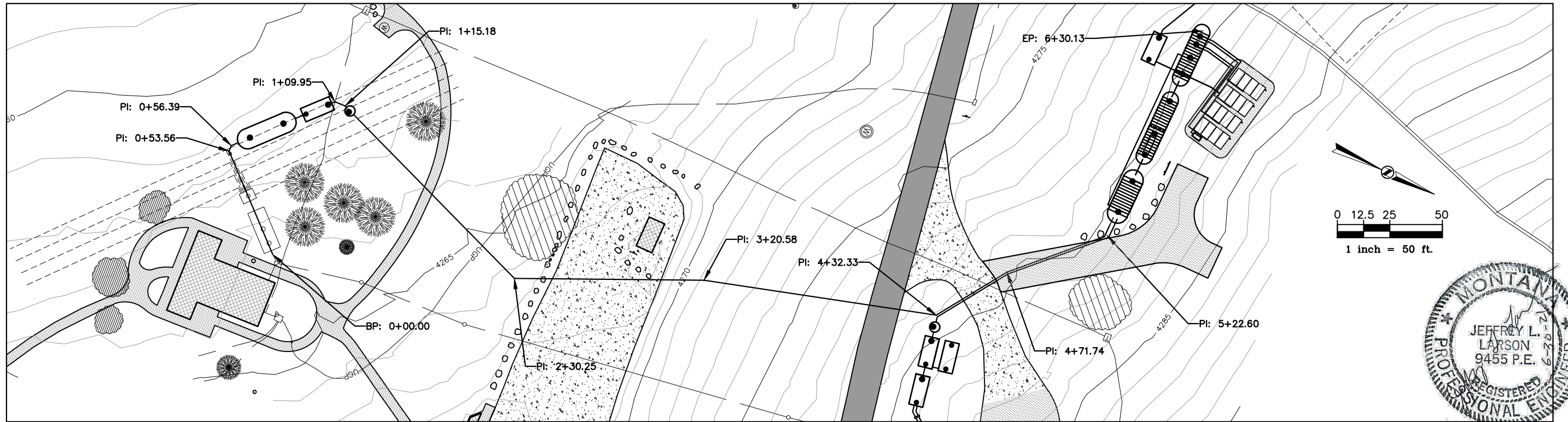
142

COMFORT STATION TANK DETAILS
 LEWIS AND CLARK CAVERNS STATE PARK
 COMFORT STATION SEPTIC PROJECT
 FWP #7176303

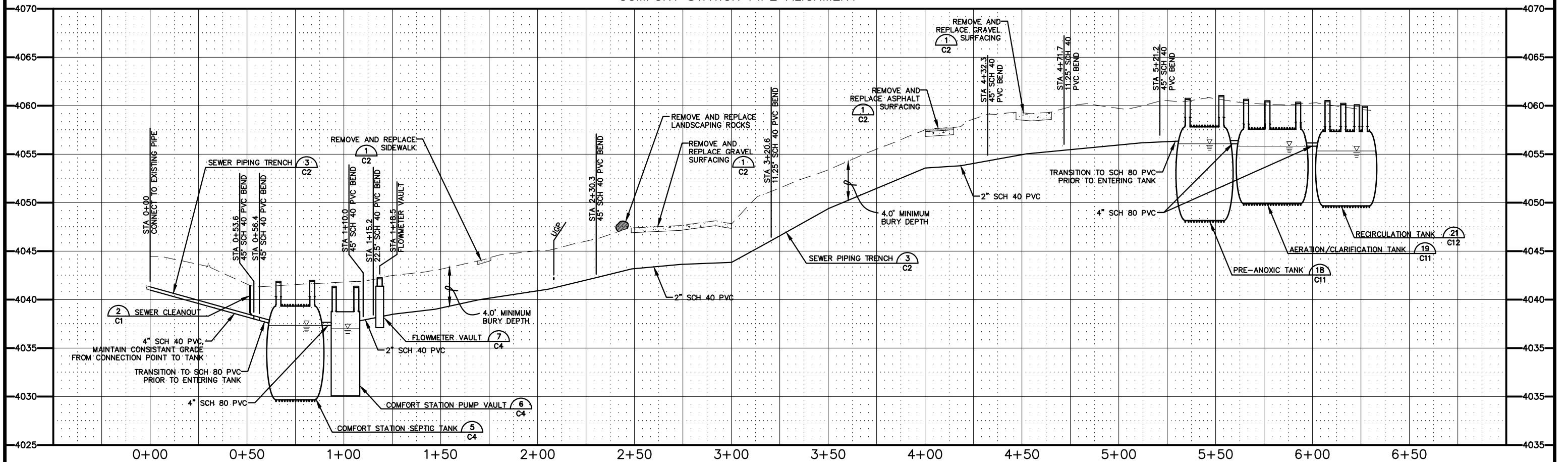


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SHEET: **C4**



COMFORT STATION PIPE ALIGNMENT



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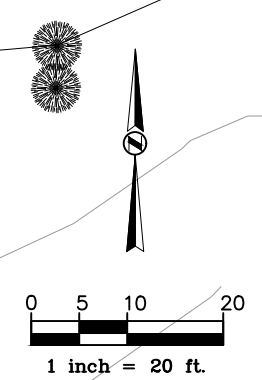
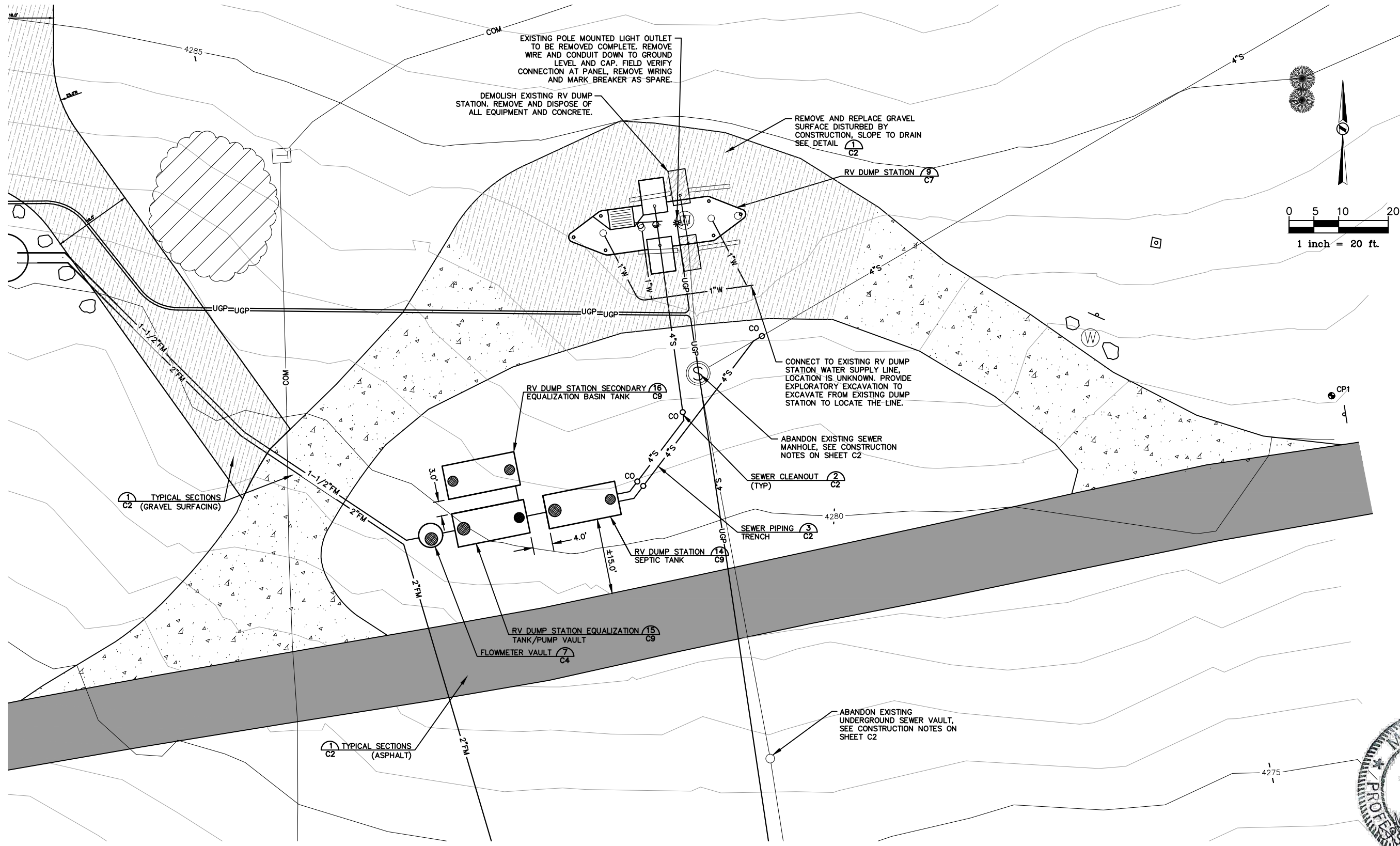
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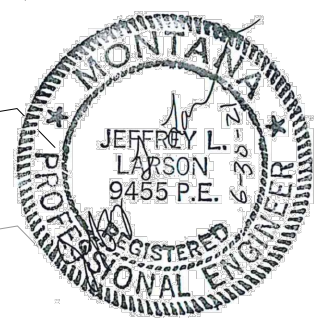
COMFORT STATION PLAN AND PROFILE
 LEWIS AND CLARK CAVERNS STATE PARK
 COMFORT STATION SEPTIC PROJECT
 FWP #7176303

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 406-443-6111
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SHEET: C5



RV DUMP STATION PLAN 8/C1



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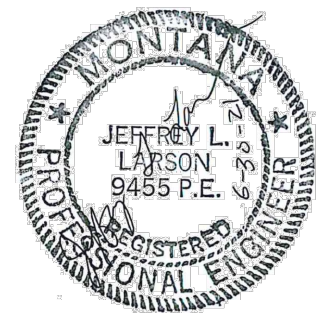
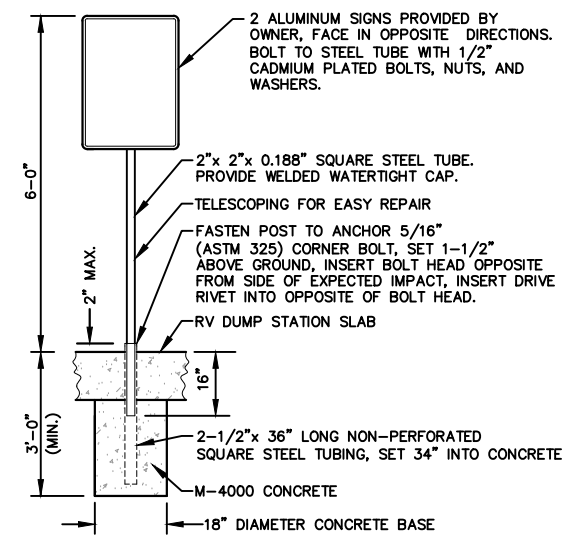
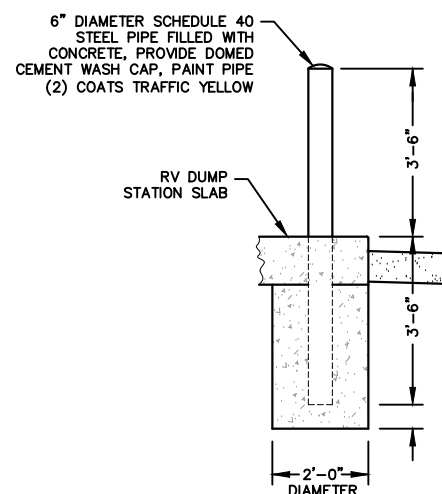
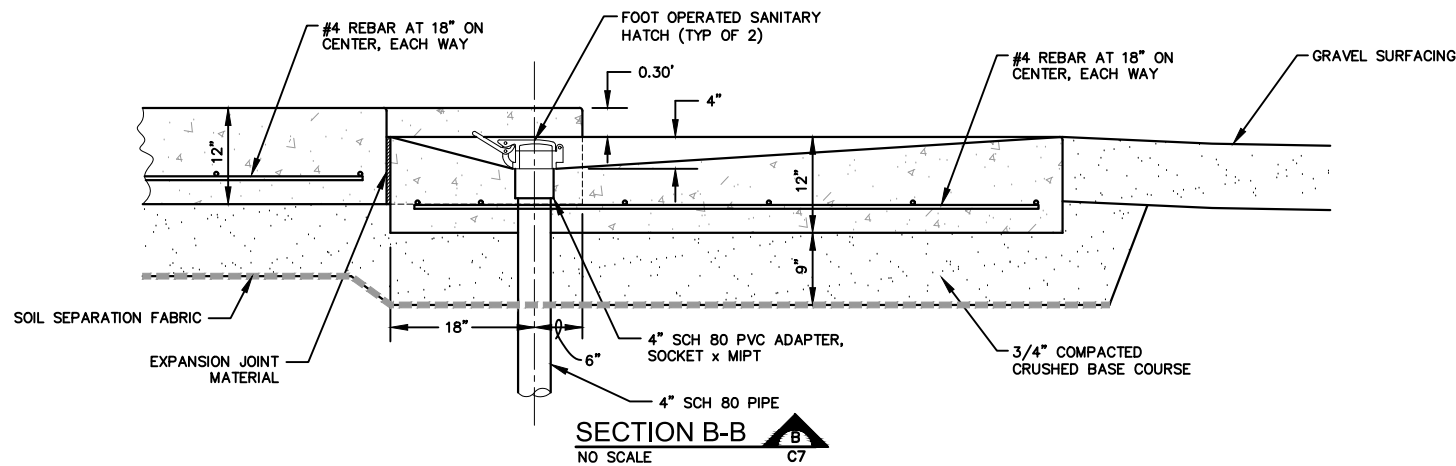
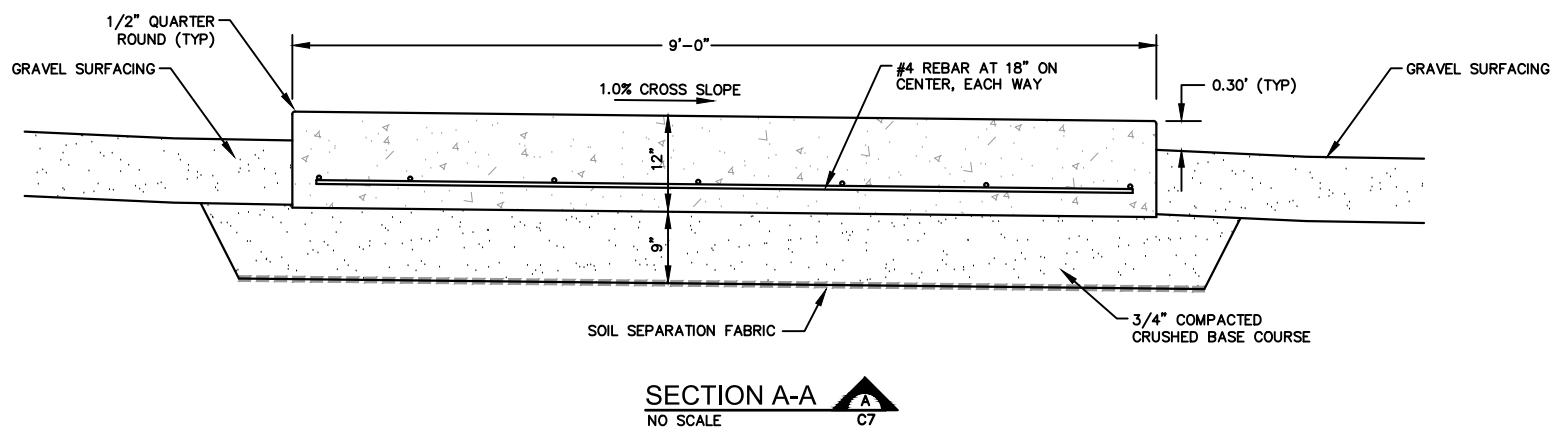
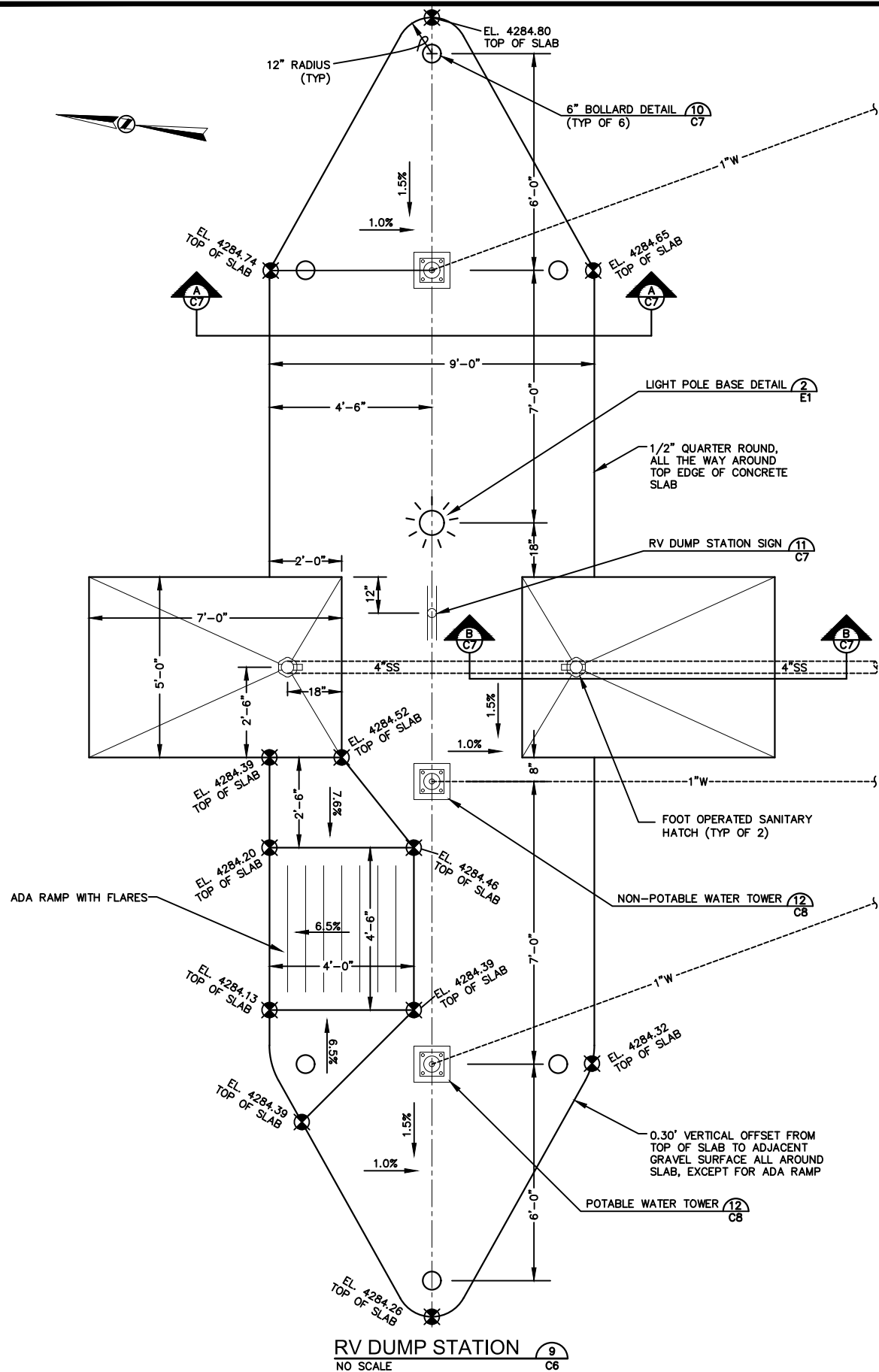
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RV DUMP STATION PLAN
 LEWIS AND CLARK CAVERNS STATE PARK
 COMFORT STATION SEPTIC PROJECT
 FWP #7176303

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 CLANCY, MT 59634
 406-443-6111
 jeff@larsonce.com

SHEET: **C6**



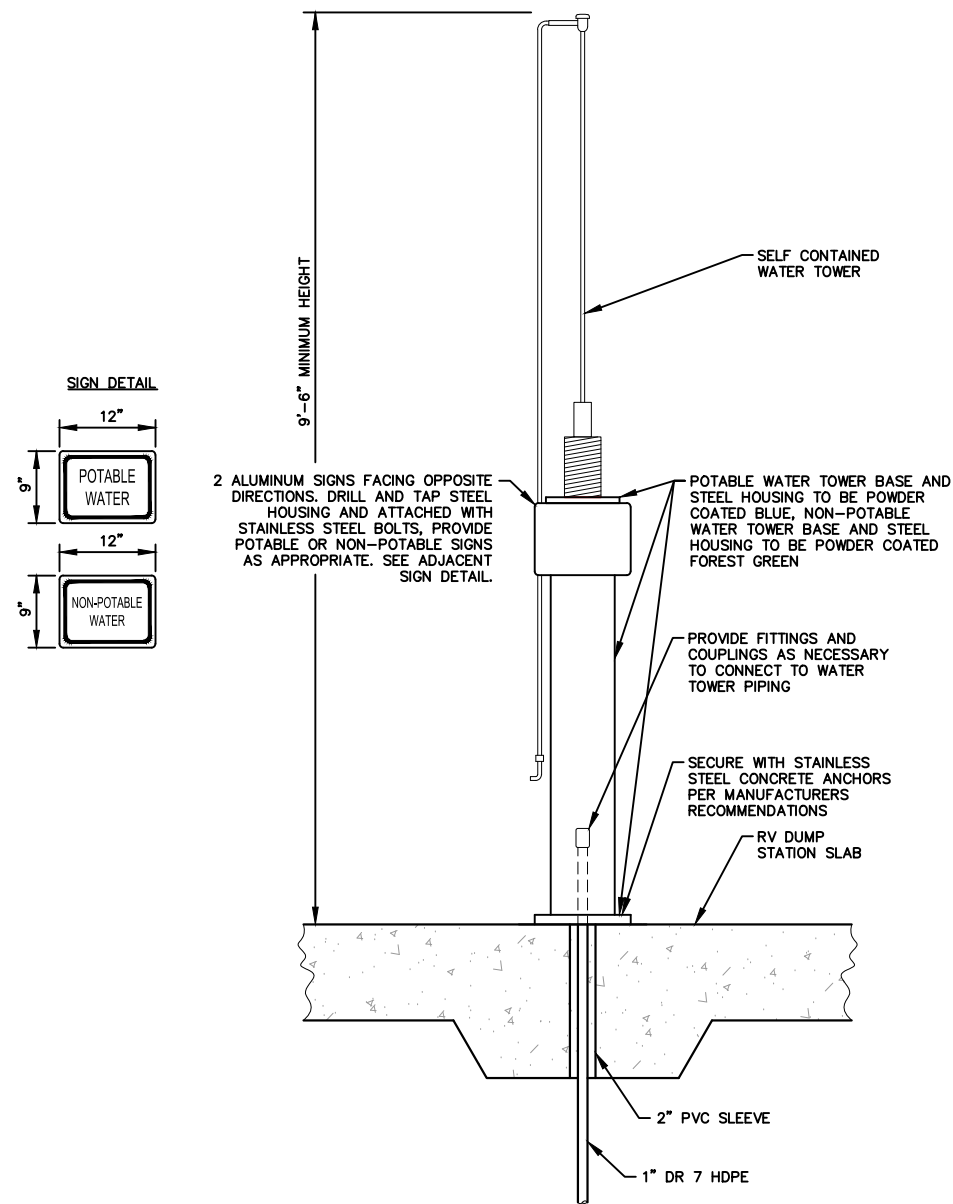
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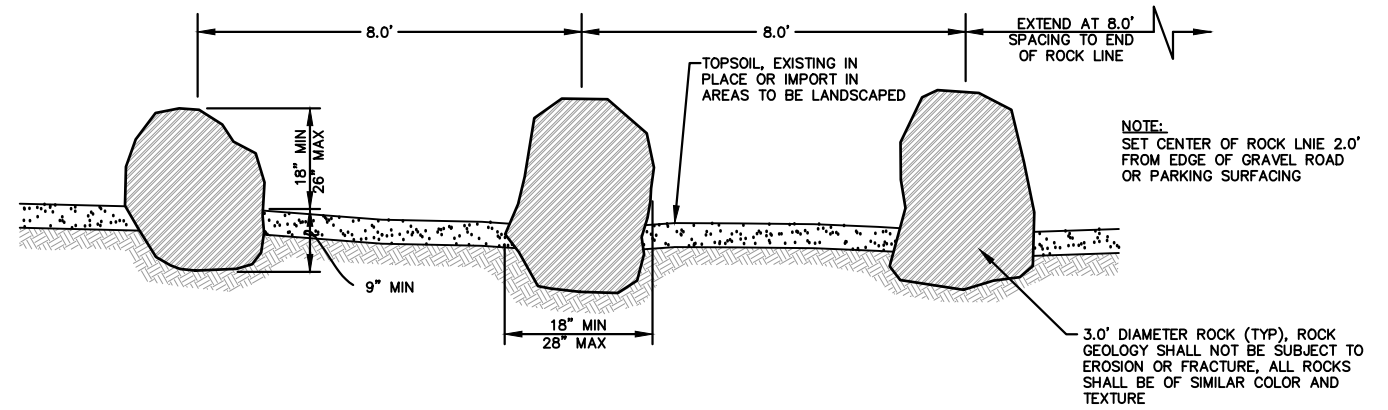
RV DUMP STATION DETAILS
LEWIS AND CLARK CAVERNS STATE PARK
COMFORT STATION SEPTIC PROJECT
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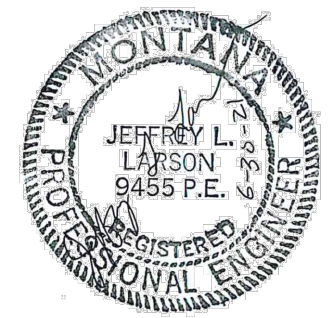
SHEET: C7



WATER TOWER 12
NO SCALE C7



ROCK LINE DETAIL 13
NO SCALE C10



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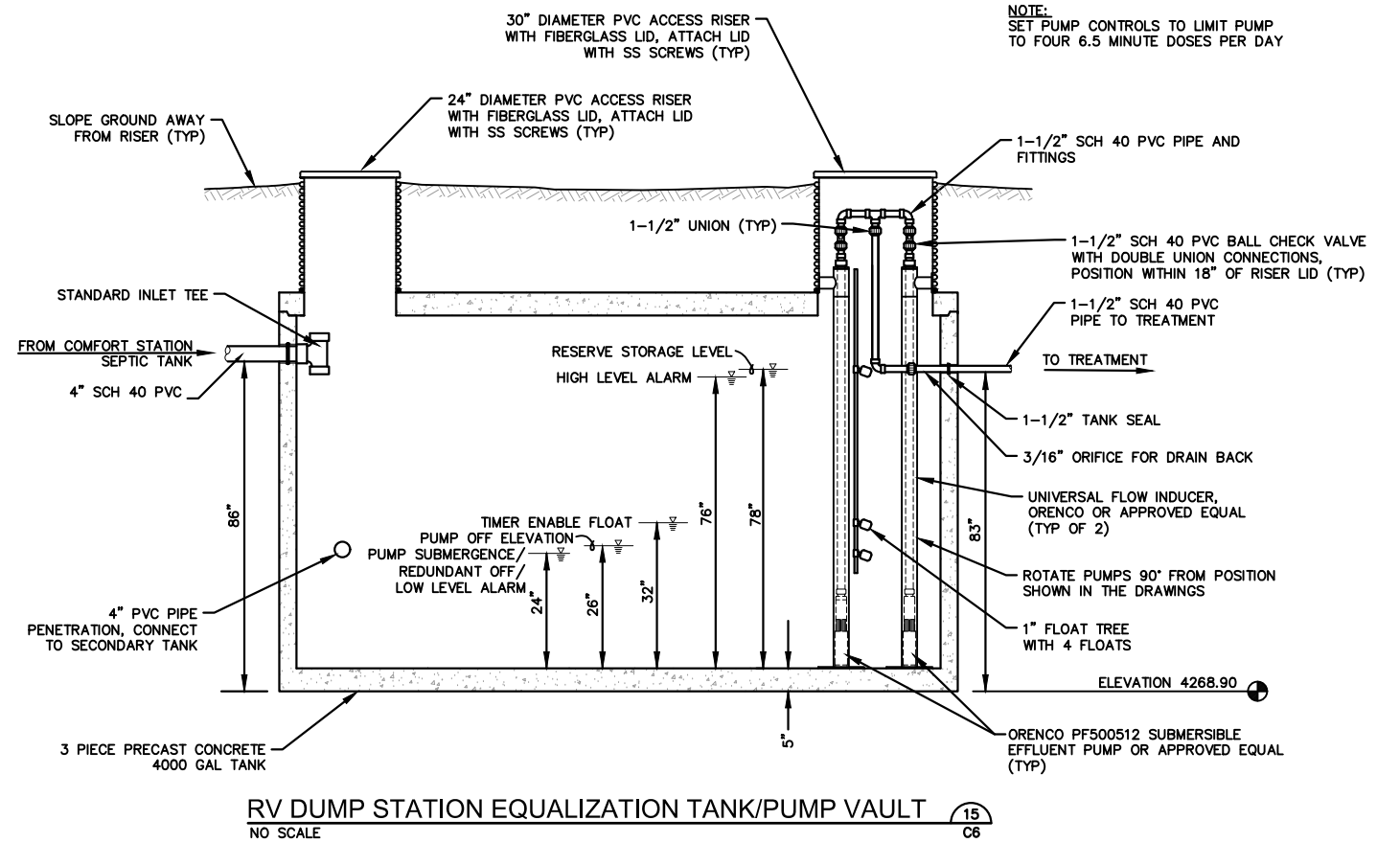
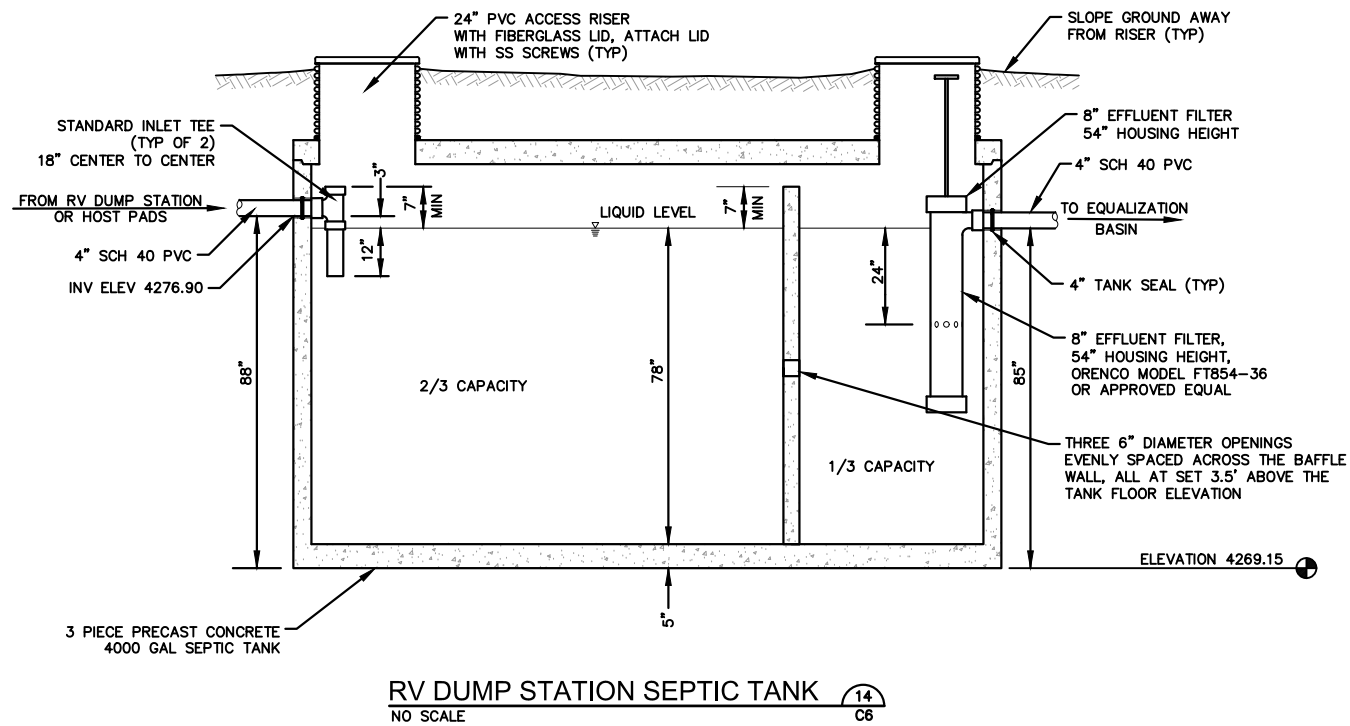
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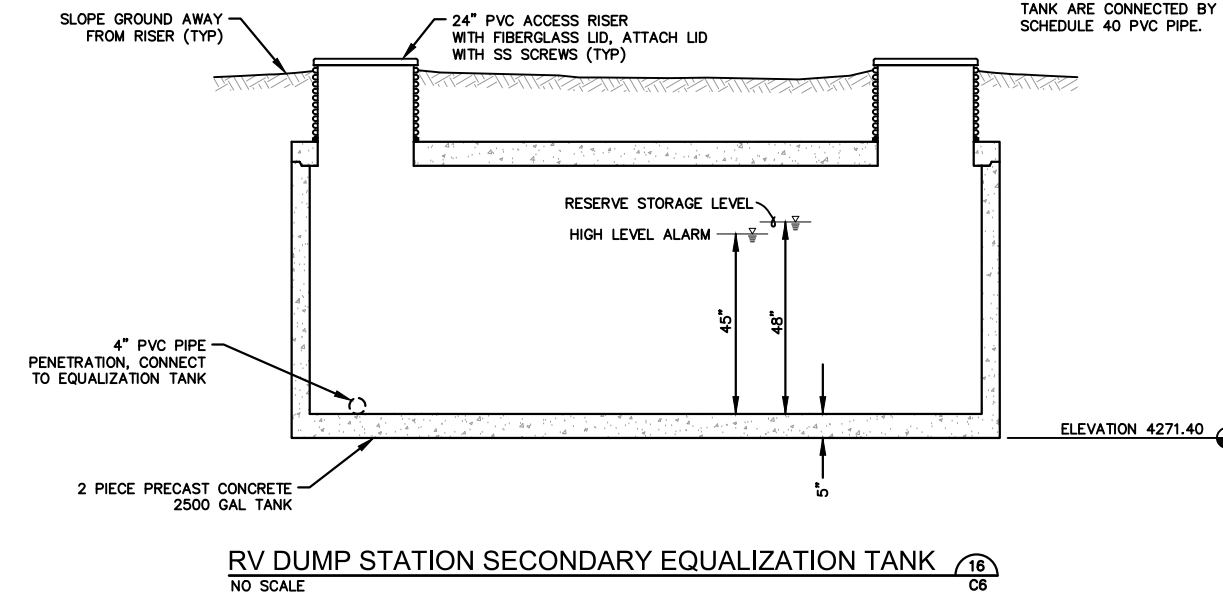
RV DUMP STATION DETAILS (2)
LEWIS AND CLARK CAVERNS STATE PARK
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CLANCY, MT 59634
406-443-6111
jeff@larsonce.com

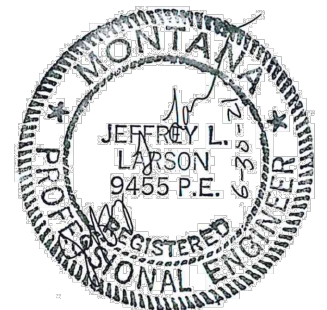
SHEET: **C8**



NOTE:
SET PUMP CONTROLS TO LIMIT PUMP TO FOUR 6.5 MINUTE DOSES PER DAY



NOTE:
THE RV DUMP STATION EQUALIZATION BASIN AND SECONDARY EQUALIZATION TANK ARE CONNECTED BY A 4" SCHEDULE 40 PVC PIPE.



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**MONTANA FISH,
WILDLIFE & PARKS**

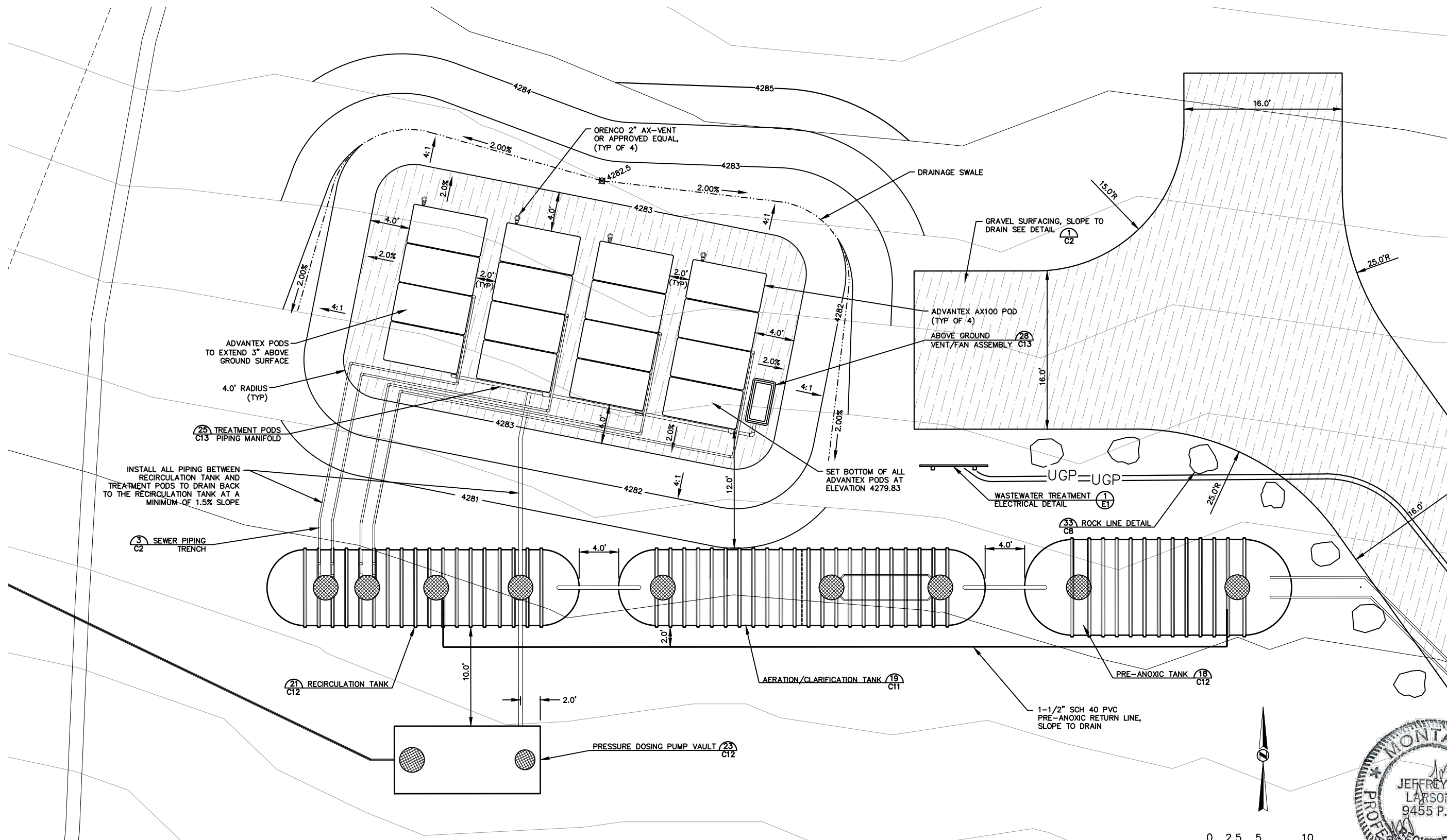
147

RV DUMP STATION TANK DETAILS
LEWIS AND CLARK CAVERNS STATE PARK
COMFORT STATION SEPTIC PROJECT
FWP #7176303

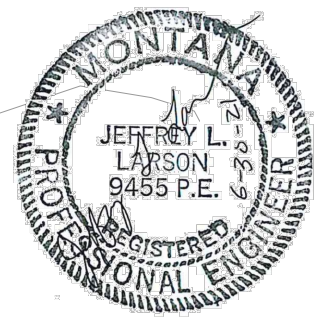


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SHEET: **C9**



WASTEWATER TREATMENT SITE PLAN (17) C1



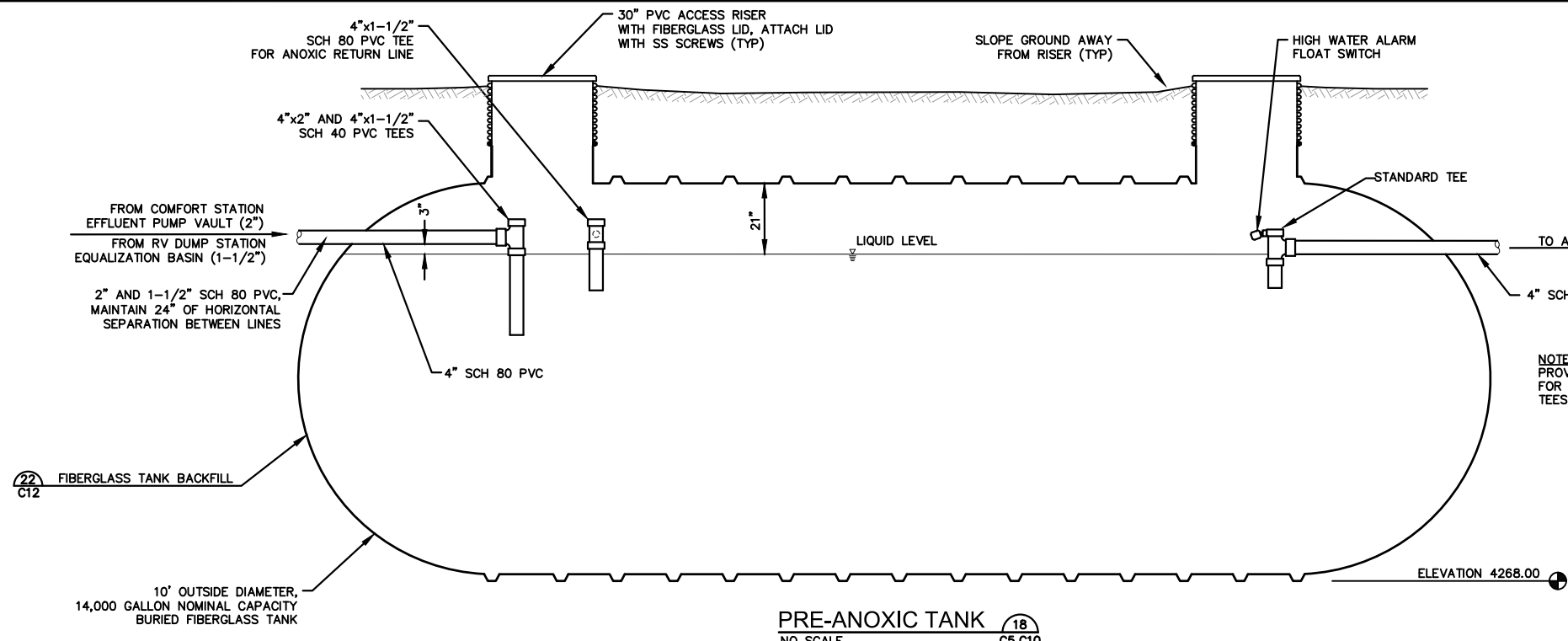
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WASTEWATER TREATMENT SITE PLAN
 LEWIS AND CLARK CAVERNS STATE PARK
 COMFORT STATION SEPTIC PROJECT
 FWP #7176303

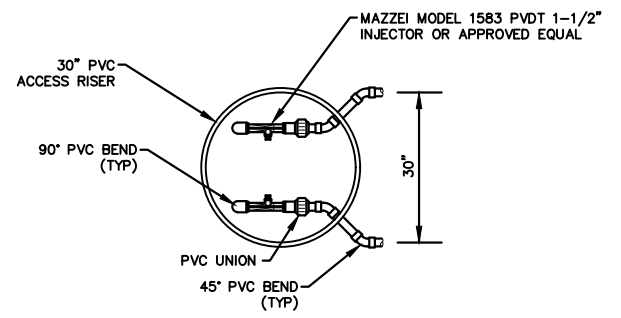
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SHEET: **C10**



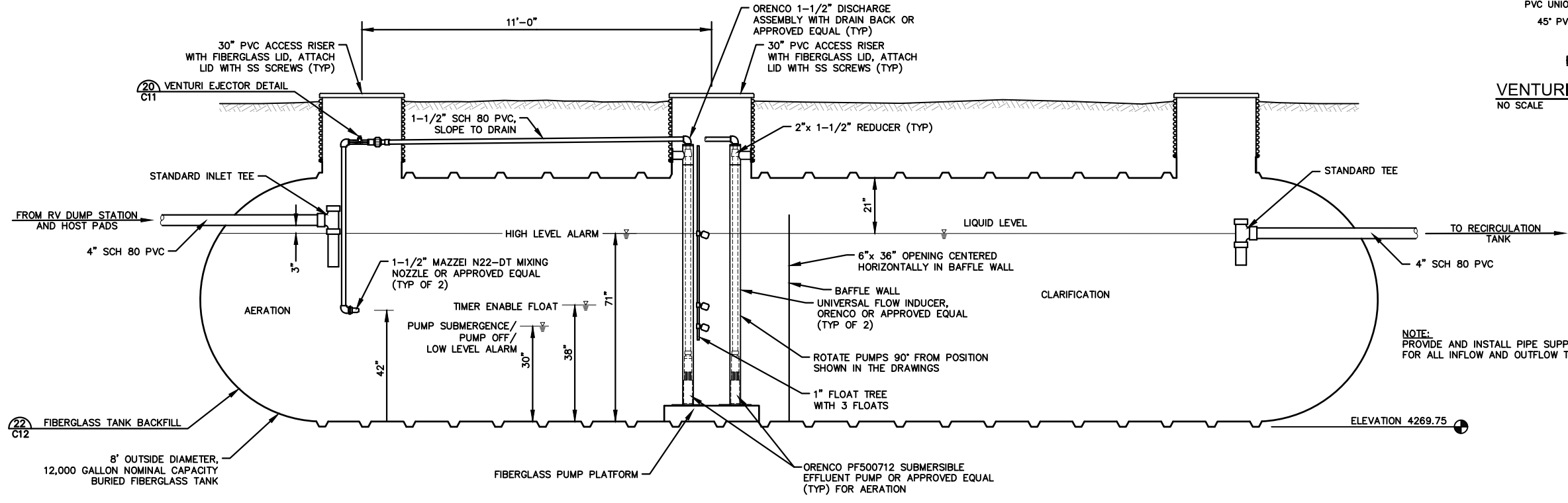
PRE-ANOXIC TANK 18
NO SCALE C5,C10

NOTE:
PROVIDE AND INSTALL PIPE SUPPORTS
FOR ALL THREE INFLOW AND OUTFLOW
TEES

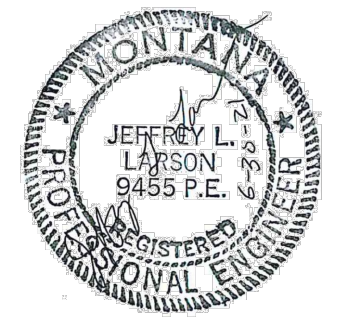


PLAN VIEW
VENTURI INJECTOR 20
NO SCALE C11

NOTE:
PROVIDE AND INSTALL PIPE SUPPORTS
FOR ALL INFLOW AND OUTFLOW TEES



AERATION/CLARIFICATION TANK 19
NO SCALE C5,C10



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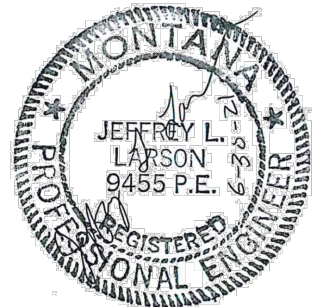
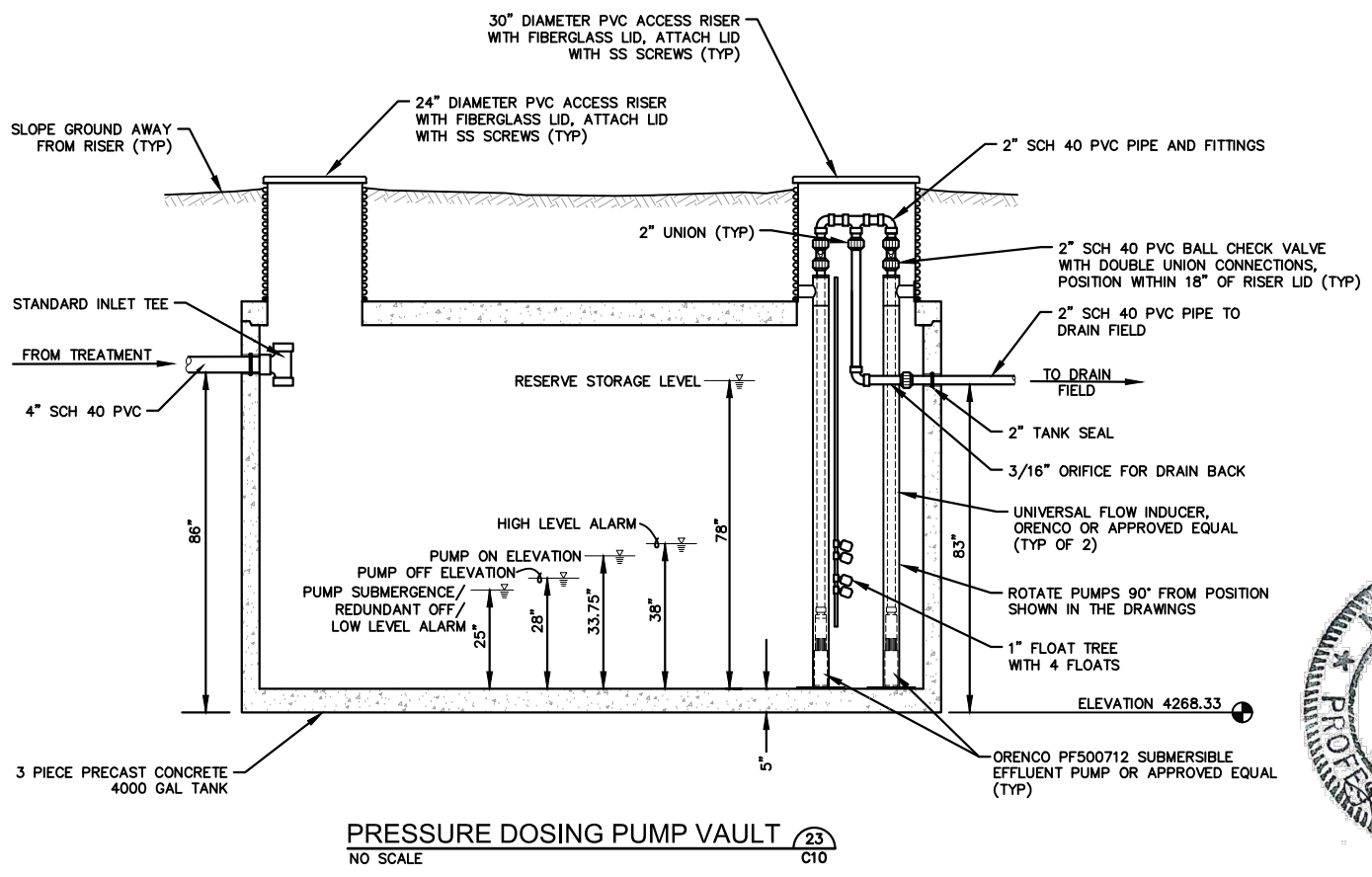
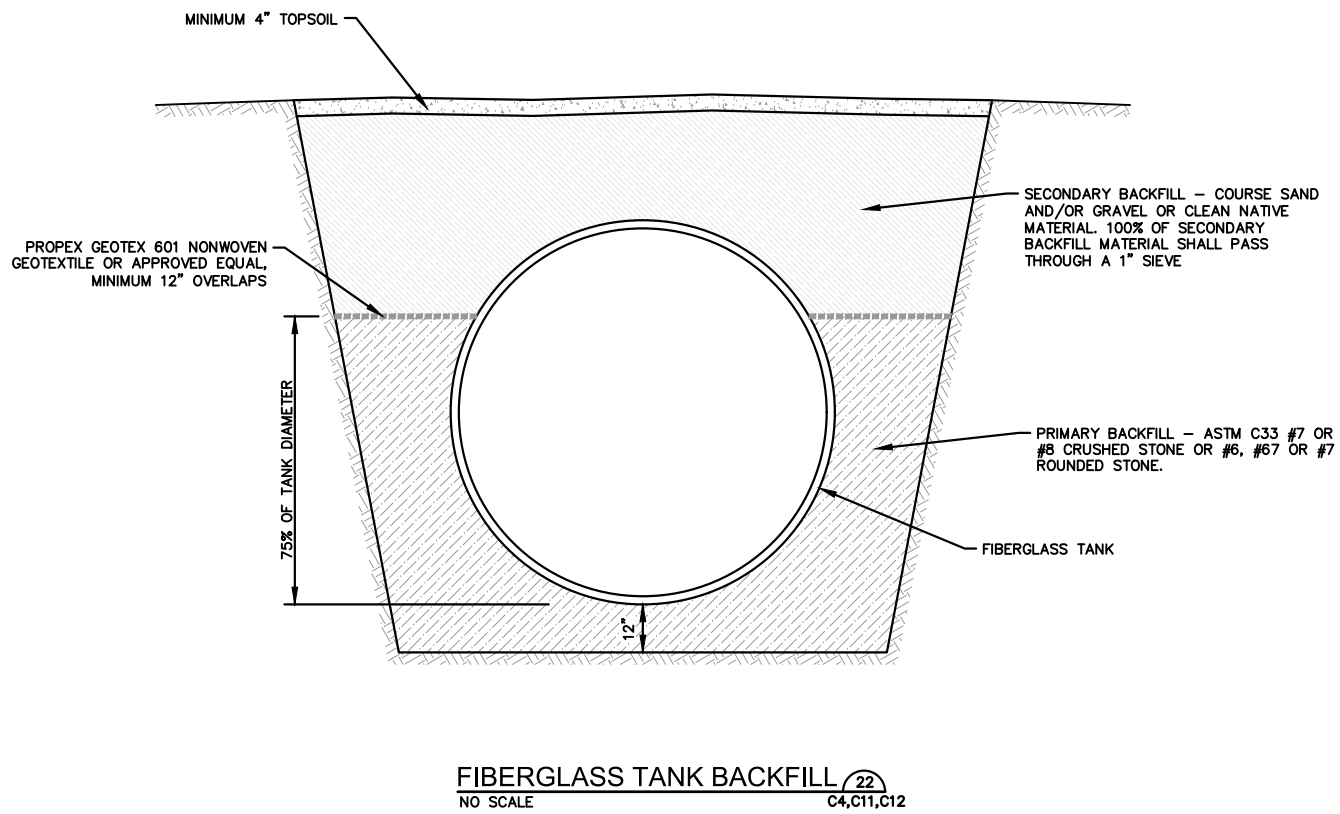
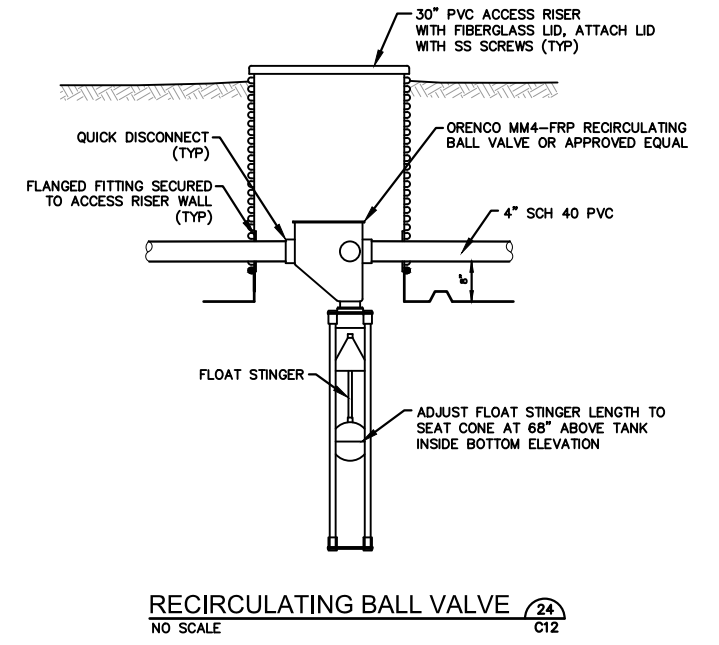
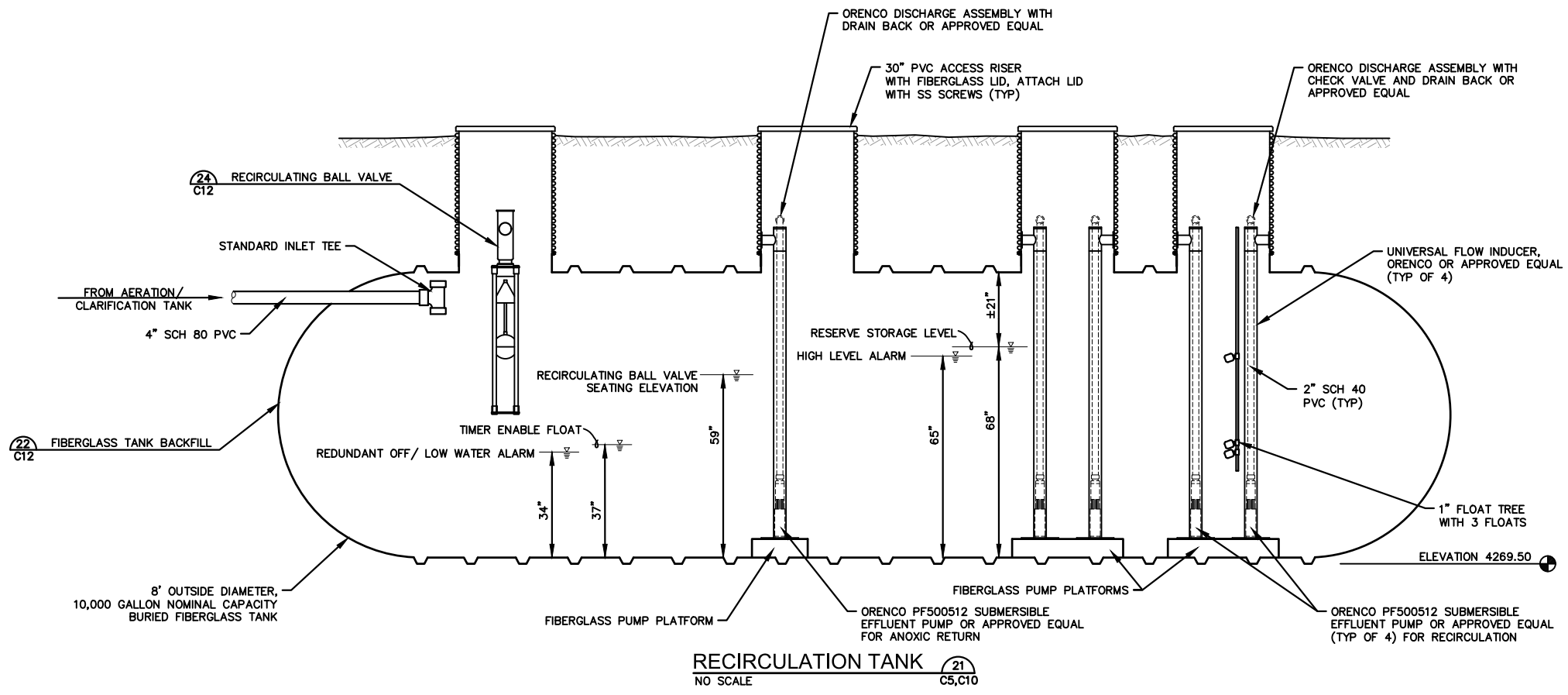
**MONTANA FISH,
WILDLIFE & PARKS**

TANK DETAILS
LEWIS AND CLARK CAVERNS STATE PARK
COMFORT STATION SEPTIC PROJECT
FWP #7176303



28 ANTLER AVENUE
CLANCY, MT 59634
406-443-6111
jeff@larsonce.com

SHEET: **C11**



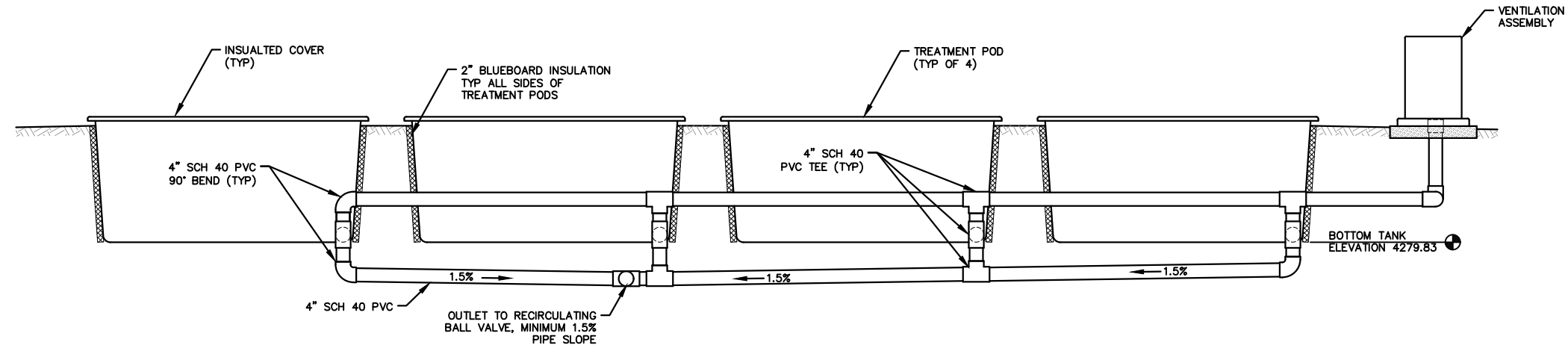
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| J. LARSON | MARCH 30, 2021 | REVISOR: | DATE: | APPROVED BY: | DATE: |
| DRAWN BY: | DATE: | J. LARSON | MARCH 30, 2021 | | |
| J. LARSON | MARCH 30, 2021 | APPROVED BY: | DATE: | | |
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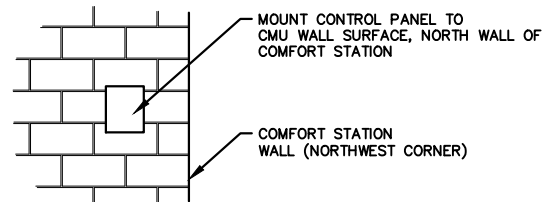
TANK DETAILS (2)
LEWIS AND CLARK CAVERNS STATE PARK
COMFORT STATION SEPTIC PROJECT
FWP #7176303

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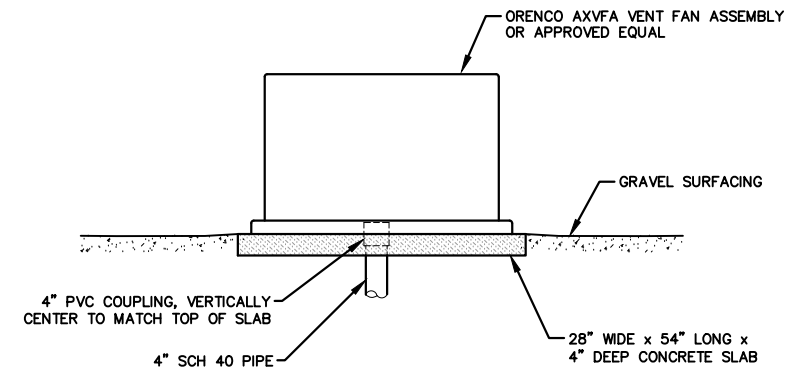
SHEET: **C12**



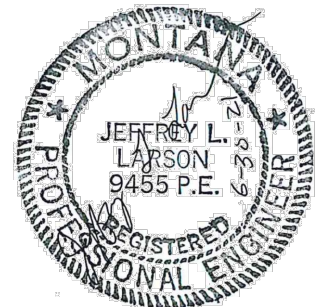
PROFILE
TREATMENT PODS PIPING MANIFOLD 25
 NO SCALE C10



COMFORT STATION CONTROL PANEL 25
 NO SCALE C3



ABOVE GROUND VENT/FAN ASSEMBLY 27
 NO SCALE C10



J. LARSON MARCH 30, 2021
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 J. LARSON MARCH 30, 2021
 CHECKED BY: DATE:

REVISED BY: DATE:
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**MONTANA FISH,
 WILDLIFE & PARKS**

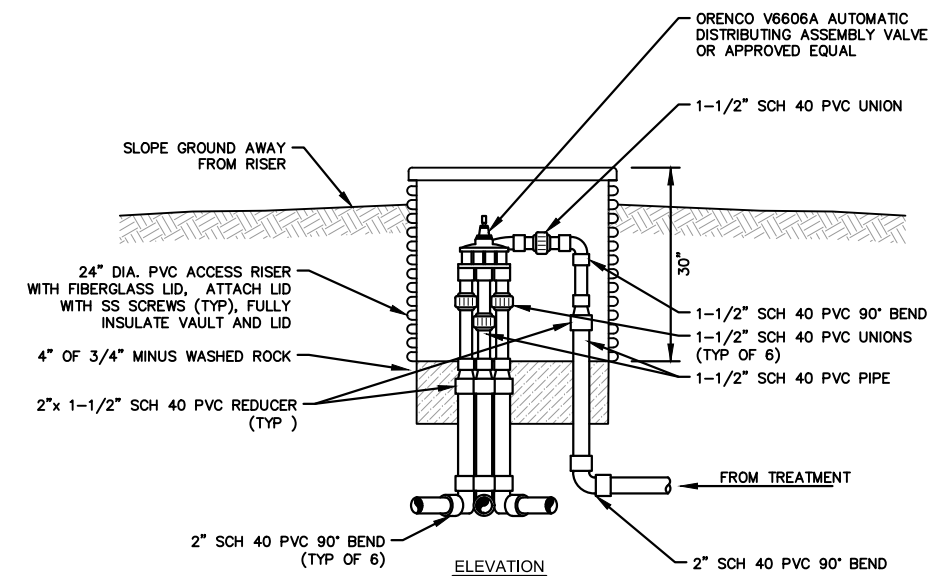
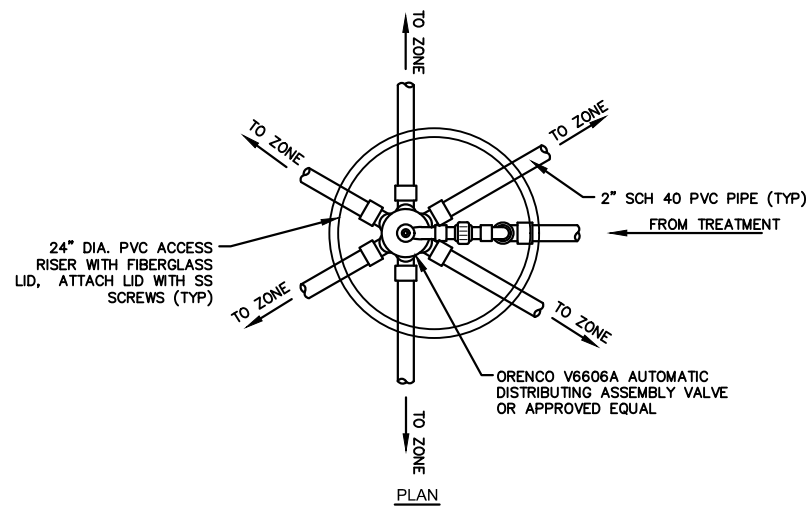
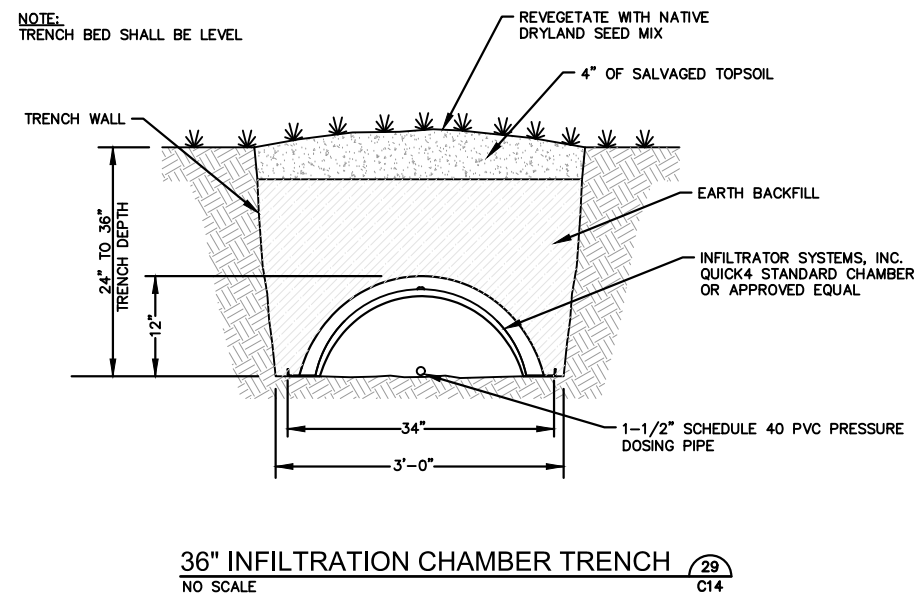
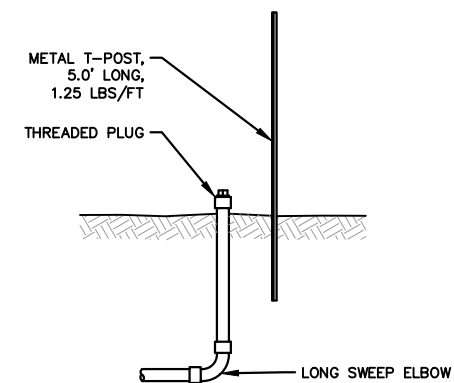
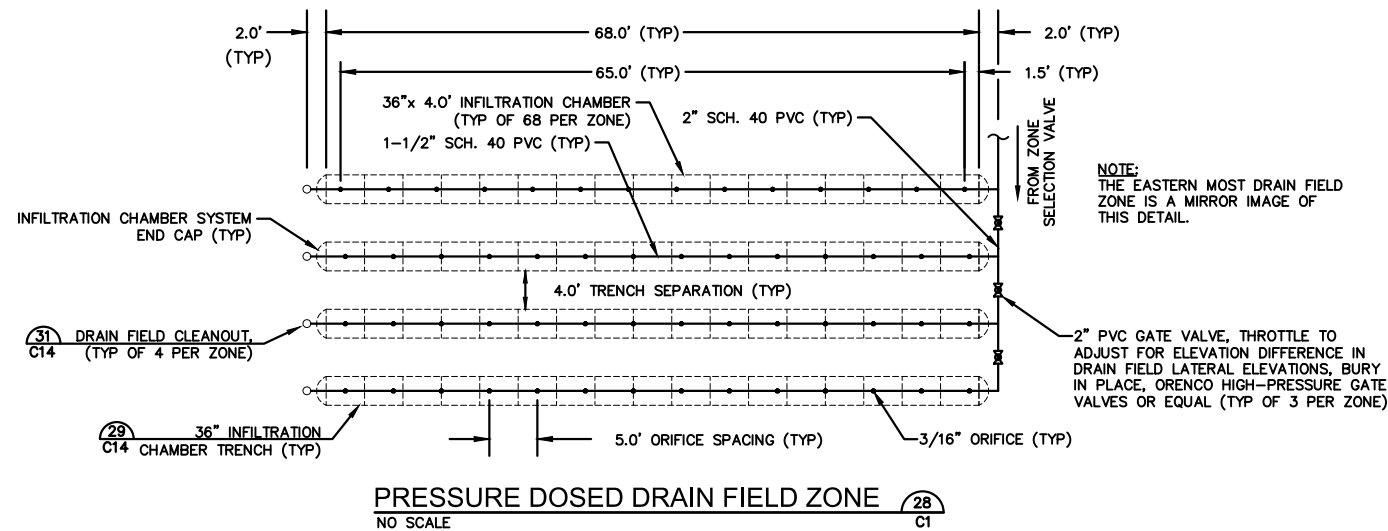
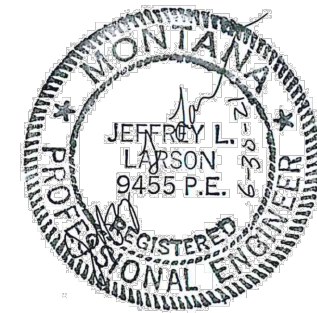
151

TREATMENT DETAILS
 LEWIS AND CLARK CAVERNS STATE PARK
 COMFORT STATION SEPTIC PROJECT
 FWP #7176303



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 CLANCY, MT 59634
 406-443-6111
 jeff@larsonce.com

SHEET: **C13**



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J. LARSON MARCH 30, 2021
APPROVED BY: DATE:

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APPROVED BY: DATE:



**MONTANA FISH,
WILDLIFE & PARKS**

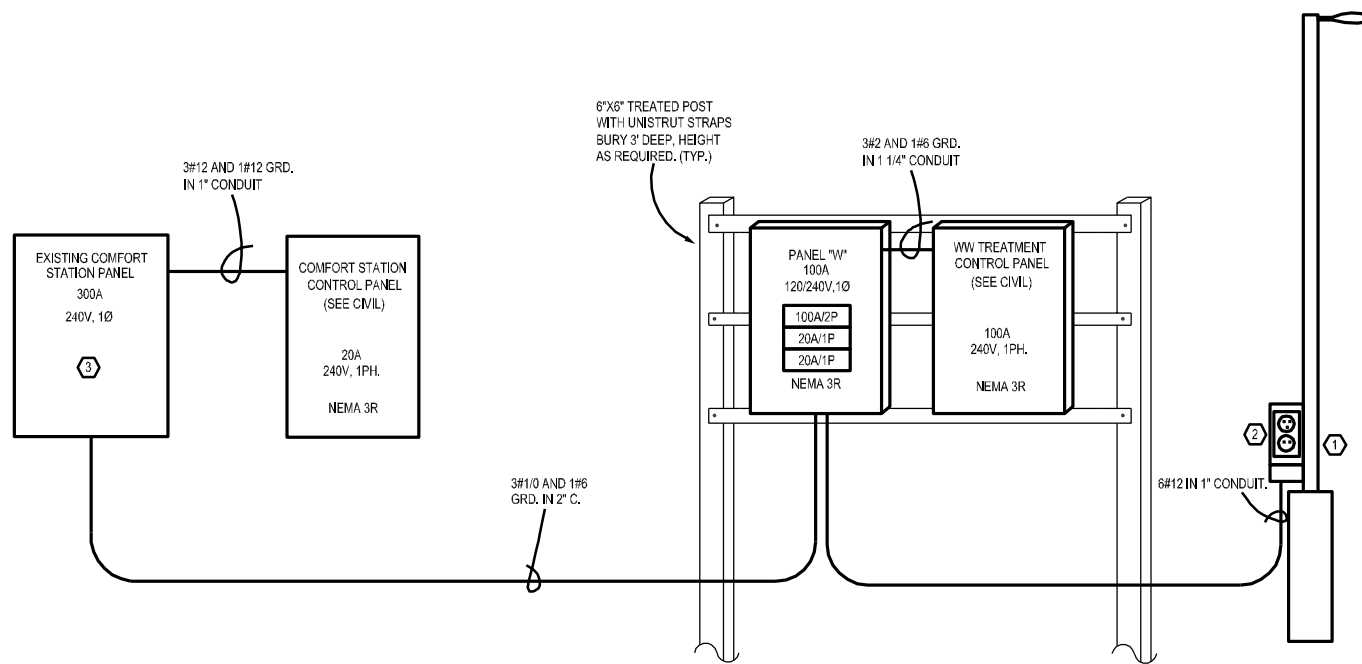
152

DRAIN FIELD DETAILS
LEWIS AND CLARK CAVERNS STATE PARK
COMFORT STATION SEPTIC PROJECT
FWP #7176303



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406-443-6111
jeff@larsonce.com

SHEET: **C14**



GENERAL NOTES:

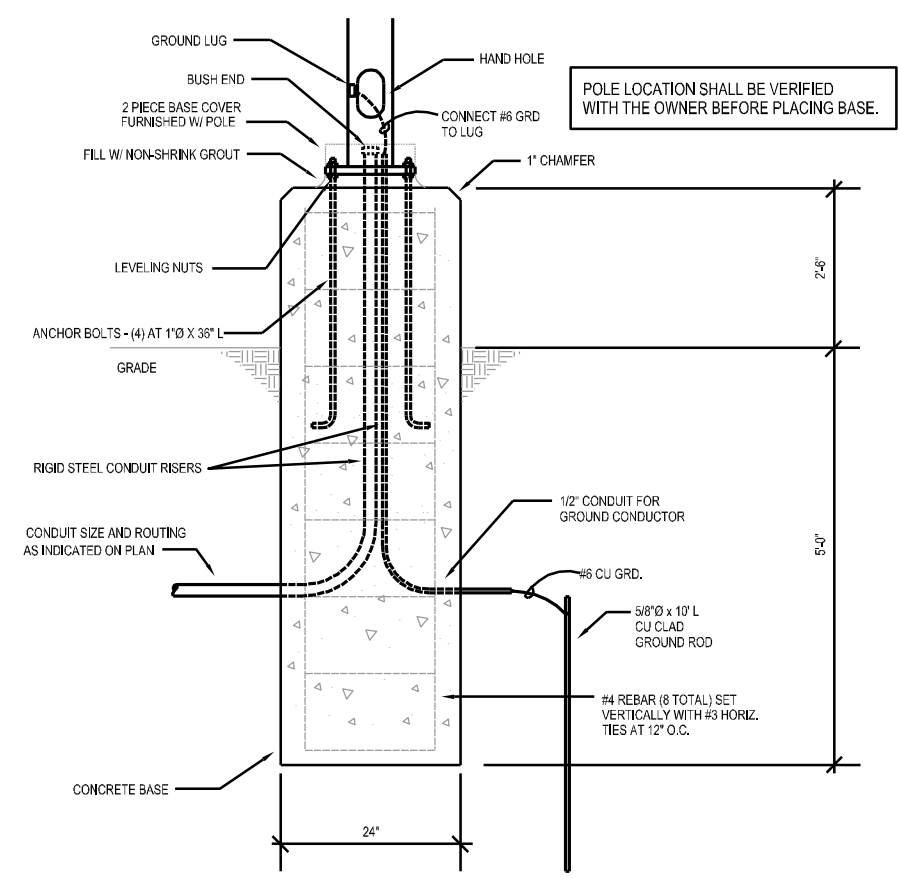
- SEE CIVIL SITE PLAN FOR EXACT LOCATIONS OF ALL ITEMS.
- ALL ENCLOSURES SHALL BE CLEARLY MARKED WITH WARNINGS STATING THE FOLLOWING: "CAUTION: SERIES RATED SYSTEM _AMPS AVAILABLE. IDENTIFIED REPLACEMENT COMPONENT REQUIRED."
- ALL WIRE TO BE COPPER THHN/THWN.

CONSTRUCTION NOTES:

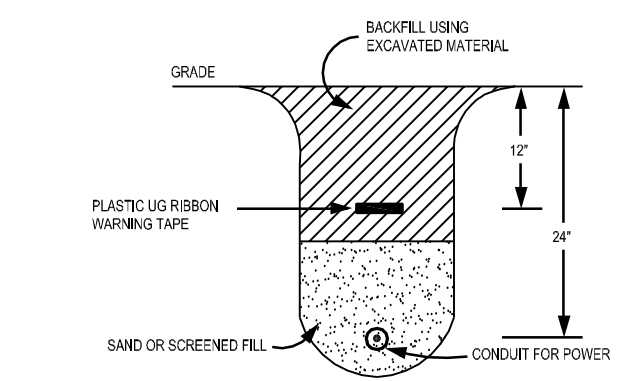
- NEW POLE LIGHT WITH 5" SQUARE POLE, 11GA SIDES, 25" TALL RATED FOR 100MPH. PROVIDE POLE BASE PER DETAIL. EXTEND WIRING AS REQUIRED. COORDINATE EXACT LOCATION WITH GENERAL CONTRACTOR BEFORE ROUTING CONDUIT. LIGHT TO BE LSI/LSLMA/ED-12L-SIL-FT-04MS WITH INTEGRAL PROGRAMMABLE DAYLIGHT AND MOTION SENSOR, CONNECT TO 20A/1P BREAKER.
- PROVIDE GFI DUPLEX RECEPTACLE IN HEAVY DUTY LOCKABLE ENCLOSURE, NEMA 3R RATED. MOUNT ENCLOSURE ON POLE LIGHT AS REQUIRED. CONNECT TO 20A/1P BREAKER.
- EXISTING COMFORT STATION PANEL ON NORTH EXTERIOR WALL. GE A SERIES PANELBOARD. PROVIDE TWO NEW BREAKERS: 100A/2P FOR WASTEWATER TREATMENT SYSTEM; AND 20A/2P FOR COMFORT STATION PUMP CONTROL PANEL. NEW BREAKERS WILL REPLACE FOUR EXISTING 1P BREAKERS.

1 WASTEWATER TREATMENT ELECTRICAL DETAIL
E1 NO SCALE

SEE CIVIL SITE PLAN FOR DISTANCES AND EXACT LOCATION OF COMFORT STATION ELECTRICAL PANEL, LIGHT POLE AND BOTH TREATMENT PANELS.



2 LIGHT POLE BASE DETAIL
E1 NO SCALE



3 ELECTRICAL TRENCH DETAIL
E1 NO SCALE

Electrical Specifications

Scope: All electrical work under this contract as shown on the plans and indicated in the specifications. Work shall be performed by a licensed and bonded contractor utilizing tradesmen skilled in the art and in accordance with acceptable practices. All work shall comply with local, state, and the National Electrical Code, latest edition.

Permits: The electrical contractor shall secure all permits in connection with his work.

Work Included: All lighting and power systems including fixtures, devices, boxes, conduit, disconnects, motor starters, etc. Provide and install all incidental items required for a complete and functioning system. Service equipment, motors, etc. to be located and installed as shown on the plan. Deviations shall be approved prior to installation by the architect and/or engineer.

Tests: Prior to tests or usage, all switches, panels, devices shall be in place. All branch circuits shall be free of faults or shorts. The complete installation and all components shall have a resistance between conductors and between conductors and ground as specified by the N.E.C.

Ground: There shall be continuity of ground throughout the system. System ground to comply with N.E.C. requirements.

Materials: All materials such as receptacles, switches, conduit, conductors, panelboards, devices, fixtures, etc. to be new and bear the U.L. label or to conform to applicable standards.

Manufacturers Directions, Procedures and Operating Instructions: Manufacturers materials, and equipment applied, installed, connected, erected, used, cleaned, and conditioned as per manufacturers directions or recommendations prior to installation.

Guarantee/Warranty: Contractor guarantees that all work and plant will be free from defects of materials and workmanship for a period of one (1) year from the date of final acceptance. Contractor further agrees that he will replace or repair all defective equipment and installation that become defective during the term of the warranty. This does not include excessive abuse or damage inflicted by the owner and/or others.

Installation: All equipment, droultry, etc. shall be installed as follows or as specified otherwise. The electrical contractor shall verify all nameplate ratings of equipment to be connected and verify electrical compatibility and code compliance. Manufacture's recommendations shall take precedence unless verified otherwise.

Current Characteristics: 120/240V, 1 phase, 3W

Conduits: PVC schedule 40 acceptable where routed underground. If PVC is used, provide ground wire. Compression couplings in wet locations and in concrete walls and floors. RGS for conduit above ground.

Wire and Cable: Type THHN or THWN for application or as noted otherwise. Color code in accord with the NEC.

Conductors and Cable: All conductors shall be copper with a weather-resistant thermoplastic cover. No branch circuit conductors shall be smaller than #12 unless for low voltage wiring.

AMES ENGINEERING, LLC
815 JADE STREET
HELENA, MT 59602
PHONE/FAX: (406) 458-0494
E-MAIL: susanames@mt.net



LARSON CIVIL ENGINEERING, LLC
28 ANTLER AVENUE
CLANCY, MT 59634
406-443-6111
jeff@larsonce.com

| REVISIONS: | NO.: | DATE: | DESCRIPTION: |
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ELECTRICAL DETAILS

PROJECT: LEWIS & CLARK CAVERNS STATE PARK
CAMPGROUND WASTEWATER SYSTEM
NEAR CARDWELL, MONTANA

DATE: JULY 06, 2021

DWG NAME: ELECTRICAL DETAILS

SHEET #: E1