



# Building Permit Application

Email to: [info@townofblueriver.org](mailto:info@townofblueriver.org)

Questions? Call (970) 547-0545 ext. 1

**Lot Number:** 532 **Subdivision:** THE CROWN  
**Blue River Physical Address:** 0039 LODESTONE TRAIL TOWN OF BLUE RIVER, CO. 80424

### Homeowner Information:

Name: \_\_\_\_\_  
Mailing Address: 3347 CEMETERY ROAD TRENTON, KY. 42286  
Phone: \_\_\_\_\_  
Email: \_\_\_\_\_

### Contractor Information

Company Name: MIRIAM AND LEE HOLOMBO  
Contact Name: LEE HOLOMBO (HOWEOWNER)  
Mailing Address: 3347 CEMETERY ROAD TRENTON, KY. 42286  
Phone: 931.220.7787  
Email: holombocon@aol.com  
Contractor Registration #: N/A

*\*\*Please note a Town of Blue River Business License is required for all businesses to conduct business in the Town of Blue River including contractors, sub-contractors and architects. \*\**

### Description of Project:

TO BUILD A 3,500 SQ. FT SINGLE FAMILY HOME  
\_\_\_\_\_  
\_\_\_\_\_

Distance to Property Line	Type of Heat: <u>RADIANT</u>	Construction Type: <u>V-N</u>
North: <u>52'</u>	Roof: <u>COMPOSITION</u>	Building Height: <u>35'-0"</u>
South: <u>15'</u>	Exterior Walls: <u>2X6</u>	No. Stories: <u>2</u>
East: <u>15'</u>	Interior Walls: <u>2X4, 2X6</u>	Total # Bedrooms: <u>4</u>
West: <u>90'</u>	Basement Fin. Sq.Ft.: <u>1445</u>	Total # Bathrooms: <u>3.5</u>
New Addition/Res. Sq.Ft.:	Main Level Sq.Ft.: <u>1488</u>	Septic or Sewer:
Garage Sq.Ft.: <u>562</u>	2 <sup>nd</sup> Level Sq.Ft.:	<u>SEWER</u>
Total Square footage: <u>3495</u>	3 <sup>rd</sup> Level Sq.Ft.:	

SEPARATE PERMITS ARE REQUIRED FOR ELECTRICAL, PLUMBING, HEATING, VENTILATION WORK, & FIREPLACES. THIS PERMIT BECOMES NULL AND VOID IF CONSTRUCTION AUTHORIZED IS NOT COMMENCED WITHIN \_\_\_\_ OR IF CONSTRUCTION IS SUSPENDED OR ABANDONED FOR A PERIOR OF \_\_\_\_ AT ANY TIME AFTER WORK IS COMMENCED.

I HEREBY CERTIFY THAT I HAVE READ AND EXAMINED THIS APPLICATION AND KNOW THE SAME TO BE TRUE AND CORRECT. I AGREE TO COMPLY WITH ALL TOWN ORDINANCES AND STATE LAWS REGARDING BUILDING CONSTRUCTION AND TO BUILD ACCORDING TO THE APPROVED PLANS. THE GRANT OF A PERMIT DOES NOT PRESUMED TO GIVE AUTHORITY TO VIOLATE OR CANCEL THE PROVISIONS OF ANY OTHER STATE OR LOCAL LAW REGULATING CONSTRUCTION OR THE PERFORMANCE OF CONSTRUCTION.

Signature of Owner or Contractor: LEE HOLOMBO Date: 10.26.23

# Submittal Requirements

**\*\*ALL Submittals Must be Electronic\*\***

**Emailed to: [info@townofblueriver.org](mailto:info@townofblueriver.org)**

## Planning & Zoning Review Submittal Requirements

**\*\*Please indicate via check box item included as well as page number in submitted packet.**

Completed <input checked="" type="checkbox"/>	Item	Description	Page #
X	<b>Site Plan</b>	Scale: 1" = 10'; May appear on a single sight plan. IF on a separate page, please indicate the page.	SP-1.1
X		Property Boundaries	SP-1.1
X		Building Envelope with setbacks	SP-1.1
X		Proposed Buildings	SP-1.1
X		Structures (existing & proposed)	SP-1.1
X		Driveway & Grades	SP-1.1
NA		A wetlands delineation & Stream crossing structures where applicable.	NA
X		Topographic survey, prepared and stamped by a licensed surveyor, indicating site contours at 2' intervals, easements, and significant natural features such as rock outcroppings, drainages and mature tree stands.	SEE PDF
X		Transformer & vault location (if installed by owner or existing)	SP-1.1
X		Well location; septic if applicable	SP-1.1
X		Snow storage areas and calculations	SP-1.1
X		Major site improvements	SP-1.1
X		Existing & proposed grading & drainage	SP-1.1
	<b>Landscaping Plan</b>	<b>*May be included in the site plan**</b>	
X		Landscaping must indicate tree removal for defensible space requirement; any trees 6" or more primarily noting the removal of any ponderosa pines or large trees. Clear cutting of a site is not allowed.	SP-1.1
X		Indicate the percentage of trees removed and revegetation to be conducted.	SP-1.1
X		Upon completion of the construction project, all land must be raked and	SP-1.1

		reseeded with native seed prior to issuance of CO. in cases of completion during snow coverage and/or winter, CO may be issued with conditions for completions within 60 days of the last snow and a deposit.	SP-1.1
		Any major structures (retaining walls; fences; landscaping rocks) must be indicated in detail on plans in conformance with the design regulations.	SP-1.1
		Indicating building walls, floors and roof relative to the site, including existing and proposed grades, retaining wall and proposed site improvements.	SP-1.1
	<b>Floor Plans</b>	<b>Scale 1/8" = 1'</b>	
		Indicate the general layout of all rooms, approximate size, and total square footage of enclosed space for each floor level.	A-1.1 A-1.2 A-1.3
	<b>Exterior Elevations</b>	<b>Scale same as floor plans</b>	
		Detail to indicate the architectural character of the residence, fenestration and existing and proposed grades. Elevations must include a description of exterior materials and colors.	A-2.1 A-2.2 A-2.3
	<b>Roof Plan</b>	<b>Scale same as floor plans</b>	
		Indicate the proposed roof pitch, overhang lengths, flue locations, roofing materials and elevations of major ridge lines and all eave lines.	A-1.4
	<b>Materials Sheet</b>	Display materials to be used. Color renderings are suggested as well. In cases of additions, if matching the existing structure, photos of current home.	A-2.1 SEE PDF

After Approval and BEFORE Permit is Issued:

**ELECTRONIC COPY Stamped set.**

- All of the above mentioned plus items below in one plan set.

Completed ✓	Item	Page #
	Soils report if applicable	OPEN HOLE
X	Electrical, plumbing and mechanical plans.	SEE PLANS
X	Construction Management Plan. Please refer to the Town Code and Architectural Guidelines for all requirements.	CMP-1.1
X	Stamped structural plan	SEE PLANS
X	Current Summit County Septic System Permit (including system plot plan), or evidence of full payment of tap fees to Upper Blue Sanitary District.	SEE PDF
X	Current Colorado Well Permit or evidence of full payment of tap fees to Timber Creek Water District	SEE PDF
	Colorado Department of Transportation Hwy Access Permit	N/A
	Designation of General Contractor, except for bona fide homeowner contractor	N/A
	For Manufactured Homes the following additional information is required	N/A
	<ul style="list-style-type: none"> <li>• State of Colorado Division of Housing Approved Plans</li> </ul>	N/A
	<ul style="list-style-type: none"> <li>• State of Colorado Division of Housing Registered Installer Certificate</li> </ul>	N/A

# Blue River Plan Submittal Requirements for Residential Plan Review

- ❖ When designing the structure, refer to the Blue River Municipal Town Code, Chapter 16 for zoning information and allowable uses/construction. The Building Code information is available under Chapter 18. <https://townofblueriver.colorado.gov>.
- ❖ Building Codes Adopted:
  - International Residential Code 2018
  - The Electrical Code is the current code adopted by the State of Colorado: 2020

**Note: Applicable codes are required to be notated on plans.**

- ❖ Snow loads:
  - Roofs shall be designed in accordance with accepted engineering practice based upon a ground snow load of 100 psf.
  - Balconies/decks-125 psf.
  - No reductions for duration.
- ❖ Frost line depth:
  - Foundation footing minimum depth below grade-40 inches.
  - Uncovered deck piers may be set at 24 inches.
- ❖ Roof underlayment 100% Ice & Water shield.
- ❖ Roof may be metal; 30-year minimum architectural grade, composition fiberglass (dark brown, dark gray, dark green, weathered wood or black only); or class-A #1 cedar shakes.
- ❖ Wind speed: 90 mph, exposure “B”. Seismic design category: “B”.
- ❖ Propane gas alarm/shutoff system required.
- ❖ Wood burning stoves: Required to meet Colorado Dept. of Health, Regulation No. 4.
- ❖ The building height limit in the Town is 35 feet. Refer to the Architectural Guidelines for additional information.
- ❖ Locally re-settable GFCI breakers are required in bathrooms.
- ❖ Compliance with the International Energy Conservation Code is required.
- ❖ Any application that would create an accessory apartment must meet zoning regulations and will not be processed without prior approval of the Town Board of Trustees.
- ❖ Note that Hwy 9 access permits may require 3-4 months and well permits 5-6 weeks.
- ❖ Planning & Zoning Commission approvals become void if the building permit is not issued within eighteen (18) months.
- ❖ Building permits become void if construction is discontinued for more than 180 days.

In order for your permit application to be reviewed and processed properly, the following construction information must be provided. **Note:** "Preliminary" and/or plans shown as "Not for Construction" or similar are unacceptable. ***Hardcopy submittals will not be accepted.***

***Note: Items below are not all inclusive of the requirements. Please review the Building Application Packet, design guidelines, building and land use codes for complete information.***

### **Soils Report**

Must be sealed and signed by a licensed Colorado Engineer.

- Provide an engineer's soil investigation report indicating type of soil and recommended foundation design. include any required shoring.

### **Improvement Survey Plat**

- Provide an Improvement Survey Plat (ISP) following Colorado Revised Statutes for new principal structures, substantial expansions (25% or more) to principal structures and new accessory dwelling units (ADU's).
- Provide a permanent reference to spot elevation (benchmark) that will not be disturbed during construction.
- Provide existing spot elevations at property corners and at midpoints of the side property lines.
- Must be stamped and signed by a Professional Land Surveyor (PLS) licensed by the state of Colorado.

### **Site Plan**

- Provide site plan that shows dimensions reflecting the distances to property lines
- Indicate all public or private easements
- Show location of all proposed and existing structures with dimensions
- Provide type of construction for all structures on site
- Provide landscaping plan.
- Show permanent reference spot elevation (benchmark), existing spot elevations at property corners and at midpoints of the side property lines.
- Indicate roof drainage on site plan with arrows showing the direction of the gutter downspouts. Roof drainage shall flow towards the road and away from all structures.

### **Structural Plans**

Plans must be sealed and signed by a Colorado Structural Engineer or Architect

- Indicate size, location and method of reinforcement for all proposed footings, column pads, piers, caissons, grad beams, foundation walls, decks, guardrails, guardrail posts. Specify location of reinforcing steel and anchor bolts.

- Provide complete and clearly dimensioned floor framing plan for each level and roof framing plan which indicates the materials, types, sizes and location of all structural elements.
- Provide complete structural design criteria including but not limited to required design loads, material specifications and structural construction requirements.
- Provide complete structural calculations for each structure.

### **Architectural Plans**

- Provide complete and dimensioned floor layout at each level which identifies the use of each room.
- Provide Complete and dimensioned roof plan and indicate all roof slopes.
- Provide complete and dimensioned reflected ceiling plan.
- Provide exterior elevations for each side of the building which contains an overall building height and floor-to-floor heights and indicate location, size and types of all doors and glazed openings including hazardous glazing and fall protection locations.
- Provide a bulk plane diagram on front and rear exterior elevations relative to the base plane elevation. The base plan for the bulk plane is establishing by taking the average of the existing grades of the midpoints of the two side property lines.
- Provide building and wall sections which clearly identify the required type and location of all materials for construction of beams, columns, floors, walls, ceilings, roofs.
- Provide stair geometry. Include rise and run, handrail and guardrail heights.
- Provide one major section through the exterior wall from footings to the highest part of the roof (min. scale 1/4"=1')
- Provide square foot area breakdown per floor level.

### **Electrical Plans**

Provide electrical plans showing the location and capacity of the service equipment and electrical panels, the location of all smoke detectors, carbons monoxide detectors, electrical receptacles, switches, and lighting fixtures.

### **Mechanical Plans**

- Provide mechanical plans and indicate the location of all heating, ventilating and air conditioning equipment. Show the location of the condensing unit. Detail the equipment access and working clearances.
- Show dryer exhaust termination location and clearances, environmental exhaust termination locations and clearances.
- Provide Manual J and Manual D calculations. Must be legible. No exceptions.
- Provide all fireplace specifications, rated separation details, direct vent termination details when applicable, hearth extensions when required, chimney clearances, shutoff and control access.

### **Plumbing Plans**

- Provide plumbing plans and indicate the location of all plumbing fixtures and appliances (Isometric may be required per the discretion of the plans examiner.)
- Provide the supply line size and main discharge size. Note the water supply inlet location.
- Indicate whether appliances are gas-operated, electric, or otherwise. List types of material to be used for all water supply, drainage and vent piping. Provide fixture max flow rates and insulation values.
- Gas load calculations and piping diagram is required.

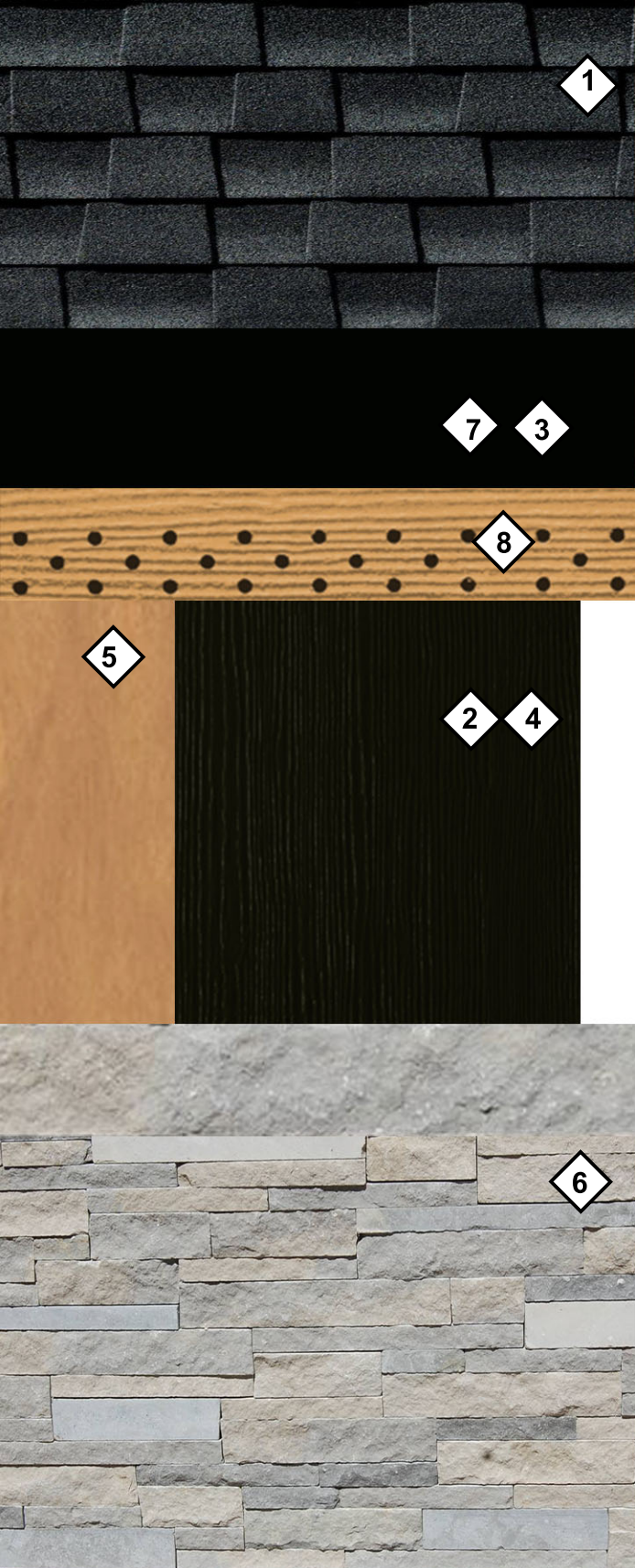
### **Energy Conservation Plans**

Provide verification that the project meets the requirements of the IECC, or provide a simulated energy performance analysis such as RES-check. Provide all required information per 2012 IECC R103.2.

### **Resubmittal Requirements**

- Provide a written response addressing each correction.
- Provide revision clouds for each correction made.
- Provide updated information in the revision section of the title block.
- Provide complete plan packs per discipline requiring corrections. Example: If you are resubmitting for Civil corrections, provide a complete revised plan pack.





**1. COMPOSITION  
SHINGLE ROOFING**

**MFGR: CERTAINTEED  
LANDMARK PRO  
COLOR: MAX DEF MOIRE  
BLACK**

**2. FASCIA and TRIM**

**MFGR: JAMES HARDIE  
PROFILE: 5/4 X  
COLOR: MIDNIGHT SOOT**

**3. WINDOW CLAD**

**MFGR: SIERRA PACIFIC  
COLOR: BLACK**

**4. VERTICAL BOARD  
and BATTEN**

**MFGR: JAMES HARDIE  
COLOR: MIDNIGHT SOOT**

**5. BEAMS and  
COLUMNS**

**MFGR: SHERWIN WILLIAMS  
COLOR: CROSSROADS**

**6. STONE VENEER**

**MFGR: GALLEGOS STONE CO  
COLOR: #366  
COURTLAND LOW RISE**

**7. METALS**

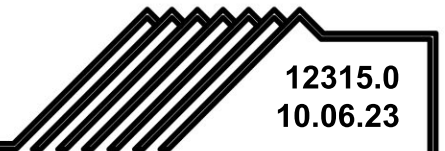
**COLOR: MATTE BLACK**

**8. SOFFITS**

**MFGR: JAMES HARDIE  
COLOR: CYPRUS YELLOW**

**bhh** *Partners*

P.O. BOX 931, 160 EAST ADAMS BRECKENRIDGE, CO 80424 (970) 453-6880  
P.O. BOX 2113, 560 ADAMS AVENUE SILVERTHORNE, CO 80498 (970) 513-1000



12315.0  
10.06.23

**HOLOMBO RESIDENCE**

0039 LODESTONE TRAIL, BLUE RIVER, COLORADO 80424



# AN ADVANCED TREATMENT ADVANTEX AX-25RT-(MODE 3B) PRESSURIZED GRAVEL ON-SITE WASTEWATER TREATMENT SYSTEM

## 39 LODESTONE TRAIL, BLUE RIVER, CO 80424

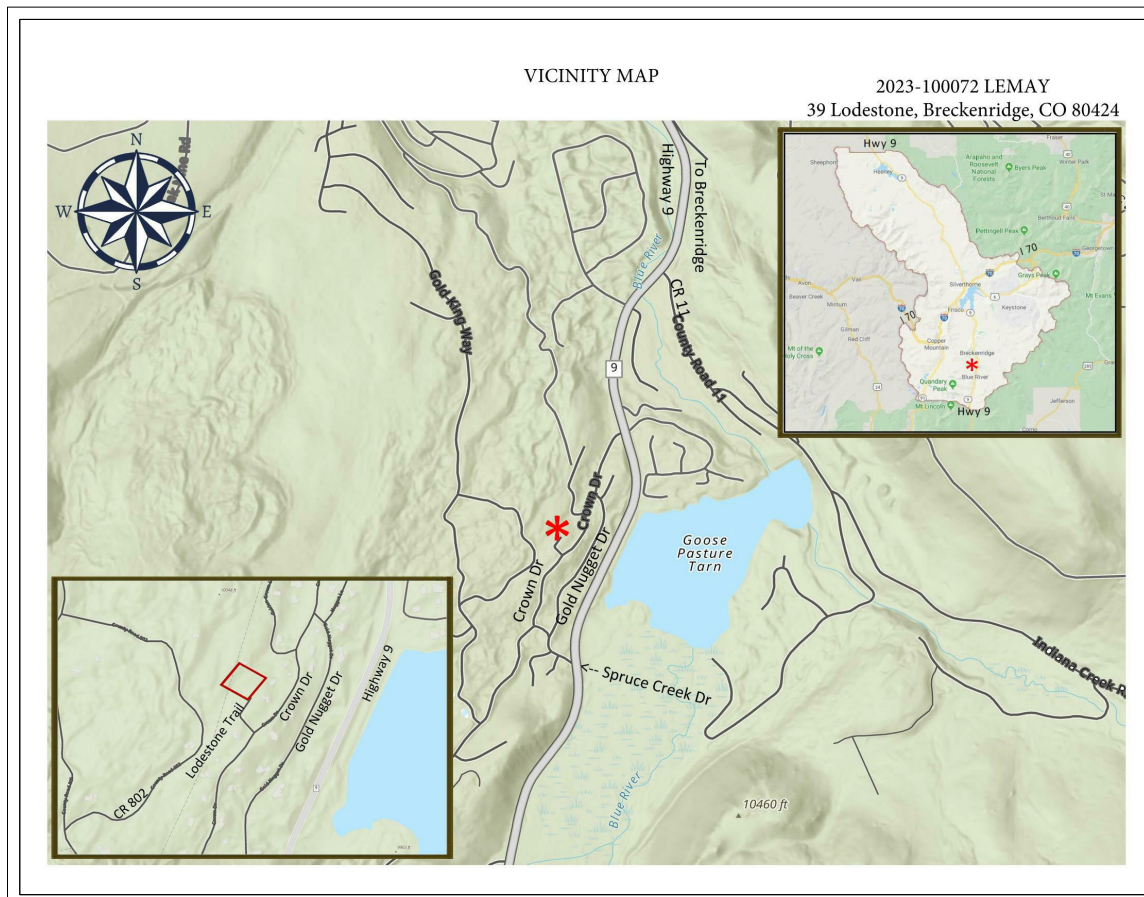
A PERMIT IS REQUIRED FROM SUMMIT COUNTY TO INSTALL THIS 4 BEDROOM OWTS SYSTEM

### INSPECTION REQUIREMENTS:

1. THE COUNTY WILL CONDUCT INSPECTIONS AS REQUIRED BY THEIR PERMIT.
2. IT IS HIGHLY RECOMMENDED THAT THE CLIENT CONTACT THE ENGINEER AND SCHEDULE A PRE-CONSTRUCTION MEETING TO DISCUSS THE PROPOSED LAYOUTS AND DESIGN.
3. THE ENGINEER SHALL BE CONTACTED TO PERFORM THREE INSPECTIONS OF THE SEPTIC SYSTEM:
  1. AN OPEN HOLE OF THE SEPTIC TANK AND STA.
  2. A PRE-COVER INSPECTION (PRIOR TO BACKFILL).
  3. A FINAL GRADE INSPECTION AFTER BACKFILL. ANY EQUIPMENT SHOULD BE OPERATIONAL AND ACCESSIBLE DURING THIS INSPECTION. IF A POTABLE WELL IS PLANNED, IT SHOULD BE DRILLED BY THE TIME OF THIS INSPECTION.
4. SOILS COMPACTION SHALL BE TESTED AS REQUIRED (REFER TO SHEET D0 FOR COMPACTION NOTES).
5. IF RETAINING WALLS ARE TO BE INSTALLED WITHIN 25 FEET OF THE STA, THESE SHALL BE INSPECTED AT THE BEGINNING OF THE INSTALLATION, DURING THE INSTALLATION, AND AFTER COMPLETION.

### SOME ABBREVIATIONS USED:

AM: AS MEASURED WITH HAND TAPE  
 BOC: BOTTOM OF CHAMBER  
 BOG: BOTTOM OF GRAVEL  
 BOS: BOTTOM OF SAND  
 BR: BEDROOM  
 CH: INFILTRATOR CHAMBER  
 EXT: EXISTING  
 OWTS: ON-SITE WASTEWATER TREATMENT SYSTEM  
 RV: RECREATIONAL VEHICLE OR CAMPER  
 SFR: SINGLE-FAMILY RESIDENCE  
 STA: SOIL TREATMENT AREA (AKA LEACH FIELD OR ABSORPTION BED)  
 TBD: TO BE DETERMINED  
 TOCH: TOP OF CHAMBER  
 TOG: TOP OF GRAVEL  
 TOR: TOP OF RISER  
 TOS: TOP OF SAND  
 TOT: TOP OF TANK



VICINITY MAP

PROPERTY INFORMATION  
 CROWN SUBDIVISION, LOT 532  
 39 LODESTONE TRAIL  
 BLUE RIVER, CO 80424

DRAWINGS PREPARED FOR:  
 HELEN LEMAY  
 P.O. BOX 7571  
 BRECKENRIDGE, CO 80424

THE SEPTIC TANK AND ON-SITE WASTEWATER TREATMENT SYSTEM SHALL BE COMPRISED OF THE MATERIALS AND EQUIPMENT CONFORMING TO THE REQUIREMENTS OF THE COUNTY HEALTH DEPARTMENT AND THE STATE OF COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT. OPERATING PERMITS ARE REQUIRED FOR CERTAIN TYPES OF SYSTEMS. REFER TO THE COUNTY REGULATIONS FOR MORE INFORMATION.



DIG SAFELY - CALL 811  
 GAS/ELECTRIC/TELEPHONE/CABLE  
 WWW.UNCC2.ORG



SHEET INDEX	
SHEET#	SHEET DESCRIPTION
COVER	OWTS COVER SHEET
D0	GENERAL CONSTRUCTION & SITE NOTES
D1	DESIGN & INSTALLATION NOTES
D2	OVERALL SITE PLAN FOR OWTS
D2.1	SITE PLAN DETAIL FOR OWTS
D3	STA DETAILS & NOTES
D4	SEPTIC TANK DETAILS & SPECIFICATIONS
D4.1	ORENCO ADVANTEX AX-RT MFG. DRAWING 1 OF 2
D4.2	ORENCO ADVANTEX AX-RT MFG. DRAWING 2 OF 2
D5	OWTS DETAIL DRAWINGS
D6	OWTS OWNER'S MAINTENANCE REQUIREMENTS
D7	SOILS TESTING & PUMP CALCULATIONS

### CONTRACTOR INSTALLATION REFERENCE TABLE:

#### SEPTIC TANK:

VALLEY PRECAST 1500 GALLON TOP SEAM 2 COMPARTMENT CONCRETE TANK WITH EFFLUENT FILTER  
 - ITEM #1500T-2CP-F  
 -ADVANTEX AX-25RT (MODE 3B) ADVANCED TREATMENT UNIT

#### SOIL TREATMENT AREA:

SIZE: 12'X36' GRAVEL BED OVER 18'X42' SAND BASIN AREA

DEPTH: 60" MAX. ALONG THE HIGH SIDE OF SAND BASIN. KEY IN SAND 12" MIN. ALONG THE LOW SIDE.

MATERIALS: 24" CLEAN SECONDARY-TYPE SAND, 1" OR 1.5" Ø GRAVEL. 8" GRAVEL BELOW PIPE AND 2" GRAVEL ABOVE PIPE.

LATERALS: 3, 1.5" Ø SCH 40 PVC, USE ORIFICE SHIELDS BY SIM/TECH (STF-106D) OR ORENCO (OS150).

ORIFICES: 7/32" Ø @ 24" O.C. AT 6:00 WITH ORIFICE SHIELDS. 17 ORIFICES PER LATERAL, 51 TOTAL.

#### SUBMITTALS REQUIRED:

- SAND
- GRAVEL
- TANK AND ASSOCIATED EQUIPMENT (INCLUDING AIR-RELIEF AND BALL VALVES)
- PIPE AND ASSOCIATED CEMENT/PRIMER

CONTRACTOR SHALL OBTAIN COUNTY APPROVAL BEFORE ORDERING MATERIALS AND PRIOR TO ANY CONSTRUCTION.

THESE CONSTRUCTION PLANS SHALL BE CONSIDERED VALID FOR THREE (3) YEARS FROM THE DATE ON THE ENGINEERING STAMP, AFTER WHICH TIME THESE PLANS SHALL BE VOID AND WILL BE SUBJECT TO RE-REVIEW AND RE-ACCEPTANCE BY LITTLEHORN ENGINEERING.

THESE PLANS ARE THE PROPERTY OF LITTLEHORN ENGINEERING, LLC. ANY REPRODUCTION OR COPYING OF THE INFORMATION CONTAINED IN THESE PLANS IS CONSIDERED AN INFRINGEMENT ON COPYRIGHT LAWS.

OWTS COVER SHEET  
 CROWN SUBDIVISION, LOT 532  
 39 LODESTONE TRAIL  
 BLUE RIVER, CO 80424

**LITTLEHORN ENGINEERING, LLC**  
 "PEACE OF MIND THROUGH HOLISTIC DESIGN"

351 US HWY 285, #201  
 FAIRPLAY, CO 80440  
 FAIRPLAY OFFICE 719.836.7120  
 SILVER CLIFF OFFICE 719.783.3757



PROJECT NO.  
 2023-100072

CLIENT  
 HELEN LEMAY

DATE  
 07.31.2023

REVISION:  
 △ N/A  
 △ N/A  
 △ N/A

**COVER**

**CONSTRUCTION NOTES- CONSTRUCTION NOTES SHALL GOVERN ALL SEPTIC (OWTS) DRAWINGS**

**GENERAL**

1. THE SITE IS NOT SERVED BY A PUBLIC WASTEWATER SYSTEM SO THE PROPOSED RESIDENCE WILL HAVE TO BE SERVED BY A PRIVATE, ON-SITE WASTE DISPOSAL TREATMENT SYSTEM (OWTS). AS REQUESTED, WE HAVE PREPARED THESE DESIGN DRAWINGS TO PRESENT THE METHODOLOGY AND ENGINEERING FOR THE NEW DISPOSAL SYSTEM.
2. CONTRACTOR SHALL PROVIDE MATERIALS AND WORKMANSHIP AS MAY BE REQUIRED TO COMPLETE THE NECESSARY WORK IN ACCORDANCE WITH THE DESIGN DRAWINGS AND ANY MUNICIPALITY REQUIREMENTS. THE DESIGN DRAWINGS AND SPECIFICATIONS HEREIN REFER TO THE ONSITE WASTEWATER TREATMENT SYSTEM (OWTS). THIS INCLUDES WASTEWATER PIPING LOCATED OUTSIDE THE RESIDENCE. PIPING WITHIN THE RESIDENCE IS REGULATED BY OTHER APPLICABLE BUILDING & PLUMBING REGULATIONS.
3. THE OWNER AND BUILDER SHALL BE RESPONSIBLE FOR AND VERIFY, PRIOR TO CONSTRUCTION COMMENCEMENT: 1) PERMIT ISSUANCE, 2) SITE CONDITIONS, 3) ALL SITE SETBACKS, 4) BUILDING LOCATIONS, 5) COMPONENT DIMENSIONS, 6) MATERIALS, 7) QUANTITIES, AND 8) ELEVATIONS AND GRADE FINISHES. ALL WORK SHALL COMPLY WITH APPLICABLE GOVERNING CODES, HEALTH DEPARTMENT ORDINANCES, LAWS, AND MANUFACTURER'S SPECIFICATIONS.
4. IT IS THE OWNER'S AND CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE DISPOSAL SYSTEM IS: 1) DESIGNED FOR THE CORRECT NUMBER OF BEDROOMS AND APPLIANCES, 2) WILL MEET ALL SETBACK REQUIREMENTS, AND 3) IS INSTALLED PER THIS ENGINEERED DESIGN, COUNTY GUIDELINES, NATIONAL ELECTRIC CODE, AND COLORADO STATE GUIDELINES.
5. IF NOT ALREADY COMPLETED, A REGISTERED SURVEYOR SHOULD CONDUCT A BOUNDARY SURVEY TO ENSURE THAT THE PROPERTY PINS ARE IN THEIR CORRECT LOCATIONS AND HAVE NOT BEEN MOVED.
6. THESE PLANS ARE NOT AN INSTALLATION MANUAL. INSTALLATION MANUALS AND CODES ARE LISTED ON THIS SHEET. THE CONTRACTOR SHALL NOTIFY ENGINEER OF DETAILS NOT SHOWN ON PLANS THAT ARE NECESSARY FOR THE WORK TO PROCEED.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL METHODS OF CONSTRUCTION AND CONSTRUCTION SEQUENCING, INCLUDING TEMPORARY BRACING OR SHORING REQUIRED TO PROTECT WORKERS, THE EXCAVATED TRENCHES, AND ANY EXCAVATED HOLES, AS MAY BE REQUIRED. SITE VISITS BY THE ENGINEER SHALL NOT INCLUDE INSPECTION OF THE ABOVE. JOB-SITE SAFETY IS BEYOND THE SCOPE OF THESE DRAWINGS AND THE ABILITY OF THE ENGINEER TO MANAGE. THE OWNER AND CONTRACTOR BEAR ALL RESPONSIBILITY FOR THEIR OWN SAFETY AND THE SAFETY OF EMPLOYEES, WORKERS, AND ALL PASSERSBY'S.
8. LOCATE ALL BURIED UTILITIES PRIOR TO ANY CONSTRUCTION.
9. ALL MATERIALS SHALL BE PROTECTED WITH SUITABLE TEMPORARY WEATHER FACILITIES AS MAY BE REQUIRED TO PROTECT MATERIALS FROM DAMAGE DURING CONSTRUCTION. WEATHER PROTECTION AND SNOW REMOVAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND OWNER.
10. DO NOT SCALE DRAWINGS. VERIFY LINES & DIMENSIONS ON DRAWINGS PRIOR TO ANY WORK. CALL ENGINEER FOR ANY DIMENSIONING QUESTIONS.
11. SURFACING OF PARKING AND DRIVE AREAS: IF THE AREA ABOVE THE TANK OR SEWER LINE IS TO BE PAVED WITH CONCRETE OR ASPHALT OR SIMILAR MATERIALS, THE ENGINEER SHALL BE NOTIFIED FOR SOILS TESTING OF THE BACKFILL PLACED WITHIN ANY EXCAVATED TRENCHES AND HOLES. IF SOILS TESTING IS NOT PERFORMED, THE SOIL MAY SETTLE AND CRACK THE ASPHALT OR CONCRETE PAVING. WHERE THE ACCESS ROAD IS PAVED, DRIVES ARE USUALLY PAVED (THIS MAY BE REQUIRED BY THE MUNICIPALITY).
12. RE-VEGETATION, LANDSCAPING WORK, AND EROSION CONTROL SYSTEMS ARE OUTSIDE THE SCOPE OF THESE PLANS. THIS WORK SHALL BE IN ACCORDANCE WITH THE APPLICABLE LAND USE AND DEVELOPMENT CODE.
13. IF A RETAINING WALL OR SUBSURFACE DRAIN IS TO BE LOCATED BELOW AND WITHIN 25 FEET OF THE STA, IT SHALL BE DESIGNED BY AN ENGINEER REGARDLESS OF THE HEIGHT.
14. SNOW STACK SPACE: THE STA, SEPTIC TANK, AND SEWER PIPE AREAS SHALL NOT BE USED AS A SNOW STORAGE AREA.

**CODES GOVERNING MATERIALS AND WORKMANSHIP:**

- ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS.
- CDPHE: COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT.
- IRC: RESIDENTIAL/BUILDING CODE & ADOPTED PLUMBING CODE & ELECTRICAL CODE
- MSDS: MATERIAL SAFETY DATA SHEETS
- NSF: NATIONAL SANITATION FEDERATION INTERNATIONAL
- OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
- SCEHSD: SUMMIT COUNTY ENVIRONMENTAL HEALTH DEPARTMENT
- UL: UNDERWRITERS LABORATORIES, INC.
- WATER: STATE OF COLORADO & DIVISION OF WATER RESOURCES

15. THE RESIDENCE AND DRIVEWAY DIMENSIONS MAY BE GENERALLY SHOWN. THE PROPOSED DRIVEWAY AND RESIDENCE LOCATION, DIMENSIONS, SITE LAYOUT, ETC. SHALL BE VERIFIED PRIOR TO CONSTRUCTION. IF DEVELOPMENT PLANS ARE DIFFERENT FROM WHAT IS SHOWN HEREIN, PLEASE NOTIFY THE ENGINEER.
16. TREE CLEARING SHALL BE COMPLETED IN ACCORDANCE WITH FIRE REGULATIONS, SUBDIVISION REGULATIONS, HOME OWNERS DESIRES, AND COUNTY REGULATIONS.
17. INSULATION: THE STA, SEPTIC TANK, AND SEWAGE PIPING HAS BEEN DESIGNED WITH A MINIMUM SPECIFIED SOIL COVER. THE MINIMUM SOIL COVER ASSUMES THE SYSTEM IS USED PROPERLY, ON A FULL-TIME BASIS, AND IS MAINTAINED PROPERLY. IF ANY OF THESE THREE ITEMS ARE LACKING, THE SYSTEM MAY FREEZE. AS AN EXTRA PRECAUTIONARY METHOD THE SEPTIC TANK, BUILDING SEWER, AND EFFLUENT SEWER LINE MAY BE INSULATED OR HEAT-TAPED ON THE EXTERIOR. THE STA SHALL NOT BE INSULATED AS THE "FOAM" WILL HINDER EVAPORATION FROM THE STA. REFER TO SYSTEM MAINTENANCE AND OPERATION GUIDELINES.



**GROUND AND IRRIGATION WATER:**

1. WATER AND MOISTURE IN AND AROUND STA'S IS A MAJOR PROBLEM IN THE MOUNTAIN AREAS, DUE TO SNOW MELT. TO MITIGATE WATER APPROPRIATELY AWAY FROM THE OWTS, THE STA HAS BEEN DESIGNED TO BE A VERY SPECIFIC VERTICAL DISTANCE ABOVE THE AVERAGE SEASONAL WATER TABLE. REFER TO STA CROSS SECTION FOR DESIGN DEPTHS.
2. SEPTIC TANKS SHALL NOT BE PLACED WITHIN A 100 YEAR FLOOD PLAIN OR NEAR ANY TYPE OF FLOODWAY UNLESS OTHERWISE APPROVED BY THE ENGINEER. WHEN PLACED IN OR NEAR THESE AREAS, APPROVAL FROM THE ENGINEER IS REQUIRED. TYPICALLY THE TOP OF THE TANK IS MAINTAINED AT LEAST 18 INCHES ABOVE THE BASE FLOOD ELEVATION AND PROTECTED BY A SURROUNDING DRAIN/SUMP. SEPTIC TANKS WHICH ARE PLACED IN HIGH GROUND WATER AREAS SHALL BE WATERPROOFED AND A TOP SEAM TANK SHALL BE USED. SOME COUNTIES NOW REQUIRE TOP SEAM TANKS FOR ALL SEPTIC TANKS.
3. FOUNDATION DRAINS AND WATER SOURCES MUST NOT BE DIRECTED TOWARDS SEPTIC TANKS, STA'S, WELLS, OR BURIED UTILITIES. EROSION MUST ALSO BE CONSIDERED AND MITIGATED PER COUNTY REQUIREMENTS AT DAYLIGHT LOCATIONS.
4. LAWN SPRINKLER HEADS, SNOW BUILDUP AND IMPROPER WATER MITIGATION PRACTICES CAN CAUSE REAL PROBLEMS FOR THE SEPTIC SYSTEM AND MUST BE APPROPRIATELY CONTROLLED.

**WATER SUPPLY**

1. WHEN WATER FOR THE RESIDENCE IS TO BE OBTAINED FROM A PRIVATE WELL OR DEVELOPED SPRING, IT SHALL BE DRILLED/INSTALLED/DEVELOPED AT THE MINIMUM SPECIFIED DISTANCE SHOWN IN THE SITE PLAN FROM THE STA AND AT LEAST 50 FEET FROM THE SEPTIC TANK AND SEWER LINES. ALL SPRINGS/WELLS REQUIRE STATE APPROVAL.
2. ACCESS, UTILITY LINES, EASEMENTS, AND OTHER CRITERIA MUST BE EVALUATED BY A QUALIFIED WELL DRILLER TO ENSURE THE WELL CAN BE DRILLED AT THE PROPOSED LOCATION SHOWN. THE ATTACHED PLAN SHOWS A LOCATION FOR THE WELL THAT IS ONLY INTENDED TO MEET THE SETBACK REQUIREMENTS.
3. EXISTING AND PROPOSED WELL LOCATIONS WITHIN 200 FEET OF THE PROPOSED SEPTIC SYSTEM ARE TYPICALLY DEPICTED IN THE DRAWINGS. SOMETIMES DUE TO SNOW COVER, BUILDINGS, OR OTHER ISSUES ALL NEIGHBORING WELLS CAN NOT BE LOCATED. THE CONTRACTOR SHALL VERIFY SUCH LOCATIONS BEFORE THE WASTE DISPOSAL SYSTEM IS INSTALLED.
4. THE WELL SHALL BE GROUTER PER STATE AND COUNTY REQUIREMENTS.

**GRADING AND EXCAVATION SPECIFICATIONS:**

1. ALL FINISH SLOPES MUST SLOPE AWAY FROM BUILDINGS, BUILDING SEWER, SEPTIC TANK(S), EFFLUENT LINES, AND STA AREAS. WHEN INSTALLING BERMS, SUBSURFACE DRAINS, AND OTHER METHODS TO MITIGATE THE WATER AWAY FROM THESE AREAS, BE SURE THE HISTORICAL FLOW QUANTITIES AND PATTERNS ARE VERIFIED AND MAINTAINED FOR ANY WATER LEAVING THE SITE.
2. WHEN THE GRADING/EXCAVATION OPERATIONS ENCOUNTER REMAINS OF PREHISTORIC PEOPLE'S DWELLING SITES, REMAINS, OR ARTIFACTS OF HISTORICAL, PALEONTOLOGICAL OR ARCHAEOLOGICAL SIGNIFICANCE, THE OPERATIONS SHALL BE TEMPORARILY DISCONTINUED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND PROMPTLY CONTACT THE PROPER AUTHORITIES TO DETERMINE THE DISPOSITION THEREOF. IF REQUIRED BY STATE OR FEDERAL AUTHORITIES, THE CONTRACTOR SHALL PRESERVE THE AREA OF SIGNIFICANCE TO ALLOW AUTHORITIES TO EXCAVATE AND RECOVER THE ITEMS OF SIGNIFICANCE.
3. AT ALL TIMES, PRECAUTIONS SHALL BE TAKEN FOR THE PROTECTION OF CULVERTS, EROSION CONTROL STRUCTURES, IRRIGATION CROSSINGS, SURVEY MONUMENTS, UNDERGROUND OR OVERHEAD UTILITY LINES AND ALL OTHER PUBLIC OR PRIVATE INSTALLATIONS THAT MAY BE ENCOUNTERED DURING CONSTRUCTION. ANY DAMAGE TO SUCH STRUCTURES SHALL BE REPAIRED, DOCUMENTED AND SUBMITTED TO THE APPROPRIATE AUTHORITY.
4. CLEARING AND GRUBBING. ALL TREES AND OTHER VEGETATION SHALL BE SALVAGED WHERE POSSIBLE (VERIFY WITH THE HOME OWNER BEFORE REMOVING TREES). STUMP HOLES AND OTHER HOLES FROM WHICH OBSTRUCTIONS ARE REMOVED, SHALL BE BACKFILLED (AND COMPACTED WHEN REQUIRED) WITH SUITABLE MATERIALS. STUMPS, DEBRIS, AND WOOD SHALL NOT BE PLACED IN ANY TRENCHES OR USED FOR ANY BACKFILL. ALL TREES AND SHRUBS WITHIN 10 FEET OF THE STA AND SEPTIC TANK AND WITHIN 5 FEET OF THE WASTE WATER PIPING SHALL BE CLEARED. MATERIALS AND DEBRIS SHALL BE DISPOSED OF IN ACCORDANCE WITH STATE AND COUNTY REGULATIONS. WITH OWNER APPROVAL, STUMPS MAY BE BURIED ON-SITE AT AN APPROVED LOCATION.
5. TOPSOIL. ALL TOPSOIL, WHERE PHYSICALLY PRACTICABLE, SHALL BE SALVAGED. TOPSOIL SHALL CONSIST OF LOOSE FRIABLE LOAM REASONABLY FREE OF ADMIXTURES OF SUBSOIL, REFUSE, STUMPS, OR TREE ROOTS. MATERIALS SELECTED FOR TOPSOIL SHALL BE EXCAVATED AND STOCKPILED AS REQUIRED. TOPSOIL SHALL BE KEYED TO THE UNDERLYING MATERIALS BY THE USE OF HARROWS, ROLLERS, OR OTHER EQUIPMENT SUITABLE FOR THE PURPOSE. FOR SITES THAT DON'T CONTAIN ENOUGH REUSABLE TOP SOIL, APPROVED TOP SOIL WILL HAVE TO BE IMPORTED TO THE SITE. SITES WITH MORE THAN 1.0 ACRE OF DISTURBANCE REQUIRE SPECIAL PERMITTING.
6. EXCAVATION. VIBRATORY EQUIPMENT AND OTHER EQUIPMENT WHICH MIGHT COMPACT THE SOILS SHALL BE KEPT OUT OF THE STA BED. IF A RUBBER Tired VEHICLE ABSOLUTELY MUST BE USED WITHIN THE STA, SCARIFY THE SOILS VERY CAREFULLY BEFORE STA CONSTRUCTION TO ENSURE THE UNDERLYING SOILS ARE NOT COMPACTED. SHORTCUTTING GOOD CONTRACTOR PRACTICE WILL CAUSE PREMATURE STA FAILURE (SEE COMPACTION BELOW).
7. WHEN GROUND WATER IS ENCOUNTERED, THE CONTRACTOR SHALL PUMP, OR OTHERWISE REMOVE ANY WATER THAT ACCUMULATES IN THE TRENCHES, TANK HOLE, AND STA. MATERIALS SHALL NOT BE CONSTRUCTED IN WATER AND WATER SHALL NOT BE ALLOWED TO DRAIN THROUGH THE SEWER PIPE. AT THE END OF THE DAY, THE OPEN END OF THE PIPE SHALL BE KEPT CLOSED BY PLACING A WATERTIGHT FITTING PLUG INTO THE BELL END TO PREVENT WASHING OF ANY FOREIGN MATTER INTO THE LINE. ALL WATER REMOVED FROM THE CONSTRUCTION SITE SHALL BE CONVEYED IN A PROPER MANNER TO A SUITABLE POINT OF DISCHARGE AND SHALL COMPLY WITH THE APPLICABLE EROSION, SEDIMENTATION AND WATER CONTROL LAWS.
8. BACKFILLING SHALL BE THE RESPONSIBILITY OF THE OWNER/CONTRACTOR. ALL DISTURBED AREAS SHOULD BE RESEDED TO MITIGATE EROSION. IT IS GOOD PRACTICE TO SLIGHTLY MOUND THE AREA OVER THE TRENCHES, THE TANK, AND THE STA AREAS TO MITIGATE SURFACE WATER AWAY FROM THESE AREAS.
9. COMPACTION. ALL PLACED FILL SHALL BE BROUGHT TO THE PROPER MOISTURE CONTENT AND ADEQUATELY COMPACTED TO PREVENT SETTLEMENT. CALL ENGINEER FOR INSPECTION OF THE ABOVE ITEMS AS REQUIRED. SOILS WHICH ARE NOT TESTED FOR COMPACTION ADEQUACY MAY SETTLE AND LEAD TO SYSTEM FREEZING AND PREMATURE FAILURE. A) HOUSE: SOILS BELOW THE BUILDING SLAB AND BELOW ANY HOUSE FOOTINGS SHALL BE ADEQUATELY COMPACTED AS REQUIRED BY THE HOUSE GEOTECHNICAL ENGINEER OF RECORD; B) SEPTIC TRENCHES AND SEPTIC TANK: SOILS SHOULD BE COMPACTED TO MINIMUM 95% STANDARD PROCTOR AND WITHIN 2% OF OPTIMUM MOISTURE. COMPACT SOILS UNDER PIPE IN TRENCHES AND UNDER SEPTIC TANK AREA WITH SHEEPSFOOT ROLLERS, MULTIPLE-WHEEL PNEUMATIC-TIRED ROLLERS, OR OTHER APPROVED EQUIPMENT. FILL-TYPE SOILS SHALL BE PLACED IN NO MORE THAN 10-INCH LOOSE LIFTS; C) SOIL TREATMENT AREA: AREAS UNDER THE STA SHALL NOT BE COMPACTED; KEEP TIRE AND TRACK-TYPE EQUIPMENT OUT OF THE EXCAVATED BED WHEN THE LAST 12 INCHES IS EXCAVATED. WHEN AN STA CONTAINS MORE THAN 24 INCHES OF SAND, THE SAND SHALL BE CONSOLIDATED BY THE APPLICATION OF CLEAN WATER OVER EVERY 12-INCH SAND LAYER/LIFT. ANY TYPE OF MECHANICAL COMPACTION OF THE SAND & STA IS PROHIBITED.

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GENERAL CONSTRUCTION & SITE NOTES

CROWN SUBDIVISION, LOT 532  
39 LODESTONE TRAIL  
BLUE RIVER, CO 80424

**LITTLEHORN ENGINEERING, LLC**  
"PEACE OF MIND THROUGH HOLISTIC DESIGN"

351 US HWY 285, #201  
FAIRPLAY, CO 80440  
FAIRPLAY OFFICE 719.836.7120  
SILVER CLIFF OFFICE 719.783.3757

PROJECT NO.  
2023-100072

CLIENT  
HELEN  
LEMAY

DATE  
07.31.2023

REVISION:  
△ N/A  
△ N/A  
△ N/A

**DO**

**PROJECT SUMMARY AND SOILS TESTING**

1. THE OWNERS ARE PREPARING TO INSTALL A NEW WASTEWATER DISPOSAL SYSTEM FOR A PROPOSED SINGLE-FAMILY RESIDENCE. A CONVENTIONAL-TYPE SEPTIC SYSTEM CANNOT BE PLACED ON THE PROPERTY AND MEET COUNTY REQUIRED SETBACKS. ACCORDINGLY AN ADVANCED-TREATMENT TYPE SEPTIC SYSTEM IS DESIGNED.
4. THE SURFACE GEOLOGY OF THE LOT IS COMPRISED GENERALLY OF ORGANIC TOPSOIL WITH PINE TREES, NATIVE GRASSES, AND SHRUBS.
3. WE VISITED THE REFERENCED SITE ON JUNE 13, 2023. THE SITE WAS ENTIRELY FREE OF SNOW. PROFILE AND SOIL TESTING HOLES WERE EXCAVATED ON THE PROPERTY IN THE AREA OF THE PROPOSED STA AND EXAMINED. THESE HOLES REVEALED THE FOLLOWING:

**Soil Profile Hole A (96-inch depth)**

HOLE	DEPTHS	DESCRIPTION	SHAPE	GRADE	TYPE	COLOR
ROCK	70%	Organic topsoil with medium to fine roots	GR	WK	2A	Dark brown
SLOPE SHAPE	LL					
NOTES ↓		Sandy silt loam with gravel, cobbles and a few boulders	BK	WK	R2/2A	Brown
No standing water. Minimal smearing. Fine roots to 60"	8 - 96"					

**Soil Profile Hole B (96-inch depth)**

HOLE	DEPTHS	DESCRIPTION	SHAPE	GRADE	TYPE	COLOR
ROCK	65%	Organic topsoil with medium to fine roots	GR	WK	2A	Dark brown
SLOPE SHAPE	LL					
NOTES ↓		Sandy silt loam with gravel, cobbles and a few boulders	BK	WK	R2/2A	Brown
No standing water. Minimal smearing. Fine roots to 60"	8 - 96"					

**DESIGN CRITERIA**

1. BASED ON THE DATA RECORDED FROM THE REFERENCED SITE, R2/SOIL TYPE 2A WILL BE USED FOR THE DESIGN.
2. THERE WAS EVIDENCE OF A SEASONAL HIGH GROUND WATER TABLE AT 60" BELOW THE SURFACE.

**GENERAL SETBACKS NOTES:**

1. STA: PLACE STA AT LEAST (A) 10' FROM ALL PROPERTY LINES, (B) 20' FROM ANY STRUCTURE WITH A FOUNDATION DRAIN; (C) 10' FROM ANY STRUCTURE WITHOUT A FOUNDATION DRAIN; (D) 25' FROM A LAKE, WATER COURSE, IRRIGATION DITCH, STREAM, AND/OR WETLAND WITH ADVANCED TREATMENT (TL3N); (E) 5' FROM SEPTIC TANK; (F) AT LEAST 100 FEET FROM ANY POTABLE SPRING/WELL (WITHOUT JUSTIFICATION), OR SUCTION LINE. FOR TL3N EFFLUENT, A REDUCTION TO 75 FEET IS ALLOWED IF A VARIANCE FROM THE WATER WELL CONSTRUCTION REGULATIONS IS OBTAINED.; (G) 25' FROM A DRY GULCH, CUTBANK, OR SWALE AND; (H) 100' FROM ANY WATER CISTERN UNLESS A VARIANCE IS OBTAINED IN ACCORDANCE WITH DIVISION OF WATER RESOURCES, RULE 18.2.
2. SEPTIC TANK: PLACE SEPTIC TANK AT LEAST (A) 50' FROM ALL WELL HEADS AND SPRINGS, (B) 10' FROM ALL PROPERTY LINES, (C) 5' FROM ANY DWELLING OR OCCUPIED STRUCTURE, (D) 50' FROM A LAKE, WATER COURSE, STREAM, WATER CISTERN, IRRIGATION DITCH AND/OR WETLAND (E) 10' FROM FROM A DRY GULCH OR SWALE.
3. WATER LINES: ALL POTABLE WATER SUPPLY LINES SHALL BE POSITIONED A MINIMUM OF 10' FROM THE SEPTIC TANK AND SEWAGE PIPING AND 25' FROM AN STA.
4. SEWAGE PIPING: ALL SEWAGE PIPING SHALL BE LOCATED AT LEAST 50' FROM A WELL HEAD, LAKE, WATER COURSE, STREAM, WATER CISTERN, IRRIGATION DITCH AND/OR WETLAND, 10' FROM ALL PROPERTY LINES, AND 3 FEET FROM ANY DECK FOOTING OR PIER.

**OWTS DESIGN FLOWS AND CALCULATIONS**

1. THE AVERAGE FLOW AND DESIGN SEWAGE WASTE FLOWS DISCHARGED TO THE SOIL TREATMENT AREA (STA) EVERY DAY, AS REQUIRED BY THE COUNTY AND AS LISTED UNDER THE RESIDENTIAL WASTEWATER DESIGN FLOW TABLE FOR A FOUR (4) BEDROOM SINGLE-FAMILY RESIDENCE WITH A CLOTHES WASHER, ONE AUTOMATIC DISHWASHER, AND A GARBAGE DISPOSAL.

AVERAGE FLOW : 4 BEDROOM = 600 GALLONS PER DAY (GPD)  
(TABLE 13-1)

2. DUE TO SOIL TYPE, A PUMP IS REQUIRED. PER TABLE 15-1, A TANK THAT IS AT LEAST 1500 GALLONS IS REQUIRED. A 1500 GALLON TWO COMPARTMENT TANK (TOTAL TANK CAPACITY IS 1509 GALLONS) SHALL BE INSTALLED ALONG WITH AN ORENCO ADVANTEX AX25RT-(MODE 3B) ADVANCED TREATMENT UNIT (CONTAINING THE DISCHARGE PUMP) DOWNSTREAM OF THE PRIMARY TANK. THE LIQUID VOLUME OF 1509 GALLONS SHALL BE PROVIDED IN THE FIRST TWO COMPARTMENTS OF THE PRIMARY TANK. THIS WILL PROVIDE 2.52 DAYS (1509/600) OF RETENTION FOR THE WASTEWATER PRIOR TO THE ADVANCED TREATMENT UNIT.
3. WITH A DESIGN FLOW OF 600 GPD AND 4 DOSES PER DAY. A 150 GALLON DOSE IS RECOMMENDED. A 16-INCH DRAW-DOWN EQUATES TO A 162 GALLON DOSE. GIVEN THE DISCHARGE PIPE SIZE AND SLOPE TO THE STA, 12 GAL IS LOST IN THE PUMP CYCLE. THEREFORE WITH A 162 GALLON VOLUME MOVED IN A PUMP CYCLE, 150 GALLONS IS ACTUALLY RECEIVED BY THE STA AND 12 GAL IS DRAINED BACK INTO THE TANK. USE AN ORENCO MODEL PF5005 HIGH HEAD EFFLUENT PUMP IN THE PUMP TANK. AN ORENCO EFFLUENT FILTER SHALL BE INSTALLED IN THE MIDDLE COMPARTMENT OF THE TANK. USE AN ORENCO MODEL PF5005 HIGH HEAD EFFLUENT PUMP IN THE TANK. THE TANK MANUFACTURER, VALLEY PRECAST, SHALL INSTALL THE PUMP CONTROL PANEL AS REQUIRED BY ADOPTED COUNTY AND STATE REGULATIONS AND PER MANUFACTURER SPECIFICATIONS.
4. FOR AN STA WITH TL3N EFFLUENT TREATMENT (ORENCO ADVANTEX AX25-RT MODE 3B) AT THE SEPTIC TANK AND DISCHARGE INTO A DEEP SECONDARY SAND FILTER AND THEN TO A NATIVE SOIL TYPE R2/ 2A INTERFACE AT THE BOTTOM OF THE SAND FILTER: APPLICATION FACTORS:

BED IS PRESSURE DOSED: 1.0 (TABLE 16-1)  
BED IS GRAVEL: 1.0 (TABLE 16-2)  
NO APPLICATION FACTORS ALLOWED FOR R-TYPE SOILS

**TOP OF SAND/BOTTOM OF GRAVEL**

- 4.1 RECEIVING SOIL IS SAND VIA TREATMENT LEVEL 3N: FLOW/LTAR FOR SAND = 600 GPD /1.55 LTAR = 388 SQFT.
- 4.2 A GRAVEL BED THAT IS 12 FEET X 36 FEET IS PROPOSED. THIS WILL PROVIDE 432 SQUARE FEET.
- 4.3 SAND LOADING RATE WILL BE 16.67 GALLONS PER LINEAR FOOT (600 GPD/ 36 FEET.)

**BOTTOM OF SAND FILTER UNDER THE STA**

- 4.4 FLOW/LTAR FOR INSITU SOIL TYPE 2A, TL3N = 600 GPD /0.8 LTAR = 750 SQFT.
- 4.5 A SAND BED THAT HAS A BASIL AREA OF 18 FEET IN WIDTH AND 42 FEET IN LENGTH SHALL BE INSTALLED. THIS WILL PROVIDE 756 SF.
- 4.6 SOIL LOADING RATE WILL BE 14.28 GALLONS PER LINEAR FOOT (600 GPD/ 42 FEET.)

**INSPECTION REQUIREMENTS AND GUARANTEE:**

1. SEE COVER SHEET FOR REQUIRED INSPECTIONS. WITHOUT OUR INSPECTIONS WE CANNOT VERIFY THAT THE SYSTEM WAS INSTALLED TO OUR SPECIFICATIONS. A MINIMUM OF FIVE (5) WORKING DAYS' ADVANCE NOTICE IS REQUESTED FOR CONDUCTING EACH INSPECTION. INSPECTION APPROVALS DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE DESIGN DRAWINGS & SPECIFICATIONS. UPON REQUEST AND FOR A FEE, THE ENGINEER CAN PREPARE THE AS-BUILT OR RECORD DRAWING.

**SOIL TREATMENT AREA (STA):**

1. SUBMIT SAND, GRAVEL, TANK AND ASSOCIATED EQUIPMENT (INCLUDING AIR-RELIEF AND BALL VALVES), PIPING AND ASSOCIATED CEMENT/PRIMER FOR ENGINEER APPROVAL.
2. STRIP ALL TOPSOIL (SEE GRADING & EXCAVATION SPECIFICATIONS ON SHEET D0) IN THE AREA OF THE NEW BED AND EXCAVATE A LEVEL BED WHERE SHOWN IN THE SITE PLAN THAT IS 60 INCHES MAX. ALONG THE HIGH SIDE (KEY IN SAND 12 INCHES MIN. ALONG THE LOW SIDE) IN DEPTH X 18 FEET WIDE X 42 FEET IN LENGTH. BE SURE TO KEEP RUBBER TIERED AND OTHER EXCAVATION-TYPE EQUIPMENT OUT OF THE STA BED WHEN THE LAST 12 INCHES OF THE BED IS EXCAVATED.
3. INSTALL AT LEAST 24 INCHES OF SECONDARY-TYPE CLEAN SAND\* \*\* THAT IS FREE OF ORGANIC MATTER, DIRT, DEBRIS, SNOW, ICE, AND ROCKS THAT MEETS THE FOLLOWING ASTM 33 CRITERIA SHALL:
  - 3.1. PASS A SCREEN HAVING FOUR MESHES TO THE INCH;
  - 3.2. HAVE AN EFFECTIVE SIZE BETWEEN 0.15 AND 0.60 MM;
  - 3.3. FINES PASSING A #200 SIEVE SHALL NOT EXCEED 3%;
  - 3.4. HAVE A UNIFORMITY COEFFICIENT OF 7.0 OR LESS.

4. AFTER SAND APPROVAL\* AND SAND INSTALLATION, INSTALL AT LEAST 8-9 INCHES OF CLEAN (DIRT AND SAND FREE) GRADED, COARSE 1" OR 1-1/2" GRAVEL\* IN THE ENTIRE BED TO BE USED AS THE STA CONFORMING TO THE FOLLOWING TABLE:

SIEVE SIZE%	PASSING BY WEIGHT%
2 1/2"	100
3/4 -1"	0-20
4	0-3

\* SUBMIT A MATERIAL ANALYSIS TO LITTLEHORN; IF A SIEVE AND MATERIAL ANALYSIS IS UNAVAILABLE, A SAMPLE OF THE MEDIA MUST BE PROVIDED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.

\*\* THE BASIL AREA OF THE SAND BED SHALL BE KEYED IN BELOW ALL ORGANIC TOPSOIL

- 4.1 WHEN THE GRAVEL IS INSTALLED, IT MUST CREATE A LEVEL AREA FOR THE DISTRIBUTION PIPING.
- 4.2 ALL GRAVEL MUST BE FREE OF DIRT; AVOID PICKING UP DIRT, DEBRIS (STICKS, ROOTS, LEAVES) AND ANY ICE AND SNOW WITH THE LAST BUCKETS OF GRAVEL PUT ON THE STA.
- 4.3 FOR SOME ADDED PROTECTION, THE OWNER SHOULD STRONGLY CONSIDER INSTALLING 1 TO 3 INCHES OF ADDITIONAL GRAVEL UNDER THE PIPING.
5. AFTER THE INITIAL GRAVEL LAYER IS INSTALLED, INSTALL LEVEL DISTRIBUTION PIPING FOLLOWED BY 6 MORE INCHES OF GRAVEL (GRAVEL WILL BE AT LEAST 12" THICK; GRAVEL MUST BE AT LEAST 2 INCHES ABOVE THE PIPE AND LEVEL). ALL GRAVEL THAT IS NOT CLEAN WILL BE REJECTED BY THE ENGINEER AND SHALL BE REPLACED.
6. INSTALL APPROVED FILTER (MAX. 2 OZ. PER SQUARE YARD) FABRIC [BOWMAN CONSTRUCTION (303) 696-8960] OVER THE GRAVEL FIELD. THEN INSTALL AT LEAST 18 INCHES OF SOIL COVER AND NO MORE THAN 36 INCHES OF SOIL COVER OVER THE FILTER FABRIC PER COUNTY GUIDELINES TO MITIGATE FREEZING.
7. CREATE A MOUND OVER THE BED TO PREVENT SURFACE WATER PONDING AND FACILITATE RAIN WATER AND SNOW MELT RUN-OFF. WHEN A MOUND IS CREATED, USE 3:1 (3 FEET HORIZONTAL TO 1 FOOT VERTICAL) SIDE SLOPES ON THE MOUND BACKFILL. FINISH GRADING AROUND THE ENTIRE STA AREA MUST MITIGATE WATER AWAY FROM THE STA.
8. RESEED DISTURBED AREAS WITH NATIVE GRASSES AND WILD FLOWERS HAVING A SHALLOW ROOT SYSTEM TO PREVENT EROSION PROBLEMS. SIDE SLOPES OF MOUNDED STA'S SHOULD BE NETTED TO PREVENT EROSION. IF EROSION BEGINS IN ANY PART OF THE DISPOSAL SYSTEM, CONTACT US IMMEDIATELY.



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DESIGN & INSTALLATION NOTES

CROWN SUBDIVISION, LOT 532  
39 LODGESTONE TRAIL  
BLUE RIVER, CO 80424

**LITTLEHORN ENGINEERING, LLC**  
"PEACE OF MIND THROUGH HOLISTIC DESIGN"

351 US HWY 285, #201  
FAIRPLAY, CO 80440  
FAIRPLAY OFFICE 719.836.7120  
SILVER CLIFF OFFICE 719.783.3757

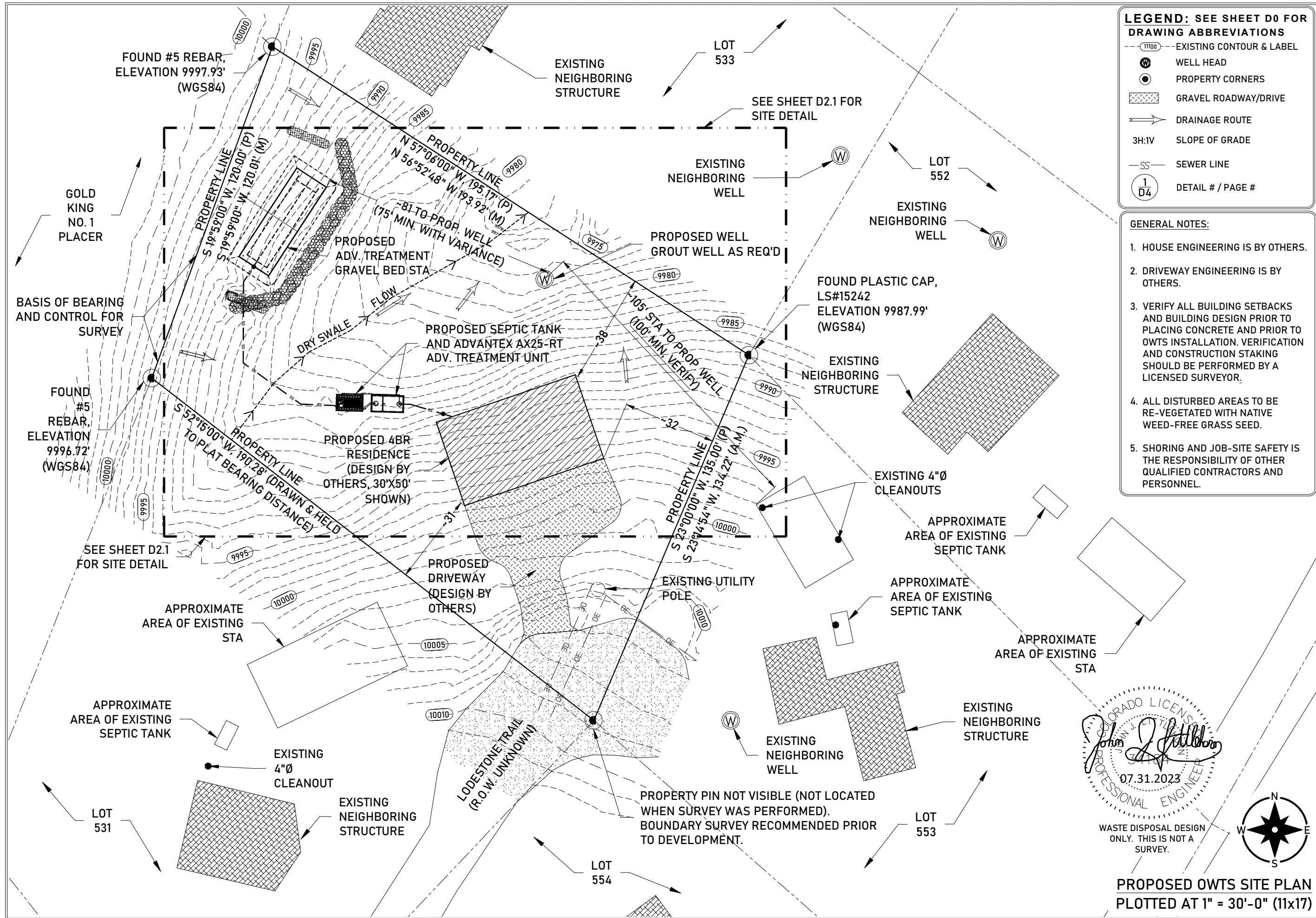
PROJECT NO.  
2023-100072

CLIENT  
HELEN LEMAY

DATE  
07.31.2023

REVISION:  
△ N/A  
△ N/A  
△ N/A

D1



**LEGEND: SEE SHEET D0 FOR DRAWING ABBREVIATIONS**

- EXISTING CONTOUR & LABEL
- WELL HEAD
- PROPERTY CORNERS
- GRAVEL ROADWAY/DRIVE
- DRAINAGE ROUTE
- SLOPE OF GRADE
- SEWER LINE
- DETAIL # / PAGE #

- GENERAL NOTES:**
1. HOUSE ENGINEERING IS BY OTHERS.
  2. DRIVEWAY ENGINEERING IS BY OTHERS.
  3. VERIFY ALL BUILDING SETBACKS AND BUILDING DESIGN PRIOR TO PLACING CONCRETE AND PRIOR TO OWTS INSTALLATION. VERIFICATION AND CONSTRUCTION STAKING SHOULD BE PERFORMED BY A LICENSED SURVEYOR.
  4. ALL DISTURBED AREAS TO BE RE-VEGETATED WITH NATIVE WEED-FREE GRASS SEED.
  5. SHORING AND JOB-SITE SAFETY IS THE RESPONSIBILITY OF OTHER QUALIFIED CONTRACTORS AND PERSONNEL.

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OVERALL SITE PLAN FOR OWTS

**LITTLEHORN ENGINEERING, LLC**

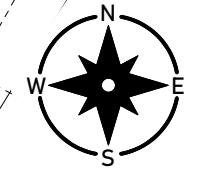
351 US HWY 285, #201  
FAIRPLAY, CO 80440  
FAIRPLAY OFFICE 719.836.7120  
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"PEACE OF MIND THROUGH HOLISTIC DESIGN"

PROJECT NO.	2023-100072
CLIENT	HELEN LEMAY
DATE	07.31.2023
REVISION:	<ul style="list-style-type: none"> <li>△ N/A</li> <li>△ N/A</li> <li>△ N/A</li> </ul>
<b>D2</b>	



WASTE DISPOSAL DESIGN ONLY. THIS IS NOT A SURVEY.



**PROPOSED OWTS SITE PLAN**  
PLOTTED AT 1" = 30'-0" (11x17)

**LEGEND: SEE SHEET D0 FOR DRAWING ABBREVIATIONS**

- 11100 — FINISH CONTOUR & LABEL
- - 11100 - - EXISTING CONTOUR AND LABEL
- ⊙ WELL HEAD
- PROPERTY CORNERS
- ▨ GRAVEL ROADWAY/DRIVE
- DRAINAGE ROUTE
- 3H:1V SLOPE OF GRADE
- SS — SEWER LINE
- ② / D3 DETAIL # / PAGE #

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WASTE DISPOSAL DESIGN ONLY. THIS IS NOT A SURVEY.

SITE PLAN DETAIL FOR OWTS

**LITTLEHORN ENGINEERING, LLC**

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FAIRPLAY, CO 80440  
FAIRPLAY OFFICE 719.836.7120  
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"PEACE OF MIND THROUGH HOLISTIC DESIGN"

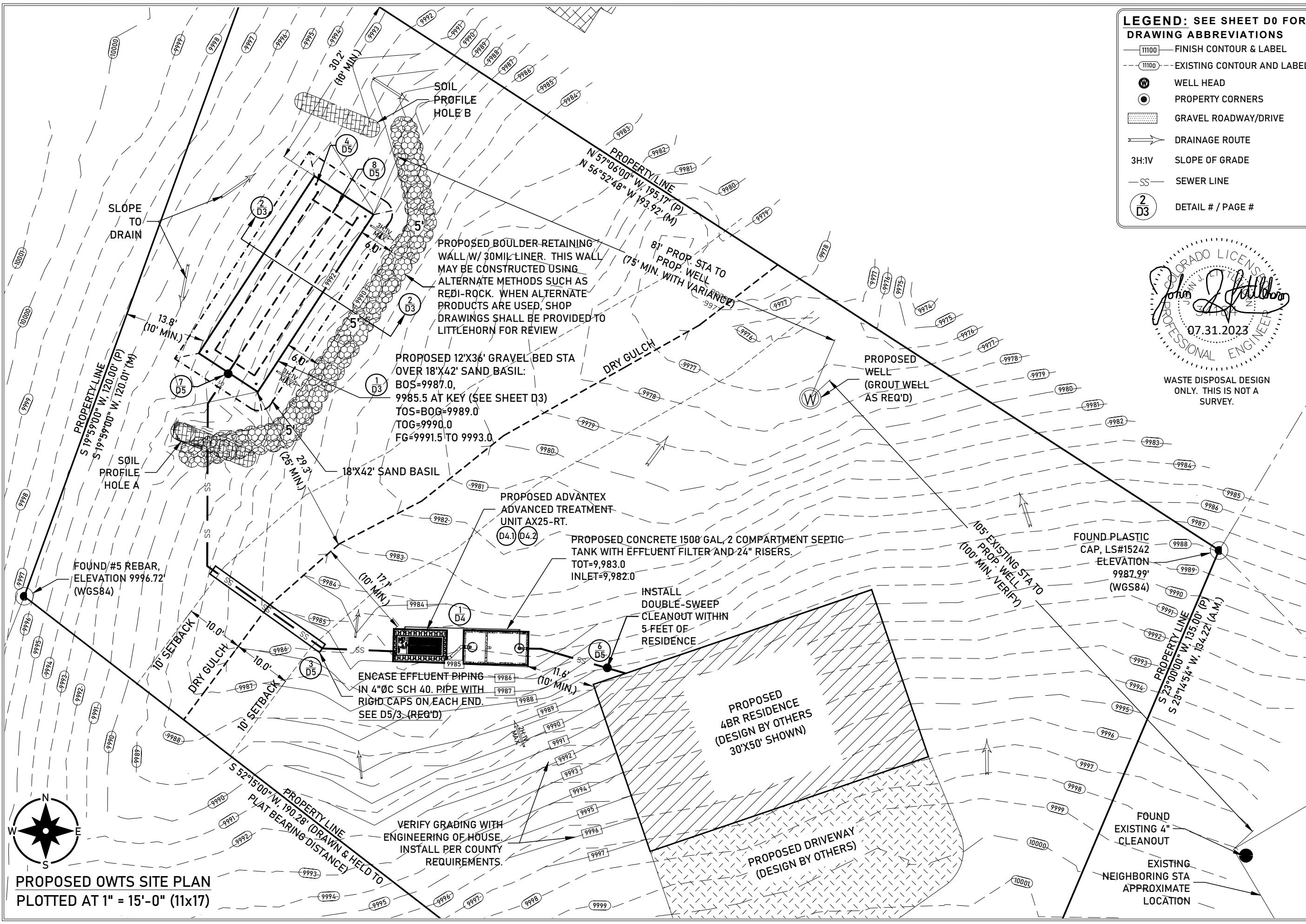
PROJECT NO. 2023-100072

CLIENT HELEN LEMAY

DATE 07.31.2023

REVISION:  
 △ N/A  
 △ N/A  
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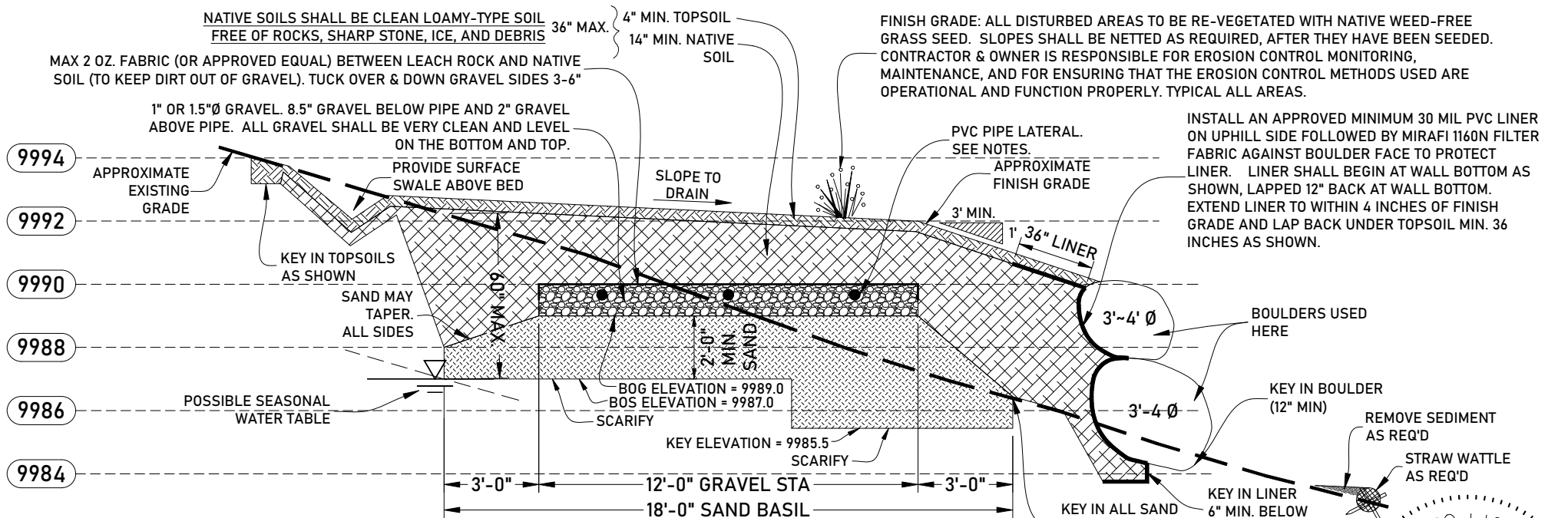
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**PROPOSED OWTS SITE PLAN**  
 PLOTTED AT 1" = 15'-0" (11x17)

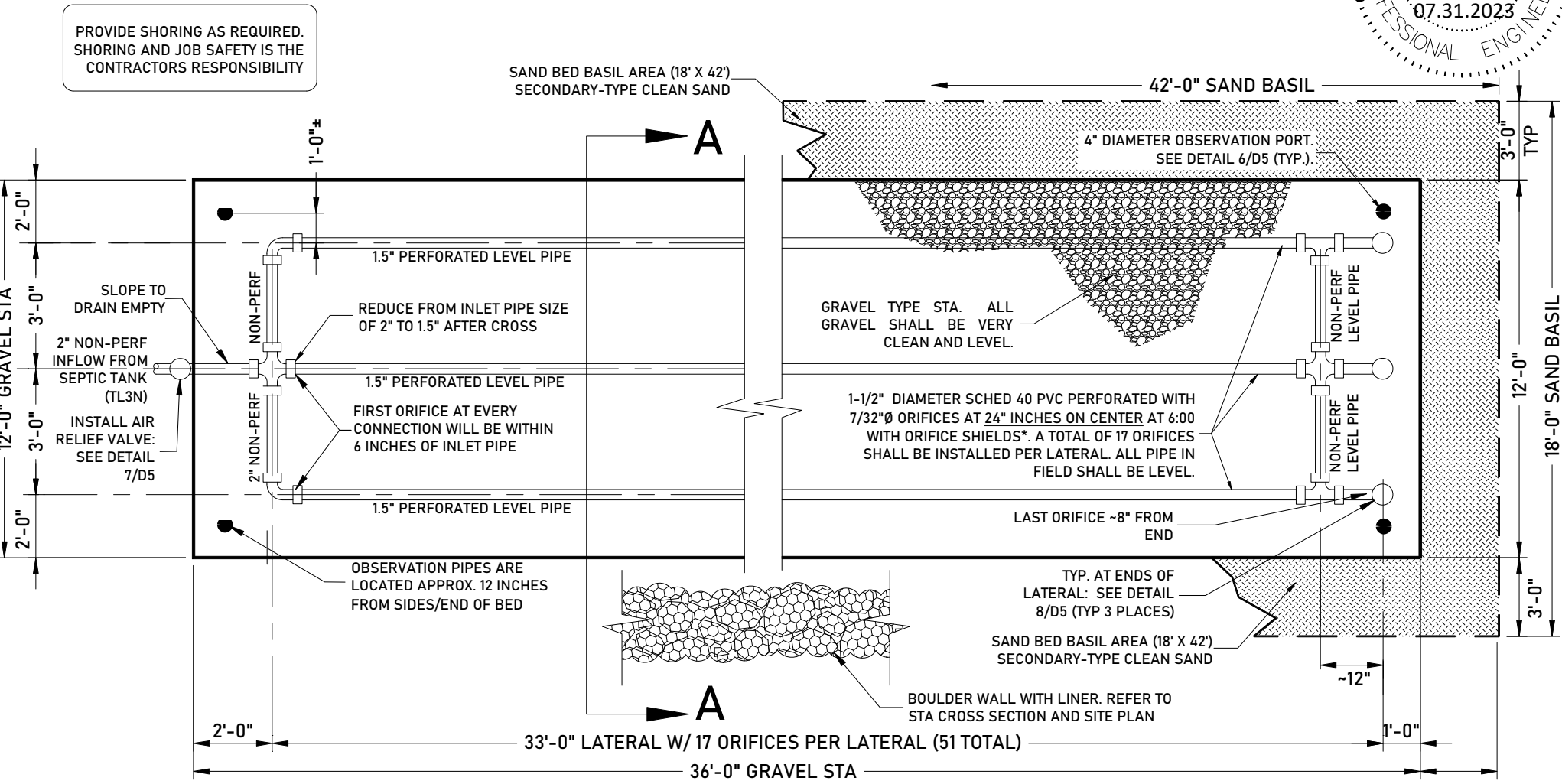
**BUILDING SEWER AND WASTEWATER PIPING:**

- ALL PIPING JOINTS MUST BE WATERTIGHT, ROOT PROOF, AND LAID WITH THE FLARED ENDS IN THE PROPER DIRECTION.
- ALL PIPING SHALL BE ADEQUATELY BEDDED WITH GRAVEL, PEA GRAVEL, OR APPROVED EQUAL COMPACTED AND VIBRATED INTO PLACE PROPERLY TO PREVENT SETTLEMENT AND HAVE AT LEAST 30 INCHES OF SOIL COVER (i.e. MOUNDING IS PERMITTED WITH COMPACTED STRUCTURAL FILL) TO MITIGATE FREEZING; ALL PIPING LAID WITHIN 5 FEET AND BELOW A VEHICULAR TRAFFIC AREA SHALL HAVE A MINIMUM OF 3 FEET OF SOIL COVER UNLESS OTHERWISE APPROVED.
- ALL BENDS IN THE SEWER LINE GREATER THAN 45° MUST BE LONG SWEEP ELBOWS.
- ALL PIPING WHICH WILL BE LAID IN A VEHICULAR TRAFFIC AREAS SHALL BE MINIMUM SCHEDULE 40 PVC PIPE OR EQUIVALENT. PIPING BETWEEN THE TANK AND STA THAT IS NOT WITHIN A VEHICULAR TRAFFIC AREA MAY BE SDR35 U.N.O.
- LAYING PIPE IN THE TRENCH: EVERY PRECAUTION SHALL BE TAKEN TO PREVENT FOREIGN MATERIAL FROM ENTERING THE PIPE DURING PLACEMENT. DURING LAYING OPERATIONS, NO DEBRIS, TOOLS, CLOTHING OR OTHER MATERIAL SHALL BE PLACED IN THE PIPE. SEE DETAILS FOR PIPE BEDDING INSTRUCTIONS.
- BACKFILLING AROUND THE SEPTIC TANK SHALL BE ACCOMPLISHED IN A MANNER THAT PREVENTS SETTLEMENT AND AVOIDS UNDUE STRAIN ON THE PIPES ENTERING AND EXITING THE SEPTIC TANK.
- FOR PIPING FROM THE RESIDENCE TO THE SEPTIC TANK, USE 4-INCH DIAMETER SCHEDULE 40 PVC PIPE, OR EQUIVALENT, LAID WITH A DOWNWARD SLOPE OF 2% TO 8% (1/4-INCH PER FOOT TO 3/4-INCH PER FOOT) EXCEPT FOR THE LAST 5 FEET WHERE THE SLOPE MUST NOT EXCEED 4%. IF POSSIBLE IT IS ALWAYS BETTER TO LAY THE PIPING AT A CONSTANT GRADE WITHOUT FLUCTUATIONS. IF A 2% TO 8% PERCENT GRADE CANNOT BE MAINTAINED AND STEP DOWNS ARE REQUIRED, USE 22 OR 45 DEGREE ELBOWS.
- INSTALL CLEAN-OUTS:
  - WITHIN 5 FEET OF THE RESIDENCE (USE DOUBLE SWEEP HERE)
  - AT INTERVALS OF 100 FEET OR LESS.
  - WHERE THE LINE BENDS AT ANGLES FORTY-FIVE DEGREES OR MORE.
- USE TRAFFIC RATED RISERS WHERE REQUIRED.
- USE PRESSURIZED CAP WHERE REQUIRED (SEE SHEET D5, ITEM 9, PRESSURE CAP DETAIL).
- FOR PIPING FROM THE SEPTIC TANK TO THE STA, USE 2-INCH DIAMETER SCHEDULE 40 PVC PIPE, LAID WITH A MINIMUM UPWARD SLOPE OF 2% TO ALLOW DRAINING OF THE PIPE AT THE END OF THE DOSING CYCLE. ACCORDINGLY, THE PIPE SHALL DRAIN EMPTY AT THE END OF THE DOSING CYCLE.
- FOR PIPING IN THE STA, INSTALL 1.5"Ø PIPING, SCHEDULE 40 PVC, SET ON A LEVEL GRADE USING A BUILDER'S OR ENGINEER'S LEVEL INSTRUMENT WITH PERFORATIONS AS SHOWN IN THE STA PLAN VIEW.
- NO PART OF THE SYSTEM CAN BE BACKFILLED PRIOR TO INSPECTION. IF ANY PART OF THE SYSTEM IS BACKFILLED WITHOUT APPROVAL OR CONSENT OF THE ENGINEER AND THE COUNTY, AS REQUIRED, REMOVAL OF BACKFILL MAY BE REQUIRED FOR EXAMINATION. IT IS THE CONTRACTORS RESPONSIBILITY TO BUILD THE SYSTEM IN COMPLIANCE WITH THE ENGINEERS SPECIFICATIONS, COUNTY REGULATIONS, AND STATE REGULATIONS, AS REQUIRED.
- FOR BACKFILL, ALL PIPE SHALL BE INSTALLED AND BEDDED PROPERLY. THIS REQUIRES MOISTURE TO BE APPLIED TO THE BACKFILL TO OBTAIN PROPER COMPACTION. REFER TO SHEET D0.



**2 STA CROSS SECTION A-A**

NO SCALE CALL ENGINEER FOR INSPECTION: 1). AFTER HOLE IS EXCAVATED (BEFORE SAND INSTALLATION). 2). AFTER GRAVEL BED IS INSTALLED BUT PRIOR TO BACKFILL. 3). AFTER FINAL BACKFILL.



**1 STA PLAN VIEW**

NO SCALE \* ORIFICE SHIELDS BY SIM/TECH (STF-10&D) OR ORENCO (OS150). FOLLOW MFG'S GUIDELINES AND INSTALL AS REQ'D

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STA DETAILS AND NOTES

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39 LODGESTONE TRAIL  
BLUE RIVER, CO 80424

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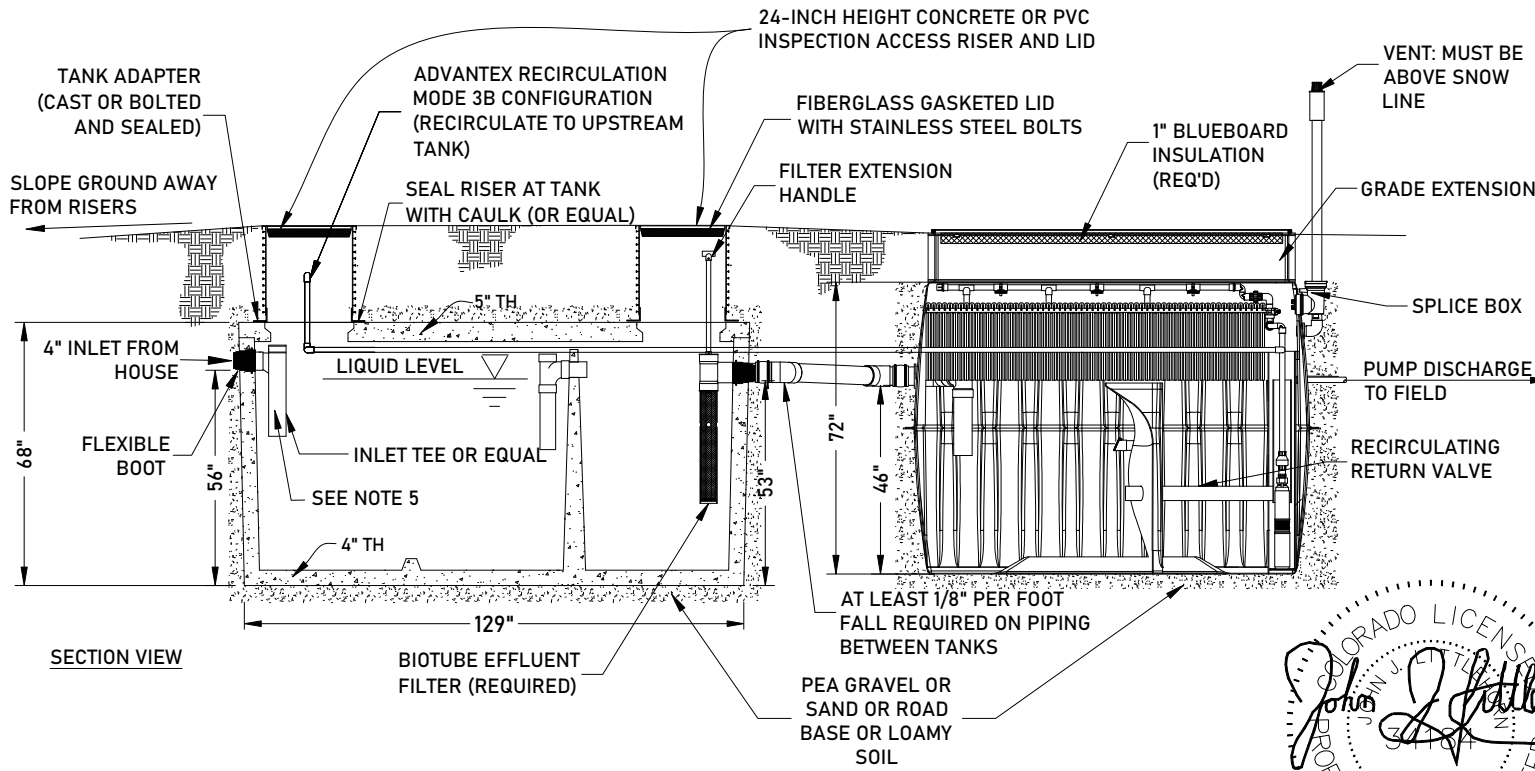
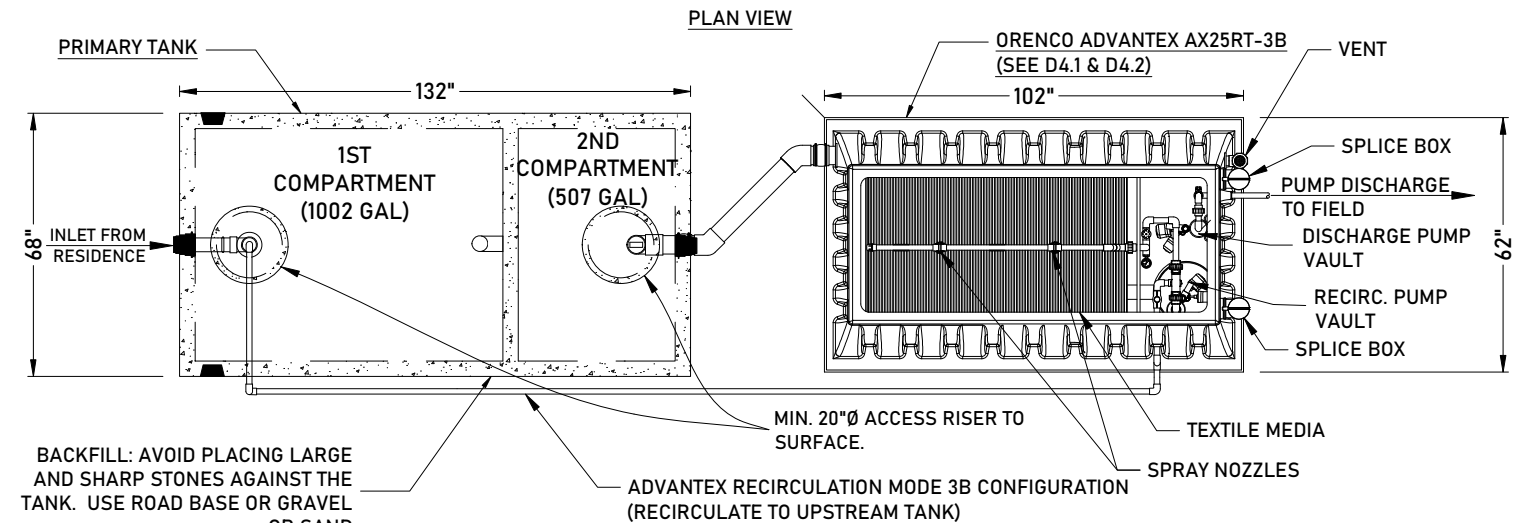
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PROJECT NO.	2023-100072
CLIENT	HELEN LEMAY
DATE	07.31.2023
REVISION:	
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**SEPTIC TANK:**

1. THE PRIMARY SEPTIC TANK SHALL HAVE A MINIMUM HOLDING CAPACITY OF 1500 GALLONS IN THE FIRST TWO COMPARTMENTS (1509 GALLON TANK CAPACITY TOTAL). THIS TANK WILL SERVE AS PRIMARY TREATMENT AND ALL EFFLUENT DISCHARGED WILL ENTER THE ORENCO ADVANTEX AX25RT-(MODE 3B) ADVANCED TREATMENT UNIT.
2. ORENCO ADVANTEX AX25RT-(MODE 3B): EFFLUENT ENTERING THE ADVANCED TREATMENT UNIT (ORENCO ADVANTEX AX25RT) IS RECIRCULATED OVER A SERIES OF TEXTILE MEDIA UTILIZING A SELF-CONTAINED RECIRCULATION PUMP. NATURAL BACTERIA IN THE UNIT BECOME "FIXED" OR ATTACHED TO THE STATIONARY TEXTILE MEDIA. THIS IS WHERE THE ABUNDANT, DIVERSE, SELF-REGULATING POPULATION OF MICROBES CONSISTENTLY METABOLIZE THE RECIRCULATED WASTE. DUE TO THE NATURAL AEROBIC PROCESSES OCCURRING, A PASSIVE VENT IS ATTACHED TO THE UNIT. THE PASSIVE VENT MUST EXTEND ABOVE SNOWLINE. AN ADDITIONAL DISCHARGE PUMP IS USED TO PUMP THE TREATED WATER TO THE SOIL TREATMENT AREA. FOR THE DISCHARGE PUMP, USE AN ORENCO PUMP MODEL PF5005 HIGH HEAD EFFLUENT PUMP, 2-INCH DISCHARGE, 1/2 HP, 115V OR 230V [(719) 395-6764]. FOR THIS SYSTEM, THE PUMP IS DESIGNED FOR A FLOW RATE OF 61.8 GPM WITH A TOTAL DYNAMIC HEAD OF 32.2 FEET.
3. THE ORENCO EFFLUENT DISCHARGE PUMP SHALL BE EQUIPPED WITH A COLD WEATHER DISCHARGE ASSEMBLY WITHOUT CHECK VALVE. THE COLD WEATHER ASSEMBLY WILL ENABLE THE LINE TO EMPTY AT END OF PUMPING CYCLE. INSTALL CONTROL PANEL AND FLOATS FOR TIMED DOSING PER MANUFACTURER REQUIREMENTS. A REDUNDANT UL LISTED FLOAT SHOULD BE INSTALLED TO ENSURE THE PUMP DOES NOT RUN DRY. THE FLOATS SHOULD BE SET FOR A 16-INCH DRAW DOWN TO DOSE THE FIELD WITH 150 GALLONS (PIPE DRAINS BACK TO TANK). INSTALL PUMP CONTROL PANEL WITH BOTH AUDIBLE AND VISUAL ALARM SIGNALS WITHIN THE INTERIOR OF THE HOME OR GARAGE IN A DRY AND SECURE PLACE. AN ELAPSED TIME METER AND COUNTER IS REQUIRED. THE INSTALLER SHALL PERFORM ALL ELECTRICAL WIRING IN ORDER TO AVOID THE HAZARDOUS AREA (REF. TO COUNTY REGULATIONS). NON-METALLIC PVC OR THREADED RIGID METAL CONDUIT WILL BE REQUIRED BETWEEN THE JUNCTION BOX WITHIN THE TANK AND THE ELECTRICAL EQUIPMENT OUTSIDE OF THE TANK. CONDUIT SEALS SHALL BE USED WHEN ENTERING OR LEAVING THE ELECTRICAL CONTROL BOX. BE SURE THE HIGH WATER ALARM AND PUMP ARE CONNECTED TO SEPARATE CONTROL BREAKERS
4. THE DISCONNECT/CONTROL EQUIPMENT ENCLOSURE MUST BE WEATHERPROOF.
5. THE EFFLUENT PUMPING SYSTEM AND CONTROL PANEL SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND ALL STATE AND LOCAL REGULATIONS. THE PUMP SHALL BE PRIMED PROPERLY PRIOR TO START-UP.
6. THE SEPTIC TANK SHALL BE A WATERTIGHT PRECAST CONCRETE (EQUIPPED WITH LIFTING RINGS) VAULT MEETING ASTM C1227-13. THE TANK SHALL HAVE TWO COMPARTMENTS SEPARATED BY INTEGRAL OR SEPARATELY CAST WALLS, KEYED INTO THE SIDES OF THE TANK. THE TANK SHALL CONFORM TO SUMMIT COUNTY REGULATIONS. IN PART THESE REGULATIONS STATE THE FOLLOWING: A) THE FIRST COMPARTMENT SHALL HAVE THE SPECIFIED MINIMUM LIQUID CAPACITY. B) THE LIQUID DEPTH IN THE TANK SHALL BE NO LESS THAN 30". C) FREE VENTILATION BETWEEN COMPARTMENTS SHALL BE PROVIDED IMMEDIATELY BELOW THE VAULT CEILING. D) AN INLET TEE OR Baffle SHALL BE PROVIDED AND SHALL EXTEND ABOVE THE SURFACE OF THE LIQUID AT LEAST 5" AND SHALL EXTEND A MINIMUM OF 8" BELOW THE LIQUID SURFACE. E) Baffle SYSTEMS SHALL BE PROVIDED TO DISSIPATE ENERGY AND PREVENT SHORT CIRCUITING FLOW THROUGH THE COMPARTMENTS (35 TO 40% OF THE LIQUID DEPTH). F) THE INLET INVERT SHALL BE AT LEAST 2" ABOVE THE OUTLET INVERT. J) THE Baffles SHALL EXTENT TO 14" BELOW THE OUTLET INVERT. I) THE SEPTIC TANK AND EQUIPMENT AND MATERIALS WITHIN THE TANK SHALL BE MANUFACTURED FROM DURABLE AND CHEMICALLY RESISTANT MATERIALS WHICH ARE UNAFFECTED BY GASES AND FLUIDS ASSOCIATED WITH DOMESTIC SEWAGE.
7. ACCESS RISERS: ACCESS OPENINGS WITH A MINIMUM DIMENSION OF 20 INCHES SHALL BE PROVIDED OVER EACH COMPARTMENT WITH THE EXCEPTION OF THE DOSING COMPARTMENT, WHERE A 24"Ø RISER IS REQUIRED. CONCRETE, PVC OR FIBERGLASS RISERS WITH SECURE CLOSING MECHANISMS OR OF SUFFICIENT WEIGHT SHALL BE PROVIDED OVER EACH ACCESS OPENING AS NECESSARY TO PROVIDE ACCESS FROM FINISH GRADE. RISERS SHALL BE ATTACHED TO THE TANKS SUCH THAT A WATERTIGHT SEAL IS PROVIDED; MECHANICAL FASTENERS ARE RECOMMENDED TO AUGMENT THE SAFETY (& SEAL) OF POSITIVE CLOSURE OF THE LID. TO MITIGATE FREEZING, AT LEAST 18-INCH TALL RISERS SHALL BE USED. TANK HEATERS ARE A MUST IN PART-TIME SYSTEMS & WHEN THE TANK IS MORE THAN 50 FEET FROM THE HOUSE. USE TRAFFIC RATED LIDS WHERE REQUIRED.
8. TANK SUB-GRADE/WATERPROOFING: THE TANK SHALL BE INSTALLED ON A LEVEL SUBGRADE OF UNDISTURBED SOIL OR WELL COMPACTED BACKFILL CAPABLE OF SUPPORTING A 2000 PSF LOAD (TESTING IS HIGHLY RECOMMENDED IF YOU'RE NOT SURE). THE TANK SHALL BE BACKFILLED WITH SUITABLE GRANULAR SOIL (FREE OF CLAY, ORGANIC MATTER, COBBLES, SNOW, OR ICE), SAND, PEA GRAVEL, OR SQUEEGEE. IN AREAS OF HIGH GROUND WATER, THE TANK SHOULD BE PROTECTED BY APPLYING A HEAVY CEMENT-BASE WATERPROOF COATING IN COMPLIANCE WITH TANK MANUFACTURER.
9. DRAINAGE: ROOF DRAINS, FOUNDATION DRAINS, AREA DRAINS, AND SPRINKLER HEADS MUST BE DIRECTED AWAY FROM THE SEPTIC TANK. MAKE SURE ALL AREAS AROUND THE TANK ARE GRADED TO MITIGATE GROUND WATER AWAY FROM THE TANK LIDS TO PREVENT WATER INFILTRATION INTO THE TANK.
10. PIPING: FOR THE INFLOW LINE, SET THE TANK AT A DEPTH THAT PERMITS GRAVITY INFLOW AS SPECIFIED. ALL PIPING SHALL BE ADEQUATELY SUPPORTED ON COMPACTED SELECT BACKFILL TO PREVENT FAILURE FROM DIFFERENTIAL SETTLEMENT. BACKFILLING AROUND THE SEPTIC TANK SHALL BE ACCOMPLISHED IN A MANNER THAT PREVENTS SETTLEMENT AND AVOIDS UNDUE STRAIN ON THE PIPES ENTERING AND EXITING THE SEPTIC TANK.
11. GENERAL: NO STRUCTURE SHALL BE CONSTRUCTED OVER ANY PORTION OF THE SEPTIC TANK. FOR INSTALLATION IN TRAFFIC AREAS, THE TANK SHALL BE DESIGNED TO WITHSTAND AN AASHTO H20-44 WHEEL LOAD + THE EQUIVALENT SOIL WEIGHT ON THE TANK + A 30 PSF FLUID UNIT SIDE WALL PRESSURE. ALL TANKS MUST BE WATERTIGHT.



**MANUFACTURER NOTES\*:**

- ORENCO ADVANTEX AX25RT INSTALLATION TO BE PERFORMED BY AN ADVANTEX TRAINED INSTALLER ONLY.
- ORENCO ADVANTEX AX25RT START-UP AND SERVICE TO BE PERFORMED BY AN ADVANTEX TRAINED SERVICE PROVIDER ONLY.
- TANK TO BE SET ON 5" MIN. SAND BED OR PEA GRAVEL
- TANK TO BE BACKFILLED UNIFORMLY ON ALL SIDES IN LIFTS LESS THAN 24" AND MECHANICALLY COMPACTED
- EXCAVATION SHOULD BE DEWATERED
- FILL TANK WITH CLEAN WATER PRIOR TO BEING PUT IN SERVICE WHEN WATER TABLE IS WITHIN 24" OF TANK TOP.

\*SEE INSTALLATION GUIDE ON WEBSITE

PRIMARY TANK	TOTAL CAPACITY		APPROXIMATE WEIGHTS		
	1509 GALLONS		TANK	TOTAL	LID
			11,180 LBS	14,780 LBS	3,600 LBS

**1 SEPTIC TANK DETAILS**  
NO SCALE FOR THIS PROJECT, A VALLEY PRECAST TANK IS SPECIFIED (719-395-6764). IF A DIFFERENT TANK MFG IS CHOSEN BY THE CONTRACTOR, SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.



GENERAL OWTS DESIGN ONLY. NO TANK STRUCTURALS.

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**SEPTIC TANK DETAILS & SPECIFICATIONS**  
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39 LODGESTONE TRAIL  
BLUE RIVER, CO 80424

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PROFESSIONAL ENGINEER  
07.31.2023



PROJECT NO. 2023-100072  
CLIENT HELEN LEMAY  
DATE 07.31.2023  
REVISION:  
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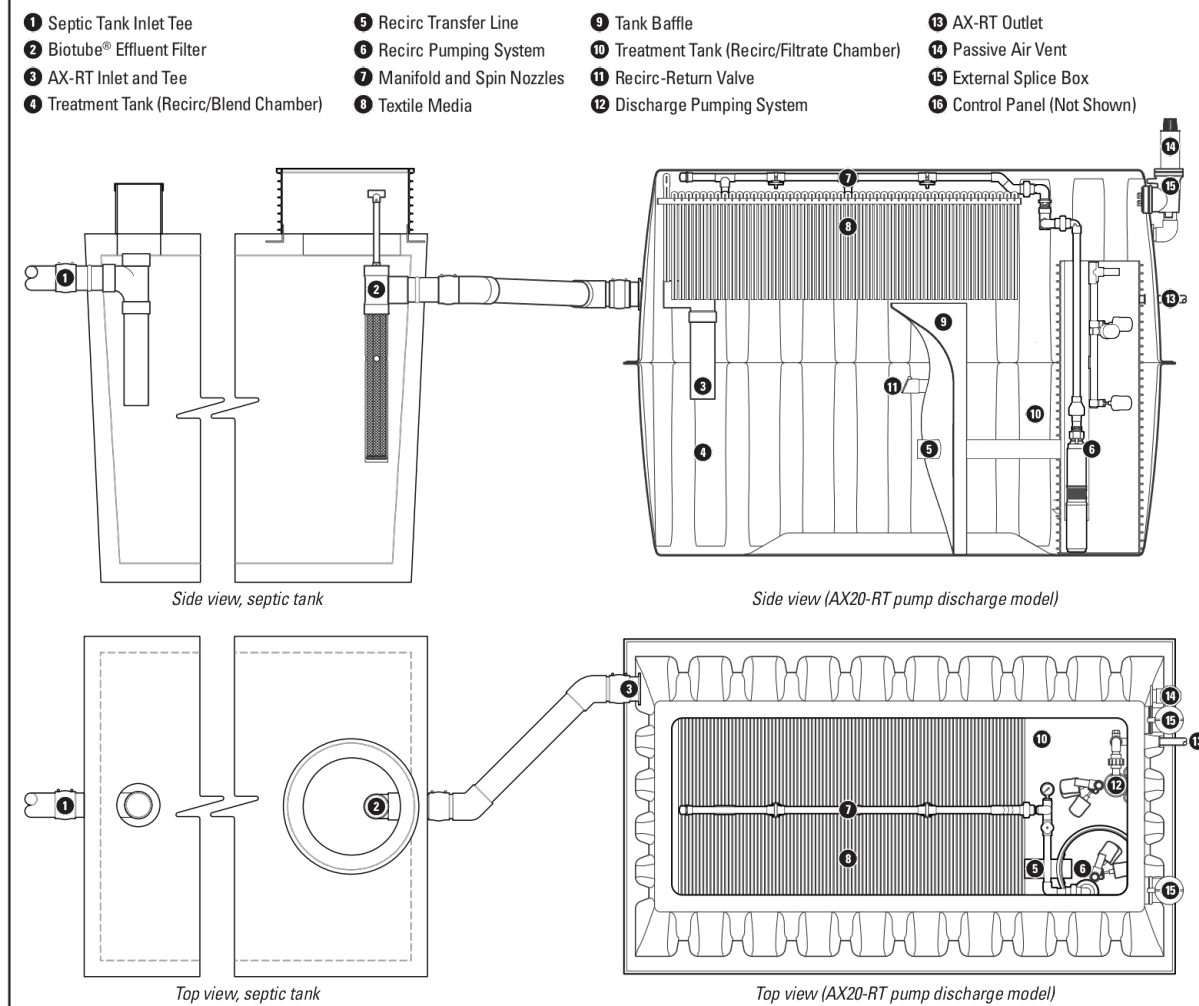
## Introduction: AdvanTex® AX-RT Treatment Unit Operation

This supplement contains information to help you successfully operate and maintain an AdvanTex® AX-RT Treatment System. The AX-RT operates similarly to the AdvanTex AX20 Treatment System, but there are some differences to be aware of when performing O&M activities. A big difference is that the AX-RT consists of a single, self-contained module for recirculation, treatment, and dosing, instead of separate units.

Another difference is that the AX-RT has no Recirculating Splitter Valve (RSV). Effluent percolates down through the textile media and is split — by means of a tank baffle — between the recirc/blend chamber and the recirc/filtrate chambers of the AX-RT recirculating treatment tank.

Raw sewage enters the septic tank through its inlet tee. In the septic tank, the raw sewage separates into three distinct zones — a scum layer, a sludge layer, and a clear zone. Effluent from the clear layer passes through a Biotube® effluent filter and is discharged by gravity to the recirc/blend chamber of the AX-RT unit. The effluent then flows through the recirc transfer line to the recirc pumping system. The recirc pumping system pumps effluent from the recirc/blend chamber through the manifold to the spray nozzles in the top of the unit. Effluent percolates down through the textile media and is divided — by means of a tank baffle — between the recirc/blend chamber and the recirc/filtrate chamber inside of the unit.

**Figure 1. AdvanTex® AX-RT Functional Areas and Components (AX20-RT Shown):**



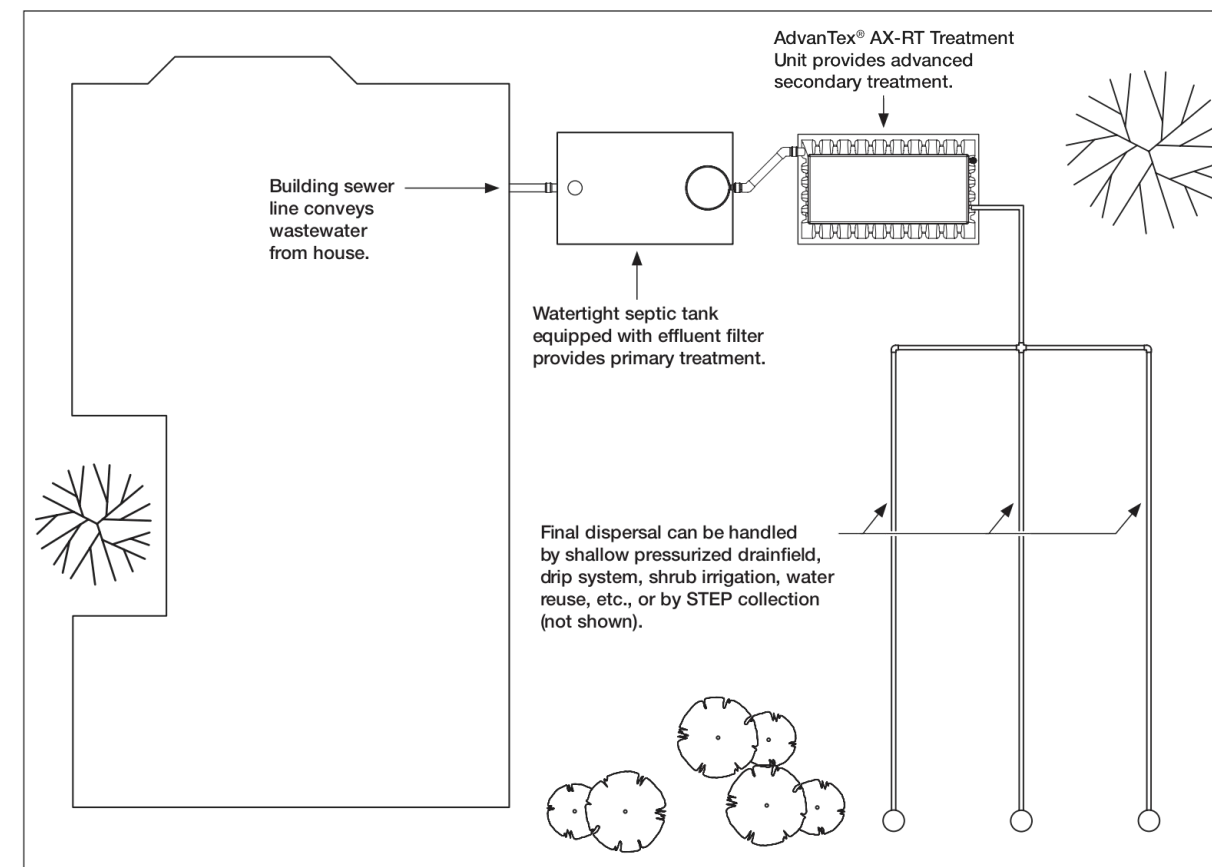
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## Introduction to AdvanTex AX-RT, continued

The recirc pump's operation is controlled by a timer in the control panel. It allows the pump to dose the textile media for short periods (usually 0.8 to 1.0 minutes), typically 72 times a day. These frequent "micro-doses," which optimize the treatment process, occur 24 hours a day, to maintain the proper biological environment.

Treated effluent can be discharged to the drainfield by means of a discharge pump system or by gravity discharge. The "High Level Alarm" and "ON" floats for the discharge pump are set at the factory and are non-adjustable. Dose volume for the discharge pump system is determined by adjustments to the "OFF" float. AX-RT units with gravity discharge simply discharge when the level of treated effluent in the recirc/filtrate chamber is at the level of the discharge outlet. For units equipped with UV disinfection, the effluent passes through the UV treatment unit before being pumped or flowing by gravity to final dispersal.

## Typical Site Plan for an AdvanTex AX-RT Treatment Unit



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ORENCO ADVANTEX AX-RT MFG. DRAWING 1 OF 2

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## AdvanTex O&M Manual: Changes Specific to the AX-RT

The following shows AX-RT-specific information not found in Parts 1 and 2 of the *AdvanTex® O&M Manual* that are relevant to operating and maintaining the AdvanTex AX-RT Treatment Unit. Use the general information found in the *O&M Manual* along with this information to start up and properly service AX-RT systems.

### Start-Up Checklist Changes Primary Treatment

**Note:** All pumping equipment is contained in the AX-RT unit. Substitute the checklist item below for the checklist items in the "Process Tank Pumping Equipment" and "Process Tank Pumping System" sections.

#### Septic Tank

- Biotube® filter installed correctly on the septic tank outlet.

**Note:** There is no recirculating splitter valve (RSV) or separate discharge basin in an AX-RT system. Floats in the recirculation pump system are set at the factory for correct performance. Do not adjust the floats in the recirculation pump system. Substitute the checklist items below for the checklist items in the "Secondary Treatment" section.

#### Secondary Treatment AX-RT Unit

- AX-RT unit installed level.
- All piping properly covered and compacted.

#### Ventilation System

- Passive air vent on AX-RT unit properly installed.

#### Recirculation Pump System

- Floats operate properly.
- Pump plumbing connected correctly to manifold.

#### Recirculation Pump System Operation

- Pump operates in "Manual."
- Pump operates in "Automatic."
- Pump run amps: \_\_\_\_\_
- Pump rest volts: \_\_\_\_\_ run volts: \_\_\_\_\_

#### AX-RT Filter Operation

- Complete, square spray square pattern with full coverage of sheets

#### AX-RT Discharge Unit (pump discharge only)

- Floats operate properly.
- Pump discharge plumbing connected correctly.
- "Off" float adjusted for correct discharge dose to dispersal.

### Setting Timers for New Systems

Initial timer settings for an AX-RT should be established based upon expected average daily flows and a recirculation ratio of 4:1 (filter recirculation ratio). Table 1 provides recommended timer settings. If flows vary significantly from expected flows, timer settings should be adjusted accordingly. Contact Orenco for more information.

**Table 1. Recommended Timer Settings for New Systems**

Models AX20-RT, AX20-RTUV	Number of Residents	Time On Setting Min (Sec)	Avg Daily Flow, gpd (L/day)	Time Off Setting Min
	2	0.8 (48)	100 (379)	36.1
	3	0.8 (48)	150 (568)	23.8
	4	0.8 (48)	200 (757)	17.6
	5	0.8 (48)	250 (946)	13.9
	6	0.8 (48)	300 (1136)	11.5
	7	0.8 (48)	350 (1325)	9.7
	8	0.8 (48)	400 (1514)	8.4

Model AX25-RT	Number of Residents	Time On Setting Min (Sec)	Avg Daily Flow, gpd (L/day)	Time Off Setting Min
	2	0.7 (42)	100 (379)	47.7
	3	0.7 (42)	150 (568)	31.6
	4	0.7 (42)	200 (757)	23.5
	5	0.7 (42)	250 (946)	18.7
	6	0.7 (42)	300 (1136)	15.4
	7	0.7 (42)	350 (1325)	13.1
	8	0.7 (42)	400 (1514)	11.4
	9	0.7 (42)	450 (1703)	10.1
	10	0.7 (42)	500 (1893)	9.0
	11	0.7 (42)	550 (2082)	8.1
	12	0.7 (42)	600 (2271)	7.4

• Assumes water usage of 50 gal. (190 L) per person per day and a return recirculation ratio of 3:1. (Filter recirculation ratio of 4:1.)

• Override OFF cycle time is set at one-half of the OFF cycle time. Override ON cycle time is set the same as the ON cycle time.

### Setting Discharge Dose Volume

The AX-RT is pre-set at the factory for a discharge dose volume of 43 gal/dose (162 L/dose). If necessary, use the discharge pump "Off" float to make adjustments to the discharge dose volume. Each 1-in. (25 mm) increase or decrease in "Off" float height is equal to approximately 8.7 gal. (33 L) change in dose volume.

Do not adjust the settings of the "High-Level Alarm" and "On" floats.

**Table 2. Dose Volume Information**

Pump gal./min (L/sec)	10 (0.6)	20 (1.3)	30 (1.9)	50 (3.2)
Factory float setting*, in. (mm)	30 (762)	30 (762)	30 (762)	30 (762)
Lowest "Off" setting, in. (mm)	16 (406)	18 (457)	20 (508)	24 (610)
Max dose volume, gal. (L)	156 (591)	139 (526)	123 (466)	90 (341)

\*Settings are measured from the bottom of the discharge side of the AX-RT unit.

### Perform Field Sampling

When you arrive at the site, remove the lid from the AX-RT and take your sample from the recirc/filtrate side of the AX-RT unit before doing anything else, so that the sample won't be contaminated by material that you stir up while working.

### Notes

When you collect effluent samples, be careful not to touch the textile sheets, unit walls, or other components. Disturbing the sheets, walls, or other components could contaminate the samples. Also, be sure to thoroughly clean and dry your sampling device between uses to avoid cross-contamination.

### Measure Sludge and Scum

Measure sludge and scum in the septic tank AND on the recirc/blend side of the AX-RT unit. Follow the instructions for pumpouts found in the *AdvanTex O&M Manual* for the process tank.

**NOTE:** A light buildup of solids is expected to form in the AX-RT unit over time. After the second year that the system is in use, we recommend measuring solids accumulation in the AX-RT whenever you perform regularly scheduled maintenance.

If more than trace amounts of scum or solids are found in the recirc/blend side of the AX-RT unit, check the recirc/filtrate side of the unit for solids and scum, schedule a pumpout, and begin troubleshooting the system. The Advanced Service Tips and Troubleshooting Guide can help you determine the cause. You may need to change timer settings or discuss household habits with the system users.

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ORENCO ADVANTEX AX-RT MFG. DRAWING 2 OF 2

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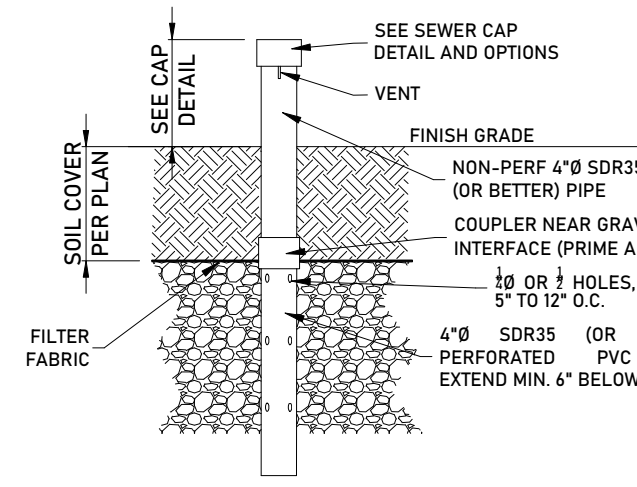
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HELEN  
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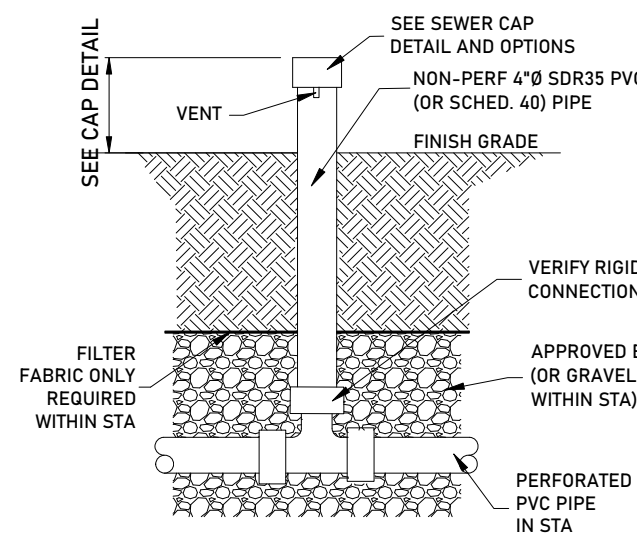
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△ N/A  
△ N/A

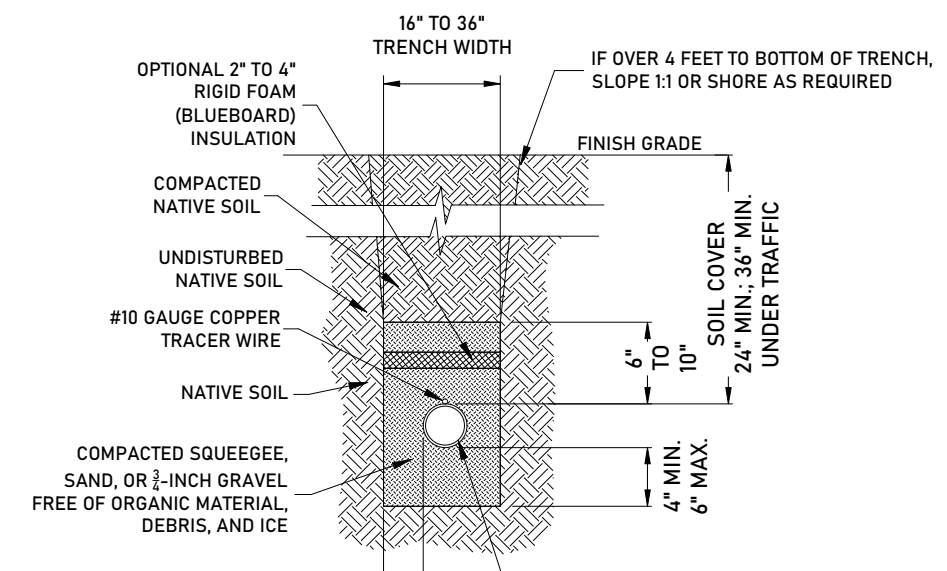
D4.2



**4 4" STA OBSERVATION/VENT DETAIL**  
NO SCALE



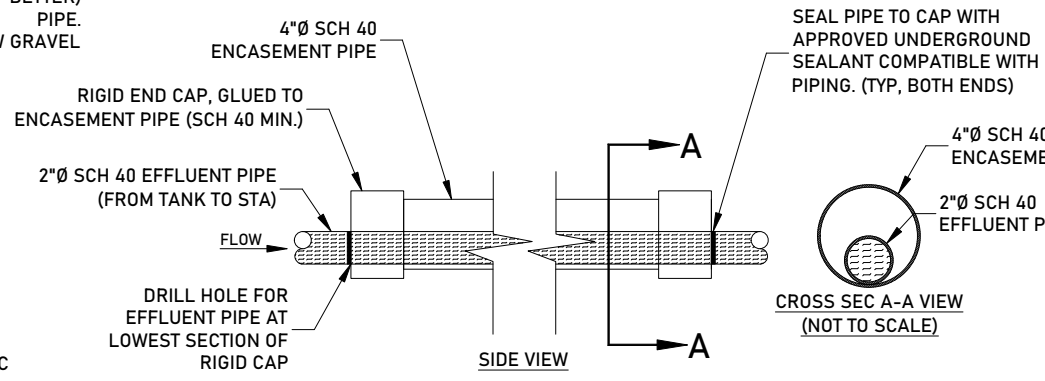
**5 4" OBSERVATION/VENT PIPE DETAIL**  
NO SCALE



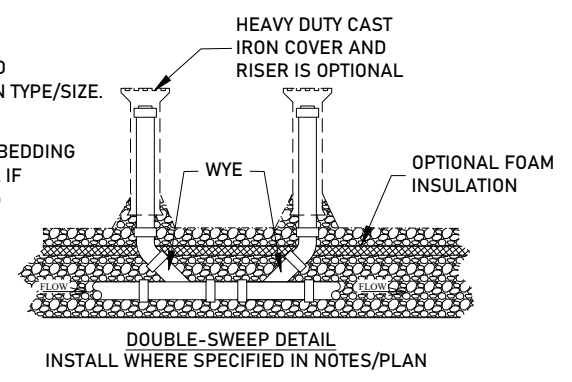
**6 TRENCH DETAIL**  
NO SCALE

**LEGEND:**

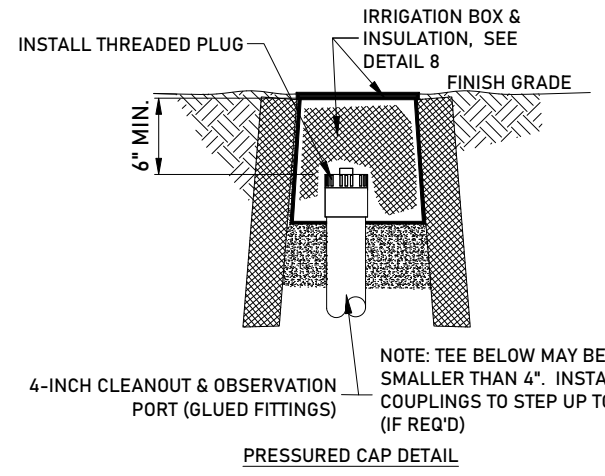
- CLEAN GRAVEL
- APPROVED BEDDING
- COMPACTED TOPSOIL
- INSULATION



**3 EFFLUENT PIPING ENCASEMENT DETAIL**  
NO SCALE

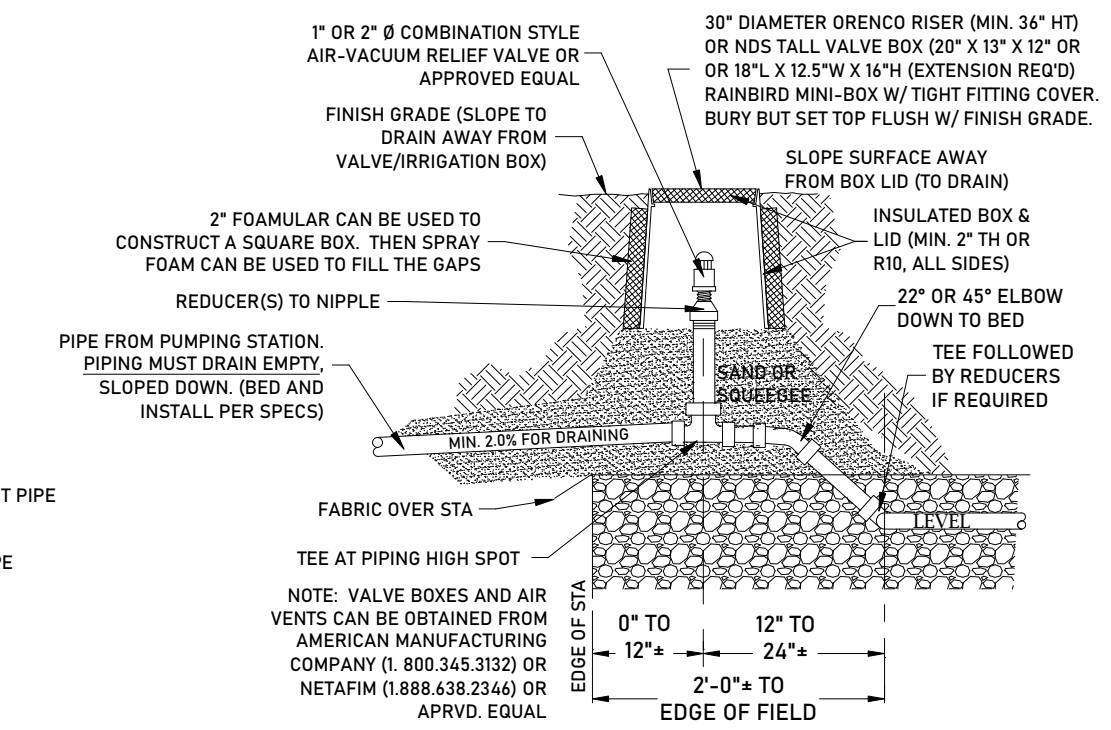


**DOUBLE-SWEEP DETAIL**  
INSTALL WHERE SPECIFIED IN NOTES/PLAN

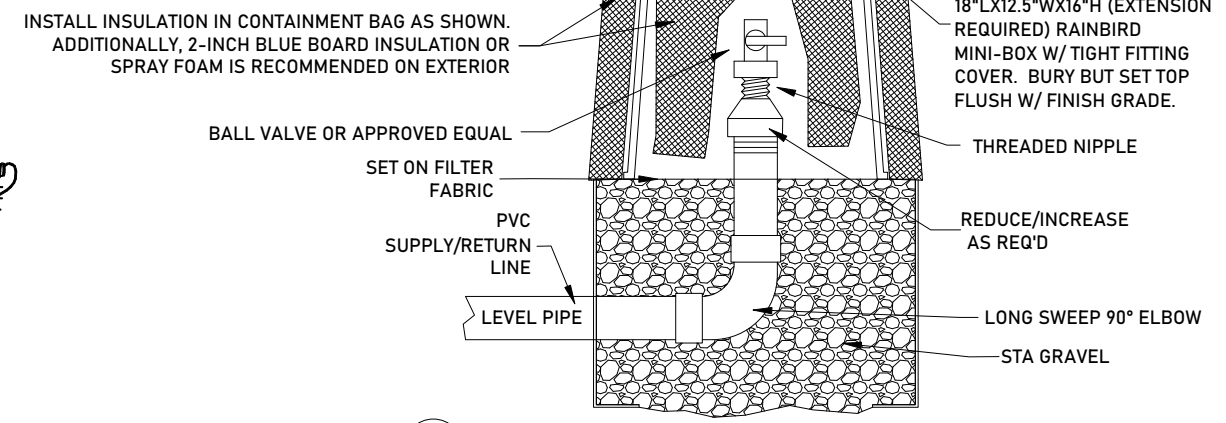


**9 SEWER CAP DETAIL & OPTIONS**  
NO SCALE

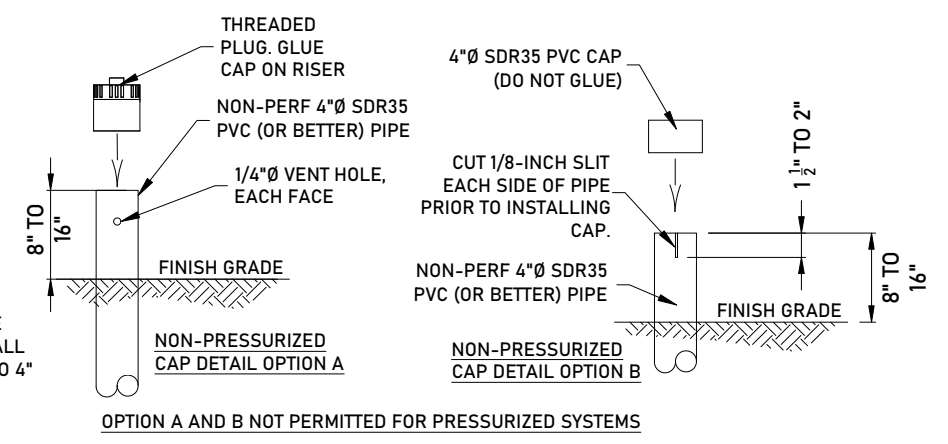
WHEN WASTEWATER IS NON-PRESSURIZED, USE OPTION A OR B OR C. WHEN PORT IS WITHIN PRESSURIZED PIPE SYSTEM, USE PRESSURIZED CAP DETAIL



**7 AIR-VAC FIELD INLET DETAIL**  
NO SCALE



**8 FLUSHING VALVE ASSEMBLY IN BED**  
NO SCALE



OPTION A AND B NOT PERMITTED FOR PRESSURIZED SYSTEMS

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OWTS DETAIL DRAWINGS  
CROWN SUBDIVISION, LOT 532  
39 LODGESTONE TRAIL  
BLUE RIVER, CO 80424

**LITTLEHORN ENGINEERING, LLC**  
351 US HWY 285, #201  
FAIRPLAY, CO 80440  
FAIRPLAY OFFICE 719.836.7120  
SILVER CLIFF OFFICE 719.783.3757  
"PEACE OF MIND THROUGH HOLISTIC DESIGN"



PROJECT NO. 2023-100072

CLIENT HELEN LEMAY

DATE 07.31.2023

REVISION:  
 △ N/A  
 △ N/A  
 △ N/A

**IMPORTANT**  
**SAVE**  
**TO BE GIVEN TO PROPERTY TENANTS**  
**(POST IN MECH. ROOM)**

1. AN OPERATION AND MAINTENANCE CONTRACT IS REQUIRED FOR ALL ADVANCED TREATMENT SYSTEMS. THIS ENTAILS HAVING A QUALIFIED SERVICE PROVIDER (NAWT O&M 2 CERTIFIED OR EQUAL) MAINTAIN AND INSPECT THE SYSTEM ROUTINELY. IN GENERAL, MAINTENANCE SHALL BE PERFORMED EVERY SIX (6) MONTHS FOR HIGHER LEVEL TREATMENT SYSTEMS. THE COUNTY MAY AMEND OPERATION PERMITS TO REDUCE OR INCREASE THE MAINTENANCE FREQUENCY BASED ON THE INFORMATION CONTAINED IN THE REQUIRED INSPECTION REPORTS.
2. SYSTEMS WHICH ARE ABUSED BY IMPROPER USE AND NOT PROPERLY MAINTAINED WILL FAIL AND CAN FREEZE DURING THE COLD SEASON.
3. IT IS THE PROPERTY OWNER'S RESPONSIBILITY TO USE THE SYSTEM CORRECTLY, OBSERVE THE OPERATION OF THE SYSTEM, AND TO PERFORM REGULAR MINOR MAINTENANCE TO ALLOW FOR PROPER, LONG-TERM FUNCTIONING OF THE DISPOSAL SYSTEM.
4. HAVE YOUR SYSTEM INSPECTED BY A QUALIFIED INSPECTOR OR CONTRACTOR AT LEAST ONCE EVERY TWO YEARS.
5. AN OPERATION AND MAINTENANCE CONTRACT WITH AN ON-SITE WASTEWATER COMPANY IS REQUIRED TO ENSURE PROPER OPERATION AND LONGEVITY.
6. DO NOT DRIVE OR PARK OVER YOUR SEPTIC TANK OR ANY PART OF YOUR ABSORPTION FIELD. THIS CAN COMPACT THE SOIL AND CRUSH YOUR SYSTEM RENDERING IT INOPERABLE. TRAFFIC BARRIERS SHOULD BE INSTALLED AROUND THE PERIMETER OF THE ABSORPTION FIELD AND SEPTIC TANK.
7. PRACTICE WATER CONSERVATION.
8. REPAIR DRIPPING FAUCETS AND LEAKING TOILETS AND USE WATER-SAVING FEATURES IN SHOWER HEADS, FAUCETS, AND TOILETS. LARGE GATHERINGS WILL OVERLOAD THE SYSTEM SINCE SEVERAL PEOPLE MAY BE USING THE SYSTEM IN A SHORT PERIOD OF TIME. FAILURE TO PROPERLY CONSERVE WATER MAY DAMAGE YOUR SEPTIC SYSTEM OR CAUSE COMPLETE FAILURE.
9. TOILET SEALS SHOULD BE REPLACED AS NEEDED OR EVERY 3 YEARS.
10. SEPTIC TANKS CONTAIN HARMFUL, HAZARDOUS GASES. ONLY QUALIFIED PERSONNEL SHOULD ENTER THE SEPTIC TANK IF REQUIRED WITH AN APPROPRIATE AIR SUPPLY.
11. STA OR LEACH FIELD AREAS MUST BE KEPT FREE OF ASPEN TREES, SHRUBS, OR ANY PLANT SPECIES HAVING A DEEP ROOT SYSTEM. DISTURBED AREAS SHOULD BE RE-SEEDED WITH NATIVE GRASSES HAVING A SHALLOW ROOT SYSTEM. MONITOR SOIL EROSION AROUND THE OSWTS.
12. FREEZING CAN OCCUR DURING PERIODS OF STARTUP, WHEN THE SYSTEM IS USED ON A PART TIME BASIS, AND DURING THE WINTER. IN THE DESIGN DRAWINGS WE HAVE SPECIFIED A MINIMAL SOIL COVER. SIX INCHES TO 12 INCHES OF ADDITIONAL SOIL COVER OVER THE ENTIRE SYSTEM CAN HELP TO MITIGATE FREEZING HOWEVER THE BEST OPTION TO MITIGATE FREEZING IS TO INSTALL A SEPTIC HEATER (MODEL A100 OR T100) [719.395.6764] AT THE TANK AND RISER AT THE STA. IN LIEU OF THE HEATER A 115 VOLT SUBMERSIBLE FLOATING TANK HEATER CAN BE USED (BUT IS NOT AS EFFECTIVE AND MAY BE ILLEGAL IF NOT PROPERLY INSTALLED) IN EACH COMPARTMENT OF THE SEPTIC TANK(S) BUT THESE TANK HEATERS WILL NOT MITIGATE LEACH FIELD FREEZING.
13. IF YOU PLAN TO INSTALL A JACUZZI, HOT TUB, THERAPEUTIC OR RECREATIONAL BATHING FACILITY, THIS OFFICE SHALL BE NOTIFIED TO INCLUDE THIS PROVISION IN THE DESIGN OF THE SYSTEM. DO NOT CONNECT THESE ITEMS TO THE SYSTEM WITHOUT CONSULTING WITH US TO PREVENT PERMANENT DAMAGE OR COMPLETE FAILURE.
14. BE AWARE OF YOUR ENVIRONMENT. REPORT ANY SURFACE WATER SEEPING OUT OF THE SOIL THAT SMELLS FUNNY.
15. USE PHOSPHATE-FREE OR LOW PHOSPHATE AUTOMATIC DISH WASHING DETERGENTS.
16. NOTIFY THE ENGINEER OF ANY UNUSUAL CONDITIONS AS SOON AS THEY ARE DISCOVERED.
17. CONTACT THE ENGINEER OR THE COUNTY HEALTH DEPARTMENT FOR ANY HEALTH RELATED QUESTIONS AND FOR ANY QUESTIONS ABOUT THE INSTALLATION OR MAINTENANCE OF THE SEPTIC SYSTEM.



ADVANTEX® **HOMEOWNER'S** MANUAL

**AXN**  
**SUPPLEMENT**

Your home includes a reliable, carefully engineered AdvanTex®-AXN Treatment System for the collection and treatment of residential wastewater. This AdvanTex-AXN Treatment System has been evaluated by the National Sanitation Foundation (NSF) and has been certified by NSF to meet the requirements of NSF-ANSI Standard 40 for Class I Systems.

Your AdvanTex-AXN Treatment System can effectively treat household-strength waste. And it can recycle precious water resources because the treated effluent can be returned harmlessly to the soil, where it receives final polishing and filtration for groundwater recharge.

Your AdvanTex-AXN Treatment System comes with an initial, two-year service contract, which includes regular testing and servicing after system start-up by an authorized AdvanTex Service Provider. All testing and servicing activities are to be performed three to six months after start-up; and an annual field-service inspection, including sampling, is to be scheduled in late spring or in early summer, with a minimum of four inspections during the first two years and annual inspections thereafter. For a complete description of those services, consult your service contract. An extended service contract is also available. Consult your AdvanTex-AXN Treatment System Dealer or Service Provider for a complete description of those services.

Many people are responsible for the care and maintenance of your AdvanTex-AXN Treatment System:

**Homeowner's Responsibilities** – Homeowners and other system users are responsible for preventive maintenance. You need to know what can go into the wastewater treatment system and what cannot. Read and practice the "Do's and Don'ts" in your Homeowner's Manual and instruct all system users to do the same.

Also, you need to know what to do in the event a problem arises or service is required:

- First, call your authorized Service Provider. Your Service Provider's name and phone number are on the back page of your Homeowner's Manual.
- If you cannot reach your Service Provider, call your authorized AdvanTex Dealer. Your AdvanTex Dealer's name and phone number are on the back page of your Homeowner's Manual.
- If you cannot reach either your Service Provider or your AdvanTex Dealer, call the manufacturer: Orenco Systems®, Inc., at **800-348-9843**.

(You'll also find the manufacturer's name and address on the System Data Plate affixed to the inside of the filter pod.)

Finally, ask for and retain copies of all maintenance and service calls on your system.

**Service Provider's Responsibilities** – Authorized AdvanTex Service Providers are responsible for regular testing and servicing of your system, as spelled out in your initial service contract. Service Providers are also responsible for alarm response, in the event of a problem.

In addition, Service Providers should be present at system installation (so that they are familiar with your individual system, especially the location of service lines, conduits, and connections that get buried), and at system start-up.

**Manufacturer's Responsibilities** – Orenco Systems is responsible for training authorized AdvanTex Dealers and providing Dealers with training materials for authorized AdvanTex Service Providers. As long as the system is serviced in accordance with the initial service contract by an authorized AdvanTex Service Provider, Orenco Systems® will replace or repair any AdvanTex Treatment System components that fail because of defects in workmanship or materials.

One last note: If your AdvanTex-AXN Treatment System is used intermittently or if extended periods of non-use are anticipated, no special action needs to be taken. That's one of the advantages of the AdvanTex technology. Within the first day of operation after start-up or after extended periods of non-use, AdvanTex units achieve treatment removal efficiencies of 80% or greater. The system may be left running even during periods of vacancy, as the electrical consumption is negligible and the unit will continue to break down organic and inorganic wastewater constituents, even when the system isn't continually loaded. Nevertheless, it is always good practice to periodically observe your system and verify that it is functioning and that the effluent quality is consistent with the expectations described in your O&M manual.

With your preventive maintenance and with regular maintenance by an authorized Service Provider, your AdvanTex-AXN Treatment System should function for decades, providing better wastewater treatment than many municipal systems, without degradation to rivers and oceans. Congratulations, again, for making an environmentally sound investment.

Congratulations!



**Orenco Systems**  
Incorporated

*Changing the Way the World Does Wastewater®*

**800-348-9843**  
**www.orenco.com**

ABR-OM-2  
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OWTS OWNER'S MAINTENANCE REQ.

CROWN SUBDIVISION, LOT 532  
39 LODGESTONE TRAIL  
BLUE RIVER, CO 80424

**LITTLEHORN ENGINEERING, LLC**

351 US HWY 285, #201  
FAIRPLAY, CO 80440  
FAIRPLAY OFFICE 719.836.7120  
SILVER CLIFF OFFICE 719.783.3757

"PEACE OF MIND THROUGH HOLISTIC DESIGN"



PROJECT NO.  
2023-100072

CLIENT  
HELEN LEMAY

DATE  
07.31.2023

REVISION:  
△ N/A  
△ N/A  
△ N/A

# LITTLEHORN ENGINEERING, LLC

205 FOURTH STREET, SILVER CLIFF, CO 81252

(719) 836-7120 - FAIRPLAY (719) 783-3757 - SILVER CLIFF

## Sieve Test Results - Profile Hole A

Project Number: 2023-1519

Date of Testing: 19-Jun-23

Client: Lemay

Property Information

39 Lodestone Trail

Blue River, CO (Summit County)

### Soil Classification:

Soil Group - Gravelly poorly graded sand with silt(SP-SM)

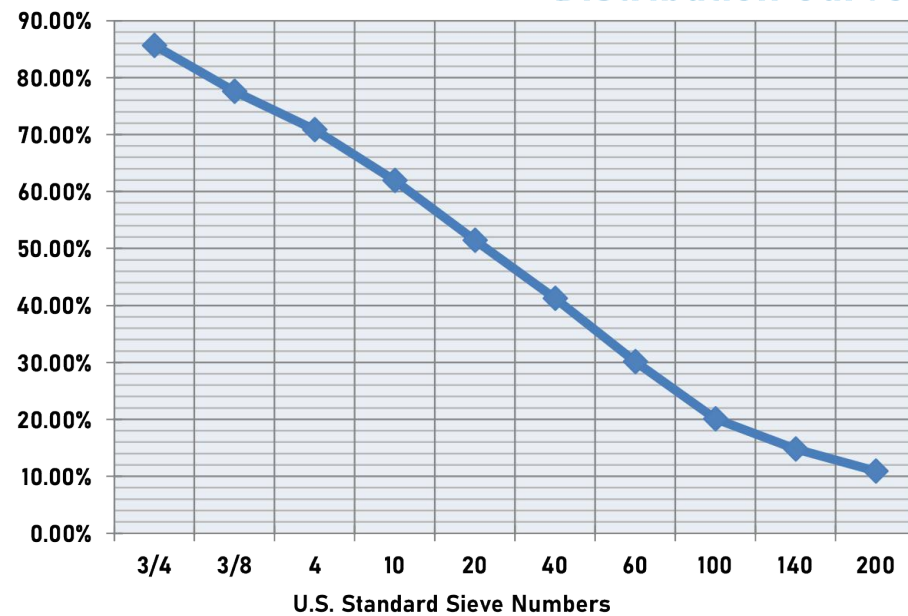
### Soil Type:

LTAR Soils Type - Silt Loam - R2/2A

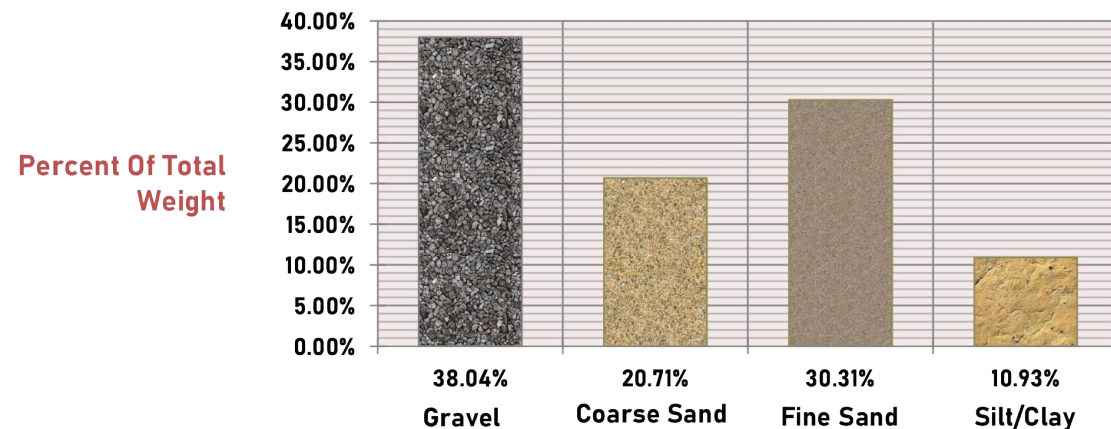
### Typical Grain Size Distribution Curve

Moisture Content: 7.87%

Percent Finer by Weight



### AASHTO Classification By Particle Size



Uniformity Coefficient (Cu): 44.46

Curvature Coefficient (Cc): 0.44

### Pump Selection for a Pressurized System - Single Family Residence Project

LEMAY / 2023-100072

#### Parameters

Discharge Assembly Size	2.00	inches
Transport Length	73	feet
Transport Pipe Class	40	
Transport Line Size	2.00	inches
Distributing Valve Model	None	
Max Elevation Lift	11.5	feet
Manifold Length	8	feet
Manifold Pipe Class	40	
Manifold Pipe Size	2.00	inches
Number of Laterals per Cell	3	
Lateral Length	33	feet
Lateral Pipe Class	40	
Lateral Pipe Size	1.50	inches
Orifice Size	7/32	inches
Orifice Spacing	2	feet
Residual Head	4.1	feet
Flow Meter	None	inches
'Add-on' Friction Losses	4.2	feet

#### Calculations

Minimum Flow Rate per Orifice	1.20	gpm
Number of Orifices per Zone	51	
Total Flow Rate per Zone	61.8	gpm
Number of Laterals per Zone	3	
% Flow Differential 1st/Last Orifice	3.4	%
Transport Velocity	5.9	fps

#### Frictional Head Losses

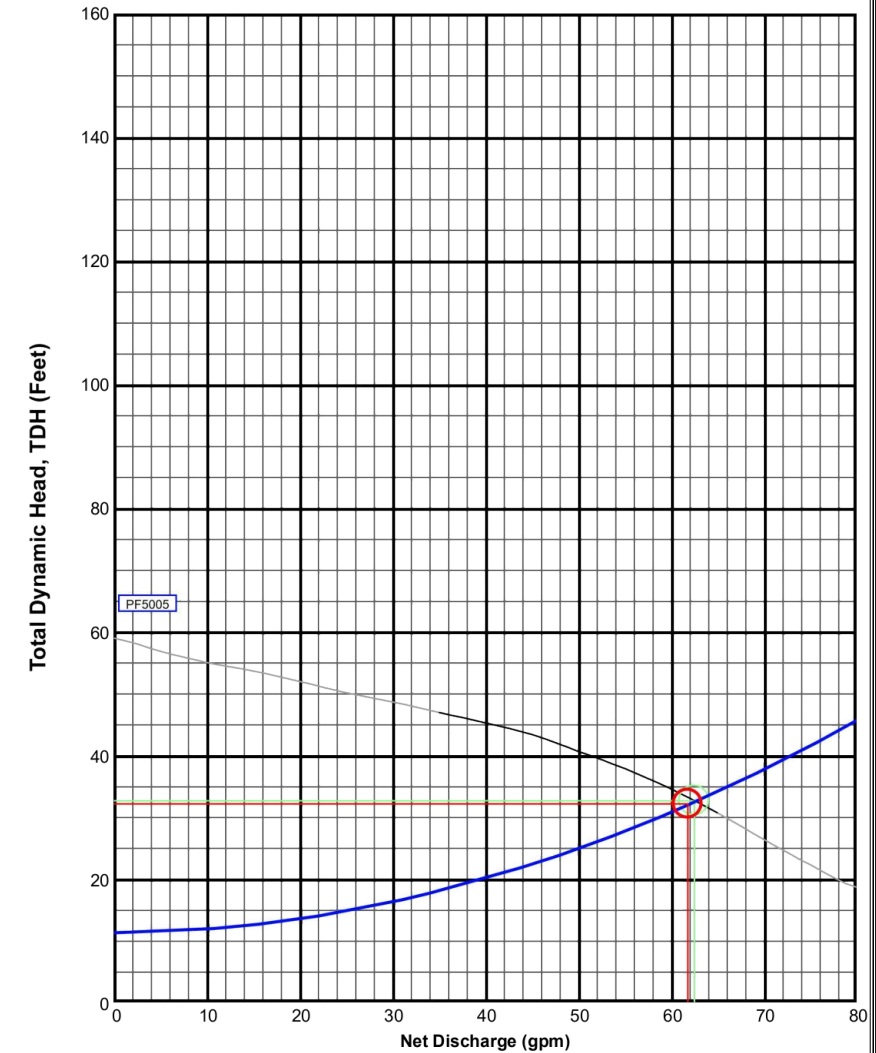
Loss through Discharge	7.6	feet
Loss in Transport	4.3	feet
Loss through Valve	0.0	feet
Loss in Manifold	0.1	feet
Loss in Laterals	0.3	feet
Loss through Flowmeter	0.0	feet
'Add-on' Friction Losses	4.2	feet

#### Pipe Volumes

Vol of Transport Line	12.7	gals
Vol of Manifold	1.4	gals
Vol of Laterals per Zone	10.5	gals
Total Volume	24.6	gals

#### Minimum Pump Requirements

Design Flow Rate	61.8	gpm
Total Dynamic Head	32.2	feet



#### PumpData

PF5005 High Head Effluent Pump  
50 GPM, 1/2HP  
115/230V 1Ø 60Hz, 200/230V 3Ø 60Hz

#### Legend

System Curve:	—
Pump Curve:	—
Pump Optimal Range:	—
Operating Point:	●
Design Point:	○



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SOILS TESTING & PUMP CALCULATIONS

LITTLEHORN ENGINEERING, LLC

CROWN SUBDIVISION, LOT 532  
39 LODESTONE TRAIL  
BLUE RIVER, CO 80424

351 US HWY 285, #201  
FAIRPLAY, CO 80440  
FAIRPLAY OFFICE 719.836.7120  
SILVER CLIFF OFFICE 719.783.3757

"PEACE OF MIND THROUGH HOLISTIC DESIGN"



PROJECT NO. 2023-100072

CLIENT HELEN LEMAY

DATE 07.31.2023

REVISION:  
△ N/A  
△ N/A  
△ N/A



Ted Shaffer <tshaffer@bhpartners.com>

---

## Fwd: Contact info and link to monitor status of re-issuance of well permit from State of Colorado

1 message

---

**Lee Holombo** <holombocon@aol.com>  
To: Ted Shaffer <tshaffer@bhpartners.com>

Mon, Oct 9, 2023 at 11:38 AM

Hi Ted,  
See attached

Sent from my iPad  
Lee's Excavation LLC  
931-220-7787  
[www.clarksvilleexcavatingservices.com](http://www.clarksvilleexcavatingservices.com)

Begin forwarded message:

**From:** Guilhem Buiguès <[guilhem.buigues@gmail.com](mailto:guilhem.buigues@gmail.com)>  
**Date:** August 31, 2023 at 4:24:06 PM CDT  
**To:** Lee Holombo <[holombocon@aol.com](mailto:holombocon@aol.com)>  
**Subject:** Fwd: Contact info and link to monitor status of re-issuance of well permit from State of Colorado

Hi Lee,

Here is everything you need to follow up on the Well Permit Application.

Let me know if you have any questions.

Best,

Guilhem

----- Forwarded message -----

De : **Rob Neyland** <[rob@breckenridgeassociates.com](mailto:rob@breckenridgeassociates.com)>  
Date: ven. 18 août 2023 à 11:49  
Subject: Contact info and link to monitor status of re-issuance of well permit from State of Colorado  
To: [guilhem.buigues](mailto:guilhem.buigues@gmail.com) <[guilhem.buigues@gmail.com](mailto:guilhem.buigues@gmail.com)>  
Cc: Natalie Murray <[natalie@tccreated.com](mailto:natalie@tccreated.com)>

Begin forwarded message:

**From:** "Whitehead - DNR, Dwight" <[dwight.whitehead@state.co.us](mailto:dwight.whitehead@state.co.us)>  
**Date:** August 15, 2023 at 11:49:24 AM MDT  
**To:** Kelly Smith <[kellyanmarie@hotmail.com](mailto:kellyanmarie@hotmail.com)>  
**Subject:** Re: Question about Well Permit Application status

Kelly, the Water Well Permit application for Helen Lemay, 39 Lodestone Trail (Tax #100072), was received by our Denver Office on August 3, 2023, which was entered and will be reviewed under Receipt no. 10030827. Currently our Denver Staff is running about six weeks from the date an application received for review of the application. When the permit is approved or if additional information is requested, correspondence will be sent to the email address noted on the permit application, being: [HELENS@SGMEET.COM](mailto:HELENS@SGMEET.COM). You can always monitor the status of the application at our website, under receipt no. 10030827, hyperlink attached

Receipt no. 10030827: . <https://dwr.state.co.us/Tools/WellPermits/10030827>

I hope it helps.

Regards

**Dwight Whitehead**  
**Well Commissioner**  
**Division 5 Water Resources**  
**PO Box 396**  
**Glenwood Springs, CO 81602**



**P 970-945-5665 x5011 f 970-945-8741**  
**[dwight.whitehead@state.co.us](mailto:dwight.whitehead@state.co.us) | [www.water.state.co.us](http://www.water.state.co.us)**

**Rob Neyland**

**Partner/Broker**

