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### Septic System Feasibility Proposal for Quail Mesa Subdivision

The purpose of this submission is to establish septic feasibility for Quail Mesa Subdivision, a proposed 22 lot subdivision on 35 acres located at 265 S. Red Hill Lane in Virgin, Utah (Washington County parcel V-2-1-26-4421). It is under the ownership of Hidden Canyon Mesa LLC. General engineering is being provided by Civil Science Engineering, and Roger A. New MS,EHS is acting as an Environmental Health consultant.

Pressurized culinary water will be provided by an existing pipeline from the Town of Virgin, an approved community water system. Waste water treatment and disposal will be addressed through an AquaTech BioMOD MBBR onsite treatment system and pressurized distribution into leaching trenches. It will be subject to approval by the Utah State Department of Environmental Quality - Division of Water Quality, and will require sponsorship of a body politic.


Soil exploration was conducted to a depth of 11 to 13 ft. at 7 test locations. Soil conditions were marginal, but within parameters acceptable for underground waste water disposal. Hydraulic loading rates within the treatment area varied from 0.35 to 0.65 gallons per sq ft per day and suitable soils ranging from 10 to 13 feet in depth. Overall system design is based on 0.35 g/sqft/day loading rate, and a 4.0 ft deep trench in 10 ft soil depth. Ground water was not encountered in this study.

There are no, wells, streams, or ponds in the vicinity. There is ample space for the leach field and septic replacement area.

Specifications, calculations and maps are included in this report. Permit application will follow "LUWWDS Alternative Wastewater System" format.

Feel free to contact me with any questions.

Respectfully,

  
Roger A. New

# TREATMENT AND ABSORPTION SYSTEM DESIGN SPECIFICATIONS

Roger A. New M.S., E.H.S  
 Box 460849 Leeds, UT 84746  
 Phone/text (435) 632-2833

Hidden Canyon Mesa LLC  
 Quail Mesa Subdivision  
 265 South Red Hill Lane  
 Lot size 35 acres  
 Topography: Varied

Washington Co.  
 Parcel: V-2-1-26-4421  
 Virgin, UT

**Absorption area required:** 22 lots = 450 gpd x 22 / 0.35gal/sq ft/day = 28,286 sq ft

**Proposed absorption area:** 3536 linear feet of 4.0 ft deep trench.

**Minimum septic tank capacity:** Included in AquaTech BioMOD

**Pump chamber:** 2500 gallon Geneva concrete tank

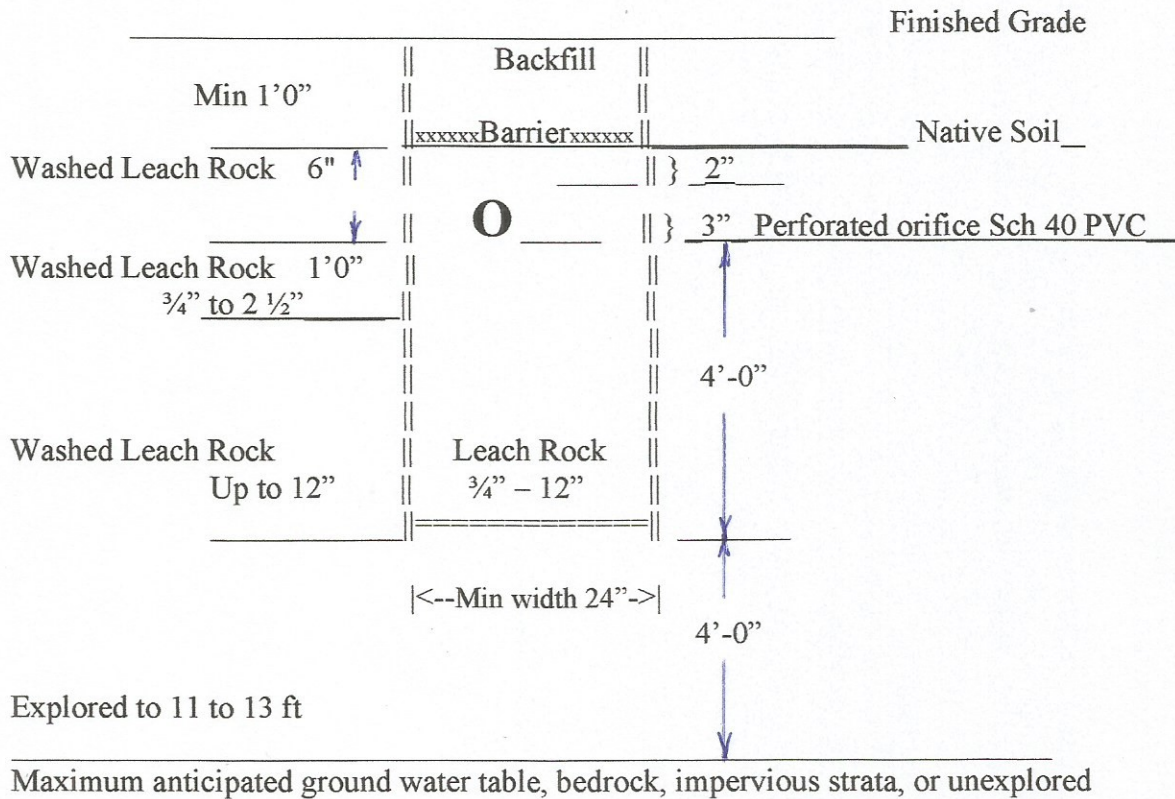
**Minimum septic tank depth is 6 inches below finished grade.**

**Maximum septic tank depth is 4 feet.** For deep installations manholes are required by R317-4-7 to extend to within 6 inches of finished grade.

**Construction Materials:** 3 inch dia. PVC schedule 40 for force main, manifold, and perforated lateral pipe with specified orifices.

**Washed leach rock:** 3/4" to 2 1/2" dia. Deep trenches may use up to 12" rock more than 6" below pipe.

**Dirt barrier material:** May be comprised of 2+ inches of compacted straw, or non-degradable filter fabric 4.0 ounces per square yard, or other effective pervious material approved by the local Health Department.



5/5/2011

## Quail Mesa Subdivision Waste Water System Calculations and Specifications

**Estimated waste water flow:** 22 lots @ 450 gal/lot/day = 9,900 gal/day

**Treatment system:** AquaTech BioMOD - MBBR

**Treated waste water distribution:**

9,900 gpd / hydrolic loading rate 0.35 gal/sq ft/day = 28,286 sq ft absorption area.

3536 linear feet of 4.0 ft deep trench with pressurized distribution.

**Pressurized Distribution:**

10 laterals x 354 linear feet/ lateral. 10 laterals divided into 5 zones, 2 laterals per zone.

Lateral diameter 3". Orifices 5/32" at 4 foot separation, 89 orifices per lateral

5/32 " orifices, 3 ft squirt height = flow rate 0.5 gpm/orifice

89 orifices / lateral x 0.5 gpm = 44 gpm/lateral

**System flow rate** = 88 gpm per zone

Force main is 870 ft of 3" sch40 PVC

Manifold is 60 ft of 3" sch40 PVC

**Pump Selection:**

**TDH** = 43 ft **Zone flow** = 88 gpm

**Recommend:** 2 redundant Zoeller 189-4189 or equivalent

**Automatic Multizone Valve:** Zoeller 6000 series, model 6605. part # 170-0072

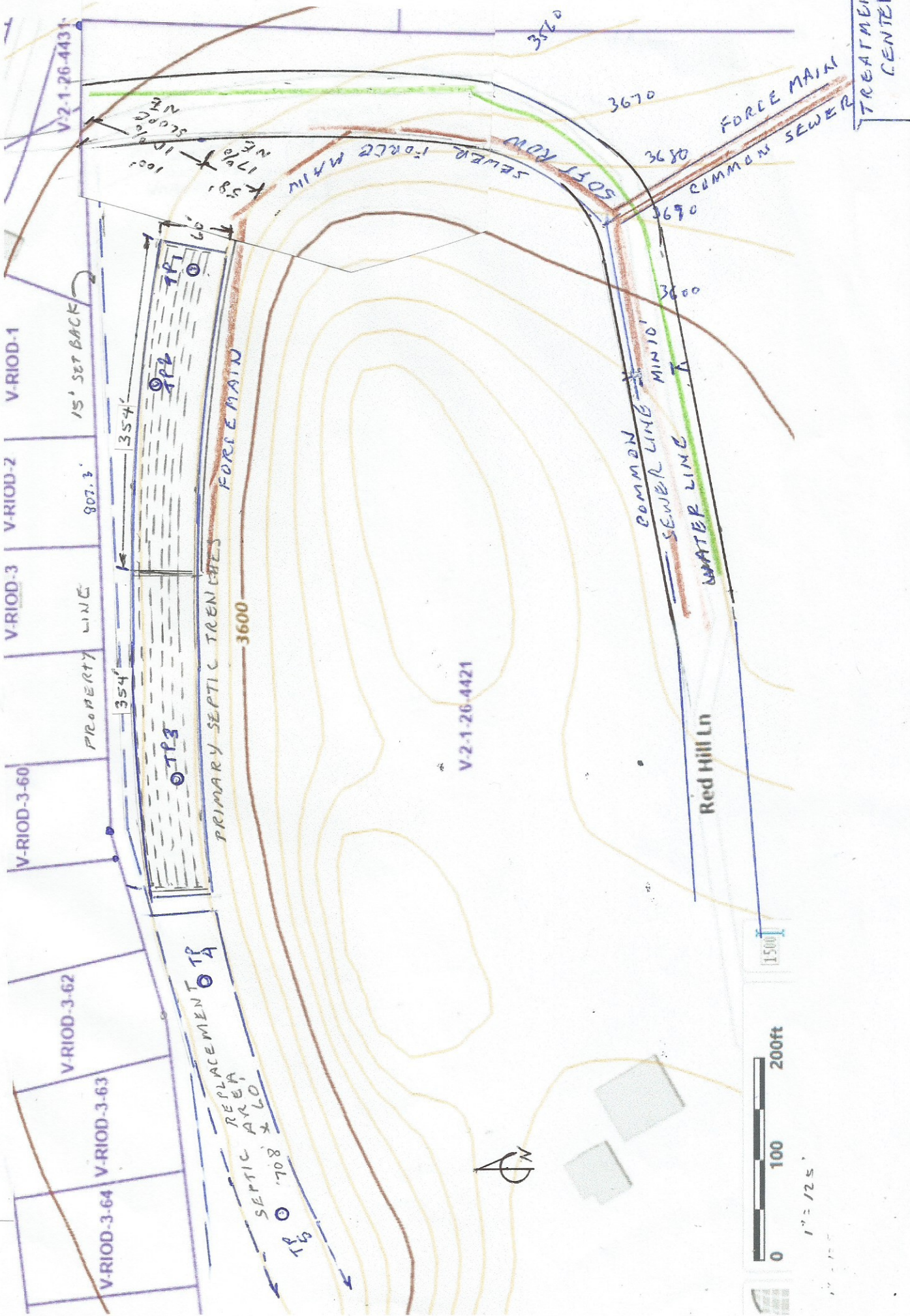
Pressure Network Design Notes:	Step:																
Determine the head loss through automatic distributing valve. This information is usually supplied by the manufacturer.	<b>21. Head loss for systems with multiple zones (if used)</b>  _____ ft.																
The vertical distance (elevation difference) from the water level in the pump tank to the water level at the discharge point (site-specific).	<b>22. Elevation head difference</b>  _____ ft.																
To determine the TDH, add together: <table style="margin-left: 40px; width: 80%;"> <tr> <td>Squirt Height (Step 6)</td> <td><u>3.0</u></td> </tr> <tr> <td>Lateral Head Loss (Step 13)</td> <td><u>1.0</u></td> </tr> <tr> <td>Manifold Head Loss (Step 16)</td> <td><u>1.236</u></td> </tr> <tr> <td>Force Main Head Loss (Step 19)</td> <td><u>18.0</u></td> </tr> <tr> <td>Miscellaneous Head Loss (Step 20)</td> <td><u>9.0</u></td> </tr> <tr> <td>Zone Valve Head Loss (Step 21)</td> <td><u>10.0</u></td> </tr> <tr> <td>Elevation head difference (Step 22)</td> <td><u>0</u></td> </tr> <tr> <td>Result in feet = TDH</td> <td><u>42.36</u></td> </tr> </table>	Squirt Height (Step 6)	<u>3.0</u>	Lateral Head Loss (Step 13)	<u>1.0</u>	Manifold Head Loss (Step 16)	<u>1.236</u>	Force Main Head Loss (Step 19)	<u>18.0</u>	Miscellaneous Head Loss (Step 20)	<u>9.0</u>	Zone Valve Head Loss (Step 21)	<u>10.0</u>	Elevation head difference (Step 22)	<u>0</u>	Result in feet = TDH	<u>42.36</u>	<b>23. Total Dynamic Head (TDH)</b>  _____ ft.
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<table style="margin-left: 40px; width: 80%;"> <tr> <td>Design Flow Rate (Step 14)</td> <td>gpm <u>88</u></td> </tr> <tr> <td>Total Dynamic Head (Step 23)</td> <td>ft. <u>42.36</u></td> </tr> </table>	Design Flow Rate (Step 14)	gpm <u>88</u>	Total Dynamic Head (Step 23)	ft. <u>42.36</u>	<b>24. Pump Selection</b>  <b>USE PUMP CURVES TO SELECT THE CORRECT PUMP</b>												
Design Flow Rate (Step 14)	gpm <u>88</u>																
Total Dynamic Head (Step 23)	ft. <u>42.36</u>																



Hidden Canyon Mesa LLC  
Quail Mesa Subdivision  
265 South Red Hill Lane  
Virgin, UT

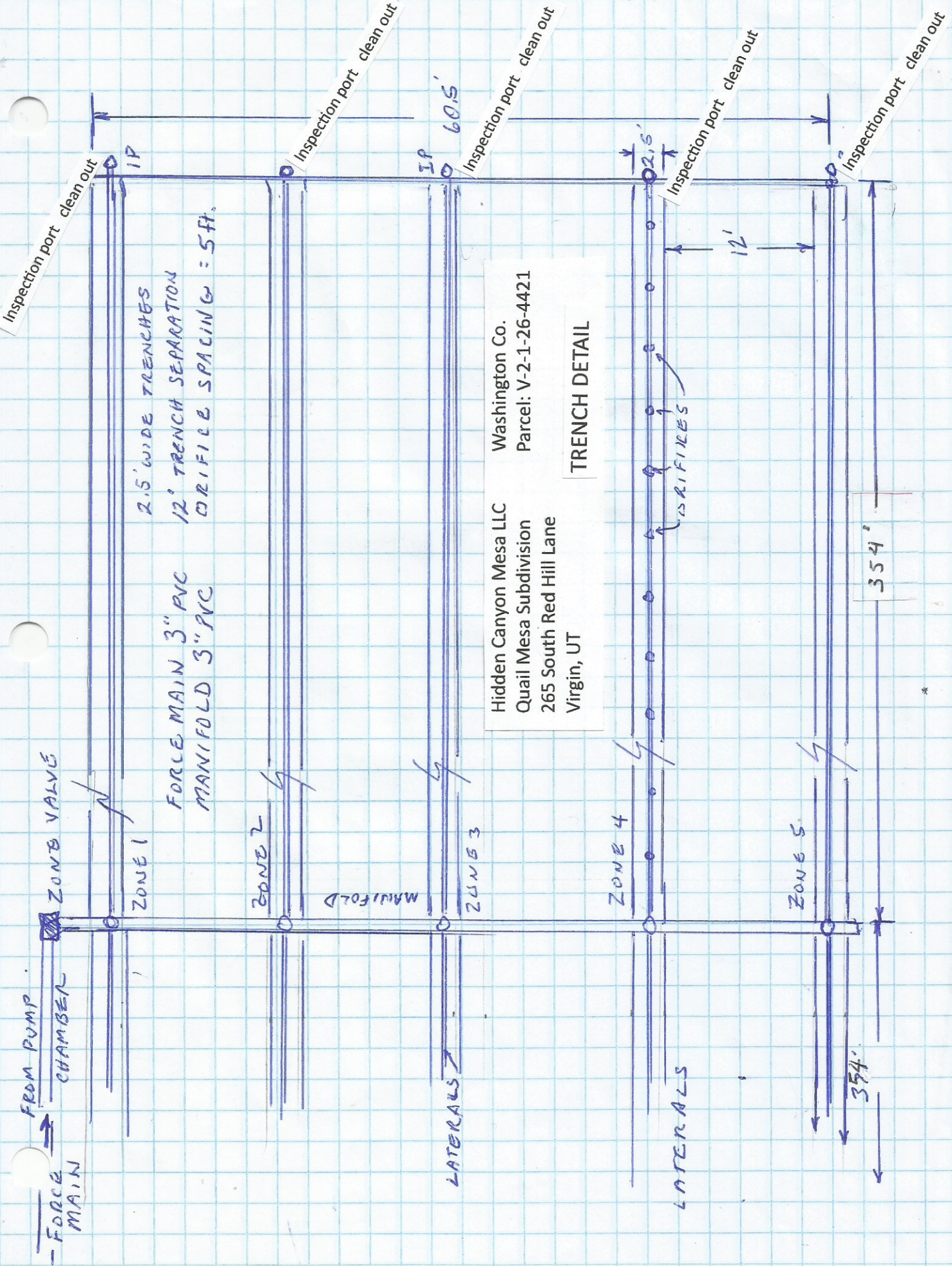
Washington Co.  
Parcel: V-2-1-26-4421

### PLOT PLAN



0 100 200ft  
1" = 12.5'

12/15



Inspection port clean out

2.5' WIDE TRENCHES  
12' TRENCH SEPARATION  
DRIFILE SPACING = 5ft.

Inspection port clean out

IP 60.5'

Inspection port clean out

Inspection port clean out

Inspection port clean out

Hidden Canyon Mesa LLC  
Quail Mesa Subdivision  
265 South Red Hill Lane  
Virgin, UT

Washington Co.  
Parcel: V-2-1-26-4421

TRENCH DETAIL

DRIFILES

12'

354'

354'

FROM PUMP  
CHAMBER  
ZONE VALVE

ZONE 1

FORCE MAIN 3" PVC  
MANIFOLD 3" PVC

ZONE 2

MANIFOLD

ZONE 3

LATERALS

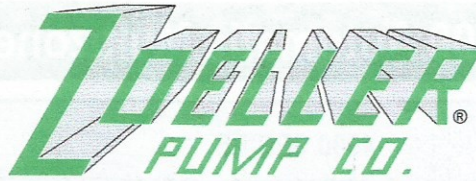
ZONE 4

LATERALS

ZONE 5

\*

"QUALITY PUMPS SINCE 1939"



SECTION: 3.20.175

FM1732

0606

Supersedes

1204

Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.

MAIL TO: P.O. BOX 16347 • Louisville, KY 40256-0347  
SHIP TO: 3649 Cane Run Road • Louisville, KY 40211-1961  
(502) 778-2731 • 1 (800) 928-PUMP • FAX (502) 774-3624

visit our web site:  
[www.zoeller.com](http://www.zoeller.com)

# ZOELLER ON-SITE WASTEWATER PRODUCTS

## ZOELLER SEPTIC SYSTEM ACCESSORIES



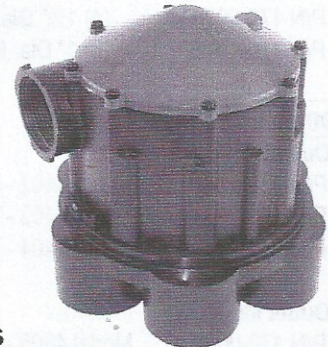
### Automatic Multizone Valves

The Zoeller 4000 Series distribution valve offers an easy, reliable and economical way to automate multiple zoned residential and small commercial disposal fields. The simplicity of design ensures ease of maintenance and long service life. These patented valves are ideally suited for pump fed applications using reclaimed or dirty water.

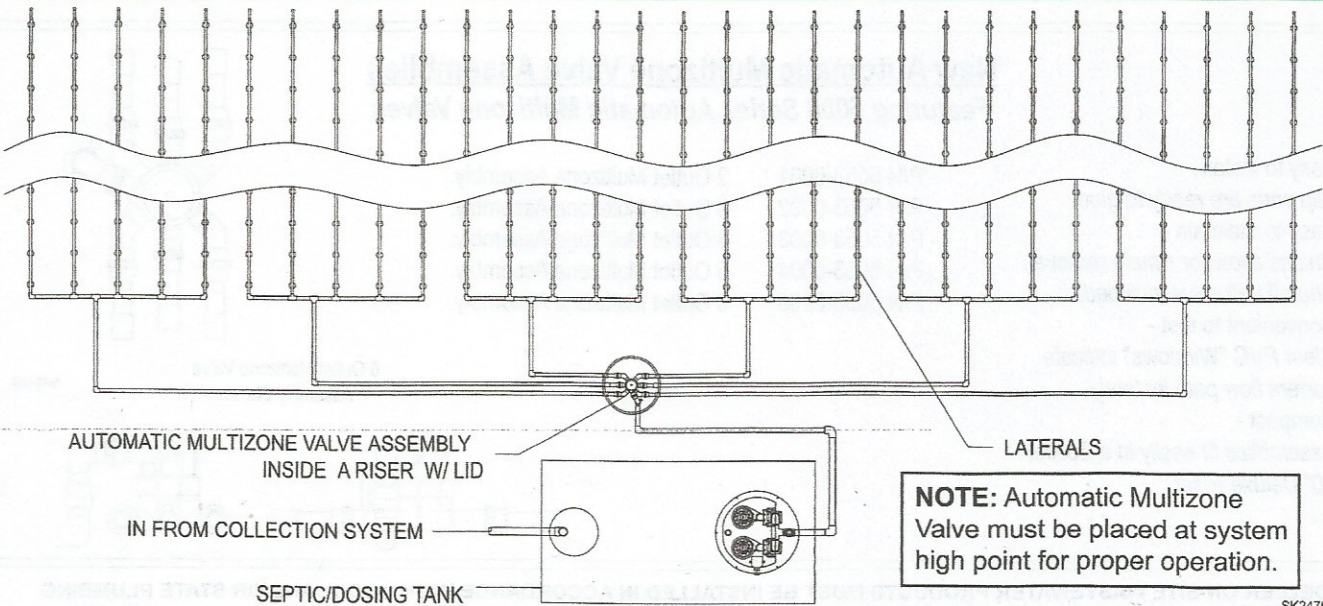


4000 Series

The Zoeller 6000 Series is the foundation of distributing valves. Patented for its ability to manifold multiple zones with only one moving part, this valve offers exceptional reliability and durability under dirty water conditions. With its metal die cast body, the 6000 Series valve is capable of high pressure applications and is recommended for use on pump fed systems.



6000 Series



**NOTE:** Automatic Multizone Valve must be placed at system high point for proper operation.

# 4000 & 6000 Automatic Multizone Valves

SPECIFICATIONS	4000 SERIES	6000 SERIES
<b>Flow Range:</b> (Minimum flow of 10 gpm for the 4000 Series and 15 gpm for the 6000 Series must be maintained in order for the valve to index properly.)	4 Outlet Valve: 10 - 50 GPM 6 Outlet Valve: 10 - 40 GPM	4 Outlet Valve: 15 - 150 GPM 6 Outlet Valve: 15 - 150 GPM
<b>Pressure Rating:</b>	2½ - 75 PSI	2½ - 150 PSI
<b>Pressure Loss - 4 Outlet Valve:</b>	Flow (GPM): 10 20 30 40 50 PSI Loss: 2.0 3.0 4.5 6.4 10.0	Flow (GPM): 15 30 60 90 120 150 PSI Loss: 2.0 3.0 5.0 9.0 11.0 13.0
<b>Pressure Loss - 6 Outlet Valve:</b>	Flow (GPM): 10 20 30 40 PSI Loss: 2.5 4.5 7.5 11.5	Flow (GPM): 15 30 60 90 120 150 PSI Loss: 2.0 3.5 6.0 10.0 12.0 14.0
<b>Inlet:</b>	Slip and glue connections to 1¼" PVC pipe	Threaded 1½" NPT Connection.
<b>Outlets:</b>	Slip and glue connections. 4 Outlet Valve: To 1¼" PVC Pipe 6 Outlet Valve: To 1" PVC Pipe	Slip and glue connections to 1½" PVC Pipe.
<b>Construction:</b>	High strength noncorrosive ABS polymer.	Die Cast Metal Housing High strength noncorrosive ABS Polymer Outlets
<b>Dimensions:</b>	Height: 5¾"      Width: 5¾"	Height: 7"      Width: 8"

## 6" Clear PVC Pipe

P/N 170-0074  
P/N 170-0075

(4) 1¼" Dia. Pieces For 4400 2-4 Zone.  
(6) 1" Dia. Pieces For 4600 5-6 Zone.

P/N 170-0076  
P/N 170-0077

(4) 1½" Dia. Pieces For 6400 2-4 Zone.  
(6) 1½" Dia. Pieces For 6600 5-6 Zone.

## 4000 SERIES:

### 4 Outlet Models

P/N 170-0064      Model 4402 - For 2 Zone operation.  
P/N 170-0065      Model 4403 - For 3 Zone operation.  
P/N 170-0066      Model 4404 - For 4 Zone operation.

### 6 Outlet Models

P/N 170-0067      Model 4605 - For 5 Zone operation.  
P/N 170-0068      Model 4606 - For 6 Zone operation.

## 6000 SERIES:

### 4 Outlet Models

P/N 170-0069      Model 6402 - For 2 Zone operation.  
P/N 170-0070      Model 6403 - For 3 Zone operation.  
P/N 170-0071      Model 6404 - For 4 Zone operation.

### 6 Outlet Models

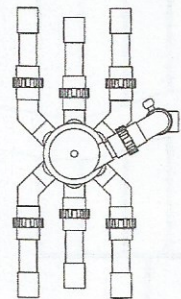
P/N 170-0072      Model 6605 - For 5 Zone operation.  
P/N 170-0073      Model 6606 - For 6 Zone operation.

## New Automatic Multizone Valve Assemblies

### Featuring 6000 Series Automatic Multizone Valves

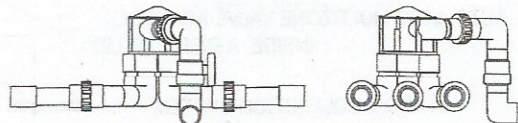
- Easy to install -  
*Slip ends are ready to glue.*
- Easy to maintain -  
*Unions allow for simple removal.  
Shutoff ball valve included.*
- Convenient to test -  
*Clear PVC "Windows" indicate  
current flow path instantly.*
- Compact -  
*Assemblies fit easily in a Zoeller  
30" Deluxe Riser.*

P/N 5053-0001      2 Outlet Multizone Assembly.  
P/N 5053-0002      3 Outlet Multizone Assembly.  
P/N 5053-0003      4 Outlet Multizone Assembly.  
P/N 5053-0004      5 Outlet Multizone Assembly.  
P/N 5053-0005      6 Outlet Multizone Assembly.



6 Outlet Multizone Valve  
Assembly Shown

SK2469



ALL ZOELLER ON-SITE WASTEWATER PRODUCTS MUST BE INSTALLED IN ACCORDANCE WITH LOCAL AND/OR STATE PLUMBING AND/OR HEALTH DEPARTMENT CODES.