

Cover Page

CALCULATIONS (New OWTS):

Proposed Guest House with 3 Bedrooms

LTAR = 0.15 Gallons per Day per Square Foot (GPD/SF). USDA Soil Type 4A per Profile Pit 7/13/2020.

$$Q = (3 \text{ BDRM})(150 \text{ GPD})$$

$$Q = 450.0 \text{ Gallons per Day (GPD)}$$

$$A = \frac{Q}{\text{LTAR}} = \frac{450.0 \text{ GPD}}{0.15 \text{ GPD/SF}}$$

$$A = 3,000.0 \text{ SF}$$

Gravity Fed Chamber Beds:

$$A = (3,000.0 \text{ SF})(1.2)(0.7)$$

$$A = 2,520.0 \text{ SF Required}$$

CHAMBER BED SYSTEM (Gravity Fed):

Infiltrator Systems Inc. Quick 4 Standard Chambers

Chambers = SF RQD / 12.0 SF per Chamber

Chambers = 2,520.0 SF / 12.0 SF = Min. 210 Chambers

Install 3 Zones: 4 Rows x 18 Chambers Long

Chambers Provided = 216 Total

Total Contact Area = 2,592.0 SF Actual

Total Contact Area = 2,520.0 SF Required

Note: Use of Alternative Chambers is Acceptable.

For ARC 36 Standard Chambers (15.0 SF / Chamber, Min. 168

Chambers). Install 3 Zones with 4 Rows of 14 Chambers (168

Total). Contact Engineer for Clarification.

MAXIMUM DEPTH:

48" As Measured on the Up-Hill Side of the Excavation

TANK SIZES:

Main Tank Size = Min. 1,000 Gallons (Two-Compartment)

EPCHD Approved Effluent Filter on Outlet

INSPECTIONS REQUIRED ARE AS FOLLOWS:

1.) Engineer Will Inspect the Installation of All OWTS Components (i.e. All Plumbing, Tanks, Pump Chamber, STA, etc.) Prior to Backfill.

2.) Engineer to Inspect the Soil Treatment Area After Backfill to Insure Min. Cover and Proper Drainage Away from Soil Treatment Area.

Please Notify this Office Min. 24 Hours Prior to Inspection.

PIPE NOTES:

Provide 2.0% Min. Grade on Pipe to Septic Tank. Provide 2.0% Min. Grade on Pipe to the Soil Treatment Area.

All Bends Limited to 45 Degree Ells or Long Sweep Quarter Bends. Areas Under Driveways Shall Be Protected as Per El Paso County Health Department Regulations.

Building Sewer Clean-Outs Shall Be Installed within 5 FT of the Structure and at Intervals Not to Exceed 100' in Straight Runs and When the Cumulative Change in Direction Exceeds 135 Degrees.

FINAL GRADING NOTES:

Soil Treatment Area Shall Be Crowned and Covered with a Minimum of 6" of Select Topsoil to Provide a Base for Good Vegetative Cover.

Contact Soil Conservation Service or County Extension Agent for Vegetation Best Suited for the Area. Grasses are Best. Trees and Shrubs May Damage/Block Pipes. Vegetation Shall Be Maintained and Mowed to Prevent Formation of Bio-Matting. Do Not Pave Over the Soil Treatment Area.

Provide Drainage Swale Around Uphill Side of the Soil Treatment Area.

HOMEOWNER RESPONSIBILITY:

- Have Septic Tank Pump Every 3-5 Years (or As Needed, Contact Licensed Pumper)
 - Have OWTS Inspected Annually
 - Clean Effluent Filter
 - Check Water Levels in Inspection Ports
 - Plant Native Grass Over STA (No Plants with Roots or that Require Irrigation)
 - Don't Pour Chemicals Down Drain
 - Don't Throw Trash in Toilet (Minimize Toilet Paper Consumption)
 - Use of Garbage Disposal is Discouraged
 - Conserve Water and Repair Leaking Fixtures
- This is NOT a Complete List (Contact Local Health Department and EPA List of Septic "Do's and Don'ts")

GENERAL NOTES:

All Work per El Paso County Board of Health Regulations Chapter 8: On-Site Wastewater Treatment Systems (OWTS) Criteria.

All Setbacks Shall Conform to El Paso County Regulations (See Table 7-1 in the Regulations for Additional Information). Contractor/Homeowner Must Verify All Setbacks and Obtain Utility Clearances Prior to Construction.

Contractor/Homeowner is Responsible for Permit. Contractor/Homeowner Must Obtain Approval of Engineered OWTS from the El Paso County Health Department.

All Bends Limited to 45 Degree Ells or Long Sweep Quarter Bends. Areas Under Driveways Shall Be Protected as Per El Paso County Health Department Regulations.

Building Sewer Clean-Outs Shall Be Installed within 5 FT of the Structure and at Intervals Not to Exceed 100 FT in Straight Runs, Upstream at Each Change of Direction Greater Than 45°, and at Any Combination of Bends Greater Than 45° within a 40 FT Section of Building Sewer.

Grade Surrounding Area to Drain Away from the Soil Treatment Area (STA).

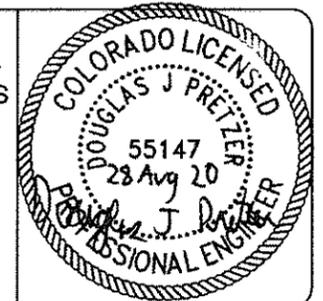
Paving, Planting of Trees/Shrubs, Irrigation, Vehicular Traffic or Hoofed Animal Traffic of Any Kind Over the STA may Cause Premature Failure and is Prohibited.

Refer to Sheet 2, 3, and 4 for Additional Details and Information.

GEOQUEST, LLC.

6825 SILVER PONDS HEIGHTS
SUITE 101
COLORADO SPRINGS, CO
80908

OFFICE: (719) 481-4560
FAX: (719) 481-9204



Geoquest, LLC. has Provided this Design in Accordance with the Standards of Practice Common to the Area. However, as with All Underground Absorption Fields, Guarantee from Failure is Impossible. Even with Proper Installation, as Outlined for this Proposed Construction, There Can Remain Many Uncertainties, and Difficulties Can Still Arise in the Operation of the System in the Future. Proper Design, Construction, and Maintenance can Assist in Minimizing Uncertainties, but Cannot Entirely Eliminate Them. Homeowners Should be Advised of Maintenance and Special Considerations for Septic Systems. Refer to El Paso County Public Health Brochure: "Maintaining Your Septic System" for Additional Information. Due to the Possibility of Unknown Water Usage Factors, Geoquest, LLC. Provides No Warranty of this Design or Installation Against Failure or Damage of Any Type.

Project: 19-0878	Project Name and Address
Sheet: 1 of 4	Trent Baines 9390 Hardin Road, Lot #20,
Date: 28 Aug 2020	Hih Acres Subdivision, Sch. No. 5215002033
Revised:	El Paso County, Colorado
Drawn by: jhr	
Checked by: djp	

CHAMBER BED SYSTEM (Gravity Fed):

Infiltrator Systems Inc. Quick 4 Standard Chambers
 # Chambers = SF RQD / 12.0 SF per Chamber
 # Chambers = 2,520.0 SF / 12.0 SF = Min. 210 Chambers
 Install 3 Zones: 4 Rows x 18 Chambers Long
 # Chambers Provided = 216 Total
 Total Contact Area = 2,592.0 SF Actual
 Total Contact Area = 2,520.0 SF Required

Note: Use of Alternative Chambers is Acceptable.
 For ARC 36 Standard Chambers (15.0 SF / Chamber, Min. 168 Chambers). Install 3 Zones with 4 Rows of 14 Chambers (168 Total). Contact Engineer for Clarification.

OWTS to be Roped Off (Caution Tape or Temporary Construction Fencing is Acceptable) Prior To and During Construction to Prevent Construction Traffic from Compacting Surface Soils and Protect the STA from Traffic After Installation.

Minor Rotation or Curvature (ie. Less Than 15°) of the Soil Treatment Area (STA) Beds to Best Fit the Site Topography is Acceptable (i.e. Parallel to Site Contours). STA shall Maintain the Approximate Orientation Shown w/ Respect to Buildings and Lot Lines. Contact Engineer for Clarification.

Install Drainage Swale Between the House and Soil Treatment Area to Ensure Surface Runoff is Diverted Around the STA. Downspouts near the STA Shall Discharge into the Swale or Extended Beyond the STA.

Quick4 Plus Standard Chambers:
 34" W x 48" L x 12" H Each
 3 Zones: 4 Rows x 18 Chambers Long (216 Total). **Max. Depth of Installation 48" Below Native Grade (As Measured on the Uphill Side).** See STA Layout and Cross-Section for Additional Detail and Clarification.

Distribution Box w/ Speed Levelers to Ensure Equal Distribution. Install a Secure Access Riser to Grade to Allow for Future Speed Leveler Adjustment.

4" Ø PVC Solid Pipe from the Proposed House to the Septic Tank, with Cleanout within 5 FT of House and at Intervals Not to Exceed 100 FT in Straight Runs, Upstream at Each Change of Direction Greater Than 45°, and at Any Combination of Bends Greater Than 45° within a 40 FT Section of Building Sewer. Maintain 2.0% Min. Grade on Pipe Feeding the Septic Tank. Exact Location of the Discharge Line from the House per Plumbing Design by Others.

Existing Well (Field Verify Exact Location). Maintain Min. 100 FT to Any STA. and Min. 50 FT to the Septic Tank (100 FT Preferred).

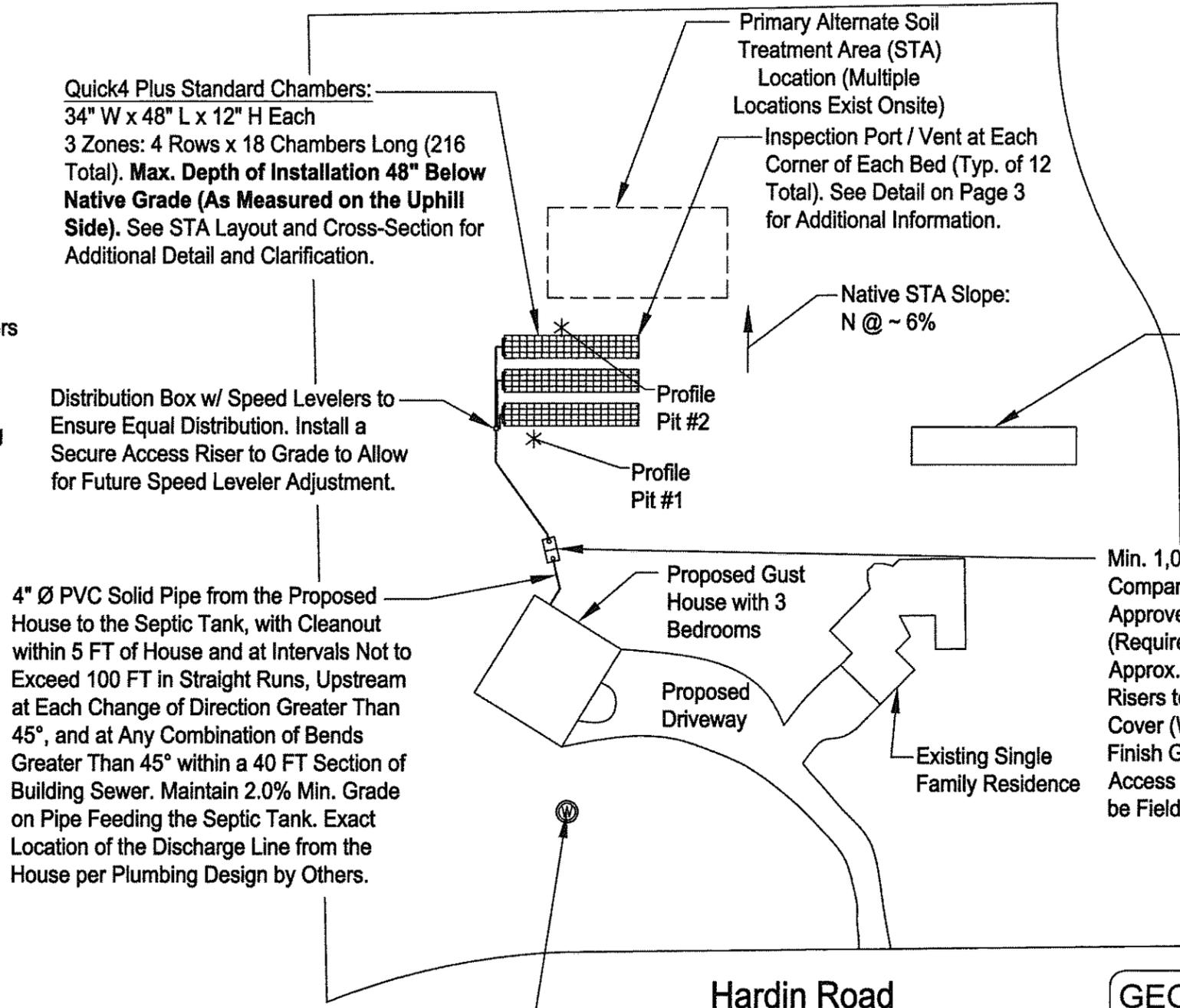
Primary Alternate Soil Treatment Area (STA) Location (Multiple Locations Exist Onsite)

Inspection Port / Vent at Each Corner of Each Bed (Typ. of 12 Total). See Detail on Page 3 for Additional Information.

Native STA Slope: N @ ~6%

Existing OWTS Location to Remain Separate from New OWTS for Guest House

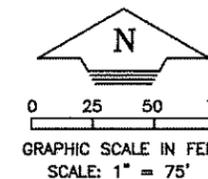
Min. 1,000 Gal. Precast Concrete Two Compartment Septic Tank w/ EPCPH Approved Effluent Filter on Outlet (Requires Regular Maintenance). Inlet Approx. 24" Below Existing Grade. Risers to Grade with Secure Access Cover (Water Tight, Min. 3" Above Finish Grade, Typ. All Septic Tank Access Locations). Exact Location to be Field Determined.



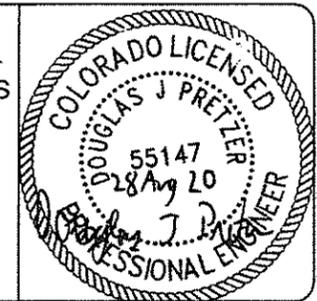
Hardin Road

* Indicates Geoquest, LLC. Profile Pit Test Locations
 Location from Southwest Lot Corner to Profile Pit # 1: N. 20° E. - 319'
 Location from Profile Pit # 1 to Profile Pit # 2: N. 14° E. - 61'
 GPS Coordinates Pit # 1: N. 39° 00' 31.05", W. 104° 39' 10.53"
 GPS Coordinates Pit # 2: N. 39° 00' 31.71", W. 104° 39' 10.15"

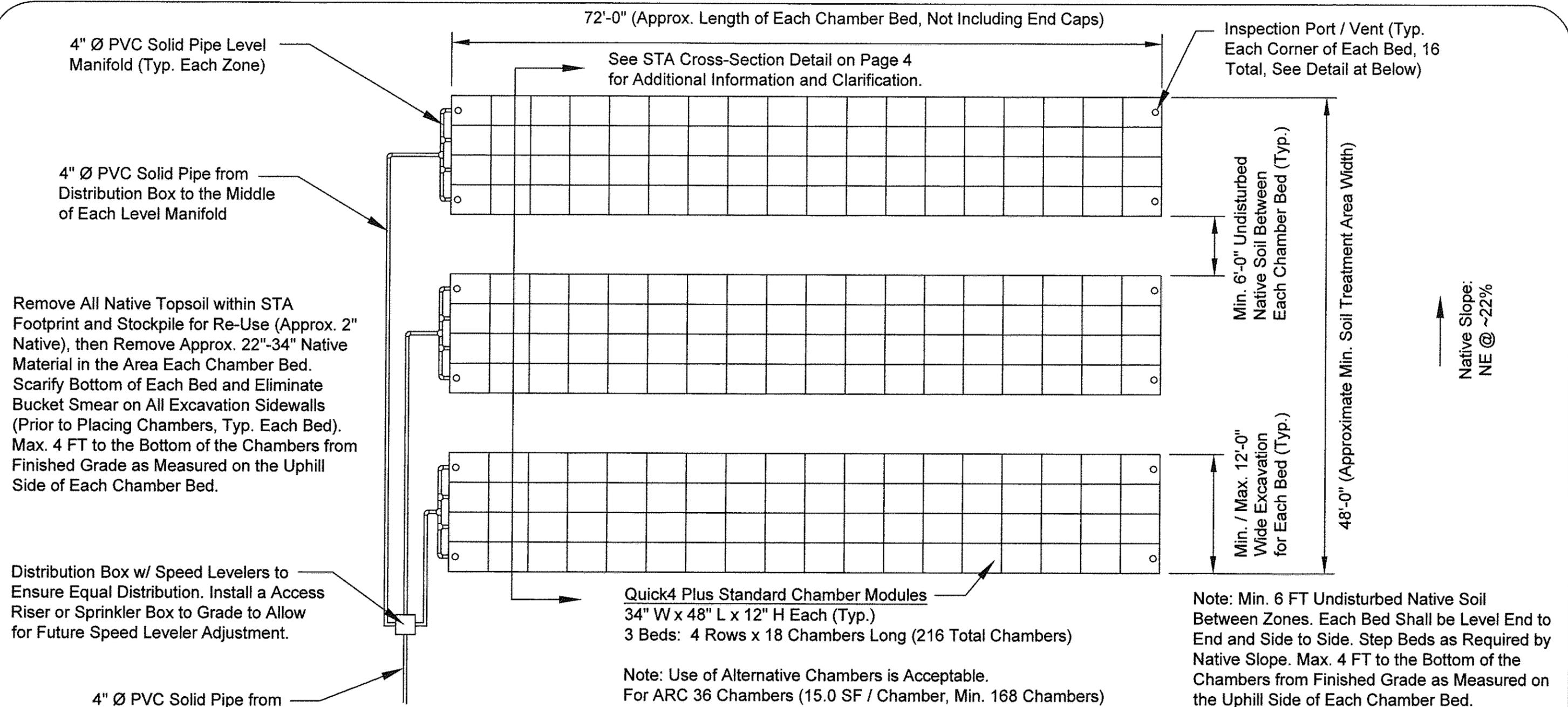
Site Plan



GEOQUEST, LLC.
 6825 SILVER PONDS HEIGHTS
 SUITE 101
 COLORADO SPRINGS, CO
 80908
 OFFICE: (719) 481-4560
 FAX: (719) 481-9204

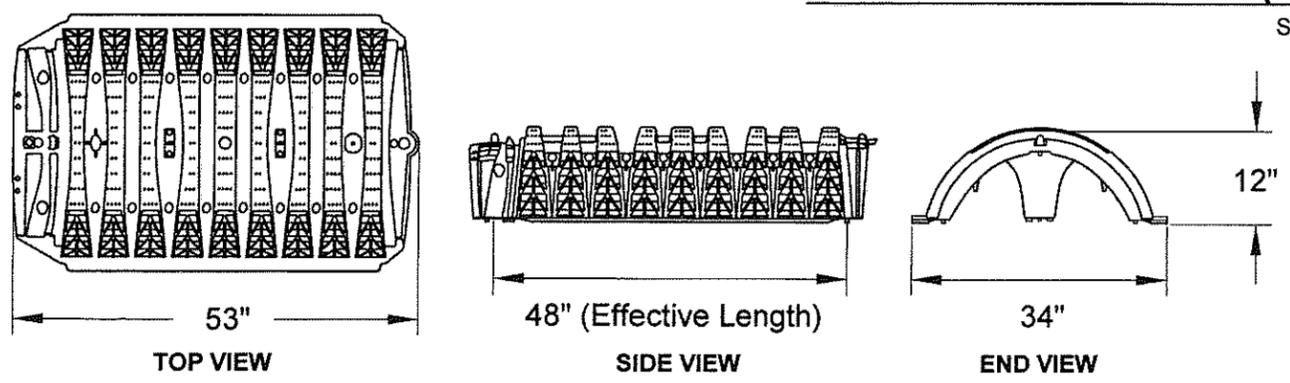


Project: 19-0878	Project Name and Address Trent Baines 9390 Hardin Road, Lot #20, Hih Acres Subdivision, Sch. No. 5215002033 El Paso County, Colorado
Sheet: 2 of 4	
Date: 28 Aug 2020	
Revised:	
Checked by: djp	



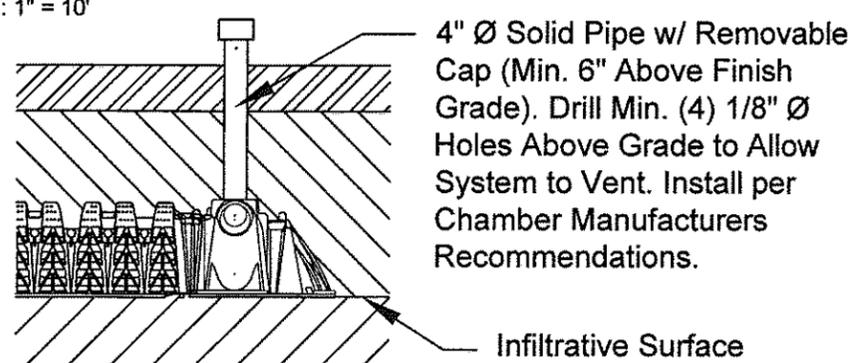
Soil Treatment Area (STA) Layout (Chamber Beds)

SCALE: 1" = 10'



Quick 4 Plus Standard Details

Not to Scale



Inspection Port / Vent Detail

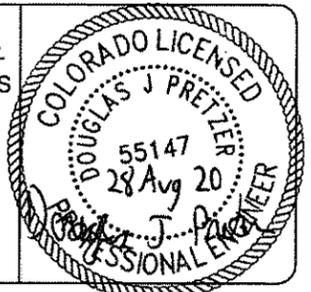
Not to Scale

Note: Min. 6 FT Undisturbed Native Soil Between Zones. Each Bed Shall be Level End to End and Side to Side. Step Beds as Required by Native Slope. Max. 4 FT to the Bottom of the Chambers from Finished Grade as Measured on the Uphill Side of Each Chamber Bed.

GEOQUEST, LLC.

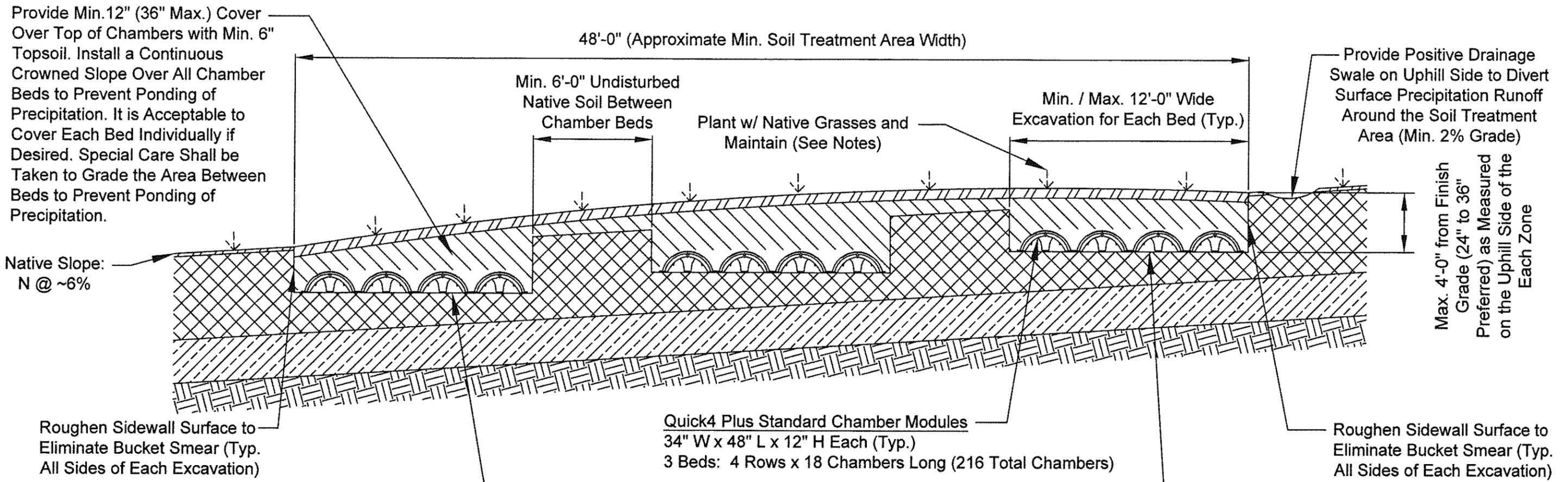
6825 SILVER PONDS HEIGHTS
SUITE 101
COLORADO SPRINGS, CO
80908

OFFICE: (719) 481-4560
FAX: (719) 481-9204



Project: 19-0878
Sheet: 3 of 4
Date: 28 Aug 2020
Revised:
Drawn by: jhr
Checked by: djp

Project Name and Address
Trent Baines
9390 Hardin Road,
Lot #20,
Hih Acres Subdivision,
Sch. No. 5215002033
El Paso County, Colorado



Provide Min. 12" (36" Max.) Cover Over Top of Chambers with Min. 6" Topsoil. Install a Continuous Crowned Slope Over All Chamber Beds to Prevent Ponding of Precipitation. It is Acceptable to Cover Each Bed Individually if Desired. Special Care Shall be Taken to Grade the Area Between Beds to Prevent Ponding of Precipitation.

Native Slope: N @ ~6%

Roughen Sidewall Surface to Eliminate Bucket Smear (Typ. All Sides of Each Excavation)

Remove All Native Topsoil within STA Footprint and Stockpile for Re-Use (Approx. 2" Native), then Remove Approx. 22"-34" Native Material in the Area Each Chamber Bed. Scarify Bottom of Each Bed and Eliminate Bucket Smear on All Excavation Sidewalls (Prior to Placing Chambers, Typ. Each Bed). Max. 4 FT to the Bottom of the Chambers from Finished Grade as Measured on the Uphill Side of Each Chamber Bed.

Quick4 Plus Standard Chamber Modules
 34" W x 48" L x 12" H Each (Typ.)
 3 Beds: 4 Rows x 18 Chambers Long (216 Total Chambers)

Note: Use of Alternative Chambers is Acceptable.
 For ARC 36 Chambers (15.0 SF / Chamber, Min. 168 Chambers)
 Install 3 Beds: 4 Rows x 14 Chambers Long (171 Total Chambers)
 Contact Engineer for Clarification.

Provide Positive Drainage Swale on Uphill Side to Divert Surface Precipitation Runoff Around the Soil Treatment Area (Min. 2% Grade)

Max. 4'-0" from Finish Grade (24" to 36" Preferred) as Measured on the Uphill Side of the Each Zone

Roughen Sidewall Surface to Eliminate Bucket Smear (Typ. All Sides of Each Excavation)

Step Beds as Required by Native Slope. Chambers Shall be Set Level in Each Bed.

Soil Treatment Area (STA) Cross-Section (Chamber Beds)

Not to Scale

Note: Min. 6 FT Undisturbed Native Soil Between Zones. Each Bed Shall be Level End to End and Side to Side. Step Beds as Required by Native Slope. Max. 48" to the Bottom of the Chambers from Finished Grade as Measured on the Uphill Side of Each Chamber Bed.

- Topsoil (Min. 6" on Final Cover)
- Native Topsoil (Approx. 2", Remove All from STA Footprint and Stockpile for Re-Use on Final Cover)
- Approved Material to Provide Cover (Min. 12", Max. 36" Total, Including Topsoil)
- Native Soil - Sandy Loam (USDA 2A, Approx. 2" - 52" Below Existing Grade)
- Native Soil - Sandy Clay (USDA 4A, Approx. 52" - 78" Below Existing Grade)
- Native Soil - Sandy Clay Loam (USDA 3A, Approx. 78" - 8'-0" Below Existing Grade)

Special Note: STA Layout Illustrates the General Design Layout. Minor Rotation or Curvature (ie. Less Than 15°) of the Soil Treatment Area (STA) Beds to Best Fit the Site Topography is Acceptable.

GEOQUEST, LLC.
 6825 SILVER PONDS HEIGHTS, SUITE 101
 COLORADO SPRINGS, CO 80908
 OFFICE: (719) 481-4560
 FAX: (719) 481-9204

Project: 19-0878	Project Name and Address Trent Baines 9390 Hardin Road, Lot #20, Hih Acres Subdivision, Sch. No. 5215002033 El Paso County, Colorado
Sheet: 4 of 4	
Date: 28 Aug 2020	
Revised:	
Checked by: djp	