



Jerome W.

HANNIGAN and ASSOCIATES, INC.

Land Planning • Land Surveying • Land Development Consulting

May 27, 2019
Job No. 19-003

WOODARD MINOR SUBDIVISION ONSITE WASTEWATER TREATMENT SYSTEM REPORT

Woodard Minor Subdivision is a proposed 2 lot residential subdivision of a 14 acre parcel in Section 6, T12S, R65W, of the 6th P.M., in northern El Paso County. The property lies on the south side of Vessey Road approximately a half mile west of it's intersection with Black Forest Road. The street address is 6385 Vessey Road and the tax assessor parcel number is 52060-00-065. This is an area within which the Black Forest Fire destroyed many homes and the Woodard home was unfortunately one of them. Several neighbors have been able to rebuild and Jessie will do so as well, once the proposed 5 acre lot can be sold.

The original home was constructed prior to the County requirement for septic permits. An On Premise Inspection form was however completed on March 8, 1976 and is on file with the Health Department. This is the system that served the existing residence until the fire. A new inspection was done after the fire on July 19, 2017, again finding the system in working order. The new home is proposed to locate in the same area that the original occupied and will connect to this original system. The existing well, which lies on the owner's proposed 8+ acre lot, has been re-permitted in accordance with the adjudication and Court approved augmentation plan completed for the proposed subdivision.

The lot which is proposed for sale is just over 5 acres and is currently vacant. This portion of the original property was heavily forested. These trees were all destroyed. This is the lot that will have a new home, well and septic system.

According to the United States Department of Agriculture, Soil Conservation Service, *Soil Survey of El Paso County Area*, issued in June 1981, soils onsite are (#40) Kettle gravelly loamy sand, 3 to 8 percent slopes and (#26) Elbeth sandy loam, 8 to 15 percent slopes. The 8+ acre lot (and homesite) is almost all Kettle soils while the 5 acre lot is perhaps half Kettle and half Elbeth. Both are deep, well drained soils that formed in sandy arkosic deposits. Permeability of these soils is moderate. A typical Kettle gravelly loamy sand profile follows:

- E- 0 to 16 inches: gravelly loamy sand.
- Bt- 16 to 40 inches: gravelly sandy loam.
- C- 40 to 60 inches: extremely gravelly loamy sand.

A typical Elbeth Sandy Loam profile follows:

- A- 0 to 3 inches: sandy loam.
- E- 3 to 23 inches: loamy sand.
- Bt- 23 to 68 inches: sandy clay loam.
- C- 68 to 74 inches: sandy clay loam.

(2)

These soils have good potential for homesites. The main limitation is a limited ability to support a load and potential frost action. The main limitation for septic tank absorption fields is due to the moderate permeability.

In anticipation of new home construction, the owner had a Soils Report done by Geoquest on June 26, 2017. One test hole was bored to a depth of 15 feet. That report is attached. The location of that hole is shown as are the results of the testing. Neither groundwater nor bedrock was encountered during those investigations.

Given that one of the two proposed lots has a long functioning system in place and that soils mapped on these two lots (and the surrounding area) are both suitable for individual sewage disposal systems and that on site testing confirms those soils, it seems reasonable to conclude the 5 acre lot will be suitable for an individual onsite wastewater treatment system (OWTS) and that contamination of surface or subsurface water resources should not occur provided that the OWTS sites are evaluated, installed and maintained according to El Paso County Health Department and State guidelines. Individual site evaluations are required for the 5 acre lot. Septic absorption fields must be located at least 100 feet from any well including those offsite. They must also be located at least 50 feet from any drainages, floodplains or ponded areas and 25 feet from dry gulches.

cc 3/9/76

paid yet

Receipt acc. # mar. '76 to N. 18 yr. old House. # 3408 Nothing on file!

CITY-COUNTY HEALTH DEPARTMENT
501 NORTH FOOT AVENUE
COLORADO SPRINGS, COLORADO 80909
471-3700

#52060-00-065

ON PREMISE INSPECTION

DATE: 3/8 1976

ADDRESS OF PROPERTY 6385 Ossey Road Black Forest.

NAME OF OWNER Melores Wegner (Seller) PHONE 495-4356

LETTER FOR: V.A. ___ FHA ___ OTHER Cont. WATER SUPPLY: PVT PUB. ___

LETTER REQUESTED BY: SELLER ___ BUYER ___ REALTY CO. ___ OTHER ___

NAME OF PERSON OR COMPANY REQUESTING LETTER Ellen Toft 475-9401

ADDRESS Widmer Co 3515 S. Chestnut PHONE 475-9400

LETTER TO BE: PICKED UP ___ MAILED ___ OTHER ___ Sam Oriebeus 11am

DISPECTION

DISTANCE FROM LEACHING FIELD Unknown. 3 bdom.

WELL: GENERAL DESCRIPTION well casing to be raised out of pit one foot above ground surface.

PLUMBING AND VENTING appears to be properly trapped & vented.

LAVATORY FACILITIES: appear to be in good working order.

OTHER INFORMATION: No evidence of sewage from toilets on ground surface however, washing machine wastes must be rerouted to drain into S.T. This completed as requested 2 Apr. '76 b.d.

Water OK.
taken 3/10/76

New well started 4/14/76

water sample taken 10 mar. '76

INSPECTION MADE BY: D. Harris DATE OF INSPECTION 10 Mar 1976

Evaluating OWTS (septic system) for Black Forest Fire Building Permit

Application Activity Log



Application No: 39723

Reviewer Details:

Neil Mayes

corneliusmayes@elpasoco.com

(719) 575-8967

Assigned ID: n/a

Application Status Complete ▼
Applicant's Address

Richard Broders

Broders Excavating

557 Rose Dr.

Colorado Springs, CO 80911

Email: 2broders@q.com

Phone: 719-338-4630

Property Information

6385 Vessey Rd.

Colorado Springs, CO 80908

Property Owner First & Last Name: Janice

Woodard

Parcel Number: 52060-00-065

Building Permit Number:

Property Owner Phone Number: 719-205-1338

Property Owner Email: jesardhunt@gmail.com
Attachments

No Attachments

Questions/Answers

Evaluation Report

Q: Is the existing system a cesspool?

A: No

Q: Is there any visual damage to the building sewer line or cleanout? (House to septic tank)

A: No

Q: Is there any visual damage to the septic tank, lid or risers?

A: No

Q: Is there any visual damage to the sewer line or cleanout? (septic tank to soil treatment area)

A: No

Q: Is there any visual damage to the soil treatment area?

A: No

Q: Is there any visual damage to electrical components of the septic system?

A: N/A

OWTS Certification

Q: I certify that the evaluation of the septic system represented on this application is true and accurate, and was completed per the "Black Forest Fire On-site Wastewater Treatment System Evaluation Requirements" form.

A: Yes

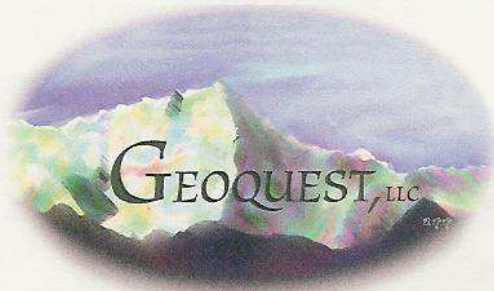
Q: I certify that I am either: An El Paso County Public Health Licensed System Installer, Licesned System Cleaner, or Colorado Registered Professional Engineer.

A: Yes

Q: OWTS Evaluator Type

A: Licensed System Installer

Comment History



6825 Silver Ponds Heights #101
Colorado Springs, CO 80908
(719) 481-4560

SOILS REPORT

FOR

JESSE WOODORD

JOB #17-0566

6385 Vessey Road,
El Paso County,
Colorado

Respectfully submitted,

Charles E. Milligan, P.E.
Civil Engineer

TABLE OF CONTENTS

INTRODUCTION	1
CONCLUSIONS	1
GENERAL	1
FIELD AND LABORATORY INVESTIGATION	1
TOPOGRAPHY	2
WEATHER	2
DESIGN AND CONSTRUCTION CONSIDERATIONS	2 - 3
RECOMMENDATION REMARKS	3
COLD TEMPERATURE CONSIDERATIONS	3
SURFACE DRAINAGE	4
SUBSURFACE DRAINAGE	4
REINFORCING	4
FOOTING DESIGN	4
CONSTRUCTION DETAILS	4
MINIMUM MATERIALS SPECIFICATIONS	5
OPEN HOLE OBSERVATION	5
LOGS	6
SITE MAP	7
SIEVE ANALYSIS RESULTS	8
PERIMETER DRAIN SKETCH	9
LIMITATIONS	10

INTRODUCTION

The owners must be made aware of the contents of this report. If there are any questions or concerns regarding the information in this report please contact us. This is to ensure that the recommendations and requirements of the report, especially regarding the surface drainage, are acknowledged and followed. This report is prepared for **Jesse Woodord, owner on 6385 Vessey Road, El Paso County, Colorado**. It is my understanding that a single-family residence is planned for this site. The site is currently vacant.

CONCLUSIONS

A satisfactory foundation for this structure is a properly designed shallow foundation system consisting of foundation components resting directly on undisturbed materials. Foundation components resting directly on undisturbed materials shall be designed for a loading of not greater than **1,000 pounds per square foot. Any design by any engineer is subject to revision based on the results of the open hole observation.** The compressibility of this material is low to moderate. This bearing capacity is calculated with a safety factor of three. The type of foundation configuration used depends on the building loads applied. The depth of foundation elements shall be determined by the foundation engineer, but should be at least as deep as the minimum depth required by the governing building authority. The laboratory testing revealed that the on-site soil is silty sand (U.S.C. Classification Symbol SM). The unit weight of equivalent fluid soil pressure of this material is 40 pounds per cubic foot. **The owners shall be made aware that movement will occur if surface or subsurface water is allowed to collect around the foundation wall.**

GENERAL

The investigation was made to reveal important characteristics of the soils and of the site influencing the foundation design. Also evaluated during the investigation were subsurface conditions that affect the depth of the foundation and subsequent loading design, such as ground water levels, soil types, and other factors which affect the bearing capacity of the soils. Design loadings are based on soils characteristics and represent the maximum permissible loads for these conditions.

FIELD AND LABORATORY INVESTIGATION

One exploratory hole was drilled on June 26, 2017, at the location shown on the enclosed site map. The location of this test hole was determined by Jesse Woodord. The test holes was drilled with a 4-inch diameter auger. At intervals anticipated to be the foundation depths, and as determined by the soils conditions, the drill tools were removed and samples were taken by the use of a 2-inch split barrel sampler connected to a 140 pound drop-hammer. This hammer is dropped 30 inches to drive the penetration sampler into the soil (**ASTM D-1586**). The depths and descriptions of the materials encountered in each test boring at which the samples were taken are shown on the enclosed log sheets. All samples were classified both in the field and in the laboratory to evaluate the physical and mechanical properties of the materials encountered.

TOPOGRAPHY

The topography of this site is that of an incline sloping down towards the south at 4%.

WEATHER

The weather at the time of the soil examination consisted of partly cloudy skies with hot temperatures.

DESIGN AND CONSTRUCTION CONSIDERATIONS

Residential basement slabs-on-grade may move and crack. Vertical slab movement of one to three inches is considered normal for soils of low to moderate expansion potential and for compacted structural fill after removal of highly expansive soils. In some cases vertical movement may exceed this range. If movement and associated damage to basement floors and finish cannot be tolerated, a structural floor system should be installed. If compaction is not performed, settlement may occur causing cracking of foundation walls and floors. Soil located beneath concrete walls shall be compacted to at least 95% Modified Proctor density. Soil located beneath concrete floors shall be compacted to at least 85% Modified Proctor density. Special care is to be taken to re-compact the material above utility lines to a minimum of 85% Modified Proctor density. During construction, conditions that could cause settlement shall be eliminated. Interior non-bearing partition walls shall be constructed such that they do not transmit floor slab movement to the roof or overlying floor. The gap or void (1.5" min.) installed in these non-bearing partitions may require re-construction over the life of the structure to re-establish the gap or void to allow for vertical slab movement. Stairwells, doorways and sheeted walls should be designed for this movement. The following are general recommendations of on-grade slabs:

1. Slabs shall be placed on well-compacted, non-expansive materials, and all soft spots shall be thoroughly excavated and replaced with non-expansive fill materials as stated above.
2. Separate the slab from all foundation walls, load bearing members, and utility lines.
3. At intervals not to exceed 12 feet in each direction, provide control joints to reduce problems with shrinkage and curling as recommended by the American Concrete Institute (ACI). Moisten the ground beneath the slab prior to placement of concrete.
4. All concrete placed must be cured properly as recommended by the American Concrete Institute (ACI). Separate load bearing members from slabs, as discussed above. Care must be exercised to prevent excess moisture from entering the soil under the structure, both during and after construction.

DESIGN AND CONSTRUCTION CONSIDERATIONS (CONTINUED)

5. Due to the exposure of exterior concrete to variations in moisture fluctuations, heaving and cracking of exterior slabs-on-grade should be expected. Placement of at least 3 feet of non-expansive fill beneath the slabs can help to reduce the impact of differential movement and cracking but may not eliminate movement.
6. The soil has been analyzed for its expansion and/or consolidation potential. Basement slabs, garage slabs, and all concrete floor slabs, however, exert a very low dead-load pressure on the soil. Since this soil contains at least a small amount of expansion potential, slabs will crack and heave or settle if excess water is allowed to penetrate the sub-grade. For example, column openings to pads below the placed slab, if exposed to precipitation during construction, will conduct water to the sub-grade, possibly causing it to expand. Also, if the slab is placed with concrete too wet, expansion may occur. We recommend 3,000 psi concrete placed at a maximum slump of 4 inches.

RECOMMENDATION REMARKS

The recommendations provided in this report are based upon the observed soil parameters, anticipated foundation loads, and accepted engineering procedures. The recommendations are intended to minimize differential movement resulting from the heaving of expansive soil or from the settlement induced by the application of loads. **It must be recognized that the foundation will undergo some movement on all soil types.** In addition, concrete floor slabs will move vertically, therefore, adherence to those recommendations which isolate floor slabs from columns, walls, partitions or other structural components is extremely important, if damage to the superstructure is to be minimized. Any subsequent owners should be apprized of the soil conditions and advised to maintain good practice in the future with regard to surface and subsurface drainage and partition framing, drywall and finish work above floor slabs.

Geoquest, LLC does not assure that the contractor and/or homeowner will comply with the recommendations provided in this report. Geoquest, LLC provides recommendations and requirements only and does not supervise, direct or control the implementation of such.

COLD TEMPERATURE CONSIDERATIONS

1. Concrete shall not be placed upon frozen soil.
2. Concrete shall be protected from freezing until it has been allowed to cure for at least 7 days after placement in forms.
3. Snow or other frozen water shall not be allowed in the forms during placement of concrete.

COLD TEMPERATURES CONSIDERATIONS (CONTINUED)

4. Concrete shall be cured in forms for at least 72 hours.
5. The site shall be kept well drained at all times.

SURFACE DRAINAGE

After construction of foundation walls, the backfill material shall be well compacted to 80% Modified Proctor density, to prevent future settlement. Any areas that settle after construction shall be filled to eliminate ponding of water adjacent to the foundation walls. The finished grade shall have a positive slope away from the structure with an initial slope of 6" in the first 10'. If a 10' zone is not possible on the upslope site of the structure, then a well defined swale should be created a minimum of 5' from the foundation and sloped parallel with the wall at a 2% grade to intercept the surface water and carry it around and away from the structure. Homeowners shall maintain the surface grading and drainage installed by the builder to prevent water directed in the wrong direction. All downspouts shall have splash blocks that will remove runoff to outside the foundation area and carried across backfill zones. No irrigation devices shall be placed within 7' of the foundation. Shrubs and plants requiring minimal watering shall be established in this area. Irrigated grass shall not be located within 5' of the foundation. Sprinklers shall not discharge water within 5' of the foundation. Irrigation should be limited to the minimum amount sufficient to maintain vegetation. Application of more water will increase likelihood of floor slab and foundation movement.

SUBSURFACE DRAINAGE

The necessity for perimeter drains will be determined at the time of the Open Hole Observation.

REINFORCING

The concrete foundation walls shall be properly reinforced as per the specific design for this foundation by a Professional Engineer. Exact requirements are a function of the design of the structure. Questions concerning the specific design requirements shall be referred to the design engineer.

FOOTING DESIGN

The design for footings for this structure is determined by applying the dead load and full live load to the foundation walls.

CONSTRUCTION DETAILS

It is necessary with any soils investigation to assume that the materials from the test holes are representative of the materials in the area. On occasion variations in the subsurface materials do occur, therefore, should such variations become apparent during construction, the owner is advised to contact this office for a determination as to whether these variations will affect the design of the structure's foundation. If clay layers are observed during the excavation for the dwelling, this office should be contacted to determine whether the layers will adversely affect the design.

MINIMUM MATERIALS SPECIFICATIONS

1. Minimum materials specifications of the concrete, reinforcing, etc., shall be determined by the Professional Engineer.
2. Compact beneath foundation walls a minimum of 95% Modified Proctor density to prevent settlement.
3. Compact all backfill material located around the perimeter of the foundation to a minimum of 80% Modified Proctor density.
4. Concrete shall be vibrated or rodded in forms to avoid segregation and cold joints.
5. The site shall be kept well drained at all times.

OPEN HOLE OBSERVATION (added cost)

If anyone other than Geoquest performs the Open Hole Observation, that person/company assumes liability for the soils, and any possible changes to the foundation design.

The owner, or a representative of the construction company shall contact **Geoquest, LLC**, a minimum of **24 hours** prior to excavating for the foundation. An Open Hole Observation must be performed on each individual structure prior to the placement of concrete, and preferably prior to the placement of forms in the excavated area. **The failure to request or obtain an Open Hole Observation prior to the placement of foundation components may result in this Soils Report being declared null and void.** This is to insure that soft areas, anomalies, etc., are not present in the foundation region. At the time of the open hole observation the **foundation type recommendations, maximum allowable bearing capacity may be revised** according to soil conditions found at that time. If revisions are made to the Soils Report Due to the soil conditions of the excavation, **the Foundation Design Engineer must be notified of all revisions.**



DRILL LOGS

JOB #: 17-0566	DEPTH (in ft.)	SYMBOL	SAMPLES	BLOW COUNT	WATER %	SOIL TYPE
TEST BORING NO.: TH-1						
DATE: 6/26/2017						
0"-15' Sand (SM) Fine-coarse grained Low-moderate density Moderate-high moisture content Low-moderate clay content Low plasticity Brown color	2					
	4			19 12"	13.5	SM
	6					
	8					
	10					
	12			18 12"	9.9	SM
	14					
	16					
	18					
	20					

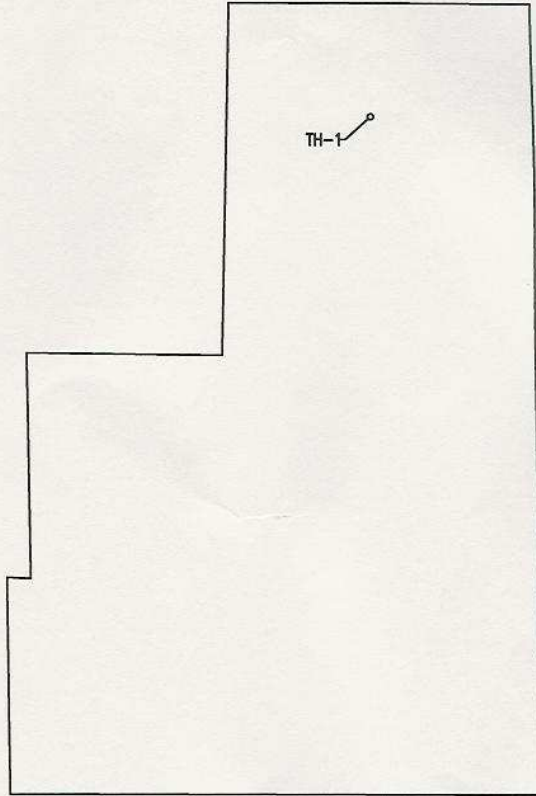
JOB #:	DEPTH (in ft.)	SYMBOL	SAMPLES	BLOW COUNT	WATER %	SOIL TYPE
TEST BORING NO.: TH-						
DATE:						
	2					
	4					
	6					
	8					
	10					
	12					
	14					
	16					
	18					
	20					

GEOQUEST LLC

SITE MAP

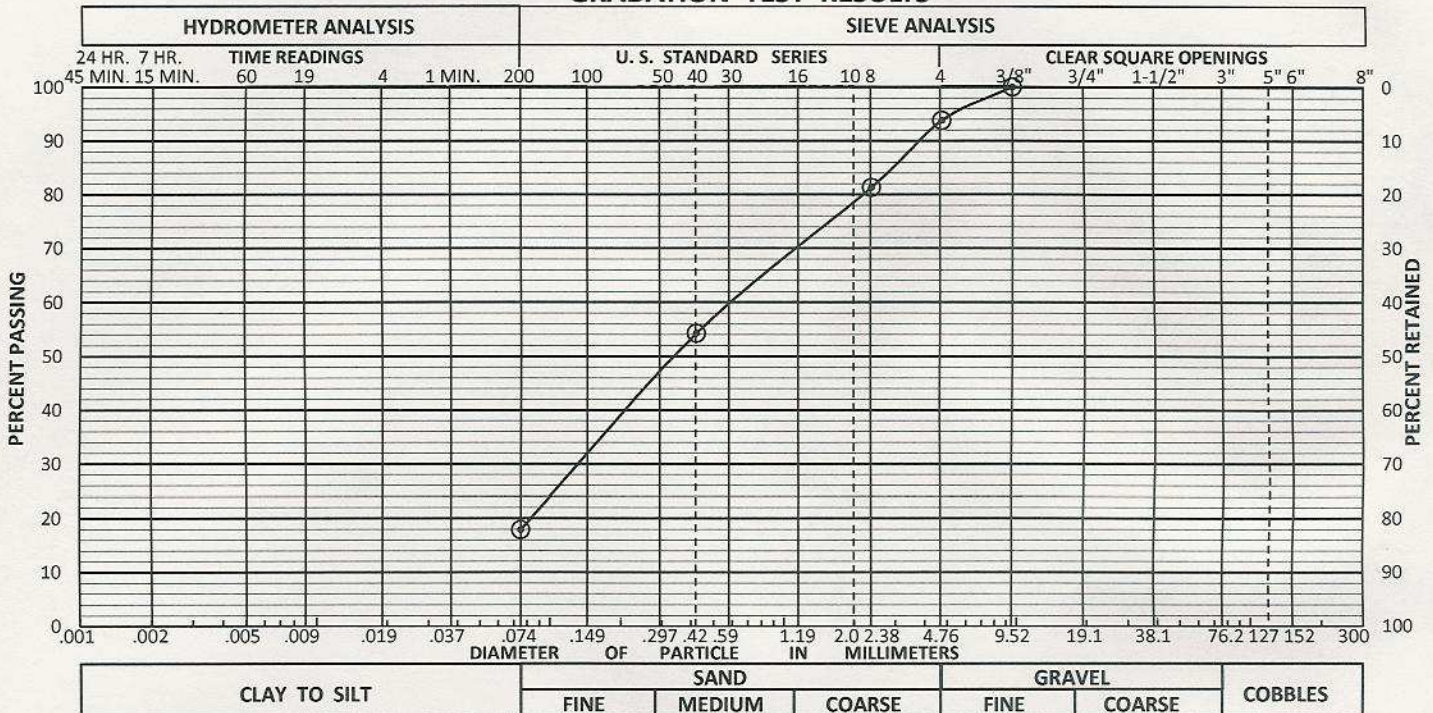
6385 Vessey Rd.
El Paso County,
Colorado,
Job #17-0566

Vessey Rd.



0 50 150 250
GRAPHIC SCALE IN FEET
SCALE: 1" = 250'

GEOQUEST LLC GRADATION TEST RESULTS



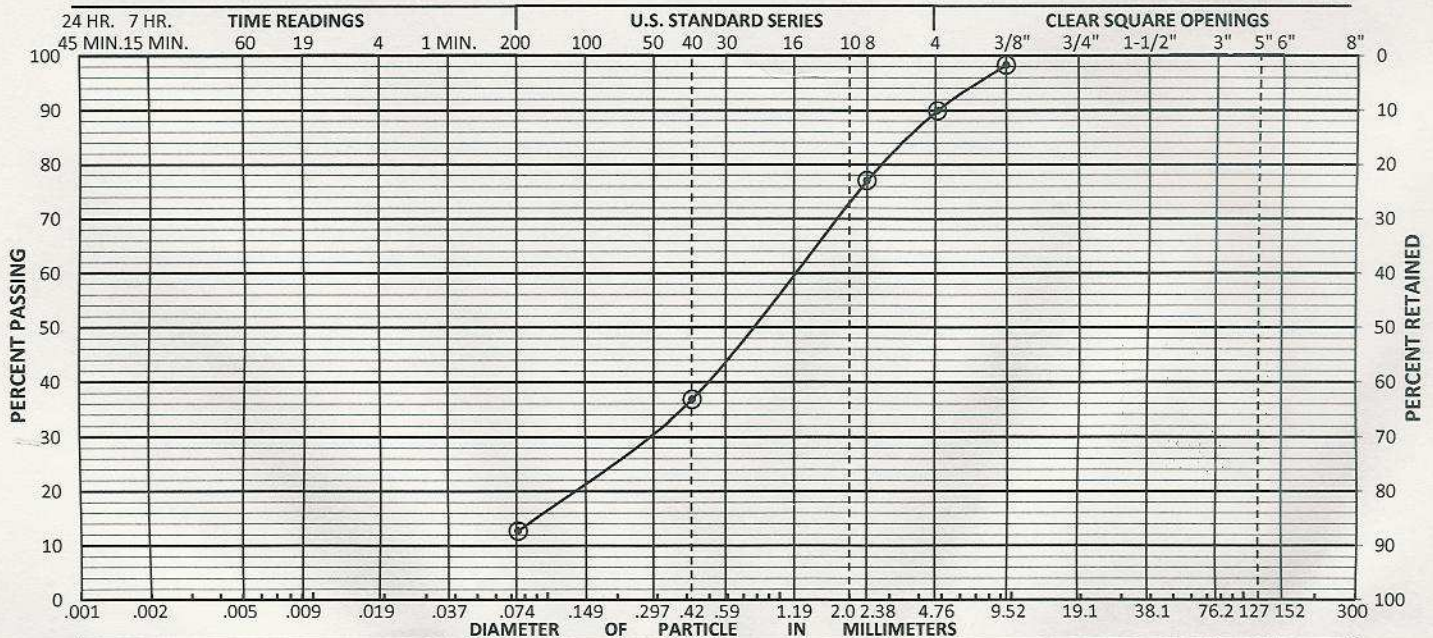
CLAY TO SILT	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

CLASSIFICATION SM

NOTES: 13.5 % Moisture Content

GRAVEL 6.2 %
SAND 75.9 %
FINES 17.9 %

SAMPLE # 1 HOLE # TH-1 DEPTH 3 FEET



CLAY TO SILT	SAND			GRAVEL		COBBLES
	FINE	MEDIUM	COARSE	FINE	COARSE	

CLASSIFICATION SM

NOTES: 9.9 % Moisture Content

GRAVEL 10.1 %
SAND 77.2 %
FINES 12.7 %

SAMPLE # 1 HOLE # TH-1 DEPTH 12 FEET

Job #: 17-0566 By: MJ

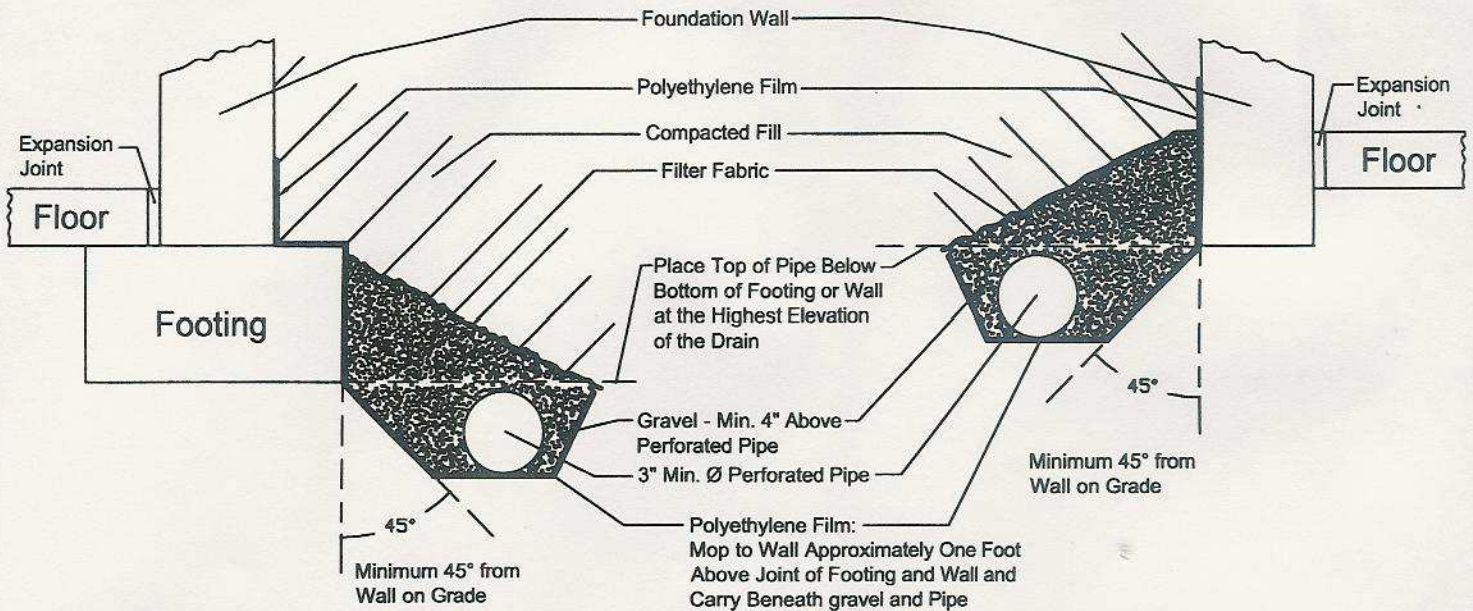
6/26/2017



EXTERIOR DRAIN DETAIL

SPREAD FOOTING TYPE

WALL ON GRADE TYPE



1. Gravel to be Not More Than 1-1/2" and Not Less Than 1/2" Diameter.
2. Perforated Pipe Diameter Varies With Expected Seepage. 3" \emptyset and 4" \emptyset are Most Common. ABS and PVC are Most Common Materials for Pipe.
3. Pipe to be Laid out in a Minimum Slope of 1" in 10'.
4. Gravity Outfall is Desired if Possible. Portion of Pipe in Area Not Drained Shall be Non-Perforated. Daylight Must be Maintained Clear of Debris in Order to Function Properly.
5. If Gravity Outfall is Not Possible, Provide a Sump With Operational Pump. Pump May Not Connect to Any Sanitary or Storm Sewer.
6. Soil Backfill Should be Compacted to at Least 80% of the Modified Proctor Density in the Upper Three Feet of Fill.
7. Filter Fabric to be Mirafi 140s or Approved Equivalent. Roofing Felt and Sheet Plastic are Not Acceptable.
8. Drain Pipe Shall be Laid Below Protected Area, as Shown in The Detail Above.
9. Mop Polyethylene Film to Wall Approximately One Foot Above Joint of Footing and Wall and Carry Beneath Gravel and Pipe.
10. The Polyethylene Film Shall be Continued to the Edge of the Excavation.

LIMITATIONS

This report is issued based on the understanding that the owner or his representative will bring the information, data, and recommendations contained in this report to the attention of the project engineer and architect, in order that they may be incorporated into the plans for the structure. It is also the owner's responsibility to ensure that all contractors and sub-contractors carry out these recommendations during the construction phase.

This report was prepared in accordance with generally accepted professional geotechnical/engineering methods. However, Geoquest, LLC makes no other warranty, express or implied, as to the findings, data, specifications, or professional advice rendered hereunder.

This report is considered valid as of the present date. The owner acknowledges, however, that changes in the conditions of the property might occur with the passage of time, such as those caused by natural effects or man-made changes, both on this land and on abutting properties. Further, changes in acceptable tolerances or standards might arise as the result of new legislative actions, new engineering advances, or the broadening of geotechnical knowledge. Thus certain developments beyond our control may invalidate this report, in whole or in part.

This report and its recommendations do not apply to any other site than the one described herein and are predicated on the assumption that the soil conditions do not deviate from those described. In the event that any variations or undesirable conditions should be detected during the construction phase or if the proposed construction varies from that planned as of this report date, the owner shall immediately notify Geoquest, LLC in order that supplemental recommendations can be provided, if so required.