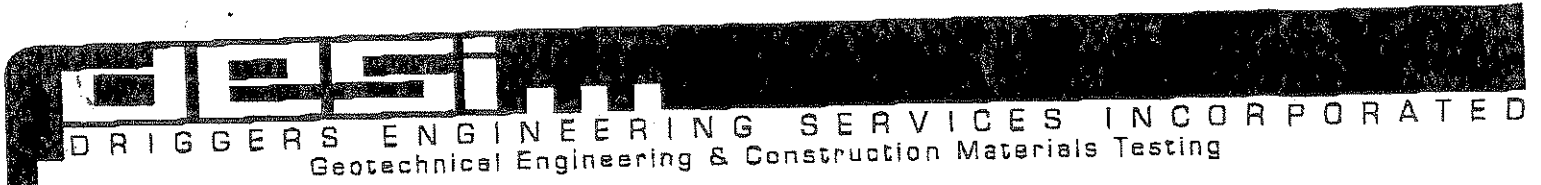


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## FAX TRANSMISSION COVER SHEET

DATE: 10/25/04  
Attn: Steve Gamm  
TO: Beazer Homes - Tampa Division  
FAX: 813/663-9493  
Results of Test Pit Excavations  
RE: Proposed Townhouse Development; Countryside Executive Golf Course  
Pinellas County, FL  
OUR FILE: DES 045290  
SENDER: Wayne S. Driggers, P.E. - Project Engineer

YOU SHOULD RECEIVE [ 7 ] PAGE(S) INCLUDING THIS COVER SHEET.  
IF NOT RECEIVED, PLEASE CALL:  
727-571-1313

MAIL COPY TO FOLLOW: [ x ] YES [ ] NO



Beazer Homes  
2630 S. Faulkenburg Road  
Riverview, Florida 33569

October 25, 2004

Attention: Mr. Steve Gamm

RE: Results of Test Pit Excavations  
Proposed Townhouse Development  
Countryside Executive Golf Course  
Pinellas County, Florida  
Our File: DES 045290

Dear Mr. Gamm:

Pursuant to our original report, dated September 16, 2004, we have completed a series of twenty-four (24) test pits throughout the limits of the construction area. The purpose of the test pits was to investigate the general make-up of the apparent debris and organic soils identified within some of our borings.

### FOUNDATION CONDITIONS

The results of the test pits have revealed two (2) conditions that warrant consideration when evaluating potential earthwork impacts. These conditions include debris-laden soils within portions of the site and other areas where a shallow, variably organic zone was identified.

**DEBRIS-LADEN SOILS** - Several of the test pits have identified debris-laden soils beginning about 4 to 6 feet below grade and continuing to depths of 8 to greater than 14 feet below grade. At some of the borings, the debris started from at or near the surface. Please see the attached Table depicting the test pits that encountered soils with varying concentrations of debris.

The debris-laden materials consisted primarily of organic and highly organic sands mixed with variable concentrations of roots, stumps and vegetative materials. This debris-laden soil has the potential for nested voids and poorly densified zones which could produce significant

settlement. Also long-term settlements can occur resulting from decomposition of buried logs, stumps and roots. Utilization of conventional footing and slab-on-grade construction could result in unacceptable total and differential settlements over the life of the structure. Accordingly, where these materials occur beneath the structure or are present within close proximity to the foundation perimeter, alternatives must be employed to prevent the structure from undergoing unacceptable settlement.

**SHALLOW VARIABLY ORGANIC SOILS** - Some of the test pits and borings also identified a shallow variably organic zone. Organic contents typically ranged from about 3.5%, which is considered acceptable to greater than 8% which is considered excessive. Organic contents in the 5% to 6% range is considered marginal and requires careful examination to determine whether the materials will require removal beneath structures.

This shallow organic zone likely represents the previous ground surface prior to the application of fill utilized to develop the present grades. Such zones can occur sporadically in varying thicknesses as noted in our pattern of borings. Depending on the lateral and vertical extent of the zone and the organic content, the organic soils may require removal to prevent unacceptable total and differential settlement.

### **FOUNDATION ALTERNATIVES**

The alternatives for structure support would include either over-excavation and replacement of these problematic materials or a pile foundation system including a structurally supported floor to transfer the structural loads below these materials.

**PILE FOUNDATIONS** - With regard to piling, treated timber piling having a minimum tip diameter of 8 inches and a butt diameter of not less than 10 inches should be capable of developing an allowable axial compressive resistance of at least 15 tons when penetrated to a depth of 25 feet below grade. Also, 10-inch and 12-inch, square prestressed concrete piles should be capable of developing compression capacities of greater than 30 to 40 tons, respectively. Should the decision be made to utilize a pile foundation system, deeper test borings will be warranted during the design stage to evaluate deeper subsurface conditions in order to provide the most cost effective alternatives.

It is recommended that dynamic pile driving formulae be utilized for control of pile penetration. It must be recognized that the installation of timber piles will impart some vibration. This vibration can cause minor settlements of adjacent structures if supported on shallow foundations. Accordingly, the pile driving contractor should certainly be cautioned with respect to special care that he must exercise in order to avoid potential damage to neighboring structures.

Your attention is directed to the fact that the potential exists for encountering large stumps or other debris which could damage and/or prevent penetration of piles to the required depth to bypass the debris zone. Therefore, the contractor should plan for the potential need for excavation equipment such as a track-hoe to remove these large debris, if necessary.

**OVER-EXCAVATION AND REPLACEMENT** - Where over-excavation and replacement is incorporated, the over-excavation of the debris-laden soils should be planned to depths of 10 to 15 feet including a margin of at least 10 feet outside the foundation perimeter. Following removal of the materials, suitable fill should be replaced and compacted to not less than 95% of the Modified Proctor maximum dry density per ASTM D-1557. Suitable fill soils would represent the SP to SP-SM Unified Soil Classification.

Your attention is directed to the fact that the excavations will likely extend below the groundwater table. The contractor must therefore plan for appropriate control and management of groundwater to maintain the excavation in a drained condition. This will likely require well points. Also, it may be beneficial to apply an initial, relatively thick lift of backfill not exceeding 24 inches to improve trafficability with compaction equipment. This initial lift should be carefully compacted utilizing a vibratory compactor having a minimum drum width of 36 inches. Compaction should consist of no less than ten (10) complete coverages in a criss-crossed pattern on this initial lift so as to achieve a minimum density of at least 95% of the Modified Proctor maximum dry density measured at the top of the fill lift and at a depth of 1 foot. Subsequent backfill soils may be placed and compacted in accordance with the fill placement recommendations presented herein.

It is recommended that a geotechnician be retained during this over-excavation operation to inspect the removal of the debris. This inspection will be important not only to check that all unsuitable materials are removed, but also avoid unnecessary removal of soils that do not exhibit inordinate settlement potential.

Following successful completion of the over-excavation and replacement operation, where necessary, shallow foundations may be designed based upon an allowable soil bearing pressure of up to 2,500 psf. We would anticipate that post-construction total and differential settlements should not exceed 0.5 inches. Where debris removal is not required, subgrade preparation should include careful stripping of the surficial vegetative material followed by proof-rolling with a heavy vibratory compactor.

It should also be recognized that shallow zones of variably organic soils were noted within many of the borings and test pits. These zones appear to be present within the upper 3 to 4 feet below present grade. Where over-excavation of these materials is necessary, a 5-foot margin outside the structure perimeter should be planned.

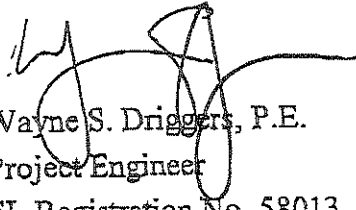
**NEED FOR FURTHER STUDY** - As discussed in our preliminary report, additional SPT borings will be necessary within each individual structure area possibly in conjunction with supplemental test pits to investigate foundation conditions. The studies conducted to date were intended to provide a general assessment of the subsurface conditions and allow analyses of the anticipated foundation concepts for the planned development. It must, therefore, be understood that the potential exists for encountering buried debris or otherwise deleterious materials within other portions of the site not identified within our widely spaced borings and test pits.

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**DRIGGERS ENGINEERING SERVICES, INC.** appreciates the opportunity to be of continued service to you on this project. Should you have any questions concerning our geotechnical recommendations, please do not hesitate to contact the undersigned at your convenience.

Respectfully submitted,

**DRIGGERS ENGINEERING SERVICES, INC.**



Wayne S. Driggers, P.E.

Project Engineer

FL Registration No. 58013

F. Jaime Driggers, P.E.

President

FL Registration No. 16989

WSD/FJD:wsd

WSD-REF\045290a

Copies submitted: (3)

**SUMMARY OF DELETERIOUS MATERIALS**

Test Pit Number	Depth to Deleterious Materials (ft)	Thickness of Deleterious Materials (ft)	Nature of Deleterious Material
TP-1	6.3	>8.0	Large roots and wood
TP-3	0	3.5	Large roots, tire, PVC, etc.
TP-6	4.0	>8.0	Large roots, stumps
TP-7	3.0	4.5	Palmetto, vegetative material
TP-8	3.0	6.0	Large roots, stumps
TP-10	2.0	0.8	Highly organic sands
TP-15	2.4	10.6	Roots, stumps, vegetative material, trace plastic
TP-16	3.8	8.7	Roots, vegetative material, trace plastic
TP-21	0	1.8	Highly organic sand
TP-23	3.0	8.0	Palmetto, stumps, vegetative material