

Section 4, Township 29 South, Range 18 East
Pinellas County, Florida
GRAPHIC SCALE



GEOTECHNICAL NOTES

- PRIOR TO ANY SITE GRADING, THE CONTRACTOR SHALL UNDERSTAND THE SUBSURFACE CONDITIONS OF THE SITE BY REVIEWING THIS SHEET OF THE DRAWINGS AND READING THE GEOTECHNICAL REPORTS. ANY QUESTIONS SHOULD BE ADDRESSED TO MR. RICHARD A. MORTENSEN, P.E. OF MORTENSEN ENGINEERING, INC., 5708 BENJAMIN CENTER DR., SUITE 120, TAMPA, FLORIDA 33634, (813) 889-8800.
- BASED ON THE ESTIMATED CLAY STRATA CONTOUR DEVELOPED FROM THE SUBSURFACE BORINGS, LOTS NORTH OF LINE A-A ON THE PLAN AT THE LEFT HAVE BEEN IDENTIFIED AS REQUIRING SPECIAL CONSIDERATION TO MAINTAIN THE RECOMMENDED CLAY/FOOTING SEPARATION.
- TO DETERMINE FINAL MINIMUM FINISHED LOT GRADES, THE GEOTECHNICAL CONSULTANT RECOMMENDS THAT TWO (2) AUGER BORINGS BE PERFORMED WITHIN EACH BUILDING PAD FOR EACH LOT NORTH OF LINE A-A. ALL BORING LOCATIONS SHALL BE STAKED IN THE FIELD BY THE PROJECT SURVEYOR, IN ORDER TO ACCURATELY DETERMINE THE TOP OF CLAY ELEVATION.
- ON SITE CLAY MATERIAL SHALL BE USED TO PROVIDE A GROUND WATER BARRIER AROUND DRY TREATMENT BASIN "A1" AND "B1". THE SECTIONS SHOWN ON THE PLAN FOR EACH BASIN SHALL BE USED AS A GUIDE TO CONSTRUCT THESE BASINS.
- THE ORGANIC SOILS FOUND ON THE SITE IDENTIFIED IN THE AREA SHOWN ON THE DRAWINGS, SHALL BE REMOVED PRIOR TO ANY FILLING.
- SUBSURFACE MATERIALS THAT ARE REQUIRED TO BE REMOVED FROM THE CONSTRUCTION SITE SHALL BE BURIED WITHIN THE LITTORAL SHELF OF THE WET TREATMENT BASINS, EXCHANGED FOR GOOD MATERIAL IN THE SIDE SLOPES OF THE BASINS, OR USED AS THE CORE OF THE BERMS DESIGNATED FOR MAINTENANCE OF THE TREATMENT BASINS.
- DURING CONSTRUCTION THE REQUIREMENT FOR UNDERDRAINS ALONG THE STREET SHALL BE RE-EVALUATED BY THE GEOTECHNICAL ENGINEER AND THE CITY TO: INSTALL AS SHOWN ON THE DRAWINGS, ELIMINATE, OR REQUIRE ADDITIONAL UNDERDRAINS TO SERVE THE SITE. THE CONTRACTOR SHALL FULLY COOPERATE WITH THE GEOTECHNICAL RECOMMENDATIONS.
- THE GEOTECHNICAL CONSULTANTS' RECOMMENDATIONS BASED ON THE PRELIMINARY SOILS STUDY AND SUBSEQUENT ANALYSIS PROVIDES SIX (6) RECOMMENDATIONS FOR THE CONSTRUCTION OF THE SITE, AND ARE LISTED BELOW.

The following items are noteworthy considering the test boring results on Plates 2 and 3 and in the Appendix, considering the anticipated construction:

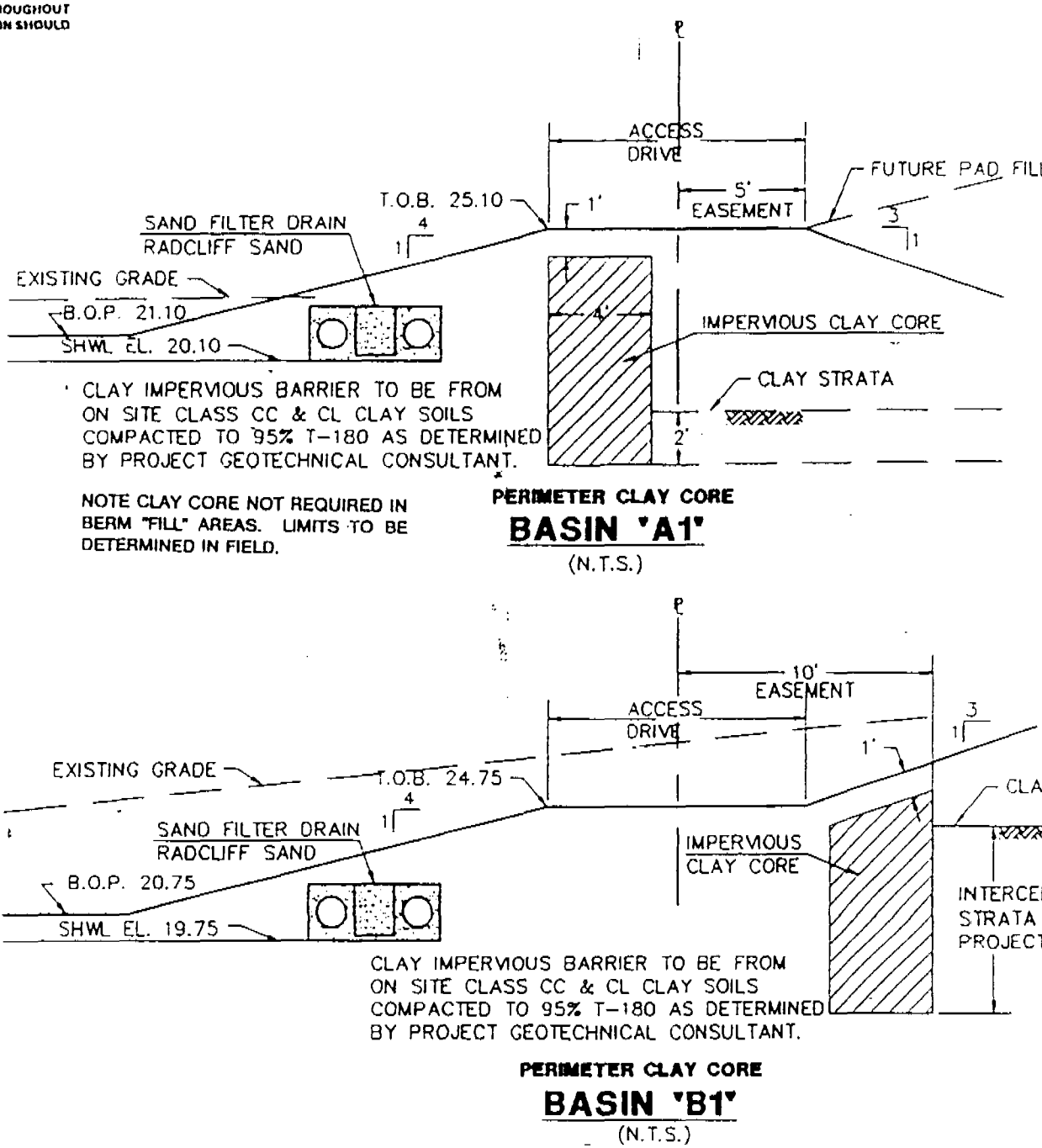
- Shallow plastic clay soils (Strata 7 and 8) were noted at borings PA-1, PA-2, HA-1 to HA-3, HA-5 to HA-7 and AB-3 to AB-9 in the northern half of the site, beginning initially at depths of 2 to 6 feet and extending to at least 12-1/2 to 15 feet deep. These clay soils are generally highly plastic and are of concern from a geotechnical house foundation system performance standpoint. We typically recommend as a minimum (and would for this project) that highly plastic clays (Strata 7 and 8) be at least 7 feet below house foundation bearing levels to minimize the risk of post-construction house wall or slab cracking due to clay activity (shrinking/swelling due to varying clay moisture contents); with some minor house foundation system enhancements to increase foundation wall cracking resistance due to differential subgrade movement. This minimum separation distance (with foundation enhancements) will not eliminate the risks related to clay activity; these considerations will however, reduce the risks to a more tolerable level which will be assumed by the site owner. At this time, because of the shallow clay concern, no cutting of the higher northern half of the site should be contemplated, except for cut necessary to remove and replace (to varying degrees) any shallow clays with suitable sands to the above minimum criteria at least in house building pad areas. If the above minimum considerations and risks are acceptable to the site owner, we need to be consulted for more specific earthwork recommendations on a lot by lot basis, after design plans have been prepared considering this report. Regarding roadway design, the shallow clay soils (Strata 6-8) should be a minimum of 2 feet below proposed pavement subgrade (bottom of base) levels.
- Because of shallow clayey soils over at least the northern half of the site, the clayey soils (Strata 6, 7 and 8) excavated during deeper utility pipeline excavations will not be suitable for reuse as trench backfill. The contractor should anticipate this requirement in his bid.
- Boring PA-9 (in Appendix) showed various soil/clay fills to 5-1/2 feet deep over at least 5 feet (+/-) of organic laden/debris laden sand (Stratum 9). It is apparent that some limited portion(s) of the lake on-site (at least along the western bank) has been refilled with various unacceptable soil/organic materials (unacceptable from a roadway and house subgrade support standpoint). The lateral and vertical extent of this unacceptable refilled portion of the lake needs to be determined during construction; it appears limited to a small area based on the results of AB-13 to AB-26. This unacceptable filled area(s), if it is a house (or pool) pad or roadway area, will require excavation and replacement with suitable compacted material prior to house or road construction.
- Shallow groundwater will be a significant design and construction issue over the lower southern half of the site, and of significance as "perched" groundwater overtop of clayey sands and clays (Strata 6 - 8) over the northern portion of the site. In the lower southern half of the site, in general, normal wet season groundwater levels (pre-development) should be anticipated 1 to 2 feet above the levels measured and reported herein. In the higher northern half of the site, where shallow clayey sands and clays (Strata 6 - 8) will have the potential for wet season groundwater levels "perched" overtop of the clayey soils at levels significantly higher than those reported herein, it should be anticipated (pre-development) that "perched" groundwater during normal wet seasons could be about 1 to 2 feet (+/-) above the top of the shallow clayey sand or clay stratum (Strata 6 - 8) depending upon the area on-site. Considering the retention pond area test borings herein HA-1 to HA-8, the following normal wet season (or "perched") groundwater levels (pre-development) should be anticipated:
 - HA-1: 2 feet (+/-) above the level reported herein. REVISED
 - HA-2: 1 to 1-1/2 feet (+/-) above the top of Stratum 7. REVISED
 - HA-3: 0.5 foot (+/-) above the top of Stratum 6.
 - HA-4: 2 feet (+/-) above the level reported herein.
 - HA-5: 1 to 2 feet (+/-) above the level reported herein.
 - HA-6: 1-1/2 to 2 feet (+/-) above the top of Stratum 7.
 - HA-7: 2 feet (+/-) above the level reported herein.
 - HA-8: 1 to 2 feet (+/-) above the level reported herein.

- Because of the presence of buried deleterious materials noted at PA-9 to at least 10 feet deep (+/-), it is our opinion that some limited Phase 2 environmental testing is warranted around the lake area during any subsequent site environmental assessment activities.
- Surficial clayey fill materials, often over buried organic topsoil materials were noted at boring locations AB-14 to AB-20 along the west side of the existing lake. These surficial clayey fill soils and the buried organic laden sands are unacceptable for conventional house foundation/slab support. These unacceptable materials should be completely removed from all building (and pool) pad and roadway areas prior to any new filling or house/road construction.

- SEE GEOTECHNICAL REPORT FOR ADDITIONAL BORING ALONG CENTERLINE OF STREET.
- AS OF JAN. 1995, P.S.I., INC. HAS BEEN RETAINED AS THE GEOTECHNICAL CONSULTANT FOR SITE CONSTRUCTION PURPOSES. CONTACT P.S.I. INC. 5801 BENJAMIN CENTER DRIVE, SUITE 12, TAMPA, FLORIDA 33634. ATTN: JOHN SANSONE.

SOIL PROFILES

VERTICAL SCALE:
AS NOTED



ON SITE DISPOSAL OF CLAY MATERIALS TO BE APPROVED BY ENGINEER.

SOURCE:
PROJECT GEOTECHNICAL CONSULTANT
MORTENSEN ENGINEERING, INC.
5708 BENJAMIN CENTER DR. SUITE 120
TAMPA, FL. 33634
TEL: 889-8806 FAX: (813) 889-0256
TECHNICAL REPORTS ARE AVAILABLE FOR REVIEW AT THE ENGINEERS OFFICE

TOPOGRAPHIC CONTOURS ARE BASED ON SWFWMD AERIALS. EXISTING FIELD GRADES HAVE BEEN SHOWN ON PROFILE SHEETS #5 AND #6 ALONG THE CENTER LINE ONLY. CLAY CONTOURS HAVE BEEN PROJECTED AS A GUIDE TO DETERMINE LOTS REQUIRING FURTHER INVESTIGATION AS REQUESTED BY THE CITY OF SAFETY HARBOR. CLAY CONTOURS ARE BASED UPON LIMITED FIELD DATA, AND MAY NOT REPRESENT ACTUAL FIELD CONDITIONS.

GEOTECHNICAL SITE DATA SHEET

McMULLEN - BOOTH ROAD

TOPO SOURCE: SWFWMD SHEET 4-29-16 DATED OCTOBER 1976 CHICAGO AERIAL SURVEY

OLD HARBOR PLACE

TOWERMARC CONSTRUCTION CORP.
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SHEET
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