# GULF CITIES TESTING & ENGINEERING

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February 3, 2009

Client: Broadmoor Design Group
Metairie, LA

Ref: Sof Riverine and Combatant Craft Operations Facility
Stennis Space Center
Hancock County, MS

Attn: Craig T. Seals

Dear Mr. Seals:

Gulf Cities Testing Laboratories has visited the above referenced Project Site and met with your representatives concerning excavation and backfill procedures to be utilized during construction.

Our first visit was for the purpose of securing suitable samples for Proctors and Soil Classifications. A list of these Proctors and Soil Classifications and location on the project site is as follows:

| | | | | | |
|---|---|---|---|---|---|
| 1. | Tan Fine to Medium Sand | (SW) | 115.2 | 11.1 | Submitted by Creel excavation |
| 2. | Tan Medium Sand | (SW) | 117.6 | 11.9 | S/W Ridge |
| 3. | Tan & Gray Silty Clayey Sand | (SW) | 122.8 | 12.3 | Military vehicle parking lot |
| 4. | White Coarse Sand | (SW) | 107.0 | 11.4 | South Bldg. area - 6'-8' depth |
| 5. | Dark Tan Clayey Sand | (SC) | 124.0 | 12.3 | South End hill at 3' |
| 6. | Brown & Tan Very Fine Silty Sand w/organic | (SC) | 125.6 | 12.4 | North Ridge |

A swell exists on the site south/west to a northeast direction. The majority of this swell, to a depth of approximately 2' contains organics and deleterious materials, however, it was obvious some areas of the swell had deeper stratums of unsuitable materials.

The Unified Soils Classification of the materials would classify as CH &MH, unsuitable for structural fill.

It is our opinion that 2' be excavated in the swell area, and a decision made and agreed upon by all parties if additional material be removed.

The higher elevations of the site (North & Southwest ridges) should not need more than 12" to 18" removed and can be used as a backfill in other areas of the site.

A coarse sand should be placed in the 1st 12" of the 2' cut. All fill materials should be placed in 8" lifts & compacted to 95% of Modified Proctor.

If additional information is needed please contact us.

SENIOR ENGINEERING TECHNICIAN
ASCET
NO 27906
LANNY N. LADNER

Respectfully Yours,

Lanny N. Ladner

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February 19, 2009

PROJECT : Sof Riverine & Combatant Operations Facility
Stennis Space Center
Hancock County, MS.

CLIENT : Broadmoor Design Group

SUBJECT: Recommendations for placement and Testing of Soils
Borrow Fill material

At the request of the Broadmoor Corp. we visited the jobsite on 2/13/09 to discuss methods and procedures for excavation of existing soil and placing and testing of soil fill materials. Accompanying the writer was T. E. Petermann a Construction Consultant, registered PE in the State of Mississippi. The following are his observations and comments:

" The site has been cleared and grubbed allowing an examination of the existing soil materials. Test pits have been dug to obtain additional samples and to examine the material for suitability. The typical sand clay select material available in this vicinity is capable of providing a densely compacted foundation pad for the buildings when placed under controlled conditions.
These prefabricated metal buildings constructed on a 2' thick foundation pad of this select fill will have negligible differential settlement. A qualified soils technician will observe the tests and placement of fill materials at the time earthwork operations are being performed. Soils determined to be unsuitable will be replaced with select material. Proof rolling will also be used to determine suitability of soils in place"

TESTING : Select fill material should be compacted in 8" lifts to 95% density as determined by ASTM D1557 (modified proctor) as it is being placed. Samples have been obtained and

laboratory results reported under separate cover. (see copy of soils report attached including unified soil classification) We trust this information will assist you in producing a satisfactory Soil foundation for this project in accordance with project specifications and industry standards.
We would be pleased to assist you in providing a qualified soils technician to witness proof rolling operations and in taking field density tests employing the latest technology (troxler nuclear guage)

Respectfully Submitted
Gulf Cities Testing Labs

Lanny Ladner
Senior Engineering Technician

w/attachment

SENIOR ENGINEERING TECHNICIAN
ASCET
27906
LANNY N. LADNER

T. E. Petermann, PE
Construction Consultant

THOMAS E. PETERMANN
REGISTERED PROFESSIONAL
ENGINEER
3285
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02-18-2009

# SOIL CLASSIFICATION CHART

| MAJOR DIVISIONS | | | SYMBOLS | | TYPICAL DESCRIPTIONS |
|---|---|---|---|---|---|
| | | | GRAPH | LETTER | |
| COARSE GRAINED SOILS | GRAVEL AND GRAVELLY SOILS | CLEAN GRAVELS (LITTLE OR NO FINES) | | GW | WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | | | | GP | POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE | GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES) | | GM | SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES |
| | | | | GC | CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES |
| MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE | SAND AND SANDY SOILS | CLEAN SANDS (LITTLE OR NO FINES) | | SW | WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES |
| | | | | SP | POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES |
| | MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE | SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES) | | SM | SILTY SANDS, SAND - SILT MIXTURES |
| | | | | SC | CLAYEY SANDS, SAND - CLAY MIXTURES |
| FINE GRAINED SOILS | SILTS AND CLAYS | LIQUID LIMIT LESS THAN 50 | | ML | INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY |
| | | | | CL | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS |
| | | | | OL | ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY |
| MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE | SILTS AND CLAYS | LIQUID LIMIT GREATER THAN 50 | | MH | INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS |
| | | | | CH | INORGANIC CLAYS OF HIGH PLASTICITY |
| | | | | OH | ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS |
| HIGHLY ORGANIC SOILS | | | | PT | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS |

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS