A GEOLOGICAL INVESTIGATION DATED SEPTEMBER 6, 1994 IS ON FILE WITH THE COUNTY ENGINEER. GUIDELINES FOR BUILDING FOUNDATIONS ARE CONTAINED IN THE REPORT AND SHALL BE FOLLOWED.

THE FOLLOWING IS A SUMMARY OF THE RECOMMENDATIONS OF THE GEOTECHNICAL INVESTIGATION BY LRA ENGINEERING DATED 9/6/94

A. Earthwork

1. Clearing and Site Preparation:

The site should be cleared of all obstructions including surface and subsurface structures, asphalt and gravel paving above and below ground utility lines; grass or weeds estimated to be two to four inches deep, roots greater than two inches in diameter left from the removal of the trees and debris.
After clearing, the portions of the site containing surface vegetation and organic laden topsoil should be stripped to an appropriate depth to remove these materials.

2. Subgrade Preparation:

After the site has been properly cleared and stripped and any necessary excavations made, the exposed soils in those areas to receive structural fill slabs-on-grade or pavements should be scarified to a depth of 6 inches, moisture conditioned to slightly above optimum water content and compacted to the requirements for structural fill.

3. Material for fills:

All on-site soils below the stripped layer and having an organic content of less than 3 percent by volume can be used as fill. However, all fill placed at the site including on-site soils should not contain more than 15 percent rocks or lumps larger than 2.5 inches. In addition, the required import fill should be predominantly granular with a plasticity index of 7 or less.

4. Compaction:

All structural fill less than 5 feet thick should be compacted to at least 90 percent relative compaction as determined by the ASTM Test Designation D1557-78, except for the upper 12 inches of subgrade soils under pavements which should be compacted to at least 95 percent relative compaction. Fill material should be spread and compacted in lifts not exceeding 8 inches in uncompacted thickness.

5. Trench Backfill:

Pipeline trenches should be backfilled with fill placed in lifts of approximately 8 inches. Imported sand can also be used for backfilling trenches provided it is compacted to at least 90 percent relative compaction. In slab and pavement areas, the upper 3 feet of trench backfill should be compacted to at least 90 percent relative compaction for on-site soils, and 95 percent where imported sand backfill is used.

6. Drainage:
Positive surface gradients should be provided adjacent to the building so as to direct surface water away from foundations and slabs toward suitable discharge facilities.

7. Construction during wet weather:

If construction proceeds during or shortly after wet weather conditions, the moisture content of the on-site soils may be appreciably above optimum. Consequently, subgrade preparation, placement and/or reworking of on-site soils as structural fill may not be possible. Alternative wet weather construction recommendations will be provided by the soils engineer in the field at the time of construction, if appropriate.

8. Guide Specifications:

All earthwork should be performed in accordance with the Guide Specifications Site Earthwork presented in Appendix A of the soils report.

B. Foundations

1. Footings:

We recommend that the use of one of the following two alternative foundation systems. The two alternative types are conventional continuous footings for the northern area and rigid mat foundations system for the southern area where soft and compressible material was encountered.

Conventional Continuous Footings:

At the above depths, the footings bearing on undisturbed natural soils or compacted fill can be designed for allowable bearing pressures of 1500 pounds per square foot due to dead loads plus live loads and may be increased by one-third for short term wind or seismic loads. These allowable bearing pressures are net values; therefore, the weight of the footing can be neglected for design purposes. Footings should not, however, have a width of less than 12 inches.

All continuous footings must be designed with both top and bottom reinforcing to provide structural continuity and permit spanning of local irregularities.

Final design of the foundations and feinforcing requirements shall be determined by a project structural engineer responsible for the foundation design.

Rigid Mat Foundation:

With this type of design, the slab on grade and foundations must be designed to act as a rigid mat. This can be accomplished with reinforcing steel, etc. The mat must be rigid enough to move as a unit as a result of differential settlement of the soil under the foundation. The above bearing values may be used for this type of foundation.

2. Interior Slabs-on-Grade:

A minimum of four inches of clean gravel well graded between a maximum size of 1 inch and a minimum size of ¼ inch should be placed beneath the slab on grade. Slab reinforcing should be designed by the structural engineer in accordance with the anticipated use and loading of the slab.

Where moisture through the slab would be detrimental, an impervious moisture barrier and/or capillary break should be provided between the slab and subgrade. If a moisture barrier is required, we recommend it consist of 4 inches of free-draining gravel covered with an impermeable membrane placed between the subgrade and the slab. The membrane should be covered with 2 inches of sand to protect it during construction, and the sand should be lightly moistened just prior to placing the concrete.

3. Lateral Loads:

Lateral load resistance for the retaining structures can be developed in friction between the foundation bottom and the supporting subgrade. A friction coefficient of 0.35 is considered applicable. As an alternative, a passive resistance equal to an equivalent fluid weighting 300 pounds per cubic foot acting against the retaining structures may be used.

Retaining walls that are completely drained and free to rotate can be designed using an active pressure of 40 pounds per cubic foot equivalent fluid pressure.

C. Construction Observations:

The analysis and recommendations submitted in this report are based in part upon data obtained from the five soil borings. The nature and extent of variations between the borings may not become evident until construction. If variations then become apparent, it will be necessary to re-evaluate the recommendations of this report.

ADDITIONAL INFORMATION SHEET

FOR

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