FOUNDATION AND SOILS | Engineering, Inc.

mike #er325

November 3, 1994
Commission No. 2449-01-01-02B

Brittany Knolls Land L.L.C.
c/o Western States Consultants, Inc.
5555 DTC Parkway, Suite C-3009
Englewood, Colorado 80111

RE: Revised Pavement Recommendations for a portion of Brittany Knolls First Filing, Larimer County, Colorado

Gentlemen:

As you know, we have made recommendations for the pavement for the roadway in our letters (2449-01-01-02, dated September 29, 1994 and 2449-01-01-02A, dated October 28, 1994). Our design was based on an R-value of 12.9. The City of Fort Collins Engineering Department disagreed with the test results and requested an additional R-value for comparison. The Engineering Department also requested a swell-consolidation test on the subgrade soils although expansion pressure tests were conducted for the R-value test. They also requested clarification of why a perched water table is not anticipated on the street subgrades.

This letter is to address these concerns and provide alternative recommendations so that the paving project may be completed in a timely manner. We have conducted two (2) swell-consolidation tests on the subgrade soils as requested by the City of Fort Collins. The swell tests indicate 0.2% to 0.3% swell at a 500 psf surcharge on both samples. We consider this to be insignificant swell. Therefore, no special procedures (other than controlling the moisture contents) need be taken during the paving preparation. We have arbitrarily used an R-value of 5, which is the lowest reportable R-value, for this revised design. Using an R-value of 5, we make the following revisions.

	Option 1	Option 2	Option 3
HBP	3"	4"	6"
ABC	12"	7"	--
TOTALS	15"	11"	6"

The City Engineers prefer to have roadbase underneath the pavement and not a full depth asphalt section. This is due to their perception that the soils on this site are highly expansive. Test data say otherwise. The roadbase would help the flexibility of the pavement structure should swelling of the subgrade occur. As discussed above, we feel that swelling will be minimal.

We feel that the formation of a perched water table on the subgrade is not anticipated. The reason for this is: 1) the bedrock is a siltstone/sandstone type and is not the impervious claystone-type bedrock where perched water tables are most often observed, and 2) most of the subgrade has been reworked during the installation of the sewer line, changing the structure of the materials and resulting in soil. We feel that these conditions are not conducive to the formation of a perched water table in shallow subgrade conditions.

We are providing this letter as an option so as to expedite the paving project. Your options are to either persuade the City of Fort Collins Engineers to accept the original pavement recommendations using the higher R-value of 12.9 (and conducting another R-value) or use these recommendations using the lower R-value of 5. It should be noted that the procedures used for design of the pavement structures were conducted in accordance with the City of Fort Collins Standards and CDOT Procedures.

Refer to the previous pavement recommendations for material requirements and other recommendations. If you have any questions, please feel free to call.

Respectfully,

Thomas W. Finley,
Engineering Geologist

Reviewed by:

COLORADO REGISTERED KEVIN WHITE PATTERSON 23841 PROFESSIONAL ENGINEER

Kevin W. Patterson, P.E.
FOUNDATION & SOILS ENGINEERING, INC.

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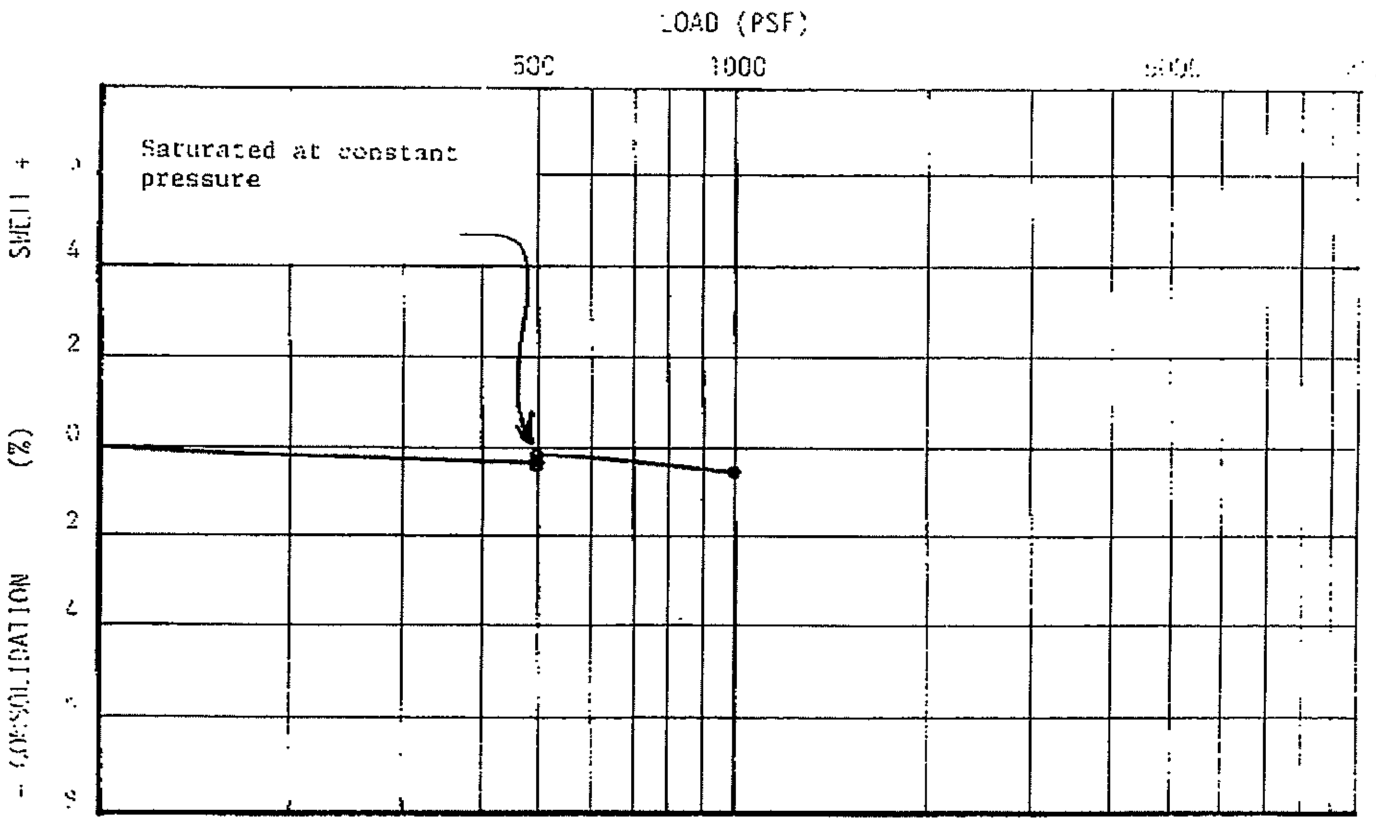
SWELL-CONSOLIDATION



SAMPLE OF Backfill-Clay & Siltstone FROM ~~TEST HOLE NO.~~ H. End Courtenet

AT DEPTH OF S.G. FEET NATURAL MOISTURE CONTENT 15.3 % NATURAL DRY DENSITY 111.6 PCF

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FIG. 1

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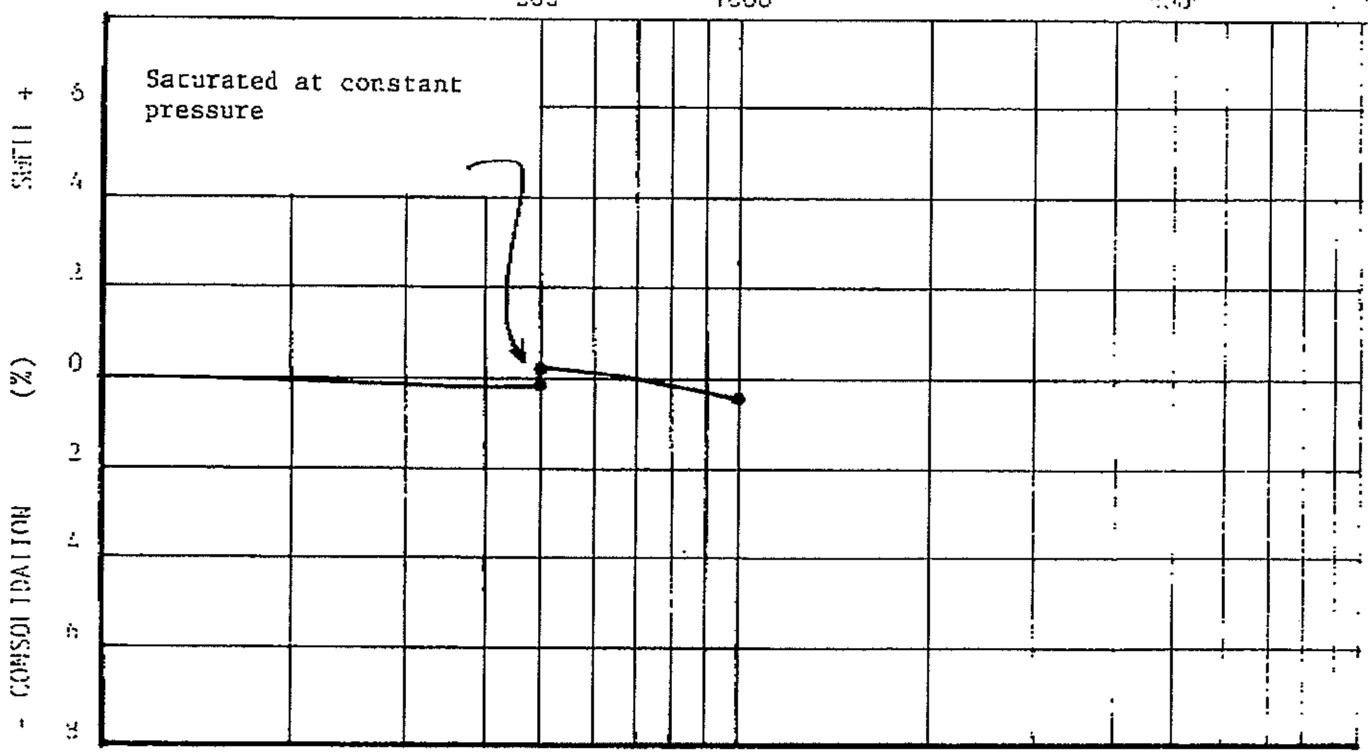
SWELL-CONSOLIDATION



SAMPLE OF Backfill-Sand, Clay & Siltstone FROM ~~TEST HOLE NO.~~ Courtney & Westbourn

DEPTH OF 5.6 FEET NATURAL MOISTURE CONTENT 15.2 NATURAL DRY DENSITY 109.6

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Fig. 2

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