Geotechnical Data Report
Laurel Street Pavements
Lounsbury & Associates
Anchorage, Alaska

February 2011

Submitted To:
Lounsbury & Associates
5300 A Street
Anchorage, Alaska 99518

By:

Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518
Phone: (907)561-2120
Fax: (907)561-4483
E-mail: klb@shanwil.com

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LAUREL STREET PAVEMENTS
LOUNSBURY & ASSOCIATES
ANCHORAGE, ALASKA

1.0 INTRODUCTION

This report presents the results of subsurface explorations and laboratory testing conducted by Shannon & Wilson, Inc. along Laurel Street in Anchorage, Alaska. The purpose of this geotechnical study was to gather geotechnical data for an evaluation of the road prism materials. To accomplish this, we advanced two geotechnical borings and soil samples recovered from the borings were tested in our Anchorage laboratory. Presented in this report are descriptions of the site and project, subsurface exploration and laboratory test procedures, and an interpretation of subsurface conditions.

Authorization to proceed with this work was received in the form of a signed proposal from Mr. Loren Becia of Lounsbury & Associates on January 19, 2011. Our work was conducted in general accordance with our January 14, 2011 proposal.

2.0 SITE AND PROJECT DESCRIPTION

The project is located near 3950 Laurel Street, along an approximately 150-foot long section of the roadway, in Anchorage, Alaska. The west side of Laurel Street is largely developed with medical/office complexes. The east side of Luarel Street is largely undeveloped. At the time of our explorations, the road surface was covered by snow and ice. The general topography slopes gently down toward the west, although Laurel Street is relatively flat-lying. A vicinity map indicating the general project location is presented as Figure 1. A site plan, included as Figure 2, shows prominent site features and the approximate boring locations.

Laurel Street is a two-lane road with curb and gutter along either side of the road. A sidewalk has been constructed along the western edge of the roadway. We understand that the current pavements in the area are experiencing distress and/or heaving and settlement and that these studies are intended to provide geotechnical data that will be used to evaluate whether there are soil conditions that may be contributing to the observed distress.

3.0 SUBSURFACE EXPLORATIONS

Subsurface explorations consisted of drilling and sampling two borings, designated Borings B-1 and B-2, at the site on February 10, 2011. The general boring locations were selected by Lounsbury & Associates to evaluate if conditions encountered by a previous study to the south on Laurel Street were persistent in the road section to the north. The boring locations, shown on Figure 2, were estimated using survey wheel measurements from existing site features. The surface elevations shown on the boring logs were estimated from the Municipality of Anchorage mapping website. Therefore the boring locations and the elevations reported on the boring logs should be considered approximate.

Drilling services for this project were provided by Denali Drilling of Anchorage, Alaska, using a truck mounted CME 55 drill rig. A geologist from our firm was present during drilling to locate the borings, observe drill action, collect samples, log subsurface conditions, and observe groundwater conditions.

The borings were advanced with $4^1/_4$-inch inner diameter (ID), continuous flight, hollow-stem augers to approximately 15.5 feet below ground surface (bgs). As the borings were advanced, samples were typically recovered using Standard Penetration Test (SPT) methods at 2.5-foot intervals to 10 feet bgs followed by a final sample at the bottom of the boring. In the SPT method, samples are recovered by driving a 2-inch outer diameter (OD) split-spoon sampler into the bottom of the advancing hole with blows of a 140-pound hammer free falling 30 inches onto the drill rods. For each sample, the number of blows required to drive the sampler the final 12 inches of an 18-inch penetration into undisturbed soil is recorded. Blow counts are shown graphically on the boring log figures as "penetration resistance" and are displayed adjacent to sample depth. The penetration resistance values give a measure of the relative density (compactness) or consistency (stiffness) of cohesionless or cohesive soils, respectively. A grab sample of the near-surface soils was collected from the auger cuttings in the upper 1.5 to 2 feet of the each boring.

Samples recovered during drilling were visually classified in the field using the Unified Soil Classification System, presented on Figure 3. The field soil classifications were verified through laboratory analysis for selected samples. Frozen soil classifications (consistent with the Corps of Engineers frozen soil classification system) based on visual evaluations were also estimated for frozen soils encountered in our borings. The frozen soil classification system is presented in

Figure 4. Frost classifications were estimated for samples based on laboratory testing (sieve analyses and hydrometers). Frost classifications shown on the boring logs are followed by the method of testing which was used to estimate them [percent finer than 0.02 millimeters (0.02Mil) for samples with hydrometer testing and percent passing the No.200 sieve (P-200) for the mechanical sieve results]. The frost classification system is presented in Figure 5. Summary logs of the borings are presented in Figures 6 and 7. The borings were backfilled with auger cuttings and the asphalt was repaired with asphalt "cold patch."

4.0 LABORATORY TESTING

Laboratory tests were performed on selected samples recovered from the borings to confirm field classifications and to estimate the index properties of the typical materials encountered. The laboratory testing was formulated with emphasis on estimating the material gradation, in-situ water content, and corrosion properties.

Water content tests were performed in general accordance with ASTM International (ASTM) D2216. The results of the water content measurements are presented graphically on the boring logs in Figures 6 and 7.

Grain size classification (gradation) testing was performed to estimate the particle size distribution of selected samples from the borings. The gradation testing generally followed the procedures described in ASTM C117/C136 and D422 for gradations with hydrometer testing. The test results are presented in Figure 8 and summarized on the boring logs as percent gravel, percent sand, and percent fines. Percent fines on the boring logs are equal to the sum of the silt and clay fractions indicated by the percent passing the No. 200 sieve. Note that hydrometer testing indicates particle size only and visual classification under USCS designates the entire fraction of soil finer than the No. 200 sieve as silt. Furthermore, plasticity characteristics (Atterberg Limits results) are required to differentiate between silt and clay soils under USCS.

5.0 SUBSURFACE CONDITIONS

The subsurface conditions encountered by our borings are presented graphically on the boring logs in Figures 6 and 7. In general, our borings encountered 2.5 to 3.2 feet of granular fill material overlying native silts and sands. Approximately 2 to 2.5 inches of asphalt underlain by about 2 inches of what appeared to be asphalt treated base was found at the ground surface.

At the time of drilling, the ground was frozen from the surface to approximately 6 feet bgs. Therefore penetration resistance values, shown on the boring logs, for the materials encountered in the frost zone are likely biased high due to frost bonding. The fill materials encountered consisted of frozen, slightly silty to silty, sandy gravel to gravelly sand with approximately 9.5 to 12.1 percent fines, based on laboratory testing. Beneath the fill in Boring B-1, the boring generally encountered silty sand with occasional gravelly zones to about 12.5 feet bgs. Based on penetration resistance values ranging from 21 to 23 blows per foot (bpf), the native soils encountered between the bottom of the frost zone to 12.5 feet bgs were typically medium dense. Beneath the fill in Boring B-2, the native soils generally comprise slightly sandy to sandy silt to about 8.5 feet bgs, followed by silty sand grading to gravelly, silty sand to 12.5 feet bgs. Penetration resistance values of 13 bpf were recorded below the frost zone and above 12.5 feet bgs in Boring B-2. These soils would be considered stiff for predominantly fine-grained soils and medium dense for the granular soils. In each boring, a dense layer of silty, gravelly sand was encountered from about 12.5 feet bgs to the bottom of the boring. Based on laboratory testing, fines contents in the native soils encountered ranged from approximately 42 to 76.5 percent. We also observed visible ice in samples recovered in the frost zone below the fill materials. The visible ice was segregated in the form of random crystals, nodules and thin seams. Groundwater [was encountered not encountered] during drilling.

6.0 CLOSURE AND LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives for evaluating the site as it relates to the geotechnical aspects discussed herein. The conclusions contained in this report are based on site conditions as they were observed on the drilling date. It is assumed that the exploratory borings are representative of the subsurface conditions throughout the site, i.e., the subsurface conditions everywhere are not significantly different from those disclosed by the explorations.

Unanticipated soil conditions are commonly encountered and cannot fully be determined by merely taking soil samples or advancing borings. Shannon & Wilson has prepared the attachments in Appendix A *Important Information About Your Geotechnical/Environmental Report* to assist you and others in understanding the use and limitations of the reports.

Copies of documents that may be relied upon by our client are limited to the printed copies (also known as hard copies) that are signed or sealed by Shannon & Wilson with a wet, blue ink signature. Files provided in electronic media format are furnished solely for the convenience of the client. Any conclusion or information obtained or derived from such electronic files shall be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, or you question the authenticity of the report please contact the undersigned.

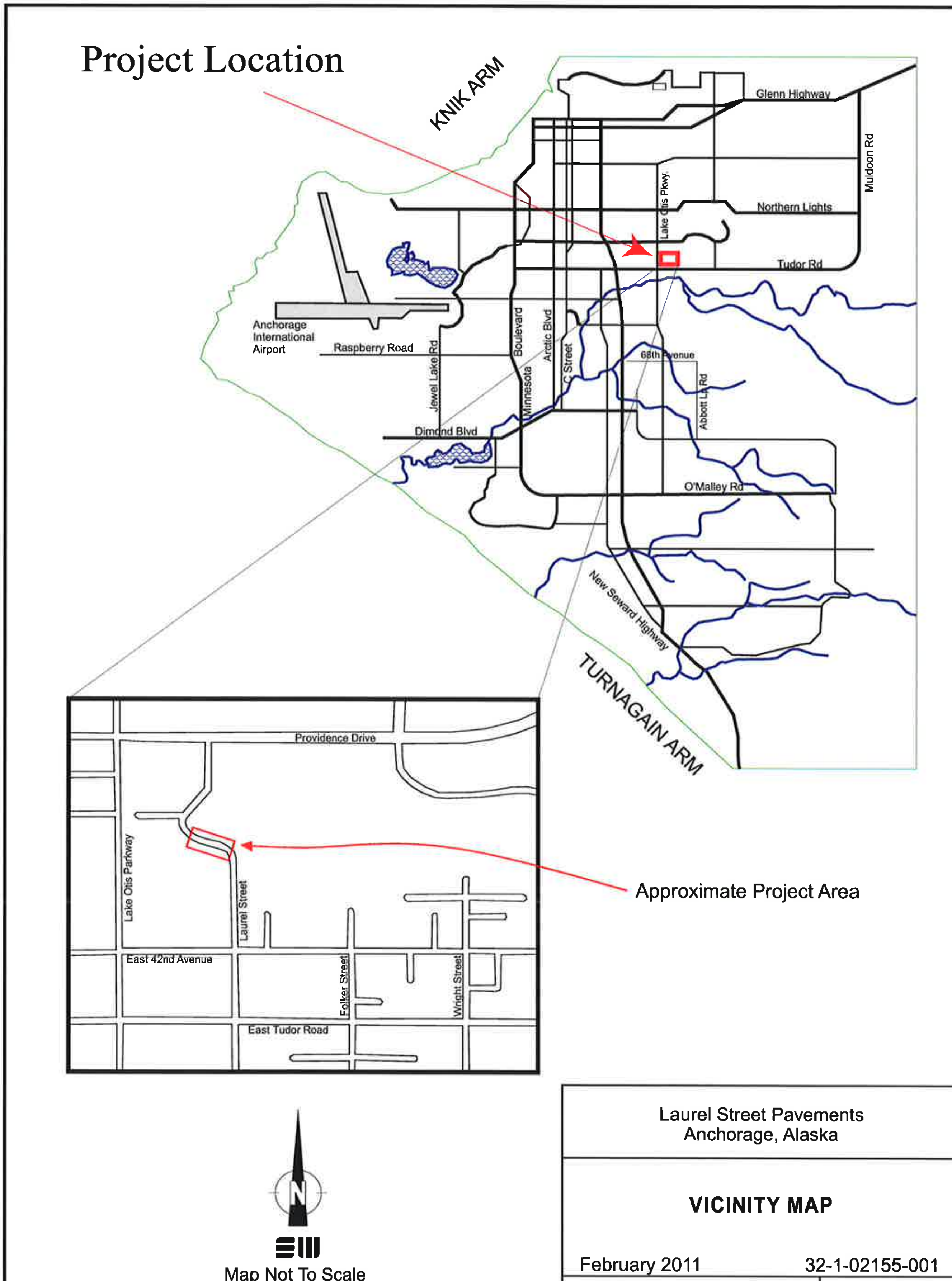
We appreciate this opportunity to be of service. Please contact the undersigned at (907) 561-2120 with questions or comments concerning the contents of this report.

SHANNON & WILSON, INC.

Ryan Collins
Geologist IV

Kyle Brennan, P.E.
Associate

RDC:KLB/sjg



Laurel Street Pavements
Anchorage, Alaska

VICINITY MAP

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FIG. 1

Drawing adapted from aerial imagery and gis layers provided by the Municipality of Anchorage

LEGEND

B-1 Approximate location of Boring B-1, advanced by Shannon & Wilson, Inc., February 2011

Laurel Street Pavements
Anchorage, Alaska

SITE PLAN

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FIG. 2

Unified Soil Classification System

GROUP NAME Criteria for Assigning Group Names and Group Symbols			Soil Classification Group Symbol with Generalized Group Descriptions	
COARSE-GRAINED SOILS more than 50% retained on No. 200 sieve	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	Clean GRAVELS Less than 5% fines	GW	Well-graded Gravels
			GP	Poorly-graded Gravels
		GRAVELS with fines More than 12% fines	GM	Gravel & Silt Mixtures
			GC	Gravel & Clay Mixtures
	SANDS More than 50% of coarse fraction passes No. 4 sieve	Clean SANDS Less than 5% fines	SW	Well-graded Sands
			SP	Poorly-graded Sands
		SANDS with fines More than 12% fines	SM	Sand & Silt Mixtures
			SC	Sand & Clay Mixtures
FINE-GRAINED SOILS 50% or more passes the No. 200 sieve	SILTS AND CLAYS Liquid limit 50% or less	INORGANIC	ML	Non-plastic & Low-plasticity Silts
			CL	Low-plasticity Clays
		ORGANIC	OL	Non-plastic and Low-plasticity Organic Clays Non-plastic and Low-plasticity Organic Silts
	SILTS AND CLAYS Liquid limit greater than 50%	INORGANIC	CH	High-plasticity Clays
			MH	High-plasticity Silts
		ORGANIC	OH	High-plasticity Organic Clays High-plasticity Organic Silts
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT	Peat

Descriptive Terminology Denoting Component Proportions

Description	Range of Proportion
Add the adjective "slightly"	5 - 12%
Add soil adjective[a]	12 - 50%
Major proportion in upper case, (e.g., SAND)	>50%

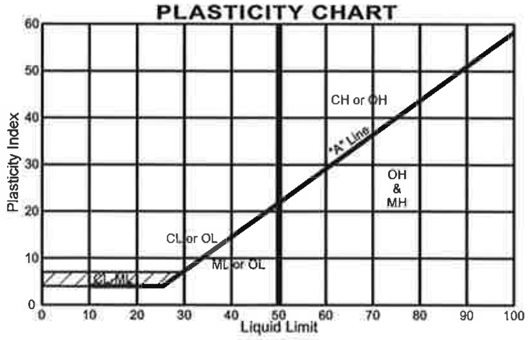
(a) Use gravelly, sandy, or silty as appropriate

NOTE: The soil descriptions used in the boring logs lists constituents from smallest percentage to largest percentage.

Organic Content

Adjective	Percent by Volume
Occasional	0-1
Scattered	1-10
Numerous	10-30
Organic	30-50, minor constituent
Peat	50-100, MAJOR constituent

PLASTICITY CHART



Laurel Street Pavements
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SOIL CLASSIFICATION LEGEND

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FIG. 3

DESCRIPTION AND CLASSIFICATION OF FROZEN SOILS

Part I Description of Soil Phase (a) (Independent of Frozen State)	Major Group: Description (2)	Major Group: Designation (3)	Sub-Group: Description (4)	Sub-Group: Designation (5)	Field Identification (6)	Pertinent Properties of Frozen Materials which may be measured by physical tests to supplement field identification (7)	Guide for Construction on Soils Subject to Freezing and Thawing: Thaw Characteristics (8)	Guide for Construction on Soils Subject to Freezing and Thawing: Criteria (9)
Part II Description of Frozen Soil	Segregated ice is not visible by eye (b)	N	Poorly Bonded or Friable	Nf	Identify by visual examination. To determine presence of excess ice, use procedure under note (c) below and hand magnifying lens as necessary. For soils not fully saturated, estimate degree of ice saturation: Medium, Low. Note presence of crystals, or of ice coatings around larger particles.	In-Place Temperature Density and Void Ratio a) In Frozen State b) After Thawing in Place Water Content (Total H_2O, including ice) a) Average b) Distribution Strength a) Compressive b) Tensile c) Shear d) Adfreeze Elastic Properties Plastic Properties Thermal Properties	Usually Thaw-Stable	The potential intensity of ice segregation in a soil is dependent to a large degree on its void sizes and may be expressed as an empirical function of grain size as follows: Most inorganic soils containing 3 percent or more of grains finer than 0.02 mm in diameter by weight are frost-susceptible. Gravels, well-graded sands and silty sands, especially those approaching the theoretical maximum density curve, which contain 1.5 to 3 percent finer than 0.02 mm by weight without being frost-susceptible. However, their tendency to occur interbedded with other soils usually makes it impractical to consider them separately.
			No excess ice	Nb: n				
			Well Bonded	Nb				
			Excess ice	Nb: e				
	Segregated ice is visible by eye. (Ice 1 inch or less in thickness) (b)	V	Individual ice crystals or inclusions	Vx	For ice phase, record the following as applicable: Location / Size Orientation / Shape Thickness Spacing / Pattern of arrangement Length Hardness } Structure } per part III Below Color } Estimate volume of visible segregated ice present as percent of total sample volume.		Usually Thaw-Unstable	Soils classed as frost-susceptible under the above criteria are likely to develop significant ice segregation and frost heave if frozen at normal rates with free water readily available. Soils so frozen will fall into the thaw-unstable category. However, they may also be classed as thaw-stable if frozen with insufficient water to permit ice segregation. Soils classed as non-frost-susceptible ("NFS") under the above criteria usually occur without significant ice segregation and are not exact and may be inadequate for some structure applications. Exceptions may also result from minor soil variations.
			Ice coatings on particles	Vc				
			Random or irregularly oriented ice formations	Vr				
			Stratified or distinctly oriented ice formations	Vs		Ice Crystal Structure (using optional instruments.) a) Orientation of Axes b) Crystal size c) Crystal shape d) Pattern of Arrangement		
Part III Description of Substantial Ice Strata	Ice (Greater than 1 inch in thickness)	Ice	Ice with soil inclusions	Ice + Soil Type	Designate material as ICE (d) and use descriptive terms as follows, usually one item from each group, as applicable: Hardness: Hard, Soft (mass, not individual crystals) Structure: Clear, Cloudy, Porous, Candled, Granular, Stratified Color: e.g.: Colorless, Gray, Blue Admixtures: e.g.: Contains Thin Silt Inclusions			
			Ice without soil inclusions	Ice		Same as Part II above, as applicable, with special emphasis on Ice Crystal Structure.		In permafrost areas, ice wedges, pockets, veins, or other ice bodies may be found whose mode of origin is different from that described above. Such ice may be the result of long-time surface expansion and contraction phenomena or may be glacial or other ice which has been buried under a protective earth cover.

DEFINITIONS:

Ice Coatings on Particles are discernible layers of ice found on or below the larger soil particles in a frozen soil mass. They are sometimes associated with hoarfrost crystals, which have grown into voids produced by the freezing action.

Ice Crystal is a very small individual ice particle visible in the face of a soil mass. Crystals may be present alone or in a combination with other ice formations.

Clear Ice is transparent and contains only a moderate number of air bubbles. (e)

Cloudy Ice is translucent, but essentially sound and non-pervious.

Porous Ice contains numerous voids, usually interconnected and usually resulting from melting at air bubbles or along crystal interfaces from presence of salt or other materials in the water, or from the freezing of saturated snow. Though porous, the mass retains its structural unity.

Candled Ice is ice which has rotted or otherwise formed into long columnar crystals, very loosely bonded together.

Granular Ice is composed of coarse, more or less equidimensional, ice crystals weakly bonded together.

Ice Lenses are lenticular ice formations in soil occurring essentially parallel to each other, generally normal to the direction of heat loss and commonly in repeated layers.

Ice Segregation is the growth of ice as distinct lenses, layers, veins and masses in soils, commonly but not always oriented normal to direction of heat loss.

Well-bonded signifies that the soil particles are strongly held together by the ice and that the frozen soil possesses relatively high resistance to chipping or breaking.

Poorly-bonded signifies that the soil particles are weakly held together by the ice and that the frozen soil consequently has poor resistance to chipping or breaking.

Friable denotes a condition in which material is easily broken up under light to moderate pressure.

Thaw-Stable frozen soils do not, on thawing, show loss of strength below normal, long-time thawed values nor produce detrimental settlement.

Thaw-Unstable frozen soils show on thawing, significant loss of strength below normal, long-time thawed values and/or significant settlement, as a direct result of the melting of the excess ice in the soil.

Modified from: Linell, K. A. and Kaplar, C. W., 1966, *Description and Classification of Frozen Soils*, Proc. International Conference on Permafrost (1963), Lafayette, IN, U.S. National Academy of Sciences, Publ. 1287, pp 481-487.

NOTES:

(a) When rock is encountered, standard rock classification terminology should be used.

(b) Frozen soils in the N group may on close examination indicate presence of ice within the voids of the material by crystalline reflections or by a sheen on fractured or trimmed surfaces. However, the impression to the unaided eye is that none of the frozen water occupies space in excess of the original voids in the soil. The opposite is true of frozen soils in the V group.

(c) When visual methods may be inadequate, a simple field test to aid evaluation of volume of excess ice can be made by placing some frozen soil in a small jar, allowing it to melt and observing the quantity of supernatant water as a percent of total volume.

(d) Where special forms of ice, such as hoarfrost, can be distinguished, more explicit description should be given.

(e) Observer should be careful to avoid being misled by surface scratches or frost coating on the ice.

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CLASSIFICATION OF FROZEN SOILS

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FIG. 4

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FROST CLASSIFICATION

(after Municipality of Anchorage)

GROUP		0.02 Mil.	P-200	USC SYSTEM (based on P-200 results)
NFS	Sandy Soils	0 to 3	0 to 6	SW, SP, SW-SM, SP-SM
	Gravelly Soils	0 to 3	0 to 6	GW, GP, GW-GM, GP-GM
F1	Gravelly Soils	3 to 10	6 to 13	GM, GW-GM, GP-GM
F2	Sandy Soils	3 to 15	6 to 19	SP-SM, SW-SM, SM
	Gravelly Soils	10 to 20	13 to 25	GM
F3	Sands, except very fine silty sands**	Over 15	Over 19	SM, SC
	Gravelly Soils	Over 20	Over 25	GM, GC
	Clays, PI>12			CL, CH
F4	All Silts			ML, MH
	Very fine silty sands**	Over 15	Over 19	SM, SC
	Clays, PI<12			CL, CL-ML
	Varved clays and other fined grained, banded sediments			CL and ML CL, ML, and SM; SL, SH, and ML; CL, CH, ML, and SM

P-200 = Percent passing the number 200 sieve
0.02 Mil. = Percent material below 0.02 millimeter grain size

*Approximate P-200 value equivalent for frost classification. Value range based on typical, well-graded soil curves.

** Very fine sand : greater than 50% of sand fraction passing the number 100 sieve

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Anchorage, Alaska

FROST CLASSIFICATION LEGEND

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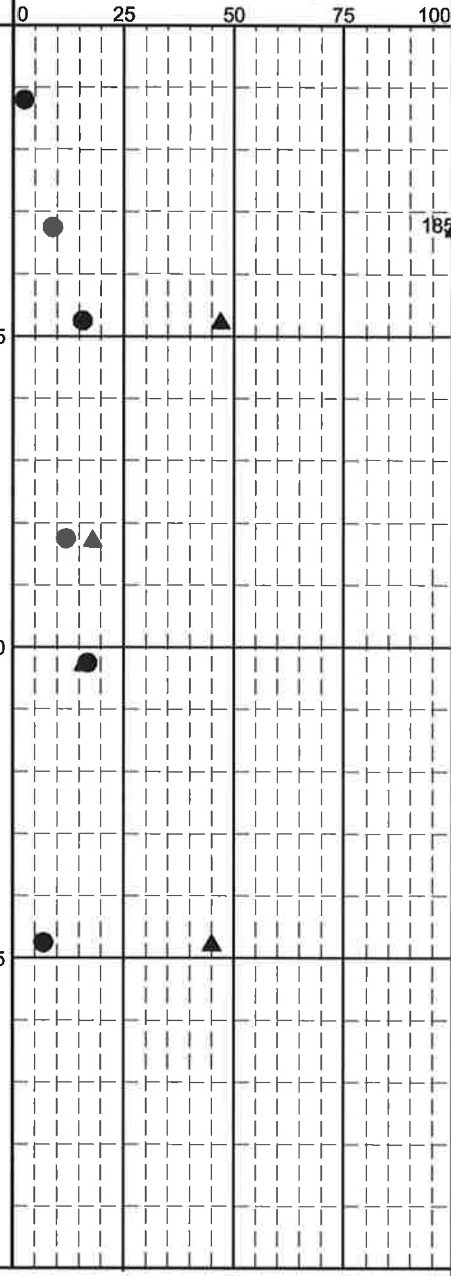
FIG. 5

MATERIAL DESCRIPTION	Depth, Ft.	Symbol	Samples	Ground Water	Depth, Ft.
Approx. Elevation: 148 Ft.					
Asphalt (2 to 2.5 inches)	0.2				
Asphalt treated base? (2 inches)	0.4				
S1: 45% Gravel, 43% Sand, 12% Fines (F1 (0.02 MI)) Frozen (Nf/Nbn), tan, silty, sandy GRAVEL to silty, gravelly SAND; moist [FILL] Occasional cobbles based on drill action and auger cuttings			S1		
S2: 25% Gravel, 47% Sand, 28% Fines (F3 (P200)) Frozen (Vs/Vr) to medium dense, tan, silty SAND to gravelly, silty SAND; moist to wet; occasional visible random ice crystals and seams in the frost zone; thawed from approximately 3.5 to 4 feet	3.2		S2, S3		5
S4: 16% Gravel, 42% Sand, 42% Fines (F3 (P200))			S4		
Lower gravel content from 10.5 to 12.5 feet			S5		10
Dense, gray, silty, gravelly SAND; moist	12.5		S6		15
Bottom of Boring Boring Completed February 10, 2011	15.5				

Groundwater not encountered during drilling on February 10, 2011

Penetration Resistance (140 lb. weight, 30" drop)
▲ Blows per foot
● Water Content (%)



LEGEND

- * Sample Not Recovered
- Grab Sample
- 2" O.D. Split Spoon Sample
- ■ Frozen

● Water Content (%)

Plastic Limit ├─●─┤ Liquid Limit

Natural Water Content

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

Laurel Street Pavements
Anchorage, Alaska

LOG OF BORING B-1

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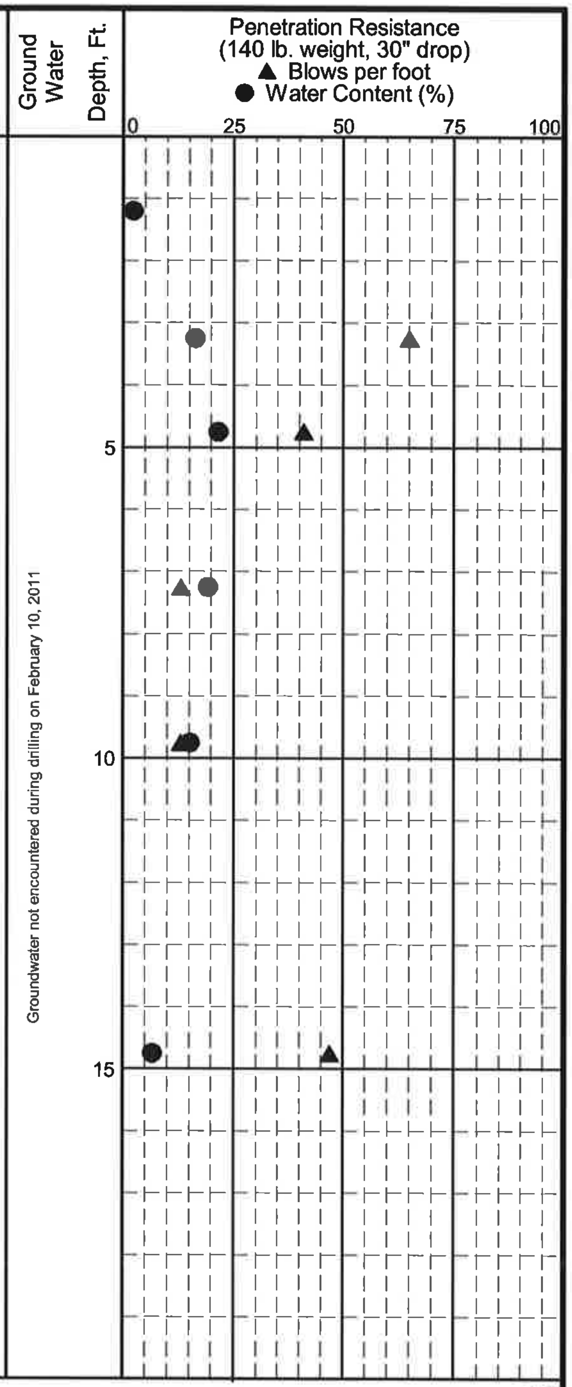
FIG. 6

MATERIAL DESCRIPTION	Depth, Ft.	Symbol	Samples	Ground Water
Approx. Elevation: 144 Ft.				
Asphalt (2.5 inches)	0.2			
Asphalt treated base? (2 inches)	0.4			
Frozen (Nf/Nbn), tan, slightly silty, gravelly SAND; moist [FILL] S1: 44% Gravel, 47% Sand, 10% Fines (F1 (0.02 Mil))			S1	
Frozen (Vs/Vr) to stiff, tan, slightly sandy to sandy SILT; moist to wet; frequent visible random ice crystals and seams in the frost zone S3: 76.5% Fines (F4 (P200))	2.5		S2, S3, S4	
Medium dense, tan, silty SAND to gravelly, silty SAND; moist Interbedded with frequent 0.5 to 1-inch silt layers from 8.5 to 10.3 feet Higher gravel content from 10.3 feet to 12.5 feet	8.5		S5	Groundwater not encountered during drilling on February 10, 2011
Dense, gray, silty, gravelly SAND; moist	12.5		S6	
Bottom of Boring Boring Completed February 10, 2011	15.5			



0 25 50 75 100

● Water Content (%)

Plastic Limit |—●—| Liquid Limit

Natural Water Content

LEGEND

- * Sample Not Recovered
- Grab Sample
- 2" O.D. Split Spoon Sample
- ▮ Frozen

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

Laurel Street Pavements
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LOG OF BORING B-2

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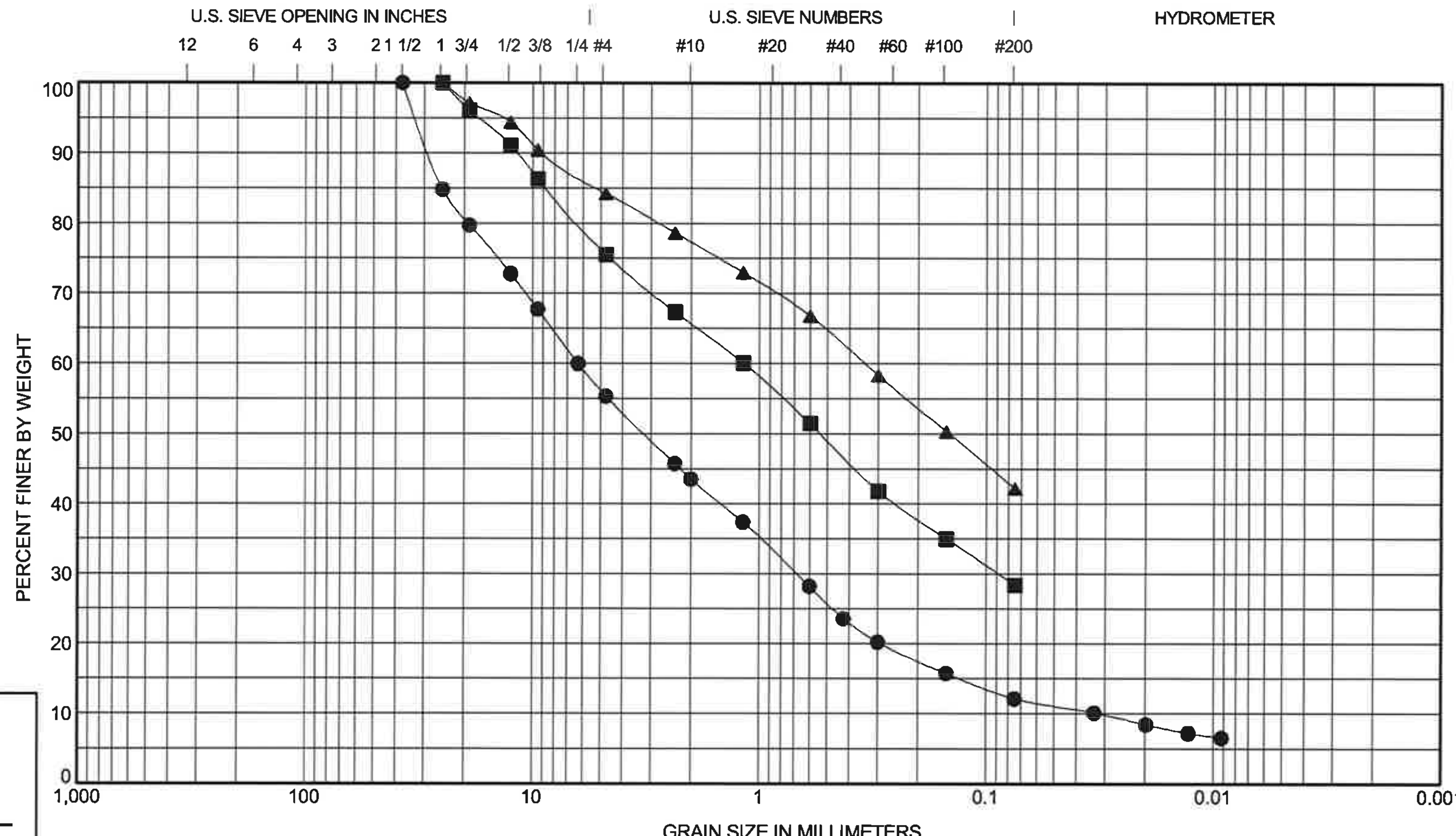
FIG. 7



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth, Ft	Classification	LL	PL	PI	Cc	Cu
●	B-1 S1	0.4 - 2.0	**Silty, sandy GRAVEL [GM]**				2.3	194.8
■	B-1 S2	2.5 - 4.0	**Silty, gravelly SAND [SM]**					
▲	B-1 S4	7.5 - 9.0	**Gravelly, silty SAND [SM]**					

	Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1 S1	0.4 - 2.0	37.5	6.31	0.68	0.03	45	43	12	
■	B-1 S2	2.5 - 4.0	25	1.18	0.09		25	47	28	
▲	B-1 S4	7.5 - 9.0	25	0.34			16	42	42	

Laurel Street Pavements
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GRAIN SIZE CLASSIFICATION

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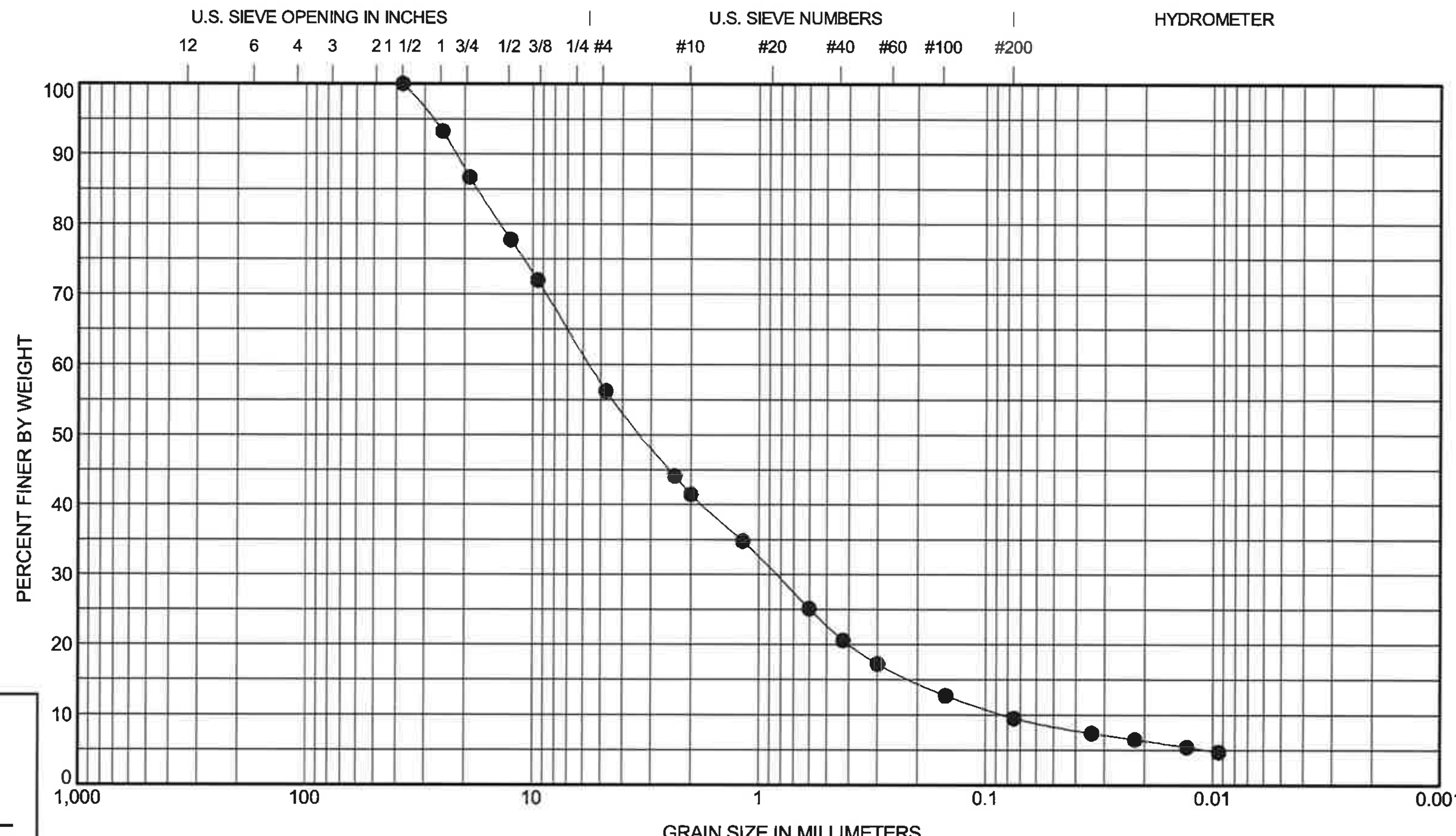
FIG. 8
Sheet 1 of 2



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample	Depth, Ft	Classification	LL	PL	PI	Cc	Cu
●	B-2 S1	0.4 - 2.0	**Slightly silty, gravelly SAND [SW-SM]**				**1.5**	**67.3**

	Sample	Depth, Ft	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-2 S1	0.4 - 2.0	**37.5**	**5.6**	**0.84**	**0.08**	**44**	**47**	**10**	

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Anchorage, Alaska

GRAIN SIZE CLASSIFICATION

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FIG. 8
Sheet 2 of 2

APPENDIX A

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to 32-1-02155-001

Date: February 2011
To: Lounsbury & Associates
Re: Laurel Street Pavements, Anchorage, Alaska

Important Information About Your Geotechnical/Environmental Report

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors, which were considered in the development of the report, have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland