

**August 24, 2005
ADDENDUM NO. 1**

TO

**PLANS, CONTRACT DOCUMENTS, AND TECHNICAL SPECIFICATIONS
DATED August 2005**

FOR

QUINLIN CREEK SEWER TRUNK MAIN PROJECT 2005

1. The addendum shall be considered to be part of the above referenced project and shall be included in the Contractor bid submitted to the City as described in Item 060 "Advertisement for Bid" of the original contract documents.
2. A Geotechnical Report submitted by Nova Consulting Group dated August 18, 2005 is attached to this Addendum and was produced specifically to aid the contractor in knowing what soil strata and presence of ground water exist in the project. Boring B1 is located at the proposed liftstation wetwell site; Boring B2 is located at proposed manhole A4 adjacent to the intersection of Lytle and Second Street; and Boring B3 is located at proposed manhole A6 adjacent to the intersection of Ross and Third Street.

Please be aware that when completing the contract form (Item 070), that section 10, "Addenda" should be signed and dated.



CORPORATE HEADQUARTERS
Minneapolis, MN

OFFICE LOCATIONS
Chicago, IL
Dallas, TX
Denver, CO
Duluth, MN
Indianapolis, IN

Los Angeles, CA
Milwaukee, WI
New York, NY
Salt Lake City, UT
San Antonio, TX

August 18, 2005

Mr. Stuart Barron
City of Kerrville
800 Junction Highway
Kerrville, TX 78028-5069

**Re: Limited Geotechnical Study
Quinlan Creek Lift Station & Trunk Main
Kerrville, Texas
NOVA Project No. T05-1567**

Dear Mr. Barron:

Per your request, Nova Consulting Group, Inc. (NOVA) is pleased to provide the results of our limited geotechnical study at the above referenced site.

FIELD STUDY

Nova conducted three (3) auger borings to depths ranging from 25 to 35 feet below existing grade on August 9, 2005. The three-inch nominal diameter borings were drilled with truck-mounted rotary drilling equipment in the locations designated by the project civil engineer, Mr. Les Harvey, P.E., with Harvey Engineering. Boring B1 was conducted in the area of the proposed lift station, while Borings B2 and B3 were located along the alignment for the new trunk main. Specifically, Boring B1 was located in the vicinity of Quinlan Creek and First Street, Boring B2 was near Quinlan Creek and Second Street, and Boring B3 was adjacent to Quinlan Creek and Third Street. At the time of our field study, the sites consisted of undeveloped fields along Quinlan Creek that had a moderate growth of native and planted grass and several moderate to large sized trees. The surface soils were slightly moist and very stiff to hard at the time of the field study.

The Boring Logs, including the material descriptions, types of sampling used, and other pertinent field data, are attached. A Symbol Key Sheet, which defines the terms and descriptive symbols used on the logs, is also attached.

The borings were augered to their termination depth using dry drilling techniques. All of the samples were prepared at the site in appropriate containers to minimize disturbance during transportation to the laboratory.

Soil samples were generally recovered by means of the Standard Penetration Test (SPT) in accordance with ASTM D 1586. This test consists of determining the number of blows required for a 140 pound hammer free falling 30 inches to drive a standard split-spoon sampler 12 inches into the subsurface

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material after an initial seating of 6 inches. This blow count or SPT "N" value is used to evaluate the engineering properties of the stratum. All samples were removed from samplers in the field, classified, and placed in sample containers to preserve their in-place moisture contents.

SUBSURFACE CONDITIONS

As previously discussed, the subsurface stratigraphy at the project site was evaluated by drilling three (3) borings to depths ranging from 25 to 35 feet below the existing ground surface elevation at the time of our drilling activities on August 9, 2005.

Based on both our observations at the time of the field study and on the results of our laboratory testing, the stratigraphy of the subsurface materials at this site can generally be described as presented in the following table:

Stratum	Average Depth (ft)	Generalized Stratigraphy Description and Unified Soil Classification Symbol
I	0.0 – 5.5	Very stiff to hard, dry to moist, brown to light brown SILTY CLAY (CL)
II	5.5 – 12.8	Dense to very dense, dry to water bearing, light brown, CLAYEY, SANDY GRAVEL (GC)
III	12.8 – TD	Hard, dry to slightly moist, blue-gray SILTY CLAY (CL)

TD = Total Depth

Stratum I – This stratum consists of very stiff to hard, dry to moist, brown to light brown silty clay with scattered gravel. This upper soil zone extends from the surface to a depth ranging 2.0 to 9.0 feet. An Atterberg Limits test conducted on a representative sample from Stratum I indicates the material has a Liquid Limit (LL) of 44 percent and a Plasticity Index (PI) of 27 percent. The moisture content of samples tested from Stratum I ranged from 7 to 15 percent. Standard Penetration Test blow counts ranged from 7 to 58 blows for 12 inches of penetration.

Stratum II – The second stratum consists of dense to very dense, dry to water bearing (fully saturated), light brown, clayey, sandy gravel. This second soil zone extends from the upper Stratum I to a depth ranging from approximately 10.0 to 16.5 feet. An Atterberg Limits test conducted on a representative sample from Stratum II indicates the material has an LL of 26 percent and a PI of 10 percent. The moisture content of samples tested from Stratum II ranged from 2 to 17 percent. Standard Penetration Test blow counts ranged from 32 blows for 12 inches of penetration to 50 blows for 6 inches of penetration.

Stratum III – This lower stratum was encountered in all three borings and consists of hard, dry to slightly moist, blue-gray, silty clay. Stratum III extends from the overlying Stratum II, through the total exploration depths. An Atterberg Limits test conducted on a representative sample from Stratum III indicates the material has an LL of 48 percent and a PI of 31 percent. The moisture content of samples tested from Stratum III ranged from 9 to 15 percent. Standard Penetration Test blow counts ranged from 50 blows for 1 to 6 inches of penetration.

GROUNDWATER CONDITIONS

The borings were dry augered to their full depth in an attempt to observe the presence of any groundwater. Groundwater was observed at borings B2 and B3 at depths of 9.5 and 9.0 feet, respectively. The groundwater was noted in the Stratum II soils in the borings along the proposed trunk main during the drilling and following completion of the borings. The boreholes were allowed to remain open for a period of time following the drilling and no appreciable rise in the water level was detected from that noted during the drilling. It should be noted that the underlying Stratum III did not appear water bearing, and in general may act as a relatively impervious zone beneath the relatively high permeability Stratum II.

EXCAVATIONS

The materials encountered in the test borings ranged from firm to hard or very dense, with moisture content and groundwater conditions also varying appreciably. All three borings were completed to their proposed depths using conventional auger drilling methods. Although Stratum II and III soils are very dense or hard, rock conditions did not appear to exist in these lower zones. Excavations are anticipated to be possible using conventional earthwork equipment, without the necessity for heavy-duty ripping, hoe-ramming, or other rock excavation techniques. However, conditions may vary along the alignment and the presence of materials that are more difficult to excavate could exist.

Excavations will also require the control of groundwater flow, which could be appreciable owing to the relatively high permeability of the Stratum II gravel.

Our comments on excavation requirements are based on our experience with similar sites and subsurface conditions. Excavating not only depends on the soil or rock strength, but also on the equipment, capabilities, and experience of the excavator. Therefore, it should be the excavator's responsibility to determine the most effective method for excavation. The above comments are intended for informational purposes for the design team and may be used in a review of the Contractor's excavation methods.

If you have any questions regarding the information provided in this report, or if we can be of further assistance, please contact us at (210) 402-3102.

We appreciate the opportunity of working with you on this project.

Respectfully submitted,
Nova Consulting Group, Inc.



Philip L. Johnson, P.E.
Operations Manager

Copies: Addressee (4)

Attachments: Logs of Boring
Key to Soil Classification and Symbols

LOG OF BORING

PROJECT: Quinlan Creek Lift Station & Sewer Line
Kerrville, Texas

CLIENT: City of Kerrville
Kerrville, Texas

PROJECT NUMBER	T05-1567
BORING NUMBER	B1
DATE DRILLED	8/9/2005
SURFACE ELEVATION	N/A

FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): DRY AUGER			
SOIL SYMBOL	DEPTH (FT)	SAMPLES N: BLOWS/FT P: TONS/SQ FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%)			DRY DENSITY (POUNDS/ CU FT)	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	PASSING #200 SIEVE (%)	GROUNDWATER INFORMATION: No groundwater encountered either during or upon completion of drilling activities.
				LL	PL	PI						
		N=29	9	44	17	27						Very stiff, dry, brown, SILTY CLAY (CL) with scattered gravel - becomes hard at 2'
		N=34										
	5	N=32 N=46	6									Hard, dry, light brown, SILTY CLAY (CL) with scattered gravel
		N=72										
	10											Very dense, dry, light brown, CLAYEY, SANDY GRAVEL (GC) - becomes slightly moist at 13.5'
	15	N=50/2"	6									
	20	N=50/6"										Hard, dry to slightly moist, blue-gray, SILTY CLAY (CL)
	25	N=50/3"	9									
	30	N=50/1"										
	35	N=50/1"										
												Boring terminated at 35 feet.
N - STANDARD PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE T - POCKET TORVANE SHEAR STRENGTH												REMARKS: Borehole backfilled upon completion of drilling activities

LOG OF BORING

PROJECT: Quinlan Creek Lift Station & Sewer Line
Kerrville, Texas

PROJECT NUMBER	T05-1567
BORING NUMBER	B2
DATE DRILLED	8/9/2005
SURFACE ELEVATION	N/A

CLIENT: City of Kerrville
Kerrville, Texas

FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): DRY AUGER				
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%)			DRY DENSITY (POUNDS/ CU FT)	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	PASSING #200 SIEVE (%)	
					LL	PL	PI						
GROUNDWATER INFORMATION: Groundwater was encountered at a depth of approximately 9.5 feet during the drilling and following completion of the boring.													
DESCRIPTION OF STRATUM													
5	N=29	7											Very stiff, dry, brown, SILTY CLAY (CL) with scattered gravel
	N=7	15											- becomes moist, firm and sandy at 3'
	N=36	12											
	N=50/6"	17											Very dense, moist to wet, light brown, CLAYEY, SANDY GRAVEL (GC)
10	N=50/6"		26	16	10								- water bearing at 9.5'
15	N=50/1"	11											Hard, slightly moist, blue-gray, SILTY CLAY (CL)
20	N=50/2"												
25	N=50/1"												
													Boring terminated at 25 feet.
N - STANDARD PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE T - POCKET TORVANE SHEAR STRENGTH											REMARKS: Borehole backfilled upon completion of drilling activities		

LOG OF BORING

PROJECT: Quinlan Creek Lift Station & Sewer Line Kerrville, Texas	PROJECT NUMBER T05-1567 BORING NUMBER B3 DATE DRILLED 8/9/2005 SURFACE ELEVATION N/A
CLIENT: City of Kerrville Kerrville, Texas	

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRILLING METHOD(S):	
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT PERCENT RECOVERY/ ROCK QUALITY DESIGNATION	MOISTURE CONTENT (%)	ATTERBERG LIMITS (%)			DRY DENSITY (POUNDS/ CU FT)	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	PASSING #200 SIEVE (%)
					LL	PL	PI					
												DRILLING METHOD(S): DRY AUGER
												GROUNDWATER INFORMATION: Groundwater was encountered at a depth of approximately 9.0 feet during the drilling and following completion of the boring.
												DESCRIPTION OF STRATUM
5	X	N=58										Hard, dry, brown, SILTY CLAY (CL) with scattered gravel
5	X	N=50/6"	2									Very dense, dry, light brown, CLAYEY, SANDY GRAVEL (GC)
5	X	N=45	6									- becomes dense at 4
5	X	N=69	9									- becomes moist and very dense at 6.5'
10	X	N=50/6"	10									- water bearing at 9.0'
15	X	N=50/1"										Hard, slightly moist, blue-gray, SILTY CLAY (CL)
20	X	N=50/4"	15	48	17	31						
25	X	N=50/3"										
												Boring terminated at 25 feet.

N - STANDARD PENETRATION RESISTANCE P - POCKET PENETROMETER RESISTANCE T - POCKET TORVANE SHEAR STRENGTH	REMARKS: Borehole backfilled upon completion of drilling activities
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KEY TO SOIL CLASSIFICATION AND SYMBOLS



CONSISTENCY OF COHESIVE SOILS

RELATIVE DENSITY OF COHESIONLESS SOILS

Penetration Resistance blows/foot	Consistency	Compressive Strength tsf	Plasticity Index	Degree of Plasticity	Penetration Resistance blows/foot	Relative Density
0 - 2	Very Soft	< 0.25	0 - 5	None	0 - 4	Very Loose
2 - 4	Soft	0.25 - 0.5	5 - 10	Low	4 - 10	Loose
4 - 8	Firm	0.5 - 1.0	10 - 20	Moderate	10 - 30	Medium Dense
8 - 15	Stiff	1.0 - 2.0	20 - 40	Plastic	30 - 50	Dense
15 - 30	Very Stiff	2.0 - 4.0	> 40	Highly Plastic	> 50	Very Dense
>30	Hard	> 4.0				

STANDARD PENETRATION TEST (ASTM D 1586) DRIVING RECORD

Note: Driving is limited to 50 blows per interval, or 25 blows for 0.25 inch advancement, whichever controls. This is done to avoid damage to sampling tools.

Blows Per Foot

34
50/9"
Ref/3"

Description

Sampler was seated 6 inches, then 34 blows were required to advance the sampler 12 inches.
Sampler was seated 6 inches, then 50 blows were required to advance the sampler 9 inches.
Sampler could only be driven 3 inches of the 6 inch seating penetration before the 50 blow limit was reached.

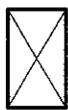
TERMS CHARACTERIZING SOIL STRUCTURE

Organic	- Material derived or decomposed from living organisms, usually dark gray in color.
Ferrous	- Containing significant quantities of iron oxide.
Calcareous	- Containing appreciable quantities of calcium carbonate.
Layer	- Inclusion of different material 3 inches to 2 feet thick.
Seam	- Inclusion of different material 1/8 inch to 3 inches thick.
Parting	- Inclusion of different material less than 1/8 inch thick.
Pocket	- Inclusion of different material that is roughly circular.
Nodule	- A small, more or less rounded body; a concretion.
Streak	- A line or mark of contrasting color or texture.
Slickensided	- Having planes of weakness that are slick and glossy in appearance.
Fissured	- Containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
Laminated	- Composed of thin layers of varying color and texture.
Interbedded	- Composed of layers of different soil types.
Blocky	- Divided into blocks generally less than 1/2 inch.
Cemented	- Material grains bound together forming an intact mass.
Fracture	- Plane of breakage.
Bentonitic	- Containing the clay mineral bentonite being highly plastic and subject to extreme shrink/swell behavior.
Mottled	- Having colored spots or blotches, as if stained.
Vuggy	- Small cavities within a rock formation size ranging from a fraction to several inches which may or may not interconnect.

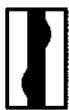
SAMPLER TYPES



Shelby Tube



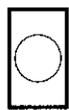
Split Spoon



Auger



U-Ring



No Recovery



Rock Core

WATER LEVEL SYMBOLS



Water encountered during drilling



Quasi-static/24 hr. (see report text)