SUBSURFACE SOIL EXPLORATION PROGRAM SPECIFICATIONS PERTAINING TO THE SITING OF THE PROPOSED DEPARTMENT OF PUBLIC WORKS BUILDING LOCATED ON KINNE ROAD IN CANTERBURY, CONNECTICUT

1.0 Scope of Work

The work to be done under this contract includes the furnishing of all material, labor, equipment, water supply and all else necessary for making and completing certain borings, auger holes and collecting soil/rock samples at the site of the proposed public works building located on Kinne Road in Canterbury, Connecticut, as described herein and shown on the Soil Exploration Location Plan.

1.1 Supervision

The work shall be performed under the supervision and direction of the authorized representative of Northeastern Connecticut Council of Governments (NECCOG), Consulting Engineer, who shall be referred to in these specifications as the Engineer.

No subsurface explorations shall be made except in the presence of the Engineer or his inspector. The inspector will check the logs of the explorations to determine that the information designated herein is being obtained, and see that all samples are properly preserved, protected against damage, boxed and stored in a suitable place or immediately turned over to the Engineer his inspector as provided hereafter.

1.2 Existing Conditions

Before any subsurface exploration is performed, the Contractor shall contact "Call Before You Dig" at 1 + (800) 922-4455 to obtain a request number. The request number expires in 30 calendar days. Therefore, the Contractor is responsible for maintaining an active request number. The Contractor will supply the Engineer with the request number (s) prior to the start of work. During the progress of the work, the Contractor shall cooperate with the owners of the utilities an permit their representative access to the work to determine if their utilities are being endangered in any way. Any relocation of borings or other subsurface explorations shall be done only with the approval of the Engineer.

1.3 Contractor's Plant and Equipment

All plant, equipment, and methods to be used by the Contractor shall be subject to approval by the Engineer at all times during the work. However, approval of the equipment shall not be construed as including the approval of the performance thereof. Additional equipment and

methods shall be provided when ordered by the Engineer if required to perform the work satisfactorily according to the Specifications.

The Contractor shall be required at all times when the work is in progress to have a minimum of one (1) drilling rig with complete crew at the site and engaged in field operations. The Contractor shall submit in writing, upon request of the Engineer, a schedule of operations for the work. The Engineer shall be notified at least 48 hours in advance of deviations from the schedule and such deviations shall be subject to the approval of the Engineer.

1.4 Cooperation by the Contractor

The Contractor shall at all times have on the work, as his agent, a competent superintendent or foreman thoroughly experienced in the type of work being performed, who shall receive instructions from the Engineer or his authorized representatives. The superintendent shall have full authority to execute the orders or directions of the Engineer, without delay, and to supply promptly such materials, equipment, tools, labor and incidentals as may be required.

1.5 Character of Workmen

The contractor shall employ only superintendents, foremen, and workmen as are careful and competent, and the Engineer may demand the dismissal of any person or persons employed by the Contractor in or about the work who misconduct himself or be incompetent or negligent in the due and proper performance of his or their duties, or neglects or refuses to comply with the directions given, and such person or persons shall not be employed again thereon without the written consent of the Engineer. Should the Contractor continue to employ or again employ such person or persons, the Engineer may withhold all payments, which are due or become due, or the Engineer may suspend the work until such orders are complied with.

1.6 Borings

a. Type: Borings shall be as necessary to take split-spoon samples in soil and rock cores in underlying bedrock or boulders as directed by the Engineer.

b. Number and Location: The approximate number and location of the borings required are shown on the Soil Exploration Location Plan. The Engineer will establish the exact locations of borings in the field. The Engineer reserves the right to increase or decrease the number of borings or samples with no change in the contract unit prices.

c. Depth: Borings shall extend no less than twenty-five (25) feet below the ground surface. If refusal occurs before the minimum depth is reached, drilling shall continue at least an additional five (5) feet to try and establish the cause of refusal. Borings may be made to such depths as directed by the Engineer.

1.7 General Procedure

The sequence of borings and the type or types of samples to be taken at each hole shall be as directed by the Engineer. In general, borings will be as follows:

a. Standard Penetration Test (SPT) and split-spoon sampling of soils will be taken in accordance with ASTM D1586/AASHTO T 206 Standard Specification, borings will be 2½" minimum diameter holes in which 1½" I.D. split-spoon samples will be taken.

b. Diamond core drilling for determination of depth to and soundness of bedrock will be in accordance with AASHTO T 225 Standard Specification, borings will be 3½" minimum diameter holes through which rock cores no less than 2⅛" can be recovered.

1.8 Split-Spoon Sampling

Split-spoon samples shall be obtained at approximately 1-foot below the ground surface and at the beginning of very change of stratum and at the intervals not to exceed 5 feet, unless otherwise directed by the Engineer. At these points, advancement of the borehole shall be stopped, and all material removed from inside the casing or borehole. The use of water for cleaning out between samples will generally be allowed, and approved chopping bits, augers, or sampling spoons may be used for cleaning the casing or borehole preparatory to taking split-spoon samples. The re-use of wash water will not be permitted except in unusual cases, and then only with the written approval of the Engineer. The pump used for wash water shall have sufficient capacity to adequately clean the boreholes before sampling the material that has been loosened. The samples should be obtained by driving a split-spoon sampler 18 inches in into the undisturbed material below the bottom of the casing or borehole.

When sampling in granular materials, the casing shall be kept full of water at all times, unless otherwise directed. The casing shall be filled with water and covered a the end of the working day, and the drop recorded when work is resumed.

Split-spoon samplers shall be equipped at the top with a reliable check valve and shall have a minimum inside sampling length of 18 inches. They shall have a minimum inside diameter of 1½". A recovery of less than 12' of soil in a split-spoon sampler shall not be considered an acceptable sample, and a second sample shall be taken immediately below the unsuccessful recovery, after first advancing the borehole into undisturbed material. If difficulty is experienced in the first attempt to recover a sample, the split-spoon sampler for the second attempt shall be equipped at the bottom with a basket shoe or other spring-type sampler retainer. Flap (trap) valves will be allowed only with the approval of the Engineer. If the earth is very compact and cannot be sampled using the split-spoon sampling methods required herein, the Contractor shall resort to coring methods to obtain a sample.

To facilitate determination of the relative resistance of the various strata, the 1½" split-spoon sampler shall be driven by a 140-poiund weight hammer having a 30" drop. The number of blows for each six inches of penetration shall be recorded.

1.9 Rock Coring—NX

Wherever rock is encountered, the Contractor will take continuous core samples to a depth directed by the Engineer by means of a rotary method and diamond bit of such size as will yield cores no less than 2⅛" diameter (NX), the size to be directed by the Engineer.

The diamond core bit shall be started in the hole and the rock shall be drilled until the required depth is reached. When the core is broken off, it shall be withdrawn, labeled and stored before the drilling is continued. The holes shall be carried into the rock to a depth sufficient to permit the Engineer to determine to his satisfaction the character of the rock penetrated. In general, it is expected that the depth of the core holes in rock will be 5 to 10 feet, but it may be required in some cases to penetrate the rock as much as 30 feet, or as directed by the Engineer. The maximum length of each coring run will be 5 feet. However, the Engineer reserves the right to reduce the length of the core run as necessary to effect maximum recovery.

Cores must be carefully handled to insure their proper identification and placed in the order in which they are removed from the hole, and care shall be taken to recover as large a percentage of cores as possible. The Contractor will regulate the speed of the drill and remove the core as often as necessary to insure the maximum percentage of recover. The drilling time for each successive foot of rock drilling shall be recorded.

Should the recovered length of core be less than 50 percent of the depth cored for any run, the Contractor will adopt such measures as may be necessary to improve the percentage of recovery. These measures may include, but shall not be limited to, changes in type of diamond bit, feed rate, speed of rotation, volume of circulation, use of Series "M" core barrel, length of run per removal, and change in machine operator. In those cases where, in the opinion of the Engineer, the competency, structure and condition of the rock are critical to the design, the Engineer reserves the right to direct that the Series "M" core barrel be used.

1.10 Abandoned Boring Holes

Should the casing or apparatus be removed from a borehole, or should the hole be abandoned without the permission of the Engineer, or should a boring be started and for any reason not be carried to the depth required by the Engineer, or should the Contractor fail to keep complete records of materials encountered, or to furnish the Engineer the required samples and cores, then the Contractor will make an addition boring at a location selected by the Engineer, and no payment will be made for either the abandoned hole or any samples or cores obtained therein. However, the Contractor will make a record of abandoned bore holes and note thereon the reasons for the abandonment.

1.11 Preserving Samples

a. Split-Spoon Samples: Representative specimens of each sample will be preserved. The containers for preserving drive samples shall be large-mouth, round, screw top, air tight, clear glass jars. Size of jars shall be 16 oz. for all drive samples. The specimens will be placed in the jars and tightly capped with gasket sealed caps as soon as taken in order to preserve the original moisture in the material. Samples which retain form upon removal from the sampling

spoon shall not be jammed or forced into the jar. The jars shall be suitably boxed in cardboard boxes, marked and identified with legible labels as directed by the Engineer. These labels shall show the date, town, project name, road name, project number, station and offset, boring number, sample number, depth at which the sample was taken, the driller's names, number of blows for each 6" of penetration and soil classification of the sample, as applicable. The samples shall be protected against freezing and the jars against breaking.

b. Rock Cores: The rock cores shall be placed in suitable wooden boxes so partitioned tha the cores from each boring will be kept separate, and the cores shall be properly placed in the order in which they were removed from the core barrel and to show where portions, if any, were lost.

Rock cores shall be suitably labeled and arranged neatly in the boxes in the sequence in which the material was removed from the hole. Adjacent runs shall be separated by means of wood blocks, on which the elevation of the top and bottom of the run shall be clearly, accurately, and permanently marked.

The core boxes shall have a cover hinged at one edge and latched at the other edge and shall be substantially made to withstand normal abuse in shipment. The boxes shall be properly labeled, showing the date the core was taken, town, project name, road name, project number, station and offset, boring number, depth of core and drillers' names, as applicable.

Core boxes shall be substantially constructed of dressed lumber, about five (5) feet in length and with a capacity for about twenty (20) feet of cores in each box. Core boxes shall be completely equipped with all necessary partitions, covers, hinges, latches for holding down the cover, and suitable identification plates and tags.

1.12 Mobilization and Dismantling

This item shall include the initial mobilization of the drill rig at the project site and the final dismantling after all borings are complete. The contractor is required to furnish the drill rig and tools, in good condition and all other equipment necessary to carry on and complete the work properly. The Contractor may be required to mobilize and dismantle this equipment at existing highway structures, highway embankments, highway rights-of-way, off the traveled way, wooded areas and other difficult sites. The Contractor shall have the necessary equipment and personnel to assemble his drilling equipment at the desired locations.

The Mobilization and Dismantling item shall include full compensation for all traffic control devices, cones, signs, etc.

All material or equipment furnished under this item shall remain the property of the Contractor and shall be maintained and disposed of by him. This item shall carry all charges incident to such plant setup and removal, in order that the charges need not be distributed among the more variable items of the contract.

1.13 Records

The Contractor shall keep complete, neat, accurate and legible field records of each boring and other subsurface exploration and these records shall show his interpretation of the results of the explorations as to the nature of the subsurface conditions. The records shall be made at the site as the work progresses and shall be furnished to the Engineer at the completion of each day. The records shall contain the following information:

General:

- ☐ Identification Number shown on subsurface exploration plan
- ☐ Date of start and date of finish
- ☐ Name of Engineer, Contractor and Lead Driller
- ☐ Town

Soil Borings:

- ☐ Size & type of any Casing, Sampler, and Core Barrel used
- ☐ Type of hammer used to drive sampler and casing (drop, safety, or automatic) – include hammer weight and drop height
- ☐ Depth of observed ground water, elapsed time of observation after completion of drilling – a water observation must be made in the borehole prior to backfilling
- ☐ Type and Number of each sample taken (all samples shall be numbered consecutively) to include sample depth from ground surface
- ☐ Number of blows required for each 6-inch penetration of split-spoon sampler and for each 12-inch penetration of casing
- ☐ Total depth penetrated by split-spoon sampler and the measured length of sample recovered from the sampler
- ☐ Material Description of samples (as shown in sample log)
- ☐ End of boring depth
- ☐ Notes regarding any other pertinent information and remarks on miscellaneous conditions encountered such as: artesian conditions, loss of wash water, obstruction encountered, odors of recovered samples

Rock Cores:

- ☐ Type and size of core barrel and bit type (diamond/carbide)
- ☐ Length of core recovered for each length drilled, including number of pieces
- ☐ Depth at which rock was encountered
- ☐ Depth at each change in rock type
- ☐ End of boring depth
- ☐ Time required to core each foot
- ☐ Description of rock in accordance with the following classifications:

KIND: shale, slate, limestone, sandstone, etc.

CONDITION: broken, fissured, disintegrated, laminated, solid, etc.
HARDNESS: soft, medium, hard and very hard

1.14 Submission of Reports and Samples

A copy of the driller's field logs shall be given to the Inspector on a daily basis. The Contractor shall provide typed boring logs of all subsurface explorations, referenced to ground surface with stratum classified as described above, together with all notes, remarks and pertinent information required by this Specification. The logs shall be submitted no later than 5 days after the completion of the subsurface exploration program. The typed logs shall be mailed to the address provided by the Consultant.

The Contractor shall maintain possession of soil and rock samples until the job is completed, unless otherwise directed by the Engineer. Borings for which soil and rock samples are not turned over by the Contractor to the Consultant will be considered as not drilled and no payment will be made for those borings.

1.15 Measurement and Payment

a. General: The contract items include all services, labor, equipment, transportation, material and supplies for the complete work. Payment for these items shall include compensation for obtaining, packing, making and submitting samples and recording and submitting data incidental to each item. No other payments for any specified or indicated work, or for any work implied there from, shall be made. Payment will not be made for boreholes, bar soundings, pipe probing or other subsurface exploration abandoned without authorization of the Engineer, or for such holes for which satisfactory samples and data are not submitted. The quantities stated in the proposal are approximate only and are for the specific purpose of comparing bids. The Engineer does not guarantee that these items or quantities will be performed. The Engineer reserves the right to vary the quantities or delete items in their entirety, and the Contractor shall not be entitled to any extra payment due to such amended quantities or deleted items.

b. Soil Borings:

1. Land Borings: This work will be measured for payment by the actual number of vertical linear feet bored for each accepted hole between the ground surface at the hole and the bottom of the accepted bore hole or the bottom of the last soil sample taken, whichever is deeper. This measurement shall include the portion(s) of the hole in boulder(s), if any, regardless of their thickness, but shall not include the portion of the hole in bedrock, if any.

i.) This work will be paid for at the respective contract unit prices per linear foot for "Soil Boring—Type A" of the sizes specified.

c. Split-Spoon Samples

1. The amounts to be included under the respective items for split-spoon samples of the size specified shall be the number of completed samples actually taken and accepted.

2. This work will be paid for at the contract unit price each for "Split-Spoon Samples" of the size specified, which price shall include compensation for all work incidental to the samples and not covered under other contract items.

d. Rock Coring

1. This work will be measured for payment by the actual number of vertical linear feet of acceptably drilled hole in bedrock and in individual boulders two (2) feet or more in thickness.

2. This work will be paid for at the contract unit prices per linear foot for "Rock Coring—NX".

e. Mobilization and Dismantling—Land

1. Method of Measurement: This item will be measured for payment by the actual number of boring rigs and/or crews specified or as directed by the Engineer. This item will be due for payment at the time of final payment after removal of all materials and equipment from the project.

2. Basis for Payment: This work will be paid for at the contract unit price each for "Mobilization and Dismantling—Land", for the number of drill rigs specified by the Engineer for a project. This item will include full compensation for all traffic control patterns, cones, and all other materials, equipment, tools, labor and work incidental thereto.

SAMPLE BORING LOG

Driller:	I. Core	**Connecticut DOT Boring Report**		Hole No.:	B-1
Inspector:	A. Bore	Town:	Somewhere, Connecticut	Stat./Offset:	67 + 123/48ft L
Engineer:	Y. Me	Project No.:	ABC-X123-Z	Northing:	1234.56
Start Date:	9-18-03	Route No.:	Main Street	Easting:	5643.21
Finish Date:	9-19-03	Bridge No.:	N/A	Surface Elevation:	123.45
Project Description:	gINT Example				
Casing Size/Type:	HSA/2.25"	Sampler Type/Size:	SS/13/8"	Core Barrel Type:	NQ
Hammer Wt.:	300lb Fall: 24in.	Hammer Wt.:	140lb Fall: 30in.		

Groundwater Observations: @11.4 after 0 hours, @14.3 after 1 hours, @12.2 after 24 hours

Depth (ft)	SAMPLES: Sample Type/No.	SAMPLES: Blows on Sampler per 6 inches	SAMPLES: Pen. (in.)	SAMPLES: Rec. (in.)	SAMPLES: RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	S-1	3 5 8 15	24	0.25		TOPSOIL / FILL	Loose brown fine SAND, some silt, trace organics.	120
5	S-2	40 50/2"	8	0.2		SAND	Medium dense brown coarse to fine SAND, some coarse to fine gravel, little silt.	115
10	S-3	8 6 5 7	24	0.45			Dense brown coarse to fine SAND, some coarse to fine gravel, trace silt with cobbles and boulders.	110
15	S-4	13 19 26 29	24	0.55			Very dense gray fine SAND, some coarse to fine gravel little silt and clay.	105
20	C-1		60	1.3	30	BEDROCK	Hard, slightly weathered, slightly fractured, gray, biotite SCHIST.	100
25							END OF BORING 25ft	95
30								90
35								85
40								80
45								75
50								

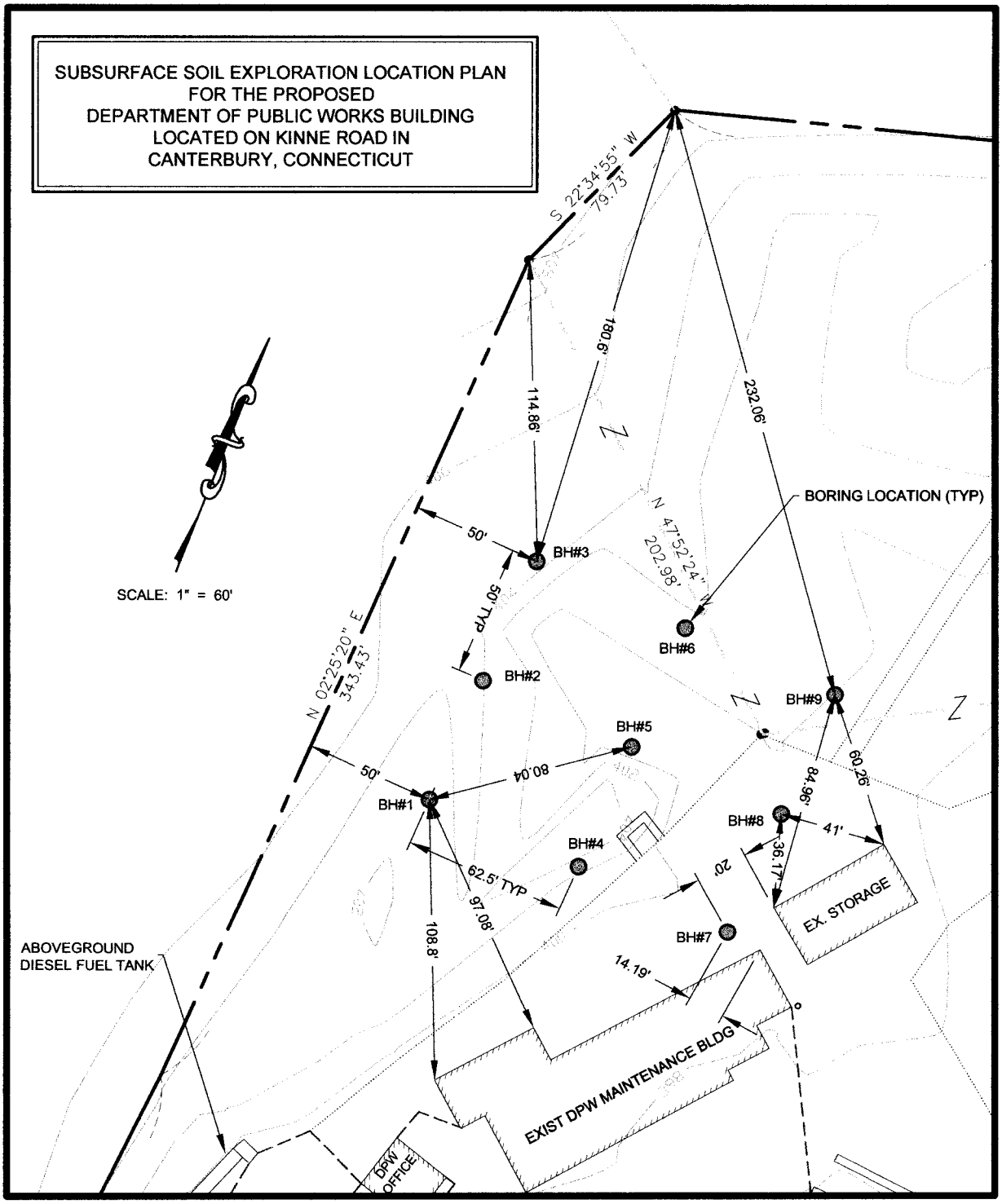
*** SAMPLE ***

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test

Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 20ft Rock: 5ft No. of Soil Samples: 5 No. of Core Runs: 1	NOTES: Hole located 65ft northwest of the intersection of State and Main streets. Ground surface was flat and dry with low shrubs. Hole backfilled with drill cuttings 24 hours after completion.	Sheet 1 of 1 SM-001-M REV. 1/02

SUBSURFACE SOIL EXPLORATION LOCATION PLAN


SUBSURFACE SOIL EXPLORATION LOCATION PLAN
FOR THE PROPOSED
DEPARTMENT OF PUBLIC WORKS BUILDING
LOCATED ON KINNE ROAD IN
CANTERBURY, CONNECTICUT
SCALE: 1" = 60'
S 22°34'55" W
79.73'
180.6'
114.86'
232.06'
BORING LOCATION (TYP)
50'
BH#3
N 47°52'24" W
202.98'
60' TYP
BH#6
BH#2
N 02°25'20" E
343.43'
BH#9
BH#5
50'
80.04'
BH#1
84.96'
60.26'
BH#8
41'
36.17'
BH#4
62.5' TYP
20'
97.08'
108.8'
BH#7
14.19'
EX. STORAGE
ABOVEGROUND
DIESEL FUEL TANK
EXIST DPW MAINTENANCE BLDG
DPW
OFFICE

BID FORM

BID FORM

Subsurface Soil Exploration Program Project
Pertaining to the Siting of the Proposed
Department of Public Works Building
Located on Kinne Road in Canterbury, Connecticut

(Note: All prices, in words and figures, must be clearly written in ink or typed for the entire bid.)

Item No.	Item Description	Unit	Quantity	Unit Price	Amount
1.	Soil Boring – Type A	VLF	225		
	Unit Price in Words:				
2.	Rock Coring – NX	VLF	30		
	Unit Price in Words:				
3.	Split-Spoon Samples	EA	45		
	Unit Price in Words:				
4.	Mobilization and Dismantling – Land	LS	1		
	Unit Price in Words:				

TOTAL BID AMOUNT FOR ALL ITEMS 1-4 INCLUSIVE: $ _____

(figures)

_____

(words)

It is understood that the unit price bids will control in any contract that may be awarded arising from this Bid. The estimated quantities above are approximate and are used only for the comparison of bids. The amounts determined by multiplication of the above unit prices by the estimated quantities, and the totals thereof, have been inserted only for the convenience of the Bidder and to facilitate consideration of this and other Bids

_____

Signature of Bidder