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Contract No.: F 306535-87-D-0012
Project No.: JREZ 87-0141
Del. Order No.: 5017

CONSTRUCTION DOCUMENTS (100%) SUBMISSION

BASIS FOR DESIGN

REMOVE CONTAMINATION
BUILDING 786
GRIFFISS AIR FORCE BASE
NEW YORK 13441-5000

MARCH 29, 1989

Sponsor

LGCC/William Turczyn
Dept. of the Air Force
416 BMW/LGCC B/DS-1
Griffiss AFB, New York 13441-5320

Contractor

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Atch. #4

INTRODUCTION

The following document constitutes a portion of the Construction Documents (100%) Submission as requested and authorized by the Department of the Air Force, 416 BMW/LGCC, under A/E Contract F 30635-87-D-0012, Delivery Order No. 5017, Project No. JREZ 87-0141, REMOVE CONTAMINATION, BLDG. 786.

Work to be accomplished is as required in the Statement of Work dated January 15, 1988, A/E Delivery Order Cost Proposal dated March 8, 1988, and Contract Modification dated June 28, 1988.

BASIS FOR DESIGN

Work under this project required a field study and investigation to determine the extent and type of contamination of the area between Bldg. 786 and Bldg. 785 and to design a proper remediation effort. As modified, the project requires the design of an environmentally acceptable storage facility and an extension of the AGE equipment parking area.

As described in the "Soil Boring/Sampling/Test Result Analysis", the surface contamination will best be remediated by removal of the soil to an industrial waste landfill. The area not included in the AGE equipment parking area extension will be replaced with granular fill and have turf reestablished.

In conjunction with our field investigation, we observed that the surface contamination was from waste oils and greases, and was most probably caused by poor housekeeping. The waste products were carried by hand in a shallow pan from the side door of Bldg. 786 to the waste oil storage container. Frequently, the gusting winds in between the two buildings would cause a loss of waste product onto the ground near the door; at other times, the wind or general mishandling of the container made spillage from the door to the waste oil storage container a real possibility. For this reason, we recommend that the system be redesigned to include underground waste and oil and anti-freeze holding tanks accessible from inside Bldg. 786. As recommended at the 35% review stage, a waste hydraulic oil storage tank will be provided as well. Access would be through controlled inlet ports, and removal of the waste products would be by pumping out through ground level draw-off when the tanks became full.

As requested by the user, the area from the walkway between Bldgs. 786 and 785 to Bldg. 786 will be reconstructed as an extension of the AGE equipment parking area. In order to accommodate a full waste oil tanker truck, this area will be designed for an HS-20-44 loading and will be constructed of asphalt concrete. A full depth subbase will be provided since the material will be required in order to refill the contaminated soil removed to a depth of 12".

It is recommended that for the safety of the underground waste oil and anti-freeze storage tanks, that no pavement be placed over the tanks, and that 6" Ø concrete filled pipe bollards be installed to protect the tanks from accidental drive-overs.

DESIGN CALCULATIONS

WASTE OIL AND ANTI-FREEZE STORAGE TANKS

Presently, the waste oil storage tank is an above ground "Bowser" unit holding approximately 500 gallons. Anti-Freeze solution is stored in 55 gallon drums inside Bldg. 786 until a large quantity has been stored up, then they are removed from the facility.

The waste oil and anti-freeze storage tanks will be designed to hold 1,000 gallons each, and the waste hydraulic oil will be designed to hold 500 gallons. Due to the fact that the organic materials stored in the proposed tanks is waste material, neither is presently regulated. However, since the Government wishes to provide state-of-the-art facilities, each will be designed as if they were regulated. Each tank will be double wall seamless fiberglass with monitoring of the interstitial (annular) space. All tank construction will be in accordance with 6 NYCRR Part 614. Provisions will be made for volume indication, vent and product withdrawal lines.

AGE EQUIPMENT PARKING AREA

Soil Characteristics:

- Silty Sand w/Gravel, N = 12-18
- Presumptive Bearing Value = 4 KSF (Hough, pg. 296)
- CBR = 30 (Oglesby/Hewes, pg. 439)

Loads:

- Truck = HS-20 44 - 32K Axle Load
- DTN = 2 x Equiv. 18^K Axle = 2.4
- $\therefore$ DTN = 4.8 (Say 5)
- TA (Total Asphalt Thickness) = 4" (Asph. Inst. MS-1)

Per Similar DOD Projects:

Use 3-1/2" Base, 1-1/2" Binder, 1" Top, Over 6" R.O.C. Subbase Course (NYSDOT 304.03) (good for CBR = 6)

SPECIFICATIONS

REMOVE CONTAMINATION B/786-(A)

WASTE PRODUCT STORAGE FACILITY B/786-(B)

GRIFFISS AIR FORCE BASE

NEW YORK 13441-5000

PROJECT: JREZ 87-0141A/B

DATE: NOVEMBER 20, 1989

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SECTION 01010

PROJECT PROVISIONS

1. GENERAL PROJECT DATA:

1.1 Description: The work is designated as Project JREZ 87-0141, "Remove Contamination, Building 786".

1.2 Location: The location of the Project described herein is at Griffiss Air Force Base, New York.

1.3 Description of Work: The work to be accomplished under this Contract encompasses the removal of oil and grease contaminated soil to the limits shown on the Contract Drawings, and replace the soil with either special backfill and topsoil or an asphaltic concrete extension of the AGE equipment storage apron. In addition, the Contractor shall furnish and install two (2) 1,000 gallon waste oil and anti-freeze storage tanks and one (1) 500 gallon waste hydraulic oil storage tank (fiberglass reinforced, double-wall construction with annular space for leak monitoring), necessary exterior piping, interior inlet ports, and protective bollards. The above description of work is for the purpose of general information only. It is not intended to include and describe every facet of work or define the scope of work.

2. SAFETY: All work shall be in conformance with OSHA (Occupational Safety and Health Administration) regulations. The soil is contaminated with waste oil and grease, but is considered nonhazardous in accordance with RCRA Regulations. The Contractor is required to comply with all USEPA and NYSDEC regulations pertaining to safety clothing and equipment, as well as proper training of personnel, while on site.

2.1 Fire Safety: Prior to performing "hot work" (welding, burning, lead melting, blow torches, tar pots) or operating other flame producing devices, the Contractor must request a hazardous operations permit from the Base Fire Department for each operation. General area or "blanket type" permits are not issued. A change or minor relocation of the welding, cutting, or other "hot" operation will require inspection and issuance of a new "hot work" permit. The Contractor shall also be required to produce a flammable explosive reading from the contaminated area prior to any "Hot Work" being done. If any hazard is present, the Contractor shall notify the Contracting Officer immediately and shall not proceed until advised. The Contractor will also provide fire extinguishers (ABC Type) when required.

3. USE OF UTILITIES: The Government shall supply to the Contractor, at no cost, reasonable amounts of water and electricity to support the construction. It shall be the Contractor's responsibility to provide hook-up to existing outlets.

4. DISPOSAL OF CONTAMINATED SOILS: The Contractor shall place all excavated soils, crushed stone, timber edging, etc., in polyethylene lined roll-off container(s) or stored on a polyethylene lined and bermed pile, covered with polyethylene until Contractor provided waste characterization testing has been completed. Upon the submission of the necessary documentation, the Contractor shall transport the excavated soil and other materials to an industrial waste landfill by a properly licenced (DEC Part 364) waste hauler.

5. STORAGE AREA: The Contractor shall be allowed to store his equipment and materials in the storage area indicated on the contract drawings. The storage area shall be kept clean at all times. At the end of the contract, the area shall be restored to its original configuration.

6. SANITARY FACILITIES: The Contractor shall furnish temporary sanitary facilities adequate for his work force and in conformance with site regulations and New York State Health Standards.

7. SPECIAL CONDITIONS:

7.1 Base Passes: The Contractor shall be required to submit names, addresses and any other information requested by the Contracting Officer to obtain badges for his employees who will be engaged in the work.

7.2 Security: The area adjacent to and access routes to Bldg. 786 are extremely sensitive, and access is tightly controlled. The work force must remain in the work area under the observation of a Government escort. Leaving the work area will be permitted only at lunch breaks. All material coordination shall be done at that time as well. Failure to comply with these security regulations will be cause for the immediate withdrawal of the employee from the Base.

7.3 Base Rules and Regulations: All Contractor personnel must remain in the contract work area and abide by all Base rules and regulations. Special emphasis should be placed on the Base safety and traffic regulations.

8. SURVEY AND STAKE-OUT:

8.1 The Contractor shall be required to perform all necessary Survey and Stake-out for the completion of the work.

9. GOVERNMENT-FURNISHED MATERIALS: No materials will be furnished by the U.S. Government.

10. ADDITIONAL TESTING: Prior to the removal from the Project site of any contaminated soil or other materials, the Contractor shall be required to perform additional sampling and testing. Initially, samples shall be secured, using standard methods and procedures, to establish soil Waste Characterization Analysis as specified in SECTION 02091. As a minimum, flash point, EP Toxicity, lead and PCB tests shall be run. In addition, a photoionization detector (PID) shall be utilized on the soils to be removed, and the soils remaining shall show PID levels less than three (3) times background readings. Should more soil require removal than indicated, the Contracting Officer shall be notified immediately for direction on the removal of additional soils.

11. NUCLEAR DENSITY TESTERS: The use of nuclear density testers will not be allowed under this Contract.

12. STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS: All New York State specification items shall be referenced from the New York State Department of Transportation: Standard Specifications, Construction and Materials, dated January, 1985, with addendums (NYSDOT Manual).

12.1 All references to "New York State Department of Transportation", "Commissioner of Transportation", "Regional Director", "Regional Office", and other governing authorities, shall be understood to mean "United States Government" and/or "Contracting Officer".

12.2 All paragraphs in the above referenced NYSDOT manual concerning Methods of Measurements and Basis of Payments shall be disregarded.

12.3 A copy of the State of New York Department of Transportation, Standard Specifications are available in the Base Civil Engineer's Office (416CSG/DEE), Griffiss Air Force Base, New York, for the Contractor's review.

13. EXCAVATION AROUND EXISTING COMMUNICATIONS/UTILITY LINES: The Contractor shall have an approved Contracting Officer's work clearance permit in his possession before any excavation work is permitted. Twenty-one days prior to any planned excavation, the Contractor shall notify the Contracting Officer in writing of his request to obtain a work clearance permit (digging permit). Work clearance permits are processed by the Construction Management Office (DEEC) of Base Civil Engineering upon receipt of request from the Contracting Officer. The Contractor shall have staked the area of excavation prior to initiating request. Upon receipt of request, DEEC will notify the 2019CS/LGPK and other appropriate offices for location of underground communication and other utility lines within the staked areas of excavation. The Contractor shall hand-excavate the immediate area where communication and utility lines are identified. In areas of uncertainty where communication and utility lines are known to exist,

but the location is uncertain, Government personnel, given a minimum of fourteen (14) days notice by DEEC will indicate where communication and utility lines have been located in the field. All excavation work in the above described known and uncertain areas where communication and other utility lines have been identified and staked shall be hand-excavated by the Contractor a minimum of five feet on both sides of staked areas. If staked lines in these areas are not found, the Contractor shall notify DEEC immediately before proceeding with any further excavation.

13.1 Interruption of Utilities: While it is not anticipated that any utilities will need to be interrupted, should the occasion arise, the following procedures shall be strictly followed:

13.1.1 No utility services will be interrupted to make connections, to relocate, or for any purpose without approval of the Contracting Officer.

13.1.2 Request for permission to shut down services shall be submitted in writing to the Contracting Officer fourteen (14) days prior to date of proposed interruption. The request shall give the following information:

13.1.2.1 Location of shut-off.

13.1.2.2 Services affected.

13.1.2.3 Hours and date of shut-off.

13.1.3 Services shall not be interrupted until receipt of approval of the proposed hours and date from the Contracting Officer.

14. WEATHER RESTRICTIONS: No work shall be performed when weather conditions are not conducive to such work such as pavement replacement, turf establishment, and any other weather restrictive operations.

15. EXCAVATIONS: Excavations shall be carried to the dimension necessary. Excavations shall kept free from water while construction is in progess. Contractor shall provide all dewatering equipment required to keep all excavations free of water. Excavations carried below the depths indicated, without specific directions shall be refilled to the proper grade with granular material and compacted to at least 100 percent of ASTM D1557 density. Soil disturbed and weakened by the Contractor's operations or soils permitted to soften from exposure to weather, shall be excavated and replaced with granular material compacted to 100 percent ASTM D1557 density. All additional work of this nature shall be at the Contractor's expense. Contractor shall provide all shoring and bracing required to prevent cave-ins of excavations.

16. FILLING AND BACKFILLING: Backfill and fill shall be placed in layers not more than 6-inches thick and each layer compacted. In all areas not accessible to rollers or compactors, the fill shall be compacted with mechanical vibratory hand tampers. If the mixture is excessively moistened by rain, it shall be arerated by means of blade graders, or harrows until the moisture is satisfactory. The surface of the layer shall be finished by blading or rolling with a smooth roller, or a combination thereof, and shall be smooth and free from waves and inequalities.

17. COMPACTION: Under pavements, the subgrade of soils in cut, shall have a density of at least 100 percent of the maximum density in accordance with the requirements of ASTM D1557 to a depth of 6 inches below the subgrade surface. Each layer of fill or backfill under paved areas shall be compacted to not less than 100 percent of the maximum density of ASTM D1557; other backfill adjacent to and not supporting any structural elements to at least 95 percent of ASTM D1557.

18. GRADING: The Contractor shall perform all grading in the areas indicated. Fill shall be brought to finished grades indicated within one-tenth of a foot and shall be graded to drain water away from structures. Grades under areas to receive topsoil shall be brought to elevation.

19. DRAINAGE: The Contractor shall provide and maintain slopes, crowns and ditches to insure satisfactory surface drainage at all times. Ditches and other drainage facilities necessary to remove ponded water shall be constructed as soon as practical to have the work area dry during the progression of work. All existing culverts and drainage system shall be maintained in satisfactory operating condition throughout the course of the work. If it is necessary to interrupt existing surface drainage, then temporary drainage facilities shall be provided until the permanent drainage work is complete.

20. SOIL SAMPLING AND TESTING: Samples of materials shall be furnished by the Contractor during construction, as required and as described in the appropriate SECTIONS of this Technical Specification. Sampling shall be observed by the Contracting Officer's Technical Representative. Contractor shall be responsible for four field compaction tests each on the subbase course materials. All laboratory and field compaction tests shall be taken in specific locations indicated by the Contracting Officer's Technical Representatives from the 416CSG/DEEC and DEV offices; all tests shall be performed by an independent testing laboratory approved by the Contracting Officer; all tests shall be at the Contractor's expense; all tests results shall be furnished to the Contracting Officer. When test results indicate that compaction is not as specified, the material shall be removed, replaced with new material, and re-compacted to meet specification requirements at no expense to the Government. Subsequent tests on re-compacted areas shall be performed, at no expense to the Government, to determine conformance with specification requirements.

21. SUBMITTALS: Submittals which may be required by this contract, if submitted in printed matter, shall be made in four copies. One copy of printed submittals will be returned to the Contractor. Except for those mandatory items listed on the submittal schedule (GRIF 140) the Contractor is not required to submit material approval submittals for those items they plan to install, incorporate or supply, which are specified by this contract. The Contractor must submit for approval those items which deviate from the specifications. Submission will be done on an AF Form 3000.

At the preconstruction conference, the Contractor, Construction Management Engineer, and Contractor Administrator will review the submittal requirements. The Contractor must be prepared to discuss the delivery dates for those submittals which are required; or for items the Contractor plans to submit for approval. Once approved, the submission deadlines will be incorporated onto the GRIF 140.

The Contractor is reminded that any item(s) installed prior to the Contracting Officer's approval is being done at their own risk. If any item does not meet the contract requirements, as determined by the Contracting Officer, the Contractor will be required to remove same at their own expense.

* * * END OF SECTION * * *

SECTION 02010

CLEARING

1. GENERAL:

1.1 Under this Item, the Contractor shall prepare and clear from the site of the work, by removal or destruction, as may be required, the following:

- Debris
- Brush
- Logs
- Trees (as indicated)
- Stumps
- Snow and Ice
- Refuse and Rubbish

1.2 The work also includes:

- Removal and replacement, as required, or supporting of all communication and power posts, poles and above and underground lines within the work area.

- Removal of crushed stone and timber edging, placement along with contaminated soils and eventual co-disposal with the contaminated soils.

- Removal of concrete sidewalk adjacent to crushed stone storage area.

*** END OF SECTION ***

SECTION 02091

REMOVAL AND DISPOSAL OF CONTAMINATED SOIL AND APPURTENANCES

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.1.1 New York State Department of Environmental Conservation (NYSDEC) Publications: (6NYCRR) -

Part 360	Solid Waste Management Facilities
Part 364	Waste Transporter Permits
Part 370	Hazardous Waste Management System: General
Part 371	Identification and Listing of Hazardous Wastes
Part 372	Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
Part 373-1	Hazardous Waste Treatment, Storage and Disposal Facility Permitting Requirements
Part 373-3	Interim Status Standards for Owners and Operators of Hazardous Waste Facilities
Part 374	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
Part 595, 596, 597	Chemical Bulk Storage
Part 612, 613, 614	Petroleum Bulk Storage

1.1.2 United States Environmental Protection Agency (USEPA):

40CFR Parts 280 and 291 - Underground Storage Tanks: Technical Requirements and State Program Approval; Final Rules.

1.2 DESCRIPTION OF WORK: The work includes removal of contaminated soil as shown and directed, along with crushed stone and timber edging, and eventual disposal of all contaminated materials in an approved manner.

1.2.1 The contaminated soil shall be excavated from the area between the northeastern side of Building 786 and the A/C Driveway as noted on Sheet 2 of 2, Plans and Details.

The soil shall be excavated to a minimum depth of twelve (12) inches, as measured vertically from the original ground surface.

Upon reaching this depth a visual inspection of the site shall be conducted by both the contracting agency's personnel and the contractor for the purpose of determining if a non-visable contamination level has been reached.

Should contamination be visually apparent, excavation of the soil shall continue until the contracting agency determines a non-visual level has been reached.

At the non-visable depth a minimum of four (4) separate and distinct soil samples shall be obtained by the contractor under the direction of the contracting officer or his representative, in accordance with the standard sampling procedures and methods specified within this contract. The number of samples may be increased at the Discretion of the Contracting Agency. Soil samples shall be taken at locations at and adjacent to areas where the overlaying contamination was most visually apparent.

Testing of the soil samples shall be the responsibility of the contractor and shall be in accordance with accepted testing procedures and methods specified for the contaminate. The standard or maximum contaminate level (MCL) for hydrocarbon contamination shall be set a 10 ppm. This MCL is based on past experience with oilspill clean-ups undertaken at GAFB.

In addition to soil sampling the contractor shall employ a vapor detection device such as an organic vapor analizer, OVA or an HNO to be used in confirming the removal of contaminates at the excavated depth.

All results of sample testing and vapor detection shall be documented and forwarded to the contracting agency as proof that the site meets the stated MCL. Backfill operations may proceed upon approval of results by the contracting agency.

1.3 SUBMITTALS:

1.3.1 Certified Test Reports:

a. Waste Characterization Analysis Test Results

1.4 DELIVERY, STORAGE, AND HANDLING: Perform in a manner to prevent contamination or segregation of materials.

1.5 CRITERIA FOR BIDDING: Base bids on the following criteria:

a. Surface elevations are as indicated.

b. Pipes or other artificial obstructions, except those indicated, will not be encountered.

c. Groundwater elevations indicated were those existing at the time subsurface investigations were made and do not necessarily represent groundwater elevation at the time of construction. See Test Boring Logs at end of this section.

d. Blasting will not be permitted. Remove material in an approved manner.

e. Quantity of soil to be removed is shown on the Contract Drawings. Should PID testing indicate more soil is contaminated as specified under Paragraph 3.2.1.b, notify the Contracting Officer immediately.

1.6 PROTECTION:

1.6.1 Personnel Protection: It is required that the Contractor provide his personnel with personal protective equipment meeting the requirements of all applicable Codes and Regulations relating to the removal of contaminated soil, underground tanks and appurtenances; consisting as a minimum Tyvek coveralls, impermeable gloves and boots, safety glasses, face shields, hard hats and NIOSH approved organic vapor respirators, and that the Contractor's personnel shall have been trained in the proper use of said equipment.

1.6.2 Supporting Systems: Provide shoring, bracing and sheeting in accordance with the COE EM 385-1-1, Section 23A & B except that banks may be sloped only when approved by the Contracting Officer.

1.6.3 Site Drainage: Provide for the collection and disposal of surface and subsurface water encountered during construction.

1.6.3.1 Surface Drainage: Completely drain construction site during periods of construction to keep soil materials sufficiently dry to permit construction operations to successfully progress. Provide temporary ditches, swales, and other drainage

features and equipment as required to maintain dry soils. When unsuitable working platforms for equipment operation and unsuitable soil suport for subsequent construction features develop, remove the unsuitable material and provide new soil mterial as specified herein.

Should well points be required for the proper dewatering of the excavations, submit well point design details to Contracting Officer's Representative for approval.

1.6.4 Protection of Underground Utilities: The Contractor is required to obtain a Digging Permit before any excavation, stripping or other site work may be performed. This request must be made to the Contracting Officer at least 21 days prior to the planned commencement of digging operations. A copy of the approved digging permit must remain at the work site until the completion of the project.

1.6.5 Movement of construction machinery and equipment over any pipes during any stage of construction shall be at the Contractor's risk. Repair or remove and provide new pipe for existing or newly-installed pipe that has been displaced or damaged.

PART 2 - PRODUCTS - NONE

PART 3 - EXECUTION

3.1 REMOVALS:

Excavations shall be in accordance with Specification Section 02220 as modified hereinafter.

3.1.1.a Excavate the contaminated soils to the extent shown on the drawings. Monitor soil removed with a PID (photoionization detector) organic vapor analyzer for contamination.

3.1.1.b Continue to excavate soils that indicate contamination levels registering three (3) times background on the PID organic vapor analyzer.

3.1.1.c Containerize and store on site, in either a lined and covered rolloff container, or stockpile over a berm-edged plastic liner with plastic cover, until the Waste Characterization Analysis has been completed and results obtained.

3.1.1.d Sample the contaminated soil and have performed a Waste Characterization Analysis sufficient to comply with related regulations for the transportation and disposal of contaminated soils and appurtenances.

3.2 DISPOSAL: Upon receipt of the Waste Characterization Analysis results, dispose of the previously stored contaminated soil (and appurtenances) at an approved disposal facility. Contractor shall provide the name of the proposed disposal facility prior prior to notice to proceed (NTP) and delivery receipts for contaminated soil disposed at disposal facility. Transportation shall only be undertaken by a hauler holding a current Part 364 Hauling Permit Proof of Part 364, Hauling Permit, shall be submitted prior to NTP and hauling contaminated soil off-base.

3.3 FINISH OPERATIONS:

3.3.1 Grading: Finish grades tomatch existing. Grade areas to drain water away from structures. For existing grades that will remain but which were disturbed by Contractor's opertions, grade to blend in existing contours.

3.3.2 Turf Replacement: Refer to Specification Section 02930; turf replacemet to be to the limits shown on the Contract Drawings and where other areas were disturbed by the Contractor's operations.

3.3.3 Asphalt Concrete Paving: Refer to Specification Section 02513; install to limits shown on the Contract Drawings.

3.3.4 Sidewalk Replacement: Refer to Specification Section 03302 (3.5.1); match existing walk.

3.4 COMPLETION DOCUMENTATION:

3.4.1 Contractor shall provide the Contracting Officer one marked up copy of the contract drawings indicating the extent of the soil removed.

3.4.2 Upon completion of the work, the Contractor shall provide to the Contracting Officer's Representative a report containing certification that the site was closed out in accordance with the requirements of closure.

3.5 FIELD SAMPLING AND TESTING:

3.5.1 Field Density: ASTM D-1557; test each lift.

3.5.2 Waste Characterization Analysis; Test soil for flash point, EP Toxicity, lead, PCB's and FID as a minimum; test for all items required by the disposal facility selected by the Contractor.

*** END OF SECTION ***

parratt wolff inc

TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/25/88 DATE COMPLETED 4/25/88

HOLE NO. B-1
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 10.0'
BEFORE CASING REMOVED 11.0'
AFTER CASING REMOVED Hole caved at 6.5' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE - HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		2/3		Brown moist loose to very dense fine to coarse SAND, trace silt	
	2.0'			4/4	7		
	2.0'-	2		9/12			
	4.0'			20/20	32		
5.0	4.0'-	3		18/22			
	6.0'			32/40	54		
	6.0'-	4		21/32			
	8.0'			50/65	82		
	8.0'-	5		26/38			
10.0	10.0'			48/69	86		10.0'
WL	10.0'-	6A		11/14		Brown wet medium dense fine to medium SAND, trace silt	11.5'
	11.5'	6B		22/24	36	Gray-brown moist dense fine to coarse SAND, trace fine gravel, trace silt	
	11.5'-						
	12.0'						
15.0						Bottom of Boring	12.0'

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TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/25/88 DATE COMPLETED 4/25/88

HOLE NO. B-2
SURF. EL.
JOB NO. 88100

GROUND WATER DEPTH
WHILE DRILLING 12.0'
BEFORE CASING REMOVED 18.6'
AFTER CASING REMOVED Hole caved at 6.4' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE- HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		3/6		Brown moist medium dense to very dense fine to coarse SAND, trace silt	
	2.0'			7/9	13		
	2.0'-	2		9/10			
	4.0'			11/12	21		
5.0	4.0' -	3		6/6			
	6.0'			8/8	14		
	6.0'-	4		10/18			
	8.0'			22/30	40		
	8.0'-	5		10/26			
10.0	10.0'			30/48	56		
	10.0'-	6		12/18			
WL ▼	12.0'			28/35	46		12.0'
	12.0'-	7A		30/33		Brown wet very dense fine to coarse SAND, trace silt	
	13.5'	7B		25/28	58		13.5'
15.0	13.5'-14'					Gray-brown moist dense to very dense fine to coarse SAND, little fine to coarse gravel, trace boulders, trace silt	
	14.0'-	8		18/31			
	16.0'			30/42	61		
	16.0'-	9		25/41			
	17.4'			100-.4'			
20.0	18.0'-	10		19/26			
	20.0'			38/55	64	Bottom of Boring	20.0'

parratt wolff inc

TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
Griffiss Air Force Base
LOCATION New York
DATE STARTED 4/25/88 DATE COMPLETED 4/25/88

HOLE NO. B-3
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 15.5'
BEFORE CASING REMOVED Dry
AFTER CASING REMOVED Hole caved at 8.5' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE - HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		2/3		Brown moist loose to dense fine SAND, trace silt	
	2.0'			5/8	8		
	2.0'-	2		9/12			
	4.0'			20/28	32		
5.0	4.0'-	3		16/18			
	6.0'			29/25	47		6.0'
	6.0' -	4		18/20		Brown moist dense to very dense fine to coarse SAND, trace silt	
	8.0'			28/36	48		
	8.0'-	5		18/22			
10.0	10.0'			40/50	62		
	10.0'-	6		20/25			
	12.0'			48/55	73		
	12'-13'	7A		25/30			13.0'
	13'-14'	7B		30/30	60	Gray moist very dense fine to coarse SAND and SILT, some fine to medium gravel, trace roots	14.0'
15.0	14.0'-	8		3/6		Brown-gray moist fine SAND and SILT, trace clay	15.5'
WL	16.0'			4/4	10	Brown wet loose fine SAND, little silt	
	16.0'-	9		2/2		Bottom of Boring	18.0'
	18.0'			2/3	4		
20.0							

parratt wolff inc

TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/26/88 DATE COMPLETED 4/26/88

HOLE NO. B-4
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 19.0'
BEFORE CASING REMOVED 19.5'
AFTER CASING REMOVED Hole caved at 9.5' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE - HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		6/10		Brown moist medium dense fine to coarse SAND, little silt, trace roots	2.0'
	2.0'			10/16	20		
	2.0'-	2		13/13		Brown moist dense to very dense fine SAND, trace silt	
	4.0'			19/37	32		
5.0	4.0'-	3		18/28			
	6.0'			46/50	74		
	6.0'-	4		25/40			
	8.0'			60/64	100		
	8.0'-	5		18/35			
10.0	10.0'			55/68	90		
	10-11.6'	6A		25/32			11.6'
	11.6-12'	6B		62/28	94	Gray moist very dense to medium dense fine to coarse SAND, little silt	
	12.0'-	7		38/37			
	14.0'			40/50	77		
15.0	14-14.4'	8		50-.4'			
	15.0'-	9		16/24			
	17.0'			25/30	49		
	17.0'-	10		17/6			19.0'
WL ▼	19.0'			5/5	11		
20.0	19.0'-	11		WR/WR		Gray wet loose fine to coarse SAND, trace fine gravel, trace silt	
	21.0'			4/4	4	Bottom of Boring	21.0'
						Note: WR = sampler penetrated under weight of rods.	
25.0							

parratt wolff inc

TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/26/88 DATE COMPLETED 4/26/88

HOLE NO. B-5
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 11.5'
BEFORE CASING REMOVED 16.0'
AFTER CASING REMOVED Hole caved at 8.5' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE - HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		3/5		TOPSOIL	0.5'
	2.0'			11/16	16	Brown moist medium dense fine to coarse SAND, some fine to coarse gravel, little silt	
	2.0'-	2		17/17			
	4.0'			28/32	45		2.2'
5.0	4.0'-	3		16/28		Brown moist very dense fine to coarse SAND, trace fine to coarse gravel; trace silt	
	6.0'			48/49	76		
	6.0'-	4		30/30			
	8.0'			40/40	70		
	8.0'-	5		17/29			
10.0	10.0'			42/62	71		
WL ▼	10.0'-	6		24/25			
	12.0'			35/42	60		
	12-12.7'	7A		21/25			12.7'
	12.7-14'	7B		50/65	75	Gray-brown moist very dense to dense fine to coarse SAND, some silt, trace fine gravel, layered	
15.0	14.0'-	8		16/30			16.0'
	16.0'			20/23	50	Brown moist medium dense fine to medium SAND, little silt	
	16.0'-	9		16/16			
	18.0'			11/12	27	Bottom of Boring	18.0'
20.0							

parratt wolff inc

TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/26/88 DATE COMPLETED 4/26/88

HOLE NO. B-6
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 10.7'
BEFORE CASING REMOVED
AFTER CASING REMOVED Hole caved at 5.2' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE - HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		1/2		Brown moist very loose to very dense fine to coarse SAND, trace silt, trace fine to medium gravel	
	2.0'			2/2	4		
	2.0'-	2		2/2			
	4.0'			2/1	4		
5.0	4.0'-	3		1/4			
	6.0'			16/24	20		
	6.0'-	4		12/25			
	8.0'			38/45	63		
	8.0'-	5		20/30			
10.0	10.0'			50/60	80		
WL	10-10.7'	6A		20/25			11.9'
	10.7-12'	6B		28/42	53	Brown-gray wet very dense fine to medium SAND, some silt	13.0'
	12'-13'	7A		16/25		Brown moist very dense fine to coarse SAND and SILT, little fine to coarse gravel, trace roots (topsoil)	13.5'
	13-13.5'	7B		36/46	61	Gray-brown moist very dense fine SAND, some silt	
15.0	13.5-14'	7C				Bottom of Boring	14.0'

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TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION - Griffiss Air Force Base
New York

DATE STARTED 4/27/88 DATE COMPLETED 4/27/88

HOLE NO. B-7
SURF. EL.
JOB NO. 88100

GROUND WATER DEPTH
WHILE DRILLING 18.0'
BEFORE CASING REMOVED 19.5'
AFTER CASING REMOVED Hole caved at 10.7' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE- HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		3/6		Brown moist medium dense to very dense fine to coarse SAND, some fine to medium gravel, trace silt	
	2.0'			8/12	14		
	2.0'-	2		30/30			
	4.0'			45/50	75		
5.0	4.0'-	3		15/22			
	6.0'			24/38	46		
	6.0'-	4		35/40			
	8.0'			65/70	105		
	8.0'-	5		25/24			
10.0	10.0'			40/46	64		
	10.0'-	6		20/26			
	12.0'			41/40	67		12.0'
	12.0'-	7		12/15		Brown moist medium dense fine to medium SAND, trace silt with black streaks, possibly oil	
	14.0'			20/40	35		
15.0	14'-15'	8A					
	15'-16'	8B					
	16-16.8'	9A		18/30			17.4'
WL ▼	16.8-17.4'	9B		45/54		Brown moist very dense fine to medium SAND, trace silt	18.0'
	17.4-18'	9C				Gray-brown wet medium dense fine to coarse SAND, trace silt, trace fine to coarse gravel	21.5'
20.0	18-18.8'	10A		16/19		Brown moist medium dense fine to medium SAND and SILT, trace roots (topsoil)	
	18.8-20'	10B		17/17	36	Bottom of Boring	22.0'
	20-21.5'	11A		11/7			
	21.5-22'	11B		5/5	12		
25.0							

parratt wolff inc

TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/28/88 DATE COMPLETED 4/28/88

HOLE NO. B-7A-W
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH WHILE DRILLING 18.0'
BEFORE CASING REMOVED 19.5'
AFTER CASING REMOVED Installed well

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE - HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
						Drilled to 22.0' without sampling	
5.0							
10.0							
15.0							
WL ▼							
20.0							
							22.0'
	22.0'-	12		1/1		Brown-gray moist loose fine to coarse	
	24.0'			6/8	7	SAND, little silt	24.0'
25.0	24.0'-	13		4/4		Gray wet loose fine to medium SAND	
	26.0'			5/7	9		
	26.0'-	14		5/6			27.0'
	28.0'			9/9	15	Gray-brown wet stiff SILT, little clay	
30.0						with lenses of fine to coarse sand	
						Bottom of Boring	28.0'
						Note: Installed 2" PVC screen 27.0' to 17.0', 2" PVC riser to surface with locking cover.	

parratt wolff inc

TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/28/88 DATE COMPLETED 4/28/88

HOLE NO. B-8
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 18.0'
BEFORE CASING REMOVED 19.5'
AFTER CASING REMOVED Hole caved at 16.5' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE - HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		3/6		Brown moist to wet very loose to very dense fine to medium SAND, trace silt, trace fine to medium gravel	
	2.0'			12/14	18		
	2.0'-	2		18/25			
	4.0'			30/45	55		
5.0	4.0'-	3		19/25			
	6.0'			60/70	85		
	6.0'-	4		25/42			
	8.0'			50/57	92		
	8.0'-	5		12/25			
10.0	10.0'			35/37	60		
	10.0'-	6		70/40			
	12.0'			60/66	100		
	12.0'-	7		33/45			
	14.0'			45/50	90		
15.0	14.0'-	8		14/24			
	16.0'			24/37	48		
	16.0'-	9		35/42			
WL ▼	18.0'			35/35	77		18.0'
	18.0'-	10		14/19		Brown wet medium dense to very loose fine to medium SAND	
20.0	20.0'			18/14	37		
	20.0'-	11		3/4			
	22.0'			5/5	9		
	22.0'-	12	No	WH			
	24.0'		Rec	WH			
25.0						Bottom of Boring	24.0'

Note: WH indicates sampler penetrated under weight of 140# hammer.

SECTION 02220

EXCAVATION

1. GENERAL:

1.1 Excavation, in open cut, includes the loosening, removing, transporting, storage and disposal of all materials necessary to be removed for the construction and completion of all work under the Contract. Excavations shall be made to the widths and depths shown on the Plans, specified or directed.

1.2 Where rock is encountered, the excavations shall be done in accordance with the applicable provisions hereof.

2. DEFINITIONS:

2.1 The term "excavation" and the term "trenching" where used, shall be deemed and understood to cover the following described work, and the price bid for any and all items including "excavation", or "trenching" shall be deemed to include and cover all of the several following detailed operations:

a. The loosening, removing, transporting, and storage of all materials;

b. All sheeting, sheetpiling, bracing and shoring, and the placing, driving, cutting off and removing of the same;

c. All diking, ditching, fluming, cofferdamming, pumping, well-pointing, bailing, dewatering and draining or otherwise disposing of water;

d. The refilling of trenches, excavations and pits, and the furnishing and placing of material over trenches, excavations and pits to the original surface of the ground or to other grades;

e. The compacting of all materials used in filling or refilling by rolling, ramming, watering, puddling, or other approved method;

f. The removing and disposing of all surplus materials from all excavations in the manner specified;

g. The maintenance, accommodation and protection of travel;

h. The supporting and protecting of all tracks, rails, buildings, curbs, sidewalks, pavements, overhead wires, poles, trees, vines, shrubbery, pipes, sewers, conduits or other structures or property and its appurtenances,

in the vicinity of the work, whether over or underground or which appear within the excavations, and the restoration of the same in case of settlement or other injury;

i. All temporary bridging and fencing and the removing of same, the temporary paving of highways, roads, driveways, and the permanent repairing or replacing and relaying of pavements, curbs, gutters and sidewalks removed, disturbed, or injured, the removing and clearing away of all construction rubbish, refuse, unused materials, plant and tools from the site;

j. The dressing, topsoiling, sodding and/or seeding of all unpaved areas disturbed by the Contractor within and outside the limits of the Contract as may be necessary to leave the surface in as good condition as it was previous to the commencement of the work.

2.2 "Earth" includes all materials, such as sand, gravel, clay loam, ashes, cinders, muck, soft or disintegrated rock, roots, or pieces of timber, not requiring blasting, barring or wedging from their original beds, and specifically excludes all ledge or bed rock, and individual boulders or masonry larger than one-half cubic yard in volume.

2.3 "Backfill" includes selected materials for the backfilling or refilling of all excavations and trenches up to the original surface of the ground or to other grades as may be shown or directed.

2.4 "Spoil" includes surplus excavated materials not required or not suitable for backfills or embankments.

2.5 "Embankments" include fills constructed of selected materials above the original surface of the ground.

3. ROCK EXCAVATION:

3.1 Rock excavation shall include the loosening, removing, transporting, storing and disposal of all materials requiring barring, or wedging for removal from their original beds. All pieces of ledge or bed rock, boulders, or masonry larger than one-half (1/2) cubic yard in volume are included under rock excavation. Rock excavations shall be made to the widths and depths shown on the Plans or as directed. For concrete structures, rock shall be excavated only to the bottom of the structure. All excavated rock which cannot be handled and compacted as earth shall not be mixed with other backfill or embankment materials except as specified herein or as directed.

4. BLASTING: Will not be permitted.

5. VACANT

6. EXCAVATION FOR STRUCTURES:

6.1 Excavation shall be of sufficient size, and only of sufficient size, to give suitable room for the proper construction of structures and appurtenances, including allowances for sheeting, dewatering, and other similar work necessary for completion of the Contract.

6.2 Excavations for structures shall be made only to the lines and grades shown on the Plans, specified or directed.

6.3 In no case will under cutting excavation faces for extended footings be permitted. Not less than twelve (12) inches clearance shall be provided between excavation faces and brick or block masonry exterior wall surfaces which are to be plastered.

6.4 Subgrade for all concrete structures shall be undisturbed original earth or, where excavation below subgrade is ordered, it shall be a thoroughly compacted and consolidated lining, special lining or special backfill as directed and shall be sufficiently stable to remain firm and intact during the surfacing of subgrade, laying reinforcing steel and placing concrete thereon.

7. BACKFILLING AROUND STRUCTURES:

7.1 Backfilling around structures shall not be commenced until all lumber, refuse, rubbish and other similar materials are removed from the excavated area. Backfill around structures may be placed by machine, provided the work shall be done carefully to prevent damage to the structure. In no case shall backfill materials be allowed to fall directly on a structure, until at least twelve (12) inches of hand-placed material has been placed thereon and compacted.

7.2 Backfill around structures shall be deposited in horizontal layers not more than eight (8) inches in thickness and shall be thoroughly compacted. Compaction shall be by a vibrating tamper or other approved method and shall be to a minimum dry density of ninety-five (95) percent of the maximum dry weight density in pounds per cubic foot as determined by the Modified Proctor Compaction Test (ASTM D-1557).

8. TRENCHING:

8.1 The alignment, depth and pipe subgrades of all pipe trenches shall be determined by overhead grade lines parallel to the pipe invert, installed and maintained by the Contractor.

8.2 Under ordinary conditions, excavation shall be by open cut with vertical sidewalls, from the ground surface. Where the depth of trench and soil conditions permit, tunneling may be required beneath crosswalks, curbs, gutters, pavements, concrete driveways, railroad tracks and other surface structures.

8.3 Trenches shall not be opened for more than three hundred (300) feet in advance of the completed pipe or sewer nor left unfilled for more than one hundred (100) feet in the rear thereof without approval. Excavation of the trench shall be fully completed at least twenty (20) feet in advance of the pipe laying or construction of the invert unless specifically permitted otherwise.

9. WIDTH AND DEPTH OF TRENCHES:

9.1 The trenches in which pipelines are to be constructed, shall be excavated in all cases in such manner and to such depths and widths as will give suitable room for the pipelines which the trenches are to contain, for sheeting, pumping, dewatering, well-pointing and draining of water, and for removing the material not suitable for pipe subgrade.

9.2 Trenches for pipes shall be not less than six (6) inches wider than the hubs of the pipe in the clear on each side, measured over the hubs of the pipe, Width of trenches, measured at a point twelve (12) inches above the top of the pipe shall not exceed twelve (12) inches on each side. Width of trenches greater than specified above will be permitted in the vicinity of joints for welded steel pipe where access for the welding of joints is required.

9.3 Where, as required by loading conditions, the width of the lower portion of the trench, measured at twelve (12) inches above top of pipe, exceeds the maximum for the size of pipe, additional concrete cradle or concrete encasement shall be installed by the Contractor at his own expense.

9.4 Ledge rock, shale, boulders and large stones shall be removed to provide minimum bottom and side clearances, for the size of pipe being laid in each case, as follows:

Size of Pipe (Inches)	Minimum Clearance Below Pipe (Inches)	Minimum Clearance At Sides (Inches)
12 or smaller	4	6
15, 18, and 21	5	6
24 to 36	7	6
Over 36	9	7

Where concrete embedment or cradle is to be placed, it shall be placed directly on the rock, and the bottom clearance shall be adjusted.

10. EARTH SUBGRADE PREPARATION FOR PIPES:

10.1 Unless otherwise permitted and approved, the trench shall have a flat bottom conforming to the grade to which the pipe is to be laid.

10.2 Except where concrete cradle or encasement is required below the specified pipe subgrade, mechanical excavation of trenches for pipe shall not extend lower than one (1) inch above the finished pipe subgrade elevation at any point. The remainder of the trench excavation shall be made with hand tools.

10.3 Pipe subgrade preparation shall be performed immediately prior to installing the pipe in the trench. The trench bottom shall be accurately graded by means of hand tools in such a manner that a uniform and continuous bearing and support on solid and undisturbed ground is provided for each pipe for its entire length or between bell holes.

10.4 All trenches shall be so graded that the spigot end of the pipe will be accurately centered in the adjacent pipe bell when laid, without raising the pipe off the trench bottom. Regrading of a trench bottom which is too high will be permitted. Correction of a subgrade that is too low shall be done only by placing and compacting lining over the entire width of the trench and regrading.

10.5 The trench bottom shall be accurately graded and ready for the installation of the pipe thereon prior to excavating bell holes if and where required.

10.6 Each bell hole shall be excavated immediately prior to laying the pipe therefor. Bell holes shall have a length, measured at the elevation of the pipe subgrade, not in excess of nine (9) inches and shall be of sufficient size so that no part of the pipe bell will be in contact with the trench bottom or granular fill thereon.

11. EXCAVATION FOR CONCRETE CRADLE OR ENCASEMENT:

11.1 Where concrete cradle or encasement is required, the trench subgrade elevation will be determined by the required concrete section in each case. Unless otherwise authorized, concrete cradle or encasement shall extend across the full width of the trench as excavated and the concrete therein shall be poured directly against vertical trench banks. In the case of concrete cradle or encasement of pipe in a sheeted trench, the concrete may be poured directly against sheeting which is to be left in place in the trench, as specified.

12. PIPE EMBEDMENT:

12.1 All pipe shall be protected from lateral displacement and possible damage resulting from superimposed backfill loads, impact or unbalanced loading during backfilling operations by being adequately embedded in suitable pipe embedment material. Except where loading or subsoil conditions require the use of concrete cradle or encasement, all pipe embedment shall be placed so as to insure adequate lateral and vertical stability of the installed pipe during pipe jointing and embedment operations. A sufficient amount of the specified pipe embedment material to hold the pipe in rigid alignment shall be uniformly deposited and thoroughly compacted on each side, and back of the bell, of each pipe laid.

12.2 Pipe embedment materials placed at any point below an elevation six (6) inches above the top of pipe or sewer, shall be deposited and compacted in layers not to exceed four (4) inches in uncompacted depth and such deposition and compaction shall be done simultaneously and uniformly on both sides of the pipe. Compaction shall be by vibrating tamper or other approved method and shall be to a minimum dry density of ninety-five (95) percent of the maximum dry weight density in pounds per cubic foot as determined by the Modified Proctor Compaction Test (ASTM D-1557). All such materials shall be placed in the trench with hand tools in such a manner that they will be scattered alongside the pipe and not dropped into the trench in compact masses.

12.3 Concrete cradle and encasement of the class specified shall be installed where and as shown on the Plans or ordered. Before concrete cradle or encasement is placed, the pipe shall be braced in all directions to prevent movement or flotation.

13. BACKFILL ABOVE EMBEDMENT:

13.1 The portion of pipe trenches between the top of the Pipe Embedment and the upper limit of backfill shall be refilled with suitable materials.

13.1.1 Backfilling to rough grade elevation shall be completed at the end of each day's work or at any time in which the Contractor is not on site in order to prevent a potential hazard.

13.2 Where trenches are within the ditch-to-ditch limits of any street, road, driveway or other recognized traveled vehicular way, or within other limits that may be specifically shown or specified for this purpose, the backfill materials shall be deposited in the trench in horizontal layers not more than six (6) inches in thickness, and each layer shall be compacted by vibrating tamper or other approved method and shall be to a minimum dry density of ninety-five (95) percent of the maximum dry

weight density in pounds per cubic foot as determined by the Modified Proctor Compaction Test (ASTM D-1557).

13.3 Where trenches are outside of the ditch-to-ditch limits of any street, road, driveway or other recognized traveled vehicular way, and outside of other limits that may be specifically shown or specified as areas in which mechanical compaction in layers is to be performed, the backfill material may be deposited in the trench by mechanical means for the full depth of the trench between the top of embedment and ground surface with no special compaction. In such case the backfill materials shall be mounded over the trench to an elevation slightly above desired finished grade to allow for settlement and compaction by natural means, and the Contractor shall return to the area during his clean-up operations to remove any excess materials remaining above finished grade or add sufficient additional backfill to bring the completed work to grade. If a hazard should be created by such excess materials, or by settlement below finished grade, prior to the performance of clean-up operations, the Contractor shall remove such excess, or add additional backfill, at the time the hazard is created or when directed.

13.4 Any additional material added during clean-up operations, or at any other time to prevent or remove a hazard, shall be placed in horizontal layers not more than eight (8) inches in thickness, with each layer adequately compacted by mechanical means, by the Contractor at his own expense.

14. REMOVAL OF WATER:

14.1 The Contractor shall at all times during construction provide and maintain proper and satisfactory means and devices for the removal of all water entering the excavations, and shall remove all such water as fast as it may collect, in such manner as shall not interfere with the prosecution of the work or the proper placing of pipe, masonry, concrete, structures, or other work.

14.2 Removal of water includes the construction and removal of cofferdams, sheeting and bracing, the furnishing of materials, equipment and labor necessary therefore, the excavation and maintenance of ditches and sluice-ways and the furnishing and operation of pumps, wellpoints, and appliances needed to maintain thorough drainage of the work in a satisfactory manner.

14.3 Water shall not be allowed to rise over or come in contact with any masonry, concrete or mortar, until at least twenty-four (24) hours after placement, and no stream of water shall be allowed to flow over such work until 48 hours after placement.

14.4 Unless otherwise specified, all excavations which extend down to below the ground water elevation at the sites of structures shall be dewatered by lowering and maintaining the ground water beneath such excavations at an elevation not less than that specified herein at all times when work thereon is in progress, during subgrade preparation and the placing of the structures or pipe thereon.

14.5 Where an upward pressure or flow of water in combination with a fine-grained subsurface material causes a quick condition, the Contractor shall install wellpoints to stabilize the subgrade. Where wellpoints are used, the ground water table shall be continuously (day and night) maintained to an elevation of not less than twenty-four (24) inches below the excavation and when subgrade is reached the ground water shall be maintained not less than twenty-four (24) inches below the subgrade. Unless otherwise permitted, the ground water shall be maintained not less than twenty-four (24) inches below the subgrade until completion of the backfilling to an elevation at least twelve (12) inches above natural ground water level. Wellpoint headers, points, and other pertinent equipment shall not be placed within the limits of the excavation in such a manner or location as to interfere with the laying of pipe or trenching operations or with the excavation for and construction of other structures.

14.6 In areas where ground water enters the excavation but does not cause a quick condition the ground water may be removed by any practical method which does not damage the subgrade, cause the same to become unstable or interferes with construction operations.

14.7 The above ground water control requirements specified for wellpointing operations apply to other dewatering methods.

14.8 Suitable stand-by pumping equipment shall be provided to insure the maintenance of the specified lowering of the water table.

14.9 Water pumped or drained from excavations, or any sewers, drains, or water courses encountered in the work, shall be disposed of in a suitable manner without injury to adjacent property, the work under construction, or to pavements, roads, and drives. No water shall be discharged to sanitary sewers. Sanitary sewage shall be pumped to sanitary sewers or shall be disposed of by an approved method, such as tank truck.

14.10 Any damage caused by improper handling of water shall be repaired by the Contractor at his own expense.

15. SHEETING & BRACING:

15.1 The Contractor shall furnish, place and maintain such sheeting, bracing and shoring as may be required to support the sides and ends of excavations in such manner as to prevent any movement which could, in any way, injure the pipe, sewers, masonry, or other work; diminish the width necessary; otherwise damage or delay the work; or endanger existing structures, pipes or pavements; cause the excavation limits to exceed the right-of-way limits; or to occassion a hazard to persons engaged on the project or to the general public.

15.2 In no case will bracing be permitted against pipes or structures in trenches or other excavations.

15.3 If, in the judgement of the Contracting Officer, the sheeting or supports furnished are inadequate or unsuited for the purpose, the Contracting Officer may order such sheeting or bracing to be replaced or additional sheeting and bracing to be installed.

16. REMOVAL OF SHEETING & BRACING:

16.1 In general, all sheeting and bracing, whether of steel, timber or other material, used to support the sides of trenches or other open excavations, shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a pipe or sewer shall be withdrawn, unless directed, before more than six (6) inches of earth is placed above the top of the pipe or sewer and before any bracing is removed. The voids left by the sheeting shall be carefully refilled with selected material and rammed tight with tools especially adapted for the purpose, or otherwise as may be approved.

16.2 The Contracting Officer may order the Contractor to delay the removal of sheeting and bracing, if in his judgment the installed work has not attained the necessary strength to permit placing of backfill.

17. DRAINAGE:

17.1 All material deposited in roadway ditches or other water courses crossed by the line of trench or near a structure shall be removed immediately after backfilling is completed and the section grades and contours of such ditches or water course restored to their original condition, in order that surface drainage will be obstructed no longer than necessary.

17.2 Backfilling of trenches for pipes installed beneath or across roadways, driveways, walks and other traffic ways adjacent to drainage ditches and water courses shall not be done prior to the completion of backfilling to the original ground surface of the trench on the upstream side of such traffic-way

in order to prevent the impounding of water at any point after the pipe has been laid, and all necessary bridges and other temporary structures required to maintain traffic across such unfilled trenches shall be constructed and maintained. All backfilling shall be done in such a manner that water will not accumulate in unfilled or partially filled trenches.

17.3 Where trenches are constructed in or across roadway ditches or other water courses, the backfill shall be protected from surface erosion by adequate means. Where trenches cross such waterways; the backfill surface exposed on the bottom and slopes thereof shall be protected by means of stone or concrete rip-rap or pavement.

18. DISPOSAL OF MATERIALS: Refer to Specification Section 02091.

19. UNFINISHED WORK:

19.1 When for any reason the work is left unfinished, all trenches and excavations shall be filled and all roadways and sidewalks left unobstructed with their surfaces in a safe and satisfactory condition.

20. HAULING MATERIAL ON STREETS:

20.1 When it is necessary to haul material over the streets or pavements, the Contractor shall provide suitable tight vehicles so as to prevent deposits on the streets or pavements. In all cases where any materials are dropped from the vehicles, the Contractor shall clean up the same as often as directed and keep the crosswalks, streets and pavements clean and free from dirt, mud, stone and other hauled material.

21. TEST PITS:

21.1 For the purpose of locating underground obstructions, the Contractor shall make such excavations in advance of the work as directed. Payment for the excavations of test pits will be made under an appropriate item of the Contract.

22. RESTORATION OF SURFACES:

22.1 The various types of street surface, gutters and culverts, disturbed, damaged or destroyed during the performance of the work under the Contract, shall be restored and maintained as specified herein and as shown and directed.

23. RESTORATION OF PROPERTY:

23.1 The Contractor shall restore all pavement, driveways, sidewalks, gutters, culverts, trees, shrubs, lawns, landscaped areas and any other public or private property damaged as a result of work under this Contract. The quality of materials and workmanship used in the restoration shall produce a condition equal to or better than the condition before the work began.

*** END OF SECTION ***

SECTION 02222

SUBBASE COURSE

1. DESCRIPTION:

1.1 Under this Item, the Contractor shall furnish and place Subbase Course in the areas shown on the Plans.

1.2 The work shall consist of the placing of Subbase Course in accordance with the New York State Department of Transportation Specifications dated January 2, 1985, and any addenda to these specifications issued after that date. The thickness of Subbase Course shall be as shown on the Drawings.

2. MATERIALS:

2.1 Materials shall conform with the following:

a. Type 2 Subbase Course - Item No. 304.03

2.2 The Contractor shall submit to the Contracting Officer a certified sieve analysis by an independent testing laboratory showing that the materials meet the required gradation.

3. PLACING:

3.1 The material shall be spread in horizontal layers so that the maximum thickness of any layer after compaction shall not exceed six (6) inches. Compaction shall be by traveling vibrators or other approved method and shall be to a minimum dry density of one hundred percent of the maximum dry density as determined by the Modified Proctor Test, ASTM D-1557. Each layer shall be thoroughly compacted before placement of overlying layers.

*** END OF SECTION ***

SECTION 02225

LINING, SPECIAL LINING, SPECIAL BACKFILL & SPECIAL BACKFILL MIX

1. GENERAL:

1.1 Lining shall consist of clean, sound, crushed stone and shall be free from coatings. Lining shall have the following ASTM No. 67 gradation by weight:

% Passing	Sieve
100	1"
90 - 100	3/4"
20 - 55	3/8"
0 - 10	No. 4
0 - 5	No. 8

1.2 Special Backfill shall consist of washed coarse sand, gravel or broken stone. The gravel or broken stone shall be well graded from fine to coarse. Special Backfill shall have the following gradation by weight:

% Passing	Sieve
100	2"
30 - 65	1/4"
0 - 10	No. 200

1.3 All granular materials shall be free from any organic or other deleterious materials.

1.4 For Special Backfill, the result of multiplying the percentage passing the No. 200 sieve by the Plasticity Index of the particles passing the No. 40 sieve shall not exceed thirty (30.0). In no case shall the Plasticity Index exceed five (5.0), or the percentage passing the No. 200 mesh sieve exceed ten percent (10%). Of the particles retained on the one-half inch (1/2") square sieve, not more than thirty percent (30%) by weight, shall consist of flat or elongated pieces. A flat or elongated piece is defined herein as one, the greatest dimension of which is more than three (3) times the least dimension.

1.5 The quality of the gravel or stone particles shall be determined by the magnesium Sulphate Soundness Test. The maximum percent loss at four (4) cycles, by weight, shall be twenty (20).

1.6 The Contractor shall employ an approved commercial testing laboratory at his own expense to conduct the sieve analysis, plasticity index and soundness tests. Prior to delivery of any of the materials to the site of the project, the Contractor shall submit the test results to the Contracting Officer for approval. The

Contracting Officer may, at the Contractor's expense, require additional tests if, in his opinion, the quality of the materials has changed during construction.

1.7 Special Backfill Mix shall consist of dry cement with gravel, meeting the specifications for Special Backfill, mixed in the proportion of one to fifteen (1:15) by volume.

1.8 Special Lining shall consist of a specially-blended mixture of not more than two approved local washed sands and one approved local screened gravel, mixed in the field to yield a uniform mixture.

1.9 Special Lining shall have the following gradation by weight:

% Passing	Sieve
100	2"
20 - 70	No. 40
2 - 10	No. 200

1.10 Lining shall be used for backfilling below subgrade in trenches for pipelines or excavations for structures, provided the sides and bottom of the excavations will remain stable when wet.

1.11 Where directed, Special Backfill shall be used for backfilling excavations in streets, roads, or drives, or in areas upon which structures are to be built or where the excavated material is unsuitable for backfilling.

1.12 Special Backfill Mix shall be used under paved highways and shoulders and for other backfilling operations as shown or directed.

1.13 Special Lining shall be used for backfilling below subgrade in trenches and excavations where the sides and bottom of the excavation will not remain stable when wet.

2. PLACING:

2.1 Lining, Special Lining, Special Backfill and Special Backfill Mix shall be placed in horizontal layers not more than eight (8) inches in thickness and shall be so thoroughly and uniformly compacted as to prevent after-settlement. In areas upon which structures are to be built, the Special Backfill shall be placed in layers not exceeding six (6) inches in thickness, measured after compaction, and shall be thoroughly and uniformly compacted to prevent settlement of the concrete or other structures to be placed on the fill. Compaction shall be by travelling vibrators or other approved method and shall be to a minimum dry density of one hundred percent (100%) of the maximum dry weight density, as determined by ASTM D-1557 (Modified Proctor Density).

2.2 All Lining, Special Lining & Special Backfill shall be inspected and approved before any pipelines are laid or any forms for structures are placed.

2.3 Any settlement in the finished work due to settlement of the compacted Lining, Special Lining, or Special Backfill shall be made good by the Contractor at his own cost and expense.

3. COMPACTION TEST (LINING, SPECIAL LINING, SPECIAL BACKFILL, SPECIAL BACKFILL MIX):

3.1 The Contractor shall employ an approved commercial testing laboratory at his own expense to conduct the compaction tests. A minimum of one density test shall be made for each one hundred (100) cubic yards of material placed. Refer to Project Provisions for additional requirements.

*** END OF SECTION ***

SECTION 02513

ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation and abbreviation only.

1.1.1 State Highway Specification: New York State Department of Transportation, Standard Specifications, Construction and Materials, January 2, 1985 with Addendums (NYSDOT Manual).

1.2 DESCRIPTION: This section includes the provision of all plant, labor and materials necessary for the preparation of the subgrade and the construction thereon of a base course, binder and a surface course.

All work and material shall be in accordance with the applicable requirements of the NYSDOT Manual. Sections mentioned herein refer to those specifications.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS: Excavation and filling to establish elevation of subgrade is specified in Section 02220, "Excavation".

1.4 CERTIFICATES: Provide approved certifications that all paving materials conform to the specification.

PART 2 - PRODUCTS AND EXECUTION

2.1 SUBGRADE: Preparation of subgrade shall be in accordance with Section 02220.

2.2 SUBBASE: Materials and methods of construction of subbase shall be in accordance with Section 304, Type 2 Subbase, Item 304.03.

2.3 BASE COURSE: Materials and methods of construction of base course shall be in accordance with Section 400, Type 1, Item 403.11.

2.4 BINDER COURSE: Materials and methods of construction of binder course shall be in accordance with Section 400, Type 3, Item 403.13.

2.5 SURFACE COURSE: Materials and methods of construction of surface course shall be in accordance with Section 400, Type 7, Item 403.17.

END OF SECTION

SECTION 02930

TURF

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.1.1 Federal Specifications (Fed. Spec.):

O-F-241D	Fertilizers, Mixed, Commercial
Q-P-166E	Peat, Moss; Peat, Humus; and Peat, Reed-Sedge

1.1.2 U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) Occupational Safety and Health Standards:

29 CFR 1910.1000	Air Contaminants

1.1.3 U.S. Department of Agriculture (USDA) Publications:

Federal Seed Act (January 1, 1985 Edition) Rules and Regulations of the Secretary of Agriculture

Soil Survey Investigation Report No. 1, Soil Survey Laboratory Methods and Procedures for Collecting Soil Samples. Soil Conservation Service, April 1972

1.1.4 American National Standards Institute (ANSI) Publication:

ANSI Z88.2-80	Practices for Respiratory Protection

1.1.5 American Society for Testing and Materials (ASTM) Publications:

D 977-84	Specification for Emulsified Asphalt
D 2607-69	Classification of Peats, Mosses, Humus and Related Products

1.1.6 American Sod Producers Association, Inc. (ASPA) Publication:

Guideline Specifications for Sodding

1.2 DEFINITION: Pesticide means soil fumigants, herbicides, insecticides and fungicides.

1.3 SUBMITTALS:

1.3.1 Samples: Two-8 by 10-inch swatches of erosion control material.

1.3.2 Certificates of Conformance:

a. Seed
b. Fertilizer
c. Topsoil
d. Peat
e. Lime

1.3.3 Laboratory Test Reports: Tests for Topsoil Composition specified in USDA Soil Survey Investigation Report No. 1.

1.3.4 Manufacturer's Data: Including physical characteristics, application and installation instructions, and recommendations:

a. Erosion Control Materials
b. Pesticides

1.3.5 Delivery Schedule: Submit at least 10 days before delivery.

1.3.6 Pesticide Control Plan: Submit proposed sequence of pesticide work. Include common name, chemical composition, formulation, concentration, rate and method of application, for all materials furnished; and names of state certified applicator(s), in the appropriate category.

1.4 DELIVERY, STORAGE, AND HANDLING:

1.4.1 Delivery:

1.4.1.1 Protect seed from drying out and from contamination during delivery, on-site storage, and handling.

1.4.1.2 Deliver fertilizer and lime to the site in original, unopened containers bearing manufacturer's chemical analysis, name, trade name, trademark, and indication of conformance to State and Federal laws.

1.4.1.3 Deliver pesticide materials to the site in the original unopened containers with legible label indicating Environmental Protection Agency registration number and manufacturer's registered uses.

1.4.2 Storage:

1.4.2.1 Store seed, lime, and fertilizer in cool, dry locations away from contaminants.

1.4.2.2 Do not store pesticides with other landscape materials.

1.4.2.3 Prior to stockpiling topsoil, treat growing vegetation with application of appropriate specified non-selective herbicide. Treat when foliage is 6 to 10 inches high and approximately 4 to 6 weeks prior to stockpiling.

1.4.3 Handling: Do not drop or dump materials from vehicles.

PART 2 - PRODUCTS

2.1 SEED:

2.1.1 Classification: State-certified of the latest season's crop delivered in original sealed packages bearing the producer's guaranteed analysis for percentages of mixtures, purity, germination, weedseed content, and inert material. Label in conformance with USDA Federal Seed Act 53 Stat., Rules and Regulations and applicable state seed laws. Wet, moldy, or otherwise damaged seed will be rejected. Field mixes will be acceptable when mix is performed on site in the presence of the Contracting Officer.

2.1.2 Composition: Proportion seed mixtures by weight as follows:

Name of Grass or Legume Botanical and Common

Seed	Percentage By Weight	Min. Percent Pure Seed	Min. Percent Germination and Hard Seed	Max. Percent Weed Seed
Perennial Ryegrass	25%	85%	75%	1%
Red Fescue (Commercial)	50%	95%	80%	1%
Red Top	25%	95%	85%	1%

2.2 TOPSOIL:

2.2.1 Existing Soil: None usable.

2.2.2 On-Site Topsoil: None usable.

2.2.3 Off-Site Topsoil: Conform to requirements specified in the paragraph entitled, "Composition." Additional topsoil shall be furnished by the Contractor.

2.2.4 Composition: Containing from 5 to 20 percent organic matter as determined by the Organic Carbon, 6A, Chemical Analysis Method described in USDA Soil Survey Investigation Report No. 1. Maximum particle size, 3/4 inch, with maximum 3 percent retained on 1/4-inch screen. Other components shall be within the following percentages:

Silt	25-50
Clay	10-30
Sand	20-35
pH	5 to 7.6
Soluble Salts	600 ppm maximum

2.3 pH ADJUSTERS:

2.3.1 Lime: Commercial grade hydrated limestone containing not less than 50 percent of total oxides, 45 percent calcium and 5 percent magnesium oxide, gradation, as follows: minimum 75 percent passing 100-mesh sieve and 100 percent passing 20-mesh sieve.

2.4 SOIL CONDITIONERS: Use singly or in combination as required to meet specified requirements for topsoil. Soil conditioners shall be nontoxic to plants.

2.4.1 Peat: Peat moss derived from a freshwater site and conforming to Fed. Spec. Q-P-166, ASTM D 2607, as modified herein. Shred and granulate peat to pass 1/2-inch mesh screen and condition in storage pile for minimum six months after excavation.

2.4.2 Sand: Clean and free of materials harmful to plants.

2.4.3 Rotted Manure: Well rotted, horse or cattle manure containing maximum 25 percent by volume of straw, sawdust, or other bedding materials. It shall be free of stones, sticks, and soil.

2.4.4 Composted Wood Derivatives: Ground bark, sawdust, or other wood waste material free of stones, sticks, and soil stabilized with nitrogen and having the following properties:

2.4.4.1 Particle Size: Minimum percent by weight passing:

No. 4 mesh screen	95
No. 8 mesh screen	80

2.4.4.2 Nitrogen Content: Minimum percent based on dry weight:

Redwood Sawdust	0.5
Fir Sawdust	0.7
Fir or Pine Bark	1.0

2.4.5 Calcined Clay: Granular particles produced from montmorillonite clay calcined to minimum temperature of 1200 degrees to the following gradation: minimum 90 percent passing 8-mesh screen, 99 percent retained on 60-mesh screen and, maximum 2 percent passing 100-mesh screen. Bulk density: 40 pounds maximum per cubic foot.

2.5 FERTILIZER:

2.5.1 Controlled Release Fertilizer: Magnesium ammonia phosphate and magnesium potassium phosphate with nitrogen-phosphorus-potassium ratio of 10 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, granulated to pass through a 1/8-inch screen.

2.5.2 Controlled Release Fertilizer with Hydroseeding: Nitrogen-phosphorus-potassium ratio of 16-7-12 plus 2 percent iron, composed of pills coated with plastic resin to provide continuous release of fertilizer for at least six months.

2.6 MULCHES: Free from, noxious weeds, mold, and other deleterious materials.

2.6.1 Wood Chips: Ground redwood or firtree bark, 3/16-inch maximum particle size.

2.6.2 Straw: Stalks from oats, wheat, rye, barley, or rice. Furnish in air-dry condition and of proper consistency for placing with commercial mulch blowing equipment.

2.6.3 Hay: Air-dry condition and of proper consistency for placing with commercial mulch blowing equipment. Use only marsh hay for lawn areas.

2.6.4 Wood Cellulose Fiber: Processed to contain no growth or germination-inhibiting factors and dyed an appropriate color to facilitate visual metering of materials application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 3.5 to 5.0. Use with hydraulic application of grass seed and fertilizer.

2.7 VACANT

2.8 WATER: Suitable quality for irrigation.

2.9 VACANT

PART 3 - EXECUTION

3.1 TIME RESTRICTIONS AND PLANTING CONDITIONS:

3.1.1 Planting Dates:

3.1.1.1 Sow seed from March 15 to May 15 for spring planting and from August 15th to October 1st for fall planting.

3.1.2 Restrictions: Do not plant when the ground is frozen, snow covered, or muddy.

3.2 PREPARATION:

3.2.1 Subgrade: After areas required to be turfed have been brought to the required subgrade, thoroughly till to minimum depth of 6 inches by scarifying, disking, harrowing, or other approved methods. Remove debris and stones larger than one inch in any dimension remaining on surface after tillage.

3.2.2 Topsoiling: Immediately prior to placing topsoil, scarify subgrade to a 2-inch depth for bonding of topsoil with subsoil. Spread topsoil evenly to the indicated depth a minimum depth of 4 inches. Do not spread topsoil when frozen or excessively wet or dry. Correct irregularities in finished surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.

3.2.3 Fertilizer, pH Adjusters, and Soil Conditioners:

3.2.3.1 Apply fertilizer at rates and analysis as determined by laboratory soil tests of the topsoil supplied.

3.3 SEEDING:

3.3.1 Approved Equipment: Sow seed by approved sowing equipment. Sow one-half the seed in one direction, and sow remainder at right angles to the first sowing. Cover seed to average depth of 1/2 inch by means of spike-tooth harrow, cultipacker, or other approved device.

3.3.2 Drill Seeding: Use cultipacker seeders. Drill seed uniformly to average depth of 1/2 inch and at a rate of 3.7 pounds per 1,000 square feet.

3.3.3 Hydroseeding: Mix seed, fertilizer, and wood cellulose fiber in required amount of water to produce a homogeneous slurry. Add wood cellulose fiber after seed, water, and fertilizer have been thoroughly mixed and apply at the rate of 200 pounds per acre dry weight. When hydraulically sprayed on the ground, material shall form a blotterlike cover impregnated uniformly with grass seed. Immediately following the application of the slurry mix, make separate application of wood cellulose mulch at the rate of 800 pounds, dry weight, per acre. Cover shall allow rainfall or applied water to percolate to underlying soil.

3.3.4 Rolling: Immediately after seeding, firm entire area except for slopes in excess of 3 to 1 with a roller not exceeding 90 pounds for each foot of roller width. If seeding is performed with cultipacker-type seeder or by hydroseeding, rolling may be eliminated.

3.3.5 Erosion Control Material: Install in accordance with manufacturer's instructions.

3.4 TURF ESTABLISHMENT PERIOD:

3.4.1 Definitions:

3.4.1.1 Turf establishment period will be in effect until the turf has been mowed three times.

3.4.1.2 A stand of turf is 95 percent ground cover of the established species.

3.4.2 Maintenance During Turf Establishment Period:

3.4.2.1 Mow turfed area to an average height of 1-1/2 inches whenever average height of grass becomes 3 inches.

3.4.2.2 Mow, remove excess clippings, eradicate weeds, water, fertilize, overseed, and perform other operations necessary to promote turf growth.

3.4.2.3 Post-fertilize the turfed areas with controlled release fertilizer approximately 45 days after planting and at intervals of 12 weeks thereafter until accepted. Apply fertilizer uniformly at the rate of 1/2 pounds per 1000 square feet.

3.5 FINAL ACCEPTANCE:

3.5.1 Final Inspection and Acceptance: Final inspection will be made upon written request from the Contractor at least 10 days prior to the last day of the turf establishment period. Final acceptance will be based upon a satisfactory stand of turf as defined in the paragraph entitled, "Turf Establishment Period". Prior to final acceptance, apply 3.7 pounds per 1,000 square feet of controlled release fertilizer.

3.5.2 Replanting: Replant, within specified planting dates, areas which do not have a satisfactory stand of turf.

*** END OF SECTION ***

SECTION 03302

CAST-IN-PLACE CONCRETE
(MINOR CONSTRUCTION)

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.1.1 U.S. Army Corps of Engineers (COE) Waterways Experiment Station Publications:

CRD-C-572-74	Specification for Polyvinylchloride Waterstop
CRD-C-621-83	Handbook for Concrete and Cement, Specification for Nonshrink Grout, Volume II (1949 Ed.)

1.1.2 American Concrete Institute (ACI) Publications:

301-84	Specifications for Structural Concrete for Buildings
304-73 (R83)	Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete
305R-77 (R82)	Hot Weather Concreting
306R-78 (R83)	Cold Weather Concreting

1.1.3 American Society for Testing and Materials (ASTM) Publications:

A 185-85	Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
A 497-79	Welded Deformed Steel Wire Fabric for Concrete Reinforcement
C 33-85	Concrete Aggregates
C 94-84	Ready-Mixed Concrete
C 143-78	Slump of Portland Cement Concrete
C 150-85	Portland Cement

C 172-82	Sampling Freshly Mixed Concrete
C 173-78	Air Content of Freshly Mixed Concrete by the Volumetric Method
C 231-82	Air Content of Freshly Mixed Concrete by the Pressure Method
C 260-77	Air-Entraining Admixtures for Concrete
C 920-79	Elastomeric Joint Sealants
D 1752-84	Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
D 1850-74 (R79)	Concrete Joint Sealer, Cold-Application Type

1.2 GENERAL REQUIREMENTS: In the ACI publications referred to herein, the advisory provisions shall be considered to be mandatory, as though the word "shall" has been substituted for "should" wherever it appears; reference to the "Building Official," the "Structural Engineer," and the "Architect/ Engineer" shall be interpreted to mean the Contracting Officer.

1.3 SUBMITTALS: Manufacturer's Certificate of Compliance:

a. Cement
b. Aggregates
c. Admixtures
d. Reinforcement
e. Joint filler
F. Joint sealant

1.4 DELIVERY: Do not deliver concrete until ready for concrete placement.

1.5 STORAGE: Store concrete aggregates to prevent contamination or segregation. Store reinforcement of different sizes and shapes in separate piles or racks raised above the ground to avoid excessive rusting. Protect from contaminants such as grease, oil, and dirt. Provide for accurate identification after bundles are broken and tags removed.

PART 2 - PRODUCTS

2.1 CONCRETE:

2.1.1 Concrete Mix Design: ACI 301, except as modified herein. Concrete shall have a 28-day compressive strength of 3000 psi. Slump shall be between 2 and 4 inches in accordance with ASTM C 143. The slump may be increased to 5 inches for

concrete utilizing either fly ash, pozzolan, or ground slag for 20 percent (minimum) of the total cementitious material. Provide ASTM C 33 aggregate Size No. 57 and 4 to 6 percent air entrainment for concrete exposed to freeze-thaw conditions. Accomplish air-entrainment using an air-entraining admixture.

2.1.2 Ready-Mixed Concrete: ASTM C 94, except as modified herein. Ready-mixed concrete is defined in this specification as concrete produced regularly by a commercial establishment and delivered to the purchaser in the plastic state.

2.2 MATERIALS:

2.2.1 Cement: ASTM C 150, Type I or II or ASTM C 595, blended cement, except as modified herein. The blended cement shall consist of a mixture of ASTM C 150 cement and one of the following materials: ASTM C 618 pozzolan or fly ash, or ASTM C 989 ground iron blast furnace slag. The pozzolan/fly ash content shall not exceed 25 percent by weight of the total cementitious material. For exposed concrete, use one manufacturer for each type of cement, ground slag, fly ash, and pozzolan.

2.2.2 Water: Water shall be potable.

2.2.3 Aggregates: ASTM C 33. Obtain aggregates for exposed concrete surfaces from one source. Aggregates shall not contain any substance which may be deleteriously reactive with the alkalies in the cement.

2.2.4 Admixtures: ASTM C 260 for air-entrained concrete. ASTM C 494 for water reducing (Type A, D, or E), accelerating (Type C), and retarding (Type B or D), to be used only when approved.

2.2.5 Reinforcement:

2.2.5.1 Reinforcing Bars: ASTM A 706, Grade 60; ASTM A 615 and ASTM A 617, Grade 60; or ASTM A 616, Grade 60.

2.2.5.2 Welded Wire Fabric: ASTM A 497 or ASTM A 185, 6 by 6, W2.9 by W2.9, unless otherwise indicated.

2.2.6 Materials for Curing Concrete:

2.2.6.1 Impervious Sheeting: ASTM C 171; waterproof paper, clear or white polyethylene sheeting, or polyethylene-coated burlap.

2.2.6.2 Liquid Membrane-Forming Compound: ASTM C 309, white-pigmented, Type 2, free of paraffin or petroleum. Do not use where finished appearance is important. Use where approved only.

2.2.6.3 Liquid Chemical Sealer-Hardener Compound: Compound shall not contain petroleum resins or waxes. Do not use on exterior slabs where exposed to freezing conditions. Compound shall not reduce the adhesion of resilient flooring, tile, paint, roofing, waterproofing, or other material to be applied to the concrete.

2.2.7 Expansion-Joint Filler: ASTM D 1751 or ASTM D 1752, 1/2-inch thick, unless otherwise indicated.

2.2.8 Joint Sealants:

2.2.8.1 Horizontal Surfaces (3 percent slope, maximum):

a. Outside Buildings: ASTM D 1190.
b. Inside Buildings: ASTM D 1190 or ASTM D 1850.

2.2.9 Vapor Barrier: ASTM C 171 polyethylene sheeting, minimum 6 mil thickness.

2.2.10 Polyvinylchloride Waterstops: COE CRD-C-572.

2.2.11 Nonshrink Grout: CRD-C-621.

PART 3 - EXECUTION

3.1 FORMS: ACI 301. Set forms true to line and grade and make mortar-tight. Chamfer above grade exposed joints, edges, and external corners of concrete 3/4 inch, unless otherwise indicated. Before concrete placement, coat the contact surfaces of forms with a nonstaining form coating compound. Do not use mineral oil on formed surfaces to be painted. Prevent concrete damage during form removal.

3.2 PLACING REINFORCEMENT AND MISCELLANEOUS MATERIALS: ACI 301. Provide bars, wire fabric, and other reinforcing materials, including wire ties, supports, and other devices necessary to install and secure the reinforcement.

3.2.1 Cover and Splicing: ACI 301, unless otherwise indicated.

3.2.2 Setting Miscellaneous Material: Place and secure anchors and bolts, pipe sleeves, conduits, and other such items in position before concrete placement. Plumb anchor bolts and check location and elevation. Temporarily fill voids in sleeves with readily removable material to prevent the entry of concrete.

3.2.3 Vapor Barrier: Provide beneath the on-grade concrete floor slab. Use the greatest widths and lengths practicable to eliminate joints wherever possible. Lap 12 inches minimum.

Remove torn, punctured, or damaged vapor barrier material and provide with new material prior to placing concrete. Place concrete to prevent damage to the vapor barrier material.

3.2.4 Construction Joints: ACI 301. Continue reinforcement across joints, unless otherwise indicated.

3.2.5 Expansion Joints and Contraction Joints: ACI 301. For slabs on grade, provide at edges of interior floor slabs, adjacent to walls, and as indicated. Make expansion joints 0.5 inch wide, except as indicated otherwise. Fill expansion joints not exposed to weather with preformed joint material. Seal joints exposed to weather with joint sealant. Do not extend reinforcement or other embedded metal items bonded to the concrete through any expansion or contraction joint, unless an expansion sleeve is used. Provide contraction joints, either formed or saw cut or cut with a jointing tool to the indicated depth after the surface has been finished. Sawed joints shall be completed within 4 to 12 hours after concrete placement. Protect joints from intrusion of foreign matter.

3.3 MEASURING, MIXING, TRANSPORTING, AND PLACING CONCRETE: ACI 304, except as modified herein. ASTM C 94; machine mix concrete and provide mandatory batch ticket information for each load of ready mix concrete. Begin mixing within 30 minutes after the cement has been added to the aggregates. Place concrete within 90 minutes of either addition of mixing water to cement and aggregates or addition of cement to aggregates if the air temperature is less than 85 degrees F. Reduce mixing time to 60 minutes if the air temperature is greater than 85 degrees F. Additional water may be added, provided that both the specified maximum slump and water-cement ratio are not exceeded. If the entrained air content falls below the specified limit, add a sufficient quantity of admixture to bring the entrained air content within the specified limits. Do not place concrete when weather conditions prevent proper placement and consolidation; in uncovered areas during periods of precipitation; or in standing water. Prior to placing concrete, remove dirt, construction debris, water, snow, and ice from within the forms. Consolidate concrete slabs greater than 4 inches in depth with high frequency, internal, mechanical vibrating equipment supplemented by hand spading and tamping. Consolidate concrete slabs 4 inches or less in depth by tamping, spading, and settling with a heavy leveling straight edge.

3.3.1 Cold Weather: ACI 306R. Provide and maintain 50 degrees F minimum concrete temperature. Do not place concrete when the ambient temperature is below 40 degrees F. Cover concrete and provide with a source of heat sufficient to maintain 50 degrees F minimum while curing.

3.3.2 Hot Weather: ACI 305R. Concrete temperature from initial mixing through final cure shall not exceed 90 degrees F. Cool ingredients before mixing, or substitute chip ice for part of required mixing water or use other suitable means to control concrete temperature to prevent rapid drying of newly placed concrete. Shade the fresh concrete and start curing as soon as the surface of the fresh concrete is sufficiently hard to permit curing without damage.

3.4 SURFACE FINISHES: ACI 301 for repair and finish, unless otherwise specified.

3.4.1 Defects: Repair formed surfaces by removing minor honeycombs, pits greater than 1 square inch surface area or 0.25 inch maximum depth, or otherwise defective areas. Provide edges perpendicular to the surface and patch with nonshrink grout. Patch tie holes and defects when the forms are removed. Concrete with extensive honeycomb (including exposed steel reinforcement, cold joints, entrapped debris, separated aggregate, or other defects) which affect the serviceability or structural strength will be rejected, unless correction of defects is approved. Obtain approval of corrective action prior to repair. The surface of the concrete shall not vary more than the allowable tolerances of ACI 301. Exposed surfaces shall be uniform in appearance and finished to a smooth form finish, unless otherwise specified.

3.4.2 Floated Finish: Place, consolidate, and immediately strike off concrete to obtain proper contour, grade, and elevation before bleedwater appears. Permit concrete to attain a set sufficient for floating and supporting the weight of the finisher and equipment. If bleedwater is present prior to floating the surface, drag the excess water off or remove by absorption with porous materials. Do not use dry cement to absorb bleedwater. Surface shall be level to within 1/4 inch in 10 feet where floor drains are not provided.

3.4.3 Steel Troweled Finish: First, provide a floated finish. When slab has attained a proper set, trowel to a smooth, hard, dense finish. Finished surfaces shall be free of trowel marks, uniform in texture, flat within 0.01 foot (approximately 1/8 inch) in 10 feet. Hand-finish portions of the slab not accessible to power finishing equipment (e.g., edges, corners) to match the remainder of the slab. Power trowel once and finally hand trowel where a finished floor covering (e.g., tile, carpet) is specified. Power trowel twice and finally hand trowel for exposed concrete floors.

3.4.4 Broomed Finish: Provide for exterior walks, platforms, patios, and ramps, unless otherwise indicated. Provide a floated finish, then finish with a flexible bristle broom. Permit surface to harden sufficiently to retain the scoring or ridges. Broom transverse to traffic or at right angles to the slope of the slab.

3.4.5 Pavement Finish: Screed the concrete with a template advanced with a combined longitudinal and crosswise motion. Maintain a slight surplus of concrete ahead of the template. After screeding, float the concrete longitudinally. Use a straight edge to check slope and flatness; correct and refloat as necessary. Obtain final finish by dragging a strip of clean, wet burlap from 3 to 10 feet wide and 2 feet longer than the pavement width across the slab. Produce a fine, granular, or sandy textured surface without disfiguring marks. Round edges and joints with an edger having a radius of 1/8 inch.

3.5 MISCELLANEOUS CONSTRUCTION:

3.5.1 Concrete Walks: Provide 4 inches thick minimum. Provide contraction joints spaced every 5 linear feet, unless otherwise indicated. Cut contraction joints 3/4 inch deep with a jointing tool after the surface has been finished. Provide 0.5 inch thick transverse expansion joints at changes in direction, where sidewalk abuts curb, steps, rigid pavement, or other similar structures; space joints not more than 50 feet apart. Provide a transverse slope of 1/4 inch per foot. Limit variation in cross section to 1/4 inch in 5 feet.

3.5.2 Pits and Trenches: Place bottoms and walls monolithically or provide waterstops and keys.

3.5.3 Curbs: Provide contraction joints spaced every 10 feet maximum, unless otherwise indicated. Cut contraction joints 3/4 inch deep with a jointing tool after the surface has been finished. Provide expansion joints 1/2 inch thick and spaced every 100 feet maximum, unless otherwise indicated. Provide a broom finish.

3.5.4 Splash Blocks: Provide at outlets of downspouts emptying at grade. Splash blocks shall be precast concrete, 24 inches long, 12 inches wide, and 6 inches thick, unless otherwise indicated, with smooth-finished countersunk dishes sloped to drain away from the building. Provide compacted earth base.

3.5.5 Grout: Grout all existing wall penetrations and grout all new pipe penetrations as indicated.

3.6 CURING AND PROTECTION: ACI 301. Protect concrete from injurious action by sun, rain, wind, flowing water, frost, mechanical injury, tire marks, and oil stains. Do not allow concrete to dry out from time of placement until the expiration of the curing period. Forms may be removed 48 hours after concrete placement.

3.6.1 Moist Curing: Provide for the removal of water without erosion or damage to the structure.

3.6.1.1 Ponding or Immersion: Continually immerse the concrete throughout the curing period. Water temperature shall not be more than 20 degrees F less than the temperature of the concrete. For temperatures between 40 and 50 degrees F, increase the curing period by 50 percent.

3.6.1.2 Fog Spraying or Sprinkling: Provide uniform and continuous application of water throughout the curing period. For temperatures between 40 and 50 degrees F, increase the curing period by 50 percent.

3.6.1.3 Pervious Sheeting: Cover the entire surface of the concrete with two thicknesses of wet sheeting. Mats shall be at least as long as the width of the surface to be cured. During application, do not drag the mats over the finished concrete nor over mats already placed. Completely cover surface and edges of the concrete, with a 6-inch overlap over adjacent mats. Wet mats thoroughly and keep continuously wet throughout the curing period.

3.6.2 Impervious-Sheeting Curing: Wet the entire exposed surface thoroughly with a fine spray of water and cover with impervious sheeting throughout the curing period. Lay sheeting directly on the concrete surface and overlap edges 12 inches minimum. Provide sheeting not less than 18 inches wider than the concrete surface to be cured. Secure edges and transverse laps to form closed joints. Repair torn or damaged sheeting or provide new sheeting.

3.6.3 Liquid Membrane-Forming Compound Curing: Seal or cover joint openings prior to application of curing compound. Prevent curing compound from entering the joint. Provide and maintain compound on the concrete surface throughout the curing period. Provide a continuously wetted, permeable cover as specified in paragraph entitled "Hot Weather".

3.6.3.1 Application: Unless the manufacturer recommends otherwise, apply compound immediately after the surface loses its water sheen and has a dull appearance, and before joints are sawed. Mechanically agitate curing compound thoroughly during use. Use approved power-spraying equipment to uniformly apply two coats of compound in a continuous operation. The total coverage for the two coats shall be 200 square feet maximum per gallon of undiluted compound, unless otherwise recommended by the manufacturer's written instructions. The compound shall form a uniform, continuous, coherent film that will not check, crack, or peel. Immediately apply an additional coat of compound to areas where the film is defective. Respray concrete surfaces subjected to rainfall within 3 hours after the curing compound application.

3.6.3.2 Protection of Treated Surfaces: Prohibit foot and vehicular traffic and other sources of abrasion for not less than 72 hours after compound application. Maintain continuity of the coating for the entire curing period and immediately repair any damage.

3.6.4 Liquid Chemical Sealer-Hardener Curing: Provide for interior floors that do not receive a floor covering, or in lieu of liquid membrane-forming compound curing for other surfaces. Apply sealer-hardener in accordance with manufacturer's recommendations. Seal or cover joints and openings in which joint sealant is to be applied, as required by the joint sealant manufacturer.

3.6.5 Curing Periods: Allow 7 days.

3.7 SAMPLING AND TESTING:

3.7.1 Sampling: ASTM C 172. Collect samples of fresh concrete to perform tests specified.

3.7.2 Testing:

3.7.2.1 Slump Tests: ASTM C 143. Take samples during concrete placement. The maximum slump may be increased as specified with the addition of an approved admixture provided that the water-cement ratio is not exceeded. Perform tests at commencement of concrete placement and for each batch or every 10 cubic yards (maximum) of concrete.

3.7.2.2 Air Content: ASTM C 173 or ASTM C 231. Test air-entrained concrete for air content at the same frequency as specified for slump tests.

*** END OF SECTION ***

SECTION 09910

PAINTING OF BUILDINGS (FIELD PAINTING)

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.1.1 Federal Specifications (Fed. Spec.):

TT-E-489G	Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces)
TT-P-645A	Primer, Paint, Zinc-chromate, Alkyd Type

1.1.2 Federal Standard (Fed. Std.):

Fed. Std. 595A & Notice 4	Colors

1.1.3 Military Standard (Mil. Std.):

DOD-P-15328D	Primer (Wash), Pretreatment (Formula No. 117) for Metals (Metric)

1.1.4 Occupational Safety and Health Administration (OSHA) Publication:

29 CFR 1910	Safety and Health Standards

1.1.5 American Society for Testing and Materials (ASTM) Publications:

D 96-73 (R77)	Test Method for Water and Sediment In Crude Oils
D 562-55 (R76)	Consistency of Paints Using the Stormer Viscometer
D 1640-69 (R74)	Test Method for Drying, Curing, or Film Formation of Organic Coatings at Room Temperature
D 1737-62 (R79)	Test for Elongation of Attached Organic Coatings With Cylindrical Mandral Apparatus

1.2 SUBMITTALS:

1.2.1 Certificates of Compliance: When the required quantity of any one type of coating is less than 50 gallons submit certificates of compliance from the manufacturer stating that previously manufactured materials have been tested by recognized laboratories; that such materials meet testing requirements in referenced specifications; and that the material furnished for this project is of the same type, quality, manufacture, and make as that tested. Copies of the test reports need not be submitted except as specifically requested by the Contracting Officer. The Government will take one pint samples from coatings being used on the job for testing by the Government.

1.2.2 Qualification Data: Submit data as required by paragraph "QUALIFICATION OF AIRLESS SPRAY APPLICATORS".

1.3 QUALIFICATION OF AIRLESS SPRAY APPLICATORS: Application of paint by airless spray shall be accomplished by firms or persons possessing the experience set forth herein. Prior to any application of coating by airless spray, submit data for approval by the Contracting Officer that indicates that the Contractor has successfully applied paint by airless spray or has a firm contractual agreement with a subcontractor having such required experience. The data shall include the names and locations of not less than two sites where the Contractor or subcontractor referred to herein has applied paint by airless spray. Indicate the type and design of the equipment, including safety devices, and certify that the method of applying coating has been performed satisfactorily.

1.4 APPROVAL OF MATERIALS: Do not apply any coating before required test reports, certificates, and requests for substitutions have been submitted and the respective material approved for use on this project. Submit all requests for substitutions to the Contracting Officer. Each such request shall include specific identification of the proposed substitute; justification for the necessity of the substitution; certified test reports of the proposed substitute, including all tests required by the specification for the substituted material; and a tabulation of the specified material compared to the proposed substitute. The tabulation shall include all tests, composition of both pigment and vehicle, and quantitative and qualitative requirements for both the specified and the proposed material; clearly indicate any deviations from specified requirements.

1.5 DELIVERY AND STORAGE: Deliver coatings and coating materials in unbroken original packages bearing the manufacturer's name and brand designation, specification number, batch number, color, date of manufacture, and manufacturer's instructions for application.

1.6 SELECTION OF COLORS: Colors of finish coats shall be as indicated. Where exterior colors are not indicated, the colors shall be #20059 "Brown" from Federal Standard No. 595A. Manufacturers' names and color designations, if indicated, are used for the purpose of color designations only and are acceptable for use on this project only if they conform to all specified requirements. Products of other manufacturers are acceptable if the colors closely approximate colors indicated and the product conforms to all specified requirements. Color samples shall be submitted for approval.

1.7 DESCRIPTION OF WORK: Surfaces of exterior objects readily accessible as described below. Do not coat surfaces of steel to be imbedded in concrete.

1.7.1 Exterior Painting: Includes new surfaces of the types listed:

a. New guard posts (complete)

PART 2 - PRODUCTS

2.1 MATERIALS: Conform to the respective specifications and standards listed for use in PART 3 and to the following requirements.

2.1.1 Deep Tone Colors: Where deep tone colors are indicated or specified and Fed. Spec. TT-P-29 is specified, modify the specifications to deep tone latex, Fed. Spec. TT-P-1728, in lieu of Fed. Spec. TT-P-29.

2.1.2 Lead Content: Do not use coatings having a lead content of over 0.06 percent by weight of nonvolatile content.

PART 3 - EXECUTION

3.1 PROTECTION OF AREAS AND SPACES: Remove, mask, or otherwise protect prior to surface preparation and painting operations such items as new turf and concrete or asphaltic paving in contact with coated surfaces. Following completion of painting, restore surfaces that are contaminated by painting materials to original condition.

3.2 PREPARATION OF SURFACES: Remove all dirt, rust, scale, splinters, loose particles, grease, oil, and other deleterious substances from all surfaces which are to be coated or otherwise finished. Inspect surfaces after preparation and receive approval before application of any coatings. On surfaces to be coated with water thinned coatings, spot prime with a brush ferrous metal with zinc chromate primer, Fed. Spec. TT-P-645.

3.2.1 New Unprimed Metal Surfaces: Immediately after cleaning, apply pretreatment wash primer, Mil. Spec. DOD-P-15328, to a dry film thickness of 0.2 to 0.5 mil ferrous surfaces. Apply primer as soon as practicable after pretreatment has dried.

3.3 APPLICATION: Provide finished surfaces free from runs, drops, ridges, waves, laps, brush marks, and variations in colors. Avoid contamination of other surfaces and public and private property in the area; repair all damage thereto. Allow sufficient time between coats to permit thorough drying and provide each coat in proper condition to receive the next coat. Each coat shall cover the surface of the preceding coat or surface completely; there shall be an easily perceptible difference in shades of successive coats. Thoroughly clean surfaces to be coated. Prior to erection, use two coats of the designated primer to prime metal surfaces which will be inaccessible after erection. Thoroughly work painting materials into all joints, crevices, and open spaces. Finished surfaces shall be smooth, even, and free of defects. Retouch damaged painting before applying succeeding coats of paint. Spray painting operations shall comply with OSHA 29 CFR 1910, Sections .94, .107, .134, and .1000. Procure and utilize the engineering controls and or personal protective equipment necessary for safe and effective application of specified paint systems.

3.3.1 Equipment: Apply coatings carefully with good, clean brushes or approved spray equipment, except as specified otherwise. Use airless type spray equipment.

3.3.2 Thinning of Paints: Reduce paints to proper brushing consistency by adding fresh paint, except that when thinning is mandatory for the type of paint being used, obtain written permission from the Contracting Officer to use thinners. The written permission shall include quantities and types of thinners to use.

3.3.3 Environmental Conditions: Do not apply exterior coatings in foggy or rainy weather or when the temperature of the air at the surface is below 45 degrees F or over 95 degrees F, unless approved by the Contracting Officer.

3.3.4 Paint Systems: New surfaces shall receive the following coatings conforming to the respective specifications listed. Apply paints, primers, varnishes, enamels, undercoats, and other coatings to a dry film thickness of not less than 2.0 mil each coat except as specified otherwise. Where coating thickness is specified, it is the minimum dry film thickness.

3.3.4.1 Exterior Surfaces:

a. Metal Surfaces:

Touch up shop prime coat on shop primed surfaces
Primer, Fed. Spec. TT-P-645A, two coats on surfaces not shop primed, one coat on shop primed surfaces
Two coats of alkyd enamel, Fed. Spec. TT-E-489G

3.3.4.2 Coat other surfaces for which the type of coating has not been specified herein as specified for surfaces having similar conditions of exposure.

*** END OF SECTION ***

SECTION 15177

DOUBLE WALL FIBERGLASS REINFORCED PLASTIC (FRP)
UNDERGROUND STORAGE TANKS

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.1.1 Military Specification (Mil. Spec.):

MIL-T-52777(A)	Tanks, Storage, Underground, Glass Fiber Reinforced Plastic
MIL-A-18001H Amendment-1	Anodes, Corrosion Preventive, Zinc; Slab Disc and Rod Shaped

1.1.2 American National Standards Institute (ANSI) Publications:

B 1.1-82	Unified Screw Threads
B 16.3-77	Malleable Iron Threaded Fittings
B 16.5-81	Pipe Flanges and Flanged Fittings
B 16.9-78	Factory-Made Wrought Steel Buttwelding Fittings Includes Errata Addenda B16.9A-81
B 16.11-80	Forged Steel Fittings, Socket-Welding and Threaded
B 16.39-77	Malleable Iron Threaded Pipe Unions

1.1.3 American Society for Testing and Materials (ASTM) Publications:

A 120-84	Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless, For Ordinary Use
A 153-84	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
A 307-84	Carbon Steel Externally Threaded Standard Fasteners

1.1.4 National Fire Protection Association (NFPA) Publication:

NFPA 30 Flammable and Combustible Liquids Code

1.1.5 ASTM D4021

1.1.6 Underwriters' Laboratories, Inc. (UL) File MH 9061(N).

1.2 GENERAL DESCRIPTION: This section includes the provision of double walled FRP underground storage tanks and related auxiliary equipment.

1.3 RELATED WORK: For piping and fittings not specified in this Section, see Section 15400, "Plumbing".

1.4 SUBMITTALS REQUIRED: Submit the following data.

1.4.1 Manufacturer's Data:

a. Holding tanks and accessories
b. Pipe
c. Fittings
d. Cathodic Protection System, including drawing(s) & test measurements.

1.4.2 Certificates of Compliance:

a. Double walled FRP underground storage tanks, UL listing
b. Certificate of tank compatibility for each waste product

1.4.3 Shop Drawings: Submit shop drawings for each double walled FRP underground storage tank. Shop drawings shall show locations of all fittings, accessories and critical dimensions.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT:

2.1.1 Steel Piping:

2.1.1.1 Pipe: ASTM A 120, Schedule 40, Galvanized, seamless.

2.1.1.2 Threaded Fittings: ASTM A 153, Galvanized steel, Class 150 lb.

2.2 Double Walled FRP Underground Storage Tanks and Accessories:

2.2.1 Double Walled FRP Underground Storage Tanks: Tanks shall be constructed of fiberglass reinforced plastic (FRP) in accordance with NFPA 30 and Mil. Spec. T-52777(A). The tanks shall have a nominal capacity of 1000 gallons each (waste oil and

waste anti-freeze) and 500 gallons (waste hydraulic oil). The tanks shall be of double wall construction. The tanks shall be designed to safely withstand a burial depth of four feet and a surcharge load of AASHTO HS20-44 truck loading. The tanks shall be equipped with accessories as specified in this section. A UL certification plate shall be attached to each tank.

2.2.2 Double Walled FRP Underground Tank Accessories:

2.2.2.1 Manways: Each tank shall be equipped with one 30-inch inside diameter flanged manway complete with UL listed gasket, bolts, nuts, washers and painted carbon steel cover. The manway shall be located as indicated. The manway shall be provided with three NPT fittings as indicated.

2.2.2.2 Fittings: All holding tank fittings shall be 4-inch half coupling, NPT threaded fittings as indicated. Fittings shall be located in the manway cover, except the flexible dipstick monitoring system.

2.2.2.3 Connections to Holding Tanks: Provide the following connections at locations indicated.

a. Four-inch fitting for vent. Vent pipe shall be 2" Ø Schedule 40 galvanized steel provided with weather shield and screen and shall be of the height indicated. The vent pipe shall not extend more than 1-inch into the tank with ball float check valve attached (provide bushings to transition to 2" Ø vent piping).

b. Four-inch inlet fitting as indicated (provide bushings to transition to 3" Ø Schedule 40 galvanized steel inlet piping).

c. Four-inch pump suction fitting. The 2" Ø Schedule 40 galvanized steel pump suction pipe shall be equipped with a threaded adaptor and cap. Pump suction pipes shall extend to 4-inches from the tank bottom with metal gauge plate embedded in tank bottom directly below (provide bushings to transition to 2" Ø pump down line).

2.2.2.4 Flexible Dipstick Monitoring System: The holding tanks shall be equipped with a flexible dipstick to allow monitoring of the double wall annular space for fluids. The dipstick shall extend to the bottom of the annular space and shall have a quick-connect fitting at the top of the standpipe. Dipstick shall be supplied by tank manufacturer or compatible with tank supplied and installed in complete accordance with manufacturer's recommendations for this type of installation. Connection size and location shall be as required by the manufacturer.

2.2.2.5 Tank Gauge Station: The holding tanks shall be provided with a wire type float gauge such as the "Scully Golden Gallon Gauge", or equal. Gauge shall be read in ten gallon increments and installed as indicated.

2.2.2.6 Hold Down Straps: Provide fiberglass reinforced plastic hold down straps as manufactured by the tank manufacturer. Number and location of straps shall be as specified by the tank manufacturer. Hole down straps shall be equipped with turnbuckles and all other required hardware.

2.2.2.7 Concrete Pad: Concrete pads for tank installation shall be as specified in Section "03302", Cast-in-Place Concrete (Minor Construction)".

2.2.2.8 Embedded Bolts: Embedded bolts for the concrete pad shall be ASTM A325 as shown on the drawings.

2.2.2.9 Cathodic Protection: Provide cathodic protection for all underground metallic piping and metallic tank-hold-down components. Protection for the piping shall be "Stuart-Mark IV" magnesium ribbon type anode with a continuous steel core wire, or approved equal. Protection for the tank hold down components shall be provided by distributed, magnesium galvanic anodes. Provide three (3) each flush-curb-box test stations for the underground piping systems and two (2) each for the tank-hold-down components (total of 5 test stations). Test stations shall have insulated terminal blocks with the required number of terminals to monitor each piping system by section and each hold-down component system. Test stations shall be provided with a lockable cover and shall have a cast-in legend "C.P. Test." Stations shall be standard product of a recognized manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION:

3.1.1 Piping: Install galvanized steel piping in accordance with requirements of Section 15400, "Plumbing".

3.1.2 Threaded Joints in Steel Piping: Use a lubricant or polytetrafluoroethylene tape on male threads of screwed joints. Lubricate threaded pipe joints, as well as bolts and studs used on high temperature pipe joints up to 1050 degrees F,with anti-sieze compound. Piping shall be free from fins and burrs. Ream or file out pipe ends to size of bore and remove chips.

3.1.3 Underground Storage Tank: Tanks shall be installed in accordance with manufacturers' installation instructions and as indicated. The tank shall be anchored to concrete slabs as indicated. Provide a minimum of 12-inches of pea gravel between the holding tank and concrete pad. Backfill for holding tank shall be pea gravel as indicated. All earthwork for installation of the holding tank shall be done in accordance with Section 02220, "Excavation". Before placing tanks into excavation, all foreign matter shall be cleaned from tanks. Excavation shall be free from all hard or sharp materials that may cause damage to the tanks. Handle tank, during transportation and while lifting into ground, in such a manner as to prevent damage to tank.

3.1.4 Cathodic Protection:

3.1.4.1 Anode Installation: Unless otherwise authorized, installation shall not proceed without the presence of a representative of the Contracting Officer. Ribbon Anodes shall be run continuously and without bends along both sides of all underground pipes. Anodes shall be installed on the bottom of each pipeline trench at the farthest possible distance from the line. Any change in location to clear obstructions must be approved by the Contracting Officer. Backfill around the anodes shall be fine soil placed in 4" to 6" layers and hand tamped for a minimum of 12" around the anodes. A 5 lb magnesium anode shall be installed for each hold-down strap of each tank, and the anodes connected by a header cable at each tank. Backfill for the anodes shall be fine soil placed in 6 inch layers and hand tamped around the anodes. Top of anodes shall be at a depth at least as deep as the bottom of the tanks.

3.1.4.2 Wire Connections

3.1.4.2.1 Ribbon Anodes: The end of anodes centrally located 1/8" iron wire core shall be connected to a No 12 AWG stranded copper, polyethylene or RHW-USE insulated cable which in turn is connected to a test station and then back to the pipe. Connections between the anode wire and the No. 12 cable shall be made with split-bolt connectors which shall be insulated with a minimum of three layers of electrical tape. The wire-to-pipe connections shall be accomplished by brazing. Before the connections are made, the pipe shall be cleaned to bare metal by means of scraping, filing, or other methods if approved by the Contracting Officer. A backfill shield filled with a pipeline mastic sealant or material compatible with the coating shall be placed over the brazed connection and shall be of such diameter as to cover the exposed metal adequately.

3.1.4.2.2 Distributed Anodes: Header or anode lead wire-to-structure connections shall be acomplished by brazing, grounding clamps, or welding as applicable. Metal surface preparation for brazing and coating of brazed connection shall be accomplished in the same manner as prescribed for exothermic welds. A backfill shield

filled with a pipeline mastic sealant or material compatible with the coating shall be placed over the weld connection and shall be of such diameter as to cover the exposed metal adequately. All in-line splices, when necessary, shall be made with copper split bolt connectors of the proper size.

3.1.4.3 Test Stations: Three (3) stations, one for each tank, shall be installed in locations to allow for convenient tie-in to the piping system protection, and two (2) stations shall be centrally located for monitoring the tie-down strap system of three (3) tanks.

3.2 Field Tests and Inspection:

3.2.1 Piping: Leak test piping in accordance with Section 15400, "Plumbing".

3.2.2 Storage Tank: After storage tank installation and prior to backfilling, leak test holding tank as follows: Tighten all fittings, equip tank with pressure gage, pressurize to 5 psi and soap entire tank. Visually inspect holding tank and ensure there are no leaks as determined by soap bubbles or a drop in pressure.

3.2.3 Cathodic Protection Systems:

3.2.3.1 General: Before cathodic protection current is applied, but after completion of the backfilling operation at the anode and structure, the static potential of the structure shall be measured at locations where structure-to-reference cell potentials, as required below, will be measured. Static potentials, as measured, shall be recorded. Prior to connection of each anode lead to the test station lead wire a milliammeter shall be inserted in the anode-to-structure circuit and the current output of each anode shall be measured and recorded. Prior to final connection of the anode test lead to the structure in the test station, the current output of the anode shall be similarly recorded. Measurement of anode currents must be made by using a low resistance milliammeter or by the use of a "Holloway" or other approved low resistance shunt and a millivolt-meter. The records so obtained shall be submitted to the Contracting Officer during anode installation. Maximum allowable current output is 45 ma.

3.2.3.2 Structure to Reference Cell Potential Measurements: Upon completion of the entire cathodic protection system, structure-to-reference cell potential measurement shall be made, using a copper-copper sulfate reference cell and a potentiometer-voltmeter, or a direct current voltmeter having an internal resistance (sensitivity) of not less than 100,000 ohms per volt and a full scale of 1 or 2 volts.

3.2.3.3 Recording Measurements: All structure to soil potential measurements including static potentials where required, shall be prepared in tabular form, and submitted in six copies, with each location identified on the as-built drawings. Contractor shall locate, correct and report to Contracting Officer any short circuits to foreign structures encountered during checkout of the installed cathodic protection system. Structure-to-soil potential measurements are required on as many structures as necessary to determine the extent of protection or to locate short-circuits.

3.2.3.4 Insufficient Protection: The criteria for determining the adequacy of protection shall be obtaining a negative voltage of at least 0.85 volt as measured between the structure and a saturated copper-copper sulphate reference cell contacting the earth directly over the protected structure. In the event that the system, when installed in accordance with the plans and specifications, will not provide the required protection, as evidenced by the above tests and measurements, the contractor, together with an authorized representative of the Contracting Officer, shall determine the cause of the deficiency and the correction measures necessary. After the necessary corrective measures have been determined, the contract may be modified and the contractor shall perform the work required to achieve a protective potential of -0.85 V for the system or other criteria as may be determined by the Contracting Officer.

*** END OF SECTION ***

SECTION 15400

PLUMBING

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

1.1.1 Military Specifications (Mil. Spec.):

MIL-A-907	Antiseize Compound, High Temperature (Navy)
MIL-T-22361 & Am 1	Thread Compound, Antiseize, Zinc Dust-Petrolatum
MIL-T-27730(A)	Tape, Antiseize, Polytetrafluoroethylene, with dispenser
MIL-T-52777(A)	Tanks, Storage, Underground, Glass Fiber Reinforced Plastic

1.1.2 American National Standards Institute (ANSI) Publication:

B16.3-85	Malleable Iron Threaded Pipe Fittings

1.1.3 American Society for Testing and Materials (ASTM) Publications:

A 120-84	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated (Galvanized) Welded and Seamless for Ordinary Uses.
B 62-82	Composition Bronze or Ounce Metal Castings

1.1.4 International Association of Plumbing and Mechanical Officials (IAPMO) Publication:

1982	Uniform Plumbing Code

1.1.5 National Fire Protection Association (NFPA) Publication:

NFPA 30-87	Flammable and Combustible Liquids Code

1.2 GENERAL REQUIREMENTS: For piping and fittings not specified in this Section, see Section 15177, Double Wall Fiberglass, Reinforced Plastic (FRP) Underground Storage Tanks.

1.3 DESCRIPTION OF WORK: The work includes providing new waste plumbing from the interior of B/786 to underground storage tanks, as well as other related tank piping. The work also includes making final plumbing connections to equipment furnished under other sections of this specification. Provide each system complete and ready for operation. Plumbing, equipment, materials, installation, and workmanship shall be in accordance with other applicable sections of this specification except as modified herein. In the Plumbing Code referred to herein, the advisory provisions shall be considered to be mandatory, as though the word "shall" had been substituted for the word "should" wherever it appears; reference to the "authority having jurisdiction", the Administrative Authority, the Plumbing Official, and the Design Engineer shall be interpreted to mean the Contracting Officer. Capacity of equipment shall be not less than that indicated. Plumbing shall include all waste, vent, tank and related piping buried and above ground.

1.4 SUBMITTALS:

1.4.1 Manufacturer's Data:

a. Pipe and fittings
b. Wall sleeves with waterstop
c. Mechanical seals (elastomeric segmented seal)
d. Premolded service basin

1.4.2 Certificates of Compliance:

a. Pipe and fittings

1.5 EXCAVATION, TRENCHING, AND BACKFILLING: Provide under this section as specified in Section 02200, "Excavation".

PART 2 - PRODUCTS

2.1 (DWV) DRAIN, WASTE, AND VENT PIPING: Fittings shall be long radius fittings, except fittings in vent piping may be short radius fittings. Minimum size piping shall be 2 inches for buried piping and 1.5 inches for above ground piping.

2.1.1 Steel Piping: Buried and above ground.

2.1.1.1 Pipe: ASTM A 120, Schedule 40, zinc-coated (galvanized) seamless.

2.1.1.2 Threaded Fittings: ANSI B 16.39, hot dipped galvanized steel.

2.2 MISCELLANEOUS PIPING MATERIALS:

2.2.1 Pipe Nipples: Hot-dip galvanized Schedule 40 steel pipe for use in steel piping.

2.2.2 Unions: ANSI B16.39 hot-dip galvanized steel for use in steel piping.

2.2.3 Pipe Sleeves: Provide where piping passes through walls, floors, roofs, and partitions. Secure sleeves in proper position and location during construction. Provide sleeves of sufficient length to pass through entire thickness of walls, floors, roofs, and partitions or as indicated. Provide not less than 0.25-inch space between exterior of piping or pipe insulation and interior of sleeve. Firmly pack space with insulation and calk at both ends of the sleeve with plastic waterproof cement which will dry to a firm but pliable mass, or provide a segmented elastomeric seal.

2.2.3.1 Sleeves in Masonry and Concrete Walls, Floors, Roofs: Provide ASTM A 53 or ASTM A 120, Schedule 40 or Standard Weight, hot-dip galvanized steel pipe sleeves. Extend sleeves in floor slabs 3 inches above the finished floor.

2.2.3.2 Mechanical Seals: Shall be as manufactured by Thunderline Corporation (Link-Seal) or equal.

Acceptable mechanical seals between piping and sleeves shall be those which will completely seal the space by a system of interlocking synthetic rubber links shaped to continuously fill the annular air space when the bolt assembly is tightened.

2.3 MISCELLANEOUS PLUMBING MATERIALS:

2.3.1 Premolded Service Basin: Basin shall be manufactured by Crane Plumbing or equal. The basin shall be a product of molding resulting in a one piece homogenous material. Sides of basin will be a minimum of 10 inches in height with not less than 1 inch wide shoulders. Manufacturer installed drain body will provide for a caulk joint to 3 inch drain pipe.

PART 3 - EXECUTION

3.1 INSTALLATION: Installation of plumbing systems including equipment, materials, and workmanship shall be in accordance with the Plumbing Code, except as modified herein.

3.1.1 Threaded Connections: Jointing compound for pipe threads shall be polytetrafluoroethylene (PTFE) pipe thread tape; apply only on male threads. Provide exposed ferrous pipe threads with one coat of primer applied to a minimum dry film thickness of 1.0 mil.

3.1.2 Cathodic Protect: Provide cathodic protection for all metallic piping installed under ground.

3.2 FIELD TESTING: Before final acceptance of the work, test each system as in service to demonstrate compliance with the contract requirements. Perform the tests specified in the IAPMO Uniform Plumbing Code, except as modified herein. Correct all defects in the work provided by the Contractor, and repeat the tests until the work is in compliance with contract requirements. Furnish water, electricity, instruments, connecting devices, and personnel for the tests.

*** END OF SECTION ***

Contract No.: F 306535-87-D-0012
Project No.: JREZ 87-0141
Del. Order No.: 5017

CONSTRUCTION DOCUMENTS (100%) SUBMISSION

SOIL BORING/SAMPLING/ TEST RESULT ANALYSIS

REMOVE CONTAMINATION
BUILDING 786
GRIFFISS AIR FORCE BASE
NEW YORK 13441-5000

MARCH 29, 1989

Sponsor

LGCC/William Turczyn
Dept. of the Air Force
416 BMW/LGCC B/DS-1
Griffiss AFB, New York 13441-5320

Contractor

Barton & Loguidice, P.C.
290 Elwood Davis Road
Box 3107
Syracuse, New York 13220

SOIL BORING/SAMPLING/
TEST RESULT ANALYSIS

REMOVE CONTAMINATION
BUILDING 786

Introduction

The subject Soil Boring/Sampling/Test Result Analysis constitutes a portion of the Schematic Design Submittal for Project No. JREZ 87-0141, REMOVE CONTAMINATION, BLDG. 786, as requested and authorized by the Department of Air Force, 416 BMW/LGCC under A-E Contract No. F 30635-87-D-0012/5017.

General

The field study portion of this project entailed soil borings between Buildings 786 and 785, continuous sampling of soil for visual classifications, securing representative samples for further analysis; installation of a 2" PVC test well and securing a water sample for analysis.

The individual soil samples were sealed in glass containers such that entrapped gases could also be tested.

The laboratory portion of this project included testing the water sample for Priority Pollutants (PPA), the soil samples for oil and grease, petroleum products (FID), EP Toxicity, BTX Plus and light volatile content.

The intent of the field and laboratory work was to determine the extent of possible contamination adjacent to Building 786, as outlined in the Statement of Work and the Engineering Cost Proposal.

Soil Borings

The soil borings, classification and sampling for this project were undertaken by Parratt Wolff, Inc., under a sub-contract with Barton & Loguidice, P.C. The methods and procedures, along with the individual test logs, are attached as Appendix A.

Continuous soil samples were taken using the split spoon method; a representative sample was then extracted from the split spoon sampler, placed in a glass jar, covered with foil and tightly capped in order to seal any organic vapors in the jar. The individual jars were removed to Parratt Wolff's office where the visual soil classifications were made without removing the foil seals.

The field observation, visual classifications and available records indicate fill soils were encountered overlying natural soils. The fill soils consisted of fine to medium sands with silt. Fill material was apparently used to fill in the low swampy areas shown on the original site topography to construct the site. Building 786 is located near the western edge of the swampy area and may be constructed partially on fill and partially on cut into natural soil. Topsoil remnants were encountered in several borings as witnessed by the Barton & Loguidice representative on site. The natural soils underlying the fill consisted of sands with gravel and silt and locally silt. Location of the soil borings shown on the Soil Boring Location Plan attached.

Typically, the natural soils were saturated, and the lower portion of the fill in the vadose zone was near saturated. Based on the near surface water table, the direction of groundwater flow most likely follows the original topography and drains to the east-southeast along the old Six Mile Creek channel. Additional monitoring wells would need to be installed to verify the direction of groundwater flows.

In general, the field technicians for both Parratt Wolff, Inc., and Barton & Loguidice, P.C., noted little about the soil until the bores approached the near saturated (vadose zone) above the water table. This zone was characterized by a strong, organic vapor odor in Borings B-4 and B-7. This observation was supported by the laboratory tests.

Water Sample Analysis

After all eight (8) soil borings were completed, we quickly reviewed the logs in conjunction with DEEV staff and determined that Boring B-7 should be re-drilled and extended in order to make this a ground water monitoring well. This decision was predicated on Boring B-7 being located in an apparent down gradient intercept location, the presence of organic vapor odor in the vadose zone and a well defined water table. Boring B-7A-W was drilled without sampling to the original depth, then continued (with sampling) another 6.0'. A 10'x2" diameter PVC well screen was then installed along with a 2" PVC riser pipe with locking cover. The screened interval and sand pack for the well was extended into the vadose zone where the odor was noted. The sand pack extended 2 feet above the top of the screen (17 to 27 feet in depth) with a 2 foot bentonite pellet seal above the sand pack. Cement bentonite grout was placed from the bentonite seal to the ground surface.

Using standard methods and procedures, Boring B-7A-W was purged and water sample extracted; this sample was delivered to Upstate Laboratories, Inc., for a Priority Pollutant Analysis (PPA). These results are shown in attached Appendix B and discussed below.

Page 1/7 of the PPA results shows total cyanides and total phenols to be less than the testing (lower) limits. Toxic metals (EPA SW-846) results indicate all elements tested are acceptable with the exception of lead (0.06 mg/l) which exceeds the drinking water standard of 0.05 mg/l.

Pages 2/7 and 3/7 list results for volatile hydrocarbons using EPA 624 test methods. No excessive quantities were found.

Pages 4/7 and 5/7 list results for semi-volatile hydrocarbons (base/neutral extractables) using EPA 625 test methods. No compounds are found in excessive amounts, but we do note the bis (2 ethylhexyl) phthalate results of 27 mg/l has been observed in many prior tests from other sources and may be due to sampling/ laboratory contamination; it merely is an indication of the presence of plastics.

Page 6/7 lists results for pesticides/PCB's using EPA 625 test method. No excessive amounts were detected.

Page 7/7 lists results for phenols (acid extractables) using EPA 625 test method. Once again no excessive amounts were found.

In summary, the water sample analysis indicates that only lead exceeds any established standards, and only by a small margin.

Soil Sample Analysis

The individual soil samples were delivered, unopened, to Upstate Laboratories, Inc., for analytical testing to determine if the soil was contaminated, and if so, to what extent. Samples were tested for light volatiles, oil and grease, petroleum products, EP Toxicity and BTX Plus. These test results are listed in attached Appendix C and discussed below.

Light volatile organic content using a portable HNU Organic Vapor Analyzer, gives a broad view of the presence of organics in the various soil strata. The results show the presence of indeterminate organic material in the vadose and saturated zones of Borings B-4 and B-7.

Oil and grease composite sample test results (using EPA SW-846 Method 9071) indicate minor amounts of these heavy organic products in all samples except for Boring B-1, which showed less than detectable results. These amounts ranged from 110 ppm to 590 ppm for the deep soil composites. Surface samples (less than 3" deep) composited by our staff immediately adjacent to and under the crushed stone oil storage pad show high oil and grease contents from 1600 ppm to 44,000 ppm (the later can be expressed as 4.4%).

SOIL SAMPLING - METHODS

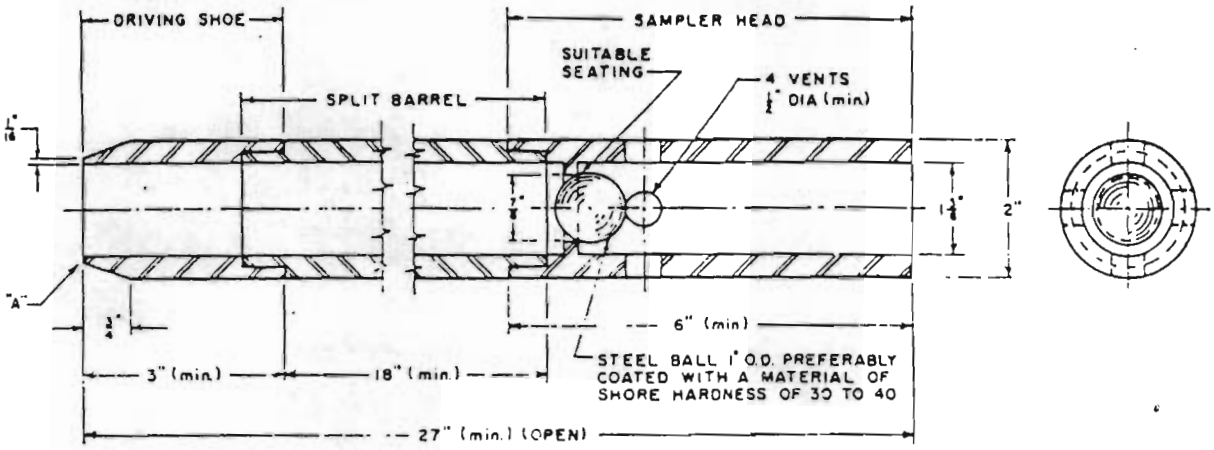


Table of Metric Equivalents.

In.	Mm	Cm	In.	Mm	Cm
1/16 (16 gage)	1.5	...	2	...	5.08
1/2	12.7	...	3	...	7.62
3/4	19.0	1.90	6	...	15.24
7/8	22.2	2.22	18	...	45.72
1-3/8	34.9	3.49	27	68.58	
1-1/2	38.1	3.81			

Fig. 1 — Standard Split Barrel Sampler Assembly

Note 1 — Split barrel may be 1-1/2 in. inside diameter provided it contains a liner of 16-gage wall thickness.

Note 2 — Core retainers in the driving shoe to prevent loss of sample are permitted.

Note 3 — The corners at A may be slightly rounded.

3. Procedure

3.1 Clear out the hole to sampling elevation using equipment that will ensure that the material to be sampled is not disturbed by the operation. In saturated sands and silts withdraw the drill bit slowly to prevent loosening of the soil around the hole. Maintain the water level in the hole at or above ground water level.

3.2 In no case shall a bottom-discharge bit be permitted. (Side-discharge bits are permissible.) The process of jetting through an open-tube sampler and then sampling when the desired depth is reached shall not be permitted. Where casing is used, it may not be driven below sampling elevation. Record any loss of circulation or excess pressure in drilling fluid during advancing of holes.

3.3 With the sampler resting on the bottom of the hole, drive the sampler with blows from the 140-lb (63.5 kg) hammer falling 30 in. (0.76 m) until either 18 in. (0.45 m) have been penetrated or 100 blows have been applied.

3.4 Repeat this operation at intervals not longer than 5 ft (1.5 m) in homogeneous strata and at every change of strata.

3.5 Record the number of blows required to effect each 6 in. (0.15 m) of penetration or fractions thereof. The first 6 in. (0.15 m) is considered to be a seating drive. The number of blows required for the second and third 6 in. (0.15 m) of penetration added is termed the penetration resistance, N. If the sampler is driven less than 18 in. (0.45 m), the penetration resistance is that for the last 1 ft (0.30 m) of penetration (if less than 1 ft (0.30 m) is penetrated, the logs shall state the number of blows and the fraction of 1 ft (0.30 m) penetrated).

3.6 Bring the sampler to the surface and open. Describe carefully typical samples of soils recovered as to composition, structure, consistency, color, and condition; then put into jars without ramming. Seal them with wax or hermetically seal to prevent evaporation of the soil moisture. Affix labels to the jar or make notations on the covers (or both) bearing job designation, boring number, sample number, depth penetration record, and length of recovery. Protect samples against extreme temperature changes.

4. Report

4.1 Data obtained in borings shall be recorded in the field and shall include the following:

4.1.1 Name and location of job,

4.1.2 Date of boring — start, finish,

4.1.3 Boring number and coordinate, if available,

4.1.4 Surface elevation, if available,

4.1.5 Sample number and depth,

4.1.6 Method of advancing sampler, penetration and recovery lengths,

4.1.7 Type and size of sampler,

4.1.8 Description of soil,

4.1.9 Thickness of layer,

4.1.10 Depth to water surface; to loss of water; to artesian head; time at which reading was made,

4.1.11 Type and make of machine,

4.1.12 Size of casing, depth of cased hole,

4.1.13 Number of blows per 6 in. (0.15 m)

4.1.14 Names of crewmen, and

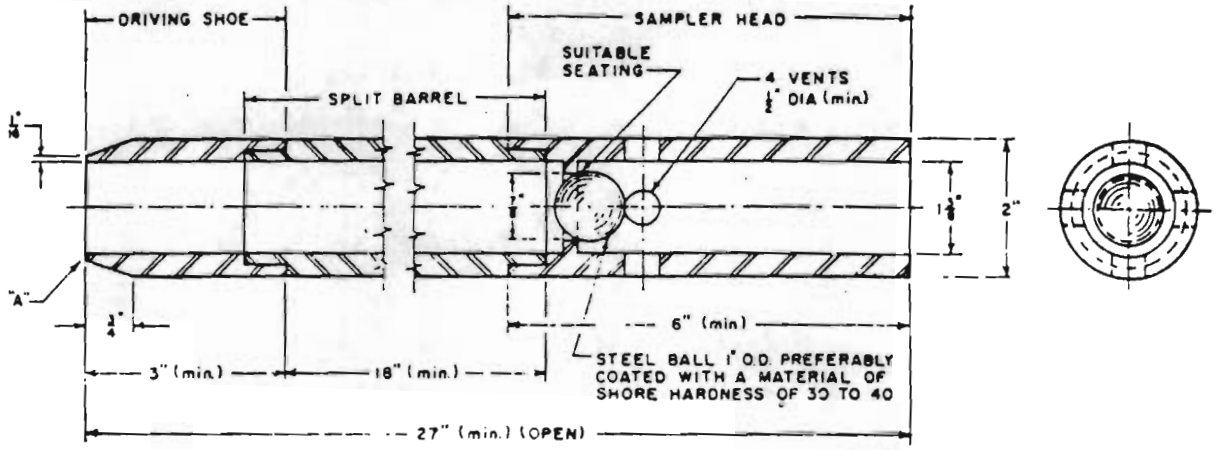
4.1.15 Weather, remarks.

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[1] Under the standardization procedure of the Society, this method is under the jurisdiction of the ASTM Committee D-18 on Soil and Rock for Engineering Purposes. A list of members may be found in the ASTM Year Book.

Current edition accepted October 20, 1967. Originally issued, 1958. Replaces D-1586-64T.

SOIL SAMPLING-METHODS



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4.1.9 Thickness of layer,

4.1.10 Depth to water surface; to loss of water; to artesian head; time at which reading was made,

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4.1.12 Size of casing, depth of cased hole,

4.1.13 Number of blows per 6 in. (0.15 m)

4.1.14 Names of crewmen, and

4.1.15 Weather, remarks.

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Current edition accepted October 20, 1967. Originally issued, 1958. Replaces D-1586-64T.

parratt wolff inc
FISHER RD., EAST SYRACUSE, N.Y. 13057
TELEPHONE AREA CODE 315/437-1429

GENERAL NOTES

1. Soil boring logs, notes and other data shown are the results of personal observations and interpretations made by Parratt-Wolff, Inc.

Exploration records prepared by our drilling foreman in the field form the basis of all logs, and samples of subsurface materials retained by the driller are observed by technical personnel in our laboratory to check field classifications.

2. Explanation of the classifications and terms:

a. Bedrock — Natural solid mineral matter occurring in great thickness and extent in its natural location. It is classified according to geological type and structure (joints, bedding, etc.) and described as solid, weathered, broken or fragmented depending on its condition.

b. Soils — Sediments or other unconsolidated accumulations of particles produced by the physical and chemical disintegration of rocks and which may or may not contain organic matter.

PENETRATION RESISTANCE

COHESIONLESS SOILS

Blows Per Ft.	Relative Density
0 to 4	Very Loose
4 to 10	Loose
10 to 30	Medium Dense
30 to 50	Dense
Over 50	Very Dense

COHESIVE SOILS

Blows Per Ft.	Consistency
0 to 2	Very Soft
2 to 4	Soft
4 to 8	Medium Stiff
8 to 15	Stiff
10 to 30	Very Stiff
Over 30	Hard

Size Component Terms

Boulder	Larger than 8 inches	
Cobble	8 inches to 3 inches	
Gravel — coarse	3 inches to 1 inch	
— medium	1 inch to 3/8 inch	
— fine	3/8 inch to 4.76 mm	
Sand — coarse	4.76 mm to 2.00 mm	(#10 sieve)
— medium	2.00 mm to 0.42 mm	(#40 sieve)
— fine	0.42 mm to 0.074 mm	(#200 sieve)
Silt and Clay	Finer than 0.074 mm	

Proportion By Weight

Major component is shown with all letters capitalized.

Minor component percentage terms of total sample are:

and	35 to 50 percent
some	20 to 35 percent
little	10 to 20 percent
trace	1 to 10 percent

c. Gradation Terms — The terms coarse, medium and fine are used to describe gradation of Sand and Gravel.

d. The terms used to describe the various soil components and proportions are arrived at by visual estimates of the recovered soil samples. Other terms are used when the recovered samples are not truly representative of the natural materials, such as soil containing numerous cobbles and boulders which cannot be sampled, thinly stratified soils, organic soils, and fills.

e. Ground water — The measurement was made during exploration work or immediately after completion, unless otherwise noted. The depth recorded is influenced by exploration methods, soil type and weather conditions during exploration. Where no water was observed it is so indicated. It is anticipated that the ground water will rise during periods of wet weather. In addition, perched ground water above the water levels indicated (or above the bottom of the hole where no ground water is indicated) may be encountered at changes in soil strata or top of rock.

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TELEPHONE AREA CODE 315/437-1429

A BRIEF DESCRIPTION OF THE UNIFIED SOIL SYSTEM

The Unified Classification System is an engineering soil classification that is an outgrowth of the Air-Field classification developed by Casagrande.

The system incorporates the textural characteristics of a soil into the engineering classification. All soils are classified into fifteen groups, each group being designated by two letters. These letters are as follows: G—gravel, S—sand, M—Non plastic or low plasticity fines, C—plastic fines, Pt—peat, humus and swamp soils, O—organic, W—well graded, P—poorly graded, L—low liquid limit, H—high liquid limit.

GW and SW Groups

These groups comprise well graded gravelly and sandy soils which contain less than 5% of non plastic fines passing a #200 sieve. Fines which are present must not noticeably change the strength characteristics of the coarse grain fraction and must not interfere with its free draining characteristics. In areas subject to frost action the material should not contain more than about 3% of soil grains smaller than .02 millimeters in size.

GP and SP Groups

These groups are poorly graded gravels and sands containing less than 5% non plastic fines. They may consist of uniform gravels, uniform sands, or non uniform mixtures of very coarse material and very fine sand with intermediate sizes lacking. Materials of this latter type are sometimes referred to as skip graded, cap graded, or step graded.

GM and SM Groups

In general, these groups include gravels or sands which contain more than 12% of fines having little or no plasticity. The plasticity index and liquid limit of a soil in either of these groups plot below the "A" line on a plasticity chart. Gradation is not important and both low grade and poorly graded materials are included. Some sands and gravels in these groups may have a binder composed of natural cementing agents so proportioned that the mixture shows negligible swelling or shrinkage. Thus, the dry strength is provided by a small amount of soil binder or dry cementation of calcareous materials or iron oxide. A fine fraction of non cemented materials may be composed of silts or rock flour types having little or no plasticity, and the mixture will exhibit no dry strength.

GC and SC Groups

These groups comprise gravelly or sandy soils with more than 12% of fines which exhibit either low or high plasticity. The plasticity index and liquid limit of a soil in either of these groups plot above the "A" line on the plasticity chart. Gradation of these materials is not important. Plasticity of the binder fraction has more influence on the behavior of the soils than does the variation in gradation. A fine fraction is generally composed of clays.

ML and MH Groups

These groups include predominantly silty materials and micaceous or diatomaceous soils. An arbitrary division between the two groups has been established with a liquid limit of 50. Soils in these groups are sandy silts, clayey silts or organic silts with relatively low plasticity. Also included are loessial soils and rock flours. Micaceous and diatomaceous soils generally fall within the MH group, but may extend into the ML group when their liquid limit is less than 50. The same is true for certain types of kaolin clays and some illite clays having relatively low plasticity.

CL and CH Groups

The CL and CH groups embrace clays with low and high liquid limits respectively. They are primarily inorganic clays. Low plasticity clays are classified as CL and are usually lean clays, sandy clays, and silty clays. The medium plasticity and high plasticity clays are classified as CH. These include fat clays, gumbo clays, certain volcanic clays and bentonite.

OL and OH Groups

The soils in these groups are characterized by the presence of organic matter including organic silts and clays. They have a plasticity range that corresponds with the ML and MH groups.

Pt Group

Highly organic soils which are very compressible have undesirable construction characteristics and are classified in one group with the symbol Pt. Peat, humus and swamp soils with a highly organic texture are typical of the group. Particles of leaves, grass, branches of bushes and other fibrous vegetable matter are common components of these soils.

Borderline Classification

Soils in the GW, SW, GP and SP groups are non plastic materials having less than 5% passing the #200 sieve, while GM, SM, GC, and SC soils have more than 12% passing the #200 sieve. When these coarse grain materials contain between 5% and 12% of fines they are classified as borderline, and are designated by the dual symbol such as GW-GM. Similarly coarse grain soils which have less than 5% passing the #200 sieve, but which are not free draining or in which the fine fraction exhibits plasticity are also classed as borderline and are given a dual symbol. Still another type of borderline classification occurs when a liquid limit of a fine grain soil is less than 29 and the plasticity index lies in the range of four to seven. These limits are indicated by the shaded area on the plasticity chart.

Silty and Clayey

In the Unified System, these terms are used to describe soils whose Atterberg limits plot below and above the "A" line on the plasticity chart. The adjectives silty and clayey are used to describe soils whose limits plot close to the "A" line.

SOIL CLASSIFICATION SYSTEM

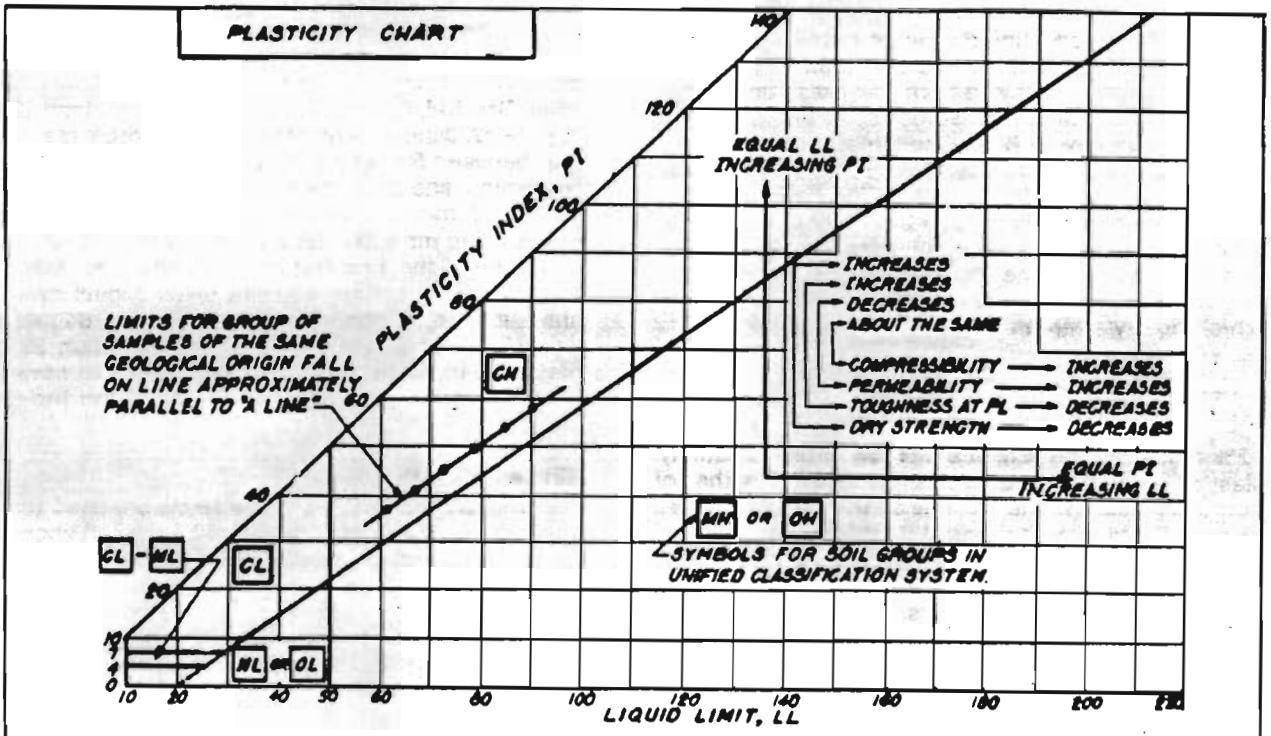
MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravels, gravel - sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel - sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines)	GM	Silty gravels, gravel - sand - silt mixtures.
			GC	Clayey gravels, gravel - sand - clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size)	CLEAN SANDS (Little or no fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amt. of fines)	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

PARTICLE SIZE LIMITS

SILT OR CLAY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		
No. 200	No. 40	No. 10	No. 4	¾ in.	3 in.	(12 in.)	

U.S STANDARD SIEVE SIZE



parratt wolff inc

TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/25/88 DATE COMPLETED 4/25/88

HOLE NO. B-1
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 10.0'
BEFORE CASING REMOVED 11.0'
AFTER CASING REMOVED Hole caved at 6.5' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE - HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		2/3		Brown moist loose to very dense fine to coarse SAND, trace silt	
	2.0'			4/4	7		
	2.0'-	2		9/12			
	4.0'			20/20	32		
5.0	4.0'-	3		18/22			
	6.0'			32/40	54		
	6.0'-	4		21/32			
	8.0'			50/65	82		
	8.0'-	5		26/38			
10.0 ▼	10.0'			48/69	86		10.0'
WL	10.0'-	6A		11/14		Brown wet medium dense fine to medium SAND, trace silt	11.5'
	11.5'	6B		22/24	36	Gray-brown moist dense fine to coarse SAND, trace fine gravel, trace silt	
	11.5'-					Bottom of Boring	12.0'
	12.0'						
15.0							

parratt wolff inc

TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/25/88 DATE COMPLETED 4/25/88

HOLE NO. B-2
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 12.0'
BEFORE CASING
REMOVED 18.6'
AFTER CASING Hole caved at
REMOVED 6.4' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING
30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE- HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		3/6		Brown moist medium dense to very dense fine to coarse SAND, trace silt	
	2.0'			7/9	13		
	2.0'-	2		9/10			
	4.0'			11/12	21		
5.0	4.0' -	3		6/6			
	6.0'			8/8	14		
	6.0'-	4		10/18			
	8.0'			22/30	40		
	8.0'-	5		10/26			
10.0	10.0'			30/48	56		
	10.0'-	6		12/18			
WL ▼	12.0'			28/35	46		12.0'
	12.0'-	7A		30/33		Brown wet very dense fine to coarse SAND, trace silt	13.5'
	13.5'	7B		25/28	58		
15.0	13.5'-14'					Gray-brown moist dense to very dense fine to coarse SAND, little fine to coarse gravel, trace boulders, trace silt	
	14.0'-	8		18/31			
	16.0'			30/42	61		
	16.0'-	9		25/41			
	17.4'			100-.4'			
20.0	18.0'-	10		19/26			
	20.0'			38/55	64	Bottom of Boring	20.0'

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TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
Griffiss Air Force Base
LOCATION New York
DATE STARTED 4/25/88 DATE COMPLETED 4/25/88

HOLE NO. B-3
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 15.5'
BEFORE CASING REMOVED Dry
AFTER CASING REMOVED Hole caved at 8.5' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE - HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		2/3		Brown moist loose to dense fine SAND, trace silt	
	2.0'			5/8	8		
	2.0'-	2		9/12			
	4.0'			20/28	32		
5.0	4.0'-	3		16/18			
	6.0'			29/25	47		6.0'
	6.0'-	4		18/20		Brown moist dense to very dense fine to coarse SAND, trace silt	
	8.0'			28/36	48		
	8.0'-	5		18/22			
10.0	10.0'			40/50	62		
	10.0'-	6		20/25			
	12.0'			48/55	73		
	12'-13'	7A		25/30			13.0'
	13'-14'	7B		30/30	60	Gray moist very dense fine to coarse SAND and SILT, some fine to medium gravel, trace roots	14.0'
15.0	14.0'-	8		3/6		Brown-gray moist fine SAND and SILT, trace clay	15.5'
WL	16.0'			4/4	10	Brown wet loose fine SAND, little silt	
	16.0'-	9		2/2		Bottom of Boring	18.0'
	18.0'			2/3	4		
20.0							

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TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/26/88 DATE COMPLETED 4/26/88

HOLE NO. B-4
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 19.0'
BEFORE CASING REMOVED 19.5'
AFTER CASING REMOVED Hole caved at 9.5' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE - HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		6/10		Brown moist medium dense fine to	
	2.0'			10/16	20	coarse SAND, little silt, trace roots	2.0'
	2.0'-	2		13/13		Brown moist dense to very dense	
	4.0'			19/37	32	fine SAND, trace silt	
5.0	4.0'-	3		18/28			
	6.0'			46/50	74		
	6.0'-	4		25/40			
	8.0'			60/64	100		
	8.0'-	5		18/35			
10.0	10.0'			55/68	90		
	10-11.6"	6A		25/32			11.6'
	11.6-12"	6B		62/28	94	Gray moist very dense to medium	
	12.0'-	7		38/37		dense fine to coarse SAND, little silt	
	14.0'			40/50	77		
15.0	14-14.4"	8		50-.4'			
	15.0'-	9		16/24			
	17.0'			25/30	49		
	17.0'-	10		17/6			19.0'
WL ▼	19.0'			5/5	11		
20.0	19.0'-	11		WR/WR		Gray wet loose fine to coarse SAND,	
	21.0'			4/4	4	trace fine gravel, trace silt	
						Bottom of Boring	21.0'
						Note: WR = sampler penetrated under weight of rods.	
25.0							

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TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/26/88 DATE COMPLETED 4/26/88

HOLE NO. B-5
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 11.5'
BEFORE CASING REMOVED 16.0'
AFTER CASING REMOVED Hole caved at 8.5' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE - HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		3/5		TOPSOIL	0.5'
	2.0'			11/16	16	Brown moist medium dense fine to coarse SAND, some fine to coarse gravel, little silt	2.2'
	2.0'-	2		17/17			
	4.0'			28/32	45		
5.0	4.0'-	3		16/28		Brown moist very dense fine to coarse SAND, trace fine to coarse gravel; trace silt	
	6.0'			48/49	76		
	6.0'-	4		30/30			
	8.0'			40/40	70		
	8.0'-	5		17/29			
10.0	10.0'			42/62	71		
WL ▼	10.0'-	6		24/25			
	12.0'			35/42	60		12.7'
	12-12.7'	7A		21/25		Gray-brown moist very dense to dense fine to coarse SAND, some silt, trace fine gravel, layered	16.0'
	12.7-14'	7B		50/65	75		
15.0	14.0'-	8		16/30		Brown moist medium dense fine to medium SAND, little silt	
	16.0'			20/23	50		
	16.0'-	9		16/16			
	18.0'			11/12	27		
						Bottom of Boring	18.0'
20.0							

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TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/26/88 DATE COMPLETED 4/26/88

HOLE NO. B-6
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 10.7'
BEFORE CASING REMOVED
AFTER CASING REMOVED Hole caved at 5.2' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE- HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		1/2		Brown moist very loose to very dense fine to coarse SAND, trace silt, trace fine to medium gravel	
	2.0'			2/2	4		
	2.0'-	2		2/2			
	4.0'			2/1	4		
5.0	4.0'-	3		1/4			
	6.0'			16/24	20		
	6.0'-	4		12/25			
	8.0'			38/45	63		
	8.0'-	5		20/30			
10.0	10.0'			50/60	80		
WL	10-10.7'	6A		20/25			
	10.7-12'	6B		28/42	53		11.9'
	12'-13'	7A		16/25		Brown-gray wet very dense fine to medium SAND, some silt	13.0'
	13-13.5'	7B		36/46	61	Brown moist very dense fine to coarse SAND and SILT, little fine to coarse gravel, trace roots (topsoil)	13.5'
15.0	13.5-14'	7C				Gray-brown moist very dense fine SAND, some silt	
						Bottom of Boring	14.0'

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TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/27/88 DATE COMPLETED 4/27/88

HOLE NO. B-7
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 18.0'
BEFORE CASING REMOVED 19.5'
AFTER CASING REMOVED Hole caved at 10.7' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE- HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		3/6		Brown moist medium dense to very dense fine to coarse SAND, some fine to medium gravel, trace silt	
	2.0'			8/12	14		
	2.0'-	2		30/30			
	4.0'			45/50	75		
5.0	4.0'-	3		15/22			
	6.0'			24/38	46		
	6.0'-	4		35/40			
	8.0'			65/70	105		
	8.0'-	5		25/24			
10.0	10.0'			40/46	64		
	10.0'-	6		20/26			
	12.0'			41/40	67		12.0'
	12.0'-	7		12/15		Brown moist medium dense fine to medium SAND, trace silt with black streaks, possibly oil	
	14.0'			20/40	35		
15.0	14'-15'	8A					
	15'-16'	8B					
	16-16.8'	9A		18/30			17.4'
WL ▼	16.8-17.4'	9B		45/54		Brown moist very dense fine to medium SAND, trace silt	18.0'
	17.4-18'	9C				Gray-brown wet medium dense fine to coarse SAND, trace silt, trace fine to coarse gravel	21.5'
20.0	18-18.8'	10A		16/19		Brown moist medium dense fine to medium SAND and SILT, trace roots (topsoil)	
	18.8-20'	10B		17/17	36	Bottom of Boring	22.0'
	20-21.5'	11A		11/7			
	21.5-22'	11B		5/5	12		
25.0							

parratt wolff inc

TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/28/88 DATE COMPLETED 4/28/88

HOLE NO. B-7A-W
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 18.0'
BEFORE CASING REMOVED 19.5'
AFTER CASING REMOVED Installed well

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING 30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE - HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
						Drilled to 22.0' without sampling	
5.0							
10.0							
15.0							
WL ▼							
20.0							
							22.0'
	22.0'- 24.0'	12		1/1 6/8	7	Brown-gray moist loose fine to coarse SAND, little silt	24.0'
25.0	24.0'- 26.0'	13		4/4 5/7	9	Gray wet loose fine to medium SAND	
	26.0'- 28.0'	14		5/6 9/9	15		27.0'
30.0						Gray-brown wet stiff SILT, little clay with lenses of fine to coarse sand	
						Bottom of Boring	28.0'
						Note: Installed 2" PVC screen 27.0' to 17.0', 2" PVC riser to surface with locking cover.	

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TEST BORING LOG

FISHER ROAD
EAST SYRACUSE, N.Y. 13057

PROJECT Building 786
LOCATION Griffiss Air Force Base
New York
DATE STARTED 4/28/88 DATE COMPLETED 4/28/88

HOLE NO. B-8
SURF. EL.
JOB NO. 88100
GROUND WATER DEPTH
WHILE DRILLING 18.0'
BEFORE CASING
REMOVED 19.5'
AFTER CASING Hole caved at
REMOVED 16.5' - Dry

N — NO. OF BLOWS TO DRIVE SAMPLER 12" W/140# HAMMER FALLING
30" — ASTM D-1586, STANDARD PENETRATION TEST

C — NO. OF BLOWS TO DRIVE CASING 12" W/ # HAMMER FALLING
"/OR — % CORE RECOVERY

CASING TYPE - HOLLOW STEM AUGER

SHEET 1 OF 1

DEPTH	SAMPLE DEPTH	SAMPLE NUMBER	C	SAMPLE DRIVE RECORD PER 6"	N	DESCRIPTION OF MATERIAL	STRATA CHANGE DEPTH
	0.0'-	1		3/6		Brown moist to wet very loose to very dense fine to medium SAND, trace silt, trace fine to medium gravel	
	2.0'			12/14	18		
	2.0'-	2		18/25			
	4.0'			30/45	55		
5.0	4.0'-	3		19/25			
	6.0'			60/70	85		
	6.0'-	4		25/42			
	8.0'			50/57	92		
	8.0'-	5		12/25			
10.0	10.0'			35/37	60		
	10.0'-	6		70/40			
	12.0'			60/66	100		
	12.0'-	7		33/45			
	14.0'			45/50	90		
15.0	14.0'-	8		14/24			
	16.0'			24/37	48		
	16.0'-	9		35/42			
WL ▼	18.0'			35/35	77		18.0'
	18.0'-	10		14/19		Brown wet medium dense to very loose fine to medium SAND	
20.0	20.0'			18/14	37		
	20.0'-	11		3/4			
	22.0'			5/5	9		
	22.0'-	12	No	WH			
	24.0'		Rec	WH			
25.0						Bottom of Boring	24.0'

Note: WH indicates sampler penetrated under weight of 140# hammer.

Contract No.: F 306535-87-D-0012
Project No.: JREZ 87-0141
Del. Order No.: 5017

CONSTRUCTION DOCUMENTS (100%) SUBMISSION

SOIL BORING/SAMPLING/
TEST RESULT ANALYSIS

REMOVE CONTAMINATION
BUILDING 786
APPENDIX B
WATER SAMPLE ANALYSIS

Upstate Laboratories inc.

143 Midler Park Drive • Box 289 • Syracuse, New York 13206 • (315) 437-0255
Southern Region (607) 272-2708 ext. 1
Western Region (716) 244-8760

June 3, 1988

8

Martin P. Chandler, Ph.D.
Engineering Geologist
Barton and Loguidice, P.C.
290 Elwood Davis Road
Box 3107
Syracuse, New York 13220

Re: Analysis Report #060388013 - Griffiss Air Force Base

Dear Dr. Chandler:

Please find enclosed the results for your water samples which were received on May 11, 1988.

If you have any questions about this report, or if we can be of any further service to you, please do not hesitate to call.

Very truly yours,

UPSTATE LABORATORIES, INC.

Daniel J. Pastuf
Manager

DJP/bf

Enclosures: report, invoice

cc/encs: N. Scala, ULI
file

NOTE: Verbal results for this analysis were given to your office on June 1, 1988. DJP

Analysis Results
Report Number 060388013
Date: June 3, 1988

Client I.D.: Barton & Loguidice, P.C. (Griffiss Air Force Base) - 403-MW-588B, 5/10/88, 2130 hrs., GRAB

ULI I.D.: 13388022

Parameters	Results
Total Cyanide	<0.01
Total Phenols	<0.005
Dissolved:	
Antimony	<0.3
Arsenic *	<0.5
Beryllium	<0.005
Cadmium	<0.005
Chromium	<0.05
Copper	<0.02
Lead *	0.060
Mercury	<0.0004
Nickel	<0.03
Selenium *	<0.001
Silver	<0.05
Thallium	<0.3
Zinc	<0.005

All results are expressed as mg/l.
*Analysis by Furnace AA.

Approved: [signature] mc

Date: 6/3/88

Disclaimer: The test results and procedures utilized, and laboratory interpretations of data obtained by ULI as contained in this report are believed by ULI to be accurate and reliable for sample(s) tested. In accepting this report, the customer agrees that the full extent of any and all liability for actual and consequential damages of ULI for the services performed shall be equal to the fee charged to the customer for the services as liquidated damages.

UPSTATE LABORATORIES, INC.

Analysis Results
Report Number 060388013
Date: June 3, 1988

METHOD: EPA 624

CLIENT I.D. Barton & Loguidice, P.C. (Griffiss Air Force Base)	403-MW-588B 5/10/88 2130 hrs. GRAB	Organic Free Blank (Received 5/11/88)		
ULI I.D.	13388022	13388023		
Chloromethane	<3	<3		
Bromomethane	<3	<3		
Vinyl Chloride	<3	<3		
Chloroethane	<3	<3		
Methylene Chloride	<3	<3		
Trichlorofluoromethane	<3	<3		
1,1-Dichloroethylene	<3	<3		
t-1,2-Dichloroethylene	<3	<3		
1,1-Dichloroethane	<3	<3		
Chloroform	<3	<3		
1,2-Dichloroethane	<3	<3		
1,1,1-Trichloroethane	<3	<3		
Benzene	<3	<3		
Carbon Tetrachloride	<3	<3		
1,2-Dichloropropane	<3	<3		
Bromodichloromethane	<3	<3		
Trichloroethylene	<3	<3		
c-1,3-Dichloropropene	<3	<3		
t-1,3-Dichloropropene	<3	<3		
1,1,2-Trichloroethane	<3	<3		
Toluene	<3	<3		
Dibromochloromethane	<3	<3		
Tetrachloroethylene	<3	<3		
2-Chloroethylvinyl ether	<3	<3		
Chlorobenzene	<3	<3		
Ethylbenzene	<3	<3		

All results are expressed as ug/l.

Analysis Results
Report Number 060388013
Date: June 3, 1988

METHOD: EPA 624

CLIENT I.D. Barton & Loguidice, P.C. (Griffiss Air Force Base)	403-MW-588B 5/10/88 2130 hrs. GRAB	Organic Free Blank (Received 5/11/88)		
ULI I.D.	13388022	13388023		
Bromoform	<3	<3		
1,1,2,2-Tetrachloroethane	<3	<3		
1,2-Dichlorobenzene	<3	<3		
1,3-Dichlorobenzene	<3	<3		
1,4-Dichlorobenzene	<3	<3		
Total Xylenes	<3	<3		

All results are expressed as ug/1.

Approved: [signature] MC 6/3/88

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UPSTATE LABORATORIES, INC.

Analysis Results
Report Number 060388013
Date: June 3, 1988

BASE/NEUTRAL EXTRACTABLES

CLIENT I.D. Barton & Loguidice, P.C. (Griffiss Air Force Base)	403-MW-588B 5/10/88 2130 hrs. GRAB			
ULI I.D.	13388022			
N-Nitrosodimethylamine	<5			
Bis(2-chloroethyl) ether	<5			
1,3-Dichlorobenzene	<5			
1,4-Dichlorobenzene	<5			
1,2-Dichlorobenzene	<5			
Bis(2-chloroisopropyl) ether	<5			
Hexachloroethane	<5			
Nitrobenzene	<5			
N-Nitrosodipropylamine	<5			
Isophorone	<5			
Bis(2-chloroethoxy) methane	<5			
1,2,4-Trichlorobenzene	<5			
Naphthalene	<5			
Hexachlorobutadiene	<5			
Hexachlorocyclopentadiene	<5			
2-Chloronaphthalene	<5			
Dimethylphthalate	<5			
Acenaphthylene	<5			
2,6-Dinitrotoluene	<5			
Acenaphthene	<5			
2,4-Dinitrotoluene	<5			
Fluorene	<5			
Diethyl phthalate	<5			

All results are expressed as ug/l.

Analysis Results
Report Number 060388013
Date: June 3, 1988

BASE/NEUTRAL EXTRACTABLES (cont.)

CLIENT I.D. Barton & Loguidice, P.C. (Griffiss Air Force Base)	403-MW-588B 5/10/88 2130 hrs. GRAB			
ULI I.D.	13388022			
4-Chlorophenylphenyl ether	<5			
N-Nitrosodiphenylamine	<5			
4-Bromophenylphenyl ether	<5			
Hexachlorobenzene	<5			
Phenanthrene	<5			
Anthracene	<5			
Dibutyl phthalate	<5			
Fluoranthene	<5			
Benzidine	<5			
Pyrene	<5			
Butyl benzyl phthalate	<5			
3,3'-Dichlorobenzidine	<5			
Chrysene	<5			
Benzo(a)anthracene	<5			
Bis(2-ethylhexyl) phthalate	27			
Dioctyl phthalate	<5			
Benzo(b)fluoranthene	<5			
Benzo(k)fluoranthene	<5			
Benzo(a)pyrene	<5			
Indeno(1,2,3-cd)pyrene	<10			
Dibenzo(a,h)anthracene	<10			
Benzo(ghi)perylene	<10			

All results are expressed as ug/l.

UPSTATE LABORATORIES, INC.

Analysis Results
Report Number 060388013
Date: June 3, 1988

PESTICIDES/PCBs

CLIENT I.D. Barton & Loguidice, P.C. (Griffiss Air Force Base)	403-MW-588B 5/10/88 2130 hrs. GRAB			
ULI I.D.	13388022			
BHC (a-isomer)	<0.01			
BHC (g-isomer)	<0.01			
BHC (b-isomer)	<0.01			
Heptachlor	<0.01			
BHC (d-isomer)	<0.01			
Aldrin	<0.01			
Heptachlor Epoxide	<0.1			
Endosulfan (a-isomer)	<0.01			
Dieldrin	<0.01			
4,4'-DDE	<0.01			
4,4'-DDD	<0.01			
Endrin	<0.01			
Endosulfan (b-isomer)	<0.01			
4,4'-DDT	<0.01			
Endrin Aldehyde	<0.03			
Endosulfan Sulfate	<0.1			
Chlordane	<0.03			
Toxaphene	<0.5			
Aroclor 1016	<0.1			
Aroclor 1221	<0.1			
Aroclor 1232	<0.1			
Aroclor 1242	<0.1			
Aroclor 1248	<0.1			
Aroclor 1254	<0.1			
Aroclor 1260	<0.1			

All results are expressed as ug/l.

Analysis Results
Report Number 060388013
Date: June 3, 1988

ACID EXTRACTABLES

CLIENT I.D. Barton & Loguidice, P.C. (Griffiss Air Force Base)	403-MW-588B 5/10/88 2130 hrs. GRAB			
ULI I.D.	13388022			
Phenol	<5			
2-Chlorophenol	<5			
2-Nitrophenol	<5			
2,4-Dimethylphenol	<5			
2,4-Dichlorophenol	<5			
4-Chloro-3-Methylphenol	<5			
2,4,6-Trichlorophenol	<5			
2,4-Dinitrophenol	<50			
4-Nitrophenol	<5			
2-Methyl-4,6-Dinitrophenol	<50			
Pentachlorophenol	<50			

All results are expressed as ug/l.
NYS DOH I.D.: 10170

Approved: _____ 6/3/88

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Contract No.: F 306535-87-D-0012
Project No.: JREZ 87-0141
Del. Order No.: 5017

CONSTRUCTION DOCUMENTS (100%) SUBMISSION

SOIL BORING/SAMPLING/
TEST RESULT ANALYSIS

REMOVE CONTAMINATION
BUILDING 786
APPENDIX C
SOIL SAMPLE ANALYSIS

MEMO

From the Desk of: TONY SCALA *Date:* June 15, 1988

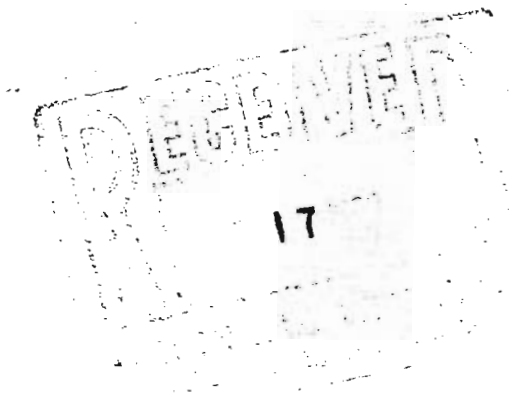
To: Mr. Roy Wagner

Per your request of June 14, 1988, please find attached a typed copy of the Organic Vapor Analyzer Readings for your Griffiss Air Force Base Soil Samples.

If we can be of any further service to you, please do not hesitate to give us a call.

Sincerely,

Anthony J. Scala
Director



Upstate Laboratories inc.
103 Horton Place • East Syracuse, NY 13057 • 315/437-0255

Griffiss Air Force Base Soil Samples

Organic Vapor Analyzer Readings (HNU Instrument)

Bore Hole#	Sample#	Depth in Feet	Reading Volatile Organics
B-3	S#7B	13-14	0
B-3	S#7A	12-13	0
B-3	S#6	10-12	0
B-4	S#2	2-4	0
B-4	S#1	0-2	0
B-3	S#9	16-18	0
B-3	S#8	14-16	0
B-4	S#6A	10-11	0
B-4	S#5	8-10	0
B-4	S#4	6-8	1
B-4	S#3	4-6	1
B-4	S#8	14-14.4	150
B-4	S#7B	12.5-14	250
B-4	S#7A	12-12.5	300
B-4	S#6B	11-12	0
B-5	S#1	0-2	0
B-4	S#11	19-21	1
B-4	S#10	17-19	9
B-4	S#9	15-17	8
B-5	S#5	8-10	0
B-5	S#4	6-8	0
B-5	S#3	4-6	0
B-5	S#2	2-4	0

All readings are expressed as ppm.

Griffiss Air Force Base Soil Samples

Organic Vapor Analyzer Readings (HNU Instrument)

Bore Hole#	Sample#	Depth in Feet	Reading Volatile Organics
B-1	S#4	6-8	<
B-1	S#3	4-6	<
B-1	S#2	2-4	<
B-1	S#1	0-2	<
B-2	S#1	0-2	<
B-1	S#6B	11.5-12	<
B-1	S#6A	10-11.5	<
B-1	S#5	8-10	<
B-2	S#5	8-10	<
B-2	S#4	6-8	<
B-2	S#3	4-6	<
B-2	S#2	2-4	<
B-2	S#8	14-16	<
B-2	S#7B	13.5-14	<
B-2	S#7A	12-13.5	<
B-2	S#2	10-12	<
B-2	S#10	18-20	0.5
B-2	S#10	8-10	6
B-2	S#9	16-17.4	<
B-2	S#8	14-16	<
B-3	S#4	6-8	<
B-3	S#3	4-6	<
B-3	S#2	2-4	<
B-3	S#1	0-2	<

All readings are expressed as ppm.

Griffiss Air Force Base Soil Samples

Organic Vapor Analyzer Readings (HNU Instrument)

Bore Hole#	Sample#	Depth in Feet	Reading Volatile Organics
B-8	S#11	20-22	<
B-8	S#7	12-14	<
B-8	S#8	14-16	<
B-8	S#9	16-18	<
B-8	S#10	18-20	<
B-8	S#3	4-6	<
B-8	S#4	6-8	<
B-8	S#5	8-10	<
B-8	S#6	10-12	<
B-7	S#13	24-26	<
B-7	S#14	26-28	<
B-8	S#1	0-2	<
B-8	S#2	2-4	<
B-7	S#10B	18-20	<
B-7	S#11A	20-21.5	<
B-7	S#11B	21.5-22	<
B-7	S#12	22-24	<
B-7	S#9A	16-16.8	200
B-7	S#9B	16.8-17.4	150
B-7	S#9C	17.4-18	2
B-7	S#10A	18-18.8	220

All readings are expressed as ppm.

Griffiss Air Force Base Soil Samples

Organic Vapor Analyzer Readings
(HNU Instrument)

Bore Hole#	Sample#	Depth in Feet	Reading Volatile Organics
B-7	S#6	10-12	<
B-7	S#7	12-14	<
B-7	S#8A	14-15	200
B-7	S#8B	15-16	280
B-7	S#2	2-4	<
B-7	S#3	4-6	<
B-7	S#4	6-8	<
B-7	S#5	8-10	<
B-6	S#7A	12-13	<
B-6	S#7B	13.0-13.5	<
B-6	S#7C	13.5-14	<
B-7	S#1	0-2	<
B-6	S#4	6-8	<
B-6	S#5	8-10	<
B-6	S#6A	10-10.7	<
B-6	S#6B	10.7-11.7	<
B-5	S#9	16-18	<
B-6	S#1	0-2	<
B-6	S#2	2-4	<
B-6	S#3	4-6	<
B-5	S#6	10-12	<
B-5	S#7A	12-12.7	<
B-5	S#7B	12.7-14	<
B-5	S#8	14-16	<

All readings are expressed as ppm.

Upstate Laboratories inc.

143 Midler Park Drive • Box 289 • Syracuse, New York 13206 • (315) 437-0255
Southern Region (607) 272-2708 ext. 1
Western Region (716) 244-8760

June 10, 1988

Mr. Roy Wagner
Barton and Loguidice, P.C.
290 Elwood Davis Road
Box 3107
Syracuse, New York 13220

Re: Analysis Report #061088006 - Griffiss Air Force Base

Dear Mr. Wagner:

Please find enclosed the results for your soil samples which were picked up by ULI personnel on May 17, 1988.

Should you have any questions, please feel free to give us a call.

Thank you for your patronage.

Sincerely,

UPSTATE LABORATORIES, INC.

Anthony J. Scala
Director

AJS/bf

Enclosures: report, invoice

cc/encs: N. Scala, ULI
file

1 A

Petroleum Products (FID) test results, using DOH Method 310.13, indicate detectable limits of kerosene in Borings B-4 (12'-18') and B-7 (14'-20').

EP Toxicity (for metals) test results, using EPA SW-846, Method 310, show no samples exceed the 6 NYCRR Part 371 maximum concentrations for those tested elements; and therefore, the soil as a composite may be considered non-hazardous under RCRA guidelines for these parameters.

Finally, the BTX Plus test results, using EPA 503.1 procedures, indicate the presence of several benzene compounds in Boring B-4 in the 12'-18' range. Other tested compounds are below the detectable levels in the samples tested.

Conclusion

The field investigations for this project, including field observations and laboratory analysis of soil and water samples, indicate that contamination exists on the site, but in a different manner than had been anticipated. There is surface contamination from heavy organics (oils and grease) in the immediate vicinity of the door to Bldg. 786 and the waste oil storage tank (generally less than 3"). It appears this material has escaped to the environment more through sloppy housekeeping than by system leaks or failures.

There is another type of contamination present on this site, and it appears to be from a separate source. The test results would indicate the material is likely JP-4 jet fuel. The test results show elevated concentrations of kerosene in Borings B-4 and B-7 and benzene in Boring B-4. These compounds were detected in the relatively deeper vadose zones of the respective borings in the soil samples only; none were detected in the water sample. These two (2) borings are located down gradient from the JP-4 jet fuel line running between Bldg. 786 and Bldg. 785 toward the AGE equipment apron. It is possible that this line contains a leak or did so in the past, and the leaked fuel settled toward the water table, but being lighter than water, remained above the water surface in the saturated vadose zone in the area under investigation. The slight change in soil characteristics may also have held the fuel above the groundwater table.

Recommendations

From the data made available through this project, we recommend the following courses of action be taken:

1. Clean up the surface contamination by removal of 12" of potentially contaminated soil over the area between the driveway and Bldg. 786, from the present AGE apron to a point approximately 20' north of the crushed stone waste oil storage area.

Contract No.: F 306535-87-D-0012
Project No.: JREZ 87-0141
Del. Order No.: 5017

CONSTRUCTION DOCUMENTS (100%) SUBMISSION

SOIL BORING/SAMPLING/
TEST RESULT ANALYSIS

REMOVE CONTAMINATION
BUILDING 786
APPENDIX A
SOIL BORING LOGS

parratt wolff inc
FISHER RD., EAST SYRACUSE, N.Y. 13057
TELEPHONE AREA CODE 315/437-1429

May 3, 1988

Barton and Loguidice, P.C.
Consulting Engineers
290 Elwood Davis Road
Box 3107
Syracuse, New York 13220

Attention: Mr. Roy Wagner

Re: 88100
Building 786
Griffiss Air Force Base
New York

Gentlemen:

Enclosed are the logs of nine test borings made for you for the above project.

Soil samples from these borings were picked up from our office by a representative of Upstate Laboratories.

The borings were made at points located by you and were drilled in accordance with your instructions.

Thank you for this opportunity to work with you.

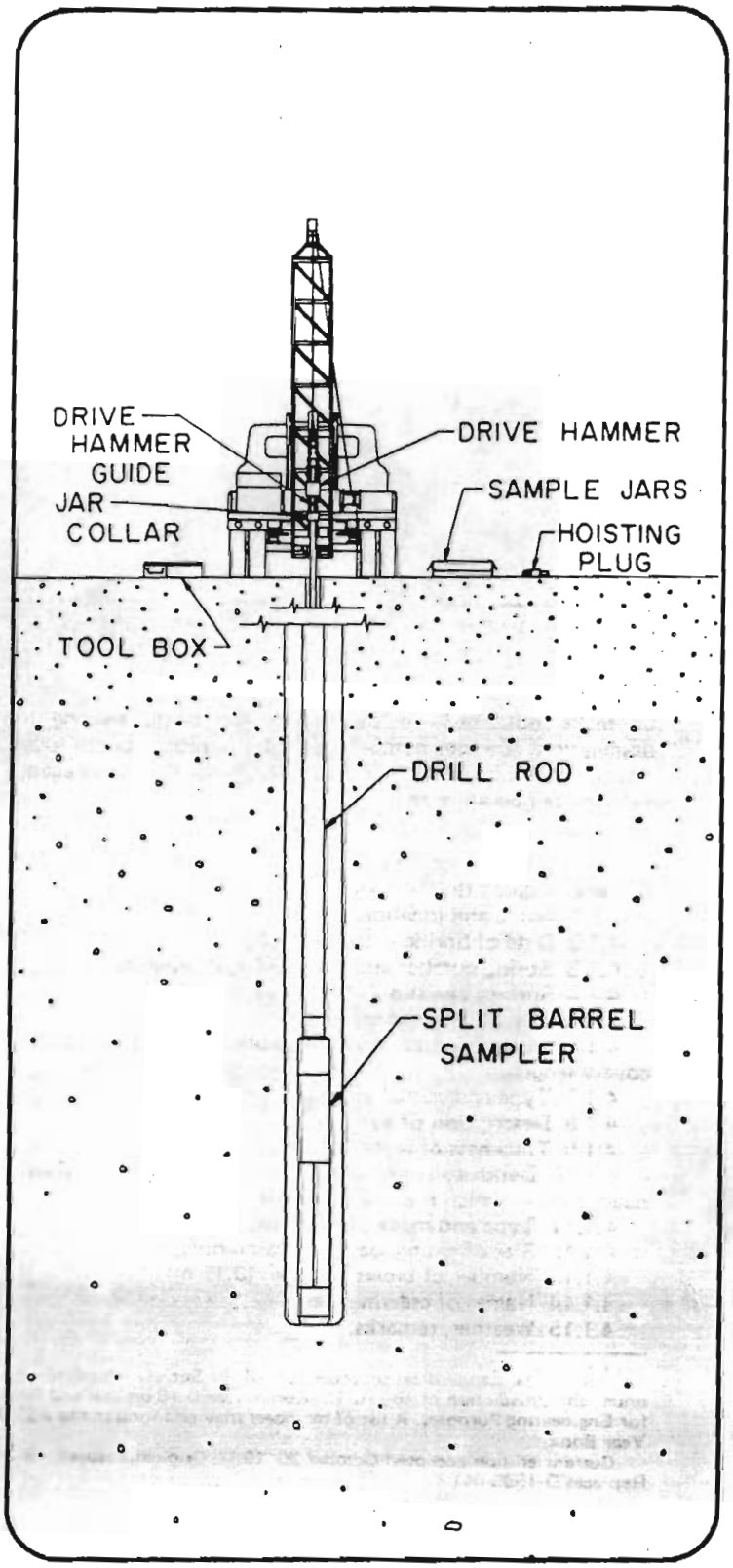
Very truly yours,

PARRATT - WOLFF, INC.

Steffen Wolff
SW/lc
encs:

SOIL SAMPLING - METHODS

parratt wolff inc
FISHER RD., EAST SYRACUSE, N.Y. 13057
TELEPHONE AREA CODE 315/437-1429



Split barrel sampling

The following excerpts are from "Standard Method for penetration test and split-barrel sampling of soils."[1] (ASTM designation: D-1586-67 AASHO Designation: T-206-70.)

1. Scope

1.1 This method describes a procedure for using a split-barrel sampler to obtain respresentative samples of soil for identification purposes and other laboratory tests, and to obtain a measure of the resistance of the soil to penetration of the sampler.

2. Apparatus

2.1 Drilling Equipment — Any drilling equipment shall be acceptable that provides a reasonably clean hole before insertion of the sampler to ensure that the penetration test is performed on undisturbed soil, and that will permit the driving of the sampler to obtain the sample and penetration record in accordance with the procedure described in 3. Procedure. To avoid "whips" under the blows of the hammer, it is recommended that the drill rod have stiffness equal to or greater than the A-rod. An "A" rod is a hollow drill rod or "steel" having an outside diameter of 1-5/8 in. or 41.2 mm and an inside diameter of 1-1/8 in. or 28.5 mm, through which the rotary motion of drilling is transferred from the drilling motor to the cutting bit. A stiffer drill rod is suggested for holes deeper than 50 ft (15m). The hole shall be limited in diameter to between 2-1/4 and 6 in. (57.2 and 152mm).

2.2 Split-Barrel Sampler — The sampler shall be constructed with the dimensions indicated (in Fig. 1.) The drive shoe shall be of hardened steel and shall be replaced or repaired when it becomes dented or distorted. The coupling head shall have four 1/2-in. (12.7-mm) (minimum diameter) vent ports and shall contain a ball check valve. If sizes other than the 2-in. (50.8-mm) sampler are permitted, the size shall be conspicuously noted on all penetration records.

2.3 Drive Weight Assembly — The assembly shall consist of a 140-lb (63.5-kg) weight, a driving head, and a guide permitting a free fall of 30 in. (0.76 m). Special precautions shall be taken to ensure that the energy of the falling weight is not reduced by friction between the drive weight and the guides.

2.4 Accessory Equipment — Labels, data sheets, sample jars, paraffin, and other necessary supplies should accompany the sampling equipment.