83164

NOTICE:

Bids to be opened at 2:00 P.M.
at the
office of
Officer in Charge Of Construction
Jacksonville, North Carolina Area
Building 1005, Marine Corps Base
Camp Lejeune, North Carolina 28542

CONTRACT N62470-85-B-6400

NAVFAC SPECIFICATION
NO. 05-85-6400

REPLACE WATER AND SEWER MAINS AND PROVIDE BACKFLOW PREVENTERS

at the

MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA

and at the

MARINE CORPS AIR STATION, NEW RIVER, JACKSONVILLE, NORTH CAROLINA

(BMO Projects 6C06, 6C05, 6C52, 6C64, and 6C114)

DESIGN BY:

Design Branch, Public Works Division
Marine Corps Base, Camp Lejeune, North Carolina

SPECIFICATION PREPARED BY:

J. H. Fitch, P.E.
4 June 1986

SPECIFICATION APPROVED BY:

F. E. Cone, P.E., Director
Design Branch, Public Works Division

T. L. Huguelet, Commander, CEC, U. S. Navy
for Commander, Naval Facilities Engineering Command

CONTENTS

This Invitation for Bids, IFB No. N62470-85-B-6400, consists of the following documents:

(I) Bidding Instructions

(1) Solicitation, Offer and Award (Standard Form 1442 (Rev. 4-85))
*(2) Instructions to Bidders (Construction Contract) April 1985

(II) Bid Submittal Documents

(1) Solicitation, Offer and Award (Standard Form 1442 (Rev. 4-85))
*(2) Representations and Certifications, April 1985
(3) Bid Guaranty (Standard Form 24 (Rev. 4-85))

(III) Contract Documents

(1) Solicitation, Offer and Award (Standard Form 1442 (Rev. 4-85))
(2) Performance Bond (Standard Form 25 (Rev. 10-83))
(3) Payment Bond (Standard Form 25A (Rev. 10-83))
*(4) Contract Clauses (Construction Contract) January 1986
(5) Labor Standards Provisions, November 1979 (Rev. 8-83)
*(6) NAVFAC Specification No. 05-85-6400
(7) Drawings identified in Section 01011 of the Specification
**(8) Wage Determination, Secretary of Labor Decision No. NC86-4, Building Construction - for work in buildings or within five feet of a building, and Decision NO. NC86-9, Heavy Construction (including Sewer and Water Lines) for work more than five feet outside of buildings.

* These items are bound within the Specification at the front

** The Wage Determinations are attached as the last pages of the Specification

NOTE: All other items are attached on top of the Specification

NOTE:

INQUIRIES

PLANS AND SPECIFICATIONS: Questions regarding the plans and Specification occurring prior to bid opening shall be presented to the Public Works Design Division, Building 1005, Marine Corps Base, Camp Lejeune, North Carolina 28542, telephone (919) 451-5507. Questions requiring interpretation of drawings and the Specification must be submitted at least ten days before bid opening. Interpretations or modifications to specifications made as a result of questions will be made by amendment only, and unless so done, all bidders should base their bids on the plans and Specification as issued.

BIDDING PROCEDURES: All questions concerning the bidding procedures shall be presented to OICC-ROICC Contract Branch, Room 26, Building 1005, Marine Corps Base, Camp Lejeune, North Carolina, telephone (919) 451-2582.

CONTENTS

SECTION 00101
Instructions to Bidders
(Construction Contract)

1. SOLICITATION DEFINITIONS - SEALED BIDDING (APR 1985)

"Offer" means "bid" in sealed bidding.
"Solicitation" means an invitation for bids in sealed bidding.
(FAR 52.214-1).

2. BIDS:

(a) Instructions to Bidders and Standard Form 1442 (Solicitation, Offer, and Award) shall be observed in the preparation of bids. Bidders shall affix their names and return addresses in the upper left corner of the bid envelope. Envelopes containing bids must be sealed.

(b) Bids shall be submitted in triplicate on Standard Form 1442 (10-83) and, for bids of $25,000 or greater, shall be accompanied by a bid guarantee as stipulated in paragraph titled Bid Guarantee of this Section. Bid security shall be in the sum of 20% of the largest amount for which award can be made under the bid submitted, but in no case to exceed 3 million dollars. The bid quaranty bond shall be accompanied by a verifax or other facsimile copy of the agent's authority to sign bonds for the surety company.

(c) The basis of bid shall be lump sum price for the following item:

Base Bid Price for the entire work, complete in accordance with the drawings and Specification.

NOTE: The lump sum price shall be deemed to include all costs required for the specified work, complete in accordance with the drawings and specifications, including all materials, labor, equipment, tools, supervision, and related items.

(d) All hand delivered bids must be deposited with personnel in the Contract Branch, Room No. 26, Building 1005, Marine Corps Base, Camp Lejeune, North Carolina 28542, prior to the time and date set for bid opening. Any bids submitted by hand after the time set for receipt will not be accepted.

3. PRE-BID SITE VISITATION. To inspect the site of the work prior to bid opening, an appointment must be made with the Officer in Charge of Construction, Jacksonville, North Carolina Area, telephone 919-451-2581.

4. CONDITIONS AFFECTING THE WORK. Bidders should visit the site and take such other steps as may be reasonably necessary to ascertain the nature and location of the work, and the general and local conditions which can affect the work or the cost thereof. Failure to do so will not relieve bidders from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Government will assume no responsibility for any understanding or representations concerning conditions made by any of its officers or agents prior to the execution of the contract, unless included in the invitation for bids, the specifications, or related documents.

5. RATED OR AUTHORIZED CONTROLLED MATERIAL ORDERS (APR 1984). Contracts or purchase orders to be awarded as a result of this solicitation shall be assigned a _____ DX rating; DO-C2 rating; _____ DMS allotment number in accordance with Defense Priorities System Regulation 1 and/or Defense Materials System Regulation 1. (FAR 52.212-7)

6. EXPLANATION TO PROSPECTIVE BIDDERS (APR 1984). Any prospective bidder desiring an explanation or interpretation of the solicitation, drawings, specifications, etc., must request it in writing soon enough to allow a reply to reach all prospective bidders before the submission of their bids. Oral explanations or instructions given before the award of a contract will not be binding. Any information given a prospective bidder concerning a solicitation will be furnished promptly to all other prospective bidders as an amendment to the solicitation, if that information is necessary in submitting bids or if the lack of it would be prejudicial to other prospective bidders. (FAR 52.214-6)

7. AVAILABILITY OF SPECIFICATIONS LISTED IN THE DOD INDEX OF SPECIFICATION AND STANDARDS (DODISS) (APR 1984). Single copies of specifications cited in this solicitation may be obtained by submitting a written request to the supply point listed below. The request must contain the title of the specification, its number, date, applicable amendment(s), and the solicitation or contract number. In case of urgency, telephone or telegraphic requests are acceptable. Voluntary standards, which are not available to offerors and contractors from Government sources, may be obtained from the organization responsible for their preparation, maintenance, or publication. (FAR 52.210-2)

Commanding Officer
U.S. Naval Publication and Forms Center
5801 Tabor Avenue
Philadelphia, Pennsylvania 19120
Telex Number 834295
Western Union Number 710-670-1685
Telephone Number (215) 697-3321

AVAILABILITY OF SPECIFICATIONS AND STANDARDS NOT LISTED IN DODISS, DATA ITEM DESCRIPTIONS NOT LISTED IN DOD DIRECTIVE 5000.19-L, VOLUME II, AND PLANS, DRAWINGS, AND OTHER PERTINENT DOCUMENTS (JUN 1977). The specifications, standards, plans, drawings, descriptions and other pertinent documents cited in this solicitation may be obtained by submitting request to:

Public Works Division
Specifications and Estimates Section
Building 1005, Marine Corps Base
Camp Lejeune, North Carolina 28542

NOTE: Due to budgetary restriction, it is unlikely that Public Works Division will be able to furnish more than the name and address which may be used to order these publications.

Requests should give the number of the solicitation and the title and number of the specification, standard, plan, drawing or other pertinent document requested, exactly as cited in this solicitation. (DOD FAR SUPP 52.210-7002)

AVAILABILITY FOR EXAMINATION OF SPECIFICATIONS, STANDARDS, PLANS, DRAWINGS, DATA ITEM DESCRIPTIONS, AND OTHER PERTINENT DOCUMENTS (JUN 1977). The specification, standards, plans, drawings, descriptions, and other pertinent documents cited in this solicitation may be examined at the following locations: (DOD FAR SUPP 52.210-7003)

Public Works Division
Specifications and Estimates Section
Building 1005, Marine Corps Base
Camp Lejeune, North Carolina 28542

8. NOTICE OF TOTAL SMALL BUSINESS SET-ASIDE (APR 1984).

(a) Definition.
"Small business concern," as used in this clause, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the size standards in this solicitation.

(b) General.

(1) Offers are solicited only from small business concerns. Offers received from concerns that are not small business concerns shall be considered nonresponsive and will be rejected.
(2) Any award resulting from this solicitation will be made to a small business concern.

(c) Agreement. A manufacturer or regular dealer submitting an offer in its own name agrees to furnish, in performing the contract, only end items manufactured or produced by small business concerns inside the United States, its territories and possessions, the Commonwealth of Puerto Rico, the Trust Territory of the Pacific Islands, or the District of Columbia. However, this requirement does not apply in connection with construction or service contracts. (FAR 52.219-6)

9. THE SMALL BUSINESS SIZE STANDARD APPLICABLE TO THIS CONTRACT IS AS FOLLOWS:

SIC CODE	INDUSTRY, SUBINDUSTRY OR CLASS OF PRODUCTS	ANNUAL SIZE STANDARD (MAXIMUM IN MILLIONS)
1542	General Contractor	$17.0

10. BIDDER'S QUALIFICATIONS. Before bid is considered for award, the bidder may be requested by the Government to submit a statement regarding his previous experience in performing comparable work, his business and technical organization, financial resources, and plant available to be used in performing the work.

11. BID GUARANTEE (APR 1984)

(a) Failure to furnish a bid guarantee in the proper form and amount, by the time set for opening of bids, may be cause for rejection of the bid.

(b) The offeror (bidder) shall furnish a bid guarantee in the form of a firm commitment, such as a bid bond, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Contracting Officer will return bid guarantees, other than bid bonds, (1) to unsuccessful bidders as soon as practicable after the opening of bids, and (2) to the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.

(c) If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or give a bond(s) as required by the solicitation within the time specified, the Contracting Officer may terminate the contract for default.

(d) Unless otherwise specified in the bid, the bidder will (1) allow 60 days for acceptance of its bid and (2) give bond within 10 days after receipt of the forms by the bidder.

(e) In the event the contract is terminated for default, the bidder is liable for any cost of acquiring the work that exceeds the amount of its bid, and the bid guarantee is available to offset the difference. (FAR 52.228-1)

12. PREPARATION OF BIDS - CONSTRUCTION (APR 1984).

(a) Bids must be (1) submitted on the forms furnished by the Government or on copies of those forms, and (2) manually signed. The person signing a bid must initial each erasure or change appearing or any bid form.

(b) The bid form may require bidders to submit bid prices for one or more items on various bases, including-

(1) Lump sum bidding;
(2) Alternate prices;
(3) Units of construction; or
(4) Any combination of subparagraphs (1) through (3) above.

(c) If the solicitation requires bidding on all items, failure to do so will disqualify the bid. If bidding on all items is not required, bidders should insert the words "no bid" in the space provided for any item on which no price is submitted.

(d) Alternate bid will not be considered unless this solicitation authorizes their submission. (FAR 52.214-18)

13. SUBMISSION OF BIDS (APR 1984).

(a) Bids and bid modifications shall be submitted in sealed envelopes or packages (1) addressed to the office specified in the solicitation and (2) showing the time specified for receipt, the solicitation number, and the name and address of the bidder.

(b) Telegraphic bids will not be considered unless authorized by the solicitation; however, bids may be modified or withdrawn by written or telegraphic notice, if such notice is received by the time specified for receipt of bids. (FAR 52.214-5)

14. ACKNOWLEDGMENT OF AMENDMENTS TO INVITATIONS FOR BIDS (APR 1984). Bidders shall acknowledge receipt of any amendment to this solicitation (a) by signing and returning the amendment, (b) by identifying the amendment number and date in the space provided for this purpose on the form for submitting a bid, or (c) by letter or telegram. The Government must receive the acknowledgment by the time and at the place specified for receipt of bids. (FAR 52.214-3)

15. LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWALS OF BIDS (APR 1984)

(a) Any bid received at the office designated in the solicitation after the exact time specified for receipt will not be considered unless it is received before award is made and it-

(1) Was sent by registered or certified mail not later than the fifth calendar day before the date specified for receipt of bids (e.g., a bid submitted in response to a solicitation requiring receipt of bids by the 20th of the month must have been mailed by the 15th); or

(2) Was sent by mail (or was a telegraphic bid if authorized), and it is determined by the Government that the late receipt was due solely to mishandling by the Government after receipt at the Government installation.

(b) Any modification or withdrawal of a bid is subject to the same conditions as in paragraph (a) above.

(c) The only acceptable evidence to establish the date of mailing of a late bid, modification, or withdrawal sent either by registered or certified mail is the U.S. or Canadian Postal Service postmark on the wrapper or on the original receipt from the U.S. or Canadian Postal Service. If neither postmark shows a legible date, the bid, modification, or withdrawal shall be processed as if mailed late. "Postmark" means a printed, stamped, or otherwise placed impression (exclusive of a postage meter machine impression) that is readily identifiable without further action as having been supplied and affixed by employees of the U.S. or Canadian Postal Service on the date of mailing. Therefore, bidders should request the postal clerks to place a hand cancellation bull's-eye postmark on both the receipt and the envelope or wrapper.

(d) The only acceptable evidence to establish the time of receipt at the Government installation is the time/date stamp of that installation on the bid wrapper or other documentary evidence of receipt maintained by the installation.

(e) Notwithstanding paragraph (a) above, a late modification of an otherwise successful bid that makes its terms more favorable to the Government will be considered at any time it is received and may be accepted.

(f) A bid may be withdrawn in person by a bidder or its authorized representative if, before the exact time set for receipt of bids, the identity of the person requesting withdrawal is established and that person signs a receipt for the Bid. (FAR 52.214-7)

16. PUBLIC OPENING OF BIDS. Bids will be publicly opened at the time set for opening in the invitation for bids. Their content will be made public for the information of bidders and others interested, who may be present either in person or by representative.

17. CONTRACT AWARD - SEALED BIDDING - CONSTRUCTION (FEB 1986)

(a) The Government will evaluate bids in response to this solicitation without discussions and will award a contract to the responsible bidder whose bid, conforming to the solicitation, will be most advantageous to the Government, considering only price and the price-related factors specified elsewhere in the solicitation.

(b) The Government may reject any or all bids, and waive informalities or minor irregularities in bids received.

(c) The Government may accept any item or combination of items, unless doing so is precluded by a restrictive limitation in the solicitation or the bid. (FAR 52.214-19)

18. CONTRACT AND BONDS

(Applicable only to bids of $25,000 or more.) Within 10 days after receipt of awards the bidder to whom award is made shall furnish two bonds, each with satisfactory security; namely, a performance bond (Standard Form 25) and a payment bond (Standard Form 25A). The performance bond shall be in a penal sum equal to 100 percent of the contract price. The payment bond shall be equal to 50 percent of the contract price, except that it shall be 40 percent of the contract price if that price is more than $1,000,000 and not more than $5,000,000, and in the fixed sum of $2,500,000 if the contract price is more than $5,000,000. The bond of any surety company holding a certificate of authority from the Secretary of the Treasury as an acceptable surety on Federal bonds will be accepted. Individual sureties will be accepted in accordance with FAR 28.202-2. Options in lieu of corporate or individual sureties may be provided in accordance with FAR 28.203. The contract time for purposes of fixing the completion date, default, and liquidated damages shall begin to run 15 days from the mailing of acceptance, regardless of when performance and payment bonds are executed.

19. NOTE THE AFFIRMATIVE ACTION REQUIREMENT OF THE EQUAL OPPORTUNITY CLAUSE WHICH MAY APPLY TO THE CONTRACT RESULTING FROM THIS SOLICITATION

20. NOTE THE CERTIFICATION OF NONSEGREGATED FACILITIES IN THIS SOLICITATION

Bidders, offerors and applicants are cautioned to note the "Certification of Nonsegregated Facilities" in the solicitation. Failure of a bidder or offeror to agree to the certification will render his bid or offer nonresponsive to the terms of solicitations involving awards of contracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity clause (1978 SEP).

21. COST LIMITATION

A bid which does not contain separate bid prices for the items identified as subject to a cost limitation may be considered nonresponsive. A bidder by signing his bid certifies that each price bid on items subject to a cost limitation include an appropriate apportionment of all applicable estimated costs, direct and indirect, as well as overhead and profit. Bids may be rejected which (i) have been materially unbalanced for the purpose of bringing affected items within cost limitations or (ii) exceed the cost limitations unless such limitations have been waived by the Assistant Secretary of Defense (Installations and Logistics) prior to award. (1974 APR) (DOD FAR SUPP 52.236-7081)

22. FALSE STATEMENTS IN BIDS (APR 1984)

Bidders must provide full, accurate, and complete information as required by this solicitation and its attachments. The penalty for making false statements in bids is prescribed in 18 U.S.C. 1001.

END OF SECTION

CONTRACT CLAUSES
(Construction Contract)

CLAUSES INCORPORATED BY REFERENCE (APR 1984). This contract incorporates the following clauses by reference, with the same force and effect as if they were given full text. Upon request, the Contracting Officer will make their full text available. (FAR 52.252-2)

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES

1. FAR 52.202-1, Definitions - Alternate I (APR 1984)
2. FAR 52.203-1, Officials Not To Benefit (APR 1984)
3. FAR 52.203-3, Gratuities (APR 1984)
4. FAR 52.203-5, Covenant Against Contingent Fees (APR 1984)
5. FAR 52.212-6, Time Extensions (APR 1984)
6. FAR 52.212-8, Priorities, Allocations, and Allotments (APR 1984)
7. FAR 52.212-11, Variation in Estimated Quantity (APR 1984)
8. FAR 52.212-12, Suspension of Work (APR 1984)
9. FAR 52.214-26, Audit-Sealed Bidding (APR 1985)
10. FAR 52.214-27, Price Reduction for Defective Cost or Pricing Data-Modifications-Sealed Bidding (APR 1985)
11. FAR 52.214-28, Subcontractor Cost or Pricing Data-Modifications-Sealed Bidding (APR 1985)
12. FAR 52.215-1, Examination of Records by Comptroller General (APR 1984)
13. FAR 52.219-8, Utilization of Small Business Concerns and Small Disadvantaged Business Concerns (APR 1984)
14. FAR 52.219-9, Small Business and Small Disadvantaged Business Subcontracting Plan - Alternate I (APR 1984)
15. FAR 52.219-13, Utilization of Women-Owned Business Concerns (APR 1984)
16. FAR 52.222-3, Convict Labor (APR 1984)
17. FAR 52.222-26, Equal Opportunity (APR 1984)
18. FAR 52.222-27, Affirmative Action Compliance Requirements for Construction (APR 1984)

19. FAR 52.222-35, Affirmative Action for Special Disabled and Vietnam Era Veterans (APR 1984)

20. FAR 52.222-36, Affirmative Action for Handicapped Workers (APR 1984)

21. FAR 52.223-2, Clean Air and Water (APR 1984)

22. FAR 52.225-5, Buy American Act - Construction Materials (APR 1984)

23. FAR 52.227-1, Authorization and Consent (APR 1984)

24. FAR 52.227-4, Patent Indemnity - Construction Contract (APR 1984)

25. FAR 52.228-2, Additional Bond Security (APR 1984)

26. FAR 52.228-5, Insurance-Work on a Government Installation (APR 1984)

27. FAR 52.229-3, Federal, State, and Local Taxes (APR 1984)

28. FAR 52.230-4, Administration of Cost Accounting Standards (APR 1984)

29. FAR 52.230-6, Cost Accounting Standards (APR 1984)

30. FAR 52.232-5, Payments Under Fixed-Price Construction Contract (APR 1984)

31. FAR 52.232-17, Interest (APR 1984)

32. FAR 52.232-23, Assignment of Claims (APR 1984)

33. FAR 52.233-1, Disputes (APR 1984)

✓ 34. FAR 52.233-3, Protest after Award (JUN 1985)

35. FAR 52.236-1, Performance of work by the Contractor (APR 1984)

36. FAR 52.236-2, Differing Site Conditions (APR 1984)

37. FAR 52.236-3, Site Investigation and Conditions Affecting the Work (APR 1984)

38. FAR 52.236-5, Material and Workmanship (APR 1984)

39. FAR 52.236-6, Superintendence by the Contractor (APR 1984)

40. FAR 52.236-7, Permits and Responsibilities (APR 1984)

41. FAR 52.236-8, Other Contracts (APR 1984)

42. FAR 52.236-9, Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements (APR 1984)

43. FAR 52.236-10, Operations and Storage Areas (APR 1984)

44. FAR 52.236-11, Use and Possession Prior to Completion (APR 1984)

45. FAR 52.236-12, Cleaning Up (APR 1984)

46. FAR 52.236-13, Accident Prevention (APR 1984)

47. FAR 52.236-14, Availability and Use of Utility Services (APR 1984)

48. FAR 52.236-15, Schedules for Construction Contracts (APR 1984)

49. FAR 52.236-17, Layout of Work (APR 1984)

50. FAR 52.236-21, Specifications and Drawings (APR 1984)

51. FAR 52.243-4, Changes (APR 1984)

52. FAR 52.245-01, Property Records (APR 1984)

53. FAR 52.245-02, Government Property (Fixed Price Contract) (APR 1984)

54. FAR 52.245-4, Government-Furnished Property (Short Form) (APR 1984)

55. FAR 52.246-12, Inspection of Construction (APR 1984)

56. FAR 52.246-21, Warranty of Construction (APR 1984)

57. FAR 52.248-3, Value Engineering-Construction (APR 1984)

58. FAR 52.249-2, Termination for Convenience of the Government (Fixed-Price) - Alternate I (APR 1984)

59. FAR 52.249-10, Default (Fixed-Price Construction) (APR 1984)

60. FAR SUPP 52.217-7122, Notice and Assistance Regarding Patent and Copyright Infringement (APR 1984)

61. FAR SUPP 52.219-7000, Small Business and Small Disadvantaged Business (APR 1984)

62. FAR SUPP 52.233-7000, Certification of Requests for Adjustment or Relief Exceeding $100,000 (FEB 1980)

63. FAR SUPP 52.236-7000, Composition of Contractor (JAN 1965)

64. FAR SUPP 52.236-7001, Modification of Proposals - Price Breakdown (APR 1968)

65. FAR SUPP 52.236-7003, Shop Drawings (OCT 1976)

66. FAR SUPP 52.236-7005, Salvage Materials and Equipment (JAN 1965)

67. FAR SUPP 52.236-7006, Misplaced Material (JAN 1965)

68. FAR SUPP 52.236-7007, Identification of Employees (JAN 1965)

69. FAR SUPP 52.236-7050(a), Patent Indemnity (JUN 1974)

70. FAR SUPP 52.227-7033, Rights in Shop Drawings (APR 1966)

71. FAR SUPP 52.243-7001, Pricing of Adjustments (APR 1984)

72. Defense Acquisition Regulations (DAR) 7-602.37, Subcontractors (1979 MAR)

73. FAR 52.247-64, Preference For Privately Owned U.S. Flag Commercial Vessels (APR 1984)

(a) When ocean transportation is required to bring supplies, materials, or equipment to the construction site from the United States either for use in performance of, or for incorporation in, the work called for by this contract, the Contractor shall use privately owned U.S.-flag commercial vessels to the extent that such vessels are available at rates that are fair and reasonable for privately owned U.S.-flag commercial vessels.

(b) The Contractor shall not make any shipment exceeding 10 measurement tons (400 cubic feet) by vessels other than privately owned U.S.-flag commercial vessels without (1) notifying the Contracting Officer that U.S.-flag commercial vessels are not available at rates that are fair and reasonable for such vessels and (2) obtaining permission to ship in other vessels. If permission is granted, the contract price shall be equitably adjusted to reflect the difference in cost.

(c) (1) The Contractor shall submit one legible copy of a rated on-board ocean bill of lading for each shipment to both (i) the Contracting Officer and (ii) the Division of National Cargo, Office of Market Development, Maritime Administration, U.S. Department of Transportation, Washington, DC 20590. Subcontractor bills of lading shall be submitted through the Prime Contractor.

(2) The Contractor shall furnish these bill of lading copies (i) within 20 working days of the date of loading for shipments originating in the United States or (ii) within 30 working days for shipments originating outside the United States. Each bill of lading copy shall contain the following information:

(A) Sponsoring U.S. Government agency.
(B) Name of vessel.
(C) Vessel flag of registry.
(D) Date of loading.
(E) Port of loading.
(F) Port of final discharge.
(G) Description of commodity.
(H) Gross weight in pounds and cubic feet if available.
(I) Total ocean freight revenue in U.S. dollars.

(d) Except for small purchases as described in 48 CFR 13, the Contractor shall insert the substance of this clause, including this paragraph (d), in all subcontracts or purchase orders under this contract.

(e) The requirement in paragraph (a) does not apply to-

(1) Small purchases as defined in 48 CFR 13;

(2) Cargoes carried in vessels of the Panama Canal Commission or as required or authorized by law or treaty;

(3) Ocean transportation between foreign countries of supplies purchased with foreign currencies made available, or derived from funds that are made available, under the Foreign Assistance Act of 1961 (22 U.S.C. 2353); and

(4) Shipments of classified supplies when the classification prohibits the use of non-Government vessels.

(f) Guidance regarding fair and reasonable rates for privately owned U.S.-flag commercial vessels may be obtained from the Division of National Cargo, Office of Market Development, Maritime Administration, U.S. Department of Transportation, Washington, DC 20590, Phone: 202-426-4610.

April 1985

REPRESENTATIONS AND CERTIFICATIONS
(Construction Contract)

Invitation Reference No:

Name and Address of Bidder:

DUNS Number:

Date of Bid:

The bidder makes the following representations and certifications, by placing a check in the appropriate spaces or otherwise as appropriate, as part of the bid identified above. (In negotiated procurements, "bid" and "bidder" shall mean "offer" and "offeror.") A completed REPRESENTATIONS AND CERTIFICATIONS is to be returned with the bid.

1. SMALL BUSINESS CONCERN REPRESENTATION (APR 1984).

The offeror represents and certifies as part of its offer that it [ ] is, [ ] is not a small business concern and that [ ] all, [ ] not all supplies to be furnished will be manufactured or produced by a small business concern in the United States, its possessions, or Puerto Rico. "Small business concern," as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the size standards in this solicitation. (FAR 52.219-1)

2. CONTINGENT FEE REPRESENTATION AND AGREEMENT (APR 1984).

(a) Representation. The offeror represents that, except for full-time bona fide employees working solely for the offeror, the offeror-

[Note: The offeror must check the appropriate boxes. For interpretation of the representation, including the term " bona fide employee," see Subpart 3.4 of the Federal Acquisiton Regulation.]

(1) [ ] has, [ ] has not employed or retained any person or company to solicit or obtain this contract; and

(2) [ ] has, [ ] has not paid or agreed to pay to any person or company employed or retained to solicit or obtain this contract any commission, percentage, brokerage, or other fee contingent upon or resulting from the award of this contract.

(b) Agreement. The offeror agrees to provide information relating to the above Representation as requested by the Contracting Officer and, when subparagraph (a)(1) or (a)(2) is answered affirmatively, to promptly submit to the Contracting Officer-

(1) A completed Standard Form 119, Statement of Contingent or Other Fees, (SF 119); or
(2) A signed statement indicating that the SF 119 was previously submitted to the same contracting office, including the date and applicable solicitation of contract number, and representing that the prior SF 119 applies to this offer or quotation. (FAR 52.203-4)

3. TYPE OF BUSINESS ORGANIZATION - SEALED BIDDING (APR 1985).

The bidder, by checking the applicable box, represents that it operates as ____ a corporation incorporated under the laws of the State of _____, ____ an individual, ____ a partnership, ____ a nonprofit organization, or ____ a joint venture. (FAR 52.214-2)

4. CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1984).

(a) The offeror certifies that-
(1) The prices in this offer have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to (i) those prices, (ii) the intention to submit an offer, or (iii) the methods or factors used to calculate the prices offered;
(2) The prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a formally advertised solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and
(3) No attempt has been made or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.
(b) Each signature on the offer is considered to be a certification by the signatory that the signatory-
(1) Is the person in the offeror's organization responsible for determining the prices being offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above; or
(2) (i) Has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above _____ [insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization];
(ii) As an authorized agent, does certify that the principals named in subdivision (b)(2)(i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above; and
(iii) As an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above.
(c) If the offeror deletes or modifies subparagraph (a)(2) above, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure. (FAR 52.203-2)

5. PARENT COMPANY AND IDENTIFYING DATA (APR 1984)

(a) A "parent" company, for the purpose of this provision, is one that owns or controls the activities and basic business policies of the bidder. To own the bidding company means that the parent company must own more than 50 percent of the voting rights in that company. A company may control a bidder as a parent even though not meeting the requirement for such ownership if the parent company is able to formulate, determine, or veto basic policy decisions of the offeror through the use of dominant minority voting rights, use of proxy voting, or otherwise.

(b) The bidder [ ] is, [ ] is not [check applicable box] owned or controlled by a parent company.

(c) If the bidder checked "is" in paragraph (b) above, it shall provide the following information:

Name and Main Office Address of Parent Company (Include Zip Code)	Parent Company's Employer's Identification Number

.....

(d) If the bidder checked "is not" in paragraph (b) above, it shall insert its own Employer's Identification Number on the following line _____. (FAR 52.214-8)

6. CERTIFICATION OF NONSEGREGATED FACILITIES (APR 1984)

(Applies when the amount of the contract is in excess of $10,000.)

(a) "Segregated facilities," as used in this provision, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color religion, or national origin because of habit, 'local custom, or otherwise.

(b) By the submission of this offer, the offeror certifies that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The offeror agrees that a breach of this certification is a violation of the Equal Opportunity clause in the contract.

(c) The offeror further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will-

(1) Obtain identical certifications from proposed subcontractors before the award of subcontracts under which the subcontractor will be subject to the Equal Opportunity clause;

(2) Retain the certifications in the files; and

(3) Forward the following notice to the proposed subcontractors (except if the proposed subcontractors have submitted identical certifications for specific time periods):

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATIONS OF REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES.

A Certification of Nonsegregated Facilities must be submitted before the award of a subcontract under which the subcontractor will be subject to the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001. (FAR 52.222-21)

7. CLEAN AIR AND WATER CERTIFICATION (APR 1984)

The Offeror certifies that-

(a) Any facility to be used in the performance of this proposed contract is [ ], is not [ ] listed on the Environmental Protection Agency List of Violating Facilities;

(b) The Offeror will immediately notify the Contracting Officer, before award, of the receipt of any communication from the Administrator, or a designee, of the Environmental Protection Agency, indicating that any facility that the Offeror proposes to use for the performance of the contract is under consideration to be listed on the EPA List of Violating Facilities; and

(c) The Offeror will include a certification substantially the same as this certification, including this paragraph (c), in every nonexempt subcontract. (FAR 52.223-1)

8. SMALL DISADVANTAGED BUSINESS CONCERN REPRESENTATION (APR 1984)

(a) Representation. The offeror represents that it [ ] is, [ ] is not a small disadvantaged business concern.

(b) Definitions.

"Asian-Indian American," as used in this provision, means a United States citizen whose origins are in India, Pakistan, or Bangladesh.

"Asian-Pacific American," as used in this provision, means a United States citizen whose origins are in Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U.S. Trust Territory of the Pacific Islands, the Northern Mariana Islands, Cambodia, or Taiwan.

"Native Americans," as used in this provision, means American Indians, Eskimos, Aleuts, and native Hawaiians.

"Small business concern," as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria and size standards in 13 CFR 121.

"Small disadvantaged business concern," as used in this provision, means a small business concern that (1) is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged, or a publicly owned business having at least 51 percent of its stock owned by one or more socially and economically disadvantaged individuals and (2) has its management and daily business controlled by one or more such individuals.

(c) Qualified groups. The offeror shall presume that socially and economically disadvantaged individuals include Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Asian-Indian Americans, and other individuals found to be qualified by the SBA under 13 CFR 124.1. (FAR 52.219-2)

9. WOMEN-OWNED SMALL BUSINESS REPRESENTATION (APR 1984)

(a) Representation. The offeror represents that is [ ] is, [ ] is not a women-owned small business concern.

(b) Definitions.

"Small business concern," as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominate in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria and size standards in 13 CFR 121.

"Women-owned," as used in this provision, means a small business that is at least 51 percent owned by a woman or women who are U.S. citizens and who also control and operate the business. (FAR 52.219-3)

10. DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER REPORTING (DEC 1980)

In the block with its name and address, the offeror should supply the Data Universal Numbering System (DUNS) Number applicable to that name and address. The DUNS Number should be preceded by "DUNS:". If the offeror does not have a DUNS Number, it may obtain one from any DUN and Bradstreet branch office. No offeror should delay the submission of its offer pending receipt of its DUNS Number. (FAR SUPP 52.204-7004)

11. PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (APR 1984)

The offeror represents that-

(a) It [ ] has, [ ] has not participated in a previous contract or subcontract subject either to the Equal Opportunity clause of this solicitation, the clause originally contained in Section 310 of Executive Order No. 10925, or the clause contained in Section 201 of Executive Order No. 11114;

(b) It [ ] has, [ ] has not filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards. (FAR 52.222-22)

12. PERCENT FOREIGN CONTENT (SEP 1978)

Approximately _____ percent of the proposed contract price represents foreign content or effort. (DAR 7-2003.81)

NOTE: Bids must set forth full, accurate and complete information as required by this invitation for bids (including attachments). The penalty for making false statements is prescribed in 18 U.S.C. 1001.

A completed REPRESENTATIONS AND CERTIFICATIONS is to be returned with the bid.

CHANGES TO:

LABOR STANDARD PROVISIONS, NOVEMBER 1979 (Rev. 8/83)

2. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT-OVERTIME COMPENSATION (40. U.S.C. 327-333)(1983 AUG) - Delete clauses (a) and (b) and substitute the following therefor:

"(a) Overtime requirements. No Contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborers or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(b) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the provisions set forth in paragraph (a) of this clause, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the provisions set forth in paragraph (a) of this clause, in the sum of $10 for each calendar day in which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the provisions set forth in paragraph (a) of this clause."

SECTION 01010
GENERAL PARAGRAPHS

1. GENERAL INTENTION: It is the declared and acknowledged intention and meaning to provide and secure replacement of water and sewer mains, and providing backflow preventers, complete and ready for use.

2. GENERAL DESCRIPTION: The work includes replacing sewer mains and manholes with reconnection of house lines; replacing or reworking water mains, lines, providing triple frost-free hose bibs and a fire hydrant; modifying plumbing and providing backflow preventers, water well capping and abandonment; and incidental related work.

3. The work shall be located at the Marine Corps Base, Camp Lejeune, North Carolina, and the Marine Corps Air Station, New River, Jacksonville, North Carolina, approximately as shown. The exact location will be indicated by the Contracting Officer. "Officer in Charge of Construction (OICC)" and "Contracting Officer" are used interchangeably in this specification and have the same meaning.

4. NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (APR 1984).

(Applies when the amount of the contract is in excess of $10,000.)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for minority participation for each trade	Goals for female participation for each trade
23.5%	6.9%

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of

minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Director, Office of Federal Contract Compliance Programs, within 10 working days following award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the-

(1) Name, address, and telephone number of the subcontractor;
(i) Employer identification number of the subcontractor;
(2) Estimated dollar amount of the subcontract;
(3) Estimated starting and completion dates of the subcontract; and
(4) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is State of North Carolina; Counties of Columbus, Duplin, Onslow and Pender. (FAR 52.222-23)

5. REQUIRED INSURANCE: (a) The Contractor shall procure and maintain during the entire period of performance under this contract the following minimum insurance coverage.

Type of Insurance	Per Person	Per Accident	Property
1. Comprehensive General Liability		$500,000	
2. Automobile Liability	$200,000	$500,000	$ 20,000

3. Workmen's Compensation: As required by Federal and State workers' compensation and occupational disease statutes.

4. Employer's liability coverage: $100,000, except in states where workers' compensation may not be written by private carriers.

5. Other as required by state law.

(b) Prior to commencement of work, the Contractor shall furnish to the Contracting Officer a certificate or written statement of the above required insurance. The policies evidencing required insurance shall contain an endorsement to the effect that cancellation or any material change in the policies adversely affecting the interests of the Government in such insurance shall not be effective for such period as may be prescribed by the laws of the State in which this contract is to be performed and in no event less than thirty (30) days after written notice thereof to the Contracting Officer.

(c) The Contractor agrees to insert the substance of this clause, including this paragraph (c), in all subcontracts hereunder.

6. STATION REGULATIONS: The Contractor and his employees and subcontractor shall become familiar with and obey all Station Regulations, including fire, traffic, and security regulations. All personnel employed on the station shall keep within the limits of the work (and avenues of ingress and egress), and shall not enter any restricted areas unless required to do so and are cleared for such entry. The Contractor's equipment shall be conspicuously marked for identification.

7. ORDER OF WORK: The Contractor shall schedule his work as to cause the least amount of interference with Station operations. Work schedules shall be subject to the approval of the Officer in Charge of Construction. Permission to interrupt any station roads, railroads and/or utility service shall be requested in writing a minimum of 15 calendar days prior to the desired date of interruption.

8. SCHEDULE OF PRICES: Within 5 days of receipt of Award, the Contractor shall prepare and submit to the Officer in Charge of Construction seven copies of a Schedule of Prices (Construction Contract) on the forms furnished for this purpose. The Schedule of Prices shall consist of a detailed breakdown of the contract price, giving the quantities for each of the various kinds of work, the unit prices, and the total prices therefore. The Schedule of Prices shall be separated by sites with a Schedule and a subtotal for each site. The building numbers and subtotals shall be the first item listed and totaled on the Schedule of Prices. The required schedule must be based on the actual breakdown of the bid price. Accordingly, subcontractors who may be involved in work shall be advised of this requirement in order to furnish such data without delay. The submission of the required data shall not otherwise affect the contract terms. Each item in the Schedule of Prices shall be structured so as to identify the section of the specifications to which it applies. Further, the section number shall be listed, and then each item of work within that section shall be listed. Specification sections shall be referred to by five-digit CSI numbers which apply.

9. CONTRACTOR'S INVOICE: Requests for payment in accordance with the terms of the contract shall consist of:

(a) Contractor's Invoice on form NAVFAC 7300/30 (7/83), which shall show, in summary form, the basis for arriving at the amount of the invoice.

(b) Contractor's Monthly Estimate for Voucher (LANTNAVFACENGCOM 4-4330/110 (New 7/84)).

(c) Affidavit to accompany invoice (LANTDIV NORVA form 4-4235/4 (Rev 5/81)).

(d) Updated copy of progress schedule. (See Clause entitled "Schedules for Construction Contracts" of the Contract Clauses.)

Forms will be furnished by the Contracting Officer. The Contractor has the option to use the government furnished progress schedule and record form. Monthly invoices and supporting forms for work performed through the 20th of the month shall be submitted to the Contracting Officer by the 25th of the month in the following quantities.

(a) Contractor's Invoice - Original and five copies
(b) Contractor's Monthly Estimate for Voucher - Original and two copies shall be required on all jobs where there is a schedule of prices
(c) Affidavit - Original
(d) Progress Schedule - Two copies

10. PROPOSED MATERIAL SUBMITTALS, CATALOG DATA, AND SAMPLES:

(a) Proposed material submittals required of the Contractor shall be made allowing sufficient time for processing, reviews, approval, and procurement before the Contractor is ready to use the material. No material shall be used prior to written approval. Submittals shall be prepared and assembled as follows:

(1) Submit specified number of copies of each submittal.
(2) Present all submittals for each specification section as a complete bound volume, titled with project title and contract number.
(3) Provide index of included items with each volume. Title the index with applicable specification section name and number.
(4) Clearly mark each item in the volume with the specification paragraph number to which it pertains.
(5) Assemble each volume in the same numerical sequence as specifications section paragraphs.
(6) See individual technical sections for additional information.

The Contractor shall certify on all submittals that the material being proposed conforms to contract requirements. In the event of any variance, the Contractor shall state specifically which portions vary, and request approval of a substitute. The Contractor shall also certify that all Contractor-furnished equipment can be installed in the allocated spaces. Incomplete submittals and submittals with inadequate data will be rejected.

(b) When required, catalog data shall be printed pages on permanent copies of the manufacturer's catalogs.

(c) Samples in the number specified shall be shipped prepaid and delivered as directed by the Officer in Charge of Construction. Samples shall be marked to show the name of the material, name of supplier, contract number, segment of work where material represented by sample is to be used, and name of Contractor submitting the sample.

11. CONTRACTOR'S DAILY REPORT: The Contractor will be required to submit a "Daily Report to Inspector" on the form furnished for this purpose. The form shall be completed daily and delivered to the Officer in Charge of

Construction. Data to be reported includes data on workers by classification, the move-on and move-off of construction equipment furnished by the prime and subcontractor or furnished by the Government, and materials and equipment delivered to the site.

If "Contractor Quality Control" is applicable to this contract, the information required by this clause shall be submitted as part of tne required reports.

12. WORK OUTSIDE REGULAR HOURS: If the Contractor desires to carry on work outside regular hours or on Saturdays, Sundays, or holidays, he shall submit an application to the Officer in Charge of Construction. The Contractor shall allow ample time to enable satisfactory arrangements to be made by the Government for inspecting the work in progress. At night, he shall light the different parts of the work in an approved manner. All utility cutovers shall be made after normal working hours or on weekends. Anticipated costs shall be included in the bid.

13. EXISTING WORK:

(a) The disassembling, disconnecting, cutting, removal or altering in any way of existing work shall be carried on in such a manner as to prevent injury or damage to all portions of existing work, whether they are to remain in place, re-used in the new work, or salvaged and stored.

(b) All portions of existing work which have been cut, damaged or altered in any way during construction operations shall be repaired or replaced in kind in an approved manner to match existing or adjoining work. All work of this nature shall be performed by the Contractor at his expense and shall be as directed. Existing work shall, at the completion of all operations, be left in a condition as good as existed before the new work started.

14. EQUITABLE ADJUSTMENTS: WAIVER AND RELEASE OF CLAIMS:

(a) Whenever the Contractor submits a claim for equitable adjustment under any clause of this contract which provides for equitable adjustment of the contract, such claim shall include all types of adjustments in the total amounts to which the clause entitles the Contractor, including, but not limited to, adjustments arising out of delays or disruptions or both caused by such change. Except as the parties may otherwise expressly agree, the Contractor shall be deemed to have waived (i) any adjustments to which it otherwise might be entitled under the clause where such claim fails to request such adjustments, and (ii) any increase in the amount of equitable adjustments additional to those requested in its claim.

(b) The Contractor agrees that, if required by the Contracting Officer, he will execute a release, in form and substance satisfactory to the Contracting Officer, as part of the supplemental agreement setting forth the aforesaid equitable adjustment. The Contractor further agrees that such release shall discharge the Government, its officers, agents and employees, from any further claims, including, but not limited to, further claims arising out of delays or disruptions or both caused by the aforesaid change.

15. GOVERNMENT REPRESENTATIVES:

(a) The work will be under the general direction of the Contracting Officer, the Commander, Naval Facilities Engineering Command, who shall designate an officer of the Civil Engineer Corps, United States Navy, or other officer or representative of the Government, as Officer in Charge of Construction, referred to as the "OICC." Except in connection with the "Disputes" clause, the Officer in Charge of Construction shall be the authorized representative of the Contracting Officer, and have complete charge of the work and exercise full supervision of the work, so far as it affects the interest of the Government. For the purposes of the "Disputes" clause, "Contracting Officer" shall mean the Commander, Naval Facilities Engineering Command, the Acting Commander, their successors, or their representatives specially designated for this purpose.

(b) The provisions of this paragraph or elsewhere in this contract regarding supervision, approval or direction by the Contracting Officer or the OICC, or action taken pursuant thereto, are not intended to and shall not relieve the Contractor of responsibility for the accomplishment of the work either as regards sufficiency or the time of performance, except as expressly otherwise provided herein.

16. ORAL MODIFICATION: No oral statement of any person other than the contracting officer or his representative, as provided in the clause in this contract entitled "Changes", shall in any manner or degree modify or otherwise affect the terms of this contract.

17. NO WAIVER BY GOVERNMENT: The failure of the Government, in any one or more instances, to insist upon the strict performance of any of the terms of this contract or to exercise any option herein conferred shall not be construed as a waiver or relinquishment to any extent of the right to assert or rely upon such terms or option on any future occasion.

18. SANITATION: Adequate sanitary conveniences of a type approved for the use of persons employed on the work, shall be constructed, properly secluded from public observation, and maintained by the Contractor in such a manner as shall be required or approved by the OICC. These conveniences shall be maintained at all times without nuisance. Upon completion of the work they shall be removed from the premises, leaving the premises clean and free from nuisance.

19. PAYMENTS TO CONTRACTOR:

(a) Payments made in accordance with the clause entitled "Payments Under Fixed-Price Construction Contract" shall be made on submission of itemized requests by the Contractor and shall be subject to reduction for overpayments or increase for underpayments on preceding payments to the Contractor.

(b) The obligation of the Government to make any of the payments required under any of the provisions of this contract shall, in the discretion of the OICC, be subject to (1) reasonable deductions on account of defects in material or workmanship, and (2) any claims which the Government may have against the Contractor under or in connection with this contract. Any overpayments to the Contractor shall, unless otherwise adjusted, be repaid to the Government upon demand.

20. CHANGES BOARD AND ESTIMATES: In determining any equitable adjustment under the Changes Clause, the OICC shall, in those instances where the adjustment is estimated by the OICC to be $50,000 or more, convene and give full consideration to the report of an advisory board of three members, consisting of two Government representatives appointed by the OICC and one representative appointed by the Contractor. This board shall report to the OICC the amount of the change in cost, time, or both, resulting from the ordered change. In making all equitable adjustments under the Changes Clause, compensation for additions will be based upon estimated costs at the time the work is performed and credit for deductions will be based upon estimated costs at the time the contract was made. In arriving at the amount of the change in price, if any, allowance may be made for profit, overhead and general expenses, plant rental, and other similar items.

21. SECURITY REQUIREMENTS: No employee or representative of the Contractor will be admitted to the site of the work unless he furnishes satisfactory proof that he is a citizen of the United States or is specifically authorized admittance to the site of the work by the OICC.

22. NORTH CAROLINA STATE AND LOCAL SALES AND USE TAX (1977 JAN):

(a) As used throughout this clause, the term "materials" means building materials, supplies, fixtures and equipment which become a part of or are annexed to any building or structure erected, altered, or repaired under this contract.

(b) If this is a fixed-price contract as defined in the Defense Acquisition Regulation, the contract price includes the North carolina state and local sales and use taxes to be paid with respect to materials, notwithstanding any other provision of this contract. If this is a cost-reimbursement type contract as defined in such regulation, any North Carolina state and local sales and use taxes paid by the Contractor with respect to materials shall constitute an allowable cost under this contract.

(c) At the time specified in paragraph (d) below:

(i) The Contractor shall furnish the Contracting Officer certified statements setting forth the cost of the materials purchased from each vendor and the amount of North Carolina state and local sales and use taxes paid thereon. In the event the Contractor makes several purchases from the same vendor, such certified statement shall indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices and the North Carolina state and local sales and use taxes paid thereon by the Contractor. Any local sales or use taxes included in the Contractor's statements must be shown separately from the state sales and use tax. The Contractor shall furnish such additional information as the Commissioner of Revenue of the State of North Carolina may require to substantiate a refund claim for sales or use taxes.

(ii) The Contractor shall obtain and furnish to the Contracting Officer similar certified statements by his subcontractors.

(d) If this contract is completed before the next October 1, the certified statements to be furnished pursuant to paragraph (c) above shall be submitted within 60 days after completion. If this contract is not completed before the next October 1, such certified statements shall be submitted on or before the 30th day of November of each year and shall cover taxes paid during the twelve-month period which ended the preceding September 30.

(e) The certified statements to be furnished pursuant to paragraph (c) above shall be in the following form:

I hereby certify that during the period _____to_____, (name of Contractor or subcontractor) paid North Carolina state and local sales and use taxes aggregating $_____(state) and $_____(local) with respect to building materials, supplies, fixtures and equipment which have become a part of or annexed to a building or structure erected, altered or repaired by (name of Contractor) for the United States of America, and that the vendors from whom the property was purchased, the dates and numbers of the invoices covering the purchases, the total amount of the invoices of each vendor, the North Carolina state and local sales and use taxes paid thereon, shown separately, and the cost of property withdrawn from warehouse stock and North Carolina state and local sales or use taxes paid thereon are as set forth in the attachements hereto.

*** END OF SECTION ***

SECTION 01011
ADDITIONAL GENERAL PARAGRAPHS

1 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984): The Contractor shall be required to (a) commence work under this contract within 10 calendar days, (b) prosecute the work diligently, and (c) complete the entire work ready for use within 310 calendar days.

2 LIQUIDATED DAMAGES--CONSTRUCTION (APR 1984): (a) If the Contractor fails to complete the work within the time specified in the contract, or any extension, the Contractor shall pay to the Government as liquidated damages, the sum of $20.00 per site per day, not to exceed $100.00 for each day of delay over the entire contract. (FAR 52.212-5)

(b) If the Government terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final completion of the work together with any increased costs occasioned the Government in completing the work.

(c) If the Government does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.

3 DRAWINGS ACCOMPANYING SPECIFICATION: The following drawings accompany this specification and are a part thereof. Drawings are the property of the Government and shall not be used for any purpose other than that contemplated by the specification. If reduced size drawings are provided, grapnic scales shall be used. Full-size drawings may be inspected during regular working hours at the office of the Contracting Officer.

NAVFAC DWG. NO.	SHEET NO.	TITLE
4133035	CS-1	Location Map and Vicinity Map
4133036	C-1	Site Plans and Details
4133037	C-2	Plans and Details
4133038	C-3	Plans and Details
4133039	C-4	Plans and Details
4133040	C-5	Plans and Details

3.1 Drawing Verification and Control: The Contractor shall check all drawings furnished him immediately upon their receipt and shall promptly notify the Contracting Officer of any discrepancies. Figures marked on drawings shall in general be followed in preference to scale measurements. Large scale drawings shall in general govern small scale drawings. The Contractor shall compare all drawings and verify the figures before laying out the work and will be responsible for any errors which might have been avoided thereby. (FAR SUPP 52.236-7002 (c))

4 SPECIFICATIONS AND PRINTS FURNISHED TO CONTRACTOR: Six copies of the project specifications, and six sets of the drawings accompanying the specifications will be furnished the Contractor without charge. Additional sets of the specifications and drawings can be obtained, if required, by application to the Contracting Officer, provided that the need therefore is justified to the satisfaction of the Contracting Officer.

5 MATERIALS AND EQUIPMENT TO BE SALVAGED: Contract Clause entitled "Salvage Materials and Equipment" is hereby deleted. Except where specifically specified otherwise herein, all existing materials and equipment which are required to be removed or disconnected to perform the work, but are not indicated or specified for use in the new work, shall become the property of the Contractor and shall be removed from Government property.

6 OPERATION OF STATION UTILITIES: The Contractor shall not operate nor disturb the setting of any control devices in the station utilities system, including water, sewer, electrical, and steam services. The Government will operate the control devices as required for normal conduct of the work. The Contractor shall notify the Contracting Officer giving reasonable advance notice when such operation is required.

7 UTILITIES:

7.1 Availability of Utilities Services: Contract clause entitled "Availability and Use of Utility Services" applies. Reasonable amounts of water and electricity from the nearest available outlet free of charge for pursuance of work under this contract. If the nearest available outlet cannot be utilized by the Contractor because of improper voltage, insufficient current, improper pressure, incompatible connectors, etc., it shall be the responsibility of the Contractor to provide temporary utilities as required.

7.2 Energy and Utilities Conservation: The Contractor shall carefully conserve utilities furnished without charge. The Contractor, at his own expense and in a manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines and remove the same prior to final acceptance of the construction.

7.3 Location of Underground Utilities: Where existing piping, utilities, and underground obstructions of any type are indicated in locations to be traversed by new piping, ducts, and other work provided hereunder, and are not indicated or specified to be removed, the elevations of the existing utilities and obstructions shall be determined before the new work is laid closer than the nearest manhole or other structure at which an adjustment in grade could made. For any additional work required by reason of conflict between the new and existing work, an adjustment in contract price will be made in accordance with Contract clause entitled "Differing Site Conditions". The Base Telephone Officer, telephone 451-2531, will show the Contractor approximate locations of all buried telephone and fire alarm cables after receiving ten days notice. The locations of underground utilities shown is only approximate and the information is incomplete.

8 TRAILERS OR STORAGE BUILDINGS: In accordance with Contract Clause entitled "Operations and Storage Areas", trailers or storage buildings will be permitted, where space is available, subject to the approval of the Contracting Officer. The trailers or buildings shall be suitably painted and kept in a good state of repair. Failure of the Contractor to maintain his trailers or storage buildings in good condition will be considered sufficient reason to require their removal. A sign not smaller than 24 inches by 24 inches shall be conspicuously placed on the trailer depicting the company name, business phone number, and emergency phone number.

9 EQUIPMENT GUARANTEES:

9.1 EQUIPMENT GUARANTEE LIST: The Contractor shall obtain and furnish to the Contracting Officer writtten guarantees for all equipment furnished by the Contractor under the contract and shall prepare a complete listing of all such equipment. This equipment list shall state the specification section applicable to the equipment, duration of the warranty therefor, start date of the warranty, ending date of the warranty, and the point of contact for fulfillment of the warranty. This listing shall be fully executed and delivered to the Contracting Officer prior to final acceptance of the facility, and such acceptable listing shall be a condition to final acceptance of the facility.

9.2 EQUIPMENT WARRANTY TAGS AND GUARANTOR'S LOCAL REPRESENTATIVE: The Contractor shall furnish with each guarantee the name, address, and telephone number of the guarantor's representative nearest to the location where the equipment and appliances are installed, who, upon request of the Using Service's representative, will honor the guarantee during the guaranty period and will provide the services prescribed by the terms of the guarantee. At the time of installation, the Contractor shall tag each item of warranted equipment with a durable, oil and water resistant tag approved by the Contracting Officer. Tag shall be attached with copper wire and sprayed with a clear silicone waterproof coating. Leave the date of acceptance and inspector's signature blank until project is accepted for beneficial occupancy. Tag shall show the following information:

EQUIPMENT WARRANTY TAG

Type of Equipment.....
Accepted Date.....
Warranted Until.....
Under Contract N62470-.....
Inspector's Signature.....

STATION PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE

10 SAFETY PROGRAM: The Contractor shall implement a safety program conforming to the requirements of Federal, State and Local laws, rules and regulations. The program shall include, but is not limited to, the following:

a. "Occupational Safety and Health Standards", which can be ordered from the Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.

b. Department of the Army, Corps of Engineers, "Safety and Health Requirements Manual", which may be examined in the office where bids are being received or may be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington, DC 20402.

c. Contract Clause entitled "Accident Prevention."

d. NFPA 241-1981, Safeguarding Building Construction and Demolition Operations, which may be examined in the office where bids are being received or may be purchased from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

11 PROPRIETARY NAMES: Names indicated for colors, textures and patterns of materials are for the purpose of color, texture and pattern selection only. Other manufacturers materials are acceptable provided they closely approximate colors, textures and patterns indicated and provided they conform to all other requirements.

12 SCHEDULING THE WORK:

12.1 General Scheduling Requirements: Notwithstanding the requirements of Contract Clause entitled "Schedules for construction Contracts", immediately after award the Contractor shall meet with the Contracting Officer and present a schedule of work, prepared in accordance with said Clause, for review by the Contracting Officer. The schedule will be reviewed at this meeting and will be retained by the Contracting Officer for final review and approval. The normal working hours are 7:30 a.m. to 4:00 p.m. Monday through Friday.

12.2 The various facilities will remain in operation during the entire construction period and the Contractor shall conduct his operations so as to cause the least possible interference with the normal operations of the activity.

12.3 Sewer Work: The Government will closely coordinate the work with the Base Family Housing Division who will notifty tenants of the work; however, the Government will be unable to insure complete stoppage of flow from house connections or other portions of system during the work.

12.4 Water Work: The Contractor shall notify primary users on a line to be cut-off 24 hours before a shut-off is anticipated. Shut-off duration shall be kept to a minimum.

12.5 The existing buildings and their contents shall be kept secure at all times and the Contractor shall provide all temporary closures as required to maintain security as directed by the Contracting Officer. The Contractor shall remove all debris from all spaces being used by the activity at the end of each shift or more frequently if required to keep the space useable. Dust covers or protective enclosures shall be provided to protect existing work to remain and Government material located in the building involving interior work during the construction period.

12.6 Permission to interrupt any utility service shall be requested in writing at least fifteen days in advance and approval of the Contracting Officer shall be received before any service is interrupted. Interruptions of utility services will be allowed only when they will cause no interference with the operations of the activity. All utility cutovers shall be made after normal working hours or on weekends; anticipated costs shall be included in the bid.

13 FORWARDING OF SAMPLES AND SUBMITTALS: Notwithstanding the requirements of Clause entitled "Shop Drawings" of the Contract Clauses, the quantity of submittals required shall be as specified hereinafter.

13.1 Address for Samples and Submittals:

OICC/ROICC
Jacksonville, North Carolina Area
Building 1005, Marine Corps Base
Camp Lejeune, North Carolina 28542

13.2 Samples Required of the Contractor: As soon as practicable, and before installation, submit for approval, samples of materials and equipment as may be requested, including all samples required in the technical sections of this specification.

13.3 Shop Drawings, Manufacturers Data and Certifications Required of the Contractor: As soon as practicable after award of the contract, and before procurement or fabrication, submit all the shop drawings, manufacturers data and certifications required in the technical sections of this specification. Seven copies of all submittals to be approved by the Contracting Officer shall be forwarded.

13.4 Submittal Drawing Guidance: Specification DOD-D-1000B shall be used as a guide and its use is encouraged for all drawings and data submitted by the Contractor. Conformance to the provisions of specification DOD-D-1000B is not mandatory for maps, sketches, presentation drawings, perspectives, renderings, and all other drawings not requiring Naval Facilities Engineering Command drawing numbers.

14 APPROVAL OF SAMPLES, CUTS, AND DRAWINGS: Matter submitted for approval shall be accompanied by complete information concerning the material, articles, and/or design proposed for use in sufficient detail to show compliance with the specification, and shall be approved before incorporation into the work. Approval thereof will not be construed as relieving the Contractor of compliance with the specification, even if such approval is made in writing, unless the attention of the Contracting Officer is called to the noncomplying features by letter accompanying the submitted matter. Partial submittals or submittals of less than the whole of any system made up of interdependent components, will not be considered. Approval of drawings, cuts, and samples by the Contracting Officer shall not be construed as a complete check or approval of the detailed dimensions, weights, gauges, and similar details of the proposed articles. The conformance of such details with the contract requirements, together with the necessary coordination of dimensions and details between the various elements of the work and between the various subcontractors and suppliers, shall be solely the responsibility of the Contractor, approval of submitted matter notwithstanding. The drawings accompanying this specification shall not be used as shop drawings; for example, the editing of the drawings accompanying this specification and returning these edited drawings as shop drawings is prohibited.

15 SUBCONTRACTORS AND PERSONNEL: Promptly after the award of the contract, the Contractor shall submit to the Contracting Officer, in triplicate, a list of his subcontractors and the work each is to perform. On this form shall appear the names of the key personnel of the Contractor and subcontractors, together with their home addresses and telephone numbers, for use in event of any emergency. From time to time as changes occur and additional information becomes available, the Contractor shall amplify, correct, and change the information contained in previous lists.

16 AS-BUILT DRAWINGS: During the progress of the work, one full-size print of each of the drawings accompanying this specification shall be neatly and clearly marked in red to show all variations between the construction actually provided and that indicated or specified in the contract documents. The as-built drawings shall be kept up-to-date at the work site at all times during the contract, and shall be available for inspection by the Contracting Officer upon request. The Contractor shall also mark the drawings to indicate the exact location of any underground utility lines discovered in the course of the work. Where a choice of materials or methods, or both, is permitted herein, and where variations in the scope or character of the work indicated or specified are permitted either by award on bidding items specified for that purpose or by subsequent change to the contract, the as-built drawings shall define the construction actually provided. The representation of such variations shall conform to standard drafting practice and shall include such supplementary notes, legends, and details as may be necessary for legibility and clear portrayal of the as-built construction; the marked prints shall be subject to approval of the Contracting Officer before acceptance. Upon completion of the work, the completed as-built drawings shall be presented to the Contracting Officer.

17 OMISSIONS AND MISDESCRIPTIONS: Omissions from the drawings or specifications or the misdescription of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work but they shall be performed as if fully and correctly set forth and described in the drawings and specifications. (FAR SUPP 52.236-7002(b))

18 PRECEDENCE: In the event of conflict or inconsistency between any of the provisions of the various portions of this contract (the reconciliation of which is not otherwise provided for here), precedence shall be given in the following order, the provisions of any particular portion prevailing over those of a subsequently listed portion.

(1) Typewritten portions of the contract.

(2) The specifications referred to in Standard Form 1442 (including all addenda, and mechanical and technical but not contractual aspects of incorporated provisions) as specifically amended herein, if amended.

(3) Printed provisions of the contract form, including printed provisions of added slip sheets.

19 EMERGENCY MEDICAL CARE: Emergency medical care only is available at Government facilities at Marine Corps Base, Camp Lejeune for Contractor employees who suffer on-the-job injury or disease. Emergency care will be rendered at the prevailing rates established in BUMEDINST 6320.4 series. Reimbursement shall be made by the Contractor to the Naval Regional Medical Center Collection Agent upon receipt of a monthly statement.

20 QUARANTINE FOR IMPORTED FIRE ANT (4/82): All of Onslow, Jones and Cartaret Counties and portions of Duplin and Craven Counties have been declared a generally infested area by the United States Department of

Agriculture for the imported fire ant. Compliance with the quarantine regulations established by this authority as set forth in USDA Quarantine No. 81 dated 9 October 1970, and USDA Publication 301.81-2A of 23 July 1976, is required for operations hereunder.

20.1 The Quarantine applies to materials originating from Camp Lejeune and the Marine Corps Air Station (Helicopter), New River, which are to be transported outside the Onslow County or adjacent suppression areas.

20.2 Certification is required for the following articles, and they shall not be moved from the reservation to any point outside the Onslow County and adjacent designated areas unless accompanied by a valid inspection certificate issued by an Officer of the Plant Protection and Quarantine Program of the U.S. Department of Agriculture.

(1) Bulk soil.

(2) Used mechanized soil-moving equipment.

NOTE: Used mechanized soil-moving equipment is exempt if cleaned of all loose noncompacted soil.

(3) Any other products, articles, or means of conveyances, if it is determined by an inspector that they present a hazard of spread of the imported fire ant and the person in possession thereof has been so notified.

20.3 Authorization for movement of equipment outside the imported fire ant regulated area shall be obtained from USDA, APHIS, PPQ, Box 83, Goldsboro, North Carolina, 27530, Attn: Mr. Haywood Cox, Telephone (919) 735-1941, and requests for inspection shall be made sufficiently in advance of the date of movement to permit arrangements for the services of authorized inspectors. The equipment shall be prepared and assembled so that it may be readily inspected. All soil on or attached to equipment, supplies and materials shall be removed by washing with water and/or such other means as necessary to accomplish complete removal. Resulting spoil shall be wasted as necessary and as directed.

21 GENERAL PROVISIONS CLAUSES: Wherever a reference to a clause of the General Provisions occurs in the technical sections of the specifications, it shall be taken to mean the Contract Clause having the same title as the referenced General Provisions Clause.

22 SUBMISSION OF OPERATION AND MAINTENANCE MANUALS: Operation and Maintenance Manuals required under this contract shall be submitted to the Contracting Officer at least 60 days prior to contract completion. In addition, one complete Operation and Maintenance Manual shall be submitted to the Contracting Officer for review and approval not more than 90 calendar days after an item is approved but at least 60 calendar days prior to field acceptance testing of the item.

*** END OF SECTION ***

SECTION 01040
CUTTING AND PATCHING

1. CUTTING shall be done by sawing along straight lines. The amount cut out shall be the minimum necessary to accommodate the new work. No flame cutting will be permitted without written permission of the Officer in Charge of Construction.

2. HOLES shall be rotary drilled. The size shall be the minimum necessary to accommodate the new work.

3. PATCHING shall be done with materials which match the existing in color, quality and surface texture when finished.

END OF SECTION

SECTION 01401
CONTRACTOR INSPECTION SYSTEM

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.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

D 3666-83	Evaluation of Inspection and Testing Agencies for Bituminous Paving Materials
D 3740-80	Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
E 329-77 (R 1983)	Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction
E 543-83	Determining the Qualification of Nondestructive Testing Agencies
E 548-79	Generic Criteria for Use in Evaluation of Testing and Inspection Agencies

1.2 QUALITY CONTROL: Quality Control of this contract will be administered under the clause entitled "Inspection of Construction" of the Contract Clauses.

1.3 DEFINITIONS:

1.3.1 Factory Tests: Tests made on various products and component parts prior to shipment to the job site, including but not limited to such items as transformers, boilers, air conditioning equipment, electrical equipment, and precast concrete.

1.3.2 Field Tests: Tests or analyses made at, or in the vicinity of the job site in connection with the actual construction.

1.3.3 Product: The term "product" includes the plural thereof and means a type or a category of manufactured goods, constructions, installations, and natural and processed materials or those associated services whose characterization, classification, or functional performance determination is specified by standards.

1.3.4 Person: The term "person" means associations, companies, corporations, educational institutions, firms, government agencies at the Federal, State and local level, partnerships, and societies, as well as divisions thereof, and individuals.

1.3.5 Testing Laboratory: The term "testing laboratory" means any "person," as defined above, whose functions include testing, analyzing, or inspecting "products," as defined above, and/or evaluating the designs or specifications of such "products" according to the requirements of applicable standards.

1.3.6 Certified Test Reports: Test reports signed by an authorized official stating that tests were performed in accordance with the test method specified, that the results reported are accurate, and that items tested either meet or fail to meet the stated minimum requirements. These test reports include those performed by Factory Mutual, Underwriters Laboratories, Inc. and others.

1.3.7 Certified Inspection Reports: Reports signed by approved inspectors attesting that the items inspected meet the specification requirements other than any exception included in the report.

1.3.8 Manufacturer's Certificate of Compliance: A certificate signed by an authorized manufacturer's official attesting that the material or equipment delivered meets the specification requirements.

1.4 SUBMITTALS: Prepare in accordance with the Contract Clauses and Section 01010, "General Paragraphs," and submit for approval. Each submittal shall be accompanied with a cover letter signed by the Contractor. Clearly mark each item proposed to be incorporated into the contract and identify in the submittals, with cross-references to the contract drawings and specifications so as to identify clearly the use for which it is intended. Identify each item submitted by reference to the specific technical paragraph which specifies the item. Likewise, identify each item on the Contractor's Submittal Transmittal form by reference to the specific technical paragraph which specifies the item. Stamp each sheet of submittal with the Contractor's certification stamp. Data submitted in a bound volume or on one sheet printed on two sides, may be stamped on the front of the first sheet only. The Contractor's certification stamp shall be worded as follows:

"It is hereby certified that the (equipment) (material) shown and marked in this submittal is that proposed to be incorporated into Contract Number _____, is in compliance with the Contract drawings and specifications, can be installed in the allocated spaces, and is submitted for Government approval.

Certified by _____ Date _____"

The person signing the certification shall be one designated in writing by the Contractor as having that authority. The signature shall be in original ink. Stamped signatures are not acceptable.

1.4.1 Submittal Status Logs: Within 15 calendar days after date of Contract Award the Contractor shall submit to the Resident Officer in Charge of Construction a copy of a submittal status log listing all submittals required in this contract. The Contractor shall maintain at the job site the

submittal status log showing the status of all submittals. A sample format of an acceptable log is attached at the end of this section. While the use of this sample format is not required, any other format must contain the same information as shown on the sample. The submittal status log shall be made available for review by the Contracting Officer at all times.

1.4.2 Shop Drawings: These submittals shall be in accordance with the requirements of the clauses entitled "Shop Drawings" of the Contract Clauses and "Proposed Material Submittals, Catalog Data, and Samples" of Section 01010, "General Paragraphs."

1.4.3 Manufacturer's Data: Catalog cuts, technical data sheets, and descriptive literature, shall be in accordance with the clause entitled "Proposed Material Submittals, Catalog Data, and Samples" of Section 01010, "General Paragraphs."

1.4.4 Samples: Prepare and submit in accordance with the clause entitled "Proposed Material Submittals, Catalog Data, and Samples" of Section 01010, "General Paragraphs."

1.4.5 Certified Test Reports: Before delivery of materials and equipment, four certified copies of the reports of all tests listed in the technical sections shall be submitted and approved. The testing shall have been performed in a laboratory meeting the requirements specified herein. The tests shall have been performed within 3 years of submittal of the reports for approval except that tests for concrete and bituminous mix designs shall have been performed within one year of submittal. Test reports shall be accompanied by the certificates from the manufacturer certifying that the material and equipment proposed to be supplied is of the same type, quality, manufacture, and make as that tested.

1.4.6 Manufacturer's Certificates of Compliance: Before delivery, manufacturer's certifications shall be furnished by the Contractor as required on items of materials and equipment indicated in the technical sections. Pre-printed certifications will not be acceptable. All certifications shall be in the original. The original of all manufacturer's certifications shall name the appropriate item of equipment or material, specification, standard, or other document specified as controlling the quality of that item and shall have attached thereto certified copies of test data upon which the certifications are based. All certificates shall be signed by the manufacturer's official authorized to sign certificates of compliance.

1.4.7 Laboratory Reports: Reports shall cite the contract requirements, the test or analysis procedures used, the actual test results, and include a statement that the item tested or analyzed conforms or fails to conform to the specification requirements. Each report shall be conspicuously stamped on the cover sheet in large red letters "CONFORMS" or "DOES NOT CONFORM" to the specification requirements as the case may be. All test reports shall be signed by a representative of the testing laboratory authorized to sign certified test reports. The Contractor shall arrange for immediate and direct delivery of the signed original of all reports, certifications, and other documentation to the Contracting Officer.

1.4.8 Tabulation of Tests: Prior to final payment the Contractor shall obtain from each laboratory a tabulation of all tests it has performed in connection with the construction contract. Conforming, nonconforming, and retesting shall be tabulated. The tabulation(s) shall be certified as complete, and signed by the authorized representative of the laboratory, and shall be delivered to the Contracting Officer.

PART 2 - EXECUTION

2.1 QUALITY CONTROL REQUIREMENTS: In accordance with the clause entitled "Inspection of Construction" of the Contract Clauses, the Contractor shall inspect and test all work under the contract and maintain records of the inspections and tests; however, the Government will perform testing when so stated in the specifications. Approvals, except those required for field installations, field applications, and field tests, shall be obtained before delivery of materials and equipment to the project site. Surveillance of the inspection system will be performed by the Contracting Officer.

2.1.1 Factory Tests: Unless otherwise specified, the Contractor shall arrange for factory tests when they are required under the contract.

2.1.2 Factory Inspections by the Contractor: Unless otherwise specified, the Contractor shall arrange and perform all factory inspections specifically required in the technical sections of the specifications. These inspections shall be reported in the Daily Report to Inspector.

2.1.3 Field Inspections and Tests by the Contractor: The Contractor shall furnish all equipment, instruments, qualified personnel, and facilities necessary to inspect all work and perform all tests required by the contract. All inspections and tests performed and test results received each day shall be included in the Daily Report to Inspector.

2.1.4 Field Inspections and Tests by the Government: If deemed necessary by the Contracting Officer, field inspections and tests will be made in accordance with the clause entitled "Inspection of Construction" of the Contract Clauses.

2.1.5 Approval of Testing Laboratories: All laboratory work under this contract shall be performed by a laboratory approved by the Government, whether the laboratory is employed by the Contractor, or is owned and operated by the Contractor. The basis of approval includes the following:

a. Testing laboratories performing work in connection with concrete, steel, and bituminous materials shall comply with ASTM E 329 and ASTM D 3666, respectively.

b. Testing laboratories engaged in the testing and inspection of soils and rock or performing non-destructive testing shall comply with ASTM D 3740 and ASTM E 543, respectively.

c. Testing laboratories performing work not in connection with concrete, steel, bituminous materials, soils and non-destructive testing shall comply with ASTM E 548.

2.1.5.1 Laboratory Inspection: Prior to approval the laboratory shall submit in writing the following:

a. Functional description of the laboratories organizational structure, operational departments, and support departments and services.

b. A list and resume of the personnel assigned to the proposed testing, including the person charged with engineering managerial responsiblility.

c. Affidavit of compliance with the applicable ASTM publication and certification that the laboratory performs work in accordance with technical requirements as required by the contract specifications.

d. A list of test and inspection equipment for each of the proposed test procedures and certification that the equipment is calibrated at prescribed intervals to insure the validity of the test and inspection data.

e. A copy of any recent certification of inspection report of the laboratory by a nationally recognized agency, including a statement of corrections made based on the findings of the agency. In the absence of inspection by a nationally recognized agency, the laboratory will be subject to inspection by the Contracting Officer upon receipt of all the above information 30 days before the required approval of the testing laboratory.

2.1.6 Repeated Tests and Inspections: The Contractor shall repeat tests and inspections after each correction made to nonconforming materials and workmanship until tests and inspections indicate the materials, equipment, and workmanship conform to the contract requirements. The retesting and reinspections shall be performed at no additional cost to the Government.

2.1.7 Daily Report to Inspector: The signed "Daily Report to Inspector" Form NAVFAC 4330/34 shall be submitted to the Contracting Officer by 10:00 AM on the working day following the day the work was performed.

SUBMITTAL STATUS LOG

"SEE INSTRUCTIONS ON REVERSE BEFORE FILLING IN"

PAGE ______ OF ______

CONTRACT NUMBER	SHORT TITLE	LOCATION	CONTRACTOR

SUBMITT'L/ TRANSMITT'L NO.	DESCRIPTION OF ITEMS	SPECIFICATION SECTION REQUIRING SUBMITTAL	SUBMITTAL REQUIRES					CONTRACTOR APPV'D	GOV'T APPROVED	CONTRACTOR ACTION		DATE FORWARDED FROM ROICC	ROICC ACTION		DATE			REMARKS
			SHOP DWGS.	CATALOG DATA	SAMPLE	CERTIFI-CATION	TEST DATA			INSERT ACTION CODE	DATE OF ACTION		INSERT ACTION CODE	DATE OF ACTION	RECEIVED FROM ROICC	MAT'L/EQUIP RECEIVED ON SITE	APPROVED BY CONTRACTOR	
(a)	(b)	(c)	(d)					(e)		(f)		(g)	(h)		(i)	(j)	(k)	

05 85 6400

01401 - 6

INSTRUCTIONS

1. This form may be used by the Contractor for listing all material submittals that require action by either the Contractor or the Government.

2. Columns (a) through (e) should be completed by the Contractor and must include all submissions that are required by the specifications.

3. As submittals are received and processed, the remaining columns are to be complted by the Contracctor.

4. In those instances where the Contractor has approved the submittal under his contraact responsibility, there may be a dual Action Code under column (f); e.g., "A/E", indicating approved as submitted and forwarded to the OICC for record purposes.

5. In column (f) for those items requiring OICC action (Action Code "D"), the reason for forwarding to the OICC should be entered in the "Remarks" column; e.g., gov't approval required; waiver requested because of variance, substitution, etc..

6. Where no Government action is required, (for Contractor review/approval items), there need be no entry in columns (h) and (i).

7. Column (j) is completed when material or equipment is deliverd to the project. Column (k) is completed only afteer verifiation that the delivered item is that represented by the approval submittal.

ACTION CODE: To be used when completing columns (f) and (h)

A. Approved as submitted

B. Approved as noted

C. Disapproved

D. Forwarded to OICC for action

E. Forwarded to OICCC for record purposes

END OF SECTION

SECTION 01560

ENVIRONMENTAL PROTECTION

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.

ENVIRONMENTAL PROTECTION AGENCY (EPA):

40 CFR 61(Subpart B)	National Emission Standards for Asbestos (1979)
40 CFR 761	Polychlorinated Biphenyls (1979)

U. S. DEPARTMENT OF LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA):

29 CFR 1910.1001	General Industry Safety and Health Standards (1979)

FEDERAL REGULATION (FR):

Executive Order 11988	Flood Plain Management (42 FR 28951)

NAVAL ENVIRONMENTAL PROTECTION SUPPORT SERVICE (NEPSS):

PS-015	Disposal of Lead-Acid Battery Electrolyte, April 18, 1980

1.2 DEFINITIONS OF CONTAMINANTS:

1.2.1 Sediment: Soil and other debris that has been eroded and transported by runoff water.

1.2.2 Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations, and from community activities.

1.2.2.1 Rubbish: A variety of combustible and noncombustible wastes such as paper, boxes, glass, crockery, metal, lumber, cans, and bones.

1.2.2.2 Debris: Includes combustible and noncombustible wastes, such as ashes, waste materials that result from construction or maintenance and repair work, leaves, and tree trimmings.

1.2.3 Chemical Wastes: Includes salts, acids, alkalies, herbicides, pesticides, and organic chemicals.

1.2.4 Sanitary Wastes:

1.2.4.1 Sewage: Wastes characterized as domestic sanitary sewage.

1.2.4.2 Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

1.2.5 Asbestos and Asbestos Materials: Asbestos means actinolite, amosite, anthophyllite, chrysotile, crocidolite, and tremolite. Asbestos material means asbestos or any material containing asbestos such as asbestos waste, scrap, debris bags, containers, equipment, and asbestos-contaminated clothing consigned for disposal. Friable asbestos material means any material that contains more than one percent asbestos by weight and that can be crumbled, pulverized, or reduced to powder, when dry, by hand pressure.

1.2.6 Oily Waste: Includes petroleum products and bituminous materials.

1.3 SUBMITTALS:

1.3.1 Environmental Protection Plan: Submit four copies of the proposed Enviornmental Protection Plan not later than 14 days after the meeting with the Contracting Officer to discuss the development of an Environmental Protection Plan.

1.3.2 Notices Pertinent to Asbestos Removal:

1.3.2.1 Notice to EPA: Submit three copies of the notice of intention to demolish asbestos insulated or fireproofed materials and equipment provided to the Administrator of EPA, and the State's Environmental Protection Agency as required in paragraph titled "Written Notice."

1.3.2.2 Preconstruction Survey Report: Submit three copies of the preconstruction survey report.

1.3.3 Solid Waste Disposal Permit: Submit one copy of State and local permit or license which reflects such agency's aproval of the disposal plan as being in compliance with their solid waste disposal regulations.

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS: Provide and maintain during the life of the contract, environment protection as defined herein. Provide environmental protective measures as required to control pollution that develops during normal construction practice. Provide also environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with all federal, state, and local regulations pertaining to water, air, and noise pollution. Develop proposals for an environmental protection plan for the project and, prior to the commencement of the work, meet with the Contracting Officer and discuss the proposed environmental protection plan. The meeting shall develop mutual understanding relative to details of environmental protection, including measures for protecting natural resources, required reports, and measures to be taken should the Contractor fail to provide adequate protection in an adequate and timely manner. Perform a preconstruction survey of the project site and take photographs as necessary to enhance the survey.

PART 2 - EXECUTION

2.1 PROTECTION OF NATURAL RESOURCES: The natural resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their existing condition or restored to an equivalent or improved condition upon completion of the work. Confine construction activities to areas defined by the work schedule, drawings, and specification.

2.1.1 Land Resources: Except in areas indicated to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without special permission from the Contracting Officer. Do not fasten or attach ropes, cables, or guys to any existing nearby trees for anchorages unless specifically authorized. Where such special emergency use is authorized, the Contractor shall be responsible for any resultant damage.

2.1.1.1 Protection: Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. Protect monuments, markers, and works of art.

2.1.1.2 Repair or Restoration: Repair or restore to their original condition all trees or other landscape features scarred or damaged by the equipment or operations. Obtain approval of the repair or restoration from the Contracting Officer prior to its initiation. Include topsoil or nutriment during the seeding operation as necessary to provide a suitable stand of grass.

2.1.2 Water Resources: Perform all work in such a manner that any adverse environmental impact on water resources is reduced to a level acceptable to the Contracting Officer.

2.1.2.1 Stream Crossings: Limit equipment fording across stream to control turbidity.

2.1.2.2 Oily Substances: Take special measures to prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water. Surround all temporary fuel oil, petroleum, or liquid chemical storage tanks with a temporary earth berm of sufficient size and strength to contain the contents of the tanks in the event of content leakage or spillage.

2.1.3 Fish and Wildlife Resources: During the performance of the work take such steps as required to prevent interference or disturbance to fish and wildlife. Do not alter water flows or otherwise significantly disturb native habitat adjacent to the project area which are critical to fish and wildlife except as may be indicated or specified.

2.1.4 Historical and Archeological Resources: Carefully preserve and report immediately to the Contracting Officer all items having any apparent historical or archeological interest which are discovered in the course of any construction activities.

2.2 EROSION AND SEDIMENT CONTROL MEASURES:

2.2.1 Burn-off: Burn-off of ground cover is not permitted.

2.2.2 Borrow Pit Areas: Manage and control borrow pit areas to prevent sediment from entering nearby streams or lakes. Restore areas, including those outside borrow pit, disturbed by borrow and haul operations. Restoration includes grading, replacement of topsoil, and establishment of permanent vegetative cover. Uniformly grade side slopes of borrow pit to a slope of 30 degrees or less with the horizontal. Uniformly grade bottom of borrow pits to provide a flat bottom and drain by outfall ditches or other suitable means. Borrow locations will be as directed by the Contracting Officer.

2.2.3 Protection of Erodible Soils: All earthwork brought to final grade shall be immediately finished as indicated or specified. Protect immediately side slopes and back slopes upon completion of rough grading. Plan and conduct all earthwork in such a manner as to minimize the duration of exposure of unprotected. soils.

2.2.4 Temporary Protection of Erodible Soils: Utilize the following methods to prevent erosion and control sedimentation.

2.2.4.1 Mechanical Retardation and Control of Runoff: Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, and berms, to retard and divert runoff to protected drainage courses.

2.2.4.2 Sediment Basins: Trap sediment in temporary or permanent sediment basins. Select basin size to accommodate the runoff of a local 50 year storm. Pump dry and remove accumulated sediment after each storm. Use a paved weir or vertical overflow pipe for overflow. Remove collected sediment from the site. Institute effluent quality monitoring programs as required by state and local environmental agencies.

2.2.4.3 Vegetation and Mulch: Provide temporary protection on all side and back slopes as soon as rough grading is completed or sufficient soil is exposed to require protection to prevent erosion. Such protection shall be accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such combination of these and other methods necessary for effective erosion control.

2.3 CONTROL AND DISPOSAL OF SOLID, CHEMICAL, AND SANITARY WASTES: Pick up solid wastes and place in containers which are emptied on a regular schedule. The preparation, cooking, and disposing of food are strictly prohibited on the project site. Conduct handling and disposal of wastes to prevent contamination of the site and other areas. On completion, leave areas clean and natural looking. Obliterate signs of temporary construction and activities incidental to construction of the permanent work in place. The Base Sanitary Landfill will not accept liquid wastes or empty drums. If transporting any material off Government property, the Contractor shall provide the Contracting Officer a copy of state and/or local permit which reflects the responsible agency's approval of the disposal area and proposed waste disposal methods.

2.3.1 Disposal of Garbage, Rubbish and Debris: Remove garbage, rubbish and debris from Government property and dispose of it in compliance with federal, state and local requirements.

2.3.2 Sewage, Odor, and Pest Control: Dispose of sewage through connection to station sanitary sewage system. Where such systems are not available, use chemical toilets or comparably effective units and periodically empty wastes into municipal or station sanitary sewage system. Include provisions for pest control and elimination of odors.

2.3.3 Chemical Waste: Store chemical waste in corrosion resistant containers labeled to identify type of waste and date filled. Remove containers from the project site, and dispose of chemical waste in accordance with federal, state, and local regulations. For oil and hazardous material spills which may be large enough to violate federal, state, and local regulations, notify the Contracting Officer immediately.

2.3.3.1 Petroleum Products: Conduct fueling and lubricating of equipment and motor vehicles in a manner that affords the maximum protection against spills and evaporation. Dispose of lubricants to be discarded and excess oil in accordance with approved procedures meeting federal, state and local regulations.

2.3.3.2 Polychlorinated Biphenyls (PCB) Control: Comply with 40 CFR 761 for removal and disposal of PCB containing articles.

2.3.3.3 Lead-Acid Battery Electrolyte: Electrolyte solution from lead-acid batteries shall be disposed of in such a manner as to ensure compliance with applicable federal, state, and local regulations. The electrolyte shall not be dumped onto the ground, into storm drains or into the sanitary sewer without neutralization. One of the following alternatives shall be used for disposal of waste electrolytes.

a. An industrial waste treatment plant, if available and approved for neutralizing and disposing of battery-acid electrolyte.

b. Transport the electrolyte to a state-approved hazardous waste disposal site. Method of transportation and equipment must comply with applicable federal and state regulations.

2.3.4 Asbestos: Comply with 29 CFR 1910.1001, 40 CFR 61, and the requirements specified herein for the disposal of material containing asbestos and demolition of materials and equipment insulated or fireproofed with friable asbestos material. Use of the Base Sanitary Landfill will be mandatory for all removal involving friable asbestos fiber.

2.3.4.1 Written Notice: Provide written notice of intention to demolish to the Administrator of EPA and the State's environmental protection agency at least 20 days prior to commencement of such demolition. Prepare reports in accordance with Section 61.22 of 40 CFR 61 and forward to EPA. The notice shall contain the following information:

a. Name of Prime Contractor
b. Address of Prime Contractor
c. Address or location and description of buildings, structures, or facilities to be demolished or renovated, including size, age, prior use, and approximate amount of friable asbestos materials to be removed
d. Schedule indicating planned start and completion of demolition or renovation
e. Method of removal to be employed
f. Procedures to be employed to meet the requirements of Sections 61.22(d) and 61.22(j) of 40 CFR 61, and Volume 1 of 29 CFR 1910.1001.
g. The address or location of the waste disposal site for the friable asbestos wasted which will be the Camp Lejeune Base Sanitary Landfill.

2.3.4.2 Use the following procedures and those required by Section 61.22 of 40 CFR 61 to prevent emissions of particulate asbestos material to outside air:

a. Unless otherwise specified, wet all friable asbestos materials before removal from any building, structure, facility, or installation. Pipe, structural members, equipment, or other items insulated or fireproofed with friable asbestos materials may be removed as units or in sections without stripping. If pipes or structural members are cut or disjointed, wet all exposed friable asbestos materials. Wet all friable asbestos debris adequately to ensure that it remains wet during all stages of demolition and removal operations.

b. Do not drop or throw to ground any pipe, structural member, equipment, or item covered with friable asbestos insulation or fireproofing material. Carefully lower all asbestos and asbestos covered materials to ground level.

2.3.5 Rubble such as masonry, stone, concrete without reinforcing steel, and brick may be deposited as directed on the Base. Upon completion, the work and disposal area shall be left clean and natural looking. All signs of temporary construction and activities incidental to construction of the required permanent work in place shall be obliterated.

2.3.6 Optional use of Base Landfill shall require compliance with Landfill rules. Such rules do not allow accepting recyclable metals nor reusable wood or lumber over six feet in length.

2.4 DUST CONTROL: Keep dust down at all times, including non-working hours, weekends, and holidays. Sprinkle or treat, with dust suppressors, the soil at the site, haul roads, and other areas disturbed by operations. No dry power brooming is permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing is permitted only for cleaning nonparticulate debris, such as steel reinforcing bars. No sandblasting is permitted unless dust threrefrom is confined. Only wet cutting of concrete blocks, concrete, and asphalt is permitted. No unnecessary shaking of bags is permitted where bagged cement, concrete mortar, and plaster is used.

2.5 NOISE: When available, make the maximum use of "low-noise-emission products" as certified by EPA. No blasting or use of explosives is permitted without written permission of the Contracting Officer and then only during the designated times. Confine pile driving operations to the period between 8 a.m. and 4 p.m., Monday through Friday, unless specified otherwise.

END OF SECTION

SECTION 02050
DEMOLITION AND REMOVAL

PART 1 - GENERAL

1.1 SUBMITTALS: Submit proposed demolition and removal procedures for approval before work is started. Procedures shall provide for coordination with other work in progress, a disconnection schedule of utility services, a detailed description of methods and equipment to be used for each operation and the specialized procedures to prevent sewage spills, and of the sequence of operations.

1.2 REQUIREMENTS: The work includes demolition or removal of all construction indicated or specified. Do not begin demolition until authorization is received from the Contracting Officer; refer to paragraph "Title to Materials," hereinafter. Remove rubbish and debris from the station daily, unless otherwise directed; do not allow accumulations inside or outside the buildings. Store materials that cannot be removed daily in areas specified by the Contracting Officer. The demolition and removal of sewage system materials shall be in accordance with Section 01560, "Environmental Protection" and with North Carolina Environmental Protection regulations. Existing pipe need not be removed if the new line can be run properly without removing the existing line.

1.2.1 Buildings to be demolished are A4 and A5 which are brick and concrete construction with built-up roof.

1.3 DUST CONTROL: Take appropriate action to check the spread of dust in the work area and to avoid the creation of a nuisance in the surrounding area. Do not use water if it results in hazardous or objectionable conditions, such as ice, flooding, or pollution. Comply with all dust regulations imposed by local air pollution agencies.

1.4 PROTECTION:

1.4.1 Existing Work: Protect existing work which is to remain in place, that is to be reused, or which is to remain the property of the Government by temporary covers, shoring, bracing, and supports. Items which are to remain and which are damaged during performance of the work shall be repaired to their original contition or replace with new. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition or removal work.

1.4.2 Weather Protection: For portions of the building to remain, protect materials and equipment from the weather at all times.

1.4.3 Trees: Protect trees within the project site that might be damaged during demolition and that are indicated to be left in place. Restore trees scarred or damaged by Contractor equipment or operations to a satisfactory condition or replace as determined by the Contracting Officer. The Contracting Officer shall approve restoration prior to its initiation. Refer to Section 01560, "Environmental Protection."

1.5 EXPLOSIVES: Use of explosives will not be permitted.

1.6 BURNING: Burning will not be permitted.

PART 2 - EXECUTION

2.1 PAVING AND SLABS: Remove sawcut concrete and asphaltic concrete paving and slabs as indicated.

2.2 DISPOSITION OF MATERIAL AND TITLE TO MATERIALS: Except where indicated otherwise or specifically specified otherwise in other sections, all materials and equipment removed, and not reused, shall become the property of the Contractor and shall be removed from Government property. Title to all materials resulting from demolition, and all materials and equipment to be removed, is vested in the Contractor upon approval by the Contracting Officer of the Contractor's demolition and removal procedures, and authorization by the Contracting Officer to begin demolition. The Government will not be responsible for the condition or loss of, or damage to, such property after notice to proceed. Materials and equipment shall not be viewed by prospective purchasers or sold on the site.

2.3 CLEANUP:

2.3.1 Debris and Rubbish: Remove and transport debris and rubbish in a manner that will prevent spillage on streets or adjacent areas. Clean up spillage from streets and adjacent areas. Other applicable requirements are included under Section 01560, "Environmental Protection".

2.3.2 Regulations: Comply with federal, state, and local hauling and disposal regulations.

*** END OF SECTION ***

SECTION 02225
EXCAVATION, BACKFILLING, AND COMPACTING FOR UTILITIES

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.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

D 698-78	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5-lb (2.49-kg) Rammer and 12-in. (305-mm) Drop
D 751-79	Coated Fabrics
D 1557-78	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in. (457-mm) Drop
D 1682-64(75)	Breaking Load and Elongation of Textile Fabrics
D 2321-83	Underground Installation of Flexible Thermoplastic Sewer Pipe
D 2487-83	Classification of Soils for Engineering Purposes
D 2774-72(78)	Underground Installation of Thermoplastic Pressure Piping

UNITED STATES ARMY CORPS OF ENGINEERS (COE):

EM-385-1-1	Safety and Health Requirements Manual
CW 02215	Plastic Filter Fabric

1.2 DESCRIPTION: This section includes requirements for excavating, preparation of pipe-laying surface, pipe bedding, backfilling and compaction, open cutting pavement for the piping systems furnished and installed under Section 02713, "Exterior Water Distribution System Work"; Section 02722, "Exterior Sanitary Sewer System"; and Section 15400, "Plumbing".

1.3 DEFINITIONS:

1.3.1 Backfill: Material used in refilling a trench or other excavation.

1.3.2 Compaction: Any method of mechanically stabilizing a material by increasing its density at a controlled moisture condition. "Degree of Compaction" is expressed as a percentage of the maximum density obtained by the test procedure described in ASTM D 698 or D 1557, abbreviated in this specification as "_____ percent ASTM D ____ maximum density."

1.3.3 Granular Pipe Bedding: A dense, well-graded aggregate mixture of sand, gravel, or crushed stone (mixed individually, in combination with each other, or with suitable binder soil) placed on a subgrade to provide a suitable foundation for pipe.

1.3.4 Hard Material: Weathered rock, dense consolidated deposits, or conglomerate materials which are not included in the definition of "rock" but which usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.

1.3.5 Lift: A layer or course of soil placed on top of unprepared subgrade or a previously prepared or placed soil in a fill or backfill.

1.3.6 Rock: Solid homogenous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without systematic drilling and blasting, drilling and the use of expansion jacks or feather wedges, or the use of backhoe-mounted pneumatic hole punchers or rock breakers; also large boulders, buried masonry, or concrete other than pavement exceeding 1/2 cubic yard in volume. Removal of "hard material" will not be considered rock excavation because of intermittent drilling and blasting that is performed merely to increase production.

1.3.7 Topsoil: In natural or undisturbed soil formations, the fine-grained, weathered material on the surface or directly below any loose or partially decomposed organic matter. Topsoil may be a dark-colored, fine, silty, or sandy material with a high content of well decomposed organic matter, often containing traces of the parent rock material. Gradation and material requirements specified herein apply to all topsoil references in this contract. The material shall be representative of productive soils in the vicinity.

1.3.8 Unyielding Material: Rock or soil with cobbles in the trench bottom requiring a covering of finer grain material or special bedding to avoid bridging in the pipe or conduit.

1.3.9 Unsatisfactory Material: Soil or other material identified as having insufficient strength or stability to carry intended loads on trench backfills without excessive consolidation or loss of stability. Also backfill material which contains refuse, frozen material, large rocks, debris, and other material which could damage the pipe or cause the backfill not to compact.

1.3.10 Unstable Material: Material in the trench bottom which lacks firmness to maintain alignment and prevent joints from separating in the pipe, conduit, or appurtenance structure during backfilling. This may be material otherwise identified as satisfactory which has been disturbed or saturated.

1.4 SUBMITTALS:

1.4.1 Manufacturers Certificates of Compliance:

a. Filter fabric
b. Warning and identification tape

1.4.2 Contractor Furnished Plans, Shop Drawings, and Certifications:

a. Shoring and sheeting plan: Describe materials of shoring system to be used. Indicate whether or not components will remain after filling or backfilling. Provide plans, sketches, or details along with calculations by a professional engineer registered in any jurisdiction. Indicate sequence and method of installation and removal.

b. Dewatering plan: Describe methods for removing collected water from open trenches and diverting surface water or piped flow away from work area. Describe equipment and procedures for installing and operating the dewatering system indicated. Describe the basic components of the dewatering system proposed for use and its planned method of operation. Record performance and effectiveness of method or system in use and submit weekly.

1.4.3 Reports of Field Testing:

a. Test for Moisture-Density Relation: Submit 7 days prior to commencing utility excavation.

b. Density and Moisture Tests: Submit within 14 days of test date.

Submit any field test data not listed above sufficiently in advance of construction so as not to delay work.

1.5 DELIVERY AND STORAGE: Deliver and store materials in a manner to prevent contamination, segregation, freezing, and other damage. Store synthetic fiber filter fabric to prevent exposure to direct sunlight.

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

a. Surface elevations are as indicated.

b. No pipes or other manmade obstructions, except those indicated, will be encountered.

c. The character of the material to be excavated or found in the trench is as indicated. Rock or hard material as defined in paragraph entitled "Definitions," will not be encountered.

1.7 PROTECTION:

1.7.1 Shoring and Sheeting: Provide shoring, bracing, cribbing, trench boxes and sheeting where indicated. In addition to Section XXIII A and B of COE Manual EM-385-1-1, include provisions in the shoring and sheeting plan that will accomplish the following:

a. Prevent undermining of pavements and slabs.

b. Prevent slippage or movement in banks or slopes adjacent to the excavation.

1.7.2 Dewatering: Plan for and provide the structures, equipment, and construction for the collection and disposal of surface and subsurface water encountered in the course of construction.

1.7.3 Utilities: Movement of construction machinery and equipment over pipes and utilities during construction shall be at the Contractor's risk. Excavation made with power-driven equipment is not permitted within two feet of any known utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction,

use hand or light equipment excavation. Start hand or light equipment excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Support uncovered lines or other existing work affected by the contract excavation until approval for backfill is granted by the Contracting Officer. Report damage to utility lines or subsurface construction immediately to the Contracting Officer.

1.7.4 Structures and Surfaces: Protect newly backfilled areas and adjacent structures, slopes, or grades from traffic, erosion settlement, or any other damage. Repair and reestablish damaged or eroded grades and slopes and restore surface construction prior to acceptance. Protect existing streams, ditches, and storm drain inlets from water-borne soil by means of straw bale dike or filter fabric dams. All work shall be conducted in accordance with requirements specified in Section 01560, "Environmental Protection."

1.7.4.1 Dispose of excavated material so that it will not obstruct the flow of streams, endanger a partly finished structure, impair the efficiency or appearance of any facilities, or be detrimental to the completed work.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS: Provide soil materials as described below free of debris, roots, wood, scrap material, vegetable matter, refuse, soft unsound particles, ice, or other deleterious and objectionable materials.

2.1.1 Backfill: Bring trenches to grade indicated on the drawings using material excavated on the site of this project. This material will be considered unclassified and no testing other than for compaction will be required before use as backfill.

2.1.2 Sand: Clean, coarse-grained sand classified as SW or SP by ASTM D 2487 for bedding and backfill.

2.1.3 Pipe Bedding shall be sand conforming to SW or SP of ASTM D2487.

2.2 FILTER FABRIC: Provide a pervious sheet of polyester, nylon, glass or ultraviolet resistant polypropylene filaments woven, spun bonded, fused, or otherwise manufactured into a nonraveling fabric with uniform thickness and strength. The fabric shall have the following manufacturer certified properties:

a.	Grab tensile strength (ASTM D 1682) machine and transversed direction	min. 90 lbs
b.	Grab elongation (ASTM D 1682) machine and transverse direction	min. 15-70 percent
c.	Puncture strength (ASTM D 751)	min. 50 lbs
d.	Mullen burst strength (ASTM D 751)	min. 100 psi
e.	Equivalent opening (CW02215)	70-100

2.3 BURIED WARNING AND IDENTIFICATION TAPE: Warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3-inch-minimum width, color coded as stated below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION, BURIED (intended service) LINE BELOW" or similar wording. Color and printing is to be permanent, unaffected by moisture or soil.

Warning Tape Color Codes

Blue:	Water Systems
Green:	Sewer Systems

2.3.1 Warning Tape for Metallic Piping: Acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements indicated above. Minimum thickness of the tape shall be 0.003 inch. Tape shall have a minimum strength of 1500 psi lengthwise and 1250 psi crosswise with a maximum 350 percent elongation.

2.3.2 Detectable Warning Tape for Non-Metallic Piping: Polyethylene plastic tape conforming to the width, color, and printing requirements indicated above. Minimum thickness of the tape shall be 0.004 inch. Tape shall have a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. The tape shall be manufactured with integral wires, foil backing, or other means of enabling detection by a metal detector when the tape is buried up to 3 feet deep. Encase the metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION:

3.1.1 Stockpiling Topsoil: Strip suitable soil from the site where excavation or grading is indicated and stockpile separately from other excavated material. Material unsuitable for use as topsoil shall be stockpiled and used for backfilling. Locate topsoil so that the material can be used readily for the finished grading. Where sufficient existing topsoil conforming to the material requirements is not available on site, provide borrow materials suitable for use as topsoil. Protect topsoil and keep in segregated piles until needed.

3.1.2 Cutting Pavement, Curbs, and Gutters: Saw cut with neat, parallel, straight lines one foot wider than trench width on each side of trenches and one foot beyond each edge of pits.

3.2 GENERAL EXCAVATION: Keep excavations free from water while construction is in progress. Notify the Contracting Officer immediately in writing if it becomes necessary to remove rock or hard, unstable, or otherwise unsatisfactory material to a depth greater than indicated. Make trench sides as nearly vertical as practicable except where sloping of sides is allowed. Sides of trenches shall not be sloped from the bottom of the trench up to the elevation of the top of the pipe. Excavate ledge rock, boulders, and other unyielding material to an overdepth at least 6 inches below the bottom of the pipe and appurtenances unless otherwise indicated or specified. Blasting will

not be permitted. Use bedding material placed in 6-inch-maximum layers to refill overdepths to the proper grade. At the option of the Contractor, the excavations may be cut to an overdepth of not less than 4 inches and refilled to required grade as specified. Grade bottom of trenches accurately to provide uniform bearing and support for each section of pipe on undisturbed soil, or bedding material as indicated or specified at every point along its entire length except for portions where it is necessary to excavate for bell holes and for making proper joints. Dig bell holes and depressions for joints after trench has been graded. Dimension of bell holes shall be as required for properly making the particular type of joint to ensure that the bell does not bear on the bottom of the excavation.

3.2.1 Shoring and Sheeting: Shore and sheet excavations as described in the plan submitted with various member sizes arranged to prevent injury to persons and damage to structures. Also arrange shoring and sheeting to preclude injurious caving during removal. Obtain approval from the Contracting Officer prior to removing any shoring, sheeting, or bracing in excavations adjacent to on-grade slabs, foundations, or other structural elements.

3.3 GENERAL BEDDING: Shall be of the materials and depths as indicated for utility lines and utility line structures. Place bedding in 6-inch-maximum loose lifts. Provide uniform and continuous support for each section of structure except at bell holes or depressions necessary for making proper joints.

3.3.1 Refill: Defined as material placed in excavation to correct overcut in depth.

3.4 BURIED WARNING AND IDENTIFICATION TAPE: Install tape in accordance with manufacturer's recommendations except as modified herein. Bury tape 12 inches below finished grade; under pavements and slabs, bury tape 6 inches below top of subgrade.

3.5 GENERAL BACKFILLING: Construct backfill in two operations, initial and final, as indicated and specified in this section. Place initial backfill in 6-inch-maximum loose lifts to one foot above pipe unless otherwise specified. Ensure that initially placed material is tamped firmly under pipe haunches. Bring up evenly on each side and along the full length of the structure. Ensure that no damage is done to structures or their protective coatings. Place the remainder of the backfill in 9-inch-maximum loose lifts unless otherwise specified. Compact each loose lift as specified in paragraph "General Compaction" before placing the next lift. Do not backfill in freezing weather or where the material in the trench is already frozen or is muddy, except as authorized. Provide a minimum cover from final grade of 2 feet for sewer mains. Where settlements greater than the tolerance allowed herein for grading occur in trenches and pits due to improper compaction, excavate to the depth necessary to rectify the problem, then backfill and compact the excavation as specified herein and restore the surface to the required elevation. Coordinate backfilling with testing of utilities. Testing for the piping shall be complete before final backfilling. Provide buried warning and identification tape installed in accordance with the manufacturer's recommendation.

3.6 GENERAL COMPACTION: Use hand-operated, plate-type, vibratory, or other suitable hand tampers in areas not accessible to larger rollers or compactors. Avoid damaging pipes and protective pipe coatings. Compact material in accordance with the following unless otherwise specified. If necessary, alter, change, or modify selected equipment or compaction methods to meet specified compaction requirements.

3.6.1 Compaction of Material for Subcuts or Overexcavations: In soft, weak, or wet soils, tamp material to consolidate to density of adjacent material in trench wall. In stable soils, compact to 90 percent of ASTM D 1557 maximum density.

3.6.2 Compaction of Pipe and Conduit Bedding: In rock, compact to 95 percent and in soil, compact to 90 percent of ASTM D 1557 maximum density.

3.6.3 Compaction of Backfill: Compact initial backfill material surrounding pipes, to 90 percent of ASTM D 698 maximum density except where bedding and backfill are the same material. Where bedding and backfill are the same material, compact initial backfill to the density of the bedding. Under areas to be seeded or sodded, compact succeeding layers of final backfill to 85 percent of ASTM D 698 maximum density.

3.7 LAYING PVC PIPE shall conform to Plate 02225-3 and to:

a. PVC Water Pipe: ASTM D2774.
b. PVC Sewer Pipe: ASTM D 2321, except haunching to spring line shall be with Class III materials.

3.8 FINISH OPERATIONS:

3.8.1 Grading: Finish to grades indicated within one-tenth of a foot. Provide sod or topsoil in areas to be seeded or sodded as indicated. Grade areas to drain water away from structures and to provide suitable surfaces for mowing machines. Grade existing grades that are to remain but have been disturbed by the Contractor's operations.

3.8.2 Spreading Topsoil: Clear areas to receive topsoil for the finished surface of materials that would interfere with planting and maintenance operations. Scarify subgrade to a depth of 2 inches. Do not place topsoil when the subgrade is frozen, extremely wet or dry, or in other conditions detrimental to seeding, planting, or grading. Comply with the requirements of Section 02823, "Re-Establishing Vegetation. Spread topsoil to a uniform depth of 4-inches over the designated areas.

3.8.3 Disposition of Surplus Material: Surplus or other soil material not required or suitable for filling, backfilling, or grading shall be removed from Government property.

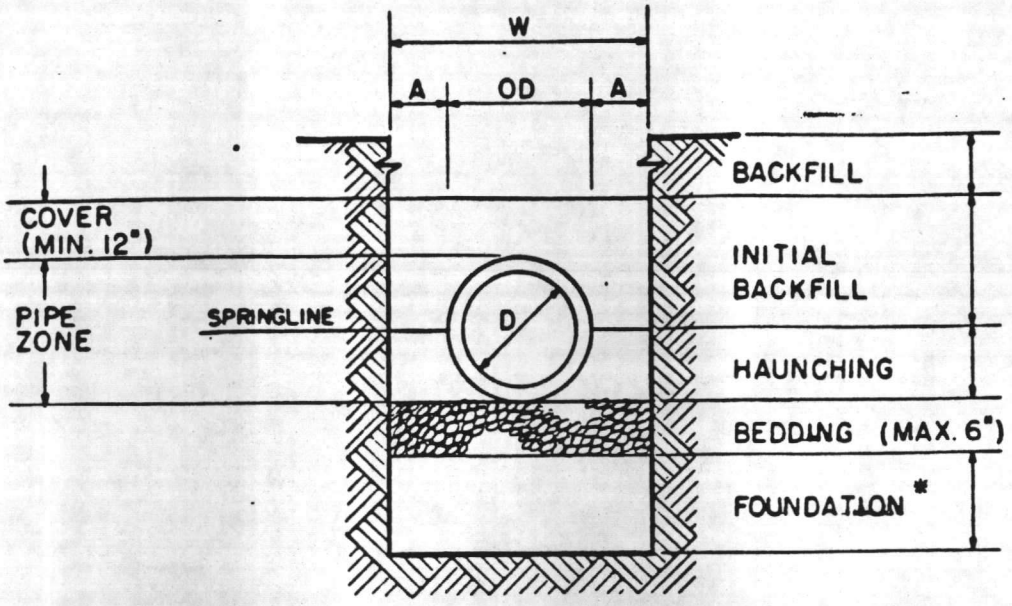
3.8.4 Protection of Surfaces: Protect newly graded areas from traffic, erosion, and settlements that may occur and as required in Section 01560, "Environmental Protection." Repair or reestablish damaged grades, elevations, or slopes.

3.9 FIELD SAMPLING AND TESTING: Test sand, bedding, backfill and topsoil for conformance to specified requirements. Test backfill to be used under roads and paved areas for conformance to special requirements. Test bedding and backfill for moisture-density relations in accordance with ASTM D 698 as specified herein. Perform at least one of each of the required tests for each material used sufficiently in advance of construction so as not to delay work. Provide additional tests as specified above for each change of source. Perform final tests on topsoil to assure adjustment of parameters into the ranges specified. Perform density and moisture tests in randomly selected locations and in accordance with ASTM D 1556 as follows:

a. Bedding and Backfill in Trenches: One test per 50 linear feet in each lift.

b. Appurtenance Structures: One test per 100 square feet or fraction thereof in each lift.

LAYING CONDITIONS FOR THERMOPLASTIC PIPE



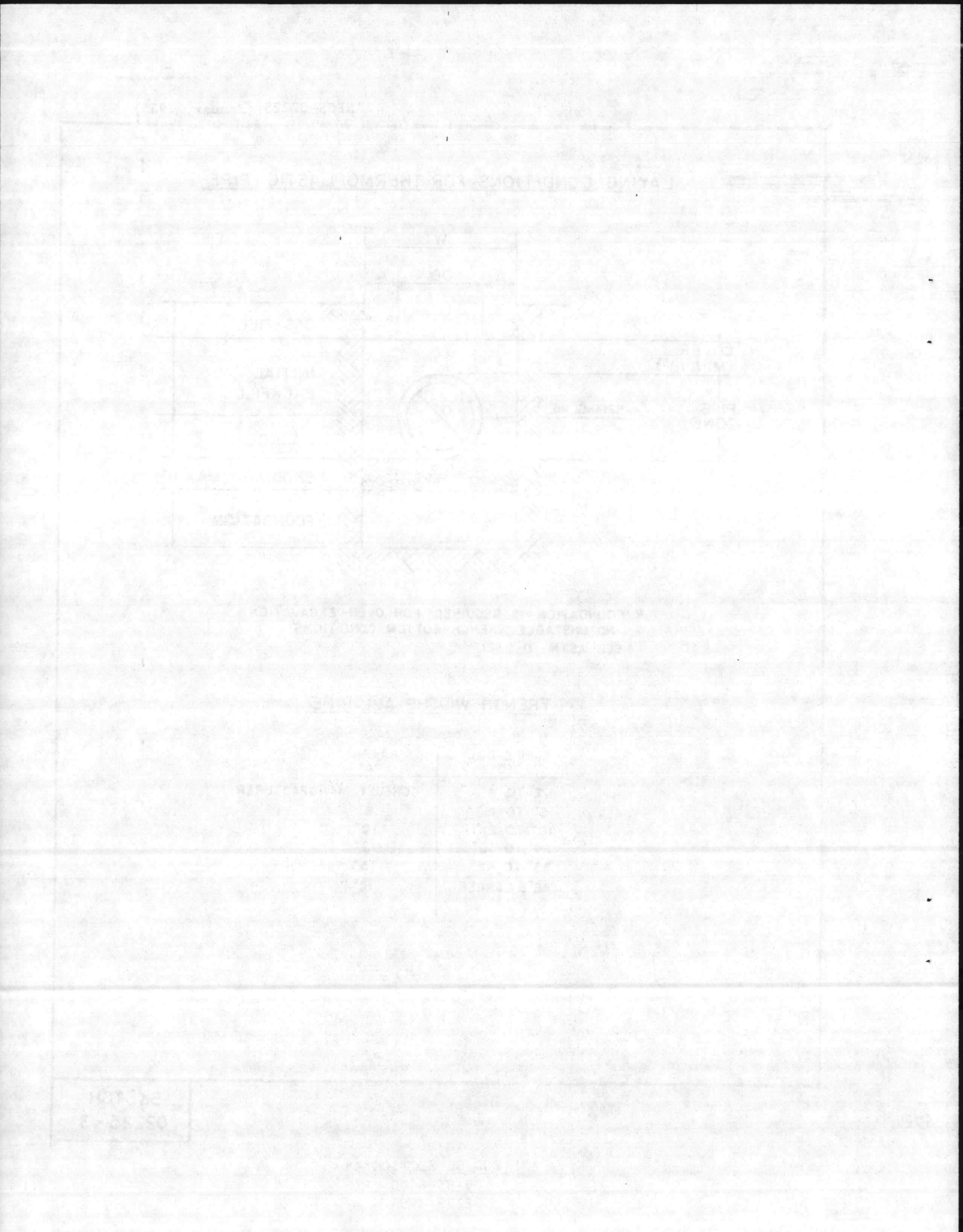
* FOUNDATION IS REQUIRED FOR OVER-EXCAVATION AND UNSTABLE TRENCH BOTTOM CONDITIONS. SEE ASTM D-2321.

TRENCH WIDTHS ALL PIPE

PIPE DIA. "D"	MAXIMUM "A"
1/2" TO 4"	CONSULT MANUFACTURER
6" TO 15"	8"
18" TO 21"	10"
24" TO 30"	12"
33" TO 42"	15"
48" & LARGER	18"

SKETCH
02225-3

END OF SECTION



SECTION 02600
ASPHALTIC CONCRETE SURFACING AND PATCHING

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 basic designation only.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT):

Standard Specifications for Roads and Structures, July 1978

1.2 GENERAL REQUIREMENTS: All "Section" references refer to NCDOT "Standard Specifications for Roads and Structures". In all references:

a. The articles entitled "Method of Measurement", "Basis of Payment" and "Acceptance of Bituminous Materials" will not apply.

b. All references to "Engineer" shall mean "Contracting Officer".

PART 2 - PRODUCTS

2.1 PRIME COAT: Work and materials shall be Grade MC-30 or RC-30 conforming to Section 600.

2.2 TACK COAT: Work and materials shall conform to Section 605.

2.3 ASPHALTIC CONCRETE BASE COURSE shall conform to Section 630.

2.4 ASPHALTIC CONCRETE SURFACE COURSE shall be Type I-1, conforming to Section 645.

2.5 CRUSHED STONE: Work and materials shall conform to Section 520.

2.6 CONSTRUCTION EQUIPMENT:

2.6.1 Mixing plant shall conform to the requirements of Section 610-5.

PART 3 - EXECUTION

3.1 CONSTRUCTION METHODS: Work shall conform to the NCDOT Standard Specifications sections referenced hereinbefore and to the following:

3.1.1 Before commencing the operations on any portion of the work, the surface of the existing pavement and any new base course shall be thoroughly cleaned of all foreign matter including grass by mechanical means if feasible.

3.1.2 Patchwork: All asphalt surfacing and loose stone base course shall be removed. Stone base course materials removed shall be replaced with a new stone base course and asphaltic concrete mixture. The patchwork shall be accomplished in advance of placing the surface course, and the surface course placed continuously over the entire area.

3.1.3 Finished surfaces shall be uniform in texture and appearance and free from cracks and creases. The finished surface shall vary not more than 1/8-inch when the test for smoothness is performed with a 10-foot staightedge. The finished thickness shall be not less than the specified thickness minus 1/8-inch. Where the irregularity of the surface or the deficiency in depth is more than the specified tolerances, the defective work shall be removed and replaced with new material, as directed, without additional cost to the Government.

3.1.4 Bituminous materials and/or mixtures shall not be produced or placed when weather is rainy or foggy, or when the air temperature is less than 40 degrees Fahrenheit in the shade away from artificial heat.

3.2 PROTECTION OF PAVEMENT: After final rolling, no vehicular traffic of any kind shall be permitted on the pavement until it has cooled and hardened.

END OF SECTION

SECTION 02713
EXTERIOR WATER DISTRIBUTION SYSTEM

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.

MILITARY SPECIFICATION (Mil. Spec.):

MIL-V-18436E	Valves, Check; Bronze, Cast-Iron and Steel Body

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI):

B16.26-75	Cast Copper Alloy Fittings for Flared Copper Tubes

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

B 61-82a	Steam or Valve Bronze Castings
B 62-82a	Composition Bronze or Ounce Metal Castings
D 1785-83	Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
D 2241-80	Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR)
D 2466-78	Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
D 2564-80	Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
D 3139-77	Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
F 477-76(81)	Elastomeric Seals (Gaskets) for Joining Plastic Pipe

AMERICAN WATER WORKS ASSOCIATION (AWWA):

C104-80	Cement-Mortar Lining for Cast-Iron and Ductile-Iron Pipe and Fittings for Water
C110-82	Gray-Iron and Ductile-Iron Fittings 3 In. through 48 In. for Water and Other Liquids
C111-80	Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings
C500-80	Gate Valves, 3 Through 48 In. NPS, for Water and Sewage Systems
C502-80	Dry-Barrel Fire Hydrants
C600-82	Installation of Ductile-Iron Water Mains and Their Appurtenances
C601-81	Disinfecting Water Mains
C800-66	Threads for Underground Service Line Fittings
C900-81	Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In., for Water

MANUFACTURER'S STANDARDIZATION SOCIETY (MSS):

SP 70-84	Cast Iron Gate Valves, Flanged and Threaded Ends
SP 80-79	Bronze Gate, Globe Angle and Check Valves

UNDERWRITERS LABORATORIES INC. (UL):

246-79(82)	Hydrants for Fire-Protection Service
262-80	Gate Valves for Fire-Protection Service
312-80(82)	Check Valves for Fire¬Protection Service

UNI-BELL PLASTIC PIPE ASSOCIATION (UNI):

B-3-79	Installation of Polyvinyl Chloride (PVC) Pressure Pipe Complying with AWWA Standard C-900

1.2 DESCRIPTION OF WORK: The work includes abandoning existing lines in place and removing valve boxes. Provide new and modifying existing water piping systems and related work. Provide each system complete and ready for operation. Water piping systems including equipment, materials, installation, and workmanship shall be as specified herein. Exterior water piping systems shall include all piping buried more than 5 feet outside of building walls. Piping less than 5 feet outside of the building walls is specified under Section 15400, "Plumbing."

1.3 SUBMITTALS:

1.3.1 Manufacturer's Data:

a. Pipe, fittings, joints, couplings, and gaskets
b. Valves
c. Fire hydrants
d. Valve boxes
e. Backflow preventers

1.3.2 Manufacturer's Certificates of Conformance:

a. Pipe and fittings, including shop-applied linings and coatings
b. Pipe joint materials
c. Solvent cement
d. Valves
e. Fire hydrants
f. Backflow preventers

1.4 DELIVERY, STORAGE, AND HANDLING OF MATERIALS:

1.4.1 Delivery and Storage: Inspect materials delivered to site for damage. Unload and store with minimum handling. Store materials in enclosures or under protective covering. Store rubber gaskets and plastic piping not to be installed immediately under cover, out of direct sunlight. Do not store materials directly on the ground. Keep interior of pipes and fittings free of dirt and debris.

1.4.2 Handling: Handle pipe, fittings, valves, hydrants, and other accessories in such manner as to ensure delivery to the trench in sound, undamaged condition. Avoid injury to coatings and linings on pipe and fittings; make satisfactory repairs if coatings or linings are damaged. Carry pipe to the trench; do not drag it.

1.5 EXCAVATION, TRENCHING, AND BACKFILLING: Provide in accordance with Section 02225, "Excavation, Backfilling, and Compacting for Utilities" except as specified herein.

PART 2 - PRODUCTS

2.1 MATERIALS FOR WATER DISTRIBUTION PIPING: Piping 4-inch diameter and larger.

2.1.1 Polyvinyl Chloride (PVC) Pipe and Fittings: AWWA C900 plain end or gasket bell end, minimum pressure Class 200 (DR14) with cast-iron pipe equivalent OD. Fittings shall be AWWA C110 gray-iron or ductile-iron, with a pressure rating not less than that of the pipe, and shall have AWWA C104 standard thickness cement-mortar lining. ASTM D 3139 push-on joints or ASTM D 3139 and AWWA C111 compression type mechanical joints for buried piping. ASTM F 477 gaskets for push-on joints for pipe, and AWWA C111 gaskets for push-on joints and mechanical joints for joint connections between pipe and metal fittings, valves, and accessories.

2.1.2 Accessories: Provide flanges, connecting pieces, transition glands, transition sleeves, and other adapters as required.

2.2 MATERIALS FOR WATER SERVICE PIPING: Piping smaller than 4-inch diameter.

2.2.1 Polyvinyl Chloride (PVC) Pipe, Fittings, and Solvent Cement: Pipe and fittings shall bear the seal of approval of the National Sanitation Foundation for potable water service. ASTM D 1785, Schedule 40; or ASTM D 2241, with SDR as necessary to provide 150 psig minimum pressure rating. Provide ASTM D 2466 fittings. Pipe and fittings shall be of the same PVC material and shall be one of the following pipe/fitting combinations, as marked on the pipe and fitting, respectively: PVC 2120/PVC II; PVC 2116/PVC II. Provide ASTM D 2564 solvent cement for jointing.

2.2.2 Accessories: Provide flanges, connecting pieces, transition glands, transition sleeves, and other adapters as required.

2.3 VALVES, HYDRANTS, AND OTHER WATER PIPING ACCESSORIES:

2.3.1 Gate Valves on Buried Piping: Valves shall have nonrising stems and shall be double-disc parallel or inclined seat type. Valves shall open by counterclockwise rotation of the valve stem. Valves shall have O-ring stem seals, except when gearing is specified, use conventional packing. Stuffing boxes shall be bolted and constructed to permit easy removal of parts for repair.

2.3.1.1 Valves 3-Inch Size and Larger: AWWA C500 or UL 262, except as specified herein. Valves shall have AWWA C111 mechanical joint or push-on joint ends and gaskets, except as follows: Valves may have special ends, as approved, for connection to asbestos-cement piping. Valves conforming to UL 262 shall be designed for a hydraulic working pressure of 175 psig for valve sizes 12-inch and smaller and 150 psig for sizes larger than 12-inch. For the following conditions, valves shall conform to UL 262 only: (a) for use at

working pressures exceeding 175 psig for valve sizes 12-inch and smaller and 150 psig for 14-inch valve size; (b) for use with indicator posts. Gate valves 16-inch size and larger shall be provided with gearing, bypasses, and indicators.

2.3.1.2 Valves Smaller Than 3-Inch Size: AWWA C500, or UL 262, except for size. Valves shall be designed for a working pressure of 175 psig.

2.3.2 Gate Valves in Valve Chambers and Valve Pits:

2.3.2.1 Valves 3-Inch Size and Larger: MSS SP-70 or UL 262. Valves shall be of outside-screw-and-yoke configuration. Valves shall have flanged end connections unless otherwise indicated or specified herein. MSS SP-70 valves shall be double disc, with a water pressure rating of 200 psig. UL 262 valves shall be designed for a hydraulic working pressure of 175 psig for valve sizes 12-inch and smaller and 150 psig for valve sizes larger than 12-inch.

2.3.2.2 Valves Smaller Than 3-Inch Size: MSS SP-70 or MSS SP-80, or UL 262. MSS SP-70 or MSS SP-80 valves shall be double disc, with a water pressure rating of 200 psig. UL 262 valves shall be of outside-screw-and-yoke configuration, designed for a hydraulic working pressure of 175 psig. Valves shall have flanged or threaded end connections, with a union on one side of the valve.

2.3.3 Check Valves:

2.3.3.1 Check Valves 3-Inch Size and Larger: Mil. Spec. MIL-V-18436 or UL 312. Valves shall have hub ends for mechanical joint on buried piping and shall have flanged end connections in valve chambers, valve pits, or in aboveground locations. Swing check valves shall have clear-port opening. Mil. Spec. MIL-V-18436 valves shall be swing check, cast-iron or steel bodies with bronze trim, and designed for a hydraulic working pressure of 175 psig for valve sizes 12-inch and smaller and 150 psig for valve sizes larger than 12-inch.

2.3.3.2 Check Valves Smaller Than 3-Inch Size: MSS SP-80, Mil. Spec. MIL-V-18436, or UL 312. Valves shall have threaded end connections. MSS SP-80 valves shall be swing check, with a water pressure rating of 200 psig. Mil. Spec. MIL-V-18436 valves shall be swing check, cast-iron or steel bodies with bronze trim, and designed for a hydraulic working pressure of 175 psig.

2.3.4 Fire Hydrants: AWWA C502 or UL 246, Base Valve design. Hydrants shall be 6-inch diameter with 5-inch clear opening through the valve and provided with a 4.5-inch pumper connection and two 2.5-inch hose connections. Hydrants shall be of the freeze-proof and nonflooding post type which shall not flood in the hydrant when the valve is closed, and shall be repairable without digging. Provide a safety flange for post type hydrants. The hydrants shall be designed for 150 psig working pressure and 300 psig hydrostatic test pressure, and shall open counterclockwise. Working parts shall be bronze. Hose and pumper connection threads and operating nut shall be National Standard male hose threads with cap and chain. Each hydrant shall

be preceded in the piping by a 6-inch gate valve. Provide hydrants with at least one coat of primer and two coats of yellow enamel paint, except red enamel paint shall be used for tops of hydrants in nonpotable water systems. Hydrant number and main size shall be stenciled on the hydrant barrel using black stencil paint.

2.3.5 Valve Boxes: Except where indicator posts are provided, each gate valve on buried piping shall be provided with an adjustable cast- iron valve box of a size suitable for the valve. Provide each cast-iron box with a heavy coat of bituminous paint. The head shall be round and the lid shall have the word "WATER" cast on it. The least diameter of the box shaft shall be 5.25 inches.

2.4 WATER SERVICE PIPING APPURTENANCES:

2.4.1 Corporation Stops: ASTM B 61 or ASTM B 62 bronze ground key type; and shall be designed for the working pressure of the system. Provide ends for solder-joint, or flared tube compression type joint. AWWA C800 threaded ends for inlet and outlet of corporation stops; and ANSI B16.26 coupling nut for connection to flared copper tubing.

2.4.2 Curb or Service Stops: ASTM B 61 or ASTM B 62 bronze, ground key, round way, inverted key type; designed for the working pressure of the system. Ends shall be appropriate for connection to the service piping. Arrow shall be cast into body of the curb or service stop, indicating direction of flow.

2.4.3 Curb Boxes: Provide each curb or service stop with an adjustable cast-iron curb box of a size suitable for the stop. The head shall be round and the lid shall have the word "WATER" cast on it. Provide each cast-iron box with a heavy coat of bituminous paint.

2.5 TRACER WIRE FOR NONMETALLIC PIPING: Shall be bare copper or aluminum wire not less than 0.10 inch in diameter and provided in sufficient length to be continuous over each separate run of nonmetallic piping. Attach wire to top of pipe to prevent displacement during construction operations.

2.6 IDENTIFICATION TAGS AND PLATES: Provide valves with tags or plates numbered and stamped for their usage. Plates and tags shall be of brass or nonferrous material and shall be mounted or attached to the valve.

PART 3 - EXECUTION

3.1 INSTALLATION: These requirements shall apply to all piping except as specified otherwise.

3.1.1 Location of Water Piping:

3.1.1.1 Water Piping Installation Parallel With Sewer Piping:

3.1.1.1.1 Normal Conditions: Water piping shall be laid at least 10 feet horizontally from a sewer or sewer manhole whenever possible. The distance shall be measured edge-to-edge.

3.1.1.1.2 Unusual Conditions: When local conditions prevent a horizontal separation of 10 feet, the water piping may be laid closer to a sewer or sewer manhole provided that:

a. The bottom (invert) of the water piping shall be at least 18 inches above the top (crown) of the sewer piping.

b. Where this vertical separation cannot be obtained, the sewer piping shall be constructed of AWWA-approved water pipe, pressure tested in place without leakage prior to backfilling.

c. The sewer manhole shall be of watertight construction and tested in place.

3.1.1.2 Installation of Water Piping Crossing Sewer Piping:

3.1.1.2.1 Normal Conditions: Water piping crossing above sewer piping shall be laid to provide a separation of at least 18 inches between the bottom of the water piping and the top of the sewer piping.

3.1.1.2.2 Unusual Conditions: When local conditions prevent a vertical separation described above, the following construction shall be used:

a. Sewer piping passing over or under water piping shall be constructed of AWWA-approved water piping, pressure tested in place without leakage prior to backfilling.

b. Water piping passing under sewer piping shall, in addition, be protected by providing:

(1) A vertical separation of at least 18 inches between the bottom of the sewer piping and the top of the water piping.

(2) Adequate structural support for the sewer piping to prevent excessive deflection of the joints and the settling on and breaking of the water piping.

(3) That the length (minimum 18 feet) of the water piping be centered at the point of the crossing so that joints shall be equidistant and as far as possible from the sewer piping.

3.1.1.3 Sewer Piping or Sewer Manholes: No water piping shall pass through or come in contact with any part of a sewer manhole.

3.1.2 Connections to Existing Water Supply Systems: Use tapping or drilling machine valve and mechanical joint type sleeves for connections to be made under pressure. Bolt sleeves around mains; bolt valve conforming to AWWA C500 to the branch. Open valve, attach drilling machine, make tap, close valve, and remove drilling machine, all without interruption of service.

Notify the Contracting Officer in writing at least 15 days prior to the date the connections are required; receive approval before any service is interrupted. Furnish all materials required to make connections into the existing water supply systems and perform all excavating, backfilling, and other incidental labor as required. Furnish the labor and the tapping or drilling machine for making the actual connections to the existing systems.

3.1.3 Pipe Laying and Jointing: Inspect pipe, fittings, valves, and accessories before and after installation; those found defective shall be replaced with new materials. Remove fins and burrs from pipe and fittings. Before placing in position, clean pipe, fittings, valves, and accessories, and maintain in a clean condition. Provide facilities for lowering sections of pipe into trenches. Do not drop or dump pipe, fittings, valves, or any other water piping material into trenches. Cut pipe accurately to measurements established at the site and work into place without springing or forcing. Replace pipe or fitting that does not allow sufficient space for proper installation of jointing material with new pipe or fittings of proper dimensions. Blocking or wedging between bells and spigots will not be permitted. Lay bell-and-spigot pipe with the bell end pointing in the direction of laying. Grade the piping in straight lines; avoid the formation of any dips or low points. Support pipe at its proper elevation and grade; ensure firm and uniform support. Wood support blocking will not be permitted. Lay pipe so that the full length of each section of pipe and each fitting will rest solidly on the pipe bedding; excavate recesses to accommodate bells, joints, and couplings. Provide anchors and supports where necessary for fastening work into place. Make proper provision for expansion and contraction of piping. Keep trenches free of water until joints have been completely assembled. At the end of each day's work, close open ends of pipe temporarily with wood blocks or bulkheads. Depth of cover over top of pipe shall be not less than 2-1/2 feet for laterals and as indicated for mains.

3.1.4 Installation of Tracer Wire: Attach wire to top of pipe to prevent displacement during construction operations.

3.2 SPECIAL REQUIREMENTS FOR INSTALLATION OF WATER DISTRIBUTION PIPING: Install pipe and fittings in accordance with the general requirements for installation of piping, except as otherwise specified herein.

3.2.1 Polyvinyl Chloride (PVC) Pipe and Fittings: UNI-B-3 for laying of pipe, joining PVC pipe to fittings and accessories, and setting of hydrants, valves, and fittings, except as specified hereunder. Make push-on joints with elastomeric gaskets using either elastomeric gasket bell-end pipe or elastomeric gasket couplings. Use push-on joint having factory-made bevel on pipe ends for pipe-to-pipe joint connections only; for push-on joint connections to metal fittings, valves, and other accessories, cut spigot end of pipe off square and rebevel pipe end to a bevel approximately the same as that on ductile-iron pipe used for the same type of joint. Use an approved lubricant recommended by the pipe manufacturer for push-on joints. Assemble push-on joints for pipe-to-pipe joint connections in accordance with the requirements of UNI-B-3 for laying the pipe. Assemble push-on joints for connection to fittings, valves, and other accessories in accordance with the requirements of UNI-B-3 for joining PVC pipe to fittings and accessories and with the applicable requirements of AWWA C600 for joint assembly. Assemble

compression-type joints and mechanical joints with the gaskets, glands, bolts, nuts, and internal stiffeners in accordance with the requirements of UNI-B-3 and AWWA C600, and Appendix A to AWWA C111. Cut off spigot end of pipe for compression-type joint and mechanical-joint connections and do not rebevel. Bedding special requirements are specified in Section 02225, "Excavation, Backfilling, and Compacting of Utilities".

3.2.2 Pipe Anchorage: Provide anchorage of buried piping by using concrete thrust blocks (reaction backing) having a minimum compressive strength of 2000 psi. All 22.5 degrees and sharper bends, tees, and dead ends of piping shall be securely blocked in the direction of flow with cast-in-place concrete bearing solidly against the piping and affording a minimum of 3 square feet of bearing area against a vertical trench face for 3- and 4-inch piping, and in accordance with Sketch NFGS-02713-1 for piping 6-inch diameter and larger, attached to this Section.

3.2.3 Valves and Hydrants for Water Mains:

3.2.3.1 Valves: AWWA C600.

3.2.3.2 Fire Hydrants: AWWA C600 and in accordance with Sketch NFGS-02713-2, attached to this Section. Set hydrants plumb. Clean foreign matter from interior of hydrants before installation. Check hydrants in open and closed positions to ensure that parts are in proper working order. Tamp earth backfill around hydrant. If the character of the soil is such that the hydrant cannot be securely blocked, provide bridle rods and rod collars. Use minimum 0.75-inch steel stock bridle rods and rod collars protected by a coat of bituminous paint.

3.3 ACCESSORIES:

3.3.1 Connections to Water Main Piping: Connect service lines to the main by a corporation stop and install a curb stop below the frostline. Connect service lines 2-inch size and larger to the main with a rigid connection and install a gate valve on service line below frostline.

3.3.2 Installation of Valves and Valve Boxes: Valves and valve boxes shall be set plumb, with valve boxes centered directly over the valves. Valve boxes shall be located outside the area of the roads and streets whenever possible. Earth fill shall be tamped around the valve box to a distance of 4 feet on all sides of the box, or to the undisturbed trench face if less than 4 feet. Clean foreign matter from interior of valves before installation. Stuffing boxes shall be tightened and the valve shall be inspected in open and closed positions to ensure that all parts are in proper working order.

3.4 DISINFECTION: Disinfect the new potable water piping and existing potable water piping affected by Contractor's operations in accordance with AWWA C601. Fill the piping systems with solution containing minimum of 50 parts per million of available chlorine, and allow solution to stand for a minimum of 24 hours. Flush the solution from the systems with clean water until maximum residual chlorine content is not greater than 0.2 parts per million.

3.5 FIELD TESTS AND INSPECTIONS: Perform all field tests, and provide all labor, equipment, and incidentals required for testing, except that water and electric power needed for field tests will be furnished free as set forth in Division 1. The Contractor shall produce evidence, when required, that any item of work has been constructed in accordance with contract requirements. Allow concrete to cure a minimum of 5 days before testing any section of piping where concrete thrust blocks have been provided.

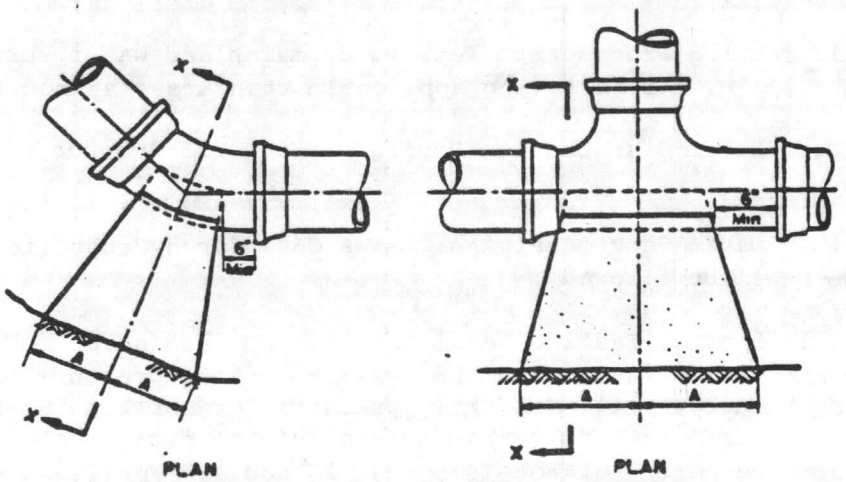
3.5.1 Testing Procedure: Test water mains and water service piping in accordance with the following applicable standards, as modified herein:

3.5.1.1 Water Distribution Piping: PVC: UNI-B-3 for pressure and leakage tests.

3.5.1.2 Water Service Piping: AWWA C600 for hydrostatic testing. No leakage shall be allowed.

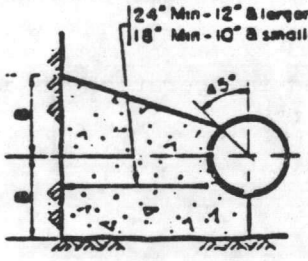
3.5.1.3 Special Testing Requirements: For pressure test, use a hydrostatic pressure 50 psi greater than the maximum working pressure of the system, but not less than 200 psi. Hold this pressure for not less than 2 hours. Prior to the pressure test, fill that portion of the piping being tested with water for a soaking period of not less than 24 hours. For leakage test, use a hydrostatic pressure not less than the maximum working pressure of the system. Leakage test may be performed at the same time and at the same test pressure as the pressure test.

3.5.1.4 All equipment shall be tested in operation to demonstrate compliance with the contract requirements.

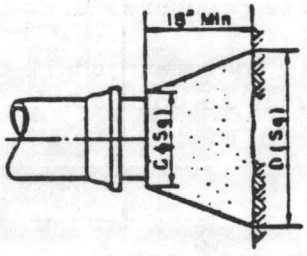


PLAN
BENDS

PLAN
TEES



SECTION X-X
BENDS & TEES



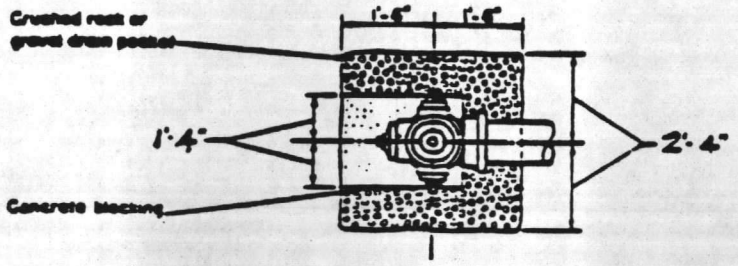
PLAN & ELEVATION
PLUGS

SIZE	1/4 BENDS		1/8 BENDS		1/16 BENDS		TEES		PLUGS	
	A	B	A	B	A	B	A	B	C	D
6"	16"	10"	9"	10"	6"	8"	10"	12"	10"	21"
8"	22"	13"	12"	13"	8"	10"	13"	16"	12"	29"
10"	26"	17"	14"	17"	10"	13"	16"	20"	14"	36"
12"	29"	21"	16"	21"	11"	16"	18"	24"	16"	41"
14"	35"	24"	19"	24"	12"	20"	22"	27"	18"	48"
16"	38"	27"	21"	27"	12"	24"	24"	30"	20"	54"

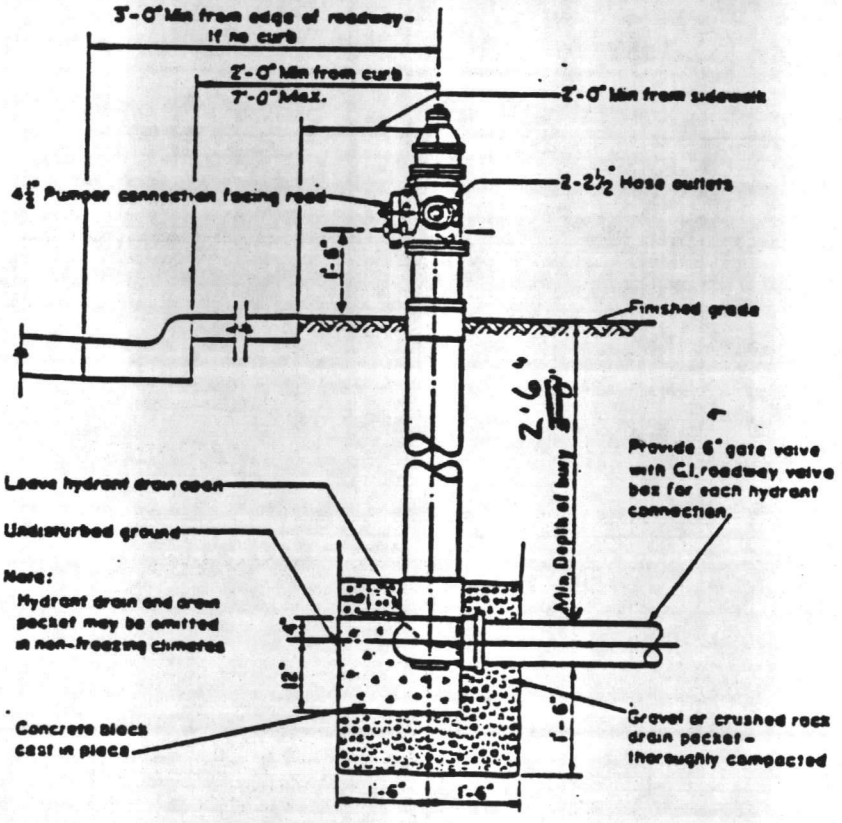
NOTE: Based on 100 p.s.i. static pressure plus A.W.W.A. water hammer
All bearing surfaces to be carried to undisturbed ground

STANDARD THRUST BLOCKS FOR WATER MAINS

Sketch NFGS-02713-1



PLAN



SECTION

FIRE HYDRANT INSTALLATION

Sketch NFGS-02713-2

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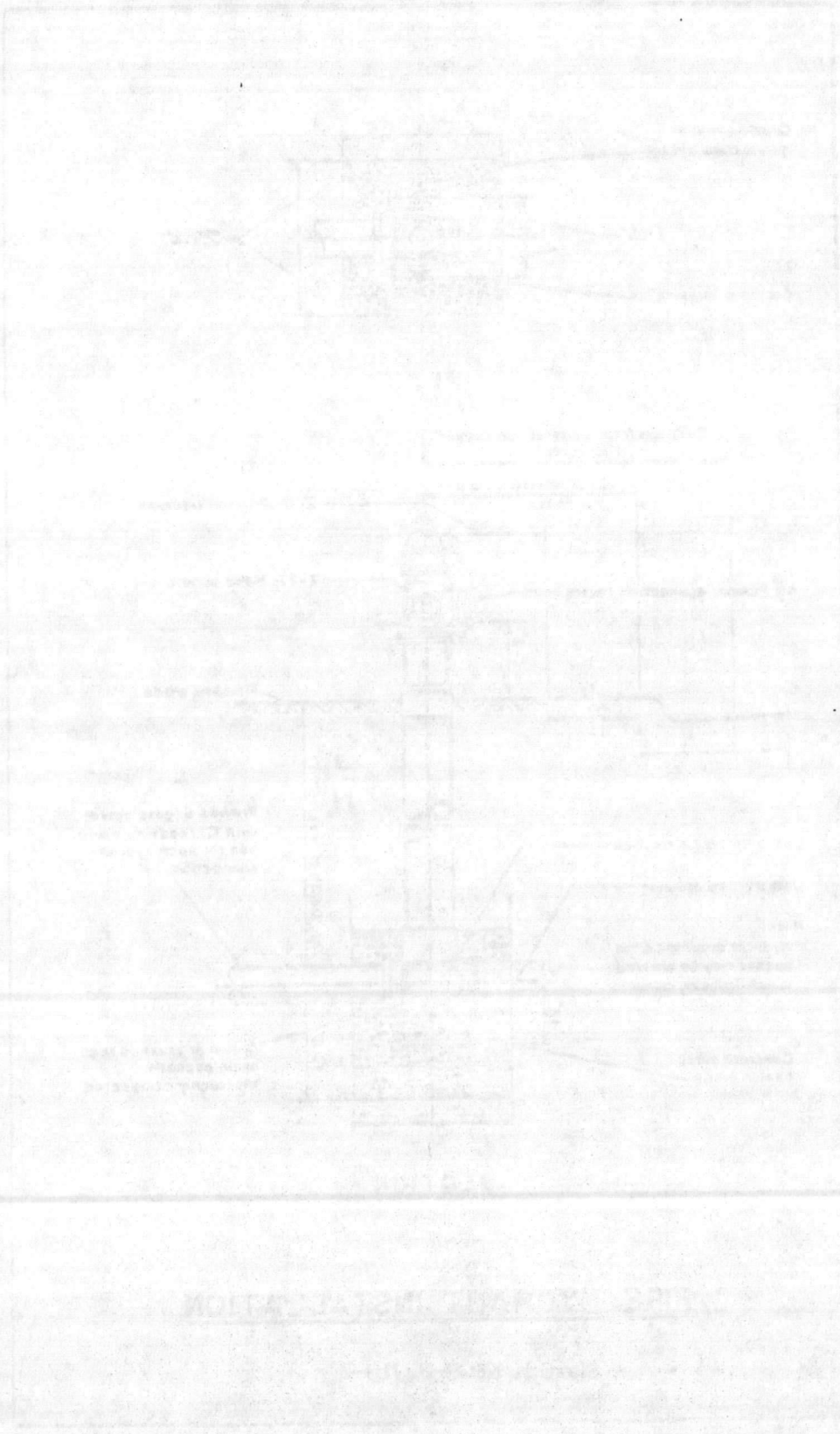


SECTION 02722
EXTERIOR SANITARY SEWER SYSTEM

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.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

C94-84	Ready-Mixed Concrete (ANSI/ASTM C94)
C144-81	Aggregate for Masonry Mortar (ANSI/ASTM C144)
C150-83a	Cement, Portland (ANSI/ASTM C150)
C207-79	Hydrated Lime for Masonry Purposes (ANSI/ASTM C207)
C270-82	Mortar for Unit Masonry
D3033-83	Type PSP Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings (ANSI/ASTM D3033)
D3034-83	Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings (ANSI ASTM D3034)
D3212-81	Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals (ANSI/ASTM D3212)
F477-76(81)	Elastomeric Seals (Gaskets) for Joining Plastic Pipe (ANSI/ASTM F477)

AMERICAN WATER WORKS ASSOCIATION (AWWA):

C111/A21.11-79	Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings (ANSI/AWWA C111/A21.11)
C600-82	Installation of Gray and Ductile Cast-Iron Water Mains and Appurtenances (ANSI/AWWA C600)

UNI-BELL PLASTIC PIPE ASSOCIATION (UNI):

UNI-B-3-79	Installation of Polyvinyl Chloride (PVC) Pressure Pipe Complying with AWWA Standard C-900
UNI-B-5-78	Installation of Polyvinyl Chloride (PVC) Sewer Pipe

1.2 GENERAL REQUIREMENTS: Section 15011,"General Requirements, Mechanical," also applies to this section except as specified otherwise.

1.2.1 Standards Compliance: Submit manufacturer's certificates of comformance or compliance for each of the following materials which are specified to conform to publications referenced under paragraph, "Materials" in this section:

a. Pipe and fittings, including factory-applied linings
b. Pipe joint materials
c. Masonry mortar
d. Masonry aggregates

All tests required by the applicable referenced publication shall have been performed, whether specified in that publication to be mandatory or otherwise. For tests which are not specified in the referenced publication to be performed

at definite intervals during manufacture, the tests shall have been performed within three years of the date of submittal of certificates on the same type, class, grade, and size of material as is being provided for the project.

1.3 DELIVERY, STORAGE, AND HANDLING OF MATERIALS:

1.3.1 Delivery and Storage:

1.3.1.1 Piping: Inspect materials delivered to site for damage; store with minimum of handling. Store materials on site in enclosures or under protective coverings. Store plastic piping and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

1.3.1.2 Cement and Lime: Store cement and lime immediately upon receipt at site of work. Store bagged cement and lime in a suitable waterproof structure made as air-tight as practicable, and with floors elevated above ground a sufficient distance to prevent absorption of moisture. Stack bags close together to reduce circulation of air, but do not stack against outside walls; arrange storage to permit easy access for inspection and identification of each shipment. Transfer bulk cement and lime to elevated weatherproof and air-tight bins. At the time of use, cement and lime shall be free-flowing and free of lumps. Cement or lime that has been in storage longer than 6 months will be tested by standard mortar tests or other tests as deemed necessary to determine its suitability for use, and such cement or lime shall not be used without approval.

1.3.1.3 Aggregates: Store aggregates on areas covered with tightly laid wood planks, sheet metal, or other hard and clean material. Store aggregates of different sizes in separate piles. Store masonry mortar aggregates separately from concrete aggregates. Build stockpiles of coarse aggregate in horizontal layers not exceeding 4 feet in depth to minimize segregation. Should coarse aggregate become segregated, remix to conform to the grading requirements given hereinafter.

1.3.2 Handling: Handle pipe, fittings, and other accessories in such manner as to ensure delivery to the trench in sound undamaged condition. Carry pipe to trench; do not drag it. Do not leave rubber gaskets and plastic piping that are not to be installed immediately in the sunlight, but store under cover out of direct sunlight.

PART 2 - PRODUCTS

2.1 POLYVINYL CHLORIDE (PVC) PLASTIC PIPING:

2.1.1 Pipe and Fittings: Pipe and fittings shall conform to ASTM D3033 or D3034, shall be SDR 35, with ends suitable for elastomeric gasket joints.

2.1.2 Joints and Jointing Material: Joints shall conform to ASTM D3212. Gaskets shall conform to ASTM F477.

2.2 MORTAR:

2.2.1 Portland Cement: ASTM C150, Type I or Type II.

2.2.2 Aggregate for Masonry Mortar: ASTM C144.

2.2.3 Hydrated Lime: ASTM C207, Type S.

2.2.4 Concrete shall be as specified in Section 03302, "Cast-in-Place Concrete."

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS FOR INSTALLATION OF PIPELINES: These requirements shall apply to all pipeline installation except where specific exception is made in the "Special Requirements ..." paragraphs hereunder.

3.2 CLEARANCES FROM WATER LINES: Where the location of the sewer is not clearly defined by dimensions on the drawings, do not lay sewer line closer horizontally than 10 feet to a water main or service line. Where sanitary sewer lines pass above water lines, encase sewer in concrete for a distance of 10 feet on each side of the crossing, or substitute rubber-gasketed pressure pipe for the pipe being used for the same distance. Where sanitary sewer lines pass below water lines, lay pipe so that no joint in the sewer line will be closer than 3 feet, horizontal distance, to the water line.

3.3 PIPE LAYING AND JOINTING: Each pipe and fitting will be inspected before and after installation and those found defective will be rejected. Provide proper facilities for lowering sections of pipe into trenches. Lay non-pressure pipe with the bell or groove ends in the upgrade direction. Adjust spigots in bells and tongues in grooves to give a uniform space all around. Blocking or wedging between bells and spigots or tongues and grooves will not be permitted. Replace by one of the proper dimensions any pipe or fitting that does not allow sufficient space for proper calking or installation of joint material. At the end of each day's work, close open ends of pipe temporarily with wood blocks or bulkheads.

3.4 CONNECTIONS TO EXISTING LINES: Make connections to existing lines in an approved manner. Conduct work so that there is minimum interruption of service on existing line.

3.5 SPECIAL REQUIREMENTS FOR INSTALLATION OF PVC PLASTIC PIPING: Install pipe and fittings in accordance with the general requirements for installation of pipelines and with the requirements of UNI-B-5 for laying and joining pipe and fittings. Make joints with the gaskets previously specified for joints with this piping; assemble these joints in accordance with the requirements of UNI-B-5 for assembly of joints. Make joints to other pipe materials in accordance with the recommendations of the plastic pipe manfacturer.

3.6 SPECIAL REQUIREMENTS FOR INSTALLATION OF PVC PLASTIC PRESSURE PIPE AND ASSOCIATED FITTINGS:

3.6.1 Installation, General: Install pipe and fittings in accordance with the general requirements for installation of pipelines and with the requirements of UNI B-3 for laying of pipe, joining PVC pipe to fittings and accessories, and setting of hydrants, valves, and fittings, except as otherwise specified in the other subparagraphs hereunder.

3.6.2 Joints: Make push-on joints with the elastomeric gaskets previously specified for this type joint, using either elastomeric-gasket bell-end pipe or elastomeric-gasket couplings. Use push-on joint having factory-made bevel on pipe ends for pipe-to-pipe joint connections only; for push-on joint connections to fittings, cut spigot end of pipe off square and re-bevel pipe end to a bevel approximately the same as that on ductile-iron pipe used for the same type of joint. Use an approved lubricant recommended by the pipe manufacturer for push-on joints. Assemble push-on joints for pipe-to-pipe joint connections in accordance with the requirements of UNI B-3 for laying the pipe. Assemble push-on joints for connection to fittings in accordance with the requirements of UNI B-3 for joining PVC pipe to fittings and accessories and with the applicable requirements of AWWA C600 for joint assembly. Make compression-type joints/mechanical-joints with the gaskets, glands, bolts, nuts, and internal stiffeners previously specified for this type joint; assemble these joints in accordance with the requiements of UNI B-3 for joining PVC pipe to fittings and accessories, with the applicable requirements of AWWA C600 for joint assembly, and with the recommendations of Appendix A to AWWA C111/A21.11. Cut off spigot end of pipe for compression-type joint/mechanical-joint connections and do not re-bevel.

3.6.3 Pipe Anchorage: Provide concrete thrust blocks (reaction backing) for pipe anchorage. Size and position thrust blocks as indicated. Use concrete conforming to ASTM C94 having a minumum compressive strength of 2,000 psi at 28 days; or use concrete of a mix not leaner than one part cement, 2-1/2 parts sand, and 5 parts gravel, having the same minumum compressive strength.

3.7 CLEANOUTS: Construct cleanouts of cast iron soil pipe and fittings.

3.8 MASONRY WORK: Do not use mortar that has hardened to the extent that it cannot be made workable without the addition of water. Use mortar conforming to Type M of ASTM C270, mixed in the proportions of one part portland cement, 1/4 part lime paste, and 3 to 3-3/4 parts sand, for brick masonry, concrete unit masonry, and for bedding cast iron frames in masonry.

3.9 METAL WORK:

3.9.1 Workmanship and Finish: Perform metal work so that workmanship and finish will be equal to the best practice in modern structural shops and foundries. Form iron to shape and size with sharp lines and angles. Do shearing and punching so that clean true lines and surfaces are produced. Make castings sound and free from warp, cold shuts, and blow holes that may impair their strength or appearance. Give exposed surfaces a smooth finish with sharp well-defined lines and arrises. Provide necessary rabbets, lugs, and brackets wherever necessary.

3.9.2 Field Painting: After installation, clean cast-iron frames, covers, gratings, and steps not buried in masonry or concrete to bare metal of mortar, rust, grease, dirt, and other deleterious materials and give a coat of bituminous paint. Do not paint surfaces subject to abrasion.

3.10 FIELD TESTS AND INSPECTIONS: The Contracting Officer will conduct field inspections and witness all field tests specified in this section. The Contractor shall perform all field tests and provide all labor, equipment, and incidentals required for testing, except that water and electric power needed for field tests will be furnished as set forth in Division 1. The contractor shall be able to produce evidence, when required, that any item of work has been constructed properly in accordance with the drawings and specifications.

3.10.1 Test Procedure:

3.10.1.1 Alignment: Check each straight run of pipeline for gross deficiencies by holding a light in a manhole; it shall show a practically full circle of light through the pipeline when viewed from the adjoining end of line. When pressure piping is used in a non-pressure line for non-pressure use, test this piping as specified for non-pressure pipe.

3.10.1.2 Leakage Tests: Test lines for leakage by either infiltration tests or exfiltration tests, as specified in this paragraph. Prior to testing for leakage, backfill trench up to at least lower half of pipe. When necessary to prevent pipeline movement during testing, place additional backfill around pipe sufficient to prevent movement, but leaving joints uncovered to permit inspection. When the water table is 2 feet or more above top of pipe at upper end of pipeline section to be tested, measure infiltration using a suitable weir or other acceptable device. When the water table is less than 2 feet above top of pipe at upper end of pipeline section to be tested, make exfiltration test by filling the line to be tested with water so that the head will be at least 4 feet above top of pipe at upper end of pipeline section being tested. Allow filled pipeline to stand until the pipe has reached its maximum absorption, but not less than 4 hours. After absorption, re-establish the head and measure amount of water needed to maintain this water level during a two-hour test period. Amount of leakage, as measured by either infiltration or exfiltration test shall not exceed 0.2 gallon per inch of diameter per hour per 100 feet of pipeline. When leakage exceeds the amount specified, make satisfactory correction and retest pipeline section in the same manner as previously specified. Correct all visible leaks regardless of leakage test results.

3.10.1.3 Deflection Testing: Make a deflection test on entire length of installed plastic pipeline on completion of all work adjacent to and over the pipeline, including leakage tests, backfilling, placement of fill, grading, paving, concreting, and any other superimposed loads. Deflection of pipe in the installed pipeline under all external loads shall not exceed 4.5 percent of the normal inside diameter of pipe. Determine whether the allowable deflection has been exceeded by use of (a) a pull-through device, or (b) a deflection measuring device.

3.10.2 Testing Devices:

3.10.2.1 Pull-through Device: This device shall be a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft. Ball, cylinder, or circular sections shall have a diameter, or minor diameter as applicable, of 95 percent of the normal inside diameter of the pipe; tolerance of plus 0.5 percent will be permitted. Ball, cylinder, or circular sections shall be of a homogeneous material throughout, shall have a density greater than 1.0 as related to water at 39.2 degrees F, and shall have a surface Brinell hardness of not less than 150. Ball, cylinder, or circular sections shall be center bored and through bolted with a 1/4-inch minimum diameter steel shaft having a yield strength of not less than 70,000 pounds per square inch, with eyes or loops at each end for attaching pulling cables. Each eye or loop shall be suitably backed with a flange or heavy washer such that a pull exerted on opposite end of shaft will produce compression throughout remote end of ball, cylinder, or circular sections. Circular sections shall be so spaced on the shaft that distance from external faces of front and back sections will equal or exceed diameter of the circular section. Pull-through device may also be of a design promulgated by the Uni-Bell Plastic Pipe Association, provided that the device meets the applicable requirements specified in this paragraph, including those for diameter of the device.

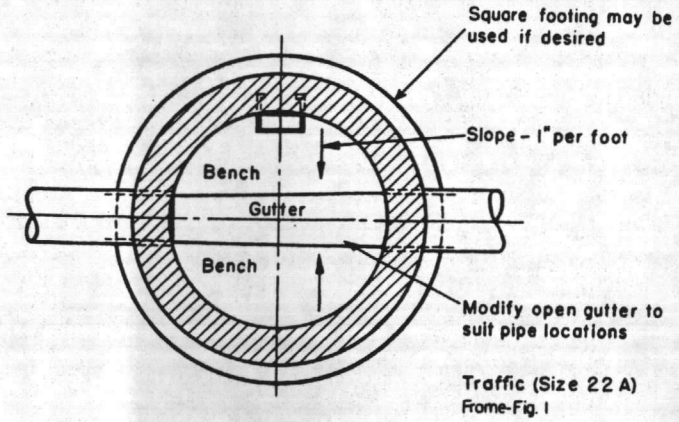
3.10.2.2 Deflection Measuring Device: This device shall be sensitive to 1.0 percent of the diameter of the pipe being tested and shall be accurate to 1.0 percent of the indicated dimension. Deflection measuring device shall be approved prior to its use.

3.10.3 Testing Procedures:

3.10.3.1 Pull-Through Device: Pass the pull-through device through each run of pipe, either by pulling it through or flushing it through with water. If the device fails to pass freely through a pipe run, replace pipe which has the excessive deflection and completely retest in same manner and under same conditions as previously specified.

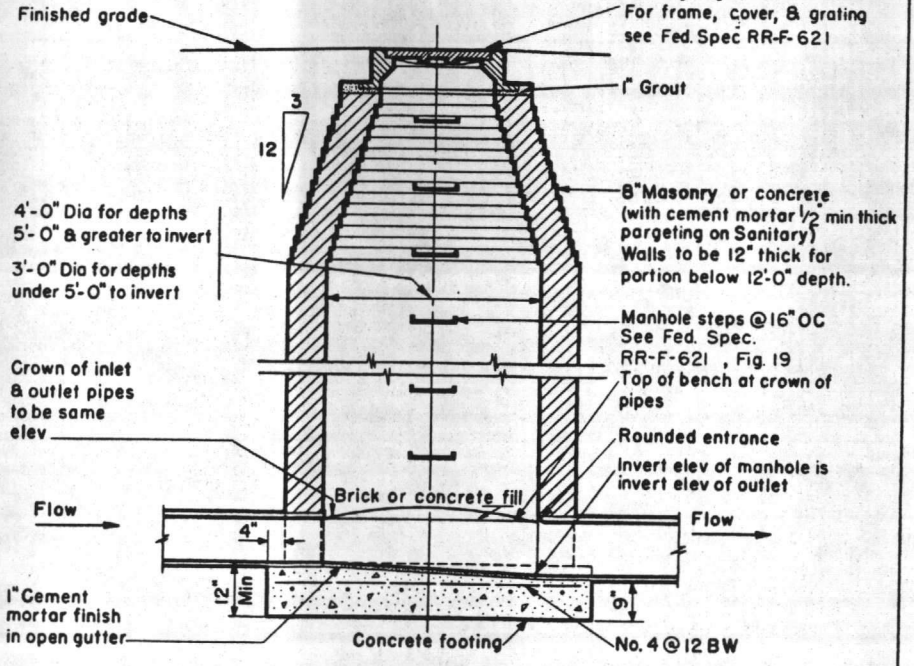
3.10.3.2 Deflection Measuring Device: Measure deflections through each run of installed pipe. If deflection readings in excess of 4.5 percent of normal inside diameter of pipe are obtained, retest pipe by a run from the opposite direction. If retest continues to show a deflection in excess of 4.5 percent of normal diameter of pipe, replace pipe which has excessive deflection and completely retest in same manner and under same conditions as previously specified.

3.10.4 Warranty Period Test: Pipe found to have a deflection of greater than 5 percent when deflection test is performed just prior to end of one-year warranty period shall be replaced and tested as previously specified for leakage and deflection.



PLAN

Traffic (Size 22 A)
Frome-Fig. 1
Cover-Fig 8
Grating- Fig. 13, Style 1
Non-Traffic (Size 22)
Frame- Fig. 4
Cover- Fig. 12
Grating-Fig. 15
For frame, cover, & grating see Fed. Spec RR-F-621



SECTION

STANDARD MANHOLE
SANITARY & DRAINAGE

Sketch TS-02722-1

END OF SECTION

SECTION 02764
WATER WELL CAPPING

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.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

A 36-81a	Structural Steel
C 658-74(80)	Chemical Resistant Resin Grouts
C 723-76(80)	Chemical Resistant Resin Tile or Brick Grouts

AMERICAN WELDING SOCIETY (AWS):

D 1.1-83	Structural Welding Code, Steel

NORTH CAROLINA ADMINISTRATIVE CODE, TITLE 15,
CHAPTER 2, SUBCHAPTER 2C (N.C. Code):

Well Construction Standards, April 1978

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA):

570/9-75-001	Manual of Water Well Construction Practices

1.2 SUBMITTALS:

1.2.1 Proposed Procedures for well abandonment shall be submitted to the Contracting Officer for approval. Work shall not begin until approval has been made in writing.

1.2.2 General: Work shall conform to N.C. Code, Subchapter 2C, and to EPA 570/9-75-001 for well abandonment. Wherever the two documents conflict, the most stringent requirement shall govern.

PART 2 - PRODUCTS

2.1 MATERIALS: Shall conform to the respective specifications and other requirements as specified herein.

2.1.1 Concrete is specified in Section 03302, "Cast-in-Place Concrete".

2.1.2 Steel Plate shall conform to ASTM A36.

2.1.3 Epoxy Grout: ASTM C658.

2.1.4 Auxiliary Equipment: Provide discharge piping to dispose of liquid wasted during the work. Locate the discharge piping a sufficient distance from each well to prevent flooding of the site and flow back into the well, as approved by the Contracting Officer.

PART 3 - EXECUTION

3.1 WELDING shall conform to AWS D1.1.

3.2 EPOXY GROUT USE: ASTM C723.

3.3 WASTE DISPOSAL: Dispose of waste materials and soil removed from the drilled holes at the Base Sanitary Landfill.

*** END OF SECTION ***

SECTION 02823
RE-ESTABLISHING VEGETATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS: The work includes seedbed preparation, liming, fertilizing and seeding of all areas where natural soil conditions have been disturbed by this contract, including damage by Contractor vehicles.

PART 2 - PRODUCTS

2.1 TOPSOIL: If stockpiled topsoil is not enough, additional topsoil shall be obtained from off Base. Topsoil shall be free from roots, wood, or other scrap material, and other vegetable matter and refuse. Fill shall be friable sandy loam with ph 6.0 to 7.0, soluble salts less than 550 ppm, high organic matter content, which is capable of producing satisfactory agricultural crops.

2.2 LIME shall be ground dolomitic agricultural limestone.

2.3 FERTILIZER shall be standard commercial product of 10-10-10 analysis.

2.4 SEED shall be 55 percent Ky-31 fescue, 25 percent annual ryegrass, and 20 percent Bermuda (unhulled), uniformly mixed with 1/8-pound centipede grass seed per 100 square feet, and shall be certified seed or equivalent based on North Carolina Seed Improvement Association requirements for certification.

PART 3 - EXECUTION

3.1 SEEDBED PREPARATION: The areas to be vegetated shall be prepared by thoroughly loosening the soil to a depth of four inches. After loosening the soil, all surface irregularities where surface water could collect and pond shall be smoothed out. Topsoil removed shall be reinstalled and leveled.

3.2 LIMING: Limestone shall be uniformly applied at the rate of 40 pounds per 1,000 square feet to all areas to be vegetated. Limestone shall be applied after seedbed preparation, but before seeding, lime shall be throughly incorporated into the entire depth of prepared seedbed.

3.3 FERTILIZING: Fertilizer shall be uniformly applied at the rate of 35 pounds per 1,000 square feet. The fertilizer shall be incorporated into the upper three or four inches of prepared seedbed.

3.4 SEEDING: Seed shall be sown by hand or an approved seeder and distributed uniformly at the rate of one-half pound per 100 square feet. The seeder shall keep the small centipede grass seeds well distributed throughout the seeding operations. The seed shall be planted no deeper than 1/4-inch. After seeding, the seeded areas shall be compacted lightly with a hand roller. All seeding and compacting shall be done when weather conditions are favorable and not when seedbed is wet.

END OF SECTION

SECTION 03302
CAST-IN-PLACE CONCRETE

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.

AMERICAN CONCRETE INSTITUTE (ACI):

211.1-81	Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
301-84	Specifications for Structural Concrete for Buildings
304-73(83)	Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

A 185-79	Welded Steel Wire Fabric for Concrete Reinforcement
A 615-82	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
C 31-84	Making and Curing Concrete Test Specimens in the Field
C 33-84	Concrete Aggregates
C 94-83	Ready-Mixed Concrete
C 143-78	Slump of Portland Cement Concrete
C 150-84	Portland Cement
C 171-69(80)	Sheet Materials for Curing Concrete
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 309-81	Liquid Membrane-Forming Compounds for Curing Concrete
C 494-82	Chemical Admixtures for Concrete

1.2 DESCRIPTION OF WORK: The work includes the provision of cast-in-place concrete. 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:

1.3.1 Contractor Mix Design: Thirty days minimum prior to concrete placement, submit a mix design for each strength and type of concrete. Include a complete list of materials including type; brand; source and amount of cement, fly ash, pozzolan, ground slag, and admixtures; applicable reference specifications; and copies of test reports showing that the mix has been successfully tested to produce concrete with the properties specified and will be suitable for the job conditions. Obtain approval prior to concrete placement. Obtain acknowledgement of receipt prior to concrete placement. Submit additional data regarding concrete aggregates if the source of aggregate has changed.

1.3.2 Manufacturer's Certificate of Compliance:

a. Cement
b. Aggregates
c. Admixtures
d. Reinforcement

1.3.3 Shop Drawings showing reinforcement layout and size.

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

PART 2 - PRODUCTS

2.1 CONCRETE:

2.1.1 Contractor-Furnished Mix Design: ACI 211.1 and ACI 301. Concrete shall have a 28-day compressive strength of 3000 psi. Slump shall be between 2 and 4 inches. 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 67 and 5 to 8 percent air entrainment for concrete exposed to the weather. 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. Ready-mixed concrete may be used provided that:

a. The plant has sufficient capacity and transportation equipment to deliver the concrete at the rate desired.

b. The plant meets the requirements specified herein for equipment, measurement of materials, and mixing.

2.2 MATERIALS:

2.2.1 Cement: ASTM C 150, Type I or II.

2.2.2 Water: Water shall be fresh, clean, and 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, E, or F), accelerating (Type C), and retarding (Type B, D, or G), to be used only when approved.

2.2.5 Reinforcement:

2.2.5.1 Reinforcing Bars: ASTM A 615, Grade 60.

2.2.5.2 Welded Wire Fabric: 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.

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. Concrete may be placed in excavations without forms upon inspection and approval by the Contracting Officer. Excavation width shall be a minimum of 4 inches greater than indicated.

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.

3.3 MEASURING, MIXING, TRANSPORTING, AND PLACING CONCRETE: ACI 301 and 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: 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: Provide and maintain 90 degrees F maximum concrete temperature. 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. Slope slabs uniformly to drains where drains are provided.

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 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.

3.5 CONCRETE WALKS: Provide broomed finish. 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.

3.6 CURING AND PROTECTION: ACI 301. Protect concrete from injurious action by sun, rain, 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 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. Do not use this method of curing where the use of Figure 2.1.5, ACI 305R indicates that hot weather conditions will cause an evaporation rate exceeding 0.2 pound of water per square foot per hour. Provide a continuously wetted, permeable cover as specified in paragraph herein 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. ASTM C 31 for making test specimens.

3.7.2 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.

3.7.3 Testing:

3.7.3.1 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, when test cylinders are made, and for each batch (minimum) or every 10 cubic yards (maximum) of concrete.

3.7.3.2 Temperature Tests: Test the concrete delivered and the concrete in the forms. Perform tests in hot or cold weather conditions (below 50 degrees F and above 80 degrees F) for each batch (minimum) or every 10 cubic yards (maximum) of concrete, until the specified temperature is obtained, and whenever test cylinders and slump tests are made.

3.7.3.3 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 05501
MISCELLANEOUS METALS

PART 1 - GENERAL

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

A36-81A	Structural Steel
A53-82	Pipe, Steel, Black, Hot-Dipped, Zinc-Coated Welded and Seamless
A120-83	Pipe, Steel, Black & Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless for Ordinary Uses
A123-78	Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strip
A153-82	Zinc-Coating (Hot-Dip) on Iron and Steel Hardware
A525-81	Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
A786-81	Rolled Steel Floor Plates

AMERICAN WELDING SOCIETY (AWS):

D1.1-83	Structural Welding Code

PART 2 - PRODUCTS

2.1 ZINC-COATING, conforming to ASTM A123 or ASTM A153, shall be applied to all ferrous metals. Floor stands and angle iron pipe brackets shall be hot dipped in assembly.

2.2 NON-FERROUS METALS shall be protected from corrosion by a coating according to manufacturer's recommendations.

2.3 DISSIMILAR METALS shall be protected by having contact surfaces coated with a heavy coat of bituminous paint. Aluminum surfaces to be embedded in plaster or mortar shall be protected with a heavy coat of bituminous paint or clear non-staining or non-yellowing colorless coating.

2.4 FASTENERS, ANCHORS, ANCHOR BOLTS and similar items necessary for installation of the work shall be provided. Sizes, types, and spacing of anchors and bolts not indicated or specified otherwise shall be as necessary for their purposes. Anchors and bolts in contact with ferrous metal shall be zinc-coated steel and those adjacent to non-ferrous metal shall be of the same or approved metals compatible with the materials which they adjoin.

2.5 PIPE shall conform to ASTM A53 or A120.

2.6 STEEL PLATE shall conform to ASTM A36.

2.7 CHECKERED STEEL PLATE shall conform to ASTM A786. Any of Patterns 2 through 5.

PART 3 - EXECUTION

3.1 WELDING shall conform to AWS D1.1.

3.2 FASTENERS shall provide rigid attachment to surfaces.

3.3 FINISHING: All surfaces of ferrous metal not zinc-coated or encased in concrete shall be painted in colors to match existing adjacent surfaces.

END OF SECTION

SECTION 09910
PAINTING

PART 1 - GENERAL

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

FEDERAL SPECIFICATIONS (Fed. Spec.):

TT-E-489G	Enamel, Alkyd, Gloss (Exterior and Interior Surfaces)
TT-F-1098D	Filler, Surface, Styrene-Butadiene, Filler for Porous Surfaces
TT-P-19C(2)	Paint, Acrylic Emulsion, Exterior
TT-P-38D(1)	Paint, Aluminum, Ready-Mixed
TT-P-102E(1)	Paint, Oil Alkyd Modified, Exterior, White and Tints
TT-P-645B	Primer, Paint, Zinc-Chromate, Alkyd Type

MILITARY SPECIFICATIONS (Mil. Spec.):

MIL-R-10036D	Rust Arresting Coating (for Treatment of Rusted Metals)
MIL-P-12742C(2)	Primer Coating, Phenolic, Water Immersible
MIL-P-28577A	Primer, Latex, Corrosion Resistant, for Metal Surfaces
MIL-P-28578A	Paint, Water Reducible, Semigloss, Exterior and Interior
MIL-P-28582	Primer Coating, Exterior, Lead Pigment-Free (Undercoat for Wood, Ready-Mixed, White and Tints)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

D 3335-78	Low Concentratons of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy

1.2 GENERAL REQUIREMENTS: Only surfaces damaged by the Contractor's operations or new surfaces shall be painted. Surfaces to be painted shall be thoroughly cleaned and shall be dry when paint is applied. Paint shall not be applied to surfaces upon which there is frost, ice, or snow. Painting materials shall be worked thoroughly into all joints, crevices, and open spaces. Samples of all finishes shall be submitted for color selection. Colors and shades of colors shall match existing colors, unless specified otherwise. Paints and paint materials shall be delivered in unbroken original packages bearing the manufacturer's name and brand designation. Storage of paints and paint materials and the mixing of paint shall be restricted to the locations directed. Reduction of paint, except when thinning is mandatory for the type of paint being used, shall not be permitted without written permission from the Contracting Officer. The written permission shall include quantities and types of thinners to use. Thinners shall not be permitted upon the job site unless written permission for thinning has been given by the Contracting Officer. Maximum lead content of any finishes applied shall be 0.06 percent by weight (calculated as lead metal). Testing shall be in accordance with ASTM D3335. Exterior putty, caulking and glazing compound shall be painted as are the surfaces on which they occur.

1.3 SPECIAL REQUIREMENTS:

1.3.1 Sampling and Testing: Samples may be taken from paints being used on the job and tested by the Government. Certificates of Compliance shall be submitted and approved before delivery of painting materials to the site.

1.3.2 Fungus Inhibitors: All paints and primers shall contain four percent tetrachlorophenol based on the total non-volatile content of the paint or other approved fungus inhibitors.

1.4 SURFACES NOT TO BE PAINTED:

a. Stainless steel surfaces
b. Prefinished items
c. Bituminous coated surfaces
d. Glazing
e. Ceramic or vitreous surfaces
f. Zinc-coated or copper pipe under insulation
g. Zinc-coated materials
h. Brick, not previously painted
i. Floors
j. Concrete, not previously painted

PART 2 - PRODUCTS

2.1 PAINTING MATERIALS shall conform to the following:

SURFACE MATERIAL	PRETREATMENT PRIMER	FINISH COATS	NO. OF FINISH COATS
Wood	MIL-P-28582(if bare)	TT-P-102	2
Metal Trim	TT-P-645(if bare)	TT-P-102	2
Concrete	----------	TT-P-19	2
Metals Scheduled for Aluminum Finish	MIL-P-12742(Type I)	TT-P-38	2
Stucco, Siding	TT-F-1098 (if scheduled)	TT-P-19	2
Miscellaneous Metals and Fire Plug	TT-P-645(if bare)	TT-E-489	2

2.2 COLOR SCHEDULE: Colors of exterior surfaces shall match existing adjacent surfaces, except Fire Plug shall be painted.

PART 3 - EXECUTION

3.1 PREPARATION OF SURFACES: Surfaces shall be free from dirt, dust, rust, scale, disintegrated paint, grease, and mildew and in proper condition to receive the paint.

3.2 MILDEW REMOVAL: All surfaces showing evidence of mildew shall be cleaned as follows:

a. Surfaces shall be brushed thoroughly with a stiff-bristled brush to remove all loose moss, dirt and mildew build-up. Wire brushes shall not be used.

b. Surfaces shall then be thoroughly scrubbed with a solution composed of two pounds trisodium phosphate, 1-1/2 pounds detergent, 10 quarts of 5 percent solution of sodium hypochlorite, and enough warm water to make up to 10 gallons. The surfaces shall be wet down with a hose prior to scrubbing, and after scrubbing operations have been completed, all loose dirt and mildew shall be rinsed off.

c. After the surfaces have dried, the scrubbing process shall be repeated using a solution composed of 10 quarts of 5 percent solution of sodium hypochlorite and enough warm water to make up to 10 gallons. After all visible evidence of mildew or fungus growth has been removed, the surfaces shall be rinsed with fresh water and allowed to dry thoroughly.

3.3 WOOD SURFACES: All loose and scaled paint shall be removed by scraping, wire brushing, hand sanding or power sanding. Loose boards shall be renailed where necessary and all loose and protruding nails shall be driven up tight. All nail holes shall be putty stopped. Defects in surfaces, such as open joints, cracks, nicks, and gouges shall be repaired. They shall be repaired in such manner as to be practically imperceptible in the finish work.

3.4 METAL SURFACES to be painted shall have all deleterious substances removed as specified hereinbefore and shall be sandpapered, wire bursched or rubbed with steel wool over the entire surfaces, and scraped where necessary to remove loose paint. Any rusted spots shall be cleaned down to bare metal, including spots where rust discoloration appears through the existing paint. The removal shall be to the extent that only rust discoloration in deep pits remains. Otherwise, the surfaces shall be cleaned to bright metal. Immediately after such cleaning and before any new rust has formed, the bare surfaces shall receive a coat of rust-arresting compound conforming to MIL-R-10036D.

3.5 APPLICATION OF PAINT: No surfaces to be painted until surface preparation has been approved by the Contracting Officer. Provide finished surfaces free from runs, drops, ridges, waves, laps, brush marks, and variations in colors.

3.6 WEATHER LIMITATIONS:

3.6.1 Exterior coatings shall not be applied in foggy or rainy weather or when the temperature of the air at the surface is below 45 degrees Fahrenheit or over 95 degrees Fahrenheit, unless approved by the Contracting Officer.

3.6.2 Interior coatings shall be applied when the surfaces to be painted are dry and the temperature can be kept above 45 degrees Fahrenheit and below 95 degrees Fahrenheit during the application of ordinary paints and between 65 degrees Fahrenheit and 95 degrees Fahrenheit during the application of enamels and varnishes.

3.7 APPLICATION EQUIPMENT: Apply coatings carefully with good, clean brushes or approved rollers.

3.8 CLEAN-UP: Paint shall be removed immediately where spilled or spattered on surfaces adjacent to the work, including fixtures, glass and fittings. The premises shall be kept free at all times from accumulation of waste material and rubbish resulting from the work. Upon completion of the work, all tools, scaffolding, surplus material and rubbish shall be removed and the premises left clean.

END OF SECTION

SECTION 15011
MECHANICAL GENERAL REQUIREMENTS

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.

FEDERAL SPECIFICATIONS (Fed. Spec.):

TT-E-489G	Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces)
TT-E-496B(2)	Enamel, Heat-Resisting (400 Degrees Fahrenheit), Black
TT-P-28F	Paint, Aluminum, Heat Resisting (1200 Degrees Fahrenheit)
TT-P-645A	Primer, Paint, Zinc-Chromate, Alkyd Type

MILITARY SPECIFICATIONS (Mil. Spec.):

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

B117-73(79)	Salt Spray (Fog) Testing, Method of

1.2 APPLICATION: This section applies to the piping sections of Division 2, "Site Work" and all sections of Division 15, "Mechanical" of this project except as specified otherwise in each individual section.

1.3 SUBMITTALS: Submit shop drawings, manufacturer's data, publication compliance, certified test reports, and manufacturer's certificates of compliance for equipment, materials and finish, and pertinent details for each system where specified in each individual section, and have them approved before procurement, fabrication or delivery of the items to the job site. Partial submittals will not be acceptable and will be returned without review. Submittals shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and the specific technical paragraph reference which specifies each item, applicable Federal, Military, industry and technical society publication references, and other information necessary to establish contract compliance of each item to be furnished.

1.3.1 Shop Drawings: Drawings shall be a minimum of 8.5-inches by 11-inches in size, except as specified otherwise. Drawings shall include floor plans, sectional views, and installation details of equipment; and equipment spaces identifying and indicating proposed location, layout and arrangement of items of equipment, accessories, piping, and other items that must be shown to assure a coordinated installation. Drawings shall indicate adequate clearance for operation, maintenance and replacement of operating equipment devices. If equipment is disapproved, drawings shall be revised to show acceptable equipment and be resubmitted.

1.3.2 Manufacturer's Data: Submittals for each manufactured item shall be manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts.

1.3.3 Publication Compliance: Where equipment or materials are specified to conform to industry and technical society publications of organizations such as American National Standard Institute (ANSI), American Society for Testing and Materials (ASTM), and Underwriters Laboratories, Inc. (UL), proof of such compliance shall be submitted. The label or listing by the specified organization will be acceptable evidence of compliance. In lieu of the label or listing, submit a certificate from an independent testing organization adequately equipped and competent to perform such services, and approved by the Contracting Officer, stating that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's publication. Where equipment or materials are specified to conform to Federal Specifications (Fed. Spec.) and Military Specifications (Mil. Spec.), the manufacturer of the product shall submit a certificate of compliance stating that the equipment or materials meets or exceeds the performance, design, and product requirements of the referenced publications.

1.3.4 Certified Test Reports: The testing requirements in referenced publications for materials will be waived provided the manufacturer's original certificates are submitted stating that previously manufactured materials have been tested by approved laboratories, that such materials meet testing requirements specified, and that the materials furnished for this project are of the same type, quality, manufacture, and make as that tested; copies of the test reports need not be submitted except as specifically requested.

1.3.5 Manufacturer's Certificates of Compliance: Submit certification from manufacturer attesting that materials and equipment to be furnished for this project comply with the requirements of this specification and of the reference publications. Pre-printed certifications will not be acceptable; certifications shall be the manufacturer's original; certifications shall be not more than one year old. The certification shall not contain statements that could be interpreted to imply that the product does not meet all requirements specified, such as "as good as"; "achieve the same end use and results as materials formulated in accordance with the referenced publications"; "equal or exceed the service and performance of the specified material". The certification shall simply state that the product conforms to the requirements specified. Certificates shall be signed by the manufacturer's official authorized to sign certificates of compliance.

1.4 OPERATION AND MAINTENANCE MANUAL: Furnish an operation and maintenance manual for each backflow preventer installation. Furnish two copies of the manual bound in hardback binders or an approved equivalent. Furnish one complete manual prior to the time that equipment tests are performed, and furnish the remaining manuals before the contract is completed. Inscribe the following identification on the cover: the words OPERATION AND MAINTENANCE MANUAL, the name and location of the equipment or the building, the name of the Contractor, and the contract number. The manual

shall include the names, addresses, and telephone numbers of each subcontractor installing equipment, and of the local representatives for each item of equipment. The manual shall have a table of contents and be assembled to conform to the table of contents with the tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in. The manual shall include: wiring and control diagrams with data to explain detailed operation and control of each item of equipment; a control sequence describing start-up, operation and shut-down; description of the function of each principal item of equipment; the procedure for starting; the procedure for operating; shut-down instructions; installation instructions; maintenance instructions; lubrication schedule including type, grade, temperature range, and frequency; safety precautions, diagrams, and illustrations; test procedures; performance data; and parts list. The parts lists for equipment shall indicate the sources of supply, recommended spare parts, and the service organization which is reasonably convenient to the project site. The manual shall be complete in all respects for equipment, controls, accessories, and associated appurtenances provided.

1.5 POSTED OPERATING INSTRUCTIONS: Furnish approved operating instructions for each principal backflow preventer installation for the use of the operation and maintenance personnel. The operating instructions shall include wiring diagrams, control diagrams, and control sequence for each principal item of equipment. Operating instructions shall be printed or engraved, and shall be framed under glass or in approved laminated plastic and posted where directed. Operating instructions shall be attached to or posted adjacent to each principal item of equipment including start up, proper adjustment, operating, lubrication, shut-down, safety-precautions, procedure in the event of equipment failure, and other items of instruction as recommended by the manufacturer of each item of equipment. Operating instructions exposed to the weather shall be made of weather-resisting materials or shall be suitably enclosed to be weather protected. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

1.6 INSTRUCTION TO GOVERNMENT PERSONNEL: Furnish the services of competent instructors to give full instruction to the Government personnel in the adjustment, operation and maintenance, including pertinent safety requirements of the backflow preventers. Each instructor shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Government for regular operation. The number of mandays (8-hours) of instruction furnished shall be as specified in each individual section.

1.7 DELIVERY AND STORAGE: Properly store, adequately protect and carefully handle equipment and materials to prevent damage before and during installation. Handle, store, and protect equipment and materials in accordance with the manufacturer's recommendations. Replace damaged or defective items.

1.8 CATALOGED PRODUCTS: Materials and equipment shall be cataloged products of manufacturers regularly engaged in production of such materials or equipment and shall be manufacturer's latest design that complies with the specification requirements. Materials and equipment shall duplicate items that have been in satisfactory commercial or industrial use. Where two or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the items need not be the products of the same manufacturer. Each item of equipment shall have the manufacturer's name, address, model number and serial number on the nameplate securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

1.9 VERIFICATION OF DIMENSIONS: Coordinate the proper relation of the work to the building structure and to the work of all trades. Visit the premises and become familiar with the dimensions in the field, and advise the Contracting Officer of any discrepancy before performing any work.

1.10 MANUFACTURER'S RECOMMENDATIONS: Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Contracting Officer prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

PART 2 - EXECUTION

2.1 PAINTING OF NEW EQUIPMENT: Equipment painting, factory applied or shop applied, shall be as specified herein, and provided under each individual section of this specification.

2.1.1 Factory Painting Systems: Manufacturer's standard factory painting systems may be provided subject to certification that the factory painting system applied will withstand 125 hours in a salt-spray fog test, except that equipment located outdoors shall withstand 500 hours in a salt spray fog test. Salt spray fog test shall be in accordance with ASTM B117. Immediately after completion of the test, the paint shall show no signs of blistering, wrinkling or cracking; and no loss of adhesion; and the specimen shall show no signs of rust creepage beyond 0.125 inch on either side of the scratch mark. The film thickness of the factory painting system applied on the equipment shall not be less than the film thickness used on the test specimen. If manufacturer's standard factory painting system is being proposed for use in lieu of the shop painting systems using Fed. Spec. TT-E-496 or TT-P-28, certifications that the manufacturer's standard factory painting system will conform to the heat resistance requirement of Fed. Spec. TT-E-496 or TT-P-28 as applicable, shall be submitted in addition to other certifications.

2.1.2 Shop Painting Systems: Clean, pretreat, prime and paint metal surfaces; except aluminum surfaces shall not be painted. Apply coatings to clean dry surfaces. Clean the surfaces to remove dust, dirt, rust, oil and grease by wire brushing and solvent degreasing prior to application of paint, except metal surfaces subject to temperatures in excess of 120 degrees

Fahrenheit (F) shall be cleaned to bare metal. Where more than one coat of paint is specified, apply the second coat after the preceding coat is thoroughly dry. Lightly sand damaged painting and retouch before applying the succeeding coat.

2.1.2.1 Metal Surfaces Subject to Temperatures Less Than 120 Degrees F.: Immediately after cleaning, the metal surfaces shall receive one coat of Mil. Spec. DOD-P-15328 pretreatment primer applied to a minimum dry film thickness of 0.3 mil, one coat of Fed. Spec. TT-P-645 primer applied to a minimum dry film thickness of one mil; and two coats of Fed. Spec. TT-E-489 enamel applied to a minimum dry film thickness of one mil per coat.

2.1.2.2 Metal Surfaces Subject to Temperatures Between 120 and 400 Degrees F.: Surfaces shall receive two coats of Fed. Spec. TT-E-496, Type II, heat-resisting enamel applied to a total minimum thickness of 2 mils.

2.1.2.3 Metal Surfaces Subject to Temperatures Greater Than 400 Degrees F.: Surfaces shall receive two coats of Fed. Spec. TT-P-28 heat-resisting aluminum paint applied to a total minimum dry film thickness of 2 mils.

*** 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.

FEDERAL SPECIFICATIONS (Fed. Spec.):

L-P-387A(2)	Plastic Sheet, Laminated, Thermosetting (For Designation Plates)
TT-P-645A	Primer, Paint, Zinc Chromate, Alkyd Type
WW-N-351C(1)	Nipples, Pipe, Threaded
WW-U-516B	Unions, Brass or Bronze, Threaded Pipe Connections, and Solder Joint Tube Connections

MILITARY SPECIFICATIONS (Mil. Spec.):

MIL-G-1086E	Gasket Material, Synthetic Rubber (For Bolted Steel Tanks)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI):

B16.1-75	Cast-Iron Pipe Flanges and Flanged Fittings
B16.12-80	Cast-Iron Threaded Drainage Fittings
B16.22-80	Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
B16.24-79	Bronze Pipe Flanges and Flanged Fittings
B16.39-77	Malleable-Iron Threaded Pipe Unions

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM):

A 53-83	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
A 120-83	Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless for Ordinary Uses
B 61-82a	Steam or Valve Bronze Castings
B 62-82a	Composition Bronze or Ounce Metal Castings

AMERICAN WATER WORKS ASSOCIATION (AWWA):

C506-78	Backflow Prevention Devices, Reduced Pressure Principle and Double-Check Valve Types
C601-81	Disinfecting Water Mains
C701-78	Cold-Water Meters, Turbine Type for Customer Service

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS):

SP-58-75	Pipe Hangers and Supports - Materials, Design and Manufacture
SP-69-76	Pipe Hangers and Supports - Selection and Application
SP 70-84	Cast Iron Gate Valves, Flanged and Threaded Ends
SP 80-79	Bronze Gate, Globe Angle and Check Valves

SOUTHERN BUILDING CODE CONGRESS INTERNATIONAL (SBCC):

1982 Standard Plumbing Code

1.2 GENERAL REQUIREMENTS: Section 15011, "Mechanical General Requirements," applies to this section, with the additions and modifications specified herein.

1.3 SUBMITTALS:

1.3.1 Manufacturer's Data:

a. Pipe and fittings
b. Valves
c. Pipe supports (hangers)
d. Backflow preventers

1.3.2 Certificates of Compliance:

a. Pipe and fittings
b. Valves
c. Backflow preventers

1.3.3 Certified Data: Backflow preventers

1.3.4 Operation and Maintenance Manuals and Posted Operating Instructions: Backflow Preventers.

PART 2 - PRODUCTS

2.1 BACKFLOW PREVENTERS: AWWA C506 reduced pressure principle type, as modified herein. Backflow preventers shall have threaded connections and all bronze construction for sizes of 2 inches and smaller, and shall have flanged connections and galvanized cast-iron or epoxy coated cast-iron construction for sizes larger than 2 inches. The backflow preventer shall include two check valves located between two shut-off valves with an area of reduced pressure between the check valves and a relief device arranged to discharge to the atmosphere. Fluctuation in piping pressure shall not cause cycling. The backflow preventer shall automatically maintain a low pressure zone to positively prevent the backflow of water into the water supply system. The backflow preventer shall automatically indicate failure of any part vital to the prevention of backflow by the continuous discharge of the relief device. The backflow preventer shall be suitable for a cold water working pressure of 175 psig. The backflow preventer shall be designed so that any moving part may be replaced without removing the backflow preventer.

2.1.1 Certificate of Full Approval or Current Certificate of Approval: Furnish for each design, size, and make of backflow preventer being provided. The certificate shall be from the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California, and shall attest that this design, size, and make of backflow preventer has satisfactorily passed the complete sequence of performance tests and evaluations for the respective level of approval. A Certificate of Provisional Approval will not be acceptable in lieu of the above.

2.1.2 Anti-Freeze Device: Provide for each backflow preventer and shall be activated by the ambient air temperature. Anti-freeze devices shall be factory set to begin to open at 35 degrees Fahrenheit air temperature, to fully open at 29 degrees Fahrenheit air temperature, and to fully close at 37 degrees Fahrenheit air temperature. Each anti-freeze device shall be provided with a strainer furnished by the anti-freeze device manufacturer. Flow at full open position shall be not less than 8 gpm at 60 psi. Anti-freeze device shall be installed so that discharge flow shall spill without any build-up of ice to block the discharge from anti-freeze device. Provide a nonferrous metal plate painted yellow with black lettering with the words "DO NOT CLOSE VALVE" adjacent to each anti-freeze device in a conspicuous location. Anti-freeze device shall be one of the following:

2.1.2.1 Automatic Bleeder Valve: Provide self-contained thermally-actuated valve operated by a material having the proper temperature and volume relationship to open and close the valve. Valve shall have overtemperature spring to protect the thermal system and poppet from damage due to high temperatures. If the thermal system fails, the valve shall open. Valve shall be all bronze with stainless steel springs and Buna-S poppet.

2.1.2.2 Temperature Control Valve: Provide self-contained, complete with thermostat and flexible armored capillary tubing. Valve shall be brass body single seated with corrosion-resistant metallic tubing; valve operator shall be fully enclosed in stainless steel.

2.2 STEEL PIPE: ASTM A 53 or ASTM A 120, Schedule 40, hot-dip galvanized, threaded end connections; with ANSI B16.12 hot-dip galvanized threaded fittings.

2.3 WATER VALVES: Provide valves suitable for minimum of 125 psig and minimum of 180 degrees F hot water. Valves shall have flanged end connections, except sizes smaller than 2.5 inches may have threaded end connections with a union on all but one side of the valve, or solder end connections for connections between bronze valves and copper tubing. Copper alloy and bronze valve body shall be ASTM B 61 or ASTM B 62 copper alloy. Ball valves and butterfly valves may be provided in lieu of gate valves.

2.3.1 Gate Valves: MSS SP-80, Class 125, except sizes 2.5 inches and larger shall conform to MSS SP-70, Class 125.

2.4 NON-FREEZE HOSE BIBBS: Provide copper alloy valve with lockshield and handwheel. Inlet shall have external threads. Outlet shall have automatic draining vacuum breaker with 0.75-inch external hose threads. Hydrant shall be of sufficient length to extend underground and place the valve seat at the indicated depth. Bonnet and valve stem shall be removable from top of above ground assembly.

2.5 WATER METERS: AWWA C701, with register reading in gallons. Provide type of meter suitable for the intended service.

2.6 PIPE NIPPLES: Fed. Spec. WW-N-351, copper alloy for use in copper tubing and hot-dip galvanized Schedule 80 steel pipe for use in steel piping.

2.7 UNIONS: Fed. Spec. WW-U-516 for use in copper tubing; ANSI B16.39 hot-dip galvanized steel for use in steel piping.

2.8 FLANGES: ANSI B16.1, Class 125, for use in ferrous piping; ANSI B16.22 or ANSI B16.24 for use in copper tubing; with Mil. Spec. MIL-G-1086 full face flat type synthetic rubber gaskets.

2.9 ESCUTCHEON PLATES: Provide one piece or split hinge type metal plates for piping passing through floors, walls, and ceilings in exposed spaces. Provide chromium-plated finish on plates in finished spaces. Provide paint finish on plates in unfinished spaces. Securely anchor plates in place with set screws or other approved positive means.

2.10 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. 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.

2.10.1 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, except sleeves are not required where DWV piping passes through concrete floor slabs located on grade.

2.10.2 Sleeves in Partitions and Other Than Masonry and Concrete Walls, Floors, and Roofs: Provide hot-dip galvanized steel sheet having a nominal weight of not less than 0.90 pounds per square foot.

2.11 PIPE SUPPORTS (Hangers): Provide MSS SP-58 and MSS SP-69, Type 1 or 6, of the adjustable type, except as indicated or specified herein. Provide Type 40 insulation protection shields for insulated piping. Provide steel support rods. Provide nonmetallic, hair felt, or plastic piping isolators between copper tubing and the hangers. Provide flat wide band hangers for uninsulated plastic piping.

PART 3 - EXECUTION

3.1 INSTALLATION: Installation of plumbing systems including fixtures, equipment, materials, workmanship, and connection to water lines installed under Section 02713, "Exterior Water Distribution Service Work", shall be in accordance with the SBCC Standard Plumbing Code, except as modified herein. When fixtures require both hot water and cold water supplies, provide the hot water supply to the left of the cold water supply. Plastic piping shall not penetrate fire walls.

3.1.1 Threaded Connections: Jointing compound for pipe threads shall be polytetrafluoroethylene (PTFE) pipe thread tape, pipe cement and oil, or PTFE powder and oil; apply only on male threads. Provide exposed ferrous pipe threads with one coat of Fed. Spec. TT-P-645 primer applied to a minimum dry film thickness of 1.0 mil.

3.1.2 Pipe Supports (Hangers): Provide additional supports at the concentrated loads in piping between supports, such as for inline water pumps and flanged valves.

3.1.3 Maximum Spacing Between Supports: Support horizontal piping as follows:

MAXIMUM SPACING (FEET)

Nominal Pipe Size (inches)	One and under	1.25	1.5	2	2.5	3	3.5	4	5	6
Steel Pipe	7	8	9	10	11	12	13	14	16	17

3.2 NAMEPLATES: Provide laminated plastic nameplates for equipment and valves; stop valves in supplies to fixtures will not require nameplates. Laminated plastic shall be 0.125-inch thick melamine plastic conforming to Fed. Spec. L-P-387, black with white center core. Surface shall be a matte finish. All corners shall be square. Accurately align lettering and engrave into the white core. Minimum size of nameplates shall be 1.0 inch by 2.5 inches. Lettering shall be minimum of 0.25-inch high normal block lettering. Key the nameplates to a chart and schedule for each system. Frame charts and schedules under glass and place where directed near each system. Furnish two copies of each chart and schedule. Each inscription shall identify its function. Equipment nameplates shall show the following information.

a. Manufacturer, type, and model number
b. Contract number and accepted date
c. Capacity or size
d. System in which installed
e. System which it controls

3.3 DISINFECTION: Disinfect the new water piping and existing water piping affected by Contractor's operations in accordance with AWWA C601. Fill the piping systems with solution containing minimum of 50 parts per million of available chlorine and allow solution to stand for minimum of 24 hours. Flush the solution from the systems with clean water until maximum residual chlorine content is not greater than 0.2 parts per million.

3.4 FIELD TESTING: Before final acceptance of the work, test each system as in service to demonstrate compliance with the contract requirements. Perform the following tests in addition to the tests specified in the SBCC Standard Plumbing Code, except as modified herein.

3.4.1 Domestic Water Piping: Hydrostatically test each piping system at not less than system working pressure with no leakage or reduction in gage pressure for 2 hours.

3.4.2 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 ***

GENERAL WAGE DECISION NO. NC86-4

Supersedes General Wage Decision No. NC81-1201

State: NORTH CAROLINA

County(ies): BRUNSWICK, CARTERET, COLUMBUS, CRAVEN, DUPLIN, JONES, LENOIR, NEW HANOVER, ONSLOW, PAMLICO, AND PENDER.

Construction Type: BUILDING

Construction Description: BUILDING CONSTRUCTION (does not include single family homes and apartments up to and including 4 stories).

Modification Record:

No.	Publication Date	Page No.(s)

	BASIC HOURLY RATES	FRINGE BENEFITS
ASBESTOS WORKERS	7.26	
BRICKLAYERS	7.10	
CARPENTERS	6.02	
CEMENT MASONS	5.68	
DRYWALL MECHANICS	7.00	
ELECTRICIANS	6.22	
ELECTRONIC TECHNICIANS	4.50	
GLAZIERS	5.38	
IRONWORKERS	6.66	
LABORERS:		
LABORERS - GENERAL	3.78	
PIPE LAYERS	4.94	
MILLWRIGHTS	9.45	
PAINTERS	5.00	
PLASTERERS	6.00	
PLUMBERS & PIPEFITTERS	6.52	
ROOFERS	5.91	
SHEET METAL WORKERS	6.38	
SOFT FLOOR LAYERS	7.00	
SPRINKLER FITTERS	7.95	
TILE SETTERS	6.00	
TRUCK DRIVERS	3.90	

WELDERS - Recieve rate for craft performing operation to which welding is incidental.

EQUIPMENT OPERATORS:		
ASPHALT RAKERS	4.27	
BACKHOE	5.32	
BULLDOZER	5.25	
CRANE	6.80	
DISTRIBUTOR	4.70	
FORK LIFT	6.50	
FRONT END LOADER	4.50	
MOTOR GRADER	5.36	
PAVER - SCREED	4.25	
ROLLER	5.00	
SCRAPER - PAN	4.60	
TRACTOR	5.00	

Unlisted classifications needed for work not included within the scope of the classifications listed may be added only as provided in the labor standards contract clauses (29 CFR, 5.5 (a) (1) (ii)).

4 APR 1986

GENERAL WAGE DECISION NO. NC86-8

Supersedes General Wage Decision No. NC84-1004

State: NORTH CAROLINA

County(ies): Statewide

Construction Type: HEAVY (including Sewer and Water Lines)

Construction Description: Sewer and Water Construction Projects and Heavy Construction Projects (excluding Dam construction projects).

Modification Record:

No.	Publication Date	Page No.(s)
1	Apr. 4, 1986	509
2	Apr. 4, 1986 (Expires 10/23/86)	509

4 APR 1986

NC86-9

	Basic Hourly Rates	Fringe Benefits
ASBESTOS WORKER (Mod. #2)	7.26	
BOILERMAKERS:		
Storage Tank Erection/Repair	12.96	4.105
All Other Work:	16.20	4.105
BRICKLAYERS	7.23	
CARPENTERS	6.63	
CEMENT MASONS/FINISHERS	6.11	
ELECTRICIANS	8.56	
FENCE ERECTORS	4.64	
IRONWORKERS	8.20	
LABORERS:		
Unskilled	4.41	
Air Drill Operator	5.92	
Asphalt Rakers	4.93	
Pipelayers	5.17	
MANHOLE BUILDERS	5.81	
MILLWRIGHTS	5.27	
PAINTERS	7.12	
PLUMBERS & PIPEFITTERS	7.42	
TRUCK DRIVERS	4.67	
TV & GROUTING TECHNICIANS	9.21	
POWER EQUIPMENT OPERATORS:		
Asphalt Distributor	5.77	
Asphalt Finisher	5.69	
Asphalt Paver	5.69	
Asphalt Screed	5.69	
Backhoe	6.40	
Boring Machine	5.65	
Bulldozer	5.96	
Crane	7.60	
Dragline	6.34	
Drill	7.23	
Loader	5.79	
Mechanic	7.16	
Motor Grader	6.24	
Roller	4.98	
Scraper, Pan	5.42	
Tractor	5.49	
Trenching Machine	6.58	
WELL DRILLERS	6.50	

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR, 5.5 (a) (1) (ii)).