

#3

Project Manual

**TOWN OF SOUTHERN SHORES  
CHICAHOK WATER SYSTEM  
EXTENSION**

**County of Dare, North Carolina**

**March 1991**

1523-02-2

**MALCOLM  
PIRNIE**



ENVIRONMENTAL ENGINEERS, SCIENTISTS & PLANNERS

COUNTY OF DARE

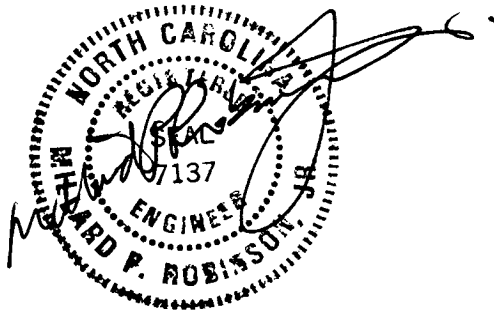
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TOWN OF SOUTHERN SHORES  
CHICAHAWK WATER SYSTEM EXTENSION

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PROJECT MANUAL

FEBRUARY 1991



MALCOLM PIRNIE, INC.  
11832 Rock Landing Drive  
Suite 400  
Newport News, Virginia 23606

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COUNTY OF DARE, NORTH CAROLINA

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TOWN OF SOUTHERN SHORES  
CHICAHUK WATER SYSTEM EXTENSION

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NOTICE TO BIDDERS

The County of Dare, North Carolina will receive sealed bids for construction of the above referenced project until 1 p.m. local time on the 28th day of March, 1991, at the County Administrative Building, Budleigh Street, Manteo, North Carolina.

The project consists of furnishing and installing approximately 2,600 linear feet of 2-inch, 8,320 linear feet of 6-inch and 360 linear feet of 8-inch potable water pressure pipe, fittings, valves and other appurtenant work. The work is located in the Town of Southern Shores, Chicahuk Subdivision.

All bids must be in strict compliance with the provisions of the Instructions to Bidders section of the Contract Documents.

Contract Documents are open to inspection at the office of Malcolm Pirnie, Inc., 11832 Rock Landing Drive, Suite 400, Newport News, Virginia; Dare County Water Department, 600 Mustian Street, Kill Devil Hills, North Carolina; and F. W. Dodge Corporation at Raleigh, North Carolina and Norfolk, Virginia.

Bidders must be licensed contractors in the State of North Carolina.

Copies of the Drawings and Specifications may be obtained from the offices of the ENGINEER at the address stipulated above upon payment of \$35 for each complete set of documents. Payments are non-refundable.

Each Bidder will be required to submit with his bid, a bid security in the amount of 5 percent of the bid submitted.

The successful Bidder will be required to furnish a performance and payment bond in statutory form and with sureties authorized to do business in the State of North Carolina, which bond shall be in the full amount of the Contract.

The County of Dare reserves the right to accept or reject any or all bids or parts thereto, to waive any informalities and to reject non-conforming, non-responsive or conditional Bids.

COUNTY OF DARE

By \_\_\_\_\_  
Terry L. Wheeler  
Interim County Manager

## INSTRUCTIONS TO BIDDERS

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#### ARTICLE 1 - DEFINED TERMS

- 1.1 Terms used in these Instructions to Bidders, which are defined in the General and Supplementary Conditions, have the meanings assigned to them in the General and Supplementary Conditions. The term "Successful Bidder" means the Bidder to whom OWNER (on the basis of OWNER'S evaluation as hereinafter provided) makes an award.

#### ARTICLE 2 - BIDS RECEIVED

- 2.1 Refer to Notice to Bidders for information on receipt of Bids.

#### ARTICLE 3 - LOCATION AND DESCRIPTION OF PROJECT

- 3.1 Refer to Section 01010 of the General Requirements for the location and description of the Project.

#### ARTICLE 4 - COPIES OF BIDDING DOCUMENTS

- 4.1 Refer to Notice to Bidders for information on examination and procurement of documents.
- 4.2 Complete sets of Bidding Documents shall be used in preparing Bids; neither OWNER assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 4.3 OWNER in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

#### ARTICLE 5 - QUALIFICATIONS OF BIDDERS

- 5.1 Bidders shall be experienced in the kind of Work to be performed, shall have the necessary equipment therefor, and shall possess sufficient capital to properly execute the Work within the time allowed. Bids received from Bidders who have previously failed to complete work within the time required, or who have previously performed similar work in an unsatisfactory manner, may be rejected. A Bid may be rejected if Bidder cannot show that he has the necessary ability, plant and equipment to commence the Work at the time prescribed and thereafter to prosecute and complete the Work at the rate or within the time specified. A Bid may be rejected if Bidder is already obligated for the performance of other work which would delay the commencement, prosecution or completion of the Work.
- 5.2 As evidence of Bidder's qualifications to perform the Work, Bidder shall complete and submit with his Bid the Bidder's Qualification Statement which is bound in the Project Manual. Low Bidders may be asked to furnish additional data to demonstrate their qualifications.
- 5.3 The Bid must contain evidence of Bidder's qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to execution of Agreement.
- 5.4 Bids will be received only from contractors who are registered by the State of North Carolina.

#### ARTICLE 6 - EXAMINATION OF CONTRACT DOCUMENTS AND SITE

- 6.1 Before submitting a Bid, each Bidder shall (a) examine the Contract Documents thoroughly, (b) visit the site to familiarize himself with local conditions that may in any manner affect cost, progress or performance of the Work, (c) familiarize himself with federal, state and local laws, ordinances, rules and regulations that may in any manner affect cost, progress or performance of the Work; and (d) examine the Contract Documents for other work to be performed on the



Project that relates to the Work for which the Bid is to be submitted, (e) study and carefully correlate Bidder's knowledge and observations with the Contract Documents, and (f) notify ENGINEER of any conflict, error, ambiguity or discrepancy in the Contract Documents of which Bidder becomes aware.

- 6.2 Neither the OWNER nor the ENGINEER has performed any subsurface investigation in connection with the design of this Project nor have they utilized any investigation which may have been performed by others. Before submitting its Bid Bidder will, at its own expense, make such investigations and tests as the Bidder may deem necessary to determine its Bid for performing and furnishing the Work in accordance with the Contract Documents.
- 6.3 On request, OWNER will provide each Bidder access to the site to conduct such investigations and tests as each Bidder deems necessary for submission of his Bid.
- 6.4 The lands upon which the Work is to be performed, rights-of-way for access thereto and other lands designated for use by CONTRACTOR in performing the Work are identified in the Drawings.
- 6.5 The submission of a Bid will constitute an incontrovertible representation by Bidder that it has complied with every requirement of this Article 6 and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

#### ARTICLE 7 - INTERPRETATIONS AND ADDENDA

- 7.1 All questions about the meaning or intent of the Bidding Documents or the Contract Documents shall be submitted to OWNER in writing. In order to receive consideration, questions must be received by OWNER at least ten days prior to the date fixed for the opening of Bids. Any interpretations of questions so raised, which in the opinion of OWNER require interpretations, will be issued by Addenda mailed or delivered to all parties recorded by OWNER as having received the Bidding and Contract Documents for receipt not later than three days prior to the date fixed for the opening of Bids. The OWNER will not be responsible for oral interpretations or clarifications which anyone presumes to make on their behalf.
- 7.2 OWNER may issue such additional Addenda as may be necessary to clarify, correct or change the Bidding Documents or the Contract Documents. Such Addenda, if any, will be issued in the manner and within the time period stated in Paragraph 7.1.

## ARTICLE 8 - BID SECURITY

- 8.1 Bids must be accompanied by a certified check or Bid Bond in the amount of 5 percent of Bid price, satisfactory to and payable to the order of the OWNER.
- 8.2 Bid Bond shall be on the form bound in the Project Manual. Bid Bond shall be issued by a surety meeting the requirements of Paragraph 5.1 of the General Conditions.
- 8.3 The bid security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required contract security, whereupon the bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within 15 days of the Notice of Award, OWNER may annul the Notice of Award and the Bid security of that Bidder will be forfeited to the OWNER as liquidated damages for such failure.
- 8.4 The bid security of any Bidder whom OWNER believes to have a reasonable chance of receiving the award may be retained by OWNER until the earlier of the seventh day after the execution of the Agreement by the Successful Bidder or the sixteenth day after the Bid opening. The bid security of other Bidders will be returned within seven days of the Bid opening.

## ARTICLE 9 - CONTRACT TIME

- 9.1 The number of days which the Work is to be substantially completed and completed (the Contract Time) are set forth in the Agreement.

## ARTICLE 10 - LIQUIDATED DAMAGES

- 10.1 Provisions for liquidated damages, if any, are set forth in the Agreement.

## ARTICLE 11 - SUBSTITUTE MATERIAL AND EQUIPMENT

- 11.1 Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or-equal" item of material or equipment may be furnished or used by CONTRACTOR if acceptable to OWNER, application for such acceptance will not be considered by OWNER until after the Effective Date of the Agreement. The procedure for submittal of any such application by CONTRACTOR and consideration by OWNER is set forth in Paragraph 6.3 of the General Conditions which may be supplemented in the General Requirements.

## ARTICLE 12 - SUBCONTRACTORS AND OTHERS

- 12.1 If the Supplementary Conditions require the identity of certain Subcontractors and other persons and organizations (including those who are to furnish the principal items of material and equipment) to be submitted to OWNER in advance of the Effective Date of the Agreement, apparent Successful Bidder, and any other Bidder so requested, will within seven days after the day of Bid opening submit to OWNER a list of all Subcontractors and other persons and organizations proposed for those portions of the Work as to which such identification is so required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, person and organization if requested by OWNER. If OWNER or ENGINEER after due investigation has reasonable objection to any proposed Subcontractor, other person or organization, either may before giving the Notice of Award request the apparent Successful Bidder to submit an acceptable substitute without an increase in Bid price. If apparent Successful Bidder declines to make any such substitution, OWNER may award contract to the next lowest Bidder that proposes to use acceptable Subcontractors or other persons or organizations. The declining to make requested substitutions will not constitute grounds for sacrificing the Bid security of any Bidder. Any Subcontractor, other person or organization so listed and to whom OWNER or ENGINEER does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to OWNER and ENGINEER.
- 12.2 No CONTRACTOR shall be required to employ any Subcontractor, other person or organization against whom he has reasonable objection.

## ARTICLE 13 - PREPARATION OF BID

- 13.1 A Bid must be made on the Bid Form bound in the Project Manual. The Bid Form shall not be separated from the Project Manual nor shall it be altered in any way.
- 13.2 The Bid Form must be completed in ink. Blank spaces in the Bid Form must be filled in correctly where indicated, and the Bidder must state, both in words and numerals, the prices proposed for each and every item of Work. Ditto marks shall not be used.
- 13.3 A Bid shall be executed as stated below.
- A. A Bid by an individual shall show the Bidder's name and official address.
  - B. A Bid by a partnership must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership shall be shown below the signature.

- C. A Bid by a corporation must be executed in the corporate name by an officer of the corporation and must be accompanied by a certified copy of a resolution of the board of directors authorizing the person signing the Bid to do so on behalf of the corporation. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The state of incorporation and the official corporate address shall be shown below the signature.
- D. All names must be printed below the signature.
- E. Contractor's license or registration number shall be entered in the space provided on the Bid Form.
- 13.4 The Bid shall contain an acknowledgement of the receipt of all Addenda in the space provided on the Bid Form.
- 13.5 The address and telephone number for communications regarding the Bid shall be shown.
- 13.6 In addition to the Bid Form, the following listed documents, which are bound in the Project Manual, shall be executed in the manner described in Paragraph 14.4 unless another manner is indicated.
  - A. Bid Security.
  - B. Bidder's Qualification Statement.

ARTICLE 14 - SUBMISSION OF BID

- 14.1 Bids shall be submitted at the time and place indicated in the Notice to Bidders.
- 14.2 Bid shall be enclosed in an opaque sealed envelope plainly marked on the outside with the name and address of the Bidder, its license or registration number if applicable, the name of the Project, and the contract name or number. Bid shall be submitted with Bid security and other required documents.
- 14.3 If the Bid is sent through the mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in another envelope plainly marked on the outside with the notation "Bid Enclosed". Mailed Bids shall be addressed to:

County of Dare  
County Manager's Office  
P.O. Box 1000  
Manteo, NC 27954

## ARTICLE 15 - MODIFICATION OR WITHDRAWAL OF BID

### 15.1 Withdrawal Prior to Bid Opening:

- A. A Bidder may withdraw its Bid before the time fixed for the opening of Bids by communicating his purpose in writing to the OWNER. Upon receipt of such written notice, the unopened Bid will be returned to the Bidder.

### 15.2 Modification Prior to Bid Opening:

- A. If a Bidder wishes to modify its Bid, it must withdraw its initial Bid in the manner specified in Paragraph 15.1.A and submit a new Bid.

## ARTICLE 16 - OPENING OF BIDS

16.1 Bids will be opened as indicated in the Notice to Bidders.

16.2 Bids received by mail or otherwise after the time specified for the opening of Bids will not be accepted and will be returned to the Bidder unopened.

## ARTICLE 17 - DISQUALIFICATION OF BIDDERS

17.1 More than one Bid for the same Work from an individual, or a firm, partnership, corporation or an association under the same or different names will not be considered. Reasonable grounds for believing that any Bidder is interested in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder is interested.

## ARTICLE 18 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.1 All Bids shall remain subject to acceptance for 60 days after the day of the Bid opening, but OWNER may, in its sole discretion, release any Bid and return the bid security prior to that date.

## ARTICLE 19 - AWARD OF CONTRACT

19.1 OWNER reserves the right to reject all Bids, to waive any and all informalities not involving price, time or changes in the Work, and the right to reject all nonconforming, nonresponsive or conditional Bids.

19.2 OWNER reserves the right to reject any Bid not accompanied by specified documentation and Bid security.

- 19.3 OWNER reserves the right to reject any Bid if it shows any omissions, alterations of form, additions not called for, conditions or qualifications, or irregularities of any kind.
- 19.4 OWNER reserves the right to reject any Bid that, in his sole discretion, is considered to be unbalanced or unreasonable as to the amount bid for any lump sum or unit price item.
- 19.5 In evaluating Bids, discrepancies between words and figures will be resolved in favor of words. Discrepancies in the multiplication of units of work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.
- 19.6 In evaluating Bids, OWNER will consider the qualifications of Bidders; whether or not the Bids comply with the prescribed requirements; the alternatives, if any; and the lump sum and unit prices, if requested in the Bid Form.
- 19.7 OWNER may consider the qualifications and experience of Subcontractors and other persons and organizations (including those who are to furnish the principal items of material or equipment) proposed for those portions of the Work as to which the identity of Subcontractors and other persons and organizations must be submitted as provided in the Supplementary Conditions.
- 19.8 OWNER may conduct such investigation as OWNER deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of the Bidders to perform and furnish the Work in accordance with the Contract Documents. OWNER reserves the right to reject the Bid of any Bidder who does not pass any such evaluation to OWNER'S satisfaction.
- 19.9 If a contract is to be awarded, it will be awarded to the lowest responsive and responsible Bidder who has neither been disqualified nor rejected pursuant to Article 17 or this Article 19.

#### ARTICLE 20 - CONTRACT SECURITIES

- 20.1 Performance Bond shall be in the form of Engineers Joint Contract Documents Committee (EJCDC) "Construction Performance Bond", 1910-28A. Payment Bond shall be in the form of EJCDC "Construction Payment Bond", 1910-28B. The amounts of and other requirements for Performance and Payment Bonds are stated in Paragraph 5.1 of the General Conditions. The requirements for delivery of Bonds are stated in Paragraph 2.1 of the General Conditions. Additional requirements may be stated in the Supplementary Conditions.

ARTICLE 21 - CONTRACTOR'S INSURANCE

- 21.1 The requirements for CONTRACTOR'S insurance are stated in Article 5 of the General Conditions and in the Supplementary Conditions. The requirements for delivery of certificates of insurance are stated in Paragraph 2.1 of the General Conditions.
- 21.2 The Successful Bidder shall within five days from the date of the Notice of Award deliver to OWNER, for his review and approval, the required policies of insurance. Upon approval, the policies will be returned to the Bidder and he shall submit certificates of insurance to the OWNER as stated in the General Conditions.

ARTICLE 22 - EXECUTION OF AGREEMENT

- 22.1 The Successful Bidder, or its authorized representative, will be required to attend with the contract securities offered and execute the Agreement within 15 days from the date of the Notice of Award.
- 22.2 The OWNER will prepare the documents, and will identify, in the Notice of Award, the location at which the documents will be executed.

ARTICLE 23 - NOTICE TO PROCEED

- 23.1 Issuance of the Notice to Proceed shall be as stated in Article 2 of the General Conditions.

ARTICLE 24 - SPECIAL REQUIREMENTS

- 24.1 Refer to Supplementary Conditions for further Special Requirements.

(This Bid Form shall not be detached from the Project Manual. The entire Manual shall be returned with the executed Bid.)

### BID FORM

BID FOR:

Town of Southern Shores  
Chicahauk Water System Extension

BID TO:

County of Dare  
P.O. Box 1000  
Manteo, North Carolina 27954

BID FROM: \_\_\_\_\_

(Print or Type Name of Bidder)  
(/A Corporation/A Partnership/An Individual/A Joint Venture/  
[Bidder to strike out inapplicable terms.]

Gentlemen:

The undersigned Bidder offers and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to complete all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the Contract Documents.

Bidder declares that no person or persons other than those named herein are interested in this Bid; that this Bid is made without collusion with any other person, firm or corporation; and that no person or persons acting in any official capacity for the OWNER are directly or indirectly interested in this Bid, or in any portion of the profit thereof.

In submitting this Bid, Bidder represents, as more fully set forth in the Agreement, that he has examined the Instructions to Bidders, all of the other Bidding Documents and all of the Contract Documents; that he has examined the actual site and locality where the Work is to be performed; that he has familiarized himself with the legal requirements (federal, state and local laws, ordinances, rules and regulations); that he has made such independent investigations as he deems necessary; and that he has satisfied himself as to all conditions affecting cost, progress or performance of the Work.

Bidder further agrees as follows: 1) that this Bid shall remain open and may not be withdrawn for the time period set forth in the Instructions to Bidders; 2) that he accepts all of the terms and conditions of the



Instructions to Bidders, including without limitation those dealing with the disposition of his bid security; 3) and that, upon acceptance of this Bid, he will execute the Agreement and will furnish the required contract security and insurance certificates within the time period(s) set forth in the Instructions to Bidders.

In accordance with the above understandings and agreements, Bidder will complete the Work for the following sums:

**BID FORM**  
**TOWN OF SOUTHERN SHORES**  
**CHICHAUK WATER SYSTEM EXTENSION**

<u>ITEM NO.</u>	<u>DESCRIPTION OF ITEM</u>	<u>UNIT</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT PRICE (WORDS)</u>	<u>UNIT PRICE (FIGURES)</u>	<u>TOTAL AMOUNT (FIGURES)</u>
1.	2-Inch PVC Water Line Complete In Place	LF	2,800			
2.	6-Inch PVC Water Line Complete In Place	LF	8,320			
3.	8-Inch PVC Water Line Complete In Place	LF	360			
4.	6-Inch Gate Valve and Box Complete In Place	EA	13			
5.	2-Inch Ball Valve and Box Complete In Place	EA	6			
6.	6-Inch Tapping Sleeve and Valve Complete In Place	EA	1			
7.	Blow-off Assembly Complete In Place	EA	6			
8.	Manual Air Release Assembly Complete In Place	EA	2			
9.	Fire Hydrant Assembly Complete In Place	EA	11			

Contractor: \_\_\_\_\_

<u>ITEM NO.</u>	<u>DESCRIPTION OF ITEM</u>	<u>UNIT</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT PRICE (WORDS)</u>	<u>UNIT PRICE (FIGURES)</u>	<u>AMOUNT (FIGURES)</u>
10.	Ductile Iron Fittings Complete In Place	LB	1,000			
11.	Concrete Driveway Removal and Replacement	SY	100			
12.	Asphalt Driveway Removal and Replacement	SY	5			
13.	Asphalt Replacement Trench Repair - Town Streets	SY	70			
14.	1-Inch Asphalt Overlay	SY	100			

TOTAL CONTRACT BID:

\_\_\_\_\_ Dollars

and \_\_\_\_\_ (words) \_\_\_\_\_ cents ( \$ \_\_\_\_\_ ) (figures)

Contractor: \_\_\_\_\_

Bidder agrees that the Work will be substantially completed and completed within the number of days indicated in the Agreement. Bidder accepts the provisions of the Agreement as to liquidated and special damages in the event of failure to substantially complete the Work on time.

Bidder acknowledges receipt of the Addenda listed below and further acknowledges that the provisions of each Addendum have been included in the preparation of his Bid.

<u>Addendum No.</u>	<u>Date Received</u>	<u>Addendum No.</u>	<u>Date Received</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

The following documents are attached to and made a condition of this Bid.

1. Bid security in the amount of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_)
2. Required Bidder's Qualification Statement with supporting data.

The terms used in this Bid, which are defined in the General and Supplementary Conditions, have the meanings assigned to them in the General and Supplementary Conditions.

Respectfully submitted on \_\_\_\_\_, 19\_\_.

If BIDDER is:

An Individual

By \_\_\_\_\_  
(Individual's Signature)

\_\_\_\_\_  
(Printed or Typed Name of Individual)

Doing business as \_\_\_\_\_

License or Registration Number: \_\_\_\_\_

Business Address: \_\_\_\_\_

\_\_\_\_\_

Phone No.: \_\_\_\_\_

A Partnership

By \_\_\_\_\_

(Firm Name)

\_\_\_\_\_

(Partner's Signature)

\_\_\_\_\_

(Printed or Typed Name of Partner)

License or Registration Number: \_\_\_\_\_

Business Address: \_\_\_\_\_

\_\_\_\_\_

Phone No.: \_\_\_\_\_

A Corporation

By \_\_\_\_\_

(Corporation Name)

\_\_\_\_\_

(State of Incorporation)

By \_\_\_\_\_

(Signature of Officer Authorized to Sign)

\_\_\_\_\_

(Printed or Typed Name and Title of Officer Authorized to Sign)

(CORPORATE  
SEAL)

Attest \_\_\_\_\_  
(Secretary)

License or Registration Number: \_\_\_\_\_

Business Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone No.: \_\_\_\_\_

**BID BOND**

KNOW ALL MEN BY THESE PRESENTS, that we \_\_\_\_\_

\_\_\_\_\_  
(Insert Name, or Legal Title, of Bidder)

of \_\_\_\_\_  
(Insert Address of Bidder)

as Principal, hereinafter called the Principal, and \_\_\_\_\_

\_\_\_\_\_  
(Insert Name, or Legal Title, of Surety)

of \_\_\_\_\_  
(Insert Address of Surety)

a corporation duly organized under the laws of the State of \_\_\_\_\_

as Surety, hereinafter called the Surety, are firmly bound unto County of Dare, P.O. Box 1000, Manteo, North Carolina 27954 as Obligee, hereinafter called the Obligee, in the penal sum of \_\_\_\_\_ Dollars.

\_\_\_\_\_  
(Surety to Insert Amount)

for the payment of which sum well and truly to be made, the said Principal and the said Surety bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for the Town of Southern Shores, Chicahauk Water System Extension.

NOW, THEREFORE, if the Obligee shall accept the Bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such Bid, and give such Bond or Bonds as may be specified in the Bidding or Documents with good and sufficient surety acceptable to the Obligee, or in the event of the failure of the Principal to enter such Contract and give such Bond or Bonds, if the Principal shall pay to the Obligee the penal amount of this bond, then this obligation shall be null and void, otherwise to remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety shall not be impaired or affected in any way by any extension of the time within which the Obligee may accept the Bid of the Principal and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, on this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_.

------(Individual Principal)-----

By \_\_\_\_\_  
(Individual's Signature)

\_\_\_\_\_  
(Printed or Typed Name of Individual)

Doing business as \_\_\_\_\_

------(Partnership Principal)-----

By \_\_\_\_\_  
(Firm Name)

\_\_\_\_\_  
(Partner's Signature)

\_\_\_\_\_  
(Printed or Typed Name of Partner)

------(Corporate Principal)-----

By \_\_\_\_\_  
(Corporation Name)

\_\_\_\_\_  
(State of Incorporation)

By \_\_\_\_\_  
(Signature of Officer Authorized to Sign)

\_\_\_\_\_  
(Printed or Typed Name and Title of Officer Authorized to Sign)

(CORPORATE  
SEAL)

Attest \_\_\_\_\_  
(Secretary)



**BIDDER'S QUALIFICATION STATEMENT**

(Completion of this statement is required in advance of consideration for award of contract.)

SUBMITTED TO:

County of Dare  
P.O. Box 1000  
Manteo, North Carolina 27954

SUBMITTED FOR:

Town of Southern Shores,  
Chicahauk Water System Extension

SUBMITTED BY:

Name: \_\_\_\_\_

(Print or Type Name of Bidder)  
(/A Corporation/A Partnership/An Individual/A Joint  
Venture/ [Bidder to strike out inapplicable terms.]

Address: \_\_\_\_\_  
\_\_\_\_\_

Gentlemen:

The undersigned certifies under oath the truth and correctness of all statements and of all answers to questions made hereinafter.

(Note: Attach Separate Sheets as Required)

- 1.0 How many years has your organization been in business as a general contractor? \_\_\_\_\_
- 2.0 How many years has your organization been in business under its present name? \_\_\_\_\_
- 3.0 Do you plan to subcontract any part of this project? \_\_\_\_\_ If so, give details.

- 4.0 Has any construction contract to which you have been a party been terminated by the owner; have you ever terminated work on a project prior to its completion for any reason; has any surety which issued a performance bond on your behalf ever completed the work in its own name or financed such completion on your behalf; has any surety expended any monies in connection with a contract for which they furnished a bond on your behalf? If the answer to any portion of this question is "yes", please furnish details of all such occurrences including name of owner, architect or engineer, and surety, and name and date of project.
- 5.0 Has any officer or partner of your organization ever been an officer or partner of another organization that had any construction contract terminated by the owner; terminated work on a project prior to its completion for any reason; had any surety which issued a performance bond complete the work in its own name or financed such completion; or had any surety expend any monies in connection with a contract for which they furnished a bond? If the answer to any portion of this question is "yes", please furnish details of all such occurrences including name of owner, architect or engineer, and surety, and name and date of project.
- 6.0 List name of project, owner, architect or engineer, contract amount, percent complete and scheduled completion of the major construction projects your organization has in process on this date.
- 7.0 List name of project, owner, architect or engineer, contract amount, date of completion and percent of work with own forces of the major projects of the same general nature as this project which your organization has completed in the past five years.

8.0 List name, address and telephone number of an individual who represents each of the following and whom OWNER may contact for a financial reference:

8.1 A surety:

8.2 A bank:

8.3 A major material supplier:

9.0 Dated at \_\_\_\_\_, this \_\_\_\_\_ day  
of \_\_\_\_\_, 19\_\_.

\_\_\_\_\_  
(Print or Type Name of Bidder)

By \_\_\_\_\_

\_\_\_\_\_  
(Title)

(Seal, if corporation)

------(Affidavit for Individual)-----

\_\_\_\_\_ being duly sworn, deposes and says that:  
a) the financial statement, taken from his/her books, is a true and accurate statement of his/her financial condition as of the date thereof; and b) all of the foregoing qualification information is true, complete, and accurate.

------(Affidavit for Partnership)-----

\_\_\_\_\_ being duly sworn, deposes and says that:  
a) he/she is a member of the partnership of \_\_\_\_\_;  
b) he/she is familiar with the books of said partnership showing its financial condition; c) the financial statement, taken from the books of said partnership, is a true and accurate statement of the financial condition of the partnership as of the date thereof; and d) all of the foregoing qualification information is true, complete, and accurate.

------(Affidavit for Corporation)-----

\_\_\_\_\_ being duly sworn, deposes and says that:  
a) he/she is \_\_\_\_\_ of \_\_\_\_\_;  
(Full name of Corporation)  
b) he/she is familiar with the books of said corporation showing its financial condition; c) the financial statement, taken from the books of said corporation, is a true and accurate statement of the financial condition of said corporation as of the date thereof; and d) that all of the foregoing qualification information is true, complete, and accurate.

------(Acknowledgment)-----

\_\_\_\_\_ being duly sworn, deposes and says  
that he/she is \_\_\_\_\_ of \_\_\_\_\_;  
(Name of Bidder)  
that he/she is duly authorized to make the foregoing affidavit and that he/she makes it on behalf of  
( ) himself/herself; ( ) said partnership; ( ) said corporation.

Sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_, in  
the County of \_\_\_\_\_, State of \_\_\_\_\_.

\_\_\_\_\_  
(Notary Public)

My commission expires \_\_\_\_\_

(Seal)

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that \_\_\_\_\_,  
a \_\_\_\_\_ corporation, hereinafter called PRINCIPAL,  
and \_\_\_\_\_

State of \_\_\_\_\_, hereinafter called SURETY, are held and firmly bound unto the County of Dare, North Carolina, hereinafter called OWNER, in the penal sum of \_\_\_\_\_ in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors jointly, severally, and firmly by these presents. Said sum shall be 100 percent of the amount of the bid.

THE CONDITION OF THIS ORGANIZATION is such that whereas, the Principal entered into a certain Contract with the Owner, dated the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, a copy of which is hereto attached and made a part hereof for potable water line extension for the OWNER in accordance with Procurement Documents - Town of Southern Shores, Chicahauk Water System Extension prepared by Malcolm Pirnie, Inc. dated February 1991.

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such Contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, supplies, repairs on machinery, equipment, and tools consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor performed in such work, whether by subcontractor or otherwise, then this obligation shall be void; otherwise, to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no charge, extension of time, alteration or addition to the terms of the Contract or to the work to be performed hereunder or the Procurement Documents accompanying the same shall in anywise affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, or to the work, or to the Procurement Documents.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in six counterparts, each one of which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_.

ATTEST:

\_\_\_\_\_

PRINCIPAL

\_\_\_\_\_  
Principal Secretary

By \_\_\_\_\_

(SEAL)

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

\_\_\_\_\_

ATTEST:

\_\_\_\_\_  
Surety Secretary

\_\_\_\_\_  
SURETY

(SEAL)

\_\_\_\_\_  
Witness as to Surety

\_\_\_\_\_  
Attorney-in-Fact

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

FORM APPROVED:

\_\_\_\_\_  
County of Dare  
Attorney or Authorized Person

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute Bond.

IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular No. 570 as amended) and be authorized to transact business in the State of North Carolina.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that \_\_\_\_\_,  
a \_\_\_\_\_ corporation, hereinafter called PRINCIPAL,  
and \_\_\_\_\_

State of \_\_\_\_\_, hereinafter called SURETY, are held and firmly bound unto the County of Dare, North Carolina, hereinafter called OWNER, in the penal sum of \_\_\_\_\_ in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors jointly, severally, and firmly by these presents. Said sum shall be 100 percent of the amount of the bid.

THE CONDITION OF THIS ORGANIZATION is such that whereas, the Principal entered into a certain Contract with the Owner, dated the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, a copy of which is hereto attached and made a part hereof for potable water line extension for the OWNER in accordance with Procurement Documents - Town of Southern Shores, Chicahauk Water System Extension prepared by Malcolm Pirnie, Inc. dated February 1991.

NOW, THEREFORE, if the Principal shall well, truly, and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said Contract during the original term thereof, and shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expenses which the Owner may incur in making good any default, then this obligation shall be void; otherwise, to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no charge, extension of time, alteration or addition to the terms of the Contract or to the work to be performed hereunder or the Procurement Documents accompanying the same shall in anywise affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, or to the work, or to the Procurement Documents.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.



IN WITNESS WHEREOF, this instrument is executed in six counterparts, each one of which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_.

ATTEST:

\_\_\_\_\_

PRINCIPAL

\_\_\_\_\_  
Principal Secretary

By \_\_\_\_\_

(SEAL)

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

\_\_\_\_\_

ATTEST:

\_\_\_\_\_  
Surety Secretary

\_\_\_\_\_  
SURETY

(SEAL)

\_\_\_\_\_  
Witness as to Surety

\_\_\_\_\_  
Attorney-in-Fact

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

FORM APPROVED:

\_\_\_\_\_  
County of Dare  
Attorney or Authorized Person

**NOTE:** Date of Bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute Bond.

**IMPORTANT:** Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular No. 570 as amended) and be authorized to transact business in the State of North Carolina.

## AGREEMENT

THIS AGREEMENT is dated as of the \_\_\_\_\_ day of \_\_\_\_\_  
in the year \_\_\_\_\_, by and between the County of Dare (hereinafter  
called OWNER) and \_\_\_\_\_  
(hereinafter called CONTRACTOR).

WITNESSETH: OWNER and CONTRACTOR, in consideration of the  
mutual covenants hereinafter set forth, agree as follows:

### ARTICLE 1 - WORK

- 1.1 CONTRACTOR shall at his own cost and expense furnish all labor, services, tools, materials, equipment and incidentals necessary to perform all Work required by the Contract Documents to construct the Town of Southern Shores, Chicahauk Water System Extension, in complete accordance with the Contract Documents. The Work under the Contract Documents is generally described in Section 01010 of the General Requirements.

### ARTICLE 2 - CONTRACT DOCUMENTS

- 2.1 The Contract Documents are defined in the General Conditions. The Contract Documents, which comprise the entire agreement between OWNER and CONTRACTOR are attached to this Agreement and are made a part hereof.

### ARTICLE 3 - ENGINEER

- 3.1 The Project has been designed by Malcolm Pirnie Inc., 11832 Rock Landing Road, Suite 400, Newport News, Virginia 23606, who is hereinafter called ENGINEER and who is to act as OWNER'S representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

### ARTICLE 4 - CONTRACT TIME

- 4.1 The Work will be substantially completed within 120 days from the date when the Contract Time commences to run as provided in Paragraph 2.3 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.9 of the General Conditions within 150 days from the date when the Contract Time commences to run.

## ARTICLE 5 - LIQUIDATED AND SPECIAL DAMAGES

### 5.1 Liquidated Damages:

- A. OWNER and CONTRACTOR recognize that time is of the essence as to Substantial Completion and that OWNER will suffer financial loss, apart from the costs described in Par. 5.2.A, if the Work is not substantially completed within the time specified in Article 4 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. OWNER and CONTRACTOR also recognize the delays, expense and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by OWNER if the Work is not substantially completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay OWNER \$300 for each day that expires after the time specified in Article 4 for Substantial Completion (adjusted for any extensions thereof made in accordance with Article 12 of the General Conditions) until the Work is substantially complete.

### 5.2 Special Damages:

- A. In addition to the amount provided for liquidated damages, CONTRACTOR shall pay OWNER the actual costs reasonably incurred by OWNER for engineering and inspection forces employed on the Work for each day that expires after the time specified in Article 4 for Substantial Completion (adjusted for any extensions thereof made in accordance with Article 12 of the General Conditions) until the Work is substantially complete.
- B. After Substantial Completion, if CONTRACTOR shall neglect, refuse or fail to complete the remaining Work within the Contract Time, CONTRACTOR shall pay OWNER the actual costs reasonably incurred by OWNER for engineering and inspection forces employed on the Work for each day that expires after the time specified in Article 4 for the Work to be completed and ready for final payment (adjusted for any extensions thereof made in accordance with Article 12 of the General Conditions) until the Work is completed and ready for final payment.

- 5.3 OWNER may deduct the amount of liquidated damages and special damages from monies due CONTRACTOR under this Agreement.

## ARTICLE 6 - CONTRACT PRICE

- 6.1 OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents the prices stipulated in CONTRACTOR'S Bid, which Bid is attached hereto and identified as Exhibit 1 of this Agreement.

## ARTICLE 7 - PAYMENT PROCEDURES

- 7.1 CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed as provided in the General Conditions.

### 7.2 Progress Payments:

- A. OWNER shall make monthly progress payments on account of the Contract Price on the basis of CONTRACTOR'S Applications for Payment as recommended by ENGINEER. CONTRACTOR'S Applications for Payment will be due on the first day of the month. All progress payments will be on the basis of the progress of the Work measured by the schedule of values provided for in Paragraph 14.1 of the General Conditions (and in the case of Work performed on the basis of unit prices, based on the number of units completed). A progress payment will not be made whenever the value of the Work completed since the last previous progress payment is less than \$5,000.
1. Prior to Substantial Completion, progress payments will be in the amount of 90 percent of the Work completed, and of the materials and equipment not incorporated into the Work but suitably stored, less the aggregate of payments previously made.
  2. Upon Substantial Completion, OWNER shall pay an amount sufficient to increase total payments to CONTRACTOR to 95 percent of the Contract Price, less such amounts as ENGINEER shall determine in accordance with Paragraph 14.4.D of the General Conditions.

### 7.3 Final Payment:

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.9 of the General Conditions, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in said Paragraph 14.9.

ARTICLE 8 - INTEREST

8.1 All moneys not paid when due hereunder shall bear interest at 1 percent per month.

ARTICLE 9 - CONTRACTOR'S REPRESENTATIONS

9.1 As part of the inducement for OWNER to enter into this Agreement CONTRACTOR makes the following representations:

- A. CONTRACTOR has familiarized himself with the nature and extent of the Contract Documents, Work, site, locality, and with all local conditions and federal, state and local laws, ordinances, rules and regulations that in any manner may affect cost, progress, performance or furnishing of the Work.
- B. CONTRACTOR has studied carefully all reports of investigations and tests of subsurface and latent physical conditions at the site or those reports that otherwise may affect cost, progress, performance or furnishing of the Work which were utilized by ENGINEER in the preparation of the Drawings and Specifications.
- C. CONTRACTOR has made or caused to be made examinations, investigations and tests and studies of such reports and related data in addition to those referred to in Paragraph 9.1.B as he deems necessary for the performance of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents; and no additional examinations, investigations, tests, reports, studies or similar information are or will be required by CONTRACTOR for such purposes.
- D. CONTRACTOR has correlated the results of all such observations, examinations, investigations, tests, reports and studies with the terms and conditions of the Contract Documents.
- E. CONTRACTOR has given ENGINEER written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

ARTICLE 10 - DRAWINGS AND ADDENDA

10.1 The Drawings comprise a set entitled "Town of Southern Shores, Chicahauk Water System Extension" dated February 1991, and include the following:

Title Sheet  
Sheets 1 through 4, inclusive

10.2 Addenda consisting of Numbers \_\_\_ to \_\_\_, inclusive.

ARTICLE 11 - MISCELLANEOUS

- 11.1 Terms used in this Agreement which are defined in Article 1 of the General Conditions have the meanings indicated in the General Conditions.
- 11.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.
- 11.3 OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, and its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the day and year first written above.

This Agreement will be effective on \_\_\_\_\_, 19\_\_\_\_.

OWNER \_\_\_\_\_

CONTRACTOR \_\_\_\_\_

By \_\_\_\_\_

By \_\_\_\_\_

[CORPORATE SEAL]

[CORPORATE SEAL]

Attest \_\_\_\_\_

Attest \_\_\_\_\_

Address for giving notices

Address for giving notices

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(If OWNER is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of Agreement.)

License No. \_\_\_\_\_

Agent for service of process: \_\_\_\_\_

\_\_\_\_\_

(If CONTRACTOR is a corporation, attach evidence of authority to sign.)



## GENERAL CONDITIONS

### TABLE OF ARTICLES

1. Definitions
2. Preliminary Matters
3. Contract Documents: Intent and Reuse
4. Availability of Lands; Physical Conditions; Reference Points
5. Bonds and Insurance
6. Contractor's Responsibilities
7. Work by Others
8. Owner's Responsibilities
9. Engineer's Status During Construction
10. Changes in the Work
11. Change of Contract Price
12. Change of the Contract Time
13. Warranty and Guarantee; Tests and Inspections; Correction, Removal or Acceptance of Defective Work
14. Payments to Contractor and Completion
15. Suspension of Work and Termination
16. Dispute Resolution
17. Miscellaneous

#### ARTICLE 1 - DEFINITIONS

- 1.1 Wherever used in these General Conditions or in the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof.
  - A. Defined Terms:
    1. Addenda: Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change, the Bidding Documents or the Contract Documents.
    2. Agreement: The written agreement between OWNER and CONTRACTOR covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.
    3. Application for Payment: The form accepted by ENGINEER which is to be used by CONTRACTOR in requesting progress or final payment and which is to include such supporting documentation as is required by the Contract Documents.
    4. Bid: The offer or proposal of the Bidder submitted on the prescribed form setting forth the price(s) for the Work to be performed.
    5. Bidder: Any person, firm or corporation submitting a Bid for the Work.
    6. Bidding Documents: Notice to bidders or advertisement, if any, instructions to bidders, other bidding information and requirements, bidding forms and attachments, contract and bond

forms, and the proposed Contract Documents, including any Addenda issued prior to receipt of Bids.

7. Bonds: Bid, Performance, and Payment bonds and other instruments of security.
8. Change Order: A written order to CONTRACTOR signed by OWNER authorizing an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Time issued after the Effective Date of the Agreement.
9. Contract Documents: The Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR'S Bid (including documentation accompanying the Bid and any post-Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications, the Drawings as the same may be more specifically identified in the Agreement, together with all Modifications issued after execution of the Agreement.
10. Contract Price: The moneys payable by OWNER to CONTRACTOR under the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.7 in the case of Unit Price Work).
11. Contract Time: The number of days (computed as provided in Paragraph 17.2) or the date stated in the Agreement for the completion of the Work.
12. CONTRACTOR: The person, firm or corporation with whom OWNER has executed the Agreement. Whenever the Project is to be constructed under multiple direct contracts, the term "CONTRACTOR" shall mean the appropriate prime CONTRACTOR. Whenever a specific prime CONTRACTOR is referred to, terms such as "General CONTRACTOR", "Electrical CONTRACTOR", etc. will be used.
13. day: A calendar day of twenty-four hours measured from midnight to the next midnight.
14. defective: An adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER'S recommendation for final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with Paragraph 14.5).
15. Drawings: The Drawings which show the character and scope of the Work to be performed and which have been prepared or approved by ENGINEER and are referred to in the Contract Documents.
16. Effective Date of the Agreement: The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
17. ENGINEER: The person, firm or corporation named as such in the Agreement.

18. Field Order: A written order issued by ENGINEER which orders minor changes in the Work in accordance with Paragraph 10.2 but which does not involve a change in the Contract Price or the Contract Time.
19. General Requirements: Sections of Division 1 of the Specifications.
20. Modifications: (a) A written amendment of the Contract Documents signed by both parties, (b) a Change Order, or (c) a Field Order. A Modification may only be issued after the Effective Date of the Agreement.
21. Notice of Award: The written notice by OWNER to the apparent successful Bidder stating that upon compliance by the apparent successful Bidder with the conditions precedent enumerated therein, within the time specified, OWNER will sign and deliver the Agreement.
22. Notice to Proceed: A written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Time will commence to run and on which CONTRACTOR shall start to perform his obligations under the Contract Documents.
23. OWNER: The public body or authority, corporation, association, partnership, or individual with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be provided.
24. Project: The total construction of which the Work to be provided under the Contract Documents may be the whole or a part as indicated elsewhere in the Contract Documents.
25. Project Manual: The bound documentary information prepared for bidding and constructing the Project. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
26. Resident Project Representative: The authorized representative of ENGINEER who is assigned to the site or any part thereof.
27. Samples: Physical examples furnished by the CONTRACTOR to illustrate materials, equipment or workmanship, and to establish standards by which some portions of the Work will be judged.
28. Shop Drawings: All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for CONTRACTOR to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a manufacturer, fabricator, supplier or distributor and submitted by CONTRACTOR to illustrate material or equipment for some portion of the Work.
29. Specifications: Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.
30. Subcontractor: An individual, firm or corporation having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the site.
31. Substantial Completion: The Work (or a specified part thereof) has progressed to the point where, in the opinion of ENGINEER as evidenced by ENGINEER'S definitive certificate of Substantial

Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it was intended; or if there be no such certificate issued, when final payment is due in accordance with Paragraph 14.9.A. The terms "substantially complete" and "substantially completed" as applied to any Work refer to Substantial Completion thereof.

32. Supplementary Conditions: Modifications and additions to the General Conditions.
33. Unit Price Work: Work to be paid for on the basis of unit prices contained in the Contract Documents.
34. Work: The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.

## ARTICLE 2 - PRELIMINARY MATTERS

### 2.1 Delivery of Bonds and Insurance Certificates:

- A. When CONTRACTOR executes Agreement with OWNER, CONTRACTOR shall deliver to OWNER such Bonds as CONTRACTOR may be required to furnish in accordance with Article 5.
- B. When CONTRACTOR executes Agreement with OWNER, CONTRACTOR shall deliver to OWNER, with a copy to ENGINEER, certificates (and other evidence of insurance requested by OWNER) which CONTRACTOR is required to purchase and maintain in accordance with Article 5, and OWNER shall deliver to CONTRACTOR certificates (and other evidence of insurance requested by CONTRACTOR) which OWNER is required to purchase and maintain in accordance with Article 5.

### 2.2 Copies of Documents:

- A. OWNER shall furnish to CONTRACTOR up to ten copies (unless otherwise provided in the General Requirements) of the Contract Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

### 2.3 Commencement of Contract Time; Notice to Proceed:

- A. The Contract Time will commence to run on the thirtieth day after the Effective Date of the Agreement; or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed; but in no event shall the Contract Time commence to run later than the ninetieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement. A Notice to Proceed may be given at any time within thirty days after the Effective Date of the Agreement.

2.4 Starting the Project:

- A. CONTRACTOR shall start to perform the Work on the date when the Contract Time commences to run, but no Work shall be done at the site prior to the date on which the Contract Time commences to run.

2.5 Before Starting Construction:

- A. Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error or discrepancy which he may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for the failure to report any conflict, error or discrepancy in the Contract Documents, unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.
- B. Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for review and acceptance, an estimated progress schedule indicating the starting and completion dates of the various stages of the Work, a preliminary schedule of Shop Drawing submissions, and a preliminary schedule of values of the Work.

2.6 Preconstruction Conference:

- A. Within twenty days after the Effective Date of the Agreement, but before CONTRACTOR starts the Work at the site, a conference will be held for review and acceptance of the schedules, referred to in Paragraph 2.5.B, to establish procedures for handling Shop Drawings and other submittals and for processing Applications for Payment, and to establish a working understanding among the parties as to the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AND REUSE

3.1 Intent:

- A. The Contract Documents comprise the entire Agreement between OWNER and CONTRACTOR concerning the Work. They may be altered only by a Modification.
- B. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. If, during the performance of the Work, CONTRACTOR finds a conflict, error or discrepancy in the Contract Documents, he shall report it to ENGINEER in writing at once and before proceeding with the Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error or discrepancy in the Specifications or

Drawings unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

- C. It is the intent of the Specifications and Drawings to describe a complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work that may reasonably be inferred from the Specifications or Drawings as being required to produce the intended result shall be supplied whether or not it is specifically called for, at no additional cost to OWNER.
- D. The Specifications may describe or the Drawings may show the general arrangement of an item of material or equipment when the actual details of said arrangement will vary with the source of the material or equipment. In such cases, CONTRACTOR shall bear all direct and indirect costs to accommodate the item of material or equipment furnished, whether the item of material or equipment is furnished by a manufacturer named in the Specifications or is furnished as an approved substitute or "or equal" item of material or equipment.
- E. When words in the Specifications or on the Drawings, which have a well-known technical or trade meaning, are used to describe Work, materials or equipment such words shall be interpreted in accordance with such meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the code of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual or code in effect at the time of opening of Bids (or, on the effective date of the Agreement if there were no Bids), except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall change the duties and responsibilities of OWNER, CONTRACTOR or ENGINEER, or any of their agents or employees from those set forth in the Contract Documents. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided for in Paragraph 9.3.
- F. The Contract Documents will be governed by the law of the place of the Project.

### 3.2 Re-use of Documents:

- A. Neither CONTRACTOR nor any Subcontractor, manufacturer, fabricator, supplier or distributor shall have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of ENGINEER; and they shall not re-use any of them on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaptation by ENGINEER.

ARTICLE 4 - AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS

4.1 Availability of Lands:

- A. OWNER shall furnish, as indicated in the Contract Documents the lands upon which the Work is to be performed, rights-of-way for access thereto, and such other lands which are designated for the use of CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by OWNER, unless otherwise provided in the Contract Documents. If CONTRACTOR believes that any delay in OWNER'S furnishing these lands or easements entitles CONTRACTOR to an extension of the Contract Time, CONTRACTOR may make a claim therefor as provided in Article 12. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.2 Physical Conditions-Investigations and Reports:

- A. Reference is made to the Supplementary Conditions for identification of those reports of investigations and tests of subsurface and latent physical conditions at the site or those reports that otherwise may affect cost, progress or performance of the Work which have been utilized by ENGINEER in preparation of the Drawings and Specifications. These reports are not intended to constitute any explicit or implicit representation as to the nature of the subsurface and latent physical conditions which may be encountered at the site or to constitute explicit or implicit representations as to any other matter contained in any report. Such reports are not guaranteed as to accuracy or completeness and are not part of the Contract Documents.

4.3 Unforeseen Physical Conditions:

- A. CONTRACTOR shall promptly notify OWNER and ENGINEER in writing of any subsurface or latent physical conditions at the site or in an existing structure differing materially from those indicated or referred to in the Contract Documents. ENGINEER will promptly review those conditions and advise OWNER in writing if further investigations or tests are necessary. Promptly thereafter, OWNER shall obtain the necessary additional investigations and tests and furnish copies to ENGINEER and CONTRACTOR. If ENGINEER finds that the results of such investigations or tests indicate that there are subsurface or latent physical conditions which differ materially from those intended in the Contract Documents, and which could not reasonably have been anticipated by CONTRACTOR, a Change Order shall be issued incorporating the necessary revisions.

4.4 Reference Points:

- A. OWNER shall provide engineering surveys for construction to establish reference points which in OWNER'S judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be

responsible for laying out the Work (unless otherwise specified in the General Requirements), and shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to ENGINEER whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for replacement or relocation of such reference points by professionally qualified personnel.

#### ARTICLE 5 - BONDS AND INSURANCE

##### 5.1 Performance, Payment and Other Bonds:

A. CONTRACTOR shall furnish Performance and Payment Bonds, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all CONTRACTOR'S obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date of final payment, except as otherwise provided by law. CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary Conditions. All Bonds shall be in the forms prescribed by the Bidding Documents or Supplementary Conditions and be executed by such sureties as:

1. Are licensed to conduct business in the state where the Project is located, and
2. Are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department.

All Bonds signed by an agent must be accompanied by a certified copy of the authority to act.

B. If the surety on any Bond furnished by CONTRACTOR is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.1.A, CONTRACTOR shall within five days thereafter substitute another Bond and surety, both of which shall be acceptable to OWNER.

##### 5.2 Contractor's Liability Insurance:

A. CONTRACTOR shall purchase and maintain such comprehensive general liability and other insurance as will provide protection from claims set forth below which may arise out of or result from CONTRACTOR'S performance of the Work and CONTRACTOR'S other obligations under the Contract Documents, whether such performance of the Work is by CONTRACTOR, by any Subcontractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

1. Claims under workers' or workmen's compensation, disability benefits and other similar employee benefit acts;



2. Claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR'S employees;
  3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR'S employees;
  4. Claims for damages insured by personal injury liability coverage which are sustained (a) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (b) by any other person for any other reason;
  5. Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
  6. Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle; and
  7. Claims for damages because of bodily injury or death of any person arising out of operation of law.
- B. The insurance required by Paragraph 5.2.A shall include the specific coverages and be written for not less than the limits of liability and coverages provided in the Supplementary Conditions, or required by law, whichever is greater. All such insurance shall remain in effect until final payment and at all times thereafter when CONTRACTOR may be correcting, removing or replacing defective Work in accordance with Paragraph 13.7. The comprehensive general liability insurance shall include completed operations insurance and shall include OWNER and ENGINEER and their agents and employees as additional insureds. CONTRACTOR shall maintain such completed operations insurance for at least two years after final payment and shall furnish OWNER with evidence of continuation of such insurance at final payment and one year thereafter.
- 5.3 Contractual Liability Insurance:
- A. The comprehensive general liability insurance required by Paragraph 5.2.A shall include contractual liability insurance applicable to CONTRACTOR'S obligations under Paragraph 6.15.
- 5.4 Owner's Liability Insurance:
- A. OWNER shall be responsible for purchasing and maintaining OWNER'S own liability insurance and, at OWNER'S option, may purchase and maintain such insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.
- 5.5 Property Insurance:
- A. Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall purchase and maintain property insurance upon the Work at the site to the full insurable value thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or as required by law). This insurance shall include the interests of the OWNER, CONTRACTOR, and Subcontractors in the Work;

shall insure against the perils of fire and extended coverage; shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage, and such other perils as may be specified in the Supplementary Conditions; shall include damages, losses and expenses arising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including fees and charges of engineers, architects, attorneys and other professionals); and shall provide that all insurance proceeds are to be paid to OWNER "as Trustee". If not covered under the "all risk" insurance or otherwise provided in the Supplementary Conditions, CONTRACTOR shall purchase and maintain similar property insurance on portions of the Work stored on or off the site or in transit when such portions of the Work are to be included in an Application for Payment. All such insurance required by this Paragraph 5.5.A shall remain in effect until the Work is substantially completed.

- B. OWNER shall purchase and maintain such boiler and machinery insurance as may be required by the Supplementary Conditions or by law. This insurance shall include the interest of OWNER, CONTRACTOR and Subcontractors in the Work. OWNER shall file a copy of all policies required by this Paragraph with CONTRACTOR before an exposure to loss may occur.
- C. The policies of insurance required under this Paragraph 5.5 shall provide that neither the OWNER nor the CONTRACTOR, nor their insurers, shall have any right of subrogation against any of the other parties enumerated in Paragraph 5.6. It is the intention of the OWNER and CONTRACTOR that the policies shall protect all of the enumerated parties and be primary coverage for any and all losses covered by the insurance described in Paragraphs 5.5.A and 5.5.B.

#### 5.6 Waiver of Rights:

- A. OWNER and CONTRACTOR waive all rights against each other and the Subcontractors and their agents and employees and against ENGINEER and separate contractors (if any) and their subcontractors', agents and employees, for damages caused by fire or other perils to the extent covered by insurance provided under Paragraph 5.5., or any other property insurance applicable to the Work, except such rights as they may have to the proceeds of such insurance held by OWNER as trustee. OWNER or CONTRACTOR, as appropriate, shall require similar waivers in writing by ENGINEER and from each separate contractor and each Subcontractor; each such waiver will be in favor of all other parties enumerated in this Paragraph 5.6.

#### 5.7 Receipt and Application of Proceeds:

- A. Any insured loss under the policies of insurance required by Paragraph 5.5 shall be adjusted with OWNER and made payable to OWNER as trustee for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.7.B. OWNER shall deposit in a separate account any

money so received, and he shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof and the Work and the cost thereof covered by an appropriate Change Order.

- B. OWNER as trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within fifteen days after the occurrence of loss to OWNER'S exercise of this power. If such objection be made, OWNER as trustee shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If required in writing by any party in interest, OWNER as trustee shall upon the occurrence of an insured loss, give bond for the proper performance of his duties.

5.8 Partial Utilization - Property Insurance:

- A. If OWNER finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all of the Work, such use or occupancy may be accomplished in accordance with Paragraph 14.6; provided that no such use or occupancy shall commence before the insurers providing the property insurance have acknowledged notice thereof and in writing effected the changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or lapse on account of any such partial use or occupancy.

5.9 Certificates of Insurance:

- A. All certificates of the insurance required to be purchased by CONTRACTOR pursuant to Article 5 shall be filed in accordance with Paragraph 2.1.B. Certificates shall be acceptable to OWNER and shall contain a provision that coverages afforded under the policies will not be canceled, materially changed or renewal refused until at least thirty days' prior written notice has been given to OWNER and ENGINEER by certified mail.

5.10 Additional Bonds and Insurance:

- A. OWNER may require CONTRACTOR to furnish such other Bonds and such additional insurance, in such form and with such sureties or insurers as OWNER may specify. If such other Bonds or such other insurance are specified in the Contract Documents, the premiums shall be paid by CONTRACTOR; if subsequent thereto, they shall be paid by OWNER except as otherwise provided in Paragraph 6.3.A.1 and Paragraph 13.8.B.

## ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

### 6.1 Supervision and Superintendence:

- A. CONTRACTOR shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but he shall not be solely responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence or procedure of construction which is indicated in and required by the Contract Documents. CONTRACTOR shall be responsible to see that the finished Work complies accurately with the Contract Documents.
- B. CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR'S representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications given to the superintendent shall be as binding as if given to CONTRACTOR.

### 6.2 Labor, Materials and Equipment:

- A. CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the site. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Supplementary Conditions, all Work at the site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without OWNER'S written consent given after prior written notice to ENGINEER.
- B. CONTRACTOR shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances and all other facilities and incidentals necessary for the execution, testing, initial operation and completion of the Work. Except as otherwise specified in the General Requirements, CONTRACTOR shall furnish all fuel, power, light, heat, telephone, water and sanitary facilities necessary for the execution, testing, initial operation and completion of the Work.
- C. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment.

- D. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, supplier or distributor, except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to impose on ENGINEER responsibility for the means, methods, techniques, sequences or procedures of construction or for safety precautions incident thereto.

### 6.3 Substitutions:

- A. Whenever materials or equipment are specified or described in the Drawings or Specifications by using the name of a proprietary item or the name of a particular manufacturer, fabricator, supplier or distributor, the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other manufacturers, fabricators, suppliers or distributors may be accepted by ENGINEER if sufficient information is submitted by CONTRACTOR to allow ENGINEER to determine that the material or equipment proposed is equivalent to that named. The procedure for review by ENGINEER will be as set forth in Paragraphs 6.3.A.1 and 6.3.A.2 below and as supplemented in the General Requirements.

1. Requests for review of substitute items of material and equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR. If CONTRACTOR wishes to furnish or use a substitute item of material or equipment, CONTRACTOR shall make written application to ENGINEER for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will state that the evaluation and acceptance of the proposed substitute will not prejudice CONTRACTOR'S timely achievement of Substantial Completion, whether or not acceptance of the substitute for use in the Work will require a change in the Drawings or Specifications to adapt the design to the substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified shall be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain a statement that CONTRACTOR agrees to pay all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change. ENGINEER may require CONTRACTOR to furnish at CONTRACTOR'S expense additional data about the proposed substitute. ENGINEER will be allowed a reasonable time within which to evaluate the proposed substitute. ENGINEER will be the sole judge of acceptability and no substitute will be ordered or installed without ENGINEER'S prior written acceptance. OWNER

may require CONTRACTOR to furnish at CONTRACTOR'S expense a special performance guarantee or other surety with respect to any substitute.

2. ENGINEER will record time required by ENGINEER and ENGINEER'S consultants in evaluating substitutions proposed by CONTRACTOR and in making changes in the Drawings or Specifications occasioned thereby. Whether or not ENGINEER accepts a proposed substitute, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER'S consultants for evaluating any proposed substitute that does not meet the requirements of the Drawings and Specifications.

6.4 Concerning Subcontractors:

- A. CONTRACTOR shall not employ any Subcontractor or other person or organization (including those who are to furnish the principal items of materials or equipment), whether initially or as a substitute, against whom OWNER or ENGINEER may have reasonable objection. A Subcontractor or other person or organization identified in writing to OWNER and ENGINEER by CONTRACTOR prior to the Notice of Award and not objected to in writing by OWNER or ENGINEER prior to the Notice of Award will be deemed acceptable to OWNER and ENGINEER. If OWNER or ENGINEER after due investigation has reasonable objection to any Subcontractor, other person or organization proposed by CONTRACTOR after the Notice of Award, CONTRACTOR shall submit an acceptable substitute and the Contract Price shall be increased or decreased by the difference in cost occasioned by such substitution, and an appropriate Change Order shall be issued. CONTRACTOR shall not be required to employ any Subcontractor, other person or organization against whom CONTRACTOR has reasonable objection. Acceptance of any Subcontractor, other person or organization by OWNER or ENGINEER shall not constitute a waiver of any right of OWNER or ENGINEER to reject defective Work.
- B. CONTRACTOR shall be fully responsible for all acts and omissions of his Subcontractors and of persons and organizations directly or indirectly employed by them and of persons and organizations for whose acts any of them may be liable to the same extent that CONTRACTOR is responsible for the acts and omissions of persons directly employed by CONTRACTOR. Nothing in the Contract Documents shall create any contractual relationship between OWNER or ENGINEER and any Subcontractor or other person or organization having a direct contract with CONTRACTOR, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any Subcontractor or other person or organization, except as may otherwise be required by law. OWNER or ENGINEER may furnish to any Subcontractor or other person or organization, to the extent practicable, evidence of amounts paid to CONTRACTOR on account of specific Work done.

- C. The Divisions and Sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or delineating the Work to be performed by any specific trade.
  - D. All Work performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and the ENGINEER and contains waiver provisions as required by Paragraph 5.6. CONTRACTOR shall pay each Subcontractor a just share of any insurance moneys received by CONTRACTOR on account of losses under policies issued pursuant to Paragraph 5.5.
- 6.5 Patent Fees and Royalties:
- A. CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of OWNER or ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorneys' fees) arising out of any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product or device not specified in the Contract Documents, and shall defend all such claims in connection with any alleged infringement of such rights.
- 6.6 Permits:
- A. Unless otherwise indicated in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of Bid. CONTRACTOR shall also pay all charges of utility service companies for connections to the Work, and OWNER shall pay all charges of such companies for capital costs related thereto.
- 6.7 Laws and Regulations:
- A. CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the Work. Except where otherwise expressly required by applicable laws, ordinances,

rules and regulations, neither OWNER nor ENGINEER shall be responsible for monitoring CONTRACTOR'S compliance with any laws, ordinances, rules or regulations.

- B. If CONTRACTOR observes that the Specifications or Drawings are at variance with any laws, ordinances, rules and regulations, CONTRACTOR shall give ENGINEER prompt written notice thereof, and any necessary changes shall be adjusted by an appropriate Modification. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to such laws, ordinances, rules and regulations, and without such notice to ENGINEER, CONTRACTOR shall bear all costs arising therefrom; however, it shall not be CONTRACTOR'S primary responsibility to make certain that the Specifications and Drawings are in accordance with such laws, ordinances, rules and regulations.

6.8 Taxes:

- A. CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by him in accordance with the law of the place of the Project.

6.9 Use of Premises:

- A. CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workmen to areas permitted by law, ordinances, permits, or the requirements of the Contract Documents, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment.
- B. During progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by OWNER. CONTRACTOR shall restore to their original condition those portions of the site not designated for alteration by the Contract Documents.
- C. CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.10 Record Documents:

- A. CONTRACTOR shall keep one record copy of all Specifications, Drawings, Addenda, Modifications, Shop Drawings and Samples at the site in good order and annotated to show all changes made during the construction process. These shall be available to ENGINEER for examination and shall be delivered to ENGINEER for OWNER upon completion of the Work.



6.11 Safety and Protection:

- A. CONTRACTOR shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
1. All persons on the Work site or who may be affected by the Work;
  2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and
  3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.
- B. CONTRACTOR shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and utilities when prosecution of the Work may affect them. CONTRACTOR shall cooperate with utility owners in the protection, removal, relocation or replacement of such utility property. All damage, injury or loss to any property referred to in Paragraph 6.11.A.2 or 6.11.A.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR). CONTRACTOR'S duties and responsibilities for safety and for the protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with Paragraph 14.9 that the Work is acceptable.
- C. Safety Representative:
1. CONTRACTOR shall designate a qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.
- D. Hazardous Communication Programs:
1. CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the site in accordance with laws, ordinances, rules, or regulations.

6.12 Emergencies:

- A. In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, CONTRACTOR, without special instruction or authorization from ENGINEER or OWNER, is obligated to act to prevent threatened damage, injury or loss. CONTRACTOR shall give ENGINEER prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby.

6.13 Shop Drawings and Samples:

- A. After checking and verifying all field measurements, CONTRACTOR shall submit to ENGINEER for review and approval, in accordance with the accepted schedule of Shop Drawing submissions (see Paragraph 2.6) and the procedures specified in the General Requirements, copies of all Shop Drawings, which shall have been checked by and stamped with the approval of CONTRACTOR and identified as ENGINEER may require. The data shown on the Shop Drawings will be complete with respect to dimensions, design criteria, materials of construction and the like to enable ENGINEER to review the information as required.
- B. CONTRACTOR shall also submit to ENGINEER for review and approval with such promptness as to cause no delay in Work, all Samples required by the Contract Documents. All Samples will have been checked by and stamped with the approval of CONTRACTOR, identified clearly as to material, manufacturer, any pertinent catalog numbers and the use for which intended.
- C. At the time of each submission, CONTRACTOR shall in writing call ENGINEER'S attention to all deviations that the Shop Drawings or Samples may have from the requirements of the Contract Documents.
- D. ENGINEER will review and approve with reasonable promptness Shop Drawings and Samples, but ENGINEER'S review and approval shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, sequences, techniques or procedures of construction or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions. CONTRACTOR shall make all corrections required by ENGINEER and shall return the required number of corrected copies of Shop Drawings and resubmit new Samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous submittals. CONTRACTOR'S stamp of approval on any Shop Drawing or Sample shall constitute a representation to OWNER and ENGINEER that CONTRACTOR has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data or assumes full responsibility for doing so, and

that CONTRACTOR has reviewed or coordinated each Shop Drawing or Sample with the requirements of the Work and the Contract Documents.

- E. Where a Shop Drawing or Sample is required by the Specifications, no related Work shall be commenced until the submittal has been reviewed and approved by ENGINEER.
- F. ENGINEER'S review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any deviations from the Contract Documents unless CONTRACTOR has in writing called ENGINEER'S attention to such deviation at the time of submission and ENGINEER has given written concurrence and approval to the specific deviation, nor shall any concurrence and approval by ENGINEER relieve CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or Samples.

6.14 Continuing The Work:

- A. CONTRACTOR shall carry on the Work and maintain the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as CONTRACTOR and OWNER may otherwise agree in writing.

6.15 Indemnification:

- A. To the fullest extent permitted by law, CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and their agents, employees and consultants from and against all claims, damages, losses and expenses including, but not limited to attorneys' fees arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom and (2) is caused in whole or in part by either (a) any negligent act or omission of CONTRACTOR, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable regardless of whether or not it is caused in part by a party indemnified hereunder, or (b) arises out of operation of law as a consequence of any act or omission of CONTRACTOR, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, regardless of whether any of them has been negligent.
- B. In any and all claims against OWNER or ENGINEER or any of their agents, employees or consultants by any employee of CONTRACTOR, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.15.A shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for CONTRACTOR or

any Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

- C. The obligations of CONTRACTOR under Paragraph 6.15.A shall not extend to the liability of ENGINEER, his agents, employees or consultants arising out of the ENGINEER'S preparation or approval of maps, Drawings, opinions, reports, surveys, Change Orders, designs or Specifications.

#### ARTICLE 7 - WORK BY OTHERS

- 7.1 OWNER may perform additional work related to the Project by himself, or have additional work performed by utility service companies, or let other direct contracts therefor which shall contain General Conditions similar to these. CONTRACTOR shall afford the utility service companies and the other contractors who are parties to such direct contracts (or OWNER, if OWNER is performing the additional work with OWNER'S employees) reasonable opportunity for the introduction and storage of materials and equipment and the execution of work, and shall properly connect and coordinate his Work with theirs.
- 7.2 If any part of CONTRACTOR'S Work depends for proper execution or results upon the work of any such other contractor or utility service company (or OWNER), CONTRACTOR shall inspect and promptly report to ENGINEER in writing any patent or apparent defects or deficiencies in such work that render it unsuitable for such proper execution and results. CONTRACTOR'S failure to so report shall constitute an acceptance of the other work as fit and proper for integration with CONTRACTOR'S Work except for latent defects and deficiencies in the other work.
- 7.3 CONTRACTOR shall do all cutting, fitting and patching of his Work that may be required to make its several parts come together properly and integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of ENGINEER and the others whose work will be affected.
- 7.4 If the performance of additional work by other contractors or utility service companies or OWNER was not noted in the Contract Documents, written notice thereof shall be given to CONTRACTOR prior to starting any such additional work. If CONTRACTOR believes that the performance of such additional work by OWNER or others involves additional expense or requires an extension of the Contract Time, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12 provided that the CONTRACTOR will make no claim which is barred by the provisions of Paragraph 12.3.

## ARTICLE 8 - OWNER'S RESPONSIBILITIES

- 8.1 OWNER shall issue all communications to CONTRACTOR through ENGINEER.
- 8.2 In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer whose status under the Contract Documents shall be that of the former ENGINEER.
- 8.3 OWNER shall furnish the data required of OWNER under the Contract Documents promptly and shall make payments to CONTRACTOR promptly after they are due as provided in Paragraphs 14.4.A and 14.9.A.
- 8.4 OWNER'S duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.1.A and 4.4.A. Paragraph 4.2.A refers to OWNER'S identifying and making available to CONTRACTOR copies of reports of investigations and tests of subsurface and latent physical conditions at the site or those reports that otherwise may affect performance of the Work which have been utilized by ENGINEER in preparing the Drawings and Specifications.
- 8.5 OWNER'S responsibilities in respect of purchasing and maintaining insurance are set forth in Article 5.
- 8.6 In connection with OWNER'S rights to request changes in the Work in accordance with Article 10, OWNER (especially in certain instances as provided in Paragraph 10.4) is obligated to execute Change Orders.
- 8.7 OWNER'S responsibility in respect of certain inspections, tests and approvals is set forth in Paragraph 13.3.
- 8.8 In connection with OWNER'S right to stop Work or suspend Work, see Paragraphs 13.5.A and 15.1. Paragraph 15.2.A deals with OWNER'S right to terminate services of CONTRACTOR under some circumstances.

## ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

- 9.1 Owner's Representative:
  - A. ENGINEER will be OWNER'S representative during the construction period. The duties and responsibilities and the limitations of authority of ENGINEER as OWNER'S representative during construction are set forth in the Contract Documents and shall not be extended without written consent of OWNER and ENGINEER.
- 9.2 Visits to Site:
  - A. ENGINEER will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. ENGINEER may make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality

of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. On the basis of such visits and on-site observations, ENGINEER will inform OWNER of the progress of the Work and will endeavor to guard OWNER against defects and deficiencies in the Work.

9.3 Clarifications and Interpretations:

- A. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the Contract Documents (in the form of Drawings or otherwise) as ENGINEER may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If CONTRACTOR believes that a written clarification or interpretation justifies an increase in the Contract Price or Contract Time, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

9.4 Rejecting Defective Work:

- A. ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be defective, and will also have authority to require special inspection or testing of the Work as provided in Article 13, whether or not the Work is fabricated, installed or completed.

9.5 Project Representation:

- A. If OWNER and ENGINEER agree, ENGINEER will designate a Resident Project Representative to assist ENGINEER in observing the performance of the Work. The duties, responsibilities and limitations of authority of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions. If OWNER designates another agent to represent him at the site who is not ENGINEER'S agent or employee, the duties, responsibilities and limitations of authority of such other person will be as set forth in the Supplementary Conditions.

9.6 Decisions on Disagreements:

- A. ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the execution and progress of the Work shall be referred initially to ENGINEER in writing with a request for a formal decision in accordance with this Paragraph, which ENGINEER will render in writing within a reasonable time. Written notice of each such claim, dispute and other matter shall be delivered by the claimant to ENGINEER and the other party to the Agreement within fifteen days of the occurrence of the event giving rise thereto, and written supporting data will be submitted to ENGINEER and the other party within forty-five days of such occurrence unless ENGINEER allows an additional period of time to

ascertain more accurate data. In his capacity as interpreter and judge, ENGINEER will not show partiality to OWNER or CONTRACTOR and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

- B. The rendering of a decision by ENGINEER pursuant to Paragraph 9.6.A with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment as provided in Paragraph 14.9) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or at law in respect of any such claim, dispute or other matter.

9.7 Limitations on Engineer's Responsibilities:

- A. Neither ENGINEER'S authority to act under this Article 9 or elsewhere in the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority shall create, impose or give rise to any duty or responsibility owed by ENGINEER to CONTRACTOR, any Subcontractor, any manufacturer, fabricator, supplier or distributor, or organization, or to any surety for or employee or agent of any of them.
- B. Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper", or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgement of ENGINEER as to the Work, it is intended that such requirement, direction, review or judgement will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective never indicates that ENGINEER shall have authority to supervise or direct performance of the Work or authority to undertake responsibility contrary to the provisions of Paragraphs 9.7.C and 9.7.D.
- C. ENGINEER will not be responsible for CONTRACTOR'S means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and ENGINEER will not be responsible for CONTRACTOR'S failure to perform the Work in accordance with the Contract Documents.
- D. ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractors, or of the agents or employees of any CONTRACTOR or Subcontractor, or of any other persons at the site or otherwise performing any of the Work.

## ARTICLE 10 - CHANGES IN THE WORK

- 10.1 Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions or revisions in the Work; these will be authorized by Change Orders. Upon receipt of a Change Order, CONTRACTOR shall proceed with the Work involved. All such Work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made as provided in Article 11 or Article 12 on the basis of a claim made by either party.
- 10.2 ENGINEER may authorize minor changes in the Work not involving an adjustment in the Contract Price or the Contract Time which are consistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order and shall be binding on OWNER, and also on CONTRACTOR who shall perform the change promptly. If CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or Contract Time, CONTRACTOR may make a claim therefor as provided in Article 11 or Article 12.
- 10.3 Additional Work performed without authorization of a Change Order will not entitle CONTRACTOR to an increase in the Contract Price or an extension of the Contract Time, except as provided in Paragraphs 10.2, 13.4.B, and except in the case of an emergency as provided in Paragraph 6.12.
- 10.4 OWNER shall execute appropriate Change Orders prepared by ENGINEER covering changes in the Work which are required by OWNER, or required because of unforeseen physical conditions or emergencies, or because of uncovering Work found not to be defective, or as provided in Paragraphs 11.6 and 15.1, or because of any other claim of CONTRACTOR for a change in the Contract Time or the Contract Price which is recommended by ENGINEER.
- 10.5 If notice of any changes affecting the general scope of the Work or change in the Contract Price is required by the provisions of any Bond to be given to the surety, it will be CONTRACTOR'S responsibility to so notify the Surety, and the amount of each applicable Bond shall be adjusted accordingly. CONTRACTOR shall furnish proof of such adjustment to OWNER.

## ARTICLE 11 - CHANGE OF CONTRACT PRICE

- 11.1 The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by CONTRACTOR shall be at his expense without change in the Contract Price.



- 11.2 The Contract Price may only be changed by a Change Order. Any claim for an increase in the Contract Price shall be based on written notice delivered to OWNER and ENGINEER within fifteen days of the occurrence of the event giving rise to the claim. Notice of the amount of the claim with supporting data shall be delivered within forty-five days of such occurrence unless ENGINEER allows an additional period of time to ascertain accurate cost data. All claims for adjustment in the Contract Price shall be determined by ENGINEER if OWNER and CONTRACTOR cannot otherwise agree on the amount involved. Any change in the Contract Price resulting from any such claim shall be incorporated in a Change Order.
- 11.3 The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price will be determined as follows:
- A. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved.
  - B. Where the Work involved is not covered by unit prices contained in the Contract Documents, by mutual acceptance of a lump sum.
  - C. Where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 11.3.B, on the basis of the Cost of the Work (determined as provided in Paragraph 11.4) plus a Contractor's Fee for overhead and profit (determined as provided in Paragraph 11.5).
  - D. Whenever the cost of any Work is to be determined pursuant to Paragraphs 11.4.A and 11.4.B, CONTRACTOR will submit in form acceptable to ENGINEER, an itemized cost breakdown together with supporting data.
- 11.4 Cost of the Work:
- A. The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in Paragraph 11.4.B.
    - 1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents

and foremen at the site. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays shall be included in the above to the extent authorized by OWNER.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and manufacturers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds, and all returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.
3. Payments made by CONTRACTOR to the Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to CONTRACTOR and shall deliver such bids to OWNER who will then determine, with the advice of ENGINEER, which bids will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work Plus a Fee, the Subcontractor's Cost of the Work shall be determined in the same manner as CONTRACTOR'S Cost of the Work. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.
4. Costs of special consultants (including, but not limited to, engineers, architects, testing laboratories, surveyors, lawyers and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
  - a. The proportion of necessary transportation, travel and subsistence expenses of CONTRACTOR'S employees incurred in discharge of duties connected with the Work.
  - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workmen, which are consumed in the performance of the Work, and cost less market value of such items used but not consumed which remain the property of CONTRACTOR.
  - c. Rentals of all construction equipment and machinery and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by OWNER with the advice of ENGINEER, and the costs of transportation, loading, unloading, installation, dismantling and removal thereof--all in accordance with terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.
  - d. Sales, use or similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by any governmental authority.
  - e. Deposits lost for causes other than CONTRACTOR'S negligence, royalty payments and fees for permits and licenses.

- f. Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by CONTRACTOR in connection with the execution of the Work, provided they have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's Fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid for services a fee proportionate to that stated in Paragraph 11.5.
  - g. The cost of utilities, fuel and sanitary facilities at the site.
  - h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.
  - i. Cost of premiums for additional Bonds and insurance required because of changes in the Work.
- B. The term Cost of the Work shall not include any of the following:
- 1. Payroll costs and other compensation of CONTRACTOR'S officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, lawyers, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in his principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.4.A.1 - all of which are to be considered administrative costs covered by the CONTRACTOR'S Fee.
  - 2. Expenses of CONTRACTOR'S principal and branch offices other than CONTRACTOR'S office at the site.
  - 3. Any part of CONTRACTOR'S capital expenses, including interest on CONTRACTOR'S capital employed for the Work and charges against CONTRACTOR for delinquent payments.
  - 4. Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for additional Bonds and insurance required because of changes in the Work).
  - 5. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.
  - 6. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 11.4.A.

11.5 Contractor's Fee:

- A. The Contractor's Fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:
  - 1. A mutually acceptable fixed fee; or.
  - 2. If a fixed fee cannot be agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    - a. For costs incurred under Paragraphs 11.4.A.1 and 11.4.A.2, the Contractor's Fee shall not exceed a total of twenty percent (ten percent for overhead and ten percent for profit).
    - b. For costs incurred under Paragraph 11.4.A.3, the Contractor's Fee shall not exceed a total of five percent; and if a subcontract is on the basis of Cost of the Work Plus a Fee, the maximum allowable to the Subcontractor as a fee for overhead and profit shall not exceed a total of twenty percent.
    - c. No fee shall be payable on the basis of costs itemized under Paragraphs 11.4.A.4, 11.4.A.5 and 11.4.B.
    - d. The amount of credit to be allowed by CONTRACTOR to OWNER for any such change which results in a net decrease in cost, will be the amount of the net decrease plus a deduction in Contractor's Fee by an amount equal to ten percent of the net decrease.
    - e. When both additions and credits are involved in any one change, the adjustment in Contractor's Fee shall be computed on the basis of the net change in accordance with Paragraphs 11.5.A.2.a through 11.5.A.2.d, inclusive.

11.6 Cash Allowances:

- A. It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be done by such Subcontractors, manufacturers, fabricators, suppliers or distributors and for such sums within the limit of the allowances as may be acceptable to ENGINEER. Upon final payment, the Contract Price shall be adjusted as required and an appropriate Change Order issued. CONTRACTOR agrees that the original Contract Price includes such sums as CONTRACTOR deems proper for costs and profit on account of cash allowances. No demand for additional cost or profit in connection therewith will be allowed.

11.7 Unit Price Work:

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

ARTICLE 12 - CHANGE OF THE CONTRACT TIME

- 12.1 The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time shall be based on written notice delivered to OWNER and ENGINEER within fifteen days of the occurrence of the event giving rise to the claim. Notice of the extent of the claim with supporting data shall be delivered within forty-five days of such occurrence unless ENGINEER allows an additional period of time to ascertain more accurate data. All claims for adjustment in the Contract Time shall be determined by ENGINEER if OWNER and CONTRACTOR cannot otherwise agree. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.
- 12.2 The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of CONTRACTOR if a claim is made therefor as provided in Paragraph 12.1. Such delays shall include, but not be limited to, acts or neglect by OWNER or others performing additional work as contemplated by Article 7, or to fires, floods, labor disputes, epidemics, abnormal weather conditions, or acts of God. No extension of the Contract Time will be granted where the delay is attributable to a Subcontractor, manufacturer, fabricator, supplier or distributor or any other party performing services or furnishing material or equipment on behalf of the CONTRACTOR unless such party's delay is attributable to one of the above enumerated causes.
- 12.3 The time limits concerning Substantial Completion and final completion as stated in the Contract Documents are of the essence. The provisions of this Article 12 shall not exclude recovery for damages (including compensation for additional professional services) for delay by either party, provided, however that CONTRACTOR shall not be entitled to damages for any delay occurring as a consequence of a delay in additional work being performed by others pursuant to Paragraph 7.1 hereof if the performance of said additional work was noted in the Contract Documents and the delay (by others) was not directly caused by the fault of OWNER.

ARTICLE 13 - WARRANTY AND GUARANTEE; TESTS AND INSPECTION; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.1 Warranty and Guarantee:

- A. CONTRACTOR warrants and guarantees to OWNER and ENGINEER that all Work will be in accordance with the Contract Documents and will not be defective. Prompt notice of all defects shall be given to CONTRACTOR. All defective Work, whether or not in place, may be rejected or corrected as provided in this Article 13.

13.2 Access to Work:

- A. ENGINEER and ENGINEER'S representatives, other representatives and personnel of OWNER, testing agencies and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspection and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR'S site safety procedures and programs so that they may comply therewith as applicable.

13.3 Tests and Inspections:

- A. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests or approvals.
- B. If any law, ordinance, rule, regulation, code, or orders of any public body having jurisdiction requires any Work (or part thereof) to specifically be inspected, tested or approved, CONTRACTOR (unless another party is specified in the General Requirements) shall assume full responsibility therefor, pay all costs in connection therewith and furnish ENGINEER the required certificates of inspection, testing or approval. CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required by the Specifications in connection with OWNER'S or ENGINEER'S acceptance of a manufacturer, fabricator, supplier or distributor of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for approval prior to CONTRACTOR'S purchase thereof for incorporation in the Work. The cost of all other inspections, tests and approvals required by the Contract Documents shall be paid by OWNER (unless otherwise specified).
- C. All inspections, tests or approvals other than those required by law, ordinance, rule, regulation, code or order of any public body having jurisdiction shall be performed by organizations acceptable to OWNER (or by ENGINEER if so specified).
- D. If any Work that is to be inspected, tested or approved is covered without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation. Such uncovering shall be at CONTRACTOR'S expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR'S intention to cover such Work and ENGINEER has not acted with reasonable promptness in response to such notice.
- E. Neither observations by ENGINEER nor inspections, tests or approvals by others shall relieve CONTRACTOR from his obligations to perform the Work in accordance with the Contract Documents.

13.4 Uncovering Work:

- A. If any Work is covered contrary to the written request of ENGINEER, it must, if requested by ENGINEER, be uncovered for ENGINEER'S observation and replaced at CONTRACTOR'S expense.

- B. If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER'S request, shall uncover, expose or otherwise make available for observation, inspection or testing as ENGINEER may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, CONTRACTOR shall bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, including compensation for additional professional services, and an appropriate deductive Change Order shall be issued. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction if he makes a claim therefor as provided in Articles 11 and 12.

13.5 Owner May Stop the Work:

- A. If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to finish or perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR or any other party.

13.6 Correction or Removal of Defective Work:

- A. If required by ENGINEER, CONTRACTOR shall promptly, without cost to OWNER and as specified by ENGINEER, either correct any defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by ENGINEER, remove it from the site and replace it with nondefective Work.

13.7 One Year Correction Period:

- A. If, within one year after the date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents, any Work is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER'S written instructions, either correct such defective Work, or, if it has been rejected by OWNER, remove it from the site and replace it with nondefective Work. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or the rejected Work removed and replaced, and all direct and indirect costs of such removal and replacement, including

compensation for additional professional services, shall be paid by CONTRACTOR.

13.8 Acceptance of Defective Work:

- A. If, instead of requiring correction or removal and replacement of defective Work, OWNER (and, prior to ENGINEER'S recommendation of final payment, also ENGINEER) prefers to accept it, OWNER may do so. In such case, if acceptance occurs prior to ENGINEER'S recommendation of final payment, a Change Order shall be issued incorporating the necessary revisions in the Contract Documents, including appropriate reduction in the Contract Price; or, if the acceptance occurs after such recommendation, an appropriate amount shall be paid by CONTRACTOR to OWNER.
- B. OWNER may require CONTRACTOR to furnish, at CONTRACTOR'S expense, a special performance guarantee or other surety prior to acceptance of defective Work.

13.9 Owner May Correct Defective Work:

- A. If CONTRACTOR fails within a reasonable time after written notice of ENGINEER to proceed to correct and to correct defective Work or to remove and replace rejected Work as required by ENGINEER in accordance with Paragraph 13.6, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents (including any requirements of the progress schedule), OWNER may, after seven days' written notice to CONTRACTOR, correct and remedy any such deficiency. In exercising his rights under this Paragraph, OWNER shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the site, take possession of all or part of the Work, and suspend CONTRACTOR'S services related thereto, take possession of CONTRACTOR'S tools, appliances, construction equipment and machinery at the site and incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER'S representatives, agents and employees such access to the site as may be necessary to enable OWNER to exercise his rights under this Paragraph. All direct and indirect costs of OWNER in exercising such rights shall be charged against CONTRACTOR in an amount verified by ENGINEER, and a Change Order shall be issued incorporating the necessary revisions in the Contract Documents and a reduction in the Contract Price. Such direct and indirect costs shall include, in particular but without limitation, compensation for additional professional services required and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of CONTRACTOR'S defective Work. CONTRACTOR shall not be allowed an extension of the Contract Time because of any delay in his performance of the Work attributable to the exercise by OWNER of OWNER'S rights hereunder.



## ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

### 14.1 Schedules:

- A. At least twenty days prior to submitting the first application for a progress payment, CONTRACTOR shall (except as otherwise specified in the General Requirements) submit to ENGINEER a progress schedule, a final schedule of Shop Drawings submission and where applicable, a schedule of values of the Work. These schedules shall be satisfactory in form and substance to ENGINEER. The schedule of values shall include quantities and unit prices aggregating the Contract Price, and shall subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Upon acceptance of the schedule of values by ENGINEER, it shall be incorporated into a form of Application for Payment acceptable to ENGINEER.

### 14.2 Application for Progress Payment:

- A. At least ten days before each application for a progress payment falls due (but not more often than once a month), CONTRACTOR shall submit to ENGINEER for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents and also as ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by such data, satisfactory to OWNER, as will establish OWNER'S title to the material and equipment and protect OWNER'S interest therein, including applicable insurance. Each subsequent Application for Payment shall include an affidavit of CONTRACTOR stating that all previous progress payments received on account of the Work have been applied to discharge in full all of CONTRACTOR'S obligations reflected in prior Applications for Payment. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

### 14.3 Contractor's Warranty of Title:

- A. CONTRACTOR warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER at the time of payment free and clear of all liens, claims, security interests and encumbrances (hereafter in these General Conditions referred to as "Liens").

### 14.4 Review of Applications for Progress Payments:

- A. ENGINEER will, within ten days after receipt of each Application for Payment, either indicate in writing his recommendation of payment and present the Application to OWNER, or return the Application to

CONTRACTOR indicating in writing ENGINEER'S reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application. OWNER shall, within thirty days of presentation to him of the Application for Payment with ENGINEER's recommendation, pay CONTRACTOR the amount recommended.

- B. ENGINEER'S recommendation of any payment requested in an Application for Payment will constitute a representation by ENGINEER to OWNER, based on ENGINEER'S on-site observations of the Work in progress as an experienced and qualified design professional and on ENGINEER'S review of the Application for Payment and the accompanying data and schedules that the Work has progressed to the point indicated; that, to the best of ENGINEER'S knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning Project upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents and any qualifications stated in the recommendation); and that CONTRACTOR is entitled to payment of the amount recommended. However, by recommending any such payment ENGINEER will not thereby be deemed to have represented that exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work, or that the means, methods, techniques, sequences, and procedures of construction have been reviewed, or that any examination has been made to ascertain how or for what purpose CONTRACTOR has used the moneys paid or to be paid to CONTRACTOR on account of the Contract Price, or that title to any Work, materials or equipment has passed to OWNER free and clear of any Liens.
- C. ENGINEER'S recommendation of final payment will constitute an additional representation by ENGINEER to OWNER that the conditions precedent to CONTRACTOR'S being entitled to final payment as set forth in Paragraph 14.9 have been fulfilled.
- D. ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER'S opinion, it would be incorrect to make such representations to OWNER. ENGINEER may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in ENGINEER'S opinion to protect OWNER from loss because:
1. The Work is defective, or completed Work has been damaged requiring correction or replacement,
  2. Written claims have been made against OWNER or Liens have been filed in connection with the Work,
  3. The Contract Price has been reduced because of Modifications,
  4. OWNER has been required to correct defective Work or complete the Work in accordance with Paragraph 13.9,
  5. Of CONTRACTOR'S unsatisfactory prosecution of the Work in accordance with the Contract Documents, or
  6. CONTRACTOR'S failure to make payment to Subcontractors for labor, materials or equipment.

#### 14.5 Substantial Completion:

- A. When CONTRACTOR considers the entire Work ready for its intended use, CONTRACTOR shall, in writing to OWNER and ENGINEER, certify that the entire Work is substantially complete and request that ENGINEER issue a certificate of Substantial Completion. Within a reasonable time thereafter, OWNER, CONTRACTOR and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER does not consider the Work substantially complete, ENGINEER will notify CONTRACTOR in writing giving his reasons therefor. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. OWNER shall have seven days after receipt of the tentative certificate during which OWNER may make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the Work is not substantially complete, ENGINEER will within fourteen days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating his reasons therefor. If, after consideration of OWNER'S objections, ENGINEER considers the Work substantially complete, ENGINEER will within said fourteen days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, heat, utilities and insurance. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER prior to his issuing the definitive certificate of Substantial Completion ENGINEER'S aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.
- B. OWNER shall have the right to exclude CONTRACTOR from the Work after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

#### 14.6 Partial Utilization:

- A. Use by OWNER of completed portions of the Work may be accomplished prior to Substantial Completion of all the Work subject to the following:
1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any part of the Work which OWNER believes to be substantially complete and which may be used without significant interference with construction of the other parts of the Work.

If CONTRACTOR agrees, CONTRACTOR will certify to OWNER and ENGINEER that said part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time thereafter OWNER, CONTRACTOR and ENGINEER shall make an inspection of that part of the Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving his reason therefor. If ENGINEER considers that part of the Work to be substantially complete, ENGINEER will execute and deliver to OWNER and CONTRACTOR a certificate to that effect, fixing the date of Substantial Completion as to that part of the Work, attaching thereto a tentative list of items to be completed or corrected before final payment. Prior to issuing a certificate of Substantial Completion as to part of the Work, ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to the division of responsibilities pending final payment between OWNER and CONTRACTOR, with respect to security, operation, safety, maintenance, utilities and insurance for that part of the Work which shall become binding upon OWNER and CONTRACTOR at the time of issuing the definitive certificate of Substantial Completion as to that part of the Work, unless OWNER and CONTRACTOR shall have otherwise agreed in writing and so informed ENGINEER. OWNER shall have the right to exclude CONTRACTOR from any part of the Work which ENGINEER has so certified to be substantially complete, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

2. In lieu of the issuance of a Certificate of Substantial Completion as to part of the Work, OWNER may take over operation of a facility constituting part of the Work whether or not it is substantially complete if such facility is functionally and separately useable; provided that prior to any such take over, OWNER and CONTRACTOR have agreed as to the division of responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, correction period, heat, utilities and insurance with respect to such facility.
3. No occupancy of part of the Work or taking over of operations of a facility will be accomplished prior to compliance with the requirements of Paragraph 5.8, in respect of property insurance.

#### 14.7 Final Inspection:

- A. Upon written notice from CONTRACTOR that the Work is complete, ENGINEER will make a final inspection with OWNER and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to remedy such deficiencies.

#### 14.8 Final Application for Payment:

- A. After CONTRACTOR has completed all such corrections to the satisfaction of ENGINEER and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance required by Paragraph 5.2.B, certificates of inspection, marked up record documents, and other documents -- all as required by the Contract Documents, and after ENGINEER has indicated that the Work is acceptable (subject to the provisions of Paragraph 14.10) CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by: 1) all documentation called for in the Contract Documents, 2) consent of the surety, if any, to final payment, and 3) complete and legally effective releases or waivers (satisfactory to OWNER) of all Liens arising out of or filed in connection with the Work. In lieu of such releases or waivers of Liens and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full and an affidavit of CONTRACTOR that: 1) the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and 2) that all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER'S property might in any way be responsible, have been paid or otherwise satisfied. If any Subcontractor, manufacturer, fabricator, supplier or distributor fails to furnish a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

#### 14.9 Final Payment and Acceptance:

- A. If, on the basis of ENGINEER'S observation of the Work during construction and final inspection and ENGINEER'S review of the final Application for Payment and accompanying documentation -- all as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR has fulfilled all of his obligations under the Contract Documents, ENGINEER will, within ten days after receipt of the final Application for Payment, indicate in writing his recommendation of payment and present the Application to OWNER for payment. Thereupon ENGINEER will give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of Paragraph 14.11. Otherwise, ENGINEER will return the Application to CONTRACTOR indicating in writing the reasons for refusing to recommend final payment in which case CONTRACTOR shall make the necessary corrections and resubmit the Application. If the Application and accompanying documentation are appropriate as to form and substance, OWNER shall, within thirty days after receipt thereof, pay CONTRACTOR the amount recommended by ENGINEER.
- B. If, through no fault of CONTRACTOR, final completion is materially delayed and if ENGINEER so confirms, OWNER shall, upon receipt of CONTRACTOR'S final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and

accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in Paragraph 5.1, the written consent of the Surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with his Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

14.10 Contractor's Continuing Obligation:

- A. CONTRACTOR'S obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by ENGINEER, nor the issuance of a certificate of Substantial Completion, nor any payment by OWNER to CONTRACTOR under the Contract Documents, nor any use or occupancy of the Work or any part thereof by OWNER, nor any act of acceptance by OWNER nor any failure to do so, nor the issuance of a notice of acceptability by ENGINEER pursuant to Paragraph 14.9, nor any correction of defective Work by OWNER shall constitute an acceptance of Work not in accordance with the Contract Documents or a release of CONTRACTOR'S obligation to perform the Work in accordance with the Contract Documents.

14.11 Waiver of Claims:

- A. The making and acceptance of final payment shall constitute:
  - 1. A waiver of all claims by OWNER against CONTRACTOR, except claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.7.A or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however it shall not constitute a waiver by the OWNER of any rights in respect of CONTRACTOR'S continuing obligations under the Contract Documents; and
  - 2. A waiver of all claims by CONTRACTOR against OWNER other than those previously made in writing and still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.1 Owner May Suspend Work:

- A. At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than ninety days by notice in writing to CONTRACTOR and ENGINEER which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an adjustment in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if CONTRACTOR makes a claim therefor as provided in Articles 11 and 12.

15.2 Owner May Terminate:

- A. Upon the occurrence of any one or more of the following events:
1. If CONTRACTOR is adjudged a bankrupt or insolvent,
  2. If CONTRACTOR makes a general assignment for the benefit of creditors,
  3. If a trustee or receiver is appointed for CONTRACTOR or for any of CONTRACTOR'S property,
  4. If CONTRACTOR files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or similar laws,
  5. If CONTRACTOR persistently fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under Paragraph 2.5 as revised from time to time),
  6. If CONTRACTOR repeatedly fails to make prompt payments to Subcontractors or for labor, materials or equipment,
  7. If CONTRACTOR disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction,
  8. If CONTRACTOR disregards the authority of ENGINEER, or
  9. If CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents,

OWNER may after giving CONTRACTOR (and the surety, if any) seven days' written notice, terminate the services of CONTRACTOR, exclude CONTRACTOR from the site and take possession of the Work and of all CONTRACTOR'S tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of completing the Work, including compensation for additional professional services, such excess shall be paid to CONTRACTOR. If such costs exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such costs incurred by OWNER will be reviewed by ENGINEER as to their reasonableness and when so approved by ENGINEER incorporated in a Change Order, provided that when exercising any rights or remedies under this Paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

- B. Where CONTRACTOR'S services have been so terminated by OWNER, the termination shall not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

- C. Upon seven days' written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the Agreement. In such case, CONTRACTOR shall be paid (without duplication of any items):
1. For completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
  2. For expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
  3. For amounts paid in settlement of terminated contracts with Subcontractors, manufacturers, fabricators, suppliers or distributors and others (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration or other dispute resolution costs incurred in connection with termination of contracts with Subcontractors and manufacturers, fabricators, suppliers or distributors); and
  4. For reasonable expenses directly attributable to termination. CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss or any consequential damages arising out of such termination.

15.3 Contractor May Stop Work or Terminate:

- A. If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within thirty days after it is submitted or OWNER fails for thirty days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days' written notice to OWNER and ENGINEER, and provided OWNER or ENGINEER do not remedy such suspension or failure within that time, terminate the Agreement and recover from OWNER payment on the same terms as provided in Paragraph 15.2.C. In lieu of terminating the Agreement and without prejudice to any other right or remedy, if ENGINEER has failed to act on an Application for Payment within thirty days after it is submitted, or OWNER has failed for thirty days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may upon seven days' written notice to OWNER and ENGINEER stop the Work until payment of all such amounts due CONTRACTOR, including interest thereon. The provisions of this paragraph are not intended to preclude CONTRACTOR from making claim under Articles 11 and 12 for an increase in Contract Price or Contract Time or otherwise for expenses or damage directly attributable to CONTRACTORS stopping Work as permitted by this paragraph.



## ARTICLE 16 - DISPUTE RESOLUTION

- 16.1 Unless otherwise provided in the Supplementary Conditions, all claims, disputes and other matters in question between OWNER and CONTRACTOR arising out of, or relating to the Contract Documents or the breach thereof, except for claims which have been waived by the making or acceptance of final payment as provided by Paragraph 14.11, shall be decided by the courts of the jurisdiction in which the Project is located.
- 16.2 In the case of any dispute that is required to be referred to ENGINEER initially for decision in accordance with Paragraph 9.6, no legal proceeding shall be instituted prior to the earlier of (a) the date on which ENGINEER has rendered a decision, or (b) the tenth day after the parties have presented their evidence to ENGINEER; and no proceeding with respect to such dispute shall be made later than thirty days after the date on which ENGINEER has rendered a written decision in respect thereof.

## ARTICLE 17 - MISCELLANEOUS

### 17.1 Giving Notice:

- A. Whenever any provision of the Contract Documents requires the giving of written notice it shall be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of notice.

### 17.2 Computation of Time:

- A. When any period of time is referred to in the Contract Documents by days, it shall be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day shall be omitted from the computation.

### 17.3 Notice of Claim:

- A. Should OWNER or CONTRACTOR suffer injury or damage to his person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim shall be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

B. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon CONTRACTOR, by Paragraphs 6.15, 13.1, 13.6, 13.9, 14.3 and 15.2 and all of the rights and remedies available to OWNER and ENGINEER thereunder, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by law or contract, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply. All representations, warranties and guarantees made in the Contract Documents shall survive final payment and termination or completion of this Agreement.

17.4 Headings:

A. The Article and Paragraph headings are inserted for convenience only and do not constitute part of these General Conditions.

SECTION 00800

SUPPLEMENTARY CONDITIONS

(These Supplementary Conditions amend or supplement the General Conditions and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.)

TABLE OF ARTICLES

SC-5	Bonds and Insurance
SC-6	Contractor's Responsibilities
SC-9	Engineer's Status During Construction

ARTICLE SC-5 - BONDS AND INSURANCE

SC-5.2 Contractor's Liability Insurance:

Add a new Paragraph immediately after Paragraph 5.2.B of the General Conditions, which is to read as follows:

- C. The limits of liability for the insurance required by Paragraph 5.2 of the General Conditions shall provide coverage for not less than the following amounts, or greater where required by law:
1. For Workers' Compensation, etc. under Paragraphs 5.2.A.1 and 5.2.A.2 of the General Conditions:
    - a. Applicable Federal or State: Statutory  
Maritime "Not Required"  
Railroad "Not Required"
    - b. Employer's Liability \$100,000 Each Occurrence
  2. For Comprehensive General Liability under Paragraphs 5.2.A.3 through 5.2.A.5 and Paragraph 5.2.A.7 of the General Conditions (including Premises-Operations, Independent Contractor's Protection, Products and Completed Operations, Broad Form Property Damage, Contractual Liability):
    - a. Bodily Injury:

\$ 500,000	Each Occurrence
\$1,000,000	Annual Aggregate
    - b. Property Damage:

\$ 500,000	Each Occurrence
\$1,000,000	Annual Aggregate
Or Combined Single Limit of \$1,000,000	
    - c. Property Damage liability insurance shall provide Explosion, Collapse and Underground coverages.

3. For Comprehensive Automobile Liability under Paragraph 5.2.A.6 of the General Conditions:
  - a. Bodily Injury:
 

\$1,000,000	Each Person
\$1,000,000	Each Accident
  - b. Property Damage:
 

\$1,000,000	Each Occurrence
	Or Combined

Single Limit of \$1,000,000

ARTICLE SC-6 - CONTRACTOR'S RESPONSIBILITIES

SC-6.8 Taxes:

Add a new paragraph immediately after Paragraph 6.8.A of the General Conditions, which is to read as follows:

- B. OWNER is exempt from payment of sales and compensating use taxes of the State of North Carolina and of cities and counties on all materials to be incorporated into the Work.
  1. OWNER will furnish the required certificates of tax exemption to CONTRACTOR for use in the purchase of supplies and materials to be incorporated into the Work.
  2. OWNER's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by CONTRACTOR, or to supplies or materials not incorporated into the Work.

SC-6.11 Safety and Protection:

Add a new Paragraph immediately after Paragraph 6.11.C of the General Conditions, which is to read as follows:

- D. Hazard Communication Programs: CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the site in accordance with all laws, ordinances, rules, regulations and orders of any public body. CONTRACTOR shall provide a centralized location for the maintenance of the material safety data sheets or other hazard communication information required to be made available by any employer on the site. Location of the material safety data sheets or other hazard communication information shall be readily accessible to the employees of any employer on the site.

ARTICLE SC-9 - ENGINEER'S STATUS DURING CONSTRUCTION

SC-9.5 Project Representation:

Add a new Paragraph immediately after Paragraph 9.5.A, which is to read as follows:

B. Resident Project Representative (RPR) is ENGINEER'S agent at the site, will act as directed by and under the supervision of ENGINEER, and will confer with ENGINEER regarding RPR's actions. RPR's dealings in matters pertaining to the on-site Work shall in general be with ENGINEER and CONTRACTOR keeping OWNER advised as necessary. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of CONTRACTOR. RPR shall generally communication with OWNER with the knowledge of and under the direction of ENGINEER.

1. Duties and Responsibilities to RPR:

a. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals and schedule of values prepared by CONTRACTOR and consult with ENGINEER concerning acceptability.

b. Conferences and Meetings: Attend meetings with CONTRACTOR, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.

c. Liaison:

1) Serve as ENGINEER'S liaison with CONTRACTOR, working principally through CONTRACTOR'S superintendent and assist in understanding the intent of the Contract Documents; and assist ENGINEER in serving as OWNER'S liaison with CONTRACTOR when CONTRACTOR'S operations affect OWNER'S on-site operations.

2) Assist in obtaining from OWNER additional details or information, when required for proper execution of the Work.

d. Shop Drawings and Samples:

1) Record date of receipt of Shop Drawings and Samples, which are received at the site.

2) Receive Samples which are furnished at the site by CONTRACTOR, and notify ENGINEER of availability of Samples for examination.

3) Advise ENGINEER and CONTRACTOR of the commencement of any Work requiring a Shop Drawing or Sample if the submittal has not been approved by ENGINEER.

e. Review of Work, Rejection of Defective Work, Inspections and Tests:

1) Conduct on-site observations of the Work in progress to assist ENGINEER in determining if

- the Work is in general proceeding in accordance with the Contract Documents.
- 2) Report to ENGINEER whenever RPR believes that any Work is unsatisfactory, faulty or defective or does not conform to the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise ENGINEER of Work that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
  - 3) Verify that tests, equipment and systems startups and operating and maintenance training are conducted in the presence of appropriate personnel, and that CONTRACTOR maintains adequate records thereof; and observe, record and report to ENGINEER appropriate details relative to the test procedures and startups.
  - 4) Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to ENGINEER.
- f. Interpretation of Contract Documents: Report to ENGINEER when clarifications and interpretations of the Contract Documents are needed and transmit to CONTRACTOR clarifications and interpretations as issued by ENGINEER.
- g. Modifications: Consider and evaluate CONTRACTOR'S suggestions for modifications in Drawings or Specifications and report with RPR's recommendations to ENGINEER. Transmit to CONTRACTOR decisions as issued by ENGINEER.
- h. Records:
- 1) Maintain at the job site orderly files for correspondence, reports of job conferences, Shop Drawings and Samples, and reproductions of original Contract Documents including all Addenda, Change Orders, Field Orders, additional Drawings issued subsequent to the execution of the Agreement. ENGINEER'S clarifications and interpretations of the Contract Documents, progress reports, and other Project related documents.
  - 2) Keep a record, recording CONTRACTOR hours on the job site, weather conditions, data relative to questions on Change Orders or changed conditions, list of job site visitors, daily activities, decisions, observations in general, and specific observations in more detail as in the case of

- observing test procedures; and send copies to ENGINEER.
- 3) Record names, addresses and telephone numbers of all CONTRACTORS, subcontractors and major suppliers of materials and equipment.
- i. Reports:
- 1) Furnish ENGINEER periodic reports as required of progress of the Work and of CONTRACTOR'S compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.
  - 2) Consult with ENGINEER in advance of scheduled major tests, inspections or start of important phases of the Work.
  - 3) Draft proposed Change Orders, obtaining backup material from CONTRACTOR and recommend to ENGINEER Change Orders and Field Orders.
  - 4) Report immediately to ENGINEER and OWNER upon the occurrence of any accident.
- j. Payment Requests: Review applications for payment with CONTRACTOR for compliance with the established procedure for their submission and submit recommendations to ENGINEER, noting particularly the relationship of the payment requested to the schedule of values, Work completed and materials and equipment delivered at the site but not incorporated in the Work.
- k. Certificates, Maintenance and Operation Manuals: During the course of the Work, verify that certificates, maintenance and operation manuals and other data required to be assembled and furnished by CONTRACTOR are applicable to the items actually installed and in accordance with the Contract Documents, and have this material delivered to ENGINEER for review and forwarding to OWNER prior to final payment for the Work.
- l. Completion:
- 1) Before ENGINEER issues a Certificate of Substantial Completion, submit to CONTRACTOR a list of observed items requiring completion or correction.
  - 2) Conduct final inspection in the company of ENGINEER, OWNER and CONTRACTOR and prepare a final list of items to be completed or corrected.
  - 3) Observe that all items on final list have been completed or corrected and make recommendations to ENGINEER concerning acceptance.

2. Limitations of Authority of RPR:

RPR shall not:

- a. Authorize any deviation from the Contract Documents or substitution of materials or equipment, unless authorized by ENGINEER.
- b. Exceed limitations of ENGINEER'S authority as set forth in the Agreement or the Contract Documents.
- c. Undertake any of the responsibilities of CONTRACTOR, subcontractors or CONTRACTOR'S superintendent.
- d. Advise on, issue directions relative to or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction unless such advice or directions are specifically required by the Contract Documents.
- e. Advise on, issue directions regarding or assume control over safety precautions and programs in connection with the Work.
- f. Accept Shop Drawing or Sample submittals from anyone other than CONTRACTOR.
- g. Authorized OWNER to occupy the Project in whole or in part.
- h. Participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by ENGINEER.



## SECTION 01010

### SUMMARY OF WORK

#### 1.1 LOCATION AND DESCRIPTION OF WORK

- A. The Work consists of the construction of approximately 2,800 linear feet of 2-inch, 8,320 linear feet of 6-inch and 360 linear feet of 8-inch diameter potable water main, fittings and appurtenances. The Work includes, but is not limited to, clearing and grubbing, sedimentation and erosion controls, concrete thrust blocks, air valves, hydrants, connection to existing mains, pavement repair, flushing and disinfection and all other appurtenances and related work to complete the Project.
- B. The Work is located in the Town of Southern Shores, Chicahauk Subdivision, North Carolina. Work to be performed shall be in accordance with applicable Dare County, Town and State standards, and drawings and specifications prepared by Malcolm Pirnie, Inc.
- C. The summary of the Work described in this Section is an overall summary of the responsibilities of the CONTRACTOR and his relation to the OWNER. It does not supersede the specific requirements of the other Contract Documents.

#### 1.2 CONTRACTS

- A. The Work shall be constructed under one prime contract.

#### 1.3 WORK BY OWNER

- A. Operations of all existing utility water system valves will be by OWNER'S crew only.
- B. CONTRACTOR'S Responsibilities:
  - 1. CONTRACTOR shall have responsibility for all Work required to successfully complete the project, including paving (pavement repair) traffic control, dewatering as required, and performing all necessary surveying to establish right-of-way lines.
  - 2. CONTRACTOR shall obtain and pay for all costs associated with all required permits not provided by the OWNER.
  - 3. CONTRACTOR shall lay out the lines and grades for the work with appropriate qualified personnel as specified in Section 01050.
  - 4. CONTRACTOR shall be solely responsible for all obligations prescribed as employer obligations under Chapter XVII of Title 29, Code of Federal Regulations, Part 1926; "Safety and Health Regulations for Construction".

#### 1.4 CONTRACTOR'S USE OF PREMISES

- A. CONTRACTOR'S use of the premises shall be confined to the limits of the existing right-of-way unless otherwise shown on the Drawings.

B. CONTRACTOR shall:

1. Assume full responsibility for protection and safekeeping of products stored on or off premises.
2. Move stored products that interfere with the operations of OWNER.
3. Obtain and pay for all additional storage or work areas required for his operations.
4. Keep all working areas in a generally neat condition.
5. Dust shall be minimized by use of water and deliquescent salts.
6. Erosion shall be controlled such that soil particles from the site do not enter public waters or neighboring property.
7. Noise shall be minimized by use of properly constructed and maintained equipment provided with suitable mufflers, snubbers and other sources of attenuating devices.

+ + END OF SECTION + +

SECTION 01030

SPECIAL CONSTRUCTION CONDITIONS

1.1 GENERAL

A. Existing Utilities:

1. The location of existing utilities have not been shown on the drawings with the exception of utilities that cross existing streets. The indicated utilities should be considered approximate only.
2. Copies of existing utility maps from North Carolina Power, Outerbanks Cable TV and Carolina Telephone are presented in Appendix A for reference.
3. If permanent relocation of an underground utility is required due to pipeline alignment, the utility will be moved by the utility company and paid for by the OWNER. Minor relocations of utilities (i.e., shifting utility less than 2 feet horizontally or 1 foot vertically) are to be performed by the CONTRACTOR at no additional cost to the OWNER.

+ + END OF SECTION + +

**SECTION 01040**  
**PROJECT COORDINATION**

1.1 GENERAL

- A. As more fully set forth in Article 6 of the General Conditions, CONTRACTOR shall be solely responsible for coordination of all of the Work. He shall supervise, direct and cooperate fully with all subcontractors, manufacturers, fabricators, suppliers, distributors, installers, testing agencies and all others whose services, materials or equipment are required to ensure completion of the Work within the Contract Time.
- B. As more fully set forth in Article 7 of the General Conditions, CONTRACTOR shall cooperate with and coordinate his Work with the work of any other contractor, utility service company or OWNER's employees performing additional work related to the Project at the site.
- C. CONTRACTOR shall not be responsible for damage done by contractors not under his jurisdiction. He will not be liable for any such loss or damage unless it is through the negligence of the CONTRACTOR.
- D. CONTRACTOR shall also coordinate his Work with the work of others to assure compliance with schedules.
- E. CONTRACTOR shall attend and participate in all project coordination or progress meetings and report on the progress of all Work and compliance with schedules.

+ + END OF SECTION + +

**SECTION 01050**  
**FIELD ENGINEERING**

1.1 GENERAL

- A. CONTRACTOR will establish base lines for the project and perform boundary surveys to establish right-of-way lines for existing streets in project area.
- B. CONTRACTOR shall:
1. Provide civil, surveying or other professional engineering services specified, or required to execute CONTRACTOR'S construction methods.
  2. Develop and make all detail surveys and measurements needed for construction including establishing right-of-way lines, proposed pipe centerline and all other working lines.
  3. Keep a transit and leveling instrument on the site at all times and a skilled instrument man employed or obtained whenever necessary for layout of the Work.
  4. Provide all material required for control points, batter boards, grade stakes, and other items.
  5. Be solely responsible for all locations, dimensions and levels. No data other than written orders of the ENGINEER shall justify departure from the dimensions and levels required by the Drawings.
  6. Safeguard all points, stakes, grade marks, monuments and bench marks made or established on the Work, re-establish same if disturbed and rectify all Work improperly installed because of not maintaining, not protecting or removing without authorization such established points, stakes, marks and monuments.
  7. When requested by ENGINEER, provide such facilities as may be necessary for ENGINEER to check line and grade points placed by CONTRACTOR.
  8. Re-establish private survey monuments disturbed by construction, replacement shall be by a surveyor licensed by the State of North Carolina.

1.2 CONTRACTOR'S FIELD ENGINEER

- A. CONTRACTOR shall employ a field engineer capable of performing all engineering tasks required of the CONTRACTOR. Tasks included are:
1. Maintain record drawings, and coordinate engineering services with subcontractors. Prepare layout and coordination drawings for construction operations.
  2. Check and coordinate Work for conflicts and interferences and immediately advise ENGINEER of all discrepancies noted.
  3. Cooperate with ENGINEER in field inspections as required.

1.3 QUALIFICATIONS OF SURVEYOR OR ENGINEER

- A. Qualified engineer or registered land surveyor, acceptable to CONTRACTOR and OWNER, to perform tasks 1.1B.2 and 1.1B.8 above.
- B. Registered Land Surveyor or Professional Engineer required for the specific service on the project, licensed in the State of North Carolina.

1.4 RECORDS

- A. Maintain a complete, accurate log of all control and survey work as it progresses.

1.5 SUBMITTALS

- A. Submit name and address of surveyor or engineer to ENGINEER.
- B. On request of ENGINEER, submit documentation to verify accuracy of field engineering work.
- C. When requested by ENGINEER, submit certificate signed by registered engineer or surveyor certifying that elevations and locations of Work are in conformance with Contract Documents. Explain all deviations.

+ + END OF SECTION + +

## SECTION 01070

### ABBREVIATIONS AND SYMBOLS

#### 1.1 ABBREVIATIONS

A. Common abbreviations which may be found in the Specifications are:

above finished floor	A.F.F.		
alternating current	a-c	maximum	max
ante meridiem	a.m.	mercury	Hg
ampere	A	milligram	mg
average	avg	milligrams per liter	mg/l
		milliliter	ml
biochemical oxygen demand	BOD	millimeter	mm
Bottom of window	B.O.W.	million gallon	mil
brake horsepower	bhp	million gallons per day	mgd
British thermal unit	Btu	minimum	min
		net positive suction head	npsH
Centigrade company	C Co	not in this contract number	NITC No.
cubic inch	cu in	National Pipe Threads	NPT
cubic foot	cu ft		
cubic yard	cu yd		
cubic feet per minute	cfm		
cubic feet per second	cfs	ounce	oz
		outside diameter	OD
decibel	db	parts per million	ppm
degree Centigrade (or Celsius)	(say) 20 C	plus or minus	(±)
degree Fahrenheit (say)	68 F	post meridiem	p.m.
diameter	diam	pound	lb
direct current	d-c	pounds per square foot	psf
dollars	\$	pounds per square inch	psi
each	ea	pounds per square inch absolute	psia
efficiency	eff	pounds per square inch gage	psig
Fahrenheit	F	revolutions per minute	rpm
feet	ft		
feet per hour	fph		
feet per minute	fpm	second	sec
feet per second	fps	specific gravity	sp gr
figure	Fig.	square	sq

flange	flg	square foot	sq ft
foot-pound	ft-lb	square inch	sq in
		square yard	sq yd
gallon	gal	Standard	std
gallons per minute	gpm	standard cubic feet	scfm
gallons per second	gps	per minute	
gram	g		
Hertz	Hz	total dynamic	TDH
hour	hr	head	
horsepower	hp	totally-enclosed-	tefc
		fan-cooled	
inch	in.	volt	V
inch-pound	in.-lb		
inside diameter	ID		
kilovolt-ampere	kva		
kilowatt	kw		
kilowatt-hour	kwh		
linear foot	lin ft		
liter	l		

## 1.2 ORGANIZATION ABBREVIATIONS

### A. Abbreviations of organizations which may be used in these Specifications are:

ACS	American Chemical Society
ACI	American Concrete Institute
AGMA	American Gear Manufacturers Association
AICHE	American Institute of Chemical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APHA	American Public Health Association
AREA	American Railway Engineering Association
ASTM	American Society for Testing and Materials
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
AWWA	American Water Works Association
AWS	American Welding Society
DIPRA	Ductile Iron Pipe Research Association
CRSI	Concrete Reinforcing Steel Institute
EPA	Environmental Protection Agency
FM	Factory Mutual



HEW	Department of Health, Education and Welfare
HUD	Department of Housing and Urban Development
IEEE	Institute of Electrical and Electronic Engineers
IRI	Industrial Risk Insurance
ISO	Insurance Services Office
NAAMM	National Association of Architectural Metal Manufacturers
NARUC	National Association of Railroad and Utilities Commissioners
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Act
PCI	Precast Concrete Institute
SMACNA	Sheet Metal and Air Conditioning National Association
SSPC	Steel Structures Painting Council
UL	Underwriters Laboratories, Inc.
USGS	United States Geological Survey
USPHS	United States Public Health Service
WWEMA	Water and Wastewater Equipment Manufacturers Association
WPCF	Water Pollution Control Federation

### 1.3 LEGEND

- A. Legends of symbols used are shown on the Drawings, and in general, use of symbols is confined to the Drawings.

+ + END OF SECTION + +

## SECTION 01150

### MEASUREMENT AND PAYMENT

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. The items listed below beginning with Article 1.5, refer to and are the same pay items listed in the Bid Form. They constitute all of the pay items for the completion of the Work. No direct or separate payment will be made for mobilization, providing bonds, permits, insurance, traffic control, miscellaneous temporary or accessory works, plant, services, CONTRACTOR'S field offices, layout surveys, job signs, sanitary requirements, testing, safety devices, replacement of unpaved roads trees and shrubbery, clean-up, field verification or location of buried utilities, approval and record drawings, water supplies, power, removal of waste, watchmen, bonds, insurance, and all other requirements of the General Conditions, Supplementary Conditions, and the General Requirements. Compensation for all such services, things and materials shall be included in the prices stipulated for unit price pay items listed herein.
- B. Each unit bid price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR'S overhead and profit for each separately identified item.

##### 1.2 ENGINEER'S ESTIMATE OF QUANTITIES

- A. ENGINEER'S estimated quantities for unit price pay items, as listed in the Bid Form, are approximate only and are included solely for the purpose of comparison of Bids. OWNER does not expressly or by implication agree that the nature of the materials encountered below the surface of the ground or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as OWNER may deem necessary. Except as provided in General and Supplementary Conditions. CONTRACTOR or OWNER will not be entitled to any adjustment in a unit bid price as a result of any change in an estimated quantity and agrees to accept the aforesaid unit bid prices as complete and total compensation for any additions or deductions caused by a variation in quantities as a result of more accurate "as-built" measurement, or by any changes or alterations in the Work ordered by OWNER, and for use in the computation of the value of the Work performed for progress payments.

### 1.3 MEASUREMENT FOR PAYMENT

#### A. Payment Limit Lines:

1. Where payment limit lines are shown on the Contract Drawings, or specified herein, measurement of a payment item will be made up to, but not beyond such lines.
2. Where the active work of a payment item falls short of the maximum payment line, measurement will be made to the line of actual work.
3. No measurement for payment will be made for quantities outside of payment limit lines unless authorized in writing by the OWNER.

### 1.4 RELATED PROVISIONS SPECIFIED ELSEWHERE

A. Payments to CONTRACTOR: Refer to General Conditions, Supplementary Conditions and Agreement

B. Changes in Contract Price: General Conditions.

### 1.5 BID ITEMS

#### A. Item 1, 2 and 3 - 2-, 6- and 8-Inch PVC Water Line:

1. Measurement: The quantity of 2-, 6- or 8-inch water main which will be paid for is the number of linear feet in place measured horizontally along the center line of the installed pipe, including length of all fittings.
2. Payment: The unit price per linear foot will be full compensation for providing 2-, 6- or 8-inch PVC water main, as shown and specified in Divisions 1 through 15 inclusive including but not limited to, furnishing, installing, cleaning, disinfection and testing of pipe, pushing of 2-inch water line where specified on contract drawings, clearing, and site restoration other than asphalt or concrete patching; excavation; drainage and dewatering; sheeting, shoring and bracing; erosion and sedimentation control measures; backfill and compaction; grading; disposal of excess excavated materials; removal and restoration of fences, signs, mailboxes, cables, poles, etc; care and protection of existing utilities and structures. Asphalt and concrete replacement will be paid for under their own respective items.

#### B. Item 4 and 5 - 2- and 6-Inch Valves:

1. Measurement: The quantity of 2- or 6-inch valves in place will be the number of each size furnished and installed as shown and specified on the drawings.
2. Payment: The unit price for each size valve will be full compensation for furnishing all labor, materials, tools, equipment, supervision, excavation and backfill and incidentals required to furnish, install, and test the valve, including but not limited to site restoration other than asphalt or concrete patching, cast iron valve box and cover, and valve marker.

Asphalt and concrete replacement will be paid for under their own respective items.

- C. Item 6 - 6-Inch Tapping Sleeve and Valve:
  - 1. Measurement: The quantity of 6-inch tapping sleeve and valve in place will be the number installed as shown and specified on the drawings.
  - 2. Payment: The unit price will be full compensation for furnishing all labor, materials, tools, equipment, supervision, excavation and backfill, dewatering and incidentals to make the required connection to existing water pipeline, including but not limited to site restoration other than asphalt or concrete patching, furnishing tapping valve, thrust block, cast iron valve box and excavation of test pits to verify location and type of existing main. Asphalt and concrete replacement will be paid for under their own respective items.
  
- D. Item 7 - Blow-Off Assembly:
  - 1. Measurement: The quantity of blow-off assemblies will be the number of assemblies installed as shown and specified on the drawings.
  - 2. Payment: The unit price will be full compensation for furnishing all labor, materials, tools, equipment, supervision, excavation and backfill for providing blow-off assembly as specified, including but not limited to, site restoration other than asphalt or concrete patching, 2-inch schedule 80 PVC pipe and fittings, 2-inch ball valve with valve box and cover with concrete protection pad, valve marker, concrete thrust block and meter box. Asphalt and concrete replacement will be paid for under their own respective items.
  
- E. Item 8 - Manual Air Release Assembly:
  - 1. Measurement: The quantity of air release assemblies will be the number of assemblies installed as shown and specified on the drawings.
  - 2. Payment: The unit price will be full compensation for furnishing all labor, materials, tools, equipment, supervision, excavation and backfill for providing air release assembly as specified, including but not limited to, site restoration other than asphalt concrete patching, service saddle, 2-inch corporation stop, 2-inch schedule 80 PVC pipe and fittings, 2-inch ball valve with valve box and cover with concrete protection pad, valve marker, concrete thrust block and meter box. Asphalt and concrete replacement will be paid for under their own respective items.
  
- F. Item 9 - Fire Hydrant Assembly:
  - 1. Measurement: The quantity of hydrant assemblies will be the number of assemblies installed as shown and specified on the drawings.
  - 2. Payment: The unit price will be full compensation for furnishing all labor, materials, tools, equipment, supervision, excavation and backfill for providing fire hydrant assembly as

specified, including but not limited to, site restoration other than asphalt or concrete patching, 6- by 6-inch tee, with concrete thrust block, gate valve and valve box, PVC pipe and ductile iron fittings and gravel bedding material. Asphalt and concrete replacement will be paid for under their own respective items.

- G. Item 10 - Ductile Iron Fittings:
  - 1. Measurement: The quantity to be paid will be the actual number of pounds of ductile iron fittings furnished and installed as shown and specified on the drawings. The weight for the ductile iron fittings shall include required bolts and follower glands.
  - 2. Payment: The unit price will be full compensation for furnishing all labor, materials, tools, equipment, supervision, excavation and backfill for providing ductile iron fitting, installation, including but not limited to site restoration, thrust blocks, disinfection and pressure testing. Asphalt and concrete driveway replacement will be paid for under their respective items.
  
- H. Item 11 and 12 - Concrete and Driveway Removal and Replacement:
  - 1. Measurement: The quantity to be paid for will be the actual number of square yards of concrete and asphalt driveway replacement along the centerline of the trench to the limits as detailed and specified. All additional driveway areas damaged outside these limits will be replaced by the CONTRACTOR at his own expense.
  - 2. Payment: The unit price will be full compensation for furnishing all labor, materials and equipment to install driveway including removal and disposal of existing driveways and foundation preparation.
  
- I. Item 13 - Asphalt Replacement - Trench Repair Town Streets:
  - 1. Measurement: The quantity to be paid for will be the actual number of square yards of pavement replacement for streets along the centerline of the trench to the limits as detailed and specified. All additional asphalt width damaged outside these limits will be replaced by the CONTRACTOR at this own expense.
  - 2. Payment: The unit price will be full compensation for furnishing all labor, materials and equipment for saw cutting, pavement removal and proper disposal, including but not limited to compacted select backfill, permits, stone base, temporary aggregate base material, prime coat, tack coat and I-2 bituminous concrete surface.
  
- J. Item 14 - 1-Inch Asphalt Overlay:
  - 1. Measurement: The quantity to be paid for will be the actual number of square yards of asphalt overlay within the limits as shown on the plans. All additional asphalt overlay outside these specified limits, without prior approval, will be at the CONTRACTOR'S own expense.

2. Payment: The unit price will be full compensation for furnishing all labor, materials and equipment for installation of a 1-inch I-2 asphalt overlay, including permits, cleaning, tack coat, pavement markings and adjustment of all existing and new frames to final surface elevation. All work and materials shall be in conformance with NCDOT requirements and specifications.

+ + END OF SECTION + +

## SECTION 01201

### PRECONSTRUCTION CONFERENCE

#### 1.1 GENERAL

- A. Date, Time and Location: Conference will be held after execution of the Contract and before construction is started at the site. ENGINEER will fix the date, time and location of the meeting in accordance with requirements of the General Conditions.
- B. ENGINEER shall prepare agenda, preside at meeting, and prepare and distribute a transcript of proceedings to all parties.
- C. CONTRACTOR(S) shall provide data required, contribute appropriate items for discussion, and be prepared to discuss all items on agenda.

#### 1.2 REQUIRED ATTENDANCE

- A. CONTRACTOR(S) and major Subcontractors.
- B. OWNER'S representative.
- C. ENGINEER and his Resident Project Representative.
- D. Representatives of government agencies having any degree of control or responsibility, if available.

#### 1.3 AGENDA

- A. Agenda will include, but will not necessarily be limited to, the following:
  - 1. Designation of responsible personnel.
  - 2. Subcontractors.
  - 3. Coordination of work.
  - 4. Construction schedule.
  - 5. Processing of Shop Drawings.
  - 6. Processing of field decisions and Change Orders.
  - 7. Requirements for copies of Contract Documents.
  - 8. Insurance in force.
  - 9. Schedule of Values.
  - 10. Schedule of Payments.
  - 11. Use of premises.
  - 12. CONTRACTOR(S) responsibility for safety and first aid procedures.
  - 13. Security.
  - 14. Maintaining access to private property.

15. Record Drawings.
16. Permits.
17. Work hours.
18. Notification of Residents - CONTRACTOR and OWNER responsibilities.
19. Erosion control measures.

+ + END OF SECTION + +



SECTION 01202  
PROGRESS MEETINGS

1.1 GENERAL

- A. Date and Time:
  - 1. Regular Meetings: As mutually agreed upon by ENGINEER, OWNER and CONTRACTOR.
  - 2. Other Meetings: On call.
- B. Place: Mutually agreed upon location.
- C. ENGINEER shall prepare agenda, preside at meetings, and prepare and distribute a transcript of proceedings to all parties within five working days after each meeting.
- D. CONTRACTOR shall provide data required and be prepared to discuss all items on agenda.

1.2 MINIMUM ATTENDANCE

- A. CONTRACTOR, Subcontractors and suppliers. Representatives present for each party shall be authorized to act on their behalf.
- B. ENGINEER.
- C. OWNER'S representative.
- D. Resident Project Representative.
- E. CONTRACTOR'S Superintendent.
- F. Others as appropriate.

1.3 AGENDA

- A. Agenda will include, but will not necessarily be limited to, the following:
  - 1. Transcript of previous meeting.
  - 2. Progress since last meeting.
  - 3. Planned progress for next period.
  - 4. Problems, conflicts and observations.
  - 5. Change Orders.
  - 6. Applications for payment.
  - 7. Quality standards and control.
  - 8. Schedules, including shop drawing and delivery schedules.
  - 9. Corrective measures required.
  - 10. Coordination between parties.
  - 11. Other business.

+ + END OF SECTION + +

**SECTION 01310**  
**CONSTRUCTION SCHEDULES**

1.1 GENERAL

- A. Provide construction schedule which conforms to the requirements below, unless otherwise approved by ENGINEER.
- B. All activities of the CONTRACTOR will be scheduled and monitored by the use of a bar chart.
- C. Update schedules every month unless otherwise specified or directed by ENGINEER.
- D. No partial payments shall be approved until there is an approved construction progress schedule in hand.

1.2 SCHEDULE CONTENT

- A. Shop Drawing submittal dates and required approval dates.
- B. Product delivery dates.
- C. Utility Coordination.
- D. Construction activity by street.
- E. Restoration schedule.

1.3 SUBMITTALS

- A. Submit initial schedule at least 5 days prior to pre-construction meeting but no later than 15 days after the effective date of the Agreement.
- B. Submit updated schedules at progress meetings.
- C. Make submittals to ENGINEER.
- D. Unless otherwise specified, submit five copies of each schedule. One copy will be reviewed by the ENGINEER and returned. The other copies will be retained by the ENGINEER.

- E. Attach a letter of transmittal to each submittal and include the following information in the letter:
  - 1. A listing of items which have changed since the last submittal.
  - 2. Discussion of problems causing delays, anticipated length of delays, and proposed countermeasures.
- F. Submit revised monthly progress schedule with application for payment.

+ + END OF SECTION + +

SECTION 01341

SHOP DRAWING PROCEDURES

1.1 GENERAL

- A. Shop Drawing procedures shall conform to requirements of General Conditions and as described in this Section.

1.2 PROCEDURE

- A. Submit Shop Drawings to: Malcolm Pirnie, Inc., 11832 Rock Landing Drive, Suite 400, Newport News, Virginia 23606.
- B. The CONTRACTOR is to maintain an accurate updated submittal log. This log shall be brought to each scheduled progress meeting with the OWNER and the ENGINEER. This log shall contain as a minimum, submittal description and assigned number, date to ENGINEER, date returned to CONTRACTOR by ENGINEER and status of submittal (approved/resubmit/rejected).
- C. A letter of transmittal shall accompany each submittal. If data for more than one Section of the Specifications is submitted, a separate transmittal letter shall accompany the data submitted for each Section.
- D. At the beginning of each letter of transmittal provide a reference heading indicating the following:
  - 1. OWNER'S Name \_\_\_\_\_
  - 2. Project Name \_\_\_\_\_
  - 3. Contract No. \_\_\_\_\_
  - 4. Transmittal No. \_\_\_\_\_
  - 5. Section No. \_\_\_\_\_
- E. If a Shop Drawing deviates from the requirements of the Contract Documents, CONTRACTOR shall specifically note each variation in his letter of transmittal.
- F. All Shop Drawings submitted for approval shall have a title block with complete identifying information satisfactory to ENGINEER.
- G. All Shop Drawings submitted shall bear the stamp of approval and signature of CONTRACTOR as evidence that they have been reviewed by CONTRACTOR. Submittals without this stamp of approval will not be reviewed by ENGINEER and will be returned to CONTRACTOR. CONTRACTOR'S stamp shall contain the following minimum information:

Project Name: \_\_\_\_\_

CONTRACTOR'S Name: \_\_\_\_\_

Date: \_\_\_\_\_

-----Reference-----

Item: \_\_\_\_\_

Specifications:

Section: \_\_\_\_\_

Page No.: \_\_\_\_\_

Para. No.: \_\_\_\_\_

Drawing No.: \_\_\_\_\_ of \_\_\_\_\_

Location: \_\_\_\_\_

Submittal No.: \_\_\_\_\_

Approved By: \_\_\_\_\_

- H. A number shall be assigned to each submittal by CONTRACTOR starting with No. 1 and thence numbered consecutively. Resubmittals shall be identified by the original submittal number followed by the suffix "A" for the first resubmittal, the suffix "B" for the second resubmittal, etc.
- I. CONTRACTOR shall initially submit to ENGINEER a minimum of 5 copies of all submittals that are on 8-1/2-inch by 11-inch or smaller sheets, and one unfolded sepia and 2 prints made from that sepia for all submittals on sheets larger than 8-1/2-inch by 11-inch. The Resident Project Representative shall receive one copy only of each submittals which will be stamped "Preliminary - Not For Construction."
- J. After ENGINEER completes his review, Shop Drawings will be marked with one of the following notations:
1. Approved
  2. Approved as Corrected
  3. Revise and Resubmit
  4. Not Approved
- K. If a submittal is acceptable, it will be marked "Approved" or "Approved as Corrected". Four prints or copies of the submittal will be returned to CONTRACTOR.

- L. Upon return of a submittal marked "Approved" or "Approved as Corrected", CONTRACTOR may order, ship or fabricate the materials included on the submittal, provided it is in accordance with the corrections indicated.
- M. If a Shop Drawing marked "Approved as Corrected" has extensive corrections or corrections affecting other drawings or Work, ENGINEER may require that CONTRACTOR make the corrections indicated thereon and resubmit the Shop Drawings for record purposes. Such drawings will have the notation, "Approved as Corrected - Resubmit."
- N. If a submittal is unacceptable, 2 copies will be returned to CONTRACTOR with one of the following notations:
  - 1. "Revise and Resubmit"
  - 2. "Not Approved"
- O. Upon return of a submittal marked "Revise and Resubmit", CONTRACTOR shall make the corrections indicated and repeat the initial approval procedure. The "Not Approved" notation is used to indicate material or equipment that is not acceptable. Upon return of a submittal so marked, CONTRACTOR shall repeat the initial approval procedure utilizing acceptable material or equipment.
- P. Any related Work performed or equipment installed without an "Approved" or "Approved as Corrected" Shop Drawing will be at the sole responsibility of the CONTRACTOR.
- Q. Shop Drawings shall be submitted well in advance of the need for the material or equipment for construction and with ample allowance for the time required to make delivery of material or equipment after data covering such is approved. CONTRACTOR shall assume the risk for all materials or equipment which are fabricated or delivered prior to the approval of Shop Drawings. Materials or equipment will not be included in periodic progress payments until approval thereof has been obtained in the specified manner.
- R. ENGINEER will review and process all submittals promptly (not to exceed 30 days), but a reasonable time should be allowed for this, for the Shop Drawings being revised and resubmitted, and for time required to return the approved Shop Drawings to CONTRACTOR.
- S. It is CONTRACTOR'S responsibility to review submittals made by his suppliers and Subcontractors before transmitting them to ENGINEER to assure proper coordination of the Work and to determine that each submittal is in accordance with his desires and that there is sufficient information about materials and equipment for ENGINEER to determine compliance with the Contract Documents. Incomplete or inadequate submittals will be returned for revision without review.

- T. CONTRACTOR shall furnish required submittals with complete information and accuracy in order to achieve required approval of an item within two submittals. All costs to ENGINEER involved with subsequent submittals of Shop Drawings, Samples or other items requiring approval, will be backcharged to CONTRACTOR, at the rate of 3.0 times direct technical labor cost, by deducting such costs from payments due CONTRACTOR for Work completed. In the event that CONTRACTOR requests a substitution for a previously approved item, all of ENGINEER'S costs in the reviewing and approval of the substitution will be backcharged to CONTRACTOR unless the need for such substitution is beyond the control of CONTRACTOR.

+ + END OF SECTION + +

**SECTION 01380**  
**CONSTRUCTION PHOTOGRAPHS**

1.1 GENERAL

- A. CONTRACTOR shall retain a photographer to perform the services specified below.

1.2 PHOTOGRAPHS

- A. Prior to commencing work and at completion of construction, the CONTRACTOR shall take a minimum of 20 color photographs along the entire length of the proposed project to serve as a record of pre-construction and post-construction.
- B. No construction shall begin prior to review of initial photographs. All photographs shall become property of OWNER.
- C. Resident Project Representative will approve the views to be taken by the photographer.

1.3 PRINTS

- A. Furnish three prints of each photograph to the ENGINEER as soon as they are available from the photographer.
- B. Furnish additional photographs or prints requested by ENGINEER at cost.
- C. Provide high quality 5-inch by 7-inch standard weight prints with a glossy finish.
- D. Place the following information on the back of each print:
  - 1. Date photograph was taken.
  - 2. Title of Project.
  - 3. Description of view shown in photograph.
  - 4. Name and address of photographer.
  - 5. Photographer's numbered identification of exposure.

+ + END OF SECTION + +



## SECTION 01410

### TESTING LABORATORY SERVICES FURNISHED BY CONTRACTOR

#### 1.1 GENERAL

- A. CONTRACTOR shall employ and pay for an independent testing laboratory to perform the specified services. Laboratory selected shall be subject to approval by the ENGINEER.
- B. Inspection, sampling and testing shall be as specified in the individual Sections. These include but are not limited to:
  - 1. Trenching, Section 02221.
  - 2. Cleaning, Testing and Disinfection, Section 15072.

#### 1.2 QUALIFICATIONS OF LABORATORY

- A. Where applicable, meet "Recommended Requirements for Independent Laboratory Qualification", latest edition, published by American Council of Independent Laboratories and the basic requirements of ASTM E 329, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction". Laboratory shall be authorized to operate in the state in which Project is located.
- B. Testing Equipment:
  - 1. Calibrated at maximum 12 month intervals by devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.
  - 2. Submit copy of certificate of calibration, made by accredited calibration agency.

#### 1.3 LABORATORY DUTIES

- A. Cooperate with ENGINEER and provide qualified personnel promptly on notice.
- B. Perform specified inspections, sampling and testing of materials and methods of construction; comply with applicable standards; ascertain compliance with requirements of Contract Documents.
- C. Promptly notify ENGINEER and CONTRACTOR, of irregularities or deficiencies of Work, which are observed during performance of services.
- D. Promptly submit 5 copies of reports of inspections and tests to ENGINEER, including:
  - 1. Date issued.
  - 2. Project title and number.
  - 3. Testing laboratory name and address.
  - 4. Name and signature of inspector.

4. Name and signature of inspector.
5. Date of inspection or sampling.
6. Record of temperature and weather.
7. Date of test.
8. Identification of product and Specification Section.
9. Location in Project.
10. Type of inspection or test.
11. Results of tests and observations regarding compliance with Contract Documents.

- E. Perform additional tests and services as required to assure compliance with the Contract Documents.

#### 1.4 CONTRACTOR'S COORDINATION WITH LABORATORY

- A. Cooperate with laboratory personnel, provide access to Work and to manufacturer's operations.
- B. Provide to laboratory, representative samples of materials to be tested, in required quantities.
- C. Furnish labor and facilities:
  1. To provide access to Work to be tested.
  2. To obtain and handle samples at the site.
  3. To facilitate inspections and tests.
  4. For laboratory's exclusive use for storage and curing of test samples.
  5. Forms for preparing concrete test beams and cylinders.
- D. Notify laboratory and ENGINEER sufficiently in advance of operations to allow for assignment of personnel and scheduling of tests.
- E. Arrange with laboratory and pay for, additional samples and tests required for CONTRACTOR'S convenience.

#### 1.5 PRODUCT TEST REPORTS

- A. Furnish copies of product test reports where required by the Specifications or requested by ENGINEER.

+ + END OF SECTION + +

## SECTION 01510

### TEMPORARY CONSTRUCTION FACILITIES

#### 1.1 GENERAL

- A. CONTRACTOR shall be responsible for all temporary construction facilities required for the Work. CONTRACTOR shall make all arrangements with utility service companies for temporary services and shall pay all costs associated therewith.
- B. Temporary construction facilities include:
  - 1. Water.
  - 2. Fire Protection.
  - 3. Sanitary and First Aid Facilities.
- C. CONTRACTOR shall abide by all rules and regulations of the utility service company or authority having jurisdiction.
- D. Provide all materials, equipment and power required for temporary electricity and lighting.
- E. Suitably enclosed chemical or self-contained toilets shall be provided for the use of the men employed on the Work. Toilets shall be located near the Work site and secluded from observation insofar as possible. Toilets shall be serviced at regular intervals, kept clean and supplied throughout the course of the Work.
- F. CONTRACTOR shall furnish and maintain a safe drinking water supply readily available to all workers.
- G. CONTRACTOR shall be responsible for all utility service costs until the Work is substantially complete. Included are all fuel, power, light, heat and other utility services necessary for execution, completion, testing and initial operation of the Work.
- H. CONTRACTOR shall:
  - 1. Comply with applicable requirements specified in Division 2.
  - 2. Maintain and operate systems to assure continuous service.
  - 3. Modify and extend systems as Work progress requires.
  - 4. Completely remove temporary materials and equipment when their use is no longer required.
  - 5. Clean and repair damage caused by temporary installations or use of temporary facilities.
  - 6. Restore existing facilities used for temporary services to specified or to original condition.

+ + END OF SECTION + +

## SECTION 01545

### PROTECTION OF THE WORK AND PROPERTY

#### 1.1 GENERAL

- A. CONTRACTOR shall be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect the Work and all public and private property and facilities from damage as specified in the General Conditions and herein.
- B. In order to prevent damage, injury or loss, CONTRACTOR'S actions shall include, but not be limited to, the following:
  - 1. Store apparatus, materials, supplies, and equipment in an orderly, safe manner that will not unduly interfere with the progress of the Work or the Work of any other contractor or utility service company.
  - 2. Provide suitable storage facilities for all materials which are subject to injury by exposure to weather, theft, breakage, or otherwise.
  - 3. Place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work.
  - 4. Clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the Work shall present a safe, orderly and workmanlike appearance.
  - 5. Provide barricades and guard rails around openings, for scaffolding, for temporary stairs and ramps, around excavations, elevated walkways and other hazardous areas.
- C. CONTRACTOR shall not, except after written consent from proper parties, enter or occupy with men, tools, materials or equipment, privately-owned land except on easements provided herein.
- D. CONTRACTOR shall assume full responsibility for the preservation of all public and private property or facility on or adjacent to the site. If any direct or indirect damage is done by or on account of any act, omission, neglect or misconduct in the execution of the Work by the CONTRACTOR, it shall be restored by the CONTRACTOR, at his expense, to a condition equal to that existing before the damage was done.

#### 1.2 BARRICADES AND WARNING SIGNALS

- A. Where Work is performed on or adjacent to any roadway, right-of-way, or public place, CONTRACTOR shall furnish and erect barricades, fences, lights, warning signs, and danger signals, shall provide watchmen, and shall take other precautionary measures for the protection of persons or property and of the Work. Barricades shall be painted to be visible at night. From sunset to sunrise, the CONTRACTOR shall furnish and maintain at least one light at each barricade. Barricades shall be erected to keep vehicles from being

driven on or into Work under construction. CONTRACTOR shall furnish watchmen in sufficient numbers to protect the Work. The CONTRACTOR'S responsibility for the maintenance of barricades, signs, lights, and for providing watchmen shall continue until the Project is accepted by OWNER.

### 1.3 TREE AND PLANT PROTECTION

- A. CONTRACTOR shall protect existing trees, shrubs and plants on or adjacent to the site that are shown or designated to remain in place against unnecessary cutting, breaking or skinning of branches, bark or roots. All trees and shrubs shall remain in place unless otherwise noted on the Contract Documents or removal is approved by the Resident Project Representative.
- B. Materials or equipment shall not be stored or parked within the drip line.
- C. Temporary fences or barricades shall be installed to protect trees and plants in areas subject to traffic.
- D. Fires shall not be permitted under or adjacent to trees and plants.
- E. Within the limits of the Work, water trees and plants that are to remain, in order to maintain their health during construction operations.
- F. Cover all exposed roots with burlap that shall be kept continuously wet. Cover all exposed roots with earth as soon as possible. Protect root systems from mechanical damage and damage by erosion, flooding, run-off or noxious materials in solution.
- G. If branches or trunks are damaged, prune branches immediately and protect the cut or damaged areas with emulsified asphalt compounded specifically for horticultural use in a manner approved by the ENGINEER.
- H. All damaged trees and plants that die or suffer permanent injury shall be removed when ordered by the ENGINEER and replaced by a specimen of equal or better quality.

### 1.4 PROTECTION OF EXISTING STRUCTURES

- A. Underground Structures:
  - 1. Underground structures are defined to include, but not be limited to, all water, gas, and other piping, and electrical conduits, tunnels and other existing subsurface work located within or adjacent to the Contract limits.
  - 2. All underground structures known to the ENGINEER except electric, cable TV and telephone are shown on the Drawings. This information is shown for the assistance of CONTRACTOR in accordance with the best information available, but is not guaranteed to be correct or complete.

3. CONTRACTOR shall explore ahead of his trenching and excavation Work and shall uncover all obstructing underground structures sufficiently to determine their location, to prevent damage to them and to prevent interruption to the services which such structures provide. If CONTRACTOR damages an underground structure, he shall restore it to original condition at his expense.
  4. Necessary changes in the location of the Work may be made by ENGINEER, to avoid unanticipated underground structures.
  5. Refer to Section 01030 for additional requirements related to existing utilities.
- B. Surface Structures:
1. Surface structures are defined as all existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.
- C. Protection of Underground and Surface Structures:
1. CONTRACTOR shall sustain in their places and protect from direct or indirect injury all underground and surface structures located within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, CONTRACTOR shall satisfy the ENGINEER that the methods and procedures to be used have been approved by the party owning same.
  2. CONTRACTOR shall assume all risks attending the presence or proximity of all underground and surface structures within or adjacent to the limits to the Work. CONTRACTOR shall be responsible for all damage and expense for direct or indirect injury caused by his Work to any structure. CONTRACTOR shall repair immediately all damage caused by his work, to the satisfaction of the owner of the damaged structure.
  3. It is understood and agreed that the CONTRACTOR has considered in his bid all of the permanent and temporary utility appurtenances and that no additional compensation will be allowed for any delays, inconvenience, or damage sustained by him due to any interference from said utilities or the operation of moving them either by the utility company or by the CONTRACTOR. Refer to Section 01030 for additional requirements related to existing utilities.
- D. All other existing surface facilities, including but not limited to, guard rails, posts, signs, poles, markers, and curbs which are temporarily removed to facilitate installation of the Work shall be replaced and restored to their original condition at CONTRACTOR'S expense.

1.5 PROTECTION OF INSTALLED PRODUCTS AND LANDSCAPING

- A. Provide protection of installed products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion of Work.
- B. Control traffic to prevent damage to equipment, materials and surfaces.
- C. Prohibit traffic of any kind across planted lawn and landscaped areas.

+ + END OF SECTION + +

## SECTION 01570

### MAINTENANCE AND PROTECTION OF TRAFFIC

#### 1.1 GENERAL

- A. All streets and trafficways shall be kept open for the passage of traffic and pedestrians during the construction period unless otherwise approved by the ENGINEER or authority having jurisdiction over same.
- B. When required to cross, obstruct or temporarily close a street or trafficway, CONTRACTOR shall provide and maintain suitable, detours or other approved temporary expedient for the accommodation of traffic. Notice shall be given no less than 72 hours in advance of the time to close a street or trafficway. Closings shall be effected only during non-peak traffic periods as directed by the OWNER. Closings shall remain in effect for the shortest time practical, and passage shall be restored immediately after completion of backfill and temporary paving or bridging. If required, obtain a permit or permits from the duly constituted public authority having jurisdiction over the thoroughfare.
- C. CONTRACTOR shall give the required advance notice to the fire and police departments of his proposed operations.
- D. CONTRACTOR shall give no less than 72 hours nor more than 120 hours notice to owners or tenants of private property who may be affected by his operations.
- E. CONTRACTOR shall provide signs, signals, barricades, flares, lights and all other equipment, service and personnel required to regulate and protect all traffic, and warn of hazards. All such work shall conform to requirements of the OWNER or authority having jurisdiction. Remove temporary equipment and facilities when no longer required, restore grounds to original, or to specified conditions.

#### 1.2 TRAFFIC SIGNALS AND SIGNS

- A. Provide and operate traffic control and directional signals required to direct and maintain an orderly flow of traffic in all areas under CONTRACTOR'S control, or affected by CONTRACTOR'S operations.



- B. Provide traffic control and directional signs, mounted on barricades or standard posts:
  - 1. At each change of direction of a roadway and at each crossroad.
  - 2. At detours and hazardous areas.
  - 3. At parking areas.

### 1.3 FLAGMEN

- A. Provide qualified and suitably equipped flagmen when construction operations encroach on traffic lanes, as required for regulation of traffic and in accordance with the requirements of the authority having jurisdiction.

### 1.4 FLARES AND LIGHTS

- A. Provide flares and lights during periods of low visibility:
  - 1. To clearly delineate traffic lanes, to guide traffic and to warn of hazardous areas.
  - 2. For use by flagmen in directing traffic.
- B. Provide illumination of critical traffic and parking areas.

### 1.5 PARKING CONTROL

- A. Control all CONTRACTOR related vehicular parking within the limits of the Work to preclude interference with public traffic or parking, access by emergency vehicles, OWNER'S operations, or construction operations. Provide temporary parking facilities for the public as may be required because of construction or operations.
- B. Monitor parking of all construction and private vehicles:
  - 1. Maintain free vehicular access to and through parking areas.
  - 2. Prohibit parking on or adjacent to access roads, or in non-designated areas.

### 1.6 HAUL ROUTES

- A. Consult with governing authorities and establish thoroughfares which will be used as haul routes and site access.
- B. Confine construction traffic to designated haul routes.
- C. Provide traffic control at critical areas of haul routes to expedite traffic flow, to minimize interference with normal public traffic.

+ + END OF SECTION + +

**SECTION 01700**  
**CONTRACT CLOSEOUT**

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Closeout Procedures.
- B. Final Cleaning.
- C. Project Record Documents.

1.2 RELATED REQUIREMENTS

- A. Section 01510, Temporary Construction Facilities.
- B. Section 01720, Record Documents.

1.3 SUBSTANTIAL COMPLETION

- A. Comply with procedures stated in General Conditions of the Contract for issuance of Certificates of Substantial Completion.
- B. Owner may occupy designated portion of Project for its intended purpose under provision stated in Certificate(s) of Substantial Completion.
- C. Substantial Completion shall apply to the entire Work.

1.4 FINAL INSPECTION AND APPLICATION FOR PAYMENT

- A. Comply with procedures stated in General Conditions of the Contract for Final Inspection and Final Application for Payment.
- B. When all items of Work are completed or corrected, and CONTRACTOR considers Work has reached final completion, submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Final Inspection.
- C. In addition to submittals required by the conditions of the Contract, provide submittals required by governing authorities, and submit a final statement of accounting giving total adjusted contract sum, previous payments, and sum remaining due.
- D. ENGINEER will issue a final Change Order reflecting approved adjustments to Contract Price not previously made by Change Order.

1.5 FINAL CLEANING

- A. Execute prior to final inspection.
- B. Remove waste and surplus materials, rubbish, and temporary construction facilities and controls from the Project and from the site.

1.6 PROJECT RECORD DOCUMENTS

- A. Submit one complete set of Project Record Documents, conforming to Section 01720 prior to CONTRACTOR's notification of completion.

+ + END OF SECTION + +

**SECTION 01720**  
**RECORD DOCUMENTS**

1.1 GENERAL

- A. CONTRACTOR shall maintain and provide the ENGINEER with record documents as specified below, except where otherwise specified or modified.
- B. Maintenance of Documents:
  - 1. Maintain in CONTRACTOR'S field office in clean, dry, legible condition complete sets of the following: Drawings, Specifications, Addenda, approved Shop Drawings, Samples, photographs, Change Orders, other modifications of Contract Documents, test records, survey data, Field Orders, and all other documents pertinent to CONTRACTOR'S Work.
  - 2. Provide files and racks for proper storage and easy access. File in accordance with filing format of Construction Specification Institute (CSI), unless otherwise approved by ENGINEER.
  - 3. Record documents shall not be used for any other purpose and shall not be removed from the CONTRACTOR'S office without ENGINEER'S approval.
- C. Marking System: Provide colored pencils or felt tipped pens for marking changes, revisions, additions and deletions, to the record set of Drawings.
- D. Recording:
  - 1. Label each document "PROJECT RECORD" in 2-inch high printed letters.
  - 2. Keep record documents current.
  - 3. Do not permanently conceal any Work until required information has been recorded.
  - 4. Drawings: Legibly mark to record actual construction including:
    - a. Depths of various elements of foundation in relation to datum.
    - b. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
    - c. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
    - d. Field changes of dimensions and details.
    - e. Changes made by Change Order or Field Order.
    - f. Details not on original drawings.

5. Specifications and Addenda: Legibly mark up each Section to record:
  - a. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
  - b. Changes made by Change Order or Field Order.
  - c. Other matters not originally specified.
- E. Submittal:
  1. Upon Substantial Completion of the Work, deliver record documents to ENGINEER. Final payment will not be made until satisfactory record documents are received by ENGINEER.
  2. Accompany submittal with transmittal letter containing:
    - a. Date.
    - b. Project title and number.
    - c. CONTRACTOR'S name and address.
    - d. Title and number of each record document.
    - e. Certification that each document as submitted is complete and accurate.
    - f. Signature of CONTRACTOR, or his authorized representative.

+ + END OF SECTION + +

**SECTION 02010**  
**EROSION AND SEDIMENT CONTROL**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope
  - 1. All vegetative and structural erosion and sediment control practices shall be implemented, maintained, and disposed of in accordance with the minimum standards and Specifications of the North Carolina Erosion and Sediment Control Planning and Design Manual and as shown and specified.
  - 2. OWNER to obtain Erosion/Sediment Control Permit(s), as necessary.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Unless otherwise shown or specified all materials provided for erosion and sediment control measures shall be in accordance with Chapter 6 of the aforementioned handbook.
- B. Synthetic filter fabric for temporary silt fences shall be of a pervious sheet of polypropylene, nylon, polyester or polyethylene yarn and shall be certified by the manufacturer as to filtering efficiency, tensile strength, and allowable flow rate. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life.
- C. Stake for filter barrier shall be rough or finished 1" x 2" wood, or equivalent metal stake with a minimum length of 4 feet.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Unless otherwise shown or specified all methods of installation and maintenance must be in accordance with Chapter 6 of the North Carolina Erosion and Sedimentation Planning and Design Manual.
- B. All filter barriers shall be installed at the first stage of excavation or grading activity with which they are associated.

- C. All roads, parking areas and/or areas to be paved shall be stabilized with the installation of sub-base or base course as soon as grading is completed and necessary compaction has been obtained, but must not exceed 30 days after preparation of the subgrade.
- D. The CONTRACTOR shall have overall responsibility for plan implementations. He shall also be responsible for seeing that appropriate construction workers and subcontractors are aware of the provisions of the plan.
- E. Filter cloth fabric shall be a minimum of 15 inches above ground and 8 inches below ground and shall be secured to the stake by suitable staples, in such a manner as to prevent water from flowing under the fence. Filter cloth fabric shall be spliced together only at support posts with a minimum 6 inch overlap and securely sealed.
- F. All disturbed areas which are not designated for paving, utility or structural uses shall be exposed for no longer than 30 days.
- G. All remaining temporary erosion and sediment control measures must be removed within 30 days after final site stabilization is achieved.

+ + END OF SECTION + +

**SECTION 02221**  
**TRENCH EXCAVATION**

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall perform all excavating, backfilling and disposing of earth materials as shown, specified, and required for the purpose of constructing pipelines as required to complete the Work in every respect.
2. Also included is earthwork for roads, grading, structures and other facilities which are required to complete the Work as shown and specified.
3. All necessary preparation of subgrade is included.
4. All temporary means needed to prevent discharge of sediment to water courses caused by erosion or dewatering systems are included.

B. Related Work Specified Elsewhere:

1. Section 01030, Special Construction Conditions.
2. Section 01410, Testing Laboratory Services Furnished by CONTRACTOR.
3. Section 02010, Erosion and Sediment Control
4. Section 02500, Driveway and Pavement Removal and Replacement.
5. Section 15000, Piping, Valves and Appurtenances.

1.2 QUALITY ASSURANCE

A. Tests:

1. The services of a qualified testing laboratory shall be engaged by CONTRACTOR to make tests and determine acceptability of the fill or material as listed herein. The laboratory shall be acceptable to the ENGINEER.
2. Required Tests:
  - a. Select Fill Samples: Gradation, ASTM D 422.
  - b. Compacted Select Fill: Compaction, ASTM D 1557.
  - c. Density: ASTM D 2922.

B. Permits and Regulations:

1. CONTRACTOR shall obtain all necessary permits for work in roads, rights-of-way, etc., not previously acquired by the OWNER. He shall also obtain permits as required by local, state and federal agencies for discharging water from excavations to rivers and streams.
2. CONTRACTOR shall perform excavation work in compliance with applicable safety and other requirements of governing authorities having jurisdiction and in accordance with recommendations outlined by the occupational Safety and Health



- C. Reference Standards: Comply with applicable provisions and recommendations of the following except as otherwise shown or specified.
1. AWWA C600, Installation of Gray and Ductile Cast-Iron Water Mains and Appurtenances.
  2. ASTM D 422, Particle-Size Analysis of Soils.
  3. ASTM D 1557, Moisture-Density Relations of Soils, using 10 lb. (4.5 kg) Rammer and 18-inch (457 mm) Drop.
  4. ASTM D 2922, Density of Soil and Soil-Aggregate in Place by Nuclear Methods.
  6. Standard Specifications for Roads and Structures (latest edition), North Carolina Department of Transportation.

### 1.3 SUBMITTALS

- A. Samples: Submit samples of all select fill, gravel and base materials required and notify ENGINEER in writing of the sources.
- B. Test Reports: Submit copies of the following reports directly to the ENGINEER from the testing laboratory, with a copy to the CONTRACTOR.
1. Tests on fill material.
  2. Field density tests
  3. Optimum moisture - maximum density curve for each type of fill material.

### 1.4 JOB CONDITIONS

- A. Existing Structures: Shown on the Drawings are only a portion of certain utilities and surface and underground structures located on or adjacent to the Work. This information has been obtained from existing records and limited field work. It is not guaranteed to be correct or complete and is shown for the convenience of the CONTRACTOR. CONTRACTOR shall explore ahead of the required excavation to determine the exact location of all structures. They shall be supported and protected from injury by the CONTRACTOR. If they are broken or injured, they shall be restored immediately by the CONTRACTOR at no additional cost to OWNER.
- B. Existing Utilities:  
Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
1. Should uncharted or incorrectly charted piping or utilities be encountered during excavation, consult piping or utility owner and ENGINEER immediately for directions. Cooperate with OWNER and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
  2. In general, service lines to individual houses are not shown; however, CONTRACTOR shall assume that a service exists for each utility to each house.

2. In general, service lines to individual houses are not shown; however, CONTRACTOR shall assume that a service exists for each utility to each house.
3. Do not interrupt existing utilities serving facilities occupied and used by OWNER or others, except when permitted in writing by ENGINEER and then only after acceptable temporary utility services have been provided.
4. Coordinate with utility companies for shut-off of services if lines are active.
5. Refer to Section 01030 for additional requirements related to existing utilities.

D. Coordination:

1. CONTRACTOR shall coordinate horizontal and vertical alignment, depth of cover, and pipe accessories to negotiate the terrain and conflicts while meeting all criteria for alignment, joint deflection, depth of cover, vertical separation, and strength of pipe.
2. CONTRACTOR shall alter the horizontal and vertical alignment to fulfill the requirement of D.1, above. Obtain ENGINEER'S approval of alterations prior to proceeding.

E. Use of Explosives:

1. Do not bring explosives onto site or use in the Work. Use of explosive materials is specifically prohibited.

F. Protection of Persons and Property:

Barricade open excavations occurring as part of this Work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.

1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
2. Consult ENGINEER and obtain his approval before removing, trimming, or disturbing trees, shrubs, plants, fences, rails, walks, structures or other facilities that are encountered on the line of the excavation.

G. Dust Control:

CONTRACTOR shall conduct all of his operations and maintain the area of his activities, including sweeping and sprinkling of roadways, so as to minimize creation and dispersion of dust.

H. Roadways and Walks:

Unless otherwise approved by ENGINEER, excavated material and materials of construction shall be so deposited, and the Work shall be so conducted as to leave open and free for pedestrian traffic all crosswalks, and for vehicular traffic a roadway not less than 10 feet in width. All hydrants, valves, fire alarm boxes, letter boxes, and other facilities which may require access during construction shall be kept accessible for use. During the progress of the Work CONTRACTOR shall maintain such crosswalks, sidewalks,

and roadways in satisfactory condition and the Work shall at all times be so conducted as to cause a minimum of inconvenience to public travel, and to permit safe and convenient access to private and public property along the line of the Work.

## PART 2 - PRODUCTS

### 2.1 SOIL MATERIALS

#### A. Select Fill:

1. Use where shown on the Plans, specified herein or as directed by the ENGINEER.
2. Select fill shall be natural bank sand, graded from coarse to fine, not lumpy or frozen and free from slag, cinders, ashes, rubbish, and other deleterious materials.
3. Particles Size:
  - a. 95% passing a No. 4 sieve.
  - b. Testing in accordance with ASTM D 422, latest revision.
4. Provide certified copies of test reports from a laboratory approved by the ENGINEER.
5. Fill material shall be free of organic matter and concentrations of silt or clay. It shall not have greater than 10% loam or clay, by weight.
6. The CONTRACTOR shall be permitted to use on-site excavated materials, provided they meet the above requirements, subject to the ENGINEER'S approval.

#### B. Gravel or Crushed Stone:

1. Use where shown on the Plans, specified herein, or as directed by the ENGINEER. Use for fill below the bottom of the pipe to replace unsuitable excavated material, as approved by the ENGINEER; or at other locations as directed by the ENGINEER.
2. Shall consist of hard, durable, well graded crushed stone, crusher run, or gravel and shall be graded from fine to coarse, in a reasonable uniform combination.
3. Size: NCDOT 57.
4. Shall not contain excessive quantities of clay or loam and shall not be frozen. Shall be free from slag, cinders, ashes, refuse and other deleterious substances.
5. Provide certified copies of test reports.

#### C. Backfill and Fill Materials: Provide approved soil materials for backfill and fill, free of clay, rock or gravel larger than 6-inches in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.

#### D. Topsoil: The CONTRACTOR'S attention is directed to Section 02900 for site restoration Work.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. CONTRACTOR shall provide ENGINEER with sufficient time and means for ENGINEER to examine the areas and conditions under which excavating, filling, and grading are to be performed. ENGINEER will notify the CONTRACTOR of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to ENGINEER.

### 3.2 TEST PITS

- A. Where shown or ordered by ENGINEER, CONTRACTOR shall excavate and backfill, in advance of construction, test pits to determine conditions or location of existing facilities. CONTRACTOR shall perform all Work required in connection with excavating, stockpiling, maintaining, sheeting, shoring, backfilling and replacing pavement for the test pits.
- B. Payment will not be made for test pits made by CONTRACTOR for his own use.

### 3.3 EXCAVATION

- A. CONTRACTOR shall perform all excavation required to complete the Work as shown and specified. Excavations shall include earth, sand, clay, gravel, hardpan, boulders and ledge not requiring drilling and blasting to remove, decomposed rock, pavements, rubbish and all other materials within the excavation limits.
- B. Excavations for pipelines and structures shall be open excavations, shored and braced where necessary to prevent possible injury to workmen and to new and existing structures or pipelines.
- C. Where the pipeline, or structure is to be placed below the ground water table, wellpoints, cofferdams, or other acceptable methods shall be used to permit construction under dry conditions. Dry conditions shall prevail until concrete has reached sufficient strength to withstand earth and hydrostatic loads and until the pipelines are properly jointed, tested and backfilled.
- D. Dewatering in excavations shall be done in such a manner so as to prevent damage to the existing subgrade, and to prevent damage to the work.
- E. Excavations for pipelines shall be made sufficiently wide to permit proper laying and jointing of the pipe. The trench width at the top of the pipe should not be greater than the outside diameter of the pipe barrel plus 2 feet, but shall be sufficient to allow thorough compacting of earth refill adjacent to the bottom half of the pipe. Enlargements of the trench shall be made to give ample space for

required operations at pipe joints. The depth of trench shall in general be as shown, but the depth may be increased or decreased if required. The use of excavating equipment which requires the trench to be excavated to an excessive width will not be allowed.

- F. Subgrades for roadways, structures and fill placed in trench bottoms shall be firm, dense, and thoroughly compacted and consolidated; shall be free from mud, muck, and other soft or unsuitable materials; and shall remain firm and intact under all construction operations. Subgrades which are otherwise solid, but which become soft or mucky on top due to construction operations, shall be reinforced with crushed stone or gravel. The finished elevation of stabilized subgrades shall not be above subgrade elevations required.
- G. Stability of Excavations: Slope sides of excavations to comply with codes and ordinances of agencies having jurisdiction. Shore and brace where sloping is not possible either because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.
- H. Material Storage: Stockpile satisfactory excavated materials in approved areas, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage.
  - 1. Locate and retain soil materials away from edge of excavations.
  - 2. Dispose of excess soil material and waste materials as specified hereinafter.
- I. Where the existing material beneath the pipe bedding material is unsuitable, the CONTRACTOR shall remove and replace it with select fill, stone, gravel and/or filter cloth when ordered in writing by the ENGINEER.
- J. Pipe Trench Length:
  - 1. No more than 300 feet of trench may be opened in advance of pipe laying.

### 3.4 UNAUTHORIZED EXCAVATION

- A. All excavation outside the lines and grades shown and not approved by ENGINEER, together with the removal and disposal of the associated material shall be at CONTRACTOR'S expense. The unauthorized excavation shall be filled as directed by ENGINEER with select compacted backfill at the CONTRACTOR'S expense. Claims and damages resulting from CONTRACTOR'S unauthorized excavation will be his sole responsibility.

### 3.5 DRAINAGE AND DEWATERING

- A. General:
  - 1. Prevent surface and subsurface water from flowing into excavations and from flooding adjacent areas.

2. Remove water from excavations as fast as it collects. CONTRACTOR shall provide for dewatering and maintain the ground water level a minimum of 12 inches below the bottom of the excavation to provide a stable surface for construction operations and to prevent damage to the Work during all stages of construction.
  3. Provide and maintain pumps, sumps, suction and discharge lines and other dewatering system components necessary to convey water away from excavations. Adequate operational standby equipment shall be maintained on the site.
  4. Provide approved sediment traps when water is conveyed into water courses.
  5. Obtain ENGINEER'S approval before shutting down dewatering system for any reason.
- B. Disposal of Water Removed by Dewatering System:
1. Dispose of all water removed from the excavation in such a manner as not to endanger public health, property, or any portion of the Work under construction or completed.
  2. Dispose of water in such a manner as to cause no inconvenience to the OWNER, or others on or adjacent to the site.
  3. Convey water from the excavation in a closed conduit. Do not use trench excavations as temporary drainage ditches.

### 3.6 SHEETING, SHORING AND BRACING

- A. General:
1. Unless otherwise shown or approved excavations shall be open excavation, shored and braced or sheeted where necessary to prevent injury to workmen, structures, pipe lines and utilities.
  2. All municipal, county, state and federal ordinances, codes, regulations and laws shall be observed.
  3. Used material shall be in good condition, not damaged or excessively pitted. Unless otherwise approved by ENGINEER, all sheeting to remain in place shall be new. New or used sheeting may be used for temporary work.
  4. All timber used for breast boards (lagging) shall be new or used, meeting the requirements for Douglas Fir Dense Construction grade or Southern Pine No. 2 Dense S3.
  5. All steel work for sheeting, shoring, bracing, cofferdams etc., shall be designed in accordance with the provisions of the "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings", of the AISC except that field welding will be permitted.
  6. Steel sheet piling shall be manufactured from steel conforming to ASTM A 328. Steel for soldier piles, wales and braces shall be new or used and shall conform to ASTM A 36.
  7. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
  8. Safe and satisfactory sheeting, shoring and bracing shall be the entire responsibility of the CONTRACTOR.

9. Unless otherwise shown, specified, or ordered, all materials used for temporary construction shall be removed when work is completed. Such removal shall be made in a manner not injurious to the pipelines or structures.

### 3.7 GENERAL BACKFILL AND COMPACTION

- A. All backfill required for trenches and structures and required to provide the finished grades shown and as described herein shall be furnished, placed and compacted by the CONTRACTOR. Unless otherwise specified or required, backfill shall be obtained from the on-site excavated materials. All materials used for filling and backfilling shall be soil of acceptable quality, free from boulders, frozen lumps of material, wood, stumps, sludge, other organic matter or other deleterious materials. On-site excavated materials meeting these requirements may be used as backfill.
- B. Backfill excavations as promptly as Work permits, but not until completion of the following:
  1. Acceptance by ENGINEER of all Work within the excavation.
  2. Inspection, testing approval, and recording of locations of underground utilities, connections, branches, structures and other facilities.
  3. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
  4. Removal of trash and debris.
- C. Excavation shall be kept dry during backfilling operations. Backfills around piping and structures shall be brought up evenly on all sides.
- D. All backfill in pipe trenches which is below or within 5 feet of pipes, foundations, paved areas, gravel walks, or driveways shall be select fill material placed in horizontal layers not exceeding 6 inches in depth and compacted to 95 percent of maximum dry density obtained in the laboratory in accordance with ASTM 1557, before the next layer is placed.
- E. Where pipe is laid in rock excavation, 6 inches minimum of crushed stone or gravel fill shall be carefully placed and tamped over the rock before the pipe is laid. After laying pipe, the balance of the backfill shall be placed as described herein.
- F. The water content of fill material shall be controlled during placement within the range necessary to obtain the compaction percent specified. The moisture content of the fill shall be within 3 percent of the optimum moisture content for compaction as determined by laboratory testing. CONTRACTOR shall perform all necessary work to adjust the water content of the material to within the range necessary to permit the compaction specified. No fill

material shall be placed when free water is standing on the surface of the area where the fill is to be placed. No compaction of fill will be permitted with free water on any portion of the fill to be compacted.

- G. No fill material shall be placed or compacted in a frozen condition or on top of frozen material. Fill containing organic materials or other unacceptable material shall be removed and replaced with approved fill material.
- H. Compaction of fill shall be performed with equipment suitable for the type of material placed on which is capable of providing the densities required. CONTRACTOR shall select compaction equipment and submit the type and proposed procedure to the ENGINEER for approval.
- I. If the specified densities are not obtained because of improper control of placement or compaction procedures or because of inadequate or improperly functioning compaction equipment, the CONTRACTOR shall perform whatever work is required to provide the required densities to include removal of unacceptable fill areas replacement and recompacting, increase the compaction efforts, or decrease lifts, until acceptable compaction is provided.
- J. CONTRACTOR shall repair, at his own expense, any damages that are caused by settlement that occurs within the guarantee period of the Contract. The CONTRACTOR shall make all repairs and replacements necessary within 30 days after notice from the ENGINEER or OWNER.

### 3.8 GRADING

- A. General: Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth subgrade surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
- B. Turfed Areas: Finish areas to receive topsoil to within not more than 1 inch above or below the required subgrade elevations.
- C. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 1 inch above or below the required subgrade elevation.
- D. Pavements: Shape surface of areas under pavements to line, grade and cross-section, with finish surface not more than 1/2 inch above or below the required subgrade elevation.
- E. Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/4 inch when tested with a 10 foot straightedge.
- F. Compaction: After grading, compact subgrade surfaces to the depth and percentage of maximum density required.



### 3.9 PAVEMENT SUBBASE COURSE

- A. General: Place subbase material, in layers of specified thickness, over ground surface to support the pavement base course.
- B. Grade Control: During construction, maintain lines and grades including crown and cross-slope of subbase course.
- C. Shoulders: Place shoulders along edges of subbase course to prevent lateral movement. Construct shoulders of acceptable soil materials, placed in such quantity to compact to thickness of each subbase course layer. Compact and roll at least a 12-inch width of shoulder simultaneously with compacting and rolling of each layer of subbase course.
- D. Placing: Place aggregate base material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting aggregate base material during placement operations.
  - 1. When a aggregate base course is shown to be 6 inches thick or less, place material in a single layer. When shown to be more than 6 inches thick, place material in equal layers, except no single layer more than 6 inches or less than 3 inches in thickness when compacted.

### 3.10 RESTORING AND RESURFACING EXISTING ROADWAYS, DRIVEWAYS AND WALKS

- A. CONTRACTOR shall place temporary aggregate base material to match existing grades and slope immediately after backfilling trenches in paved roadways, driveways and walks. He shall maintain in good and safe condition during progress of the entire Work the surface of the area over the trench, and shall promptly fill all depressions over and adjacent to the trench caused by settlement of backfilling. Immediately prior to constructing the permanent paving and base, CONTRACTOR shall remove and dispose of temporary aggregate base material. The permanent replacement pavement shall be in accordance with Section 02500, Driveway and Pavement Removal and Replacement and as shown on the Drawings.
- B. Pavement, ditches, gutters, curbs, walks, driveways and roadways disturbed or damaged by the CONTRACTOR'S operations shall be restored or replaced by him to as good condition as they were previous to the commencement of the Work and at no additional cost to OWNER.

### 3.11 DISPOSAL OF EXCAVATED MATERIALS

- A. Material removed from the excavations which does not conform to the requirements specified for fill or is in excess of that required for backfill shall be hauled away by the CONTRACTOR and disposed of in compliance with municipal, county, state, federal or other applicable regulations at no additional cost to the OWNER.

3.12 ENVIRONMENTAL PROTECTION AND RESTORATION

A. CONTRACTOR shall comply with all governmental agencies and requirements specified in Sections 02010 and 02900.

+ + END OF SECTION + +

## SECTION 02500

### DRIVEWAY AND PAVEMENT REMOVAL AND REPLACEMENT

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Scope:
1. CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to remove and replace bituminous paving and bituminous concrete, portland cement concrete and gravel driveways as shown and specified.
  2. The Work includes the following:
    - a. Saw cutting existing bituminous concrete and concrete pavement.
    - b. Replacement of existing pavement and driveways as specified.
- B. Related Work Specified Elsewhere:
1. Section 02221, Trench Excavation.
  2. Section 03000, Concrete.

##### 1.2 QUALITY ASSURANCE

- A. Reference Standards: Comply with the applicable provisions and recommendations of the following, unless otherwise shown or specified.
1. North Carolina Department of Transportation "Standard Specifications for Roads and Structures," dated 1990 or latest edition.
  2. ASTM D 1190, Concrete Joint Sealer, Hot Poured Elastic type.

##### 1.3 SUBMITTALS

- A. Shop Drawings: Submit for approval bituminous concrete job mix formula proposed, giving complete data on materials, including source, location, percentages, temperatures and all other pertinent data.
- B. Samples: Submit for approval samples, manufacturer's product data, test reports and material certifications as required in referenced Sections for concrete Work.

#### 1.4 JOB CONDITIONS

- A. Weather Limitations: Use weather limitations in the NCDOT Standards, Division 6 for the following:
  - 1. Application of bituminous prime coats.
  - 2. Construction of bituminous concrete surface course.
  - 3. Construction of portland cement concrete driveways.
  
- B. Grade Control: Establish and maintain the required lines and grades, including crown and cross-slope for each course during construction operations. All finished surfaces shall be smooth and level with adjacent paving surfaces, free of bumps and depressions. Patches shall match existing lines and grades to provide and facilitate drainage.

#### PART 2 - PRODUCTS

##### 2.1 PAVEMENT AND DRIVEWAY THICKNESS

- A. The thickness of the bituminous concrete replacement shall be as noted on Drawings.
  
- B. The thickness of the gravel driveway replacement shall be 4 inches or equal to the existing driveway thickness, whichever is greater.
  
- C. The thickness of concrete driveway replacement shall be 5 inches or equal to the existing driveway thickness, whichever is greater.

##### 2.2 MATERIALS

- A. Materials, including, bituminous prime and tack coat, and bituminous concrete shall be in accordance with the latest edition of the NCDOT Standard Specifications for Roads and Structures herein specified.
  - 1. Bituminous prime coat shall be asphalt cut back grade RC-30. Application shall be at the rate of 0.18 to 0.45 gallons per square yard.
  - 2. Bituminous tack coat shall be emulsified asphalt Grade CRS-2.
  - 3. Bituminous concrete shall be as specified on the Drawings.
  
- B. Concrete and gravel driveway replacement materials shall comply with Sections 02221 and 03000 as applicable, except as may specifically be necessary to match existing driveway materials or appearance. All such exceptions shall be submitted in writing with supporting documentation to the ENGINEER for approval.
  - 1. Reinforcing Bars and Welded Wire Fabric: Deformed steel bars and smooth wire fabric shall comply with requirements of Section 03000.
    - a. Furnish wire fabric in flat sheets, not rolls.
  - 2. Concrete Materials: Comply with requirements of applicable Division 3 - Concrete Work Sections for formwork, concrete materials, admixtures, bonding materials, curing materials and others as required.

3. Expansion Joint Material: Comply with requirements of Section 03000 for preformed expansion joint fillers.
4. Gravel or aggregate material shall match color, size and texture of existing materials to the extent practicable.
5. Concrete materials shall match color of existing materials to extent practicable. Aggregate for exposed aggregate surfaces shall match color, size and texture of existing materials to the extent practicable.

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Examine the subgrade on which bituminous concrete, concrete or gravel shall be installed. Notify the ENGINEER in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the ENGINEER.

#### 3.2 PRIME COAT

- A. Apply prime coat to subgrade in accordance with the requirements of the NCDOT Specifications.

#### 3.3 ASPHALT PAVEMENT REMOVAL

- A. Where existing asphalt pavement is to be removed, the surface shall be removed to clean, continuous, straight lines by saw cutting. Joints with existing surface and base shall be made along straight lines, parallel or perpendicular to the centerline of the trench. The width of asphalt cut shall be kept to a minimum.

#### 3.4 TEMPORARY TRENCH SURFACING

- A. Immediately following the specified backfilling and compaction, temporary aggregate base material shall be applied to asphalt cut areas. This temporary surfacing shall provide a smooth traffic surface with the existing roadway and shall be maintained until final restoration. Temporary surfacing shall remain for minimum of 14 days in order to minimize trench settlement after final paving.
- B. Prior to restoration, the temporary material shall be removed and the existing pavement mechanically sawed straight and clean to the stipulated dimensions.

#### 3.5 PAVEMENT INSTALLATION - ASPHALT

- A. Roadway pavement installation in connection with trench excavation shall be replaced or restored in equal or better condition than the original.

- B. Preparation of mixtures, placing the mixes, and compaction shall be in accordance with NCDOT standards, but shall be modified to meet the trench construction conditions.
- C. The width of surface course repair shall be a minimum of the trench width plus 2 feet; width of base course repair shall be as shown on the Drawings.
- D. Aggregate base course shall be compacted for its full thickness to not less than 98 percent of maximum density as determined by AASHTO Designation T 180. Field density of aggregate base in place shall be determined by AASHTO Designation T 238. Placement shall be in accordance with NCDOT Specifications.
- E. After the application of the prime coat on the base, the prime coat shall be allowed to cure without sanding for a period of 24 hours. The Contractor shall take all necessary precautions to protect the primed surface against damage during this interval. If, at the end of 24 hours, it is not proposed to proceed at once with the application of the surface course, primed surface shall be given a light application of clean sand and opened to traffic.
- F. Joints with existing surface and base shall be straight and neat. If necessary to obtain a straight neat joint, the Contractor shall cut out sufficient existing material and replace it with new material.
- G. The upper surface of the completed base course shall be compacted to an elevation to permit the full depth of the surface course to be constructed without deviating from the grade of the pavement surface. The completed surface shall match the line and grade of the existing surface.
- H. In-place compacted thicknesses shall average not less than the thicknesses specified.

### 3.6 PAVEMENT OVERLAY - ASPHALT

- A. Surface course overlay of reconstructed trench areas or existing pavement shall be performed where indicated on the drawings or as directed by the ENGINEER. The overlay shall be full width of the roadway.
- B. After surface reconstruction in the trench areas have been completed, the full width of the roadway shall have a tack coat and a 1-inch thickness of Type I-2 asphalt concrete applied in accordance with the requirements specified in Section 3.5.
- C. Where asphalt overlay meets the existing pavement at the limit line, the existing pavements shall be cut and milled or removed to provide a flush or butt joint. No feathered joints shall be permitted.

### 3.7 PATCHING - ASPHALT

- A. As directed by the ENGINEER, remove and replace all defective areas. Cut-out such areas and fill with fresh bituminous concrete. Compact to the required density.

### 3.8 CLEANING AND PROTECTION - ASPHALT

- A. Cleaning: After completion of paving operations, clean surfaces of excess or spilled bituminous materials and all foreign matter.
- B. Protect newly finished pavement until it has become properly hardened by cooling.
- C. Cover opening of drainage structures in the area of paving until permanent coverings are placed.

### 3.9 CONCRETE PAVEMENT

- A. Concrete walks, drive ribbons and driveways shall be removed by initially sawing the structure. When a formed joint or materials separation joint in the concrete exists within three (3) feet of the proposed saw cut, the removal shall be extended to the formed joint.
- B. Replacement of concrete walks, curbs and driveways shall conform to the lines, grades and cross sections of the removed portions and shall match color, finish, texture and overall appearance of existing work to the maximum extent practicable.

### 3.10 CONCRETE FORM CONSTRUCTION

- A. Set forms to line and grade. Install forms over full length of walk and driveway.

### 3.11 CONCRETE REINFORCEMENT

- A. Locate, place, and support reinforcement as specified in Section 03000, unless otherwise shown. Size of reinforcement shall be equal to existing or 6" x 6" 10/10 welded smooth wire fabric conforming to ASTM A 185, whichever is greater.

### 3.12 CONCRETE PLACEMENT

- A. General: Comply with the requirements of Section 03000 for mixing and placing concrete, and as specified.
- B. For walks and driveways place concrete in one course, monolithic construction, for the full width and depth. Walks will be a minimum of 4-inch thickness, driveways a minimum of 5-inch thickness or equal to existing slab thickness, whichever is greater.

### 3.13 CONCRETE JOINTS

- A. General: Construct expansion, and construction joints with faces parallel to existing joints or perpendicular to edge of pavement.
- B. Construction Joints: Place joints at locations where placement operations are stopped for a period of more than 1/2-hour, except where such pours terminate at expansion joints.
- C. Expansion Joints: Provide 1/2-inch expansion joint filler where Work abuts existing pavement.

### 3.14 CONCRETE FINISHING

- A. Smooth the exposed surface by screening and floating.
- B. Work edges of walks and driveways and round to 1/4-inch radius.
- C. Complete surface finishing by drawing a fine-hair broom across surface, perpendicular to line of traffic or as required to match existing finish to the extent practicable.

### 3.15 CONCRETE CURING

- A. Protect and cure finished concrete, complying with applicable requirements of Section 03000.

### 3.16 CONCRETE REPAIR AND CLEANING

- A. Repair or replace broken or defective walks and driveways as directed by the ENGINEER.
- B. Sweep Work and wash free of stains, discolorations, dirt and other foreign material.

### 3.17 PAVEMENT REPAIRS - WARRANTY PERIOD

- A. CONTRACTOR shall maintain pavement during the one year warranty period. All areas which have settled, cracked or are otherwise unsuitable for traffic shall be promptly repaired by the CONTRACTOR.

### 3.18 MARKING OF PAVEMENT

- A. CONTRACTOR shall replace all road markings and traffic control signs disturbed during construction.
- B. Pavement markings shall be placed to match the existing striping and patterns. An alkyd thermoplastic compound shall be extruded or sprayed onto the pavement surface.



- C. Application: Apply in accordance with manufacturer's recommendation and NCDOT.
- D. All placement and materials for traffic stripping and signing shall conform to applicable sections of NCDOT specifications.

+ + END OF SECTION + +

- D. Aggregate base course shall be compacted for its full thickness to not less than 98 percent of maximum density as determined by AASHTO Designation T 180. Field density of aggregate base in place shall be determined by AASHTO Designation T 238. Placement shall be in accordance with NCDOT Specifications.
- E. After the application of the prime coat on the base, the prime coat shall be allowed to cure without sanding for a period of 24 hours. The Contractor shall take all necessary precautions to protect the primed surface against damage during this interval. If, at the end of 24 hours, it is not proposed to proceed at once with the application of the surface course, primed surface shall be given a light application of clean sand and opened to traffic.
- F. Joints with existing surface and base shall be straight and neat. If necessary to obtain a straight neat joint, the Contractor shall cut out sufficient existing material and replace it with new material.
- G. The upper surface of the completed base course shall be compacted to an elevation to permit the full depth of the surface course to be constructed without deviating from the grade of the pavement surface. The completed surface shall match the line and grade of the existing surface.
- H. In-place compacted thicknesses shall average not less than the thicknesses specified.

### 3.6 PAVEMENT OVERLAY - ASPHALT

- A. Surface course overlay of reconstructed trench areas or existing pavement shall be performed where indicated on the drawings or as directed by the ENGINEER. The overlay shall be full width of the roadway.
- B. After surface reconstruction in the trench areas have been completed, the full width of the roadway shall have a tack coat and a 1-inch thickness of Type I-2 asphalt concrete applied in accordance with the requirements specified in Section 3.5.
- C. Where asphalt overlay meets the existing pavement at the limit line, the existing pavements shall be cut and milled or removed to provide a flush or butt joint. No feathered joints shall be permitted.

### 3.7 PATCHING - ASPHALT

- A. As directed by the ENGINEER, remove and replace all defective areas. Cut-out such areas and fill with fresh bituminous concrete. Compact to the required density.

**SECTION 02900**  
**SITE RESTORATION**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope: CONTRACTOR shall furnish all labor, materials, equipment, and incidentals necessary for site restoration during and after construction. All unpaved areas disturbed by the Work shall be restored. Items of Work include grading, seeding, cleanup, and maintenance.
- B. Related work specified elsewhere includes the following:
  - 1. Section 02010 - Erosion and Sediment Control.
  - 2. Section 02221 - Trench Excavation.

1.2 REFERENCE STANDARDS

- A. ASTM D 977, Specification for Emulsified Asphalt.
- B. Federal Specification 0-F-241D; Fertilizer, Mixed, Commercial.

1.3 SUBMITTALS

- A. Permits/Releases for disposal of material off-site.
- B. Seed and fertilizer analyses. Tags from bags are sufficient.

1.4 JOB CONDITIONS

- A. Materials shall be delivered in unbroken containers, clearly marked by the manufacturer as to contents. Seed, limestone, and fertilizer shall be labeled as to proportions, analysis, and quality. Store all materials in a manner affording protection from damage by weather or vandalism.

PART 2 - PRODUCTS

2.1 FERTILIZER

- A. Fertilizer shall meet requirements of Federal Specification 0-F-241D and shall be inorganic, uniform in composition, and suitable for application with approved equipment.
  - 1. Proportions of fertilizer nutrients for all vegetation shall be as follows:
    - 10 pounds of actual nitrogen
    - 10 pounds of actual phosphate
    - 10 pounds of actual potash

## 2.2 SEED

A. Grass seed, tested within 6 months of sowing, shall have the following characteristics:

1. Permanent Seeding, General Use:

<u>Species</u>	<u>Percentages</u>		<u>(Minimum) Germination</u>
	<u>Weight</u>	<u>Purity</u>	
Weeping Lovegrass	70	97	85
German Millet	10	97	85
Pensacola Bahiagrass	20	90	85

2. Permanent seeding, landscaped areas: Match existing species.

3. Temporary Seeding:

<u>Seeding Date</u>	<u>Species</u>	<u>Percentages</u>		<u>(Minimum) Germination</u>
		<u>Weight</u>	<u>Purity</u>	
Aug 15 - Apr 15	Rye (Grain)	100	98	80
Apr 15 - Aug 15	German Millet	100	99	80

## 2.3 LIME

A. Lime shall be ground agricultural grade limestone containing not less than 85 percent calcium and magnesium carbonates. Fineness shall be such that 100 percent will pass a No. 20 sieve, and not less than 50 percent will pass a No. 100 sieve. Burnt lime or hydrated lime may be substituted in equivalent carbonates, if requested.

## 2.4 MULCH

A. Type I mulch composed of threshed straw of cereal grain, pine needles, wood chips, or wood fiber shall be free of objectionable weed seeds or other harmful material.

1. Asphalt adhesive for use with Type I mulch shall be emulsified asphalt meeting requirements of ASTM D 977-80, Grade SS-1.

2. Synthetic mulch binder for use with Type I mulch: Curasol DCA-70, Petroset, or Terra Tack.

B. Type II mulch shall be "hold/gro" erosion control fabric manufactured by Gulf States Paper Corporation, or approved equal. The fabric shall be manufactured of materials which degrade in 6 to 8 months under outdoor exposure.

## PART 3 - EXECUTION

### 3.1 GRADING

- A. Promptly grade areas disturbed by the Work. Smooth finished surface within 0.1 foot and with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
- B. Soil stockpiled for restoration of lawns, etc. shall be replaced to the depth removed and graded to the lines and grades that existed before the Work began.

### 3.2 TEMPORARY SEEDING

- A. Use in areas when final grading has not been completed or when permanent seeding cannot be done due to the specified permanent seeding dates.
- B. Seed at a rate of 120 lbs/acre for rye, and 60 lbs/acre for millet.
- C. Apply fertilizer at a rate of 20 pounds of 10-10-10 per 1,000 square feet (900 pounds per acre) or equivalent.
- D. Apply lime at a rate of 50 pounds per 1,000 square feet.
- E. For loose soil, work lime and fertilizer into soil and then seed. For packed or hard soil, loosen top layer while working lime and fertilizer into soil and then seed at the rate required for the temporary seeding species.

### 3.3 PERMANENT SEEDING

- A. Perform permanent seeding between the dates of April 1 and July 15.
- B. Prepare soil for permanent seeding by tillage to loosen thoroughly and break up all clods to a depth of 6 inches. Remove all stumps and roots, coarse vegetation, stones larger than 1-1/2 inches, and all construction debris. Soil shall be worked by suitable agricultural equipment to a depth of not less than 4 inches. Rake to a uniform, smooth, and drainable surface.
- C. Apply lime and fertilizer uniformly and mix well into top 4 inches of seed bed. Apply lime at the rate of 70 pounds per 1,000 square feet. Apply fertilizer at the rate of 15 pounds of 10-10-10 per 1,000 square feet. Rates should be adjusted for other grades of fertilizer.
- D. Sow seed by mechanical seeder as follows:
  - 1. Apply 7 pounds of grass seed per 1,000 square feet. Broadcast at the rate of 3.5 pound per 1,000 square feet in cross directions to ensure uniform distribution.

2. Apply either Type I or Type II mulch. Apply only Type II mulch on slopes 4:1 or steeper and along ditch lines with slopes of 3 percent or greater.
  - a. Type I mulch: Apply uniformly to depth of approximately 1 1/4 inches. When wood chips are used, add 12 pounds of nitrogen per ton of chips. Anchor mulch by the following methods:
    - 1) Apply light tack coat of asphalt emulsion.
    - 2) In residential areas, apply synthetic mulch binder at rate recommended by manufacturer.
  - b. Type II mulch: Apply in accordance with manufacturer's instructions.
- E. Sow seed by hydraulic seeder as follows:
  1. Prepare homogeneous slurry of water, seed, fertilizer, and wood cellulose fiber.
  2. Distribute slurry uniformly at rate approved by the ENGINEER.
  3. Apply either Type I or Type II mulch. Apply only Type II mulch on slopes 4:1 or steeper and along ditchlines with slopes of 3 percent or greater.
    - a. Type I mulch:
      - 1) Apply uniformly to depth of approximately 1 1/4 inches.
    - b. Type II mulch: Apply in accordance with manufacturer's instructions.

#### 3.4 CLEANUP

- A. Remove all soiling or staining of walks, drives, and parking areas resulting from landscape work. Maintain paved areas in clean condition.

#### 3.5 MAINTENANCE

- A. Reseed and mulch spots without uniform coverage after 30 days from seeding.
- B. In the event that growth is not established by final project inspection, continue the specified attention until stand is accepted by OWNER.
- C. Correct or repair all barren areas, settling, erosion, or otherwise damaged surface areas which may occur within one year after final inspection.

+ + END OF SECTION + +

## SECTION 03000

### CONCRETE

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Scope:
1. CONTRACTOR shall furnish all labor, materials, equipment and incidentals required to provide cast-in-place concrete as shown and specified.
- B. Coordination:
1. Coordinate the installation of items that must be installed in the concrete.
- C. Related Work Specified Elsewhere:
1. Section 02221, Trench Excavation.
  2. Section 02500, Driveway and Pavement Removal and Replacement.
  3. Section 15000, Piping, Valves and Appurtenances.
- D. Definitions:
1. Concrete: This item includes reinforced concrete contained in sidewalks, driveways, concrete work involving simple or no forms and little or no reinforcing. More specifically, it includes concrete for thrust blocks, pipe encasement, fill concrete, and like work.
  2. Steel Reinforcement: This item includes reinforcing steel, welded wire fabric, tie wire and supports.

##### 1.2 QUALITY ASSURANCE

- A. Source Quality Control:
1. Concrete Testing Service:
    - a. CONTRACTOR shall employ acceptable testing laboratory to perform materials evaluation, testing and design of concrete mixes.
  2. Certificates, signed by concrete producer and CONTRACTOR, may be submitted in lieu of material testing when acceptable to the ENGINEER.
  3. Report test results in writing to the ENGINEER on same day tests are made.
- B. Reference Standards: Comply with the applicable provisions and recommendations of the following, except as otherwise shown or specified.
1. ACI 301, Specifications for Structural Concrete for Building (includes ASTM Standards referred to herein except ASTM A 36).
  2. ACI 347, Recommended Practice for Concrete Formwork.
  3. ACI 304, Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.

4. ACI 315, Manual of Standard Practice for Detailing Reinforced Concrete Structures.
5. ACI 305, Recommended Practice for Hot Weather Concreting.
6. ACI 306, Recommended Practice for Cold Weather Concreting.
7. ASTM A 36, Structural Steel.

### 1.3 SUBMITTALS

- A. Samples: Submit samples of materials as may be requested by the ENGINEER, including names, sources and descriptions.
- B. Shop Drawings: Submit for approval the following:
  1. List of concrete materials and concrete mix designs proposed for use. Include the results of all tests performed to qualify the materials and to establish the mix designs in accordance with ACI 301,3.9. Submit written report to ENGINEER for each proposed concrete mix at least 15 days prior to start of Work. Do not begin concrete production until mixes have been reviewed and are acceptable to ENGINEER. Mix designs may be adjusted when material characteristics, job conditions, weather, test results or other circumstances warrant. Do not use revised concrete mixes until submitted to and accepted by ENGINEER.

### 1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All materials used for concrete must be kept clean and free from all foreign matter during transportation and handling and kept separate until measured and placed in the mixer. Bins or platforms having hard clean surfaces shall be provided for storage. Suitable means shall be taken during hauling, piling and handling to insure that segregation of the coarse and fine aggregate particles does not occur and the grading is not affected.
- B. Deliver concrete reinforcement materials to the site bundled, tagged and marked. Use metal tags indicating bar size, lengths, and other information corresponding to markings shown on placement diagrams.

## PART 2 - PRODUCTS

### 2.1 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type II, except for thrust blocks installed at piping connections to existing water mains where Type III shall be used.
- B. Aggregates: ASTM C 33.
  1. Fine Aggregate: Clean, sharp, natural sand free from loam, clay, lumps or other deleterious substances.
  2. Coarse Aggregate: Clean, uncoated, processed aggregate containing no clay, mud, loam, or foreign matter, as follows:
    - a. Crushed stone, processed from natural rock or stone.



- b. Washed gravel, either natural or crushed. Use of slag and pit or bank run gravel is not permitted.
- C. Coarse Aggregate Size: Size to be ASTM C 33, Nos. 57 or 67, unless permitted otherwise by ENGINEER.
- D. Water: Clean, drinkable.
- E. Air-Entraining Admixture: ASTM C 260.
- F. Water-Reducing Admixture: ASTM C 494. Only use admixtures which have been tested and accepted in mix designs.
- G. Non-Shrink Mortar: Where shown on the Plans or specified by the ENGINEER, CONTRACTOR shall provide non-shrink mortar approved by the ENGINEER. Proportions shall be as recommended by the manufacturer. Wherever the non-shrink mortar is exposed in interior locations or exterior above grade, it shall be cut back and plastered with 1:2 cement mortar. Non-shrink mortar shall be Master Builder's "Embeco" or equal.

## 2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, and as follows: Provide Grade 60 for all bars except for stirrups and ties which shall be Grade 40.

## 2.3 RELATED MATERIALS

- A. Membrane-Forming Curing compound: ASTM C 309, Type I.

## PART 3 - EXECUTION

### 3.1 FORMWORK

- A. Formwork: Construct form so that concrete members and structures are of correct size, shape, alignment, elevation and position, complying with ACI 347.
- B. Provide openings in formwork to accommodate Work of other trades. Accurately place and securely support items built into forms.
- C. Clean and adjust forms prior to concrete placement. Apply form release agents or wet forms, as required. Retighten forms during and after concrete placement if required to eliminate mortar leaks.

### 3.2 REINFORCEMENT, JOINTS, AND EMBEDDED ITEMS

- A. Reinforcement: Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

- B. Installation of Embedded Items: Set and build into the Work anchorage devices and embedded items required for other Work that is attached to, or supported by cast-in-place concrete. Use setting diagrams, templates and instructions provided under other Sections and other contracts for locating and setting. Refer also to paragraph 1.1.B coordination, above.

### 3.3 CONCRETE AND PLACEMENT

- A. Proportioning and Design of Mix:
  - 1. Minimum compressive strength at 28 days: 4000 psi.
  - 2. Maximum water cement ratio by weight: 0.45.
  - 3. Minimum cement content: 564 pounds per cubic yard.
  - 4. Normal weight: 145 pounds per cubic foot.
  - 5. Use air-entraining admixture in all concrete: provide not less than 4 percent nor more than 6 percent entrained air.
  - 6. Calcium Chloride: Do not use calcium chloride in concrete, unless otherwise authorized in writing by the ENGINEER. Do not use admixtures containing calcium chloride where concrete is placed against galvanized steel.
  - 7. Use amounts of admixtures as recommended by the manufacturer for climatic conditions prevailing at the time of placing.
- B. Job-Site Mixing: Use drum type batch machine mixer, mixing not less than 1-1/2 minutes for one cubic yard or smaller capacity. Increase mixing time at least 15 seconds for each additional cubic yard or fraction thereof.
- C. Ready-Mixed Concrete: ASTM C 94.
- D. Concrete Placement: Comply with ACI 304, placing concrete in a continuous operation within planned joints or sections. Do not begin placement until work of other trades affecting concrete is completed.
- E. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping, so that concrete is worked around reinforcement and other embedded items and into all parts of forms.
- F. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement, and curing.
  - 1. In cold weather comply with ACI 306.
  - 2. In hot weather comply with ACI 305.

### 3.4 QUALITY OF CONCRETE WORK

- A. Make all concrete solid, compact and smooth, and free of laitance, cracks and cold joints.
- B. All concrete for liquid retaining structures, and all concrete in contact with earth, water, or exposed directly to the elements shall be watertight.

- C. Cut out and properly replace to the extent ordered by the ENGINEER, or repair to the satisfaction of the ENGINEER, surfaces which contain cracks or voids, are unduly rough, or are in any way defective. Thin patches or plastering will not be acceptable.
- D. All leaks through concrete, and cracks, holes or other defective concrete in areas of potential leakage, shall be repaired and made watertight by the CONTRACTOR.
- E. Repair, removal, and replacement of defective concrete as ordered by the ENGINEER shall be at no additional cost to the OWNER.
- F. All exposed concrete shall receive 3/4 inch chamfer.
- G. All walk surfaces shall have a broom finish.

### 3.5 CURING

- A. Curing: Begin initial curing as soon as free water has disappeared from exposed surfaces. Where possible, keep continuously moist for not less than 72 hours. Continue curing by use of moisture-rating cover or membrane-forming curing compound. Cure formed surfaces by moist curing until forms are removed. Provide protections as required to prevent damage to exposed concrete surfaces.

+ + END OF SECTION + +

## SECTION 15000

### PIPING, VALVES AND APPURTENANCES

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

###### A. Scope:

1. CONTRACTOR shall furnish all labor, tools, materials and equipment required to provide, test and place in satisfactory operation all piping, valves and appurtenances shown on the Drawings and specified herein.
2. Included hereunder are all pipe, fittings, couplings, joint restraint, taps, specials, jointing materials, bolts, nuts and gaskets, factory-applied painting, connections and modifications to existing piping, and appurtenances required for installation and testing.
3. It is the intention of the Drawings and Specifications to provide complete and workable piping systems. Miscellaneous fittings and appurtenances required for proper completion of the Work shall be considered as having been included under this Section.
4. Appurtenances include but are not limited to fire hydrants, valve markers, valve boxes and corporation stops.

###### B. General:

1. All piping, fittings, valves and appurtenances shall be new, clean and in accordance with material specifications. In no case will used or damaged material be acceptable.
2. Provisions shall be made to permit bleeding air at high points.
3. All piping shall be of the sizes and materials shown on the Drawings or specified herein.
4. All manual valve actuators shall open the valve when the nut or handwheel is rotated in the counter-clockwise direction.

###### C. Related Work Specified Elsewhere:

1. Section 02221, Trench Excavation.
2. Division 3, Concrete.
3. Section 15072, Cleaning, Testing and Disinfection.

##### 1.2 QUALITY ASSURANCE

A. Manufacturer Qualifications: Piping and valves shall be the standard product in regular production by manufacturers whose products have proven reliable in similar service. All valves and piping of the same type shall each be the product of one manufacturer.

###### B. Design Criteria:

1. Design conditions are as described in Part 2 of this Section.

- C. Source Quality Control: All pipe, specials and valves shall have the working pressure stenciled thereon. Pipe that has been designed for abnormal load conditions or thrust restraint shall have special markings thereon which can be readily identified.
- D. Reference Standards: Comply with applicable provisions and recommendations of the following:
1. Standards of American Water Works Association, AWWA.
  2. Standards of American Society for Testing and Materials, ASTM.
  3. Standards of American National Standards Institute, ANSI.
  4. Standards of American Iron and Steel Institute, AISI.
  5. Standards of Cast Iron Soil Pipe Institute, CISPI.
  6. Standards of American Association of State Highway and Transportation Officials, AASHTO.
  7. ASTM D 1598, Test for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure.
  8. ASTM D 1599, Test for Short-Time Rupture Strength of Plastic Pipe, Tubing and Fittings.
  9. ASTM D 1784, Rigid Poly (Vinyl Chloride) PVC Compounds and Chlorinated Poly (Vinyl Chloride) CPVC Compounds.
  10. ASTM D 1785, Poly (Vinyl Chloride) Plastic Pipe, Schedule 40.
  11. ASTM D 2122, Determining Dimensions of Thermoplastic Pipe and Fittings.
  12. ASTM D 2774, Underground Installation of Thermoplastic Pressure Piping.
  13. AWWA C900, Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch for water.
  14. AWWA Manual M23 PVC Pipe - Design and Installation.

### 1.3 SUBMITTALS

- A. Shop Drawings: Shop Drawing submittals shall include the following:
1. Illustrations, specifications and engineering data including: dimensions, materials, size, and weight for all piping, valves, and appurtenances including pipe supports, pipe restraints, coatings, etc.
  2. Manufacturer's instructions and recommendations for installation of each type of pipe joint, valve and special.
- B. Test Reports: Provide four copies of certified reports of all tests for resilient seat gate valves.
- C. Affidavit of Compliance: Provide four copies of a notarized affidavit for resilient seat gate valves, certifying that the valves were manufactured in full compliance with these specifications.

### 1.4 PRODUCTION, DELIVERY, STORAGE, AND HANDLING

- A. Delivery, Storage and Handling of Materials: All materials shall be delivered to the site, stored, and handled in accordance with the manufacturer's instructions. CONTRACTOR shall inspect shipments for damage and content well in advance of the date scheduled for incorporation in the Work.

- B. Prior to Shipment:
  - 1. Each piece of pipe and each fitting shall be plainly marked at the foundry with class number and weight. Ductile iron pipe and fittings shall also be marked "DI" or "DUCTILE". All piping shall be readily identifiable.
- C. To establish minimum criteria for proper installation and handling, measures to be taken by the CONTRACTOR shall include the following:
  - 1. All piping and valves shall be thoroughly cleaned of sand, scale, rust or other foreign substances. Open ends of piping and valves shall be suitably closed to prevent the entrance of foreign matter after cleaning and during shipment and storage.

### 1.5 JOB CONDITIONS

- A. Protection:
  - 1. Take all measures to ensure that all materials are protected from damage.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. 2-Inch Water Main:
  - 1. Material: Type 1, Grade 1 conforming to ASTM D 1784.
  - 2. Pipe: Schedule 40, unless specifically noted as Schedule 80 conforming to ASTM D 1785.
  - 3. Joints: Socket weld using solvent cement conforming to ASTM D 2564.
  - 4. Fittings: Socket weld, Schedule 40 or 80 conforming to ASTM D 2467, except where other type joints are required to connect to valves, special fittings, equipment or where shown on Drawings. Flanges shall be rated for 150 psi working pressure at 100 F and be suitable for connection to ANSI B16.1, Class 125 flange.
  - 5. Adapters and Specials: Provide unions, adapters and specials where required to connect to other type of piping.
- B. 6- and 8-inch Water Main:
  - 1. Pipe shall conform to AWWA C900, Class 150, DR=18.
  - 2. Fittings: Fittings shall be compact ductile iron mechanical joint conforming to ANSI A21.53, cement lined in accordance with ANSI A21.4 or ductile iron mechanical joint conforming to ANSI A21.10, cement lined in accordance with ANSI A21.4.
  - 3. Pipe Joints: Joints shall be integral bell and spigot type with rubber gasket.
  - 4. Detailed Requirements:
    - a. Workmanship: The pipe shall be homogeneous throughout and free from visible cracks, holes, foreign inclusions, or other defects. The pipe shall be uniform in color, opacity, density, and other physical properties.

- b. Dimensions and Tolerances: Dimensions and tolerances shall be measured in accordance with ASTM D 3035. The eccentricity of the inside and outside circumferences of the pipe walls shall not exceed 12 percent.
  - c. Sustained Pressure: The pipe shall not fail, balloon, burst, or weep as defined in ASTM D 1598.
  - d. Burst Pressure: The minimum burst pressure shall be as given, when determined in accordance with ASTM D 1599.
5. Mechanical Joint Accessories:
- a. Bolts, Nuts and Studs: Except as otherwise noted, all bolts and nuts for mechanical joint pipe shall be made of high-strength, low-alloy steel conforming to the requirements of ANSI A21.11. Except as otherwise noted, all bolts and nuts for flanged pipe shall be steel conforming to ASTM A 307, Grade B. All bolts shall have hexagonal heads and nuts. All nuts shall be of the heavy series type.
  - b. Restraining Rods: Use "tie-bolt" type joint restrainers with tie rods, tie bolt, nuts and other accessories as required, as manufactured by Star National Products, or equal.
6. Identification:
- a. Marking on the pipe shall include the following, spaced at intervals of not more than 5 feet.
    - 1) Pipe nominal size.
    - 2) Pipe schedule.
    - 3) Specification of plastic material.
    - 4) Type and grade of plastic.
- C. Resilient Seat Gate Valves:
- 1. Extent: 6-inch diameter and larger, including tapping valve.
  - 2. Size: Refer to Drawings.
  - 3. Minimum Working Pressure: 150 psig.
  - 4. Valves shall be cast or ductile iron body, resilient seat, with bronze stem and stem nut, Buna-N seals and O-rings and 2-inch square operating nut. Provide a cast iron valve box.
  - 5. Valves shall conform to the requirements of AWWA C509.
  - 6. End Connections: Mechanical joint end conforming to ANSI A21.11. Tapping valve shall be flange by mechanical joint with flange end conforming to ANSI B16.1, Class 125.
  - 7. Manufacturer:
    - a. American-Darling Valve.
    - b. Clow Corporation.
    - c. Mueller Company.
    - d. Or equal.
- D. Ball Valves: PVC, threaded ends suitable for 125 psi.
- 1. 2-Inch Diameter:
    - a. Type: True union ball valves.
    - b. End connections: Threaded.
    - c. Materials: Body shall be PVC with Teflon seats and EPDM "O"-rings.
    - d. Operating Nut: 2 inch square.

2. Product and Manufacturer. Provide one of the following:
    - a. NIBCO.
    - b. Or equal.
- E. Fire Hydrant:
1. General: The hydrant base shall have a 6-inch mechanical joint bell, designed for connection to a horizontal 6-inch ductile iron pipe hydrant branch.
    - a. The traffic coupling shall allow for 360 degree adjustment of the upper standpipe.
    - b. Operating nut shall turn counterclockwise to open hydrant.
    - c. Extension spools shall be available from 6 inches to at least 48 inches, in 6-inch increments.
  2. Hydrant Standards: Fire hydrants shall be of the dry barrel type and shall conform to AWWA C502.
    - a. Minimum flow rate shall be 1000 gallons per minute with not more than 5 psi pressure drop through the steamer nozzle.
    - b. Internal valve shall be 4 1/2 inches in diameter and have bronze to bronze seating.
    - c. Nozzles: Two hose nozzles placed 180 degrees apart; 2 1/2 inch National (American) fire hose coupling screw threads. One steamer nozzle with 4-1/2 inch National (American) fire hose coupling screw threads.
    - d. Manufacturers: Fire hydrants shall be Clow Medallion, or equal.
- F. Valve Boxes and Covers: Provide a cast iron, telescoping valve box and cover for each buried valve. Cover shall be cast with the word "Water" on top. Provide concrete protection pad as shown on the Drawings.
- G. Marker Post:
1. Extent: Provide marker post for each valve box.
  2. Size:
    - a. Width: Minimum 3 3/4 inches.
    - b. Length: Minimum 6 feet.
  3. Color: Blue.
  4. Decal: Manufacturer's standard decal, to include as a minimum "Warning - Water Valve".
  5. Type: Fiberglass composite.
  6. Product and Manufacturer: Provide one of the following:
    - a. Carsonite, utility marker.
    - b. Or equal.
- H. Service Saddle:
1. Extent: Provide for manual air release valve assembly as shown.
  2. Size: As shown.
  3. Type: Ductile iron or brass, coordinate threads with corporation stop.
  4. Product and Manufacturer: Provide one of the following:
    - a. Mueller.
    - b. Or equal.



- I. Corporation Stop:
1. Extent: Provide for manual air release valve assembly as shown.
  2. Size: As shown.
  3. Type: Brass, coordinate inlet threads with service saddle and outlet threads with PVC pipe.
  4. Product and Manufacturer: Provide one of the following:
    - a. Mueller.
    - b. Or equal.
- J. Meter Box:
1. Extent: Provide for manual air release valve assembly and blow off assembly as shown.
  2. Type: Plastic box with cast iron meter lid.
  3. Product and Manufacturer: Provide one of the following:
    - a. Brooks, 14.19 CE.
    - b. Or equal.
- K. Tapping Sleeve:
1. Tapping sleeves shall be split sleeve with mechanical joint type end seals.
  2. Cast sleeves shall be of grey cast iron meeting ASTM A126 Grade B, or ductile iron meeting ASTM A536 Grade 65-42-12. Cast tapping sleeves shall be as manufactured by American Darling, Mueller Co., or approved equal.
  3. Gaskets: Shall conform to applicable requirements of AWWA C111, and shall be clearly marked to identify the diameter range for which intended.
  4. Outlet Flange: Shall be 125 pound, drilling per ANSI B16.1, with standard tapping flange counterbore per MSS SP-60.
  5. Mechanical Joints, Bolts and Nuts: Shall conform with ANSI/AWWA C111/A21.11.
  6. Exterior Coatings: Shall be asphaltic varnish per Federal Specification TT-V-51, Military Specification MIL C-450, or the manufacturer's standard coating.

## 2.2 PAINTING

- A. Interior and exterior ferrous surfaces of resilient seat gate valves shall receive epoxy coating. Said coating shall be non-toxic, impart no taste to water and shall conform to AWWA C500.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. The CONTRACTOR shall inspect all piping to ensure that it is free of defects in material and workmanship. The compatibility of all pipe, fittings, and coatings shall be verified.

### 3.2 PREPARATION

- A. Excavation required for buried piping shall conform to the requirements of Section 02233, Excavation and Backfill.

### 3.3 PIPING INSTALLATION, GENERAL

- A. All piping shall be installed in complete accordance with the manufacturer's instructions and recommendations.
- B. All pipe joint deflection or pipe bending shall be in accordance with manufacturer's instructions and recommendations. Minimum allowable radius for bending 6- and 8-inch AWWA C900 pipe shall be 200 feet.
- C. If any piping must be cut, the work shall be done in a satisfactory manner using a machine specifically designed for cutting the pipe, so as to avoid damage to the pipe and to leave a smooth end.
- D. Any defective or broken pipe shall be removed from the site; if installed, it shall be removed and replaced at the CONTRACTOR'S expense.
- E. Buried Pipe:
  - 1. Pipe shall not be installed until OWNER'S Project Representatives approves the bedding conditions.
  - 2. The CONTRACTOR'S attention is directed to the fact that bulkheaded, empty, pipelines are subject to flotation in an open trench. Trench dewatering operations must be maintained while empty pipe remains exposed in the trench.
  - 3. All pipe and fittings shall be laid or placed to lines and grades as required to maintain a minimum cover over the pipe of 3 feet.
  - 4. Special care shall be taken to keep the inside of the pipe clean and free from dirt, water or other materials during laying operations. At the end of each day's laying operations, the pipe shall be inspected and an approved watertight bulkhead shall be placed to keep dirt, water or other materials from entering the pipe.
  - 5. Permissible deflections at joints shall not exceed two-thirds of the maximum deflection allowed by the pipe manufacturer.
- F. A molybdenum disulphide anti-seize compound shall be applied to all threads in mechanical connections such as bolts, studs, screws, etc., unless otherwise noted.

### 3.4 MECHANICAL JOINT INSTALLATION

- A. Prior to assembling mechanical joints the inside of the ductile iron bell shall be cleaned thoroughly with a wire brush to remove foreign matter and then painted with a soap solution and the last 8 inches of the outside of the PVC spigot shall be cleaned thoroughly with a clean rag to remove foreign matter and then painted with a soap

solution. Immediately after the soap solution is applied, the retainer gland and soaped rubber ring shall be slipped on the spigot end of the pipe. For assembly, the spigot shall be centrally located in the bell and the pipe shall be pushed forward to seat the spigot in the bell. The gasket shall be pressed into place evenly within the bell and the gland shall be moved along the pipe into position for bolting. Any deflection of the joint shall be made after the gasket is in place and before tightening the joint bolts. All joint bolts shall be inserted and all nuts hand tightened. Nuts spaced 180 degrees apart shall be tightened alternately in order to produce an equal pressure on all parts of the gland. All nuts shall be tightened with a torque-limiting wrench in accordance with the torque recommendations of the manufacturer.

### 3.5 PUSH-ON JOINT INSTALLATION

- A. Prior to assembling PVC push-on type joints, the outside of the spigot and the inside of the bell shall be cleaned thoroughly with a rag to remove foreign matter. Rubber gasket shall be wiped clean and then placed in the bell in accordance with the instructions of the manufacturer. Gasket shall be smoothed out around the entire circumference of the bell to remove bulges and to prevent interference with the proper entry of the spigot of the entering pipe. A thin film of approved lubricant shall be applied to the surface of the gasket which will come in contact with the entering spigot end of pipe. The CONTRACTOR shall apply a thin film of lubricant to the outside of the spigot of the entering pipe. Final assembly shall be made by forcing the spigot end of the entering pipe past the rubber gasket until it makes contact with the base of the bell. Where more than a reasonable amount of force is required to assemble the joint, the spigot end of the pipe shall be removed to verify the proper positioning of the rubber gasket. Gaskets which have been scoured or otherwise damaged shall not be used.
- B. Field cut pipe shall have the outside edge beveled and smoothed to prevent damage to the gasket in accordance with pipe manufacturers recommendations.

### 3.6 FLANGED JOINT INSTALLATION

- A. Flanged joints shall be drawn together until the joint is perfectly tight. The length of bolts shall be uniform and they shall not project from the nut more than 1/4-inch or fall short of the end of the nut when fully taken up. The ends of the bolts shall be cut off in a lathe so as to be neatly rounded. Threads on both nuts and bolts shall be sharply cut and accurately sized so as to turn freely without undue play. No washers shall be used. All bolts shall be inserted and all nuts screwed up tightly by hand. Nuts spaced 180 degrees apart shall be tightened alternately in order to produce an equal pressure on all parts of the gasket. All nuts shall be tightened with a torque-limiting wrench in accordance with the torque recommendations of the manufacturer.

### 3.7 MISCELLANEOUS FITTING INSTALLATION

- A. Transitions From One Type of Pipe to Another:
  - 1. Provide all necessary adapters, specials and connection pieces required when connecting different types and sizes of pipe or connecting pipe made by different manufacturers.
- B. Taps:
  - 1. Taps shall be AWWA taper thread of the size indicated or required. Install corporation stop at each tap. Install corporation stops at air release devices such that inlet is flush with inside surface of pipe wall.
  - 2. Taps in PVC C900 pipe provide tapped saddles as manufactured by Clow or equal.

### 3.8 WORK AFFECTING EXISTING UTILITIES

- A. Location of Existing Piping:
  - 1. Locations of existing piping shown on the Plans should be considered approximate.
  - 2. CONTRACTOR is responsible for determining exact location of existing piping to which he shall make connections, or which he may disturb during earth moving operations, or which may be affected by his work in anyway.
- B. Taking Existing Water Mains Out of Service:
  - 1. Coordinate with OWNER. All existing water valves will be operated by OWNER'S personnel only.
  - 2. Unless otherwise approved in writing, only the following sections of water main will be taken out of service:
    - a. Pipe section along Spindrift Trail from existing dead end to first existing line valve.
- C. Work on Existing Water Mains:
  - 1. Cut pipes as shown or required with machines specifically designed for this work.
  - 2. Install temporary plugs to keep out all mud, dirt, water and debris.
  - 3. Provide all necessary adapters, fittings, taps, outlets, pipe and appurtenances required.
  - 4. Verify dimensions of all existing piping to which connections are required and provide all necessary adapters, fittings, pipe and appurtenances required to make the connections.
  - 5. OWNER does not guarantee watertight closing of isolation valves on existing piping. CONTRACTOR shall provide, at no additional expense to the OWNER, all temporary caps, plugs, dewatering, pumping and other measures required during initial dewatering of existing pipelines to be connected to and during installation of the pipe connection.

D. Relocation of Existing Utilities:

1. Any utilities shown on the Plans to be relocated as required shall be relocated only after coordination with the applicable Authority.
2. All requirements of the Authority owning the utility to be relocated shall be followed.

3.9 FIELD TESTING

- A. General: See Section 15072, Cleaning, Testing and Disinfection.

3.10 FIELD PAINTING

- A. All buried bolts, nuts and couplings and those not receiving other paint systems shall be given a heavy coat of bitumastic paint.

3.11 CLEANING AND DISINFECTION

- A. General: See Section 15072, Cleaning Testing and Disinfection.

+ + END OF SECTION + +

## SECTION 15072

### CLEANING, TESTING AND DISINFECTION

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Scope: CONTRACTOR shall furnish all labor, materials, equipment and water necessary to clean, hydrostatically test, disinfect and flush completed portions of the pipeline as shown and specified.
- B. General:
1. All pipeline, and joints and appurtenances shall be successfully cleaned, tested and disinfected prior to acceptance of the Work.
  2. Test sections shall be as approved by the ENGINEER.
  3. CONTRACTOR shall provide all necessary thrust restraint and temporary bulkheads required for testing.
  4. Test Procedure:
    - a. Fill test sections at a maximum rate of 80 gallons of water per minute and expel air.
    - b. Pressurize test section to 125 psig measured at the lowest point in the pipe section under test.
    - c. Maintain test pressure for two hours.
  5. All blowoff and air valve assemblies shall be in place and operational during hydrostatic testing. Blowoff and manual air release valves shall be closed. Isolation valves in appurtenant assemblies shall be open.
  6. All lines shall be thoroughly cleaned and free of debris, trash or other foreign materials.
  7. ANY VALVES THAT NEED TO BE OPERATED IN THE EXISTING SYSTEM SHALL ONLY BE OPERATED BY OWNER.
- C. Related Work Specified Elsewhere:
1. Section 15000, Piping Valves and Appurtenances.
- D. Reference Standards:
1. AWWA C651.
  2. AWWA M23, PVC Pipe - Design and Installation.

##### 1.2 SUBMITTALS

- A. Submit detailed description of testing program, to ENGINEER including but not limited to the following:
1. Schedule of test sections.
  2. Type and location of test joints and bulkheads; provisions for thrust restraint.
  3. Proposed sources of water and points of introduction into the pipeline.

4. Proposed equipment and methods for cleaning and filling and dewatering the pipeline.
5. Sequence of activities.

## PART 2 - PRODUCTS

### 2.1 WATER FOR TESTING

- A. Water for cleaning and pressure test will be furnished by the OWNER to the CONTRACTOR at no charge for initial hydrostatic testing and cleaning of pipeline. However, the CONTRACTOR shall pay for all cost incurred for every successive tests required by initial test failures. CONTRACTOR shall provide all temporary piping, pumps and other appurtenances necessary to convey water from OWNER'S source to point of use by CONTRACTOR.
- B. Removal of water from piping and disposal to water courses shall be performed to avoid nuisance or damage downstream. Comply with applicable laws and regulations.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Test all piping and joints to 125 psi measured at the lowest point in the test section as approved by the ENGINEER.
- B. Notify ENGINEER 48 hours in advance of testing.
- C. Provide all testing apparatus including pumps, hoses, gages, fittings, thrust protection, temporary bulkheads, plugs, compressors, and miscellaneous other items necessary to complete the Work.
- D. Provide temporary blocking and bracing or approved thrust and joint restraint to prevent joint separation and pipe movement during testing. Do not exceed allowable tensile or compressive stress in pipe adjacent to bulkheads.
- E. All blind flanges, test bulkheads, plugs, end caps, fittings and appurtenances shall be in place during testing.
- F. Tolerance for pressure during testing: + zero, -5 psi.
- G. Pipelines which fail to hold specified test pressure or which exceed the allowable leakage rate shall be repaired and retested at the CONTRACTOR'S expense until satisfactory results are obtained.

- H. Conduct all work herein in the presence of the ENGINEER. Conduct tests in the presence of other authorities having jurisdiction, if required by them.
- I. All costs for tests shall be considered as having been included in the Contract Bid Price.

### 3.2 PRESSURE TEST PROCEDURE:

- A. Backfill and compaction shall be completed before testing, unless otherwise approved by ENGINEER. Backfill and compact around all blocking before testing and as required to assure restraint. Provide temporary blocking and bracing as required to prevent joint separation and movement during testing.
- B. Allow concrete for blocking to reach design strength before testing.
- C. Fill the pipe test sections at a rate of 80 gallons per minute.
- D. Expel all air from pipeline.
- E. Apply 100% of required test pressure at the beginning of each test.
- F. Maintain test pressure within the specified tolerance for a minimum of two hours.
- G. Accurately measure the amount of water added to the test section during the test.
- H. Leakage Allowances: Leakage for PVC C900 piping shall not exceed the allowable leakage as specified in AWWA M23.
- I. If the leakage is greater, the Contractor shall make the necessary repairs and retest the piping until the leakage requirement is satisfied.

### 3.3 DISINFECTION

- A. Flushing - All mains shall be thoroughly flushed in accordance with AWWA 651, using potable water prior to the introduction of disinfecting agents. Velocity in the main during flushing shall attain a velocity of 2.5 feet per second for a period sufficient to remove sediment and discolored water from the main. All valves and hydrants shall be operated and flushed.
- B. Flushing shall progress in a logical sequence (approved by the ENGINEER) from the source of water to the end of the installation, without flushing dirty water through portions that have already been flushed. Water for the initial flushing and flushing after chlorination will be furnished by the OWNER. It is the CONTRACTOR's responsibility to provide adequate drainage for the discharge without causing a Public nuisance.



- C. Chlorination of the main and appurtenances, and favorable bacteriological analysis received from samples collected therefrom, shall be completed before any newly laid pipeline is connected to the potable water distribution system.
- D. All work shall be in accordance with AWWA C651, and as specified herein.
- E. Chlorination shall be by the continuous feed method.
- F. Potable water shall be introduced into the pipeline at a constant flow rate. An approved doublegate-double check valve backflow preventor shall be installed in the source line to protect the existing distribution system. Prior to use, the backflow preventor shall be tested and acceptable for use as directed by the OWNER. Chlorine shall be added at a constant rate (using equipment specifically designed for the purpose), proportional to the water flow, so the chlorine concentration in the water main is at least 25 mg/L. Additional chlorine may be required depending on site specific conditions.
- G. The chlorinated water shall remain in the pipeline for at least 24 hours, after which time the residual chlorine content shall be at least 10 mg/L. All valves and appurtenances shall be operated while the heavily chlorinated water remains in the pipeline.
- H. After the required retention time the heavily chlorinated water shall be flushed from the main, using potable water. However, the highly chlorinated water shall not be flushed out until the residual is less than 1 mg/L. A reducing agent shall be applied as required to achieve this residual.
- I. Disposal of the heavily chlorinated water is the responsibility of the CONTRACTOR and shall be in such a manner as to cause no adverse environmental effects such as fish kills or erosion and in compliance with all Federal, State and local requirements.
- J. The CONTRACTOR shall provide sampling taps similar to that shown in AWWA C651. A minimum of two sampling taps shall be located as directed for any pipe being sterilized less than 1000 feet. For pipe installation greater than 1000 feet the CONTRACTOR shall provide one tap for each 2000 feet of pipe, or fraction thereof, plus one tap for each blowoff.
- K. A minimum of two samples taken 24 hours apart shall be collected from each section of pipeline and delivered to the approved testing laboratory for testing purposes. All samples must successfully pass bacteriological testing prior to placing the pipeline in service. If additional testing is required, the CONTRACTOR is responsible for the water and testing at no additional cost to the OWNER until the samples pass the above requirements. Chlorine residual measurements shall be taken and recorded at the time each sample is collected.

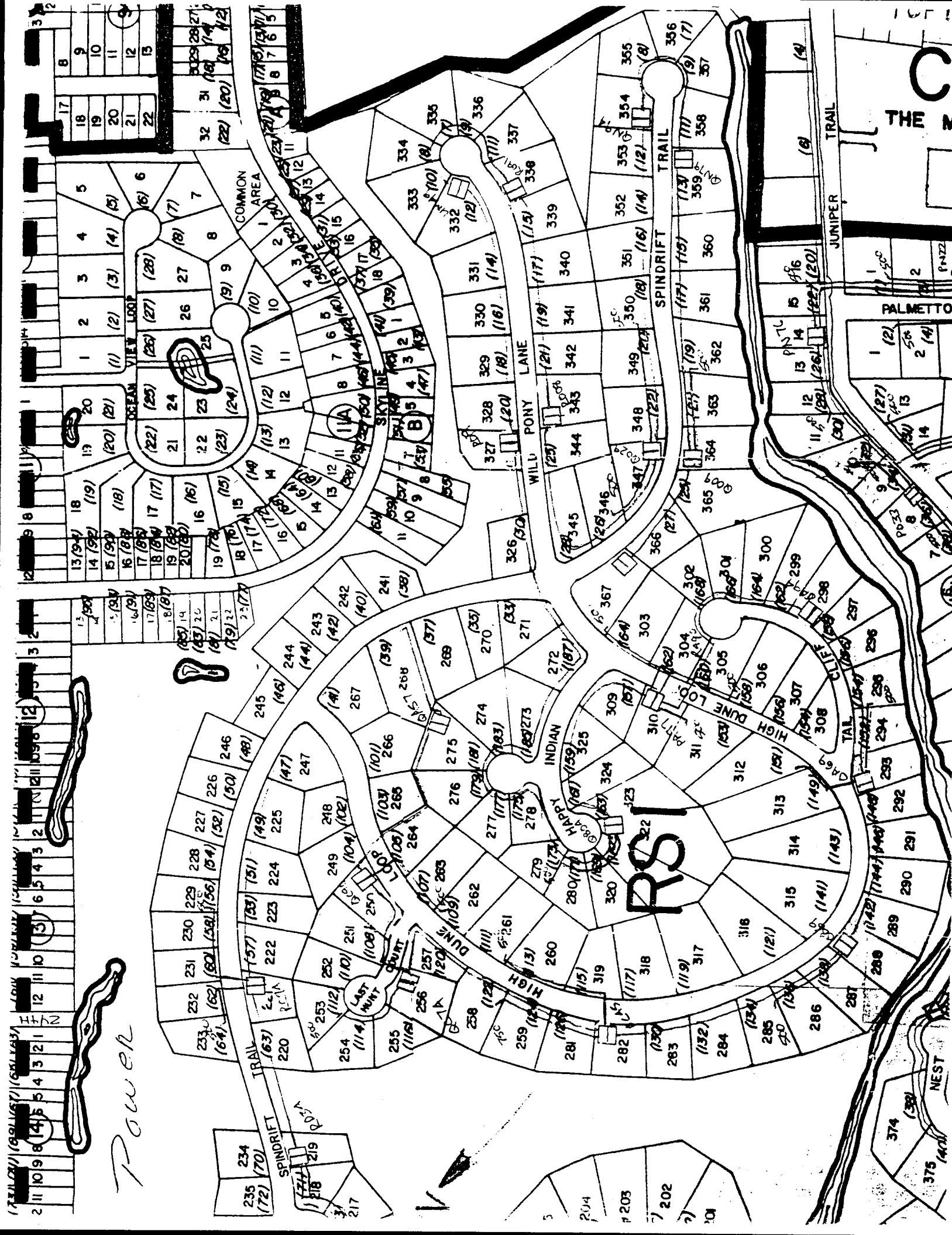
L. Disinfection at tie-in connections:

- a. Thoroughly clean all existing pipe and pipe and fittings to be installed at tie-in connections and apply a 5 percent hypochlorite solution to all interior surfaces by swabbing or spraying.
- b. Allow a minimum of 60 minutes contact time.
- c. Hose down with potable water and immediately install the connection pieces.

+ + END OF SECTION + +

**APPENDIX A**  
**UTILITY LOCATION DRAWINGS**

APPENDIX A.1  
NORTH CAROLINA POWER  
(ONE SHEET)



17	8
18	9
19	10
20	11
21	12
22	13

1	2	3	4	5	6
(11)	(2)	(3)	(4)	(5)	(6)
26	27	(8)	7		
(26)	(27)	(28)			
21	24				
(22)	(25)				
22	23	(23)			
(24)					

1	2	3	4	5	6	7	8	9	10
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
18	19	(19)	20	21	22	23	24	25	26
(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
17	18	19	20	21	22	23	24	25	26
(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)

1	2	3	4	5	6	7	8	9	10
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
11	12	13	14	15	16	17	18	19	20
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
11	12	13	14	15	16	17	18	19	20
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)

1	2	3	4	5	6	7	8	9	10
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
11	12	13	14	15	16	17	18	19	20
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
11	12	13	14	15	16	17	18	19	20
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)

1	2	3	4	5	6	7	8	9	10
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
11	12	13	14	15	16	17	18	19	20
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
11	12	13	14	15	16	17	18	19	20
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)

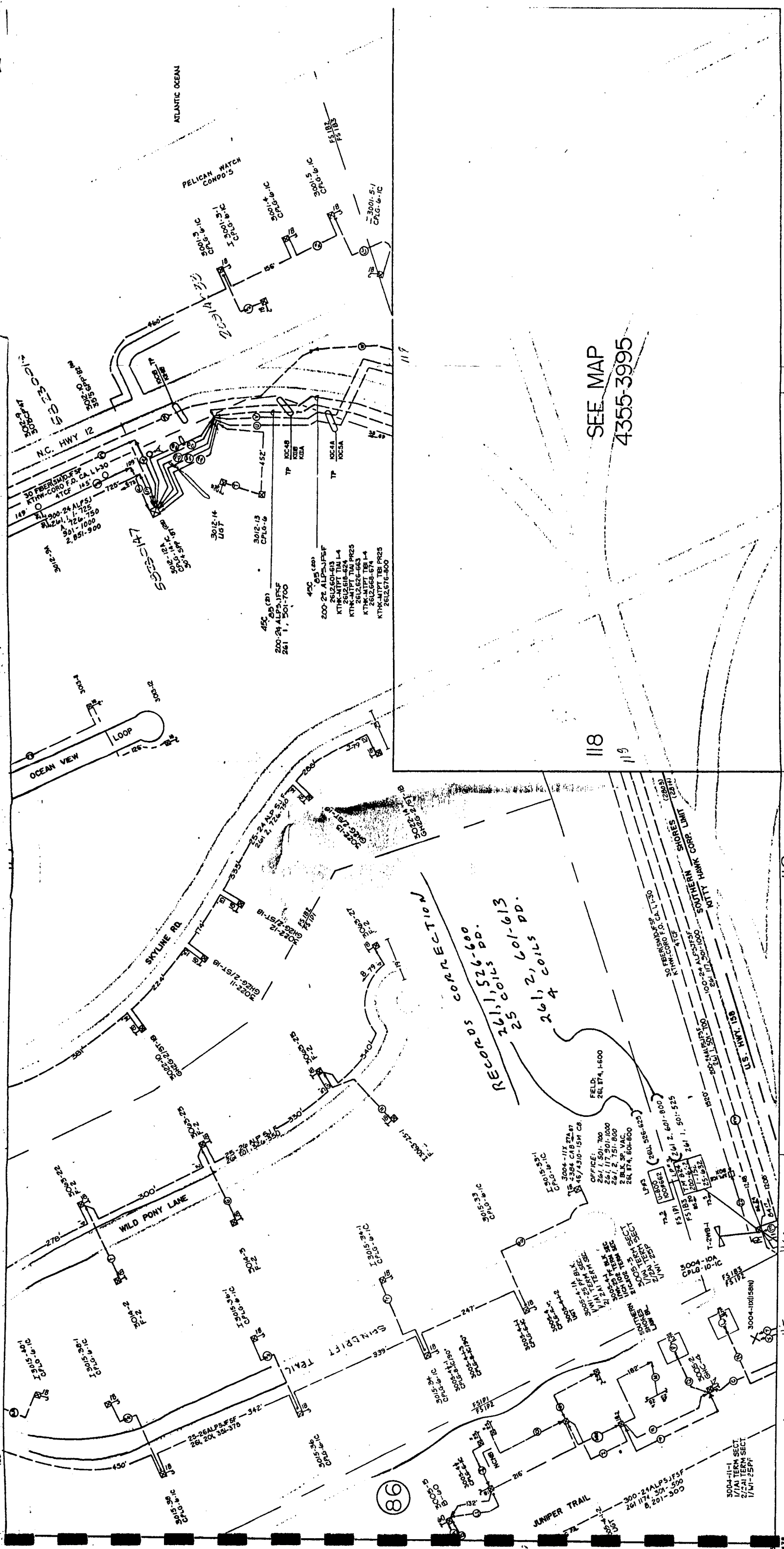
1	2	3	4	5	6	7	8	9	10
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
11	12	13	14	15	16	17	18	19	20
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
11	12	13	14	15	16	17	18	19	20
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)

1	2	3	4	5	6	7	8	9	10
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
11	12	13	14	15	16	17	18	19	20
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
11	12	13	14	15	16	17	18	19	20
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)

1	2	3	4	5	6	7	8	9	10
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
11	12	13	14	15	16	17	18	19	20
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
11	12	13	14	15	16	17	18	19	20
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)

APPENDIX A.2  
CAROLINA TELEPHONE AND TELEGRAPH COMPANY  
(THREE SHEETS)





**OUTSIDE PLANT MAP**

CAROLINA TELEPHONE AND TELEGRAPH COMPANY

PROJECT: KILL DEVIL HILLS

DATE: 11/13/11

SCALE: 1" = 100'

GRID NORTH

113(i)

CD	DATE	DESCRIPTION
1	11/13/11	ISSUED FOR CONSTRUCTION

NOTES: ALL PLANT IS ON PUBLIC RIGHT OF WAY UNLESS OTHERWISE NOTED. BASE ISSUED - AUGUST 1998.

TAX DATA	FORECAST SECTION	AUTHORIZED CODES	TRANSMISSION DATA
CD: 1200 CORP. SOUTHERN SHORES (KITTY HAWK)	182 183	K12A K12B K12C K12D	CODE: 1 ZONE: 5

118  
119  
120  
121  
122  
123  
124  
125  
126  
127  
128  
129  
130  
131  
132  
133  
134  
135  
136  
137  
138  
139  
140  
141  
142  
143  
144  
145  
146  
147  
148  
149  
150

WILD PONY LANE, SKYLINE RD, JUNIPER TRAIL, OCEAN VIEW, PELICAN WATCH CONDO'S, U.S. HWY 150, SHORES LANE UNIT, SOUTHERN SHORES, MATTLE BANK CORE UNIT.

RECORDS CORRECTED  
261, 1, 526-600  
25 COILS PD.  
261, 2, 601-613  
261, 4 COILS PD.

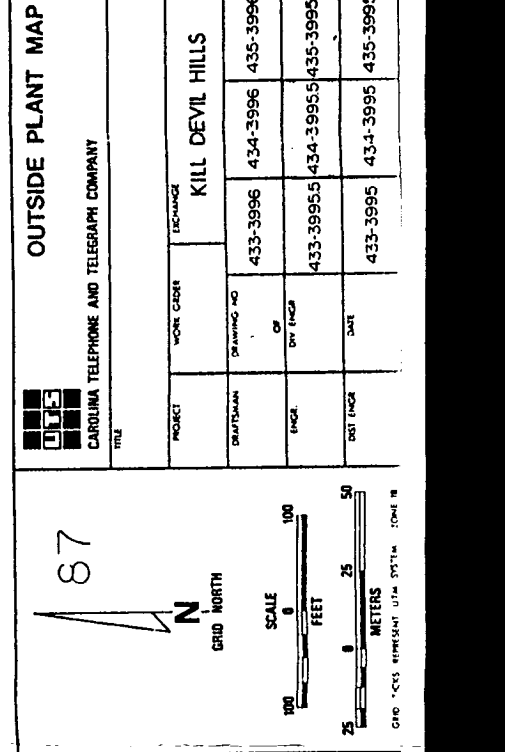
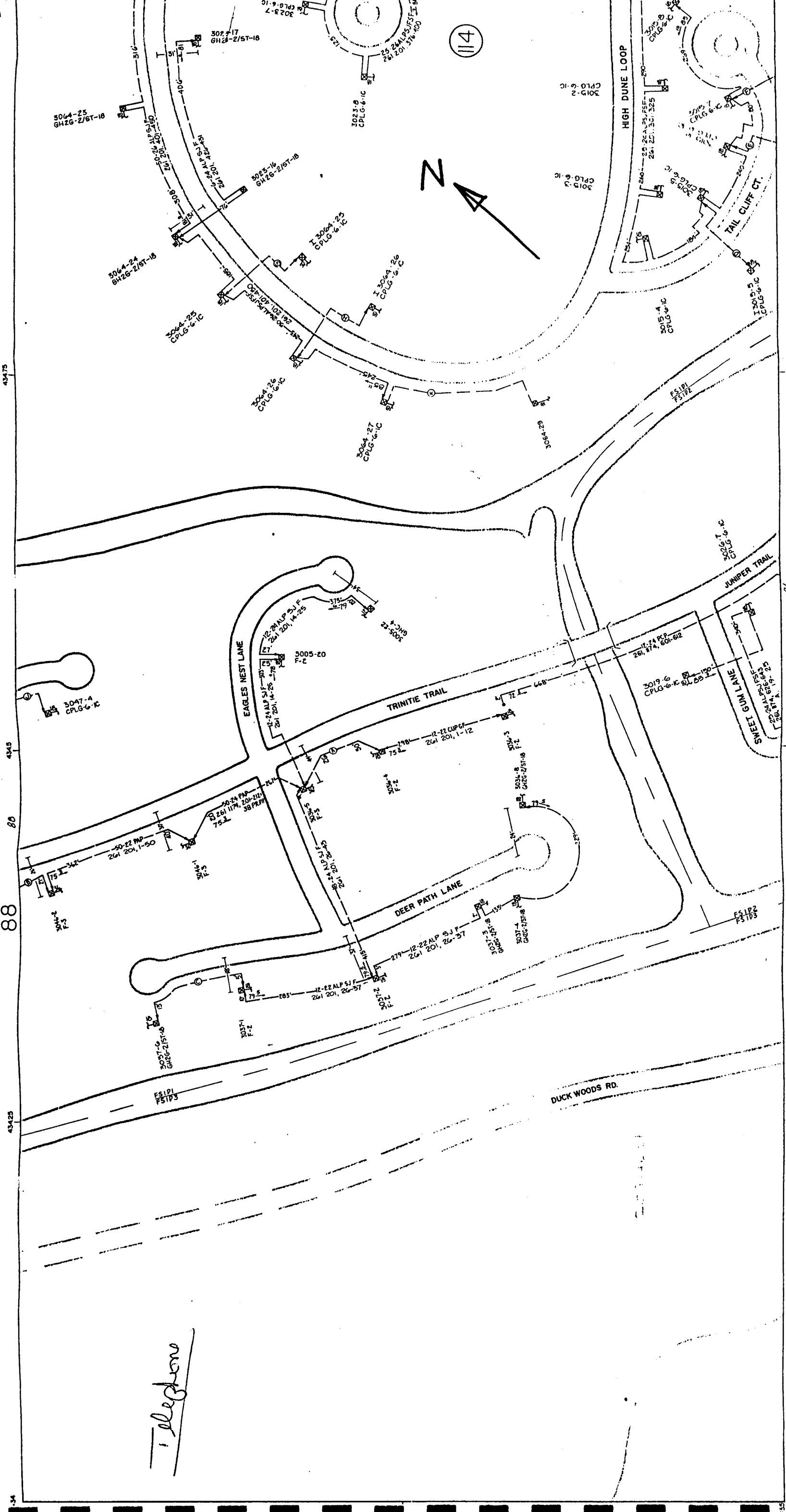
REVISED

DATE	W.D. NO.	TITLE OR REMARKS
12-00	12-00	UNKNOWN
11-55	11-55	12-00
11-54	11-54	12-00
11-53	11-53	12-00
11-52	11-52	12-00
11-51	11-51	12-00
11-50	11-50	12-00
11-49	11-49	12-00
11-48	11-48	12-00
11-47	11-47	12-00
11-46	11-46	12-00
11-45	11-45	12-00
11-44	11-44	12-00
11-43	11-43	12-00
11-42	11-42	12-00
11-41	11-41	12-00
11-40	11-40	12-00
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11-33	11-33	12-00
11-32	11-32	12-00
11-31	11-31	12-00
11-30	11-30	12-00
11-29	11-29	12-00
11-28	11-28	12-00
11-27	11-27	12-00
11-26	11-26	12-00
11-25	11-25	12-00
11-24	11-24	12-00
11-23	11-23	12-00
11-22	11-22	12-00
11-21	11-21	12-00
11-20	11-20	12-00
11-19	11-19	12-00
11-18	11-18	12-00
11-17	11-17	12-00
11-16	11-16	12-00
11-15	11-15	12-00
11-14	11-14	12-00
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07-00	07-00	12-00
06-00	06-00	12-00
05-00	05-00	12-00
04-00	04-00	12-00
03-00	03-00	12-00
02-00	02-00	12-00
01-00	01-00	12-00
00-00	00-00	12-00

DATE: 11/13/11



30FB



OUTSIDE PLANT MAP

CAROLINA TELEPHONE AND TELEGRAPH COMPANY

PROJECT	WORK CODE	EXCHANGE	KILL DEVIL HILLS
3064-25	GHZG-2/ST-18		
DRAFTER	DRAWING NO.	DATE	WORK ORDER
3064-25	GHZG-2/ST-18		
ENGR.	DW. NO.	DATE	DRAWING NO.
3064-25	GHZG-2/ST-18		
DATE	SCALE	DRAWING NO.	WORK ORDER
	1:1		

TAX DATA			
CO. DATE			
CORP. SOUTHERN SHORES			
S.D.			
S.D.			
S.D.			
S.D.			
FORECAST SECTION			
1/P1	1/P2		
TAPER POINT			
17/A			
CODE	1	ZONE	5

NOTES:

ALL PLANT IS ON PUBLIC RIGHT OF WAY UNLESS OTHERWISE NOTED.

BASE ISSUED - AUGUST, 1980

1	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
2	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
3	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
4	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
5	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
6	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
7	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
8	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
9	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
10	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
11	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
12	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
13	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
14	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
15	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
16	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
17	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
18	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
19	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25
20	45C (M)	11D (M)	25-26ALP5JFSF	ISOL. 1-6	26/117A, 20/1-212-150L, 1-25

DATE	W.D. NO.	TITLE OR REMARKS	IN EFFECT
11-80	5826048	UNKNOWN WD	1972
12-80	NC 75-39-5		1975
3-81	28100013		1978
3-81	2914098		1979
3-81	2914007		1979
3-81	58260065		1980
12-82	20914048		1980
12-82	21914142		1981
1-83	21914058		1981
5-83	29914305		1985
5-83	29914243		1985
9-83	29914252		1985
10-86	20914119		1986
11-86	26914024		1986
12-86	29914027		1989
4-90	2991405		1989

APPENDIX A.3

OUTER BANKS CABLEVISION ASSOCIATES  
(ONE SHEET)

MAP NO	1 - 25	SCALE	1" = 200'
DATE	7 / 89	TICS / DRL	
SYSTEM			
STATE	NC		
CITY	SOUTHERN SHORES		
H-24	1 - 24 J - 24		
H-25	1 - 25 J - 25		
H-26	1 - 26		
THRU FOOTAGE		2772	
HOMES UG		29	158
MULTI BLDG		0	
COMMERCIAL		0	
DENSITY		36.8	74.0
TOTAL		0	
0	AT ALL TIMES APPROX		
0	NEW CAT / GUY ANCHOR		
0	SIDEWALK GUY ANCHOR		
0	IDEWALK GUY NEW ANCHOR		
0	SLACK SPAN		
0	CORDED SPAN		
0	OVERHEAD GUY		
0	RISEH PILE		

