

PROJECT MANUAL
FOR
REHABILITATION
OF THE
PRESCOTT PARK
SEAWALL

PREPARED FOR
City of Portsmouth
New Hampshire

Funding for this Project Manual and plans has been provided by a grant from the NH Coastal Program.

PREPARED BY
Kimball Chase Company, Inc.
40 Bridge Street
Portsmouth, New Hampshire

FEBRUARY 1986

MAR 27 1986

PROJECT MANUAL

Including Specifications for

REHABILITATION OF THE PRESCOTT PARK SEAWALL

Prescott Park

Portsmouth, New Hampshire

for the

U.S. DEPARTMENT OF COMMERCE NOAA
COASTAL SERVICES CENTER
2234 SOUTH HOBSON AVENUE
CHARLESTON, SC 29405-2413

City of Portsmouth, New Hampshire

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Prepared By

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Engineer's Job No. 85-1227

Date of Issue: March 19, 1986

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SECTION 00010

INVITATION TO BID

City of Portsmouth, New Hampshire

Sealed proposals will be received at the office of Purchasing Agent, 126 Daniel Street, Portsmouth, New Hampshire 03801, before or at _____ p.m. on the _____ day of _____, for the following described project.

REHABILITATION OF THE PRESCOTT PARK SEAWALL

Plans and Specifications may be obtained at the office of Planning Department, 126 Daniel Street, Portsmouth, New Hampshire upon payment of \$25.00 which will not be refunded. Plans and Specifications will be mailed upon receipt of an additional \$10.00 to cover postage and handling.

Plans may be reviewed at the following locations:

1. Office of Kimball Chase Company, Inc., 40 Bridge Street, Portsmouth, New Hampshire 03801.
2. Office of Planning Department, City of Portsmouth, 126 Daniel Street, Portsmouth, New Hampshire 03801.
3. Office of Dodge Reports, 114 Bay Street, Manchester, New Hampshire 03101.
4. Office of Associated General Contractors, Fort Eddy Road, Concord, New Hampshire 03301.

The successful bidder will be required to furnish a bid bond in the amount of 5% of the total bid, a performance bond in the amount of 100% of the Contract Price and a Labor and Material Bond, also in the amount of 100% of the Contract Price.

Attention is called to the fact that not less than the minimum salaries and wages as set forth in the Federal Wage rates contained in the Contract Documents (said rates are subject to change) must be paid on this project, and that the Contractor must insure that employees and applicants for employment are not discriminated against because of their race, color, religion, sex, or national origin.

The City of Portsmouth reserves the right to reject any or all bids, to accept any bid, to waive any informality on bids received, and to omit and/or alter any item or items deemed advisable for the best interest of the City. Bids may be held by the City of Portsmouth, for a period not to exceed thirty (30) days from the bid opening date for the purposes of reviewing the bids and investigating the qualifications of bidder, prior to awarding the contract.

This project will be funded by the Federal Government and, as such, the successful Bidder must comply with all Federal regulations. Failure to do so will result in termination of the Contract.

This document has important legal consequences; consultation with an attorney is encouraged with respect to its completion or modification.

STANDARD FORM OF INSTRUCTIONS TO BIDDERS



Jointly Issued by

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE

A practice division of the

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

and by

AMERICAN CONSULTING ENGINEERS COUNCIL

and by

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These Instructions to Bidders have been prepared for use with the Owner-Contractor Agreements (NSPE-ACEC Document 1910-8-A-1 or 1910-8-A-2; CSI 56467, 56468, 1978 editions) and with the Standard General Conditions of the Construction Contract (NSPE-ACEC Document 1910-8; CSI 56474, 1978 edition). Their provisions are interrelated and a change in one may necessitate a change in the others. Comments concerning their usage are contained in the Commentary to the Documents, NSPE-ACEC 1910-9, 1978 edition.

1. Defined Terms.

Terms used in these Instructions to Bidders which are defined in the Standard General Conditions of the Construction Contract, NSPL-ACFC Document 1910-8, CSI 56465 (1978 editions) have the meanings assigned to them in the General Conditions. The term "Successful Bidder" means the lowest, qualified, responsible Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award.

2. Copies of Bidding Documents.

2.1. Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the Advertisement or Invitation may be obtained from Engineer (unless another issuing office is designated in the Advertisement or Invitation to Bid). The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten days after opening of Bids.

2.2. Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.3. Owner and Engineer 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.

3. Qualifications of Bidders.

To demonstrate qualifications to perform the Work, each Bidder must be prepared to submit within five days of Owner's request written evidence of the types set forth in the Supplementary Conditions, such as financial data, previous experience and evidence of authority to conduct business in the jurisdiction where the Project is located. Each 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 award of the contract.

4. Examination of Contract Documents and Site.

4.1. Before submitting a Bid, each Bidder must (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) study and carefully correlate Bidder's observations with the Contract Documents.

4.2. Reference is made to the Supplementary Conditions for the identification of those reports of investigations and tests of subsurface and latent physical conditions at the site or otherwise affecting cost, progress or performance of the Work which have been relied upon by Engineer in preparing the Drawings and Specifications. Owner will make copies of such reports available to any Bidder requesting them. These reports are not guaranteed as to accuracy or completeness, nor are they part of the Contract Documents. Before submitting his Bid each Bidder will, at his own expense, make such additional investigations and tests as the Bidder may deem necessary to determine his Bid for performance of the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

4.3. 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.

4.4. 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 Supplementary Conditions, General Requirements or Drawings.

4.5. The submission of a Bid will constitute an incontrovertible representation by the Bidder that he has complied with every requirement of this Article 4 and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the Work.

5. Interpretations.

All questions about the meaning or intent of the Contract Documents shall be submitted to Engineer in writing. Replies will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of Bids will not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

6. Bid Security.

6.1. Bid Security shall be made payable to Owner, in an amount of five percent of the Bidder's maximum Bid price and in the form of a certified or bank check or a Bid Bond (on form attached, if a form is prescribed) issued by a Surety meeting the requirements of paragraph 5.1 of the General Conditions.

6.2. The Bid Security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required Contract Security, whereupon it 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. 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 "effective date of the Agreement" (which term is defined in the General Conditions) by Owner to Contractor and the required Contract Security is furnished or the sixty-first day after the Bid opening. Bid Security of other Bidders will be returned within seven days of the Bid opening.

7. Contract Time.

The number of days within which, or the date by which, the Work is to be completed (the Contract Time) is set forth in the Bid Form and will be included in the Agreement.

8. Liquidated Damages.

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

9. Substitute Material and Equipment.

The Contract, if awarded, will be on the basis of material and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or-equal" items. 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 Engineer, application for such acceptance will not be considered by Engineer until after the "effective date of the Agreement". The procedure for submittal of any such application by Contractor and consideration by Engineer is set forth in paragraphs 6.7, 6.7.1 and 6.7.2 of the General Conditions which may be supplemented in the General Requirements.

10. Subcontractors, etc.

10.1. If the Supplementary Conditions require the identity of certain Subcontractors and other persons and organizations to be submitted to Owner in advance of the Notice of Award, the apparent Successful Bidder, and any other Bidder so requested, will within seven days after the day of the Bid opening submit to Owner a list of all Subcontractors and other persons and organizations (including those who are to furnish the principal items of material and equipment) 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 as to 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 the apparent Successful Bidder declines to make any such substitution, the contract shall not be awarded to such Bidder, but his declining to make any such substitution will not constitute grounds for sacrificing his Bid Security. 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.

10.2. In contracts where the Contract Price is on the basis of Cost-of-the-Work Plus a Fee, the apparent Successful Bidder, prior to the Notice of Award, shall identify in writing to Owner those portions of the Work that such Bidder proposes to subcontract and after the Notice of Award may only subcontract other portions of the Work with Owner's written consent.

10.3. No Contractor shall be required to employ any Subcontractor, other person or organization against whom he has reasonable objection.

11. Bid Form.

11.1. The Bid Form is attached hereto, additional copies may be obtained from Engineer.

11.2. Bid Forms must be completed in ink or by typewriter. The Bid price of each item on the form must be stated in words and numerals; in case of a conflict, words will take precedence.

11.3. Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.

11.4. Bids by partnerships 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 must be shown below the signature.

11.5. All names must be typed or printed below the signature.

11.6. The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which shall be filled in on the Bid Form).

11.7. The address to which communications regarding the Bid are to be directed must be shown.

12. Submission of Bids.

Bids shall be submitted at the time and place indicated in the Invitation to Bid and shall be included in an opaque sealed envelope, marked with the Project title and name and address of the Bidder and accompanied by the Bid Security and other required documents. If the Bid is sent through the mail or other delivery system the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face thereof.

13. Modification and Withdrawal of Bids.

13.1. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

13.2. If, within twenty-four hours after Bids are opened, any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of his Bid, that Bidder may withdraw his Bid and the Bid Security will be returned. Thereafter, that Bidder will be disqualified from further bidding on the Work.

14. Opening of Bids.

(Cross out inapplicable word) Bids will be opened (publicly) (privately).

14.1. When Bids are opened publicly they will read aloud, and an abstract of the amounts of the base Bids and major alternates (if any) will be made available after the opening of Bids.

14.2. When Bids are opened privately, an abstract of the same information will (not) be made available to Bidders within seven days after the date of Bid opening.

15. Bids to Remain Open.

All Bids shall remain open for sixty days after the day of the Bid opening, but Owner may, in his sole discretion, release any Bid and return the Bid Security prior to that date.

16. Award of Contract.

16.1. Owner reserves the right to reject any and all Bids, to waive any and all informalities and to negotiate contract terms with the Successful Bidder, and the right to disregard all nonconforming, nonresponsive or conditional Bids. Discrepancies between words and figures will be resolved in favor of words. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

16.2. In evaluating Bids, Owner shall consider the qualifications of the Bidders, whether or not the Bids comply with

the prescribed requirements, and alternates and unit prices if requested in the Bid forms. It is Owner's intent to accept alternates (if any are accepted) in the order in which they are listed in the Bid form but Owner may accept them in any order or combination.

16.3. 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. Operating costs, maintenance considerations, performance data and guarantees of materials and equipment may also be considered by Owner.

16.4. Owner may conduct such investigations as he deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of the Bidders, proposed Subcontractors and other persons and organizations to do the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

16.5. Owner reserves the right to reject the Bid of any Bidder who does not pass any such evaluation to Owner's satisfaction.

16.6. If the contract is to be awarded it will be awarded to the lowest Bidder whose evaluation by Owner indicates to Owner that the award will be in the best interests of the Project.

16.7. If the contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within sixty days after the day of the Bid opening.

17. Performance and Other Bonds.

Paragraph 5.1 of the General Conditions and the Supplementary Conditions set forth Owner's requirements as to performance and other Bonds. When the Successful Bidder delivers the executed Agreement to Owner it shall be accompanied by the required Contract Security.

18. Signing of Agreement.

When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by at least three unsigned counterparts of the Agreement and all other Contract Documents. Within fifteen days thereafter Contractor shall sign and deliver at least three counterparts of the Agreement to Owner with all other Contract Documents attached. Within ten days thereafter Owner will deliver all fully signed counterparts to Contractor. Engineer will identify those portions of the Contract Documents not fully signed by Owner and Contractor and such identification shall be binding on all parties.

19. Special Legal Requirements.

[Insert provisions as applicable re

- (a) statements required by federal, state or local law or regulation or funding agency or appropriate reference thereto;
- (b) Bid pricing requirements on base bid alternatives, cash allowances (see paragraph 11.10 of General Conditions), unit prices and acceptable combinations;
- (c) prepurchasing by Owner and subsequent assignment of purchase order to Contractor;
- (d) Owner's special tax exemption;
- (e) detailed description of Work with cross-reference to General Requirements; and
- (f) division of Work into separate parts with cross-reference to General Requirements.]

SECTION 00020

REHABILITATION OF THE PRESCOTT PARK SEAWALL

To the City of Portsmouth, herein called the Owner, for the Rehabilitation of the Prescott Park Seawall at Prescott Park, Portsmouth, New Hampshire.

The Undersigned, as Bidder, herein referred to as singular and masculine, declares as follows:

- (1) The only parties interested in the BID as Principals are named herein;
- (2) this BID is made without collusion with any other person, firm, or corporation;
- (3) no officer, agent, or employee of the Owner is directly or indirectly interested in this BID;
- (4) he has carefully examined the site of the proposed work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed Work, the difficulties attendant upon its execution and the accuracy of all estimated quantities stated in this BID, and he has carefully read and examined the Drawings, the annexed proposed AGREEMENT and the Specifications and other Contract Documents therein referred to and knows and understands the terms and provisions thereof;
- (5) he understands that information relative to subsurface and other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) has been furnished only for his information and convenience without any warranty or guarantee, expressed or implied, that the subsurface and/or other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) actually encountered will be the same as those shown on the Drawings or in any of the other Contract Documents and he agrees that he shall not use or be entitled to use such information made available to him through the Contract Documents or otherwise obtained by him in his own examination of the site, as a basis of or ground for any claim against the Owner or Engineer arising from or by reasons of any variance which may exist between the aforesaid information made available to or acquired by him and the subsurface and/or other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) actually encountered during the construction work, and he has made due allowance therefore in the BID;

- (6) he understands that all reports of investigations and tests of subsurface and latent physical conditions at the site and other information affecting the performance of the Work which have been relied upon by the Engineer in preparation of the Drawings and Specifications are not guaranteed as to accuracy or completeness and are not part of the Contract Drawings;
- (7) and he understands that the quantities of work tabulated in this BID and indicated on the Drawings and in the Specifications and other Contract Documents are only approximate and are subject to increase or decrease as deemed necessary by the Engineer.

The undersigned agrees that for extra work, if any, performed in accordance with the terms and provision of the annexed form of AGREEMENT, he will accept compensation as stipulated therein in full payment for such extra work.

If this BID is accepted by the Owner, the undersigned agrees to substantially complete the entire work provided to be done under the Contract within 140 calendar days from the date of signing the Contract, except as otherwise expressly provided in the AGREEMENT.

As provided in the INSTRUCTIONS TO BIDDERS, the Bidder hereby agrees that he will not withdraw this BID within 60 days of Bid Opening, and that if the Owner shall accept this Bid, the Bidder will duly execute and acknowledge the AGREEMENT CONTRACT BONDS within ten (10) days after notification that the AGREEMENT and other Contract Documents are ready for signature.

Should the Bidder fail to fulfill any of his agreements as hereinabove set forth, the Owner shall have the right to retain as liquidated damages the amount of the bid security which shall become the Owner's property.

This BID includes Addenda number **_____.

**To be filled in by Bidder if Addenda are issued.

The Bidder, by submittal of this BID, agrees with the Owner that the amount of the bid security deposited with this BID fairly and reasonably represents the amount of damages the Owner will suffer due to the failure of the Bidder to fulfill his agreements as above provided.

SECTION 00022

PROPOSAL

Proposal of: _____
Name

Address

to furnish and deliver all materials to perform all work in accordance with the Contract Documents for the construction of

NOTE: This proposal shall be filled in by the Bidder, with the unit prices written in both words and numerals, and the extensions shall be made by the Bidder.

ITEM NO.	UNIT	ITEMS AND UNIT PRICES BID	UNIT PRICES		AMOUNT	
			Dollars	Cents	Dollars	Cents
1	CY	Disposal of Unsuitable Material and Supplying of Granular Backfill Material				* Not Applicable
<hr/>						
2	Lump Sum	Rehabilitation of the Prescott Park Seawall				
<hr/>						
<hr/>						
TOTAL:						

The amount of the above Total attributable to Performance and Payment Bonds is:

\$ _____

* Unit price to be used as contingency item

Respectfully Submitted:

Signature

Address

Title

Date

(Seal, if Bid is by a Corporation)

Attest: _____

SECTION 00025

EXPERIENCE STATEMENT

1. General

Each Contractor will submit with his proposal a statement of projects constructed within the past two years, possibly of comparable size and character. Not over five projects need be listed. This information will be utilized by the Owner and Engineer in reviewing the bidders' qualifications and capabilities for performing the work.

2. Submittals

The Contractor will submit as a part of his statement the following:

1. Location and dollar volume of the project.
2. Brief description.
3. Length of Contract.
4. Listing of equipment which bidder considers necessary for conducting the Contract, and its availability.

SECTION 00030

NOTICE OF AWARD

Dated _____, 19__

TO: _____
(BIDDER)

OWNER'S PROJECT NO. _____

PROJECT _____

OWNER'S CONTRACT NO. _____

CONTRACT FOR _____

(Insert name of Contract as it appears in the Bidding Documents)

You are notified that your Bid dated _____, 198__ for the above Contract has been considered. You are the apparent successful bidder and have been awarded a contract for _____

(Indicate total Work, alternates or sections of Work awarded)

The Contract Price of your contract is _____ Dollars (\$ _____).

Three copies of each of the proposed Contract Documents (except Drawings) accompany this Notice of Award. Three sets of the Drawings will be delivered separately or otherwise made available to you immediately.

You must comply with the following conditions precedent within fifteen days of the date of this Notice of Award, that is by _____, 198__.

1. You must deliver to the OWNER three fully executed counterparts of the Agreement including all the Contract Documents. This includes the triplicate sets of Drawings. Each of the Contract Documents must bear your signature on (the cover) (every) page.
2. You must deliver with the executed Agreement the Contract Security (Bonds) as specified in the Instructions to Bidders (paragraph 17), General Conditions (paragraph 5.1) and Supplementary Conditions (paragraph SC-5.1).
3. (List other conditions precedent).

Failure to comply with these conditions within the time specified will entitle OWNER to consider your bid abandoned, to annul this Notice of Award and to declare your Bid Security forfeited.

Within ten days after you comply with those conditions, OWNER will return to you one fully signed counterpart of the Agreement with the Contract Documents attached.

(OWNER)

By

(AUTHORIZED SIGNATURE)

(TITLE)

Copy to ENGINEER
(Use Certified Mail,
Return Receipt Requested)

SECTION 00040

NOTICE TO PROCEED

Dated _____, 19__

TO: _____
(CONTRACTOR)

OWNER'S PROJECT NO. _____

PROJECT _____

OWNER'S CONTRACT NO. _____

CONTRACT FOR _____

You are notified that the Contract Time under the above contract will commence to run on _____, 198__. By that date, you are to start performing the Work and your other obligations under the Contract Documents. The dates of Substantial Completion and Final Completion are set forth in the Agreement; they are _____, 198__ and _____, 198__, respectively.

Before you may start any Work at the site, you and OWNER must each deliver to the other (with copies to ENGINEER) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

Also before you may start any Work at the site, you must
(add other requirements)

Work at the site must be started by _____, 198__ as indicated in the Contract Documents.

(OWNER)

By _____
(AUTHORIZED SIGNATURE)

(TITLE)

Copy to ENGINEER
(Use Certified Mail,
Return Receipt Requested)

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SECTION 00100

This document has important legal consequences; consultation with an attorney is encouraged with respect to its completion or modification.

STANDARD FORM OF AGREEMENT
BETWEEN OWNER AND CONTRACTOR
ON THE BASIS OF A STIPULATED PRICE



Jointly Issued by

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE

A practice division of the

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

and by

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1150 17TH STREET, N.W., WASHINGTON, D.C. WASHINGTON, D.C. 20036

This Standard Form of Agreement has been prepared for use with the Standard Form of Instructions to Bidders (NSPE-ACEC Document 1910-12, CSI 56466, 1978 edition) and with the Standard General Conditions of the Construction Contract (NSPE-ACEC Document 1910-8, CSI 56465, 1978 edition). Their provisions are interrelated and a change in one may necessitate a change in the others. Comments concerning their usage are contained in the Commentary to the Documents, NSPE-ACEC 1910-9, 1978 edition.

THIS AGREEMENT is dated as of the day of in the year 19..... by and between

City of Portsmouth

(hereinafter called OWNER) and

(hereinafter called CONTRACTOR)

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

Article 1. WORK.

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Rehabilitation of the Prescott Park Seawall

The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

Article 2. ENGINEER.

The Project has been designed by

Kimball Chase Company, Inc.
40 Bridge Street
Portsmouth, NH 03801

who is hereinafter called ENGINEER and who will assume all duties and responsibilities and will 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 3. CONTRACT TIME.

3.1. The Work will be substantially completed on or before 19...., and completed and ready for final payment in accordance with paragraph 14.13 of the General Conditions on or before 19....

(Strike out inapplicable paragraph)

3.1. The Work will be substantially completed within days after 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 14.13 of the General Conditions within days after the date when the Contract Time commences to run.

3.2. Liquidated Damages. OWNER and CONTRACTOR recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not substantially complete within the time specified in paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They 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 complete 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 City of Portsmouth dollars (\$.....) for each day that expires after the time specified in paragraph 3.1 for substantial completion until the Work is substantially complete.

Article 4. CONTRACT PRICE.

4.1. OWNER shall pay CONTRACTOR for performance of the Work in accordance with the Contract Documents in current funds as follows:

See Section 00022, Proposal

(here insert a lump sum, unit prices or both, attaching exhibits if necessary)

(CONTRACTOR's Bid may be attached as exhibit to avoid lengthy retyping of unit price schedules, formulae for escalation of prices, information as to alternatives, etc.)

Article 5. PAYMENT PROCEDURES.

Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

5.1. *Progress Payments.* OWNER shall make progress payments on account of the Contract Price on the basis of CONTRACTOR's Applications for Payment as recommended by ENGINEER, on or about the day of each month during construction as provided below. 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.

5.1.1. Prior to Substantial Completion progress payments will be in an amount equal to:

..... % of the Work completed, and

..... % of materials and equipment not incorporated in the Work but delivered and suitably stored, less in each case the aggregate of payments previously made.

5.1.2. Upon Substantial Completion, OWNER shall pay an amount sufficient to increase total payments to CONTRACTOR to % of the Contract Price, less such amounts as ENGINEER shall determine in accordance with paragraph 14.7 of the General Conditions.

5.2. *Final Payment.* Upon final completion and acceptance of the Work in accordance with paragraph 14.13 of the General Conditions, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in said paragraph 14.13.

Article 6. INTEREST.

All moneys not paid when due hereunder shall bear interest at the maximum rate allowed by law at the place of the Project.

Article 7. CONTRACTOR'S REPRESENTATIONS.

In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:

7.1. CONTRACTOR has familiarized himself with the nature and extent of the Contract Documents, Work, locality, and with all local conditions and federal, state and local laws, ordinances, rules and regulations that in any manner may affect cost, progress or performance of the Work.

7.2. CONTRACTOR has studied carefully all reports of investigations and tests of subsurface and latent physical conditions at the site or otherwise affecting cost, progress or performance of the Work which were relied upon by ENGINEER in the preparation of the Drawings and Specifications and which have been identified in the Supplementary Conditions.

7.3. 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 7.2 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 or similar data are or will be required by CONTRACTOR for such purposes.

7.4. CONTRACTOR has correlated the results of all such observations, examinations, investigations, tests, reports and data with the terms and conditions of the Contract Documents.

7.5. 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.

7.6.

Article 8. CONTRACT DOCUMENTS.

The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR are attached to this Agreement, made a part hereof and consists of the following:

8.1. This Agreement (pages 1 to, inclusive).

8.2. Exhibits to this Agreement (pages, to, inclusive).

8.3. Performance and other Bonds, identified as exhibits and consisting of ... pages.

8.4. Notice of Award.

8.5. General Conditions (pages to, inclusive).

8.6. Supplementary Conditions (pages to, inclusive).

8.7. Specifications bearing the title
and consisting of divisions and pages, as listed in table of contents thereof.

8.8. Drawings, consisting of a cover sheet and sheets numbered ...¹ through ...² inclusive with each sheet bearing the following general title:

Prescott Park Seawall Rehabilitation

8.9. Addenda numbers to, inclusive.

8.10. CONTRACTOR's Bid (pages to, inclusive) marked exhibit (Attach Bid Form only in special circumstances).

8.11. Documentation submitted by CONTRACTOR prior to Notice of Award (pages to, inclusive).

8.12. Any Modification, including Change Orders, duly delivered after execution of Agreement.

8.13.

There are no Contract Documents other than those listed above in this Article 8. The Contract Documents may only be altered, amended or repealed by a Modification (as defined in Section 1 of the General Conditions).

Article 9. MISCELLANEOUS.

9.1. Terms used in this Agreement which are defined in Article 1 of the General Conditions shall have the meanings indicated in the General Conditions.

9.2. 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.

9.3. OWNER and CONTRACTOR each binds himself, his partners, successors, assigns and legal representatives to the other party hereto, his partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.

Article 10. OTHER PROVISIONS.

IN WITNESS WHEREOF, the parties hereto have signed this Agreement in triplicate. One counterpart each has been delivered to OWNER, CONTRACTOR and ENGINEER. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR or by ENGINEER on their behalf.

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 document authorizing execution of Agreement.)

License No.....

Agent for service of process:.....

Failure to comply with these conditions within the time specified will entitle OWNER to consider your bid abandoned, to annul this Notice of Award and to declare your Bid Security forfeited.

Within ten days after you comply with those conditions, OWNER will return to you one fully signed counterpart of the Agreement with the Contract Documents attached.

(OWNER)

By

(AUTHORIZED SIGNATURE)

(TITLE)

Copy to ENGINEER
(Use Certified Mail,
Return Receipt Requested)

SECTION 00110

PERFORMANCE BOND

Bond Number _____

KNOW ALL MEN BY THESE PRESENTS:

That _____
as Principal, hereinafter called Contractor, and _____
(Surety Company) a corporation organized and existing under the laws of the
State of _____ as surety, hereinafter called Surety,
are held and firmly bound unto the ~~TOWN~~/City of Portsmouth, New Hampshire
Obligee, hereinafter called Owner, in the amount of _____
Dollars (\$ _____), for the payment whereof Contractor and Surety bind
themselves, their heirs, executors, administrators, successors and assigns,
jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written agreement dated _____
entered into a contract with Owner for Rehabilitation of Prescott Park Seawall
in accordance with drawings and specifications prepared by Kimball Chase
Company, Inc., 40 Bridge Street, Portsmouth, New Hampshire 03801, which
contract is by reference made a part hereof, and is hereinafter referred to as
the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the
Contractor shall well and faithfully do and perform the things agreed by him
to be done and performed, according to the terms of said Contract and such
alterations as may be made in said Contract during progress of the work, and
shall further indemnify and save harmless the said Owner from any expense
incurred through the failure of said Contractor to complete the work specified

and for any damages growing out of the manner of performance of said Contract or any subcontractors or his or their agents, and shall remedy without cost to the Owner any defect which may develop within one year from the time of completion and acceptance of the work; provided said defects, in the judgement of the Owner or its assigns, are caused by defective or inferior materials and/or workmanship then this obligation to be void, otherwise to remain in full force and effect.

The Surety hereby waives notice of any lateration in work or extension of time made by the Owner of Engineer.

Whenever Contractor shall be, and declared by Owner to be, in default under the Contract, the Owner having performed Owner's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

- (1) Complete the Contract in accordance with its terms and conditions,
or
- (2) Obtain a bid or bids for submission to the Owner for completing the Contract in accordance with its terms and conditions, and upon determination by Owner and Surety of the lowest responsible bidder, arrange for a contract between such bidder and Owner and make available as work progresses (even though there should be a default or a succession of defaults under the contract of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the contract price", as used in this paragraph, shall mean the total amount payable by the Owner to Contractor under the Contract and any amendments thereto, less the amount paid by Owner to Contractor.

Any suit under this bond must be instituted before the expiration of two (2) years from the date on which final payment under the contract falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the heirs, executors, administrators or successors of Owner.

Signed and sealed this _____ day of _____ A.D., 19____.

In the presence of:

(Witness)

By: _____

(Principal)

(Seal)

(Surety Company)

(Witness)

By: _____

(S

SECTION 00120

LABOR AND MATERIAL PAYMENT BOND

Bond Number _____

KNOW BY ALL THESE MEN PRESENTS:

That _____
as Principal, hereinafter called Principal, and _____
(Surety Company) a corporation organized and existing under the laws of the
State of _____ hereinafter called Surety, are held firmly bound
unto the City/~~TOWN~~ of Portsmouth, New Hampshire as Obligee, herinafter called
Owner, for the use and benefit of claimants as hereinbelow defined, in the
amount of _____ Dollars (\$ _____), for payment whereof
Principal and Surety bind themselves, their heirs, executors, administrators,
successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____
entered into a contract with Owner for Rehabilitation of Prescott Park Seawall in
accordance with drawings and specifications prepared by Kimball Chase Company,
Inc., 40 Bridge Street, Portsmouth, New Hampshire, which contract is by
reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that the Principal
shall promptly make payment to all claimants as hereinafter defined, for all
labor and material used or reasonably required for use in the performance of
the Contract and for the hire of all equipment, tools, and all other things
contracted for or used in connection therewith, then this obligation shall be
void; otherwise it shall remain in full force and effect, subject however, to
the following conditions:

- (1) A claimant is defined as one having a direct contract with the
Principal or, with a subcontractor of the Principal for labor, material,
equipment, or other things used or reasonably required for use in the
performance of the contract. Labor and material being construed to
include that part of water, gas, power, light, heat, oil, gasoline,
telephone service or rental of equipment applicable to the Contract.

(2) The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such a claimant, may sue on this bond for the use of such claimant, prosecute the suit by final judgement for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

(3) No suit or action shall be commenced hereunder by any claimant:

(a) Unless Claimant, other than one having a direct contract with the Principal, shall have given notice to all the following:

The Principal, the Owner and the Surety above named, within six calendar months after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner, and Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the State of _____, save that such service need not be made by a public officer.

(b) After the expiration of one (1) year following the date on which Principal ceased all work on said contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

(c) Other than in a State court of competent jurisdiction in and for the county or other political subdivision of the State in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.

(4) The amount of this bond may be reduced by and to the extent of any payment of payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed on record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

00120-3

Signed and Sealed this _____ day of _____ A.D., 19____.

In the presence of:

(Witness)

By: _____
(Principal)

(Witness)

(Seal)

Section 00200

CONTRACTOR'S AFFIDAVIT

STATE OF _____

COUNTY OF _____

Before me, the undersigned, a _____
(Notary Public, Justice of the Peace)

in for said County and State personally appeared _____
(Individual, Partner, or

_____ who being duly sworn
Duly Authorized Representative of Corporate Contractor)

according to law disposes and says that the cost of all the Work and
outstanding claims and indebtedness of whatever nature arising out of the
performance of the Contract between _____

and _____ of _____
(Contractor)

dated _____ for _____

and necessary appurtenant installations have been paid in full.

(Individual, Partner, or Duly Authorized
Representative of Corporate Contractor)

Sworn to and subscribed before me

this _____ day of _____,

19__.

Section 00210

CONTRACTOR'S RELEASE

KNOW BY ALL THESE MEN PRESENTS THAT _____

_____ of _____, County of _____ and State of _____

do _____ hereby acknowledge that _____

has _____ this day had, and received of and from _____

_____ the sum of One Dollar and other valuable considerations in full and complete satisfaction and payment of all sums of money owed, payable and belonging to _____

(Contractor)

by any means whatsoever, for on account of a Contract Agreement

between _____ and _____

dated _____ for _____.

NOW, THEREFORE, the said _____

(Contractor)

(for myself, my heirs, executors and administrators)(for itself, its successors and assigns) do/does by these presents remise, release, quit-claim and forever discharge _____, its successors and assigns of and from all claims and demands, arising from or in connection with the said Contract dated _____, and of and from all, and all manner of action and actions, cause and causes of action and actions, suits, debts, dues, duties, sum and sums of money, accounts, reckonings, bonds, bills, specialties, covenants, contracts, agreements, promises, variances, damages, judgements, extents, executions, claims and demand, whatsoever in law or equity, or otherwise, against _____, its successors and assigns, which (I, my heirs, executors, or administrators)(it successors and assigns) hereafter can, shall or may have, for, upon or by reason of any matter, cause, or thing whatsoever; from the beginning of recorded time to the date of these presents.

IN WITNESS WHEREOF, _____
(Contractor)

has caused these presents to be duly executed this _____ day of _____,
19__.

Signed, sealed and delivered in the presence of:

(Individual - Contractor) (Seal)

=====

(Partnership-Contractor) (Seal)

By: _____ (Seal)
(Partner)

=====

Attested:

(Corporation)

By: _____ (President or Vice President)
(Secretary)

(Corporate Seal)

CHANGE ORDER

Dated

OWNER's Project No. ENGINEER's Project No.

Project

CONTRACTOR

Contract For Contract Date

To:

CONTRACTOR

You are directed to make the changes noted below in the subject Contract:

OWNER

By

Dated, 19.....

Nature of the Changes

Enclosures:

These changes result in the following adjustment of Contract Price and Contract Time.

Contract Price Prior to This Change Order \$

Net (Increase) (Decrease) Resulting from this Change Order \$

Current Contract Price Including This Change Order \$

Contract Time Prior to This Change Order (Days or Date)
Net (Increase) (Decrease) Resulting from This Change Order (Days)
Current Contract Time Including This Change Order (Days or Date)

The Above Changes Are Approved:
ENGINEER
By
Date, 19.....

The Above Changes Are Accepted:
CONTRACTOR
By
Date, 19.....

CERTIFICATE OF SUBSTANTIAL COMPLETION

OWNER's Project No.

ENGINEER's Project No.

Project

CONTRACTOR

Contract For

Contract Date

This Certificate of Substantial Completion applies to all Work under the Contract Documents or to the following specified parts thereof:

To
OWNER

And To
CONTRACTOR

The Work to which this Certificate applies has been inspected by authorized representatives of OWNER, CONTRACTOR and ENGINEER, and that Work is hereby declared to be substantially complete in accordance with the Contract Documents on

.....
Date of Substantial Completion

A tentative list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include an item in it does not alter the responsibility of CONTRACTOR to complete all the Work in accordance with the Contract Documents. When this Certificate applies to a specified part of the Work the items in the tentative list shall be completed or corrected by CONTRACTOR within _____ days of the above date of Substantial Completion.

NSPE-ACEC 1910-8-D (1978 Edition)

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The date of Substantial Completion is the date upon which all guarantees and warranties begin, except as follows:

The responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities and insurance shall be as follows

RESPONSIBILITIES

OWNER: _____

CONTRACTOR: _____

The following documents are attached to and made a part of this Certificate:

Executed by ENGINEER on _____, 19____

ENGINEER

By _____

The CONTRACTOR accepts this Certificate of Substantial Completion on _____, 19____

CONTRACTOR

By _____

This document has important legal consequences: consultation with an attorney is encouraged with respect to its completion or modification.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

Engineers' Joint Contract Documents Committee

and

Issued and Published Jointly By



PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
A practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

AMERICAN CONSULTING ENGINEERS COUNCIL

AMERICAN SOCIETY OF CIVIL ENGINEERS

CONSTRUCTION SPECIFICATIONS INSTITUTE

This document has been approved and endorsed by



The Associated General Contractors of America

These General Conditions have been prepared for use with the Owner-Contractor Agreements (No. 1910-8-A-1 or 1910-8-A-2, 1983 editions). Their provisions are interrelated and a change in one may necessitate a change in the others. Comments concerning their usage are contained in the Commentary on Agreements for Engineering Services and Contract Documents, No. 1910-9, 1981 edition. For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. 1910-17, 1983 edition). When bidding is involved, the Standard Form of Instructions to Bidders (No. 1910-12, 1983 edition) may be used.

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GENERAL CONDITIONS

ARTICLE 1—DEFINITIONS

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:

Addenda—Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the bidding documents or the Contract Documents.

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.

Application for Payment—The form accepted by ENGINEER which is to be used by CONTRACTOR in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

Bid—The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

Bonds—Bid, performance and payment bonds and other instruments of security.

Change Order—A document recommended by ENGINEER, which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.

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 and the Drawings as the same are more specifically identified in the Agreement, together with all amendments, modifications and supplements issued pursuant to paragraphs 3.4 and 3.5 on or after the Effective Date of the Agreement.

Contract Price—The moneys payable by OWNER to CONTRACTOR under the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.9.1 in the case of Unit Price Work).

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.

CONTRACTOR—The person, firm or corporation with whom OWNER has entered into the Agreement.

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 of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with paragraph 14.8 or 14.10).

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.

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.

ENGINEER—The person, firm or corporation named as such in the Agreement.

Field Order—A written order issued by ENGINEER which orders minor changes in the Work in accordance with paragraph 9.5 but which does not involve a change in the Contract Price or the Contract Time.

General Requirements—Sections of Division 1 of the Specifications.

Laws and Regulations; Laws or Regulations—Laws, rules, regulations, ordinances, codes and/or orders.

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.

Notice to Proceed—A written notice given by OWNER to CONTRACTOR (with a copy to ENGINEER) fixing the date on which the Contract Time will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR'S obligations under the Contract Documents.

OWNER—The public body or authority, corporation, association, firm or person with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be provided.

Partial Utilization—Placing a portion of the Work in service for the purpose for which it is intended (or a related purpose) before reaching Substantial Completion for all the Work.

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.

Resident Project Representative—The authorized representative of ENGINEER who is assigned to the site or any part thereof.

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 Supplier and submitted by CONTRACTOR to illustrate material or equipment for some portion of the Work.

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.

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.

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 is intended; or if there be no such certificate issued, when final payment is due in accordance with paragraph 14.13. The terms "substantially complete" and "substantially completed" as applied to any Work refer to Substantial Completion thereof.

Supplementary Conditions—The part of the Contract Documents which amends or supplements these General Conditions.

Supplier—A manufacturer, fabricator, supplier, distributor, materialman or vendor.

Underground Facilities—All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

Unit Price Work—Work to be paid for on the basis of unit prices.

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.

Work Directive Change—A written directive to CONTRACTOR, issued on or after the Effective Date of the Agreement and signed by OWNER and recommended by ENGINEER,

ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed as provided in paragraph 4.2 or 4.3 or to emergencies under paragraph 6.22. A Work Directive Change may not change the Contract Price or the Contract Time, but is evidence that the parties expect that the change directed or documented by a Work Directive Change will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Time as provided in paragraph 10.2.

Written Amendment—A written amendment of the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly Work-related aspects of the Contract Documents.

ARTICLE 2—PRELIMINARY MATTERS

Delivery of Bonds:

2.1. When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish in accordance with paragraph 5.1.

Copies of Documents:

2.2. OWNER shall furnish to CONTRACTOR up to ten copies (unless otherwise specified in the Supplementary Conditions) 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.

Commencement of Contract Time; Notice to Proceed:

2.3. 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. A Notice to Proceed may be given at any time within thirty days after the Effective Date of the Agreement. In no event will the Contract Time commence to run later than the seventy-fifth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

Starting the Project:

2.4. 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.

Before Starting Construction:

2.5. 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 CONTRACTOR 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 failure to report any conflict, error or discrepancy in the Contract Documents, unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

2.6. Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for review:

2.6.1. an estimated progress schedule indicating the starting and completion dates of the various stages of the Work;

2.6.2. a preliminary schedule of Shop Drawing submissions; and

2.6.3. a preliminary schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work which will be confirmed in writing by CONTRACTOR at the time of submission.

2.7. Before any Work at the site is started, 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 paragraphs 5.3 and 5.4, 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 paragraphs 5.6 and 5.7.

Preconstruction Conference:

2.8. Within twenty days after the Effective Date of the Agreement, but before CONTRACTOR starts the Work at the site, a conference attended by CONTRACTOR, ENGINEER and others as appropriate will be held to discuss the schedules referred to in paragraph 2.6, to discuss 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.

Finalizing Schedules:

2.9. At least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, ENGINEER and others as appropriate will be held to finalize the schedules submitted in accordance with para-

graph 2.6. The finalized progress schedule will be acceptable to ENGINEER as providing an orderly progression of the Work to completion within the Contract Time, but such acceptance will neither impose on ENGINEER responsibility for the progress or scheduling of the Work nor relieve CONTRACTOR from full responsibility therefor. The finalized schedule of Shop Drawing submissions will be acceptable to ENGINEER as providing a workable arrangement for processing the submissions. The finalized schedule of values will be acceptable to ENGINEER as to form and substance.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT,
AMENDING, REUSE

Intent:

3.1. The Contract Documents comprise the entire agreement between OWNER and CONTRACTOR concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.

3.2. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied whether or not specifically called for. When words 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 that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or Laws or Regulations 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 be effective to change the duties and responsibilities of OWNER, CONTRACTOR or ENGINEER, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to ENGINEER, or any of ENGINEER's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in paragraph 9.4.

3.3. If, during the performance of the Work, CONTRACTOR finds a conflict, error or discrepancy in the Contract Documents, CONTRACTOR shall so report to ENGINEER in writing at once and before proceeding with the Work affected thereby shall obtain a written interpretation or clarification

from ENGINEER; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error or discrepancy in the Contract Documents unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

Amending and Supplementing Contract Documents:

3.4. The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

- 3.4.1. a formal Written Amendment,
- 3.4.2. a Change Order (pursuant to paragraph 10.4), or
- 3.4.3. a Work Directive Change (pursuant to paragraph 10.1).

As indicated in paragraphs 11.2 and 12.1, Contract Price and Contract Time may only be changed by a Change Order or a Written Amendment.

3.5. In addition, the requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, in one or more of the following ways:

- 3.5.1. a Field Order (pursuant to paragraph 9.5),
- 3.5.2. ENGINEER's approval of a Shop Drawing or sample (pursuant to paragraphs 6.26 and 6.27), or
- 3.5.3. ENGINEER's written interpretation or clarification (pursuant to paragraph 9.4).

Reuse of Documents:

3.6. Neither CONTRACTOR nor any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with OWNER 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 reuse 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

Availability of Lands:

4.1. OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements 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, rights-of-way 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.

Physical Conditions:

4.2.1. *Explorations and Reports:* Reference is made to the Supplementary Conditions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by ENGINEER in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such reports, but not upon nontechnical data, interpretations or opinions contained therein or for the completeness thereof for CONTRACTOR's purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to subsurface conditions at the site.

4.2.2. *Existing Structures:* Reference is made to the Supplementary Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities referred to in paragraph 4.3) which are at or contiguous to the site that have been utilized by ENGINEER in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such drawings, but not for the completeness thereof for CONTRACTOR's purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to physical conditions in or relating to such structures.

4.2.3. *Report of Differing Conditions:* If CONTRACTOR believes that:

4.2.3.1. any technical data on which CONTRACTOR is entitled to rely as provided in paragraphs 4.2.1 and 4.2.2 is inaccurate, or

4.2.3.2. any physical condition uncovered or revealed at the site differs materially from that indicated, reflected or referred to in the Contract Documents,

CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work in connection therewith (except in an emergency as permitted by paragraph 6.22), notify OWNER and ENGINEER in writing about the inaccuracy or difference.

4.2.4. *ENGINEER's Review:* ENGINEER will promptly review the pertinent conditions, determine the necessity of obtaining additional explorations or tests with respect thereto and advise OWNER in writing (with a copy to CONTRACTOR) of ENGINEER's findings and conclusions.

4.2.5. *Possible Document Change:* If ENGINEER concludes that there is a material error in the Contract Documents or that because of newly discovered conditions a change in the Contract Documents is required, a Work Directive Change or a Change Order will be issued as provided in Article 10 to reflect and document the consequences of the inaccuracy or difference.

4.2.6. *Possible Price and Time Adjustments:* In each such case, an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, or any combination thereof, will be allowable to the extent that they are attributable to any such inaccuracy or difference. If OWNER and CONTRACTOR are unable to agree as to the amount or length thereof, a claim may be made therefor as provided in Articles 11 and 12.

Physical Conditions—Underground Facilities:

4.3.1. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to OWNER or ENGINEER by the owners of such Underground Facilities or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

4.3.1.1. OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and,

4.3.1.2. CONTRACTOR shall have full responsibility for reviewing and checking all such information and data, for locating all Underground Facilities shown or indicated in the Contract Documents, for coordination of the Work with the owners of such Underground Facilities during construction, for the safety and protection thereof as provided in paragraph 6.20 and repairing any damage thereto resulting from the Work, the cost of all of which will be considered as having been included in the Contract Price.

4.3.2. *Not Shown or Indicated.* If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of, CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency as permitted by paragraph 6.22), identify the owner of such Underground Facility and give written notice thereof to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility to

determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the Underground Facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time, CONTRACTOR shall be responsible for the safety and protection of such Underground Facility as provided in paragraph 6.20. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any Underground Facility that was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of. If the parties are unable to agree as to the amount or length thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

Reference Points:

4.4. OWNER shall provide engineering surveys to establish reference points for construction which in ENGINEER'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), 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 the accurate replacement or relocation of such reference points by professionally qualified personnel.

ARTICLE 5—BONDS AND INSURANCE

Performance and Other Bonds:

5.1. 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 when final payment becomes due, except as otherwise provided by Law or Regulation or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary Conditions. All Bonds shall be in the forms prescribed by Law or Regulation or by the Contract Documents and be executed by such sureties as 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.

5.2. 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, CONTRACTOR shall within five days thereafter substitute another Bond and Surety, both of which must be acceptable to OWNER.

Contractor's Liability Insurance:

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

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

5.3.2. Claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR's employees:

5.3.3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees:

5.3.4. 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:

5.3.5. Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom:

5.3.6. Claims arising out of operation of Laws or Regulations for damages because of bodily injury or death of any person or for damage to property; and

5.3.7. 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.

The insurance required by this paragraph 5.3 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. The comprehensive general liability insurance shall include completed operations insurance. All of the policies of insurance so required to be purchased and maintained (or the certificates or other evidence thereof) shall contain a provision or endorsement that the coverage afforded will not be cancelled, materially changed or renewal refused until at least

thirty days' prior written notice has been given to OWNER and ENGINEER by certified mail. 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 13.12. In addition, CONTRACTOR shall maintain such completed operations insurance for at least two years after final payment and furnish OWNER with evidence of continuation of such insurance at final payment and one year thereafter.

Contractual Liability Insurance:

5.4. The comprehensive general liability insurance required by paragraph 5.3 will include contractual liability insurance applicable to CONTRACTOR's obligations under paragraphs 6.30 and 6.31.

Owner's Liability Insurance:

5.5. 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.

Property Insurance:

5.6. Unless otherwise provided in the Supplementary Conditions, OWNER 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 required by Laws and Regulations). This insurance shall include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER and ENGINEER's consultants in the Work, all of whom shall be listed as insureds or additional insured parties, shall insure against the perils of fire and extended coverage and 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 provided in the Supplementary Conditions, and 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 but not limited to fees and charges of engineers, architects, attorneys and other professionals). 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 and off the site or in transit when such portions of the Work are to be included in an Application for Payment.

5.7. OWNER shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER AND ENGINEER's consultants in the Work, all of whom shall be listed as insured or additional insured parties.

5.8. All the policies of insurance (or the certificates or other evidence thereof) required to be purchased and maintained by OWNER in accordance with paragraphs 5.6 and 5.7 will contain a provision or endorsement that the coverage afforded will not be cancelled or materially changed or renewal refused until at least thirty days' prior written notice has been given to CONTRACTOR by certified mail and will contain waiver provisions in accordance with paragraph 5.11.2.

5.9. OWNER shall not be responsible for purchasing and maintaining any property insurance to protect the interests of CONTRACTOR. Subcontractors or others in the Work to the extent of any deductible amounts that are provided in the Supplementary Conditions. The risk of loss within the deductible amount, will be borne by CONTRACTOR. Subcontractor or others suffering any such loss and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

5.10. If CONTRACTOR requests in writing that other special insurance be included in the property insurance policy, OWNER shall, if possible, include such insurance, and the cost thereof will be charged to CONTRACTOR by appropriate Change Order or Written Amendment. Prior to commencement of the Work at the site, OWNER shall in writing advise CONTRACTOR whether or not such other insurance has been procured by OWNER.

Waiver of Rights:

5.11.1. OWNER and CONTRACTOR waive all rights against each other for all losses and damages caused by any of the perils covered by the policies of insurance provided in response to paragraphs 5.6 and 5.7 and any other property insurance applicable to the Work, and also waive all such rights against the Subcontractors, ENGINEER, ENGINEER's consultants and all other parties named as insureds in such policies for losses and damages so caused. As required by paragraph 6.11, each subcontract between CONTRACTOR and a Subcontractor will contain similar waiver provisions by the Subcontractor in favor of OWNER, CONTRACTOR, ENGINEER, ENGINEER's consultants and all other parties named as insureds. None of the above waivers shall extend to the rights that any of the insured parties may have to the proceeds of insurance held by OWNER as trustee or otherwise payable under any policy so issued.

5.11.2. OWNER and CONTRACTOR intend that any policies provided in response to paragraphs 5.6 and 5.7 shall protect all of the parties insured and provide primary coverage for all losses and damages caused by the perils covered thereby. Accordingly, all such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any of the parties named as insureds or additional insureds, and if the insurers require separate waiver forms to be signed by ENGINEER or ENGINEER's consultant OWNER will obtain the same, and if

such waiver forms are required of any Subcontractor, CONTRACTOR will obtain the same.

Receipt and Application of Proceeds:

5.12. Any insured loss under the policies of insurance required by paragraphs 5.6 and 5.7 will 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 5.13. OWNER shall deposit in a separate account any money so received, and 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 or Written Amendment.

5.13. 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 such duties.

Acceptance of Insurance:

5.14. If OWNER has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by CONTRACTOR in accordance with paragraphs 5.3 and 5.4 on the basis of its not complying with the Contract Documents, OWNER shall notify CONTRACTOR in writing thereof within ten days of the date of delivery of such certificates to OWNER in accordance with paragraph 2.7. If CONTRACTOR has any objection to the coverage afforded by or other provisions of the policies of insurance required to be purchased and maintained by OWNER in accordance with paragraphs 5.6 and 5.7 on the basis of their not complying with the Contract Documents, CONTRACTOR shall notify OWNER in writing thereof within ten days of the date of delivery of such certificates to CONTRACTOR in accordance with paragraph 2.7. OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided by each as the other may reasonably request. Failure by OWNER or CONTRACTOR to give any such notice of objection within the time provided shall constitute acceptance of such insurance purchased by the other as complying with the Contract Documents.

Partial Utilization—Property Insurance:

5.15. If OWNER finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, such use or occupancy may be accomplished in accordance with paragraph 14.10; 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 cancelled or lapse on account of any such partial use or occupancy.

ARTICLE 6—CONTRACTOR'S RESPONSIBILITIES

Supervision and Superintendence:

6.1. 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 CONTRACTOR shall not be 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.

6.2. 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.

Labor, Materials and Equipment:

6.3. 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 Contract Documents, 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.

6.4. Unless otherwise specified in the General Requirements, CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.

6.5. 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. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to ENGINEER, or any of ENGINEER's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16.

Adjusting Progress Schedule:

6.6. CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.9) adjustments in the progress schedule to reflect the impact thereon of new developments; these will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

Substitutes or "Or-Equal" Items:

6.7.1. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier 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 Suppliers 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 or equal to that named. The procedure for review by ENGINEER will include the following as supplemented in the General Requirements. 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 achievement of Substantial Completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed 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 will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of 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, all of which shall be considered by ENGINEER in evaluating the proposed substitute. ENGINEER may require CONTRACTOR to furnish at CONTRACTOR's expense additional data about the proposed substitute.

6.7.2. If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to ENGINEER, if CONTRACTOR submits sufficient information to allow ENGINEER to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in paragraph 6.7.1 as applied by ENGINEER and as may be supplemented in the General Requirements.

6.7.3. ENGINEER will be allowed a reasonable time within which to evaluate each proposed substitute. ENGINEER will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without ENGINEER's prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute. ENGINEER will record time required by ENGINEER and ENGINEER's consultants in evaluating substitutions proposed by CONTRACTOR and in making changes in the Contract Documents 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 each proposed substitute.

Concerning Subcontractors, Suppliers and Others:

6.8.1. CONTRACTOR shall not employ any Subcontractor, Supplier or other person or organization (including those acceptable to OWNER and ENGINEER as indicated in paragraph 6.8.2), whether initially or as a substitute, against whom OWNER or ENGINEER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

6.8.2. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of materials and equipment) to be submitted to OWNER in advance of the specified date prior to the Effective Date of the Agreement for acceptance by

OWNER and ENGINEER and if CONTRACTOR has submitted a list thereof in accordance with the Supplementary Conditions, OWNER's or ENGINEER's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the bidding documents or the Contract Documents) of any such Subcontractor, Supplier or other person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable substitute, the Contract Price will be increased by the difference in the cost occasioned by such substitution and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by OWNER or ENGINEER of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of OWNER or ENGINEER to reject *defective Work*.

6.9. CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier or other person or organization, 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 such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws and Regulations.

6.10. The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

6.11. 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 ENGINEER and contains waiver provisions as required by paragraph 5.11. CONTRACTOR shall pay each Subcontractor a just share of any insurance moneys received by CONTRACTOR on account of losses under policies issued pursuant to paragraphs 5.6 and 5.7.

Patent Fees and Royalties:

6.12. 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 and court and arbitration costs) 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.

Permits:

6.13. Unless otherwise provided 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 Bids, or if there are no Bids on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.

Laws and Regulations:

6.14.1. CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to furnishing and performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor ENGINEER shall be responsible for monitoring CONTRACTOR's compliance with any Laws or Regulations.

6.14.2. If CONTRACTOR observes that the Specifications or Drawings are at variance with any Laws or Regulations, CONTRACTOR shall give ENGINEER prompt written notice thereof, and any necessary changes will be authorized by one of the methods indicated in paragraph 3.4. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to such Laws or 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 and Regulations.

Taxes:

6.15. CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws and Regulations of the

place of the Project which are applicable during the performance of the Work.

Use of Premises:

6.16. CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Project site and land and areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the Work. Should any claim be made against OWNER or ENGINEER by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim by arbitration or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold OWNER and ENGINEER harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any such other party against OWNER or ENGINEER to the extent based on a claim arising out of CONTRACTOR's performance of the Work.

6.17. During the 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 original condition all property not designated for alteration by the Contract Documents.

6.18. 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.

Record Documents:

6.19. CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Directive Changes, Field Orders and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order and annotated to show all changes made during construction. These record documents together with all approved samples and a counterpart of all approved Shop Drawings will be available to ENGINEER for reference. Upon com-

pletion of the Work, these record documents, samples and Shop Drawings will be delivered to ENGINEER for OWNER.

Safety and Protection:

6.20. 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:

6.20.1. all employees on the Work and other persons and organizations who may be affected thereby;

6.20.2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and

6.20.3. other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation or replacement in the course of construction.

CONTRACTOR shall comply with all applicable Laws and Regulations 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 of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property referred to in paragraph 6.20.2 or 6.20.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work 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 the safety and 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 14.13 that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.21. CONTRACTOR shall designate a responsible representative at the site whose duty shall be the prevention of accidents. This person shall be CONTRACTOR's superintendent unless otherwise designated in writing by CONTRACTOR to OWNER.

Emergencies:

6.22. 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 if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If ENGINEER determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a Work Directive Change or Change Order will be issued to document the consequences of the changes or variations.

Shop Drawings and Samples:

6.23. After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, CONTRACTOR shall submit to ENGINEER for review and approval in accordance with the accepted schedule of Shop Drawing submissions (see paragraph 2.9), or for other appropriate action if so indicated in the Supplementary Conditions, five copies (unless otherwise specified in the General Requirements) of all Shop Drawings, which will bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission. All submissions will be identified as ENGINEER may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable ENGINEER to review the information as required.

6.24. 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 accompanied by a specific written indication that CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended.

6.25.1. Before submission of each Shop Drawing or sample CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents.

6.25.2. At the time of each submission, CONTRACTOR shall give ENGINEER specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on

each Shop Drawing submitted to ENGINEER for review and approval of each such variation.

6.26. ENGINEER will review and approve with reasonable promptness Shop Drawings and samples, but ENGINEER's review and approval will 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, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) 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 corrections required by ENGINEER, and shall return the required number of corrected copies of Shop Drawings and submit as required 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.

6.27. ENGINEER's review and approval of Shop Drawings or samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of submission as required by paragraph 6.25.2 and ENGINEER has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the Shop Drawing or sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or from responsibility for having complied with the provisions of paragraph 6.25.1.

6.28. Where a Shop Drawing or sample is required by the Specifications, any related Work performed prior to ENGINEER's review and approval of the pertinent submission will be the sole expense and responsibility of CONTRACTOR.

Continuing the Work:

6.29. CONTRACTOR shall carry on the Work and adhere to 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 permitted by paragraph 15.5 or as CONTRACTOR and OWNER may otherwise agree in writing.

Indemnification:

6.30. To the fullest extent permitted by Laws and Regulations CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and their consultants, agents and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) arising out of or resulting from the performance of the Work,

provided that any such claim, damage, loss or expense (a) 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 (b) is caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work 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 arises by or is imposed by Law and Regulations regardless of the negligence of any such party.

6.31. In any and all claims against OWNER or ENGINEER or any of their consultants, agents or employees by any employee of CONTRACTOR, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.30 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 such Subcontractor or other person or organization under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

6.32. The obligations of CONTRACTOR under paragraph 6.30 shall not extend to the liability of ENGINEER, ENGINEER's consultants, agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications.

ARTICLE 7—OTHER WORK

Related Work at Site:

7.1. OWNER may perform other work related to the Project at the site by OWNER's own forces, have other work performed by utility owners or let other direct contracts therefor which shall contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to CONTRACTOR prior to starting any such other work; and, if CONTRACTOR believes that such performance will involve additional expense to CONTRACTOR or requires additional time and the parties are unable to agree as to the extent thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

7.2. CONTRACTOR shall afford each utility owner and other contractor who is a party to such a direct contract (or OWNER, if OWNER is performing the additional work with OWNER's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the Work with theirs. CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. CON-

TRACTOR 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. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.

7.3. If any part of CONTRACTOR's Work depends for proper execution or results upon the work of any such other contractor or utility owner (or OWNER), CONTRACTOR shall inspect and promptly report to ENGINEER in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results. CONTRACTOR's failure so to report will constitute an acceptance of the other work as fit and proper for integration with CONTRACTOR's Work except for latent or non-apparent defects and deficiencies in the other work.

Coordination:

7.4. If OWNER contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Supplementary Conditions, and the specific matters to be covered by such authority and responsibility will be itemized, and the extent of such authority and responsibilities will be provided, in the Supplementary Conditions. Unless otherwise provided in the Supplementary Conditions, neither OWNER nor ENGINEER shall have any authority or responsibility in respect of such coordination.

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 against whom CONTRACTOR makes no reasonable objection, whose status under the Contract Documents shall be that of the former ENGINEER. Any dispute in connection with such appointment shall be subject to arbitration.

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 and 14.13.

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 and 4.4. Paragraph 4.2 refers to OWNER's identifying and making available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions at the site and in existing struc-

tures which have been utilized by ENGINEER in preparing the Drawings and Specifications.

8.5. OWNER's responsibilities in respect of purchasing and maintaining liability and property insurance are set forth in paragraphs 5.5 through 5.8.

8.6. OWNER is obligated to execute Change Orders as indicated in paragraph 10.4.

8.7. OWNER's responsibility in respect of certain inspections, tests and approvals is set forth in paragraph 13.4.

8.8. In connection with OWNER's right to stop Work or suspend Work, see paragraphs 13.10 and 15.1. Paragraph 15.2 deals with OWNER's right to terminate services of CONTRACTOR under certain circumstances.

ARTICLE 9—ENGINEER'S STATUS DURING CONSTRUCTION

Owner's Representative:

9.1. 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.

Visits to Site:

9.2. ENGINEER will 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. ENGINEER will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. ENGINEER's efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform to the Contract Documents. On the basis of such visits and on-site observations as an experienced and qualified design professional, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defects and deficiencies in the Work.

Project Representation:

9.3. If OWNER and ENGINEER agree, ENGINEER will furnish 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 OWNER 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 provided in the Supplementary Conditions.

Clarifications and Interpretations:

9.4. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements 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 an extension of the Contract Time and the parties are unable to agree to the amount or extent thereof, CONTRACTOR may make a claim therefor as provided in Article 11 or Article 12.

Authorized Variations in Work:

9.5. ENGINEER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Time and are consistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order and will be binding on OWNER, and also on CONTRACTOR who shall perform the Work involved promptly. If CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or an extension of the Contract Time and the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a claim therefor as provided in Article 11 or 12.

Rejecting Defective Work:

9.6. 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 paragraph 13.9, whether or not the Work is fabricated, installed or completed.

Shop Drawings, Change Orders and Payments:

9.7. In connection with ENGINEER's responsibility for Shop Drawings and samples, see paragraphs 6.23 through 6.29 inclusive.

9.8. In connection with ENGINEER's responsibilities as to Change Orders, see Articles 10, 11 and 12.

9.9. In connection with ENGINEER's responsibilities in respect of Applications for Payment, etc., see Article 14.

Determinations for Unit Prices:

9.10. ENGINEER will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. ENGINEER will review with CONTRACTOR ENGINEER's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). ENGINEER's written decisions thereon will be final and binding upon OWNER and CONTRACTOR, unless, within ten days after the date of any such decision, either OWNER or CONTRACTOR delivers to the other party to the Agreement and

to ENGINEER written notice of intention to appeal from such a decision.

Decisions on Disputes:

9.11. 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 performance and furnishing of the Work and claims under Articles 11 and 12 in respect of changes in the Contract Price or Contract Time will 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 will be delivered by the claimant to ENGINEER and the other party to the Agreement promptly (but in no event later than thirty days) after the occurrence of the event giving rise thereto, and written supporting data will be submitted to ENGINEER and the other party within sixty days after such occurrence unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim.

9.12. When functioning as interpreter and judge under paragraphs 9.10 and 9.11, 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. The rendering of a decision by ENGINEER pursuant to paragraphs 9.10 and 9.11 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 14.16) 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 by Laws or Regulations in respect of any such claim, dispute or other matter.

Limitations on ENGINEER's Responsibilities:

9.13. 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 give rise to any duty or responsibility of ENGINEER to CONTRACTOR, any Sub-contractor, any Supplier, or any other person or organization performing any of the Work, or to any surety for any of them.

9.14. 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 judgment of ENGINEER as to the Work, it is intended that such requirement, direction, review or judgment 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 shall not be

effective to assign to ENGINEER any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16.

9.15. 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 or furnish the Work in accordance with the Contract Documents.

9.16. ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing 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 a Written Amendment, a Change Order, or a Work Directive Change. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

10.2. If OWNER and CONTRACTOR are unable to agree as to the extent, if any, of an increase or decrease in the Contract Price or an extension or shortening of the Contract Time that should be allowed as a result of a Work Directive Change, a claim may be made therefor as provided in Article 11 or Article 12.

10.3. CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraphs 3.4 and 3.5, except in the case of an emergency as provided in paragraph 6.22 and except in the case of uncovering Work as provided in paragraph 13.9.

10.4. OWNER and CONTRACTOR shall execute appropriate Change Orders (or Written Amendments) covering:

10.4.1. changes in the Work which are ordered by OWNER pursuant to paragraph 10.1, are required because of acceptance of *defective* Work under paragraph 13.13 or correcting *defective* Work under paragraph 13.14, or are agreed to by the parties;

10.4.2. changes in the Contract Price or Contract Time which are agreed to by the parties; and

10.4.3. changes in the Contract Price or Contract Time which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 9.11;

provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 6.29.

10.5. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Time) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR's responsibility, and the amount of each applicable Bond will be adjusted accordingly.

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 or by a Written Amendment. Any claim for an increase or decrease in the Contract Price shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within sixty days after such occurrence (unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Price shall be determined by ENGINEER in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree on the amount involved. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this paragraph 11.2.

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 shall be determined in one of the following ways:

11.3.1. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved (subject to the provisions of paragraphs 11.9.1. through 11.9.3, inclusive).

11.3.2. By mutual acceptance of a lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 11.6.2.1).

11.3.3. On the basis of the Cost of the Work (determined as provided in paragraphs 11.4 and 11.5) plus a CONTRACTOR's Fee for overhead and profit (determined as provided in paragraphs 11.6 and 11.7).

Cost of the Work:

11.4. 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 11.5:

11.4.1. 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.

11.4.2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' 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.

11.4.3. 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.

11.4.4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys and accountants) employed for services specifically related to the Work.

11.4.5. Supplemental costs including the following:

11.4.5.1. The proportion of necessary transportation, travel and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.

11.4.5.2. 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 workers, 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.

11.4.5.3. 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.

11.4.5.4. Sales, consumer, use or similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.

11.4.5.5. Deposits lost for causes other than 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, and royalty payments and fees for permits and licenses.

11.4.5.6. Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by CONTRACTOR in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property insurance established by OWNER in accordance with paragraph 5.9), 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 11.6.2.

11.4.5.7. The cost of utilities, fuel and sanitary facilities at the site.

11.4.5.8. 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.

11.4.5.9. Cost of premiums for additional Bonds and insurance required because of changes in the Work and premiums for property insurance coverage within the limits of the deductible amounts established by OWNER in accordance with paragraph 5.9.

11.5. The term Cost of the Work shall not include any of the following:

11.5.1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR's 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 11.4.1 or specifically covered by paragraph 11.4.4—all of which are to be considered administrative costs covered by the CONTRACTOR's Fee.

11.5.2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.

11.5.3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR'S capital employed for the Work and charges against CONTRACTOR for delinquent payments.

11.5.4. 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 the cost of premiums covered by subparagraph 11.4.5.9 above).

11.5.5. 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.

11.5.6. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.4.

CONTRACTOR's Fee:

11.6. The CONTRACTOR's Fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:

11.6.1. a mutually acceptable fixed fee; or if none can be agreed upon,

11.6.2. a fee based on the following percentages of the various portions of the Cost of the Work:

11.6.2.1. for costs incurred under paragraphs 11.4.1 and 11.4.2, the CONTRACTOR's Fee shall be fifteen percent;

11.6.2.2. for costs incurred under paragraph 11.4.3 the CONTRACTOR's Fee shall be five percent; and if a subcontract is on the basis of Cost of the Work Plus a Fee, the maximum allowable to CONTRACTOR on account of overhead and profit of all Subcontractors shall be fifteen percent;

11.6.2.3. no fee shall be payable on the basis of costs itemized under paragraphs 11.4.4, 11.4.5 and 11.5;

11.6.2.4. 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 actual net decrease plus a deduction in CONTRACTOR's Fee by an amount equal to ten percent of the net decrease; and

11.6.2.5. 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 11.6.2.1 through 11.6.2.4, inclusive.

11.7. Whenever the cost of any Work is to be determined pursuant to paragraph 11.4 or 11.5, CONTRACTOR will submit in form acceptable to ENGINEER an itemized cost breakdown together with supporting data.

Cash Allowances:

11.8. 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 or Suppliers and for such sums within the limit of the allowances as may be acceptable to ENGINEER. CONTRACTOR agrees that:

11.8.1. The allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and

11.8.2. CONTRACTOR's costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the

allowances. No demand for additional payment on account of any thereof will be valid.

Prior to final payment, an appropriate Change Order will be issued as recommended by ENGINEER to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

Unit Price Work:

11.9.1. 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. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by ENGINEER in accordance with Paragraph 9.10.

11.9.2. Each unit 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.

11.9.3. Where the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement and there is no corresponding adjustment with respect to any other item of Work and if CONTRACTOR believes that CONTRACTOR has incurred additional expense as a result thereof, CONTRACTOR may make a claim for an increase in the Contract Price in accordance with Article 11 if the parties are unable to agree as to the amount of any such increase.

ARTICLE 12—CHANGE OF CONTRACT TIME

12.1. The Contract Time may only be changed by a Change Order or a Written Amendment. Any claim for an extension or shortening of the Contract Time shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within sixty days after such occurrence (unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time

shall be determined by ENGINEER in accordance with paragraph 9.11 if OWNER and CONTRACTOR cannot otherwise agree. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph 12.1.

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.

12.3. All time limits stated in the Contract Documents are of the essence of the Agreement. The provisions of this Article 12 shall not exclude recovery for damages (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) for delay by either party.

**ARTICLE 13—WARRANTY AND GUARANTEE;
TESTS AND INSPECTIONS;
CORRECTION, REMOVAL OR
ACCEPTANCE OF DEFECTIVE WORK**

Warranty and Guarantee:

13.1. 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, corrected or accepted as provided in this Article 13.

Access to Work:

13.2. ENGINEER and ENGINEER's representatives, other representatives of OWNER, testing agencies and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide proper and safe conditions for such access.

Tests and Inspections:

13.3. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests or approvals.

13.4. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) to specifically be inspected, tested or approved, CONTRACTOR 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 in connection with OWNER's or ENGINEER's acceptance of a Supplier 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 inspections, tests and approvals in addition to the above which are required by the Contract Documents shall be paid by OWNER (unless otherwise specified).

13.5. All inspections, tests or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by organizations acceptable to OWNER and CONTRACTOR (or by ENGINEER if so specified).

13.6. If any Work (including the work of others) 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 the same and ENGINEER has not acted with reasonable promptness in response to such notice.

13.7. Neither observations by ENGINEER nor inspections, tests or approvals by others shall relieve CONTRACTOR from CONTRACTOR's obligations to perform the Work in accordance with the Contract Documents.

Uncovering Work:

13.8. 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.

13.9. 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 direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys and other professionals), and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, may make a claim therefor as provided in Article 11. 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; and, if the parties are unable to agree as to the amount or extent

thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

Owner May Stop the Work:

13.10. If the Work is *defective*, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish 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.

Correction or Removal of Defective Work:

13.11. If required by ENGINEER, CONTRACTOR shall promptly, as directed, either correct all *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. CONTRACTOR shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

One Year Correction Period:

13.12. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations 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, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by CONTRACTOR. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

Acceptance of Defective Work:

13.13. 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. CONTRACTOR shall bear all direct, indirect and consequential

costs attributable to OWNER's evaluation of and determination to accept such *defective* Work (such costs to be approved by ENGINEER as to reasonableness and to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals). If any such acceptance occurs prior to ENGINEER's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to OWNER.

OWNER May Correct Defective Work:

13.14. 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 13.11, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days' written notice to CONTRACTOR, correct and remedy any such deficiency. In exercising the rights and remedies 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 the rights and remedies under this paragraph. All direct, indirect and consequential costs of OWNER in exercising such rights and remedies will be charged against CONTRACTOR in an amount approved as to reasonableness by ENGINEER, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court and arbitration costs 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 performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies hereunder.

ARTICLE 14—PAYMENTS TO CONTRACTOR AND COMPLETION

Schedule of Values:

14.1. The schedule of values established as provided in paragraph 2.9 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to ENGINEER. Progress payments on account of Unit Price Work will be based on the number of units completed.

Application for Progress Payment:

14.2. At least twenty days before each progress payment is scheduled (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. 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 a bill of sale, invoice or other documentation warranting that OWNER has received the materials and equipment free and clear of all liens, charges, security interests and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect OWNER's interest therein, all of which will be satisfactory to OWNER. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

CONTRACTOR's Warranty of Title:

14.3. 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 no later than the time of payment free and clear of all Liens.

Review of Applications for Progress Payment:

14.4. ENGINEER will, within ten days after receipt of each Application for Payment, either indicate in writing a 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. Ten days after presentation of the Application for Payment with ENGINEER's recommendation, the amount recommended will (subject to the provisions of the last sentence of paragraph 14.7) become due and when due will be paid by OWNER to CONTRACTOR.

14.5. 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 whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.10, and to any other 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 beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents or that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or OWNER to withhold payment to CONTRACTOR.

14.6. 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 14.13 have been fulfilled.

14.7. 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:

14.7.1. the Work is *defective*, or completed Work has been damaged requiring correction or replacement.

14.7.2. the Contract Price has been reduced by Written Amendment or Change Order.

14.7.3. OWNER has been required to correct *defective* Work or complete Work in accordance with paragraph 13.14, or

14.7.4. of ENGINEER's actual knowledge of the occurrence of any of the events enumerated in paragraphs 15.2.1 through 15.2.9 inclusive.

OWNER may refuse to make payment of the full amount recommended by ENGINEER because claims have been made against OWNER on account of CONTRACTOR's performance or furnishing of the Work or Liens have been filed in connection with the Work or there are other items entitling

OWNER to a set-off against the amount recommended, but OWNER must give CONTRACTOR immediate written notice (with a copy to ENGINEER) stating the reasons for such action.

Substantial Completion:

14.8. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) 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 the 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 to 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 the 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, insurance and warranties. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER prior to ENGINEER's issuing the definitive certificate of Substantial Completion, ENGINEER's aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

14.9. 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.

Partial Utilization:

14.10. Use by OWNER of any finished part of the Work, which has specifically been identified in the Contract Docu-

ments, or which OWNER, ENGINEER and CONTRACTOR agree constitutes a separately functioning and useable part of the Work that can be used by OWNER without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following:

14.10.1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. 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. CONTRACTOR at any time may notify OWNER and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, 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 the reasons therefor. If ENGINEER considers that part of the Work to be substantially complete, the provisions of paragraphs 14.8 and 14.9 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

14.10.2. OWNER may at any time request CONTRACTOR in writing to permit OWNER to take over operation of any such part of the Work although it is not substantially complete. A copy of such request will be sent to ENGINEER and 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 and will prepare a list of the items remaining to be completed or corrected thereon before final payment. If CONTRACTOR does not object in writing to OWNER and ENGINEER that such part of the Work is not ready for separate operation by OWNER, ENGINEER will finalize the list of items to be completed or corrected and will deliver such list to OWNER and CONTRACTOR together with a written recommendation as to the division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, utilities, insurance, warranties and guarantees for that part of the Work which will become binding upon OWNER and CONTRACTOR at the time when OWNER takes over such operation (unless they shall have otherwise agreed in writing and so informed ENGINEER). During such operation and prior to Substantial Completion of such part of the Work, OWNER shall allow CONTRACTOR reasonable access to complete or correct items on said list and to complete other related Work.

14.10.3. No occupancy or separate operation of part of the Work will be accomplished prior to compliance with the requirements of paragraph 5.15 in respect of property insurance.

Final Inspection:

14.11. Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof 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.

Final Application for Payment:

14.12. After CONTRACTOR has completed all such corrections to the satisfaction of ENGINEER and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in paragraph 6.19) 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 14.16), CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with 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 thereof and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full; an affidavit of CONTRACTOR that the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and 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; and consent of the surety, if any, to final payment. If any Subcontractor or Supplier 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.

Final Payment and Acceptance:

14.13. 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's other obligations under the Contract Documents have been fulfilled, ENGINEER will, within ten days after receipt of the final Application for Payment, indicate in writing ENGINEER's 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 14.16.

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. Thirty days after presentation to OWNER of the Application and accompanying documentation, in appropriate form and substance, and with ENGINEER's recommendation and notice of acceptability, the amount recommended by ENGINEER will become due and will be paid by OWNER to CONTRACTOR.

14.14. If, through no fault of CONTRACTOR, final completion of the Work is significantly 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 the 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.

Contractor's Continuing Obligation:

14.15. 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 any review and approval of a Shop Drawing or sample submission, nor the issuance of a notice of acceptability by ENGINEER pursuant to paragraph 14.13, nor any correction of defective Work by OWNER will 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 (except as provided in paragraph 14.16).

Waiver of Claims:

14.16. The making and acceptance of final payment will constitute:

14.16.1. 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 14.11 or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however, it will not constitute a waiver by OWNER of any rights in respect of

CONTRACTOR's continuing obligations under the Contract Documents; and

14.16.2. 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

Owner May Suspend Work:

15.1. OWNER may, at any time and without cause, 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 increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if CONTRACTOR makes an approved claim therefor as provided in Articles 11 and 12.

Owner May Terminate:

15.2. Upon the occurrence of any one or more of the following events:

15.2.1. if CONTRACTOR commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if CONTRACTOR takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency;

15.2.2. if a petition is filed against CONTRACTOR under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against CONTRACTOR under any other federal or state law in effect at the time relating to bankruptcy or insolvency;

15.2.3. if CONTRACTOR makes a general assignment for the benefit of creditors;

15.2.4. if a trustee, receiver, custodian or agent of CONTRACTOR is appointed under applicable law or under contract, whose appointment or authority to take charge of property of CONTRACTOR is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of CONTRACTOR's creditors;

15.2.5. if CONTRACTOR admits in writing an inability to pay its debts generally as they become due;

15.2.6. 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 2.9 as revised from time to time):

15.2.7. if CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction;

15.2.8. if CONTRACTOR disregards the authority of ENGINEER; or

15.2.9. if CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents;

OWNER may, after giving CONTRACTOR (and the surety, if there be one) seven days' written notice and to the extent permitted by Laws and Regulations, 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 but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) such excess will 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 approved as to reasonableness by ENGINEER and incorporated in a Change Order, but when exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

15.3. Where CONTRACTOR's services have been so terminated by OWNER, the termination will 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.

15.4. Upon seven days' written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the Work and terminate the Agreement. In such case, CONTRACTOR shall be paid for all Work executed and any expense sustained plus reasonable termination expenses, which will include, but not be limited to, direct, indirect and consequential costs (including, but not limited to, fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs).

Contractor May Stop Work or Terminate:

15.5. 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, terminate the Agreement and recover from OWNER payment for all Work executed and any expense sustained plus reasonable termination expenses. In addition and in lieu of terminating the Agreement, if ENGINEER has failed to act on an Application for Payment or OWNER has failed to make any payment as aforesaid, CONTRACTOR may upon seven days' written notice to OWNER and ENGINEER stop the Work until payment of all amounts then due. The provisions of this paragraph shall not relieve CONTRACTOR of the obligations under paragraph 6.29 to carry on the Work in accordance with the progress schedule and without delay during disputes and disagreements with OWNER.

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ARTICLE 16—ARBITRATION

16.1. 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 14.16) will be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then obtaining subject to the limitations of this Article 16. This agreement so to arbitrate and any other agreement or consent to arbitrate entered into in accordance herewith as provided in this Article 16 will be specifically enforceable under the prevailing law of any court having jurisdiction.

16.2. No demand for arbitration of any claim, dispute or other matter that is required to be referred to ENGINEER initially for decision in accordance with paragraph 9.11 will be made until 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 if a written decision has not been rendered by ENGINEER before that date. No demand for arbitration of any such claim, dispute or other matter will be made later than thirty days after the date on which ENGINEER has rendered a written decision in respect thereof in accordance with paragraph 9.11; and the failure to demand arbitration within said thirty days' period shall result in ENGINEER's decision being final and binding upon OWNER and CONTRACTOR. If ENGINEER renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence but will not supersede the arbitration proceedings, except where the decision is acceptable to the parties concerned. No demand for arbitration of any written decision of ENGINEER rendered in accordance with paragraph 9.10 will be made later than ten days after the party making such demand has delivered written notice of intention to appeal as provided in paragraph 9.10.

16.3. Notice of the demand for arbitration will be filed in writing with the other party to the Agreement and with the

American Arbitration Association, and a copy will be sent to ENGINEER for information. The demand for arbitration will be made within the thirty-day or ten-day period specified in paragraph 16.2 as applicable, and in all other cases within a reasonable time after the claim, dispute or other matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

16.4. No arbitration arising out of or relating to the Contract Documents shall include by consolidation, joinder or in any other manner any other person or entity (including ENGINEER, ENGINEER's agents, employees or consultants) who is not a party to this contract unless:

16.4.1. the inclusion of such other person or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration,

16.4.2. such other person or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings, and

16.4.3. the written consent of the other person or entity sought to be included and of OWNER and CONTRACTOR has been obtained for such inclusion, which consent shall make specific reference to this paragraph; but no such consent shall constitute consent to arbitration of any dispute not specifically described in such consent or to arbitration with any party not specifically identified in such consent.

16.5. The award rendered by the arbitrators will be final, judgment may be entered upon it in any court having jurisdiction thereof, and will not be subject to modification or appeal except to the extent permitted by Sections 10 and 11 of the Federal Arbitration Act (9 U.S.C. §§10,11).

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ARTICLE 17—MISCELLANEOUS

Giving Notice:

17.1. Whenever any provision of the Contract Documents requires the giving of written notice, it will 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 the notice.

Computation of Time:

17.2.1. When any period of time is referred to in the Contract Documents by days, it will 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 will be omitted from the computation.

17.2.2. A calendar day of twenty-four hours measured from midnight to the next midnight shall constitute a day.

General:

17.3. Should OWNER or CONTRACTOR suffer injury or damage to person or property because of any error, omis-

sion 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 will 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 17.3 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

17.4. 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 6.30, 13.1, 13.12, 13.14, 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 Laws or Regulations, 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 will survive final payment and termination or completion of the Agreement.

SECTION 00510
SUPPLEMENTARY CONDITIONS

General Conditions

The "Standard General Conditions of the Construction Contract" National Society of Professional Engineers, NSPE 1910-8 (1978 Edition), Articles 1 through 17 inclusive, is a part of this contract, and is incorporated herein as fully as if here setforth.

Supplements

The following supplements modify, change, delete, or add to the "Standard General Conditions of the Construction Contract". Where any part of the General Conditions is modified or voided by these Sections, the unaltered provisions of that part remain in effect. Where the language of the Supplementary Conditions conflicts with that of the Standard General Conditions, the Supplementary Conditions shall take precedence.

Contents of Supplementary Conditions

<u>Section No.</u>	<u>Section Title</u>
SC-1	General
SC-2	Insurance
SC-3	Performance & Materials
SC-4	Extra Work/Change Order
SC-5	Compliance with Air and Water Acts

SECTION SC-1
GENERAL

A. Divisions & Sections:

For convenience of reference, the Specifications are separated into titled Divisions and Sections. Such separations shall not, however, operate to make the Owner or the Engineer an arbiter to establish limits to the contracts between the Contractor and Sub-Contractors.

B. Copies of the Contract:

In addition to Contract Documents furnished to Contractor by Owner for the Contractor's use during construction, there shall be at least three (3) executed copies of the Contract Documents to be distributed by the Owner as follows:

- a) One (1) copy to the Owner.
- b) One (1) copy to the Engineer.
- c) One (1) copy to the Contractor.

C. Default & Annulment of Contract:

In addition to the provisions contained in the General Conditions of the Construction Contract, the Owner may give notice in writing to the Contractor and his surety and may suspend Work upon the occurrence of any one or more of the following events:

- a. If the Contractor is adjudged bankrupt or insolvent;
- b. If the Contractor makes a general assignment for the benefit of creditors;
- c. If a trustee or receiver is appointed for the Contractor or for any of the Contractor's property;
- d. If the Contractor files a petition to take advantage of any debtor's act, or to recognize under the bankruptcy or similar laws;
- e. If the Contractor repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment;
- f. If the Contractor repeatedly fails to make prompt payments to Sub-Contractors or for labor, materials, or equipment;
- g. If the Contractor disregards laws, ordinances, rules, regulations, or orders of any public body having jurisdiction;
- h. If the Contractor disregards the authority of the Engineer;
- i. If the Contractor otherwise violates in any substantial way any provisions of the Contract Documents;
- j. If the Contractor fails to begin the Work within the time stated in the Notice to Commence Work and completion of phases of the Work in accordance with schedules approved by the Owner;
- k. If the Contractor discontinues the Work or fails to resume the Work when directed by the Owner, or;
- l. If the Contractor does not perform the Work in a manner acceptable to the Owner.

D. Non-Resident Contractors:

The successful bidder, if a corporation established under laws other than the State in which the proposed construction is located, shall file, at the time of the execution of the contract, with the Owner, notice of the name of its resident attorney, appointed as required by the laws of the State in which the proposed construction is located. The successful bidder, if a resident of another State other than that in which the proposed construction is located and not a corporation, shall file, at the time of execution of the contract, with the Owner, a written appointment of a resident of the State in which the construction is located, having an office or place of business therein, to be his true and lawful attorney upon whom all lawful processes in any actions or proceedings against him may be served; and in such writing, which shall set forth said attorney's place of residence, shall agree that any same legal force and validity as if served on him, and that the authority shall continue in force so long as any liability remains outstanding against him in said State. The power of attorney shall be filed in the office of the Secretary of State if required, and copies certified by the Secretary shall be sufficient evidence thereof. Such appointment shall continue in force until revoked by an instrument in writing, designating in a like manner some other person upon whom such processes may be served, which instrument shall be filed in the manner provided herein for the original appointment.

A Non-Resident Contractor shall be deemed to be:

- a. A person who is not a resident in the State where the proposed construction is to be located.
- b. Any partnership that has no member thereof resident in the State where the proposed construction is to be located.
- c. Any corporation established under laws other than those of the State in which the proposed construction is located.

E. Duties, Responsibilities and Limitations of the Authority of Resident Project Representative:

- a. General: Resident Project Representative is ENGINEER'S Agent and shall act as directed by and under the supervision of ENGINEER. He shall confer with ENGINEER regarding his actions. His dealings in matters pertaining to the on-site Work will in general be only with ENGINEER and CONTRACTOR. His dealings with Sub-Contractors will only be through or with the full knowledge of CONTRACTOR or his superintendent. He shall generally communicate with OWNER only through or as directed by ENGINEER.
- b. Duties and Responsibilities: Resident Project Representative shall:
 1. Schedules: Review the progress schedule, schedule of Shop Drawing submissions, schedule of values and other schedules prepared by CONTRACTOR and consult with ENGINEER concerning their acceptability.

2. Conferences: Attend preconstruction conferences. Arrange a schedule of progress meetings and other job conferences as required in consultation with ENGINEER and notify in advance those expected to attend. Attend meetings, and maintain and circulate copies of minutes thereof.

SECTION SC-2
INSURANCE

A. General:

The Contractor shall purchase and maintain, until Final Acceptance of the work, insurance of the limits and types stated in the General Conditions of the Construction Contract and as stated below, from an insurance company acceptable to the Owners.

B. Evidence of Insurance:

As evidence of insurance coverage, the Owner may, in lieu of actual policies, accept official written statements from the insurance company certifying that all the insurance policies specified below are in force for the specified period. The Contractor shall submit evidence of insurance to the Owner at the time of executing the Agreement.

C. Form of Insurance:

Insurance shall be in such form as will protect the Contractor and Owner from all claims and liabilities for damages for bodily injury, including accidental death and for property damage, which may arise from operations under this contract, whether such operation be by himself or by anyone directly or indirectly employed by him.

D. Amount of Insurance

Except when otherwise stated, the amount of insurance for each policy shall be not less than:

1. Liability for bodily injury, including accidental death:
 - a. \$1,000,000 for any one person.
 - b. \$1,000,000 for each accident.
2. Liability for Property Damage:
 - a. \$500,000 for any accident
 - b. \$500,000 for all accidents

E. Types of Insurance:

Purchase and maintain the following types of insurance:

1. Full Workmen's Compensation insurance coverage for all persons employed by the Contractor to perform work on this project. This insurance shall be in strict accordance with the requirements of the most current laws of the State.

Section SC-2-2

2. Bodily Injury insurance and Contractor's Protective Property Damage insurance, each including coverage for blasting explosion and injury to, or destruction of, wires, pipes, conduits and similar property, appurtenant apparatus, whether public or private and collapse of, or structural injury to, any building or structure, except those on which work under this Contract is being performed.
3. Bodily Injury and Property Damage insurance covering the operation of all motor vehicles and equipment, whether or not owned by the Contractor, being operated in connection with the prosecution of the work under this Contract.
4. Contractual Liability insurance coverage in the amounts specified above.
5. An Owner's Protective Liability insurance issued to the Owner at the expense of the Contractor.
6. Property insurance including "all risk" insurance as outlined in paragraph 5.6 of the General Conditions.

SECTION SC-3

PERFORMANCE & MATERIALS

A. OSHA Regulations:

This project is subject to all of the safety and health regulations as promulgated by the U. S. Department of Labor.

Contractors are urged to make themselves familiar with the requirements of these regulations.

B. Fire Hydrants:

Fire hydrants on or adjacent to the work area shall be kept accessible to fire apparatus at all time.

C. Use of Explosives:

When the use of explosives is necessary for the prosecution of the Work, exercise the utmost care not to endanger life or property. The Contractor shall be responsible for any and all damage resulting from the use of explosives.

Store all explosives in a secure manner, in compliance with all State and local laws and ordinances, and legally mark all such storage places. Storage shall be limited to such quantity as may be needed for the work underway.

Designate as a BLASTING AREA all sites where electric blasting caps are located and where explosive charges are being placed. Mark all blasting areas with signs are required by law.

Please signs as required by law at each end of the blasting area and leave in place while the above conditions prevail. Immediately remove signs after blasting operations or the storage of caps is over.

Notify each property owner and public utility company having structures in proximity to the site of the work sufficiently in advance to enable the companies to take such steps as they may deem necessary to protect their property. Such notice shall not relieve the Contractor of any of his responsibility for damage resulting from his blasting operation.

Warn all persons within the danger zone of blasting operations and do not perform blasting work until the area is cleared. Provide sufficient flagmen outside the danger zone to stop all approaching traffic and pedestrians. Provide watchmen during the loading period and until charges have been exploded. Provide adequate protective covering over all charges before being exploded.

Public Utilities:

Any elevations and locations of public utilities shown on the Drawings are approximate. It shall be the responsibility of the Contractor to make final and exact determination of the locations and extend of all utilities. The Contractor shall be liable for any expense resulting from any damage to any public utility.

It shall be the responsibility of the Contractor to notify all utility companies and pipe line owners, whether public or private and other parties affected, of his intention to perform work in the are where such utilities are located and to endeavor to have all necessary adjustments of the public or private utility fixtures, pipe lines and other appurtenances within or adjacent to the limits of constr soon as practicable and if at all possible before work contemplated is started in the area.

In general, water lines, sewer lines, gas lines, service connections, water and gas meter boxes, water and gas valve boxes, light standards, cableways, signals and other utility appurtenances within the limits of the proposed construction shall be moved by the utility involved and the Owner shall bear the full expense, if any, of this work, unless otherwise specifically stated, or if otherwise noted on the plans.

Any work done upon or within the right-of-way of a railroad company shall be done under the supervision and control of said railroad company to the extend considered necessary by said company. Any additional conditions or requirements for doing work within the railroad right-of-way will be set forth in the special provision. The Contractor shall bear the full expense of any charges made by said railroad company during the course of construction within the railroad right-of-way, insofar as inspectors, flagmen, etc., are concerned.

E. Substitute Materials and Equipment:

Section 01640, "Substitutions and Product Options" is in addition to the requirements stated in the "Equivalent Materials and Equipment" part of the Standard General Conditions of the Construction Contract.

F. Standards:

Whenever standards and standard specifications are referred to in these Specifications, they shall be the latest edition.

G. Cleaning Up:

Delete Standard General Conditions of the Construction Contract paragraph 6.17 in its entirety and substitute Section 01710, "Project Cleaning" in Division 1 of these Specifications. All references to Standard General Conditions of the Construction Contract paragraph 6.17 elsewhere in the Contract Documents shall read as referring to Section 01710 of these Specification.

EXTRA WORK/CHANGE ORDERA. Amount of Compensation:

The Engineer may at any time by written order and without notice to the sureties require the performance of such extra work or changes in the work as may be found necessary or desirable. The amount of compensation to be paid to the Contractor for any extra work so ordered shall be made in accordance with whichever of the following plans the Engineer elects.

- a. A price agreed upon between the parties and stipulated in the order for the extra work,
- b. A price based on the unit prices of the contract, or
- c. A price determined by adding 15% to the "reasonable cost" of the extra work performed, such "reasonable cost" to be determined by the Engineer in accordance with the following.
 1. In arriving at the "reasonable cost" for the purposes of the above, the Engineer shall include the reasonable cost to the Contractor of all materials used, of all labor common and skilled, of foreman, trucks and the fair-market rental rate for all machinery and equipment for the period employed directly on the work. The reasonable cost for extra work shall include the cost to the Contractor of any additional insurance that may be required covering public liability for injury to persons and property, the cost of Workman's Compensation Insurance, Federal Social Security and any other costs based on payrolls and required by law.
 2. The cost of extra work shall not include any cost or rental of small tools, buildings, or any portion of the time of the Contractor, his project supervisor or his superintendent, or any allowance for use of capital or the premium on the bond as assessed upon the amount of extra work, these items being considered covered by the fifteen percent (15%) added to the reasonable cost.

B. Subcontractors:

In the case of extra work which is done by subcontractors, whether these are under the specific contract items provided herein, or otherwise if so approved by the Engineer, the 15% added to the reasonable cost of the work will be allowed only to the subcontractor. On such work an additional 5% of the reasonable cost (before addition of the 15%) will be paid to the Contractor for his work in directing the operations of the subcontractor and for any overhead involved.

SECTION SC-5

CERTIFICATION OF NONSEGREGATED FACILITIES
AND COMPLIANCE WITH AIR AND WATER ACTS

A. Certification of Nonsegregated Facilities

By the submission of this bid, the bidder, offeror, applicant or subcontractor certifies that s/he does not maintain or provide for his/her employees any segregated facility at any of his/her establishments, and that s/he does not permit employees to perform their services at any location, under his/her control, where segregated facilities are maintained. S/He certifies further that s/he will not maintain or provide for employees any segregated facilities at any of his/her establishments, and s/he will not permit employees to perform their services at any location under his/her control where segregated facilities are maintained. The bidder, offeror, applicant or subcontractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause of this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms, and other storage or dressing areas, *transportation and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. S/He further agrees that (except where s/he has obtained identical certifications from proposed subcontractors for specific time periods) s/he will obtain identical certification from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause; that s/he will retain such certifications in his/her files; and that s/he will forward the following notice to such proposed subcontractors (except where proposed subcontractors have submitted identical certifications for specific time periods).

*Parking lots, drinking fountains, recreation or entertainment areas.

B. Civil Rights Act of 1964

Under Title VI of the Civil Rights Act of 1964, no person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

C. Section 109 of the Housing and Community Development Act of 1974.

- (a) No person in the United States shall on the ground of race, color, national origin, or sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this title.

D. "Section 3" Compliance in the Provision of Training, Employment and Business Opportunities

- a. The work to be performed under this contract is on a project assisted under a program providing direct Federal financial assistance from the Department of Housing and Urban Development and is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u. Section 3 requires that to the greatest extent feasible opportunities for training and employment be given lower income residents of the project area and contracts for work in connection with the project be awarded to business concerns which are located in, or owned in substantial part by persons residing in the area of the project.
- b. The parties to this contract will comply with the provisions of said Section 3 and the regulations issued pursuant thereto by the Secretary of Housing and Urban Development set forth in 24 CFR 135, and all applicable rules and orders of the Department issued thereunder prior to the execution of this contract. The parties to this contract certify and agree that they are under no contractual or other disability which would prevent them from complying with these requirements.
- c. The contractor will send to each labor organization or representative of workers with which he has a collective bargaining agreement or other contract or understanding, if any, a notice advising the said labor organization or worker' representative of his commitments under this Section 3 clause and shall post copies of the notice in conspicuous places available to employees and applicants for employment or training.
- d. The contractor will include this Section 3 clause in every subcontract for work in connection with the project and will, at the direction of the applicant for or recipient of Federal financial assistance, take appropriate action pursuant to the subcontract upon a finding that the subcontractor is in violation of regulations issued by the Secretary of Housing and Urban Development, 24 CFR Part 135. The contractor will not subcontract with any subcontractor where it has notice of knowledge that the latter has been found in violation of regulations under 24 CFR Part 135 and will not let any subcontract unless the subcontractor has first provided it with a preliminary statement of ability to comply with the requirements of these regulations.
- e. Compliance with the provisions of Section 3, the regulations set forth in 24 CFR Part 135, and all applicable rules and orders of the Department issued hereunder prior to the execution of the contract, shall be a condition of the federal financial assistance provided to the project, binding upon the applicant or recipient for such assistance, its successors or assigns. Failure to fulfill these requirements shall subject the applicant or recipient, its contractors and subcontractors, its successors and assigns to those sanctions specified by the grant or loan agreement or contract through which federal assistance is provided, and to such sanctions as are specified by 24 CFR Part 135.

SAMPLE

CERTIFICATION OF BIDDER REGARDING SECTION 3
AND SEGREGATED FACILITIES

Name of Prime Contractor

Project Name and Number

The undersigned hereby certifies that:

- (a) Section 3 provisions are included in the Contract.
- (b) A written Section 3 plan was prepared and submitted as part of the bid proceedings (if bid equals or exceeds \$10,000).
- (c) No segregated facilities will be maintained.

Name and Title of Signer (Print or Type)

Signature

Date

E. Certification of Compliance with Air and Water Acts

(Applicable to Federally assisted construction contracts and related subcontracts exceeding \$100,000)

During the performance of this contract, the contractor and all subcontractors shall comply with the requirements of the Clean Air Act, as amended, 42 USC 1857 et seq., the Federal Water Pollution Control Act, as amended, 33 USC 1251 et seq., and the regulations of the Environmental Protection Agency with respect thereto, at 40 CFR Part 15, as amended.

In addition to the foregoing requirements, all nonexempt contractors and subcontractors shall furnish to the owner, the following:

- (1) A stipulation by the Contractor or subcontractors, that any facility to be utilized in the performance of any nonexempt contract or subcontract, is not listed on the List of Violating Facilities issued by the Environmental Protection Agency (EPA) pursuant to 40 CFR 15.20.
- (2) Agreement by the contractor to comply with all the requirements of Section 114 of the Clean Air Act, as amended, (42 USC 1857c-8) and Section 308 of the Federal Water Pollution Control Act, as amended, (33 USC 1318) relating to inspection, monitoring, entry, reports and information, as well as all other requirements specified in said Section 114 and Section 308, and all regulations and guidelines issued thereunder.
- (3) A stipulation that as a condition for the award of the contract, prompt notice will be given of any notification received from the Director, Office of Federal Activities, EPA, indicating that a facility utilized, or to be utilized for the contract, is under consideration to be listed on the EPA List of Violating Facilities.
- (4) Agreement by the contractor that he will include, or cause to be included, the criteria and requirements in paragraph (1) through (4) of this section in every nonexempt subcontract and requiring that the Contractor will take such action as the Government may direct as a means of enforcing such provisions.
- (5) The contractor shall permit the City/Town of _____, the Department of Housing and Urban Development, the Comptroller General of the United States, or any of their duly authorized representatives, to have access to any books, documents, papers, and records, of the contractor which are directly pertinent to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

DIVISION 1

GENERAL REQUIREMENTS

Scope

The scope of this Division covers the general administration requirements and the general work related provisions of the Construction Contract.

Contents of Division

<u>Section No.</u>	<u>Section Title</u>
01010	Summary of Work
01020	Coordination
01090	Abbreviations and Symbols
01150	Measurement and Payment
01310	Construction Schedules
01510	Temporary Utilities
01630	Substitutions and Product Options
01710	Project Cleaning
01810	Project Record Documents

SECTION 01010

SUMMARY OF WORK

Location of Work

The work of this Contract is located in Portsmouth, New Hampshire at Prescott Park, a waterfront park along the Piscataqua River.

Work to be Done

The Contractor shall furnish all materials, labor, and equipment to perform the following:

Rehabilitation of approximately 120 linear feet of granite seawall. Work to include, but not be limited to, resetting of top 3 courses of granite block, installation of subsurface drainage system, and the construction of a concrete diaphragm wall. All brick walls, lawns, lights, fences, and other site fixtures/features disturbed during construction shall be reinstalled. See Sheets 1 and 2 and Prescott Park Seawall Assessment done in January, 1986 (Exhibit 01010A).

**City of Portsmouth
New Hampshire**

**PRESCOTT PARK
SEAWALL ASSESSMENT**

JANUARY 1986

**Prepared By :
Kimball Chase Company, Inc.
40 Bridge Street
Portsmouth, New Hampshire**

85-1227

PRESCOTT PARK SEAWALL ASSESSMENT

Prepared for:

City of Portsmouth, New Hampshire

Prepared by:

Kimball Chase Company, Inc.
40 Bridge Street
Portsmouth, NH 03801

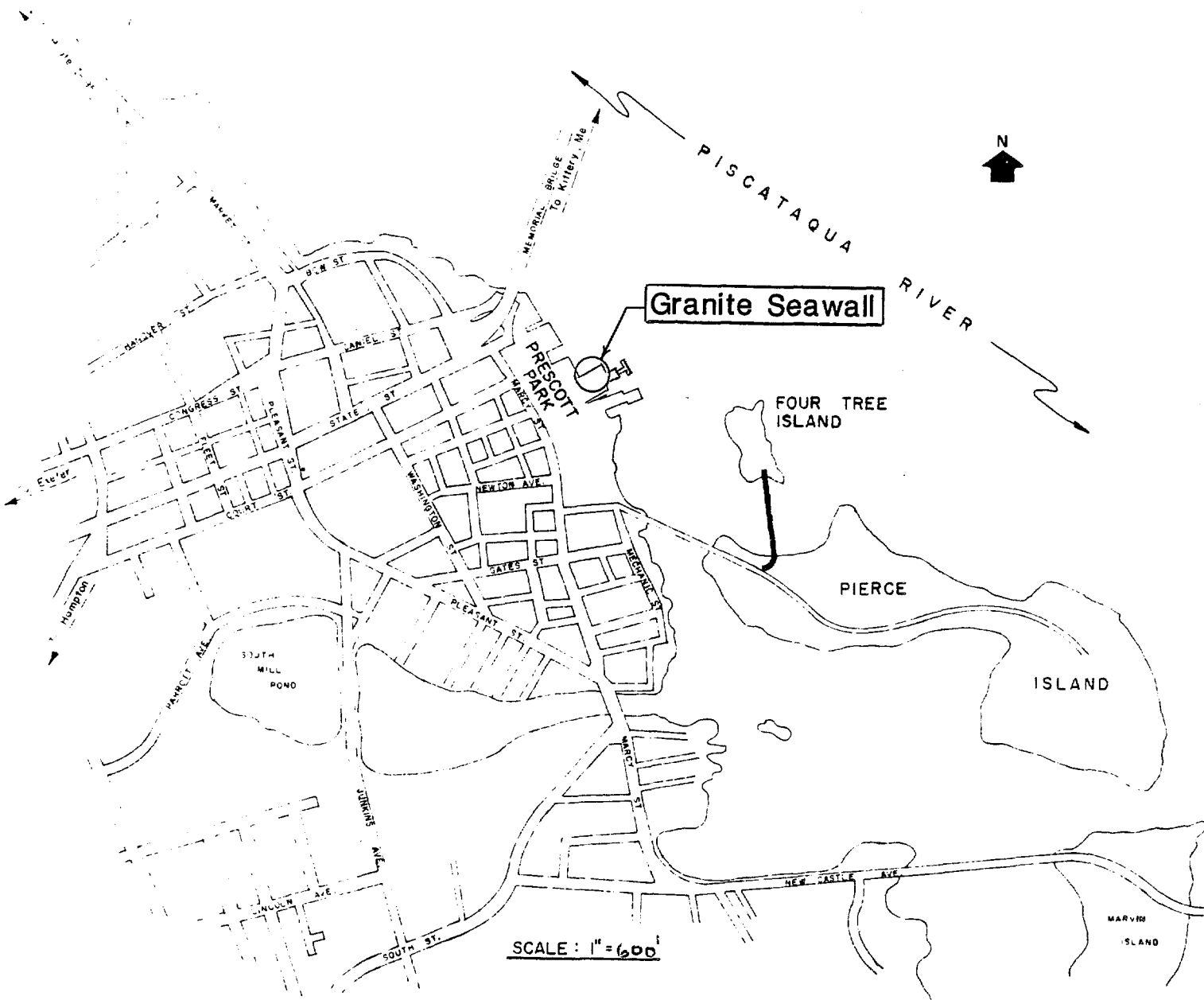
January, 1986

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2. Observed Conditions	4
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4. Conceptual Rehabilitation	10
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Photographs	

SUMMARY OF FINDINGS AND RECOMMENDATIONS

1. Visual and measured observation of the 106' granite seawall indicates that, since its construction in 1975, that the top 3 granite block courses have moved horizontally up to 7.8" towards the water.
2. The movement of the wall, in addition to possible drainage problems behind the wall, has caused settlement in the abutting brick walk of up to 8".
3. The cause of the movement and settlement appears to be a combination of poor drainage, frost heaving, failure of granite fragment between courses and/or poor construction.
4. While the wall is not in eminent danger of collapse or failure, correction of the condition should be undertaken to stop any further deterioration and to decrease maintenance and improve the aesthetic quality of the area.
5. Corrective measure should include relayering of the top 3 courses of granite stone, establishing structural connections between stones, and the construction of a perimeter drainage system along the wall.



LOCATION PLAN

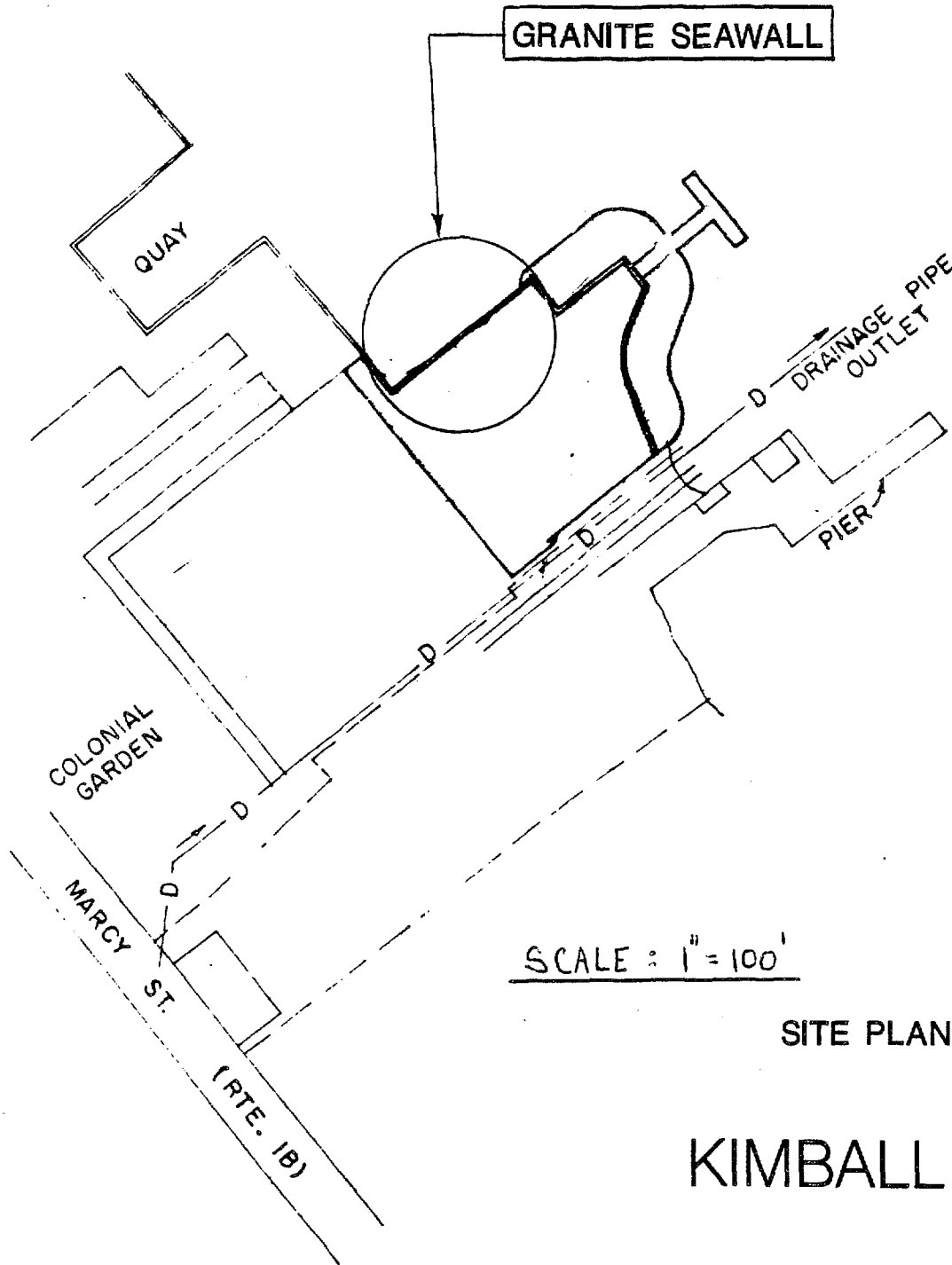
KIMBALL CHASE
 company, inc.

Civil
 Environmental
 Engineers

40 Bridge Street
 Portsmouth
 New Hampshire 03801
 603-431-2520



PISCATAQUA
RIVER



SCALE : 1" = 100'

SITE PLAN

KIMBALL CHASE
company, inc.

Civil
Environmental
Engineers

40 Bridge Street
Portsmouth
New Hampshire 03801
603-431-2520

PORTSMOUTH PARK SEAWALL ASSESSMENT

1. DESCRIPTION

The granite seawall being assessed is made up of three sections; 31' section from STA 1.5, 58.91'+ LT to STA 1.5, 27.91'; 106' section from STA 3.1, 29.59' LT to STA 109.2, 30.12' LT; and a 20' section from STA 107.7, 28.52' LT to STA 107.5, 8.6' LT. See Kimball Chase Company Existing Condition Survey of Prescott Park Seawall completed on December 19, 1985 (in folder on back cover). This section of granite seawall is a portion of a land reclamation project completed in 1975 for the Trustees of the Trust Funds. Based on original W.P.B. & W. design plans for project 4157, the following description has been summarized:

The land project involved three types of soil retaining structures; a 63'+ section of sheet pile wall with a tie-back system; a 58'+ section of rip rap embankment and a 157'+ section of granite block gravity retaining wall.

All retaining structures are capped with granite cap stone to elevation +10.0' and chain link fence except for approximately 35'+ on the southerly most section of sheet pile wall which is capped with steel channel.

The granite block gravity walls are abutted on the land side by an 8' brick walk at elevation +9.75. This walk pitches down from the granite wall to the land side of the walk (8' away) at a 1.0% slope. The brick walk is underlaid by a 3" concrete slab (fc' = 2500 psi, w/6x6 #10 wire). The remainder of the retaining walls are abutted by gardens and shrubs.

The granite block wall is made up of 3' wide by 1'-6" deep granite cap stones underlaid by two courses of 3' wide by 2'-6" deep granite blocks, followed by four courses of 3' x 4' wide by 2'-6" deep granite blocks supported on a concrete pile cap foundation. All blocks are laid dry with granite fragments being used to level stone courses. The back side of the top three joints have 4"+ of cement mortar filler. A 12" concrete diaphragm wall is located behind the bottom four courses. Vertical and horizontal joints between capstones and adjacent stones are cement mortar joints with minimum thickness of 1".

The foundation for the granite seawall is made up of an 8' wide by 3' deep concrete pile cap with 12" timber piles placed in two rows; the front row being batter piles (3:1) @ 3'+ O.C. and the rear row being bearing piles @ 6'+ O.C.. Pile tip elevations vary from elevation -25.0 to -32.0. The top of the concrete pile cap is at elevation -7.4. All piles were to be driven to a safe bearing load of 30 tons.

Backfill material is specified as granular material behind this portion of the seawall. The actual specification for this project required that the granular backfill be porous and free of injurious amounts of organic material.

Compaction was to be accomplished in 8" lifts being wet and compacted to 95% density relative to ASSHTO 99.

See Typical Seawall Section on Page 5.

2. OBSERVED CONDITIONS

Site visits have been made to Prescott Park in Portsmouth, New Hampshire on December 8, and 23, 1985 at high tides, and on January 9, and 10, 1986 at low tides. It should be noted that all the following observed relationships assume that the wall was constructed according to the original design plans unless otherwise noted.

Vertical:

The brick walk that abuts the granite seawall appears to be intact at STA 0.0, 58.91'+ LT. Unless bricks have been replaced and/or resealed, the first granite block that was placed in 1975 was slightly offset of existing block wall. The brick walk has subsided vertically relative to the top of the granite wall (assuming that the brick walk was 3" below top of wall initially) as follows:

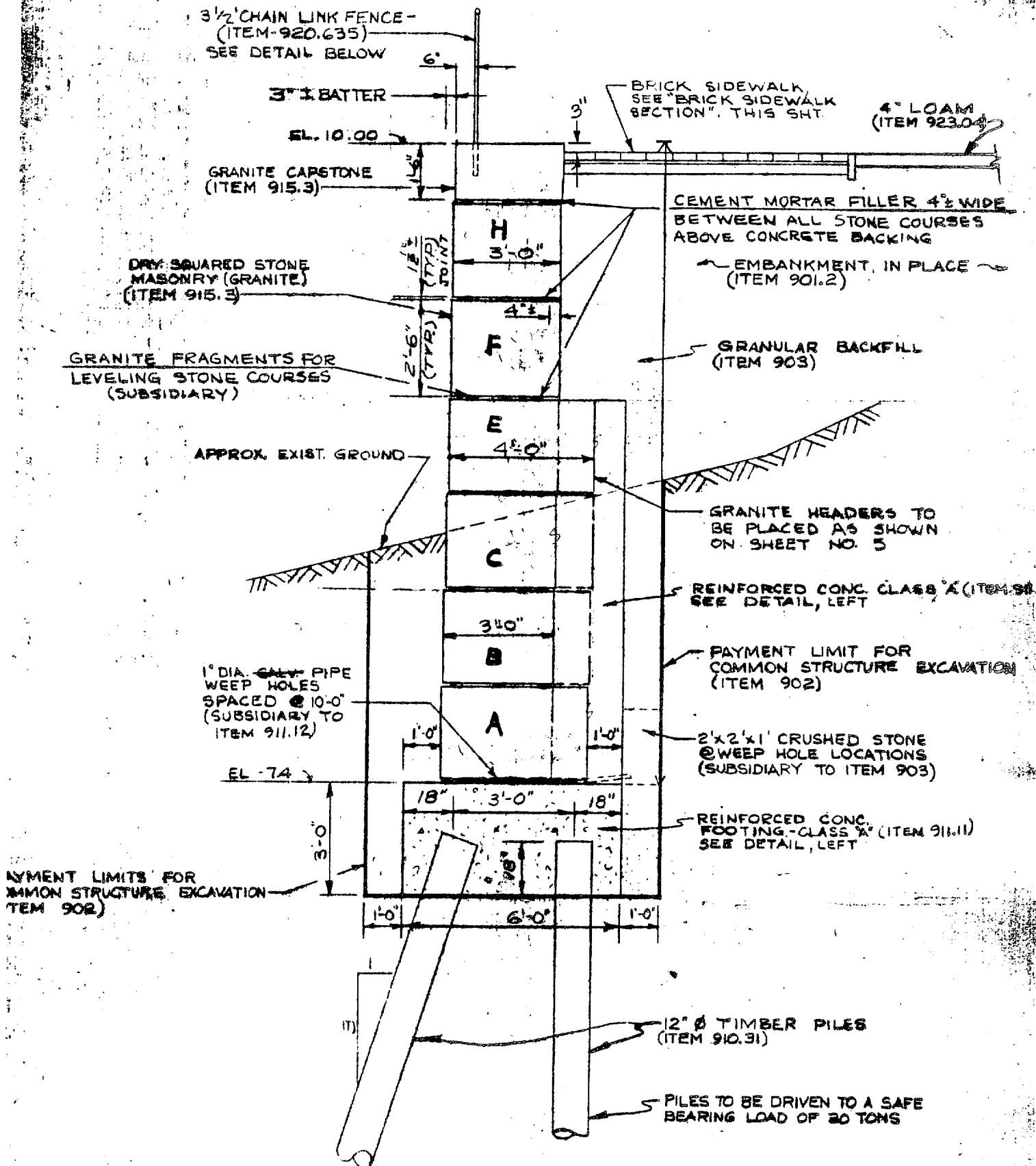
<u>STA</u>	<u>Lt. Offset</u>	<u>Vertical Subsidence</u>
0	58.91	0.00"
0	27.90	2.00"
10	28.40	2.75"
30	28.76	5.64"
50	28.79	5.64"
70	28.82	5.64"
90	28.86	4.80"
100	28.91	5.16"
106.2	28.68	8.04"
106.2	8.60	2.00"

The brick walk presently pitches up from the granite wall to the land side of the walk (8' away). This pitch varies from 0.6% to 5.0%.

The granite cap stones on the 106' section are rotating about a horizontal axis parallel to the 106' section. The river side of the cap stones are dropping in elevation relative to the land side of the cap stone.

Elevations on the top of the granite wall are as follows:

<u>STA</u>	<u>Land Side</u>	<u>River Side</u>
10	9.65'	9.57'
30	9.69'	9.50'
50	9.65'	9.46'
70	9.65'	9.52'
90	9.62'	9.48'
100	9.62'	9.51'



TYPICAL SEAWALL SECTION



GRAPHIC SCALE

It does not appear that the granite wall has subsided vertically by any appreciable amount. It does appear that the wall constructed in 1975 was placed vertically to match the existing wall which is at elevation 9.6'±.

Horizontal:

Two smaller sections of seawall (31' & 20') appear to be in approximately original position relative to sections of wall which have exhibited no movement and therefore assessed to be of no immediate concern.

Visual inspection and extensive survey of the 106' section of granite seawall indicates the exaggerated deflected shapes shown in figures 1 & 2 on page 8.

The table on page 9 summarizes the horizontal data collected and reduced.

It should be noted that there does not appear to be any mortar between the top cap stones and the first granite block course below. We were not able to determine if top 3 joints have 4" of cement mortar as specified.

Numerically, there is an indication that the fifth course has moved approximately 3" outward towards the river, but it is felt that this is not the case. The numerical values for the fifth course are fairly close in magnitude which we feel indicates that the wall was either initially constructed with (a) a 6" batter or with (b) a 3" flat bow in it horizontally at the top and a 3" batter.

Based on the above two scenarios, the top cap stone has been laterally displaced either 6.5" with scenario (a) or 3.5" with scenario (b).

The top of the first 2'-6" course has been laterally displaced either 7.8" with (a) or 4.8" with (b).

Visual observations showed that the second 2'-6" granite course has not displaced laterally as much as the first 2'-6" course and by the fourth 2'-6" course it appears the block is in approximately the correct location relative to the bottom courses.

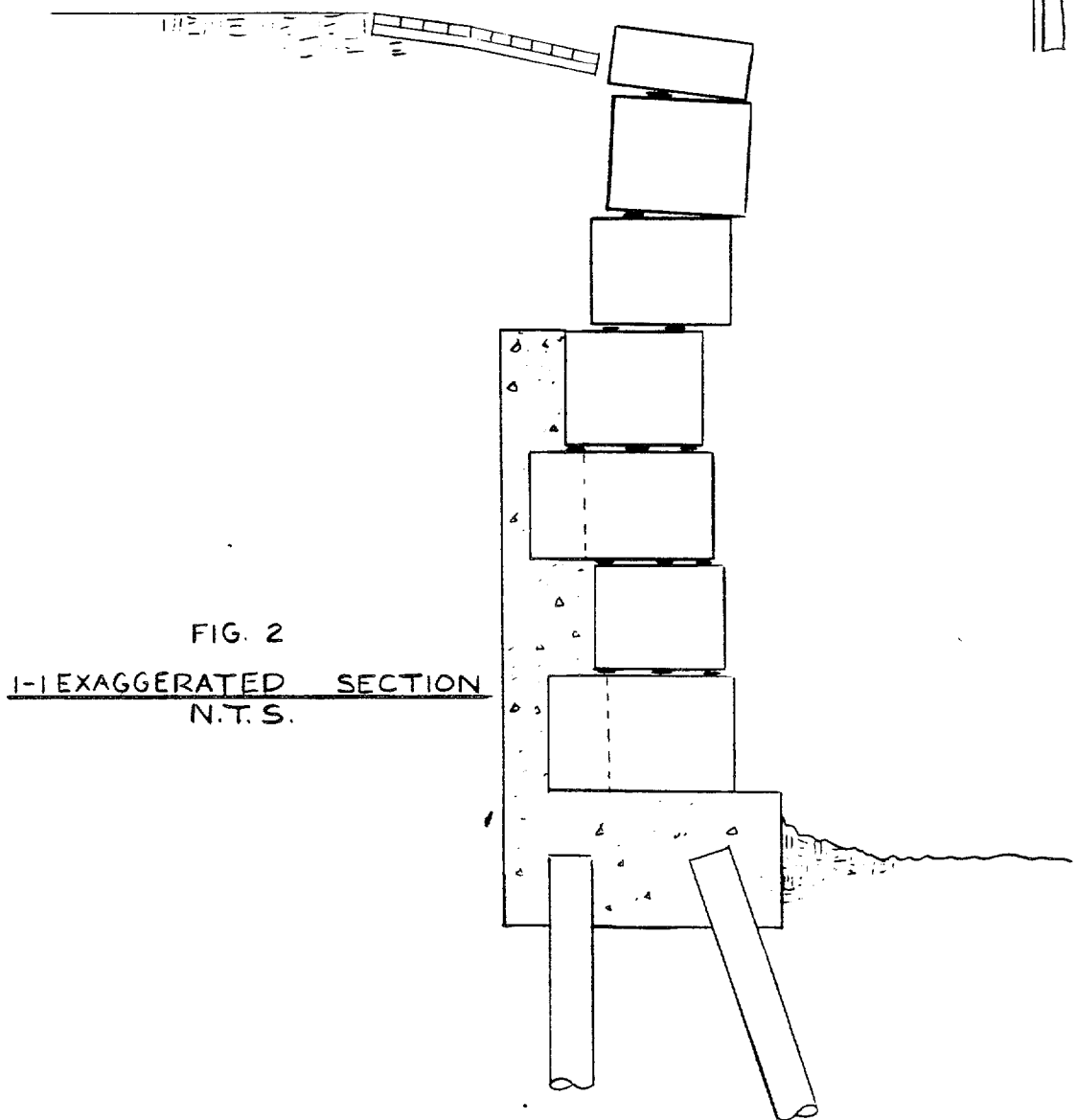
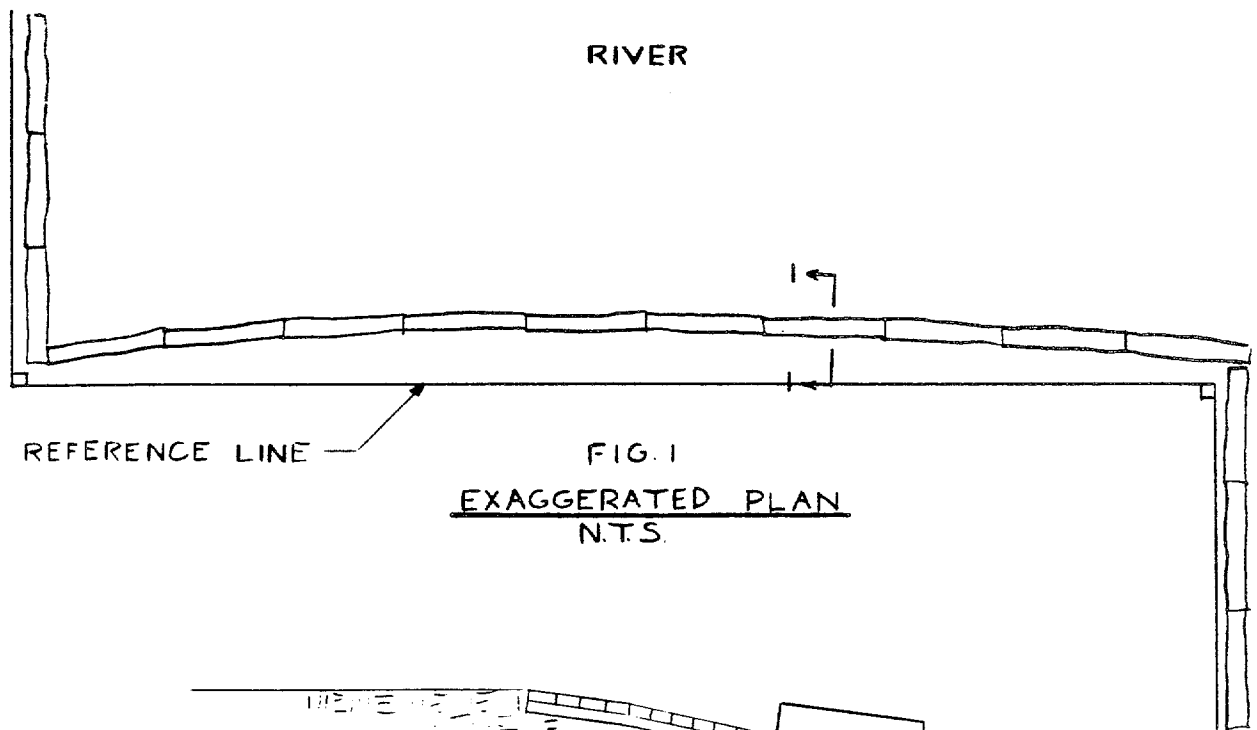
Drainage:

On January 9 & 10, 1986, site visits were made at a low tide. The older wall to the northwest which appears to be intact has a drain pipe coming out of it at elevation +4.0'±. This drain had fairly large amounts of water flowing out of it. The newer granite wall which we are assessing did not appear to have any water flowing out of its open joints.

The entire reclaimed area of land (1600± sq. ft.) pitches slightly to the center where there is one catch basin.

Piles:

No pile driving logs have been located which could indicate actual pile capacities, length, and/or tip data.



STATION AND OFFSET DATA

Top of Cap Stone					Top of First 3' Course				Top of Fifth 3' Course			
Station	Original 7/75 *	Estimated Original 7/75 **	Present 11/85	Movement (inches)	Station	Original 7/75 ***	Present 11/85	Movement (inches)	Station	Original 7/75 ***	Present 11/85	Movement (inches)
3.10	30.92	30.92	31.09	2.0	3.10	30.94			3.10	31.09		
11.80		30.97	31.25	3.3	11.80	30.99			11.80	31.14		
23.60		31.04	31.53	5.9	23.60	31.06	31.45	4.7	23.60	31.21	31.53	3.9
34.00		31.10	31.64	6.5	34.00	31.12	31.39	3.2	34.00	31.27	31.39	1.5
44.70		31.16	31.66	6.0	44.70	31.18	31.49	3.7	44.70	31.33	31.49	1.9
55.20		31.22	31.69	5.6	55.20	31.25	31.90	7.8	55.20	31.39	31.61	2.6
65.60		31.29	31.68	4.7	65.60	31.31	31.89	7.0	65.60	31.45	31.68	2.8
76.20		31.35	31.75	4.8	76.20	31.37	31.91	6.5	76.20	31.51	31.83	3.8
86.70		31.41	31.75	4.1	86.70	31.43	31.67	2.9	86.70	31.57	31.75	2.1
97.30		31.47	31.81	4.1	97.30	31.49	31.98	5.9	97.30	31.64	31.98	4.1
109.20	31.54	31.54	31.62	1.0	109.20	31.56			109.20	31.71		

- * Based on relationship to granite block that appears to not have moved.
- ** Based on offsets @ stations 3.1 & 109.2 and assumption that wall was straight initially.
- *** Based on estimated original offset of cap stone and a 3 inch batter.

Note:
Present 11/85 data for the top of the first and fifth courses at stations 23.6, 34.0, and 44.7 are estimated values

3. ASSESSMENT

The cause for the elevation of the top of the wall to be .4' below the design plans is some combination of the following:

1. Wall was actually constructed to match existing wall which was at some elevation below +10.0'.
2. Wall has uniformly settled up to .4' due to normal consolidation and additional consolidation from overloaded rear piles.

If as-built pile driving logs and data could be made available, then a more exact analysis and assessment could be made of the foundation system, but it appears that this data is not available. In situ testing is very complicated, expensive, and of questionable reliability. Considering all the above, I feel the foundation system currently in place is a sufficiently stable system but should be monitored in the future for indications of future movements.

The cause for the lateral displacement of the cap stones and first two 2'-6" courses of granite block appears to be some combination of the following:

1. Improper backfill material and compaction thereof, causing moisture retention and frost heaving action over the past 10 years. This would also explain some of the subsidence of the brick walk. If this backfill contained a large amount of fine material, it could also be washing out through the open joints; also causing subsidence of the brick walk.
2. The rear row of bearing piles is moderately overloaded. This could cause rotations about the longitudinal axis of the sea wall. The bottom four courses of granite block are tied together with a 12" concrete diaphragm wall which will keep them together during this rotation. The top 2 courses plus cap stone are not tied together, and would not rotate with the wall, therefore effectively displacing them relative to the bottom four courses. It should be noted that the front row of piles is underloaded and is therefore taking up the overload on the rear piles.
3. Vehicle wheel loading.
4. Any movement of the top cap and first two 2'-6" granite courses would cause the granite fragments (used to level blocks) to also move. If some of the front fragments were actually dislodged, this would promote further lateral movements and cause apparent rotation of the top cap.

The 106' section of granite seawall has clearly exhibited lateral movements to an extent that remedial action is necessary to solve the structural problems and return the wall to a proper level of esthetic serviceability and stability.

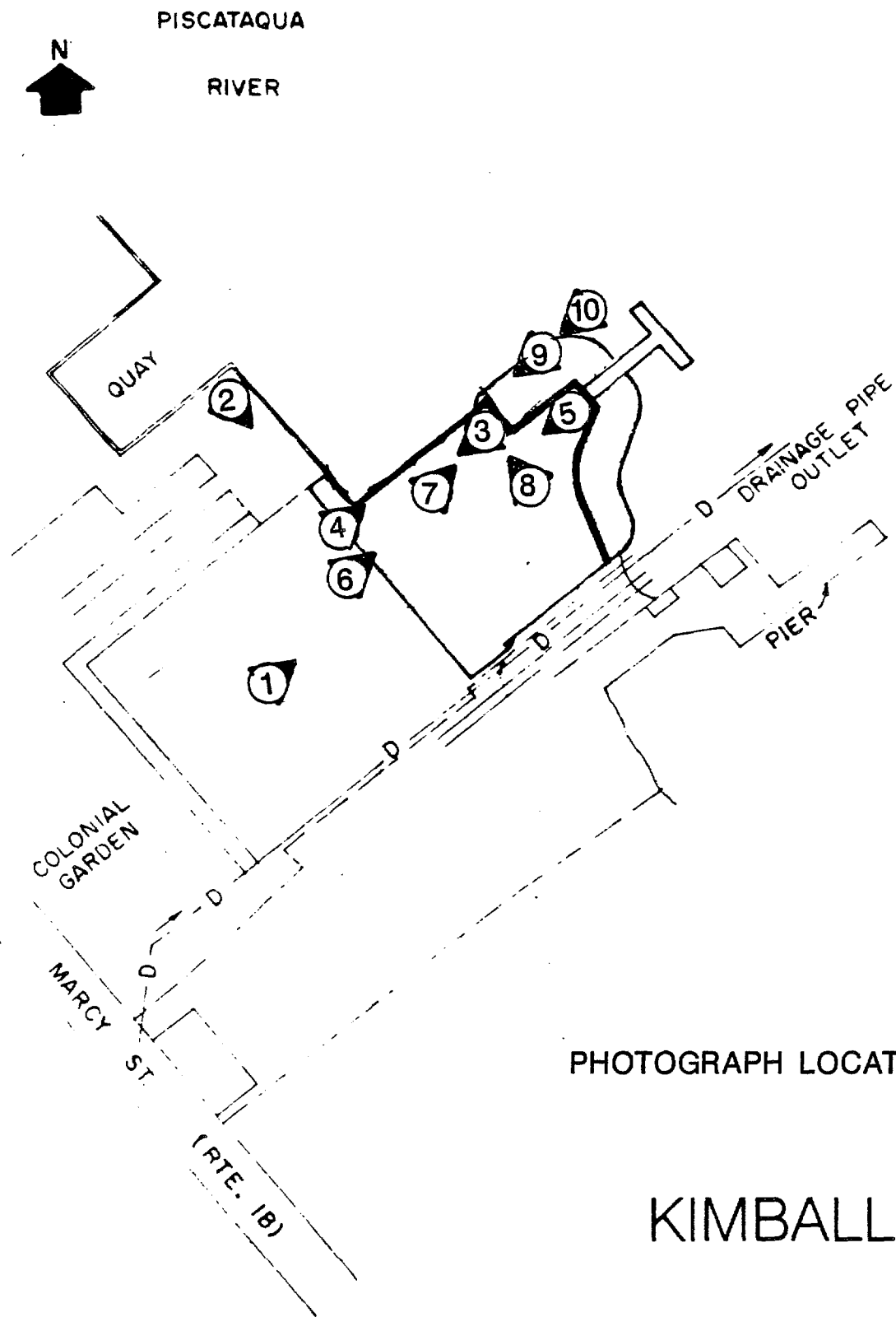
4. CONCEPTUAL REHABILITATION

The top cap stone and the first two 2'-6" granite block courses should be reseated to maintain original continuous wall batter and level elevation.

The cap stone and first two 2'-6" courses should be tied together and then tied into the bottom courses or to an independent tie back system.

A perimeter drain system should be installed into compacted free draining backfill behind the granite wall to relieve hydrostatic pressures and prevent further subsidence due to migration of fines in the backfill soil mass.

Benchmarks should be clearly established and a monitoring system developed to establish the as-built condition of the rehabilitation and measure its performance in the future. This step must be taken due to lack of available data on the existing pile foundation.



PHOTOGRAPH LOCATION PLAN

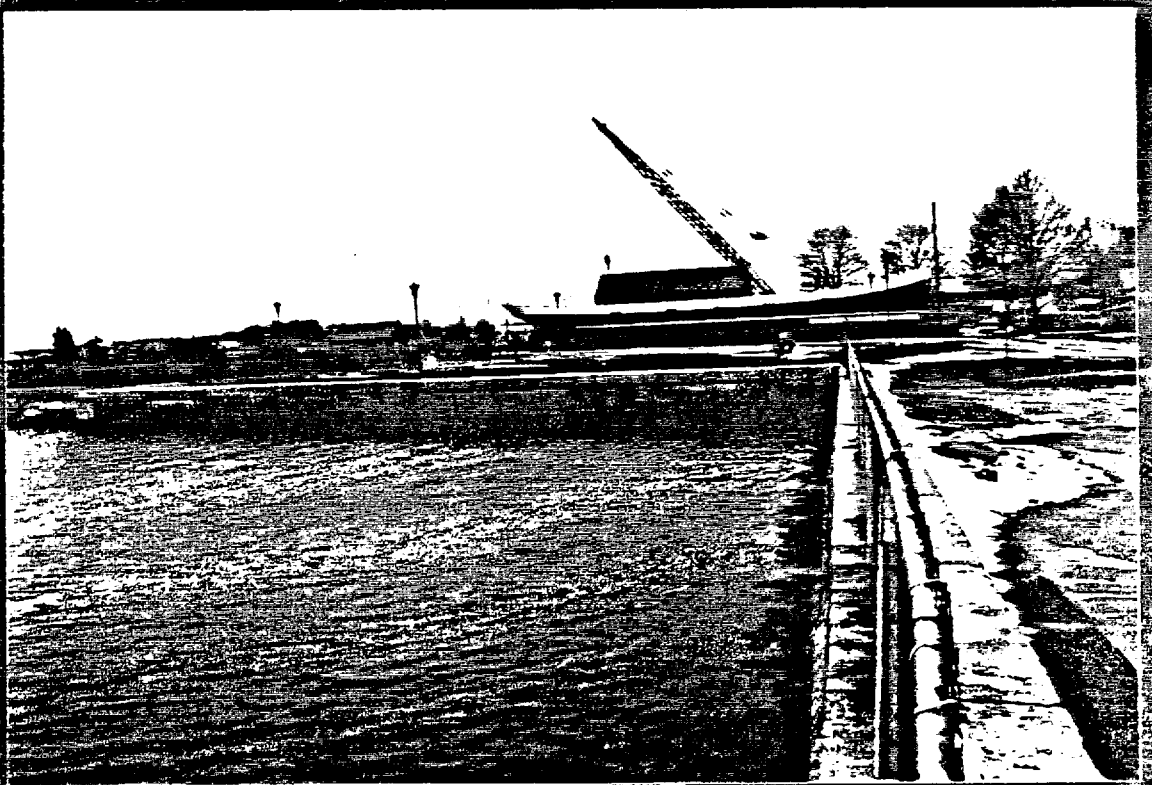
KIMBALL CHASE
company, inc.

Civil
Environmental
Engineers

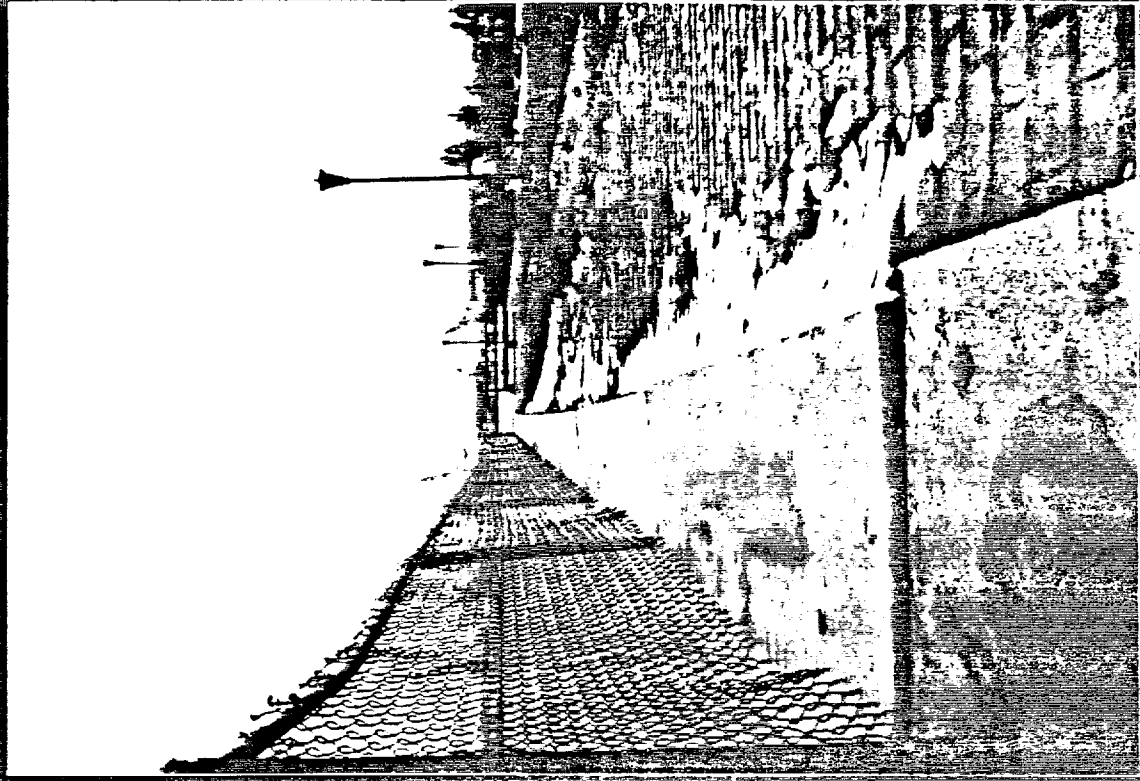
40 Bridge Street
Portsmouth
New Hampshire 03801
603-431-2520



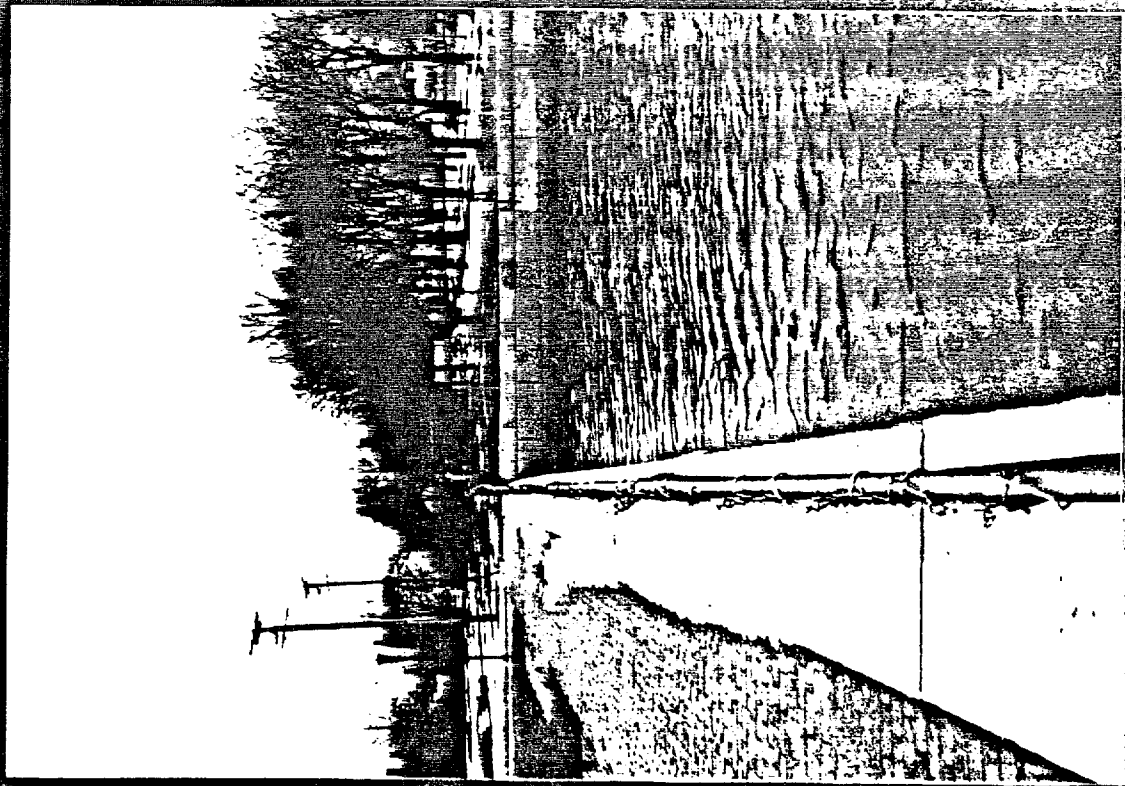
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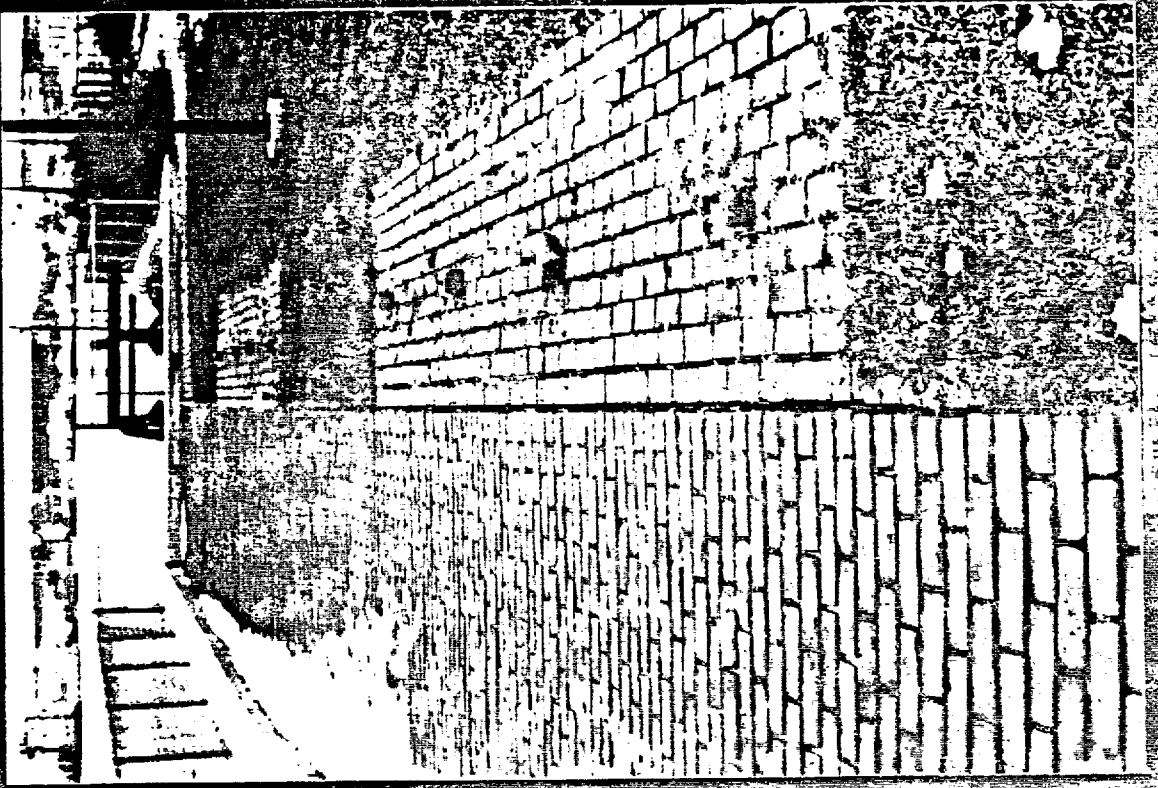
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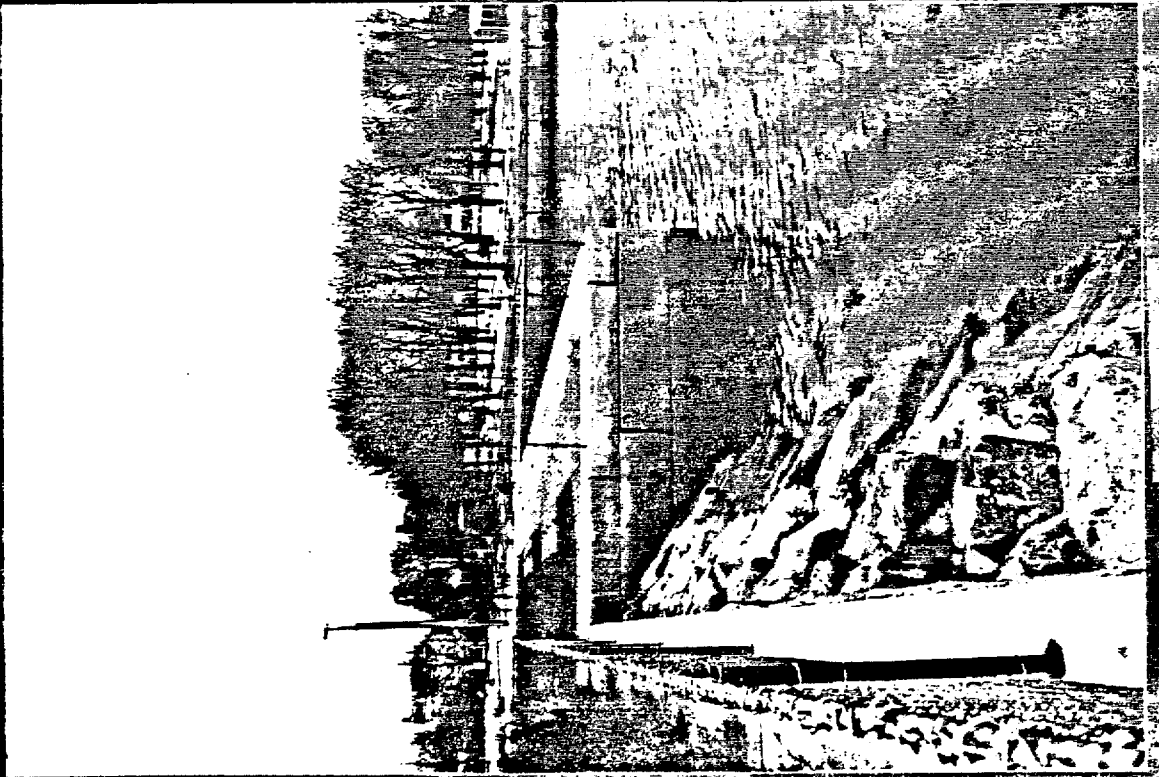
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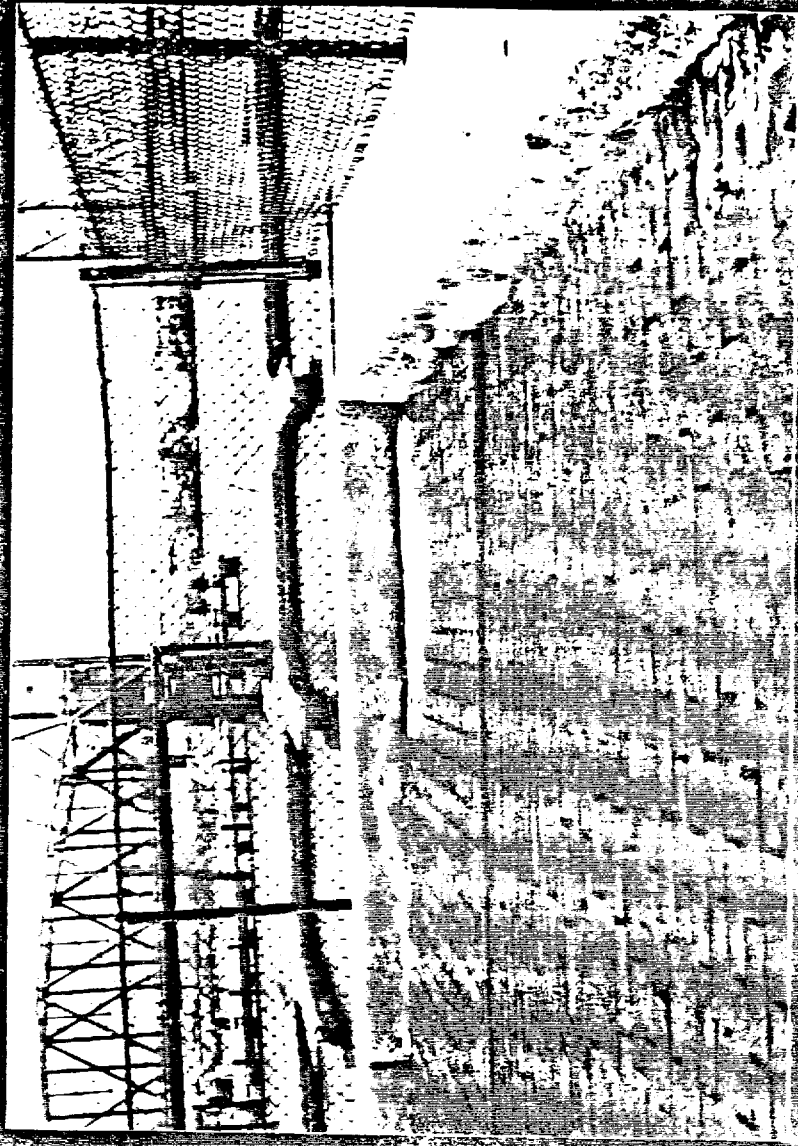
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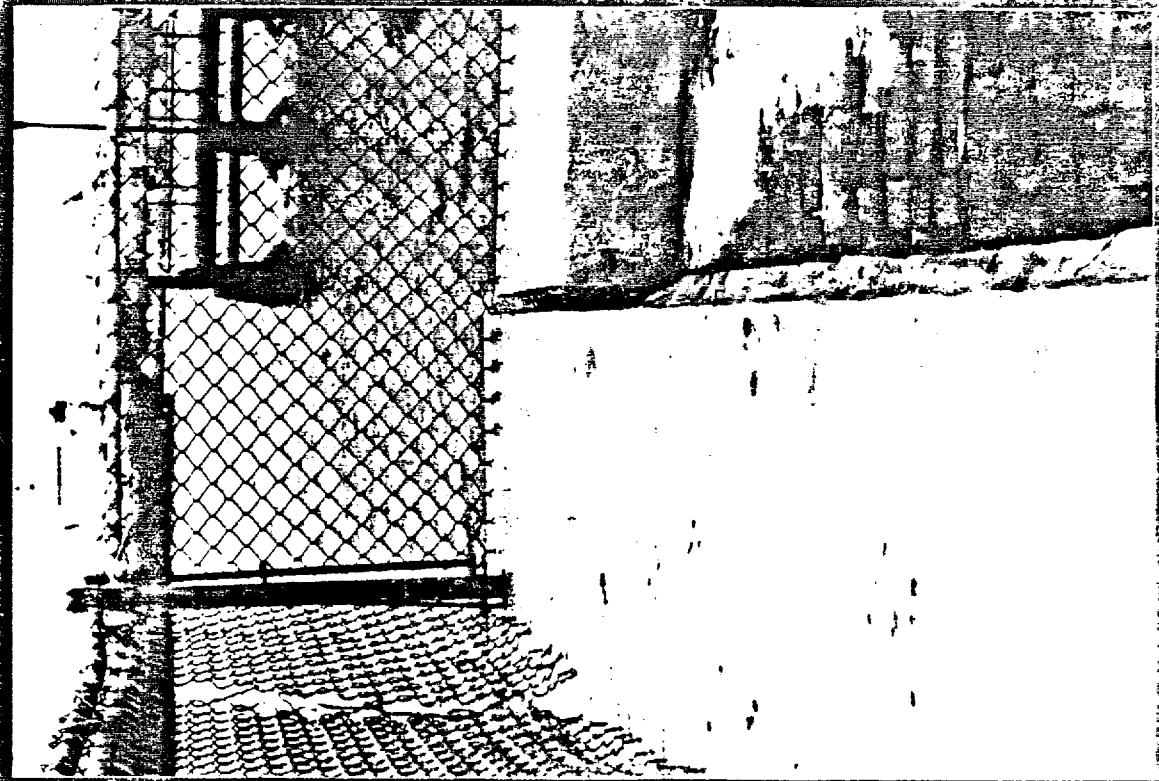
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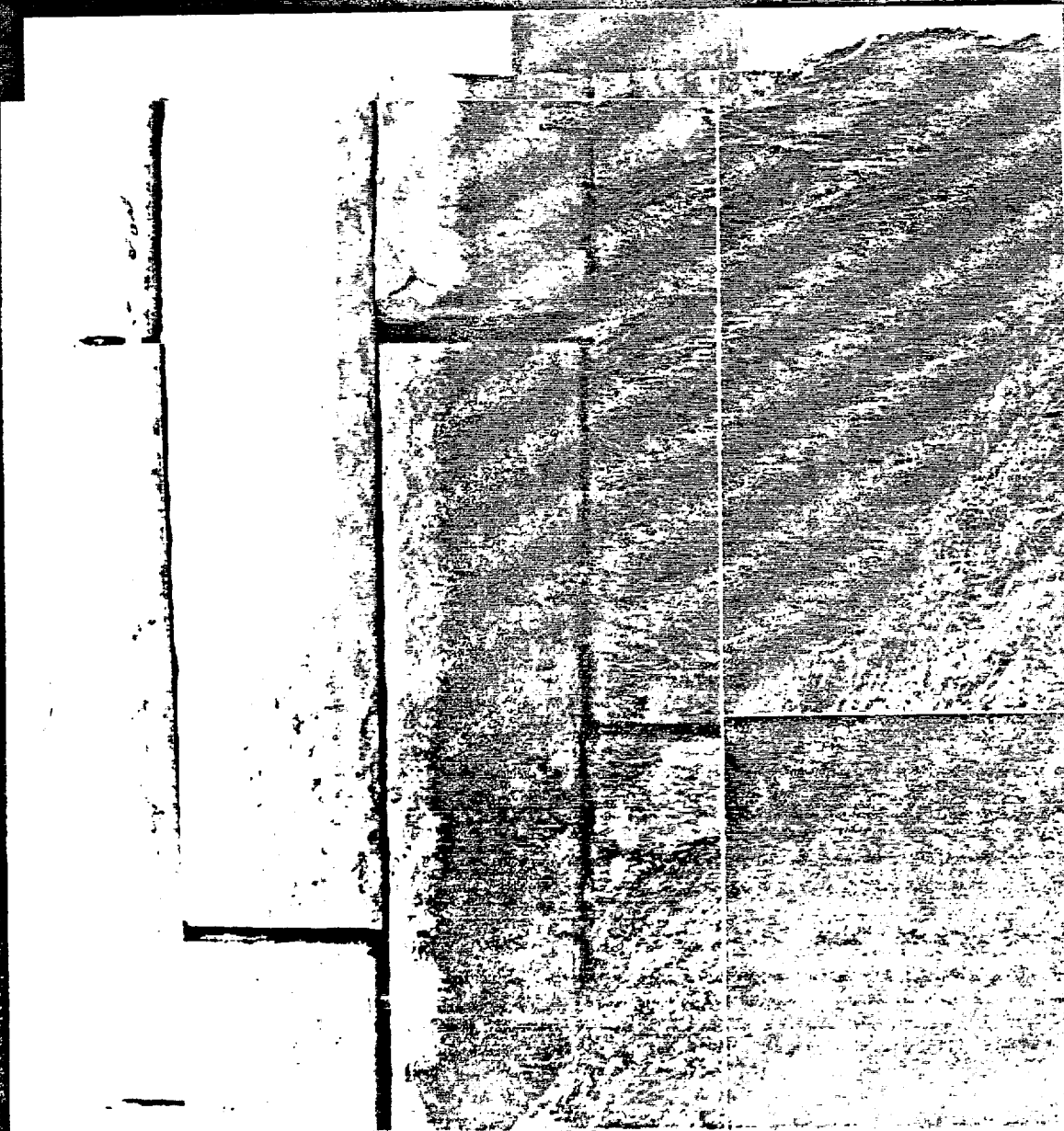
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7



110



9

SECTION 01020

COORDINATION

PART 1 - GENERAL

1.1 Description

- A. Contractor shall coordinate all work with the Trustees of the Prescott Park Trust Fund and the City of Portsmouth.

END OF SECTION

SECTION 01090
ABBREVIATIONS AND SYMBOLS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Where any of the following abbreviations are used in these Specifications, they shall have the meaning set forth opposite each.

AASHTO	American Association of State Highway and Transportation Officials
AC	Alternating Current
ACI	American Concrete Institute
ACP	Asbestos Cement Pipe
AGA	American Gas Association
AIC	Ampere Interrupting Capacity
AGMA	American Gear Manufacturers Association
AIEE (IEEE)	American Institute of Electrical Engineers (Institute of Electrical and Electronics Engineers, Inc.)
AISC	American Institute of Steel Construction
amp	Ampere
125-16	
Amer. Std.	American Standard for Cast Iron Pipe Flanges and Flanged Fittings, Class 125 (ASA B16 11960)
ANSI	American National Standards Institute
API	American Petroleum Institute
ASA	American Standards Association
ASCE	American Society of Civil Engineers
ASH & AE	American Society of Heating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWG	American or Brown and Sharpe Wire Gauge
AWWA	American Water Works Association
BOD	Biochemical Oxygen Demand
c.f.	Cubic foot
c.f.m.	Cubic Foot per Minute
c.f.s.	Cubic Foot per Second
CI	Cast Iron
CIPRA	Cast Iron Pipe Research Association
CSI	Construction Specifications Institute
c.y.	Cubic Yards
DC	Direct Current
DEP	Department of Environmental Protection
DI	Ductile Iron
DOT	Department of Transportation
EDR	Equivalent Directional Radiation
EPA	U.S. Environmental Protection Agency
Fed. Spec.	Federal Specifications issued by the Federal Supply Service of the General Service Administration, Washington, D.C.
FmHA	Farmers Home Administration
fps	Feet per Second
ft.	Feet

gal.	Gallons
gpd	Gallons per Day
gpm	Gallons per Minute
HP	Horsepower
IBR	Institute of Boiler and Radiator Manufacturers
in.	Inches
inter.	Interlock
ISA	Instrument Society of America
kva	Kilovolt-ampere
kw	Kilowatt
lb.	Pound
max.	Maximum
MCB	Master Car Builders
MGD	Million Gallons per Day
Min.	Minimum
NBS	National Bureau of Standards
NEC	National Electrical Code (Latest Edition)
NEMA	National Electrical Manufacturers Association
NEWWA	New England Water Works Association
NPT	National Pipe Thread
OS&Y	Outside Screw and Yoke
PCA	Portland Cement Association
ppm	Parts per Million
%	Percent
psi	Pounds per Square Inch
psig	Pounds per Square Inch Gauge
PVC	Polyvinyl Chloride
rpm	Revolutions per Minute
s.f.	Square Foot
SSPC	Steel Structures Painting Council
STL. W.G.	U.S. Steel Wire, Washburn and Moen, American Steel and Wire Cos., or Roebling Gauge
s.y.	Sqare Yard
TDH	Total Dynamic Head
USAS	Standards of the United States of America Standards Institute (formerly American Standards Association)
USS GUAGE	United States Standard Guage
VC	Vitrified Clay
WSP	Working Steam Pressure

END OF SECTION

SECTION 01150
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 DESCRIPTION

- A. For all items other than those to be paid for by lump sum amounts, after the work is completed and before final payment is made therefore; the Owner's Inspector shall make final measurements to determine the quantities of various items of work accepted as the basis for final settlement. The Contractor, in case of unit price items, will be paid for the actual amount of work accepted and for the actual amount of materials in place, as shown by the final measurements.
- B. All units of measurement shall be standard United States convention as applied to the specific items of work by tradition and as interpreted by the Engineer.
- C. At the end of each day's work, the Contractor's Superintendent or other authorized representative of the Contractor shall meet with the Owner's Inspector and determine and agree upon quantities of unit price work accomplished and/or completed during the work day.
- D. The Inspector will then prepare a "Daily Progress Report" which shall be signed by both the Inspector and Contractor's Representative indicating complete agreement and approval of the quantities listed.
- E. Once each month the Inspector will prepare a "Monthly Progress Summation" form from the month's accumulation of "Daily Progress Reports" which shall also be signed by both the Inspector and Contractor's Representative indicating complete agreement and approval of quantities listed.
- F. These completed forms will provide the basis of the Engineer's monthly quantity estimate upon which payment will be made. Items not appearing on both the "Daily Progress Reports" and "Monthly Progress Summation" will not be included for payment. Items appearing on forms not properly signed by the Contractor will not be included for payment.

1.2 SCOPE OF PAYMENT

- A. Payments to the Contractor will be made for the actual quantities of contract items performed and accepted in accordance with the plans and specifications. Upon completion of the construction, if these actual quantities show either an increase or decrease from the quantities given in the Proposal Form, the contract unit prices will still prevail, except as provided hereinafter.
- B. The Contractor shall accept in compensation, as herein provided, in full payment for furnishing all materials, labor, tools, equipment, and incidentals necessary to the completed work and for performing all work contemplated and embraced by the contract, also for all loss or damage arising from the nature of the work, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the work and until its final acceptance by the Engineer, and for all risks of every description connected with the prosecution of the work, except as provided herein, also for all expenses incurred in consequence of the suspension of the work as herein authorized.

- C. The payment of any partial estimate or of any retained percentage except by and under the approved final invoice in no way shall affect the obligation of the Contractor to repair or renew any defective parts of the construction or to be responsible for all damage due to such defects.

1.3 PAYMENT FOR INCREASED OR DECREASED QUANTITIES: When alterations in the quantities of work not requiring supplemental agreements, as hereinafter provided for, are ordered and performed, the Contractor shall accept payment in full at the contract price for the actual quantities of work done. No allowance will be made for anticipated profits. Increased or decreased work involving supplemental agreements will be paid for as stipulated in such agreements.

1.4 ELIMINATED ITEMS: Should any items contained in the proposal form be found unnecessary for the proper completion of the work contracted, the Engineer may eliminate such items from the contract, and such action shall in no way invalidate the contract, and no allowance will be made for items so eliminated in making final payment to the Contractor.

1.5 PARTIAL PAYMENT

- A. Partial Payments shall be made monthly as the work progresses. All partial invoices and payments shall be subject to correction in the final quantity invoice and payment.
- B. No monthly payment shall be required to be made when, in the judgement of the Engineer, the work is not proceeding in accordance with the provisions of the contract, or when, in his judgement, the total value of the work done since the last payment amounts to less than \$1,000.00.

1.6 PAYMENT FOR MATERIAL DELIVERED ON LUMP SUM PROJECTS

- A. At the discretion of the Engineer, acting upon the request of the Contractor, an invoice, accompanied by receipted bills, may be made for payment of all or part of the value of acceptable, non-perishable materials and equipment which are to be incorporated into lump sum type contracts, and which have been delivered to the site of the work or in acceptable storage places, and not used at the time of such invoice. Materials, when so paid for by the Owner, shall become the property of the Owner, and in the event of default on the part of the Contractor, the Owner may use, or cause to be used, these materials in the construction of the work provided for in the contract. The Contractor shall be responsible for any damage to, or loss of, these materials. The amount thus paid by the Owner shall go to reduce estimated amounts due the Contractor as the material is used in the work.
- B. No partial payment shall be made upon fuels, supplies, lumber, false work, or other materials, or on temporary structures of any kind which are not a permanent part of the contract.

- 1.7 FINAL PAYMENT: The Engineer shall make, as soon as practicable after the completion of the project, a final quantity invoice of the amount of work performed under the Contract and the value of such work and the Owner shall then pay the entire sum found to be due, after deducting therefrom all previous payments. All amounts to be retained or deducted under the provisions of the Contract may be held by the Owner for a period of sixty (60) days after the completion of the final quantity invoice, or until such time as the Contractor submits satisfactory evidence that all bills for labor and materials used under this Contract have been paid and all required documents submitted to the Engineer.
- 1.8 SUBSIDIARY WORK: Incidental work items for which separate payment is not measured includes the following items.
- A. Mobilization/Demobilization.
 - B. Construction Signs.
 - C. Plugging Existing Sewers and Drains.
 - D. Restoration of Property.
 - E. Cooperation with Other Contractors and Others.
 - F. Utility Crossing, unless Otherwise Paid For.
 - G. Minor Items, such as Replacement of Fences, Guard Rails, Rock Walls, etc.
 - H. Temporary Pavement and Trench Patch.
 - I. Clean Up.
 - J. Temporary Access to Businesses.
 - K. Pre Construction Videotape.
- 1.9 DESCRIPTION OF PAY ITEMS: The following sections describe the measurement and payment for Items of Work not specified in the New Hampshire Department of Public Works and Highway Specifications or Division II herein.

END OF SECTION

SECTION 01310
CONSTRUCTION SCHEDULES

Submission to Engineer

The Contractor shall be responsible for submitting to the Engineer, at least seven (7) days before the start of construction, a detailed construction schedule on a weekly basis, showing how he intends to approach the project and what he expects to have completed at the end of the work. The schedule should be in bar graph form and list the various tasks required to complete the project and the dates which these tasks will be done.

Section 01510
TEMPORARY UTILITIES

PART 1 GENERAL

1.1 DESCRIPTION

A. Work Included:

1. Provide and pay for all temporary applicable utilities required to properly perform the Work at no additional cost to the Owner including the placement and removal of the utilities.
2. Completely remove all temporary equipment and materials upon completion of the Work and repair all damage caused by the installation of temporary utilities.
3. Make all necessary applications and arrangements for electric power, light, water, telephone and other utilities with the local utility companies. Notify the local electric power company if unusually heavy loads, such as welders, will be connected.

1.2 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:

1. Obtain permits as required by local governmental authorities.
2. Obtain easements, when required, across private property other than that of the Owner for temporary power service.
3. Comply with the latest National Electrical Code.
4. Comply with all local, State, and Federal codes, laws, and regulations.

B. All temporary utilities are subject to the approval of the Engineer.

PART 2 PRODUCTS

2.1 MATERIALS

A. Electrical:

1. Provide all required facilities, including but not limited to, transformers, conductors, poles, conduits, raceways, fuses, switches, fixtures and lamps.
2. Use new or used materials adequate in capacity for the purposes intended.
3. Materials must not create unsafe conditions or violate the requirements of applicable codes.
4. Conductors:
 - a. Wire, cable or busses of appropriate type, sized in accordance with the latest National Electrical Code for the applied loads.
 - b. Use only UL approved wire.
5. Conduit:
 - a. Rigid steel, galvanized: ANSI C80.1.
 - b. Electrical metallic tubing: ANSI C80.3.
 - c. Other material approved by NEC.
6. Equipment: Provide appropriate enclosures for the environment in which used in compliance with NEMA Standards.

- B. Heating:
 - 1. When heat is required for the protection of the work, provide and install a non-hazardous type of heating apparatus, and provide adequate and proper fuel.
 - 2. Heating equipment and materials in proper condition.
- C. Water: Provide drinking water equipment and material that will prevent contamination and health hazards.
- D. Sanitary Accommodations: Shall comply with all local, State and Federal codes, laws and regulations.

PART 3 EXECUTION

3.1 PERFORMANCE

- A. Electrical:
 - 1. Provide electrical energy to:
 - a. All necessary points on the construction site so that power can be obtained at any desired point with extension cords no longer than 100 feet.
 - b. Construction site offices.
 - c. Lighting as required for safe working conditions at any location on the construction site.
 - d. Night security light.
 - e. When applicable, Owner's present facilities during the change over of electrical equipment.
 - 2. Maintain electrical energy throughout the entire construction period.
 - 3. Capacity: Provide and maintain adequate electrical service for construction use by all trades during the construction period at the locations necessary.
 - 4. Installation:
 - a. Install all work with a neat and orderly appearance.
 - b. Have all installations performed by a qualified electrician.
 - c. Modify service as job progress requires.
 - d. Locate all installations to avoid interference with cranes and materials handling equipment, storage areas, traffic areas and other work.
- B. Heating:
 - 1. Maintain a heated environment for the work at the temperature and for the length of time specified or as directed by the Engineer.
 - 2. Precaution:
 - a. Operate temporary heating apparatus in such a manner that finished work will not be damaged.
 - b. Repair all damage caused by temporary heating operations to the complete satisfaction of the Engineer.
- C. Water: Provide and maintain water for drinking and construction purposes as required for the proper execution of the Work.

- D. Sanitary Accommodations:
1. Provide and maintain sanitary accommodations for the use of the employees of the Contractor, subcontractors, and Engineer.
 2. Sanitary accommodations shall meet the requirements of all local, State and Federal health codes, laws and regulations.

END OF SECTION

SECTION 01630
SUBSTITUTIONS AND PRODUCT OPTIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. If stated in these Specifications that the Contractor may furnish or use a substitute that is equal to any material or equipment specified, he shall, promptly after the award of the Contract, apply to the Engineer for approval of such a substitute.
- B. No substitute shall be ordered or installed without the written approval of the Engineer who shall be the judge of equality.

1.2 SUBMITTALS

- A. Submit a written application for approval completely describing the proposed substitution.
- B. Submit, when requested by the Engineer:
 - 1. Manufacturer's catalog data.
 - 2. Illustrations.
 - 3. Specifications.
 - 4. Samples.
 - 5. Other material that may be required to determine equality.

1.3 CRITERIA

- A. The following criteria will be used by the Engineer in determining the equality of proposed substitutions:
 - 1. Adaptability to the design.
 - 2. Functional performance.
 - 3. Appearance when applicable.
 - 4. Quality of materials.
 - 5. Strength of materials.
 - 6. Complexity, frequency and cost of maintenance.

1.4 RESULTING CHANGES

- A. If proposed substitutions are judged as being acceptable, make all changes to structures, buildings, piping, electrical, and other items necessary to accommodate the substitutions, at no additional cost to the Owner.
- B. Whenever it may be written that an equipment manufacturer must have a specified period of experience with his product, equipment which does not meet the specified experience period can be considered if the equipment supplier or manufacturer is willing to provide a bond or cash deposit for the duration of the specified time period which will guarantee replacement of that equipment in the event of failure.

1.5 ENGINEERING SERVICES

- A. If Contractor requests substitutions which require design or other engineering services, the services will be provided by the Engineer.
- B. The cost of engineering services for substitutions shall be at the expense of the Contractor.

END OF SECTION

SECTION 01710
PROJECT CLEANING

PART 1 GENERAL

1.1 DESCRIPTION

A. Work Included:

1. Maintain premises and public properties free from accumulations of waste, debris, and rubbish caused by operations.
2. At completion of work, remove waste materials, and clean all sight-exposed surfaces. Leave project clean and ready for use.

1.2 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies: Conduct cleaning and disposal operations in accordance with all applicable local and state laws, ordinances, and code requirements.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.
- B. Use cleaning materials only on surfaces recommended by cleaning material manufacturers.

PART 3 EXECUTION

3.1 PERFORMANCE

A. Cleaning during construction:

1. Execute cleaning operation to ensure that buildings, grounds, and public properties are maintained free from accumulations of waste materials and rubbish.
2. Entirely remove and dispose of material or debris during the progress of the work that has washed into or has been placed in watercourses, ditches, gutters, drains, catch basins, or elsewhere as a result of the Contractor's operations.
3. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
4. At reasonable intervals during the progress of work, clean the site and dispose of waste materials, debris, and rubbish.
5. Clean interiors of buildings, when applicable, prior to finish painting, and continue to clean on an as-needed basis until buildings are ready for occupancy.
6. Handle materials in a controlled manner with as few handlings as possible. Do not drop or throw material from heights.
7. When applicable, schedule cleaning operations so that dust and other contaminants resulting from the cleaning process will not fall on wet, newly painted surfaces.

SECTION 01810

PROJECT RECORD DOCUMENTS

Part 1 -General

1.1 Description

- A. Work Included:
 - 1. Keep accurate record documents for all additions, substitutions of material, variations of work and any other additions or revisions to the Contract.
- B. Related Work Specified Elsewhere:
 - 1. Shop Drawings, Project Data and Samples are specified in "General Conditions".

1.2 Maintenance Of Documents

- A. Maintain at job site, one copy of:
 - 1. Contract Drawings
 - 2. Specifications
 - 3. Addenda
 - 4. Reviewed Shop
 - 5. Change Orders
 - 6. Any other modifications to the Contract
 - 7. Field Test Reports
- B. Store documents in approved files and racks apart from documents used for construction.
- C. File documents in a logical manner indexed for easy reference.
- D. Maintain documents in clean, dry, legible condition.
- E. Do not use record documents for construction purposes.
- F. Make documents available at all times for inspection by the Architect/Engineer and Owner.

1.3 Recording

- A. Label each document "PROJECT RECORD" in large high printed letters.
- B. Keep record documents current and do not permanently conceal any work until required information has been recorded.
- C. Contract Drawings Legibly mark to record actual construction:
 - 1. Depths of various elements of foundation in relation to survey data.
 - 2. Horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements.
 - a. Include all water, sewer, steam, air, instrumentation and fuel piping systems and all electrical and communications circuits including all direct burial cables.
 - b. Whenever any existing utility line is uncovered in the course of excavation for new utility installation, record location dimensions for such lines.
 - c. Method of location and recording shall have prior approval of the Architect/Engineer.

3. Location of house service connection points (when applicable) with any utility (water, sewer, electrical, telephone, etc.) and the location of capped or plugged ends of these same house service lines.
 - a. Locations shall be recorded by accurate "swing ties" or other methods approved by the Architect/Engineer.
 - b. Method of location and recording shall have prior approval of the Architect/Engineer.
4. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 - a. Electrical equipment such as conduits, piping, instrumentation located in slabs, walls and ceilings and to include approximate locations and routing.
 - b. Schematic diagram of actual electric conduit or instrument tubing routing between equipment and supply.
5. Field changes of dimension and detail and changes made by Change Order or Field Order.
6. Details not on original Contract Drawings.
- D. Specifications and Addenda - Legibly mark up each section to record:
 1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
 2. Changes made by Change Order or Field Order.

1.4 Submittals

- A. At the completion of the project, deliver record documents to the Architect/Engineer.
- B. Accompany submittal with transmittal letter, in duplicate, containing:
 1. Date, project title and number.
 2. Contractor's name and address.
 3. Title and number of each record document with certification that each document is completed and accurate.
 4. Signature of Contractor, or his authorized representative.
- C. Failure to record these locations on the Project Record Drawings shall result in non-approval of the final payment of the Contract and/or if contract time (as specified in accordance with the Standard General Conditions of the Construction Contract) has elapsed, this shall be grounds for the enactment of the liquidated damages as specified.

END OF SECTION

DIVISION 2

SITE WORK

Scope

The scope of this Division covers the general site work and related provisions of the Contract.

Contents of Division

Section No.

Section Title

02201	Excavation, Filling, and Grading
02223	Trench Excavation - Earth
02401	Dewatering
02648	Lawns
02653	Filter Fabric
02660	Erosion Control
02694	Footing Drains
02701	Sidewalks - Brick
02901	Granite Blocks

SECTION 02201

EXCAVATION, FILLING & GRADING

PART 1 - GENERAL

1.1 References

Particular attention is drawn to Division 1., General Requirements, all provisions of which are as fully applicable to work done under this Section as if repeated herein.

1.2 Description

- A. Provide all labor, materials, equipment and supervision necessary to complete the work specified in this Section as shown on the Contract Drawings or both but not limited to the following.
 - 1. Excavation, filling, backfilling, grading and subgrade preparation for concrete work.

1.2 Quality Assurance

- A. Soil testing and inspection service:
 - 1. Owner will provide soil testing and field observation of earthwork procedures for quality control testing during earthwork operations.

1.4 Submittals

- A. Contractor shall submit a 25 pound sample to an approved testing laboratory for each type of material to be brought in from off site for grain size distribution analysis. Test results shall be submitted at least two (2) weeks prior to anticipated use. All materials shall conform with the appropriate section of the State of New Hampshire Department of Public Works & Highways Standard Specifications and Paragraph 2.2 of this Section.

1.5 Job Conditions

- A. Site information: Borings done prior to initial construction in 1975 have been supplied (Exhibit 02201A). Data on indicated subsurface conditions are not intended as representations or warrants of continuity of such conditions between soil borings. It is expressly understood that the Owner will not be responsible for interpretations of conclusions drawn therefrom by Contractor. Data are made available for the convenience of Contractor.
 - 1. Additional test borings and other exploratory operations may be made by Contractor at not 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 other utilities be encountered during excavation, consult the Engineer immediately for directions as to procedure. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.
 - 2. 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.
- C. Use of explosives:
 - 1. No explosives shall be used for any purpose.
- D. Protection of persons and property: Barricade open excavations occurring as part of this work and post with warning lights and signs. Operate warning lights during hours from dusk to dawn to 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.

1.6 Disturbance Of Excavated And Filled Areas During Construction

- A. The Contractor shall take the necessary steps to avoid disturbance of subgrade during excavation and filling operations. Methods of excavation and filling operations shall be revised as necessary to avoid disturbance of the subgrade, including restricting the use of rubber tired vehicles or other equipment in areas where subgrade is above optimum moisture level and will become disturbed due to movement of vehicles.
- B. All excavated or filled areas disturbed during construction that will not meet compaction and material requirements as specified herein shall be removed and replaced with granular backfill (see item 2.2A). Costs of removal of disturbed material and recompaction with granular backfill shall be borne by the Contractor. Contractor shall be compensated for the cost of disposal of unsuitable material and supplying of granular backfill material on a unit cost basis (See Item No. 1 Section 00022).

PART 2 - PRODUCTS2.1 Definitions

- A. All sieve analysis for conformance of on-site and off-site fill materials to be used in the Work shall conform to ASTM D-422. In addition to the requirements of this ASTM designation all materials beyond the #60 sieve shall be done by means of a mechanical wet sieve analysis.

2.2 Solid Materials

- A. Granular Backfill: Material for Granular Backfill base shall be a sandy gravel, free of organic material, trash, snow, ice, frozen soil and other objectionable material and shall be well graded within the following limits.

<u>SIEVE SIZE</u>	<u>PERCENT FINER BY WEIGHT</u>
3"	100
1/2"	50-85
#4	40-75
#40	10-35
#200	0-10

On-site material may be used for granular backfill provided the material conforms to the requirements of the specifications for this type of backfill.

- B. Coarse gravel: Material for coarse gravel shall be free of organic material, trash, snow, ice, frozen soil, and other objectional material and shall fall within the following limits:

<u>SEIVE SIZE</u>	<u>PERCENT FINER BY WEIGHT</u>
2"	100
1/2"	75 - 90
#4	0

PART 3 - EXECUTION3.1 Inspection

- A. Examine the areas and conditions under which excavating, filling and grading are to be performed and 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 an acceptable manner.

3.2 Excavation

- A. Excavation consists of removal and temporary storage of materials encountered when establishing required grade elevations.
- B. Perform all excavation of every description and of whatever substances encountered to the depths and extent indicated for the proper installation of the work.
- C. Excavate to the exact depth required for all drainage systems. Drainage trenches shall be over excavated to accommodate pipe bedding as specified hereinafter.
- D. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Engineer.
 - 1. Backfill and compact unauthorized excavations with materials as specified for authorized excavation of same classification, unless otherwise directed by Engineer. This work shall be completed at no additional cost to the Owner.
- E. Stability of excavation: Slope sides of excavation to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible either because of space restrictions or stability of material excavated.
 - 1. Maintain side and slopes of excavation in a safe condition until completion of backfilling.
 - 2. Contractor is responsible for assessing influence of tidal fluctuations on excavations.
- F. Shoring and bracing: Provide adequate shoring and bracing, such as sheet piling, uprights, stringers and cross-braces, in good serviceable condition.
 - 1. Trench shoring and bracing shall comply with local codes and authorities having jurisdiction.

2. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
- G. Dewatering: Prevent surface water and subsurface or ground water from flowing into excavations or onto any work and from flooding project site and surrounding area.
1. Do not allow water to accumulate in excavations. Remove water to prevent softening of subgrades and soil changes detrimental to stability of subgrades. Provide and maintain pumps, sumps, suction and discharge lines and other dewatering system components necessary to convey water away from excavations.
- H. Material storage: Stockpile satisfactory excavated materials and granite blocks until required for backfill and resetting near edge of stockpile shall be a minimum of 30' from granite wall. Place, grade and shape stockpiles for proper drainage.
- I. Excavation for structures: Conform to elevations and dimensions 0.10' and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction required and for inspection.
1. In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete is placed. Trim bottoms to required lines and grades to leave solid base to receive concrete.
 2. If requested by the Engineer, the Contractor shall overexcavate approximately 6" for footings and place a working mat of crushed stone to prevent subgrade disturbance of material in place or in fill material.
- J. Excavation for pavements: Cut surface under pavements to comply with cross-sections, elevations and grades as shown.
- K. Excavation for ditches: Cut ditches to cross-sections and grades as shown. Deposit excavated materials to prevent cave-ins or material falling or sliding into ditch. Keep ditches free of debris until final acceptance of the work.
- L. Excavation for utilities: The trench for the pipe shall be excavated to the required line and grade and of sufficient width to permit thorough compacting and tamping of the fill material under the haunches and around the pipe. In general, utility trenches

shall be excavated to a point 6 inches below the bottom of the utility line to accommodate bedding material as specified hereinafter. Soft or unsuitable material encountered below the normal bedding line of the pipe shall be removed as directed, replaced with selected material, gravel or crushed stone and thoroughly compacted. The bottom of the trench shall be shaped to conform to the curvature of the pipe. This bed shall also be excavated to accommodate the bells of pipes.

- M. Removal of unsatisfactory soil materials: Excavate unsatisfactory soil materials encountered that extend below required elevations and beyond required excavation to additional depth directed by the Engineer.
1. Costs of such additional excavation, shall be borne by the Contractor.
 2. Material that is above or below optimum moisture for compaction of the particular material on place as determined by the Soils Representative and is disturbed by the Contractor during construction operations so that proper compaction cannot be reached shall not be construed as unsuitable bearing materials or unsatisfactory soil materials. This material shall be removed and replaced with lean concrete or compacted gravel fill at no additional charge.
- N. Cold weather protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

3.3 COMPACTION

- A. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification.
- B. Percentage of maximum density requirements: Provide not less than following percentages of maximum density of soil material as determined by ASTM Test D1557 Method C, latest revision (modified proctor).
1. Lawn or Unpaved Areas: Compact top 6" of subgrade and each layer or backfill or fill material to a density approximating that of the adjacent undisturbed material but to a minimum of 90%.
 2. Walkways: Compact top 6" of subgrade to 96% and each layer of backfill material to 96% maximum density.

- C. Moisture control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to obtain optimum moisture content.
1. Remove and replace or scarify and air dry, soil material that is too wet to permit compaction to specified density.
 - a. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing, until moisture content is reduced by a satisfactory value, as determined by moisture-density relation tests.

3.4 Backfill

- A. General: Place acceptable soil material in layers to required subgrade elevations for each area classification listed below.
1. Adjacent to granite seawall and under walkways, and landscaped areas, fill material shall be granular backfill.
- B. Backfill excavations as promptly as work permits, but not until completion of the following.
1. Acceptance by Engineer of construction below finish grade, including, but not limited to:
 - Concrete has reach 75% of 20 day strength.
 - Subsurface drainage system installed to manufacturer's recommendations.
 - Granite blocks are properly grouted into place to be level and plumb with proper batter.
 2. Inspection, testing, approval and recording locations of underground utilities.
 3. Removal of concrete framework.
 4. 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.
 5. Removal of trash and debris.
- C. Ground surface preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions and deleterious materials from ground surface prior to placement of fills.

- D. Placement and compaction: All compacted fill shall be placed in layers having a maximum loose layer thickness of 18 inches. Each layer shall be systematically compacted to the density specified hereinbefore.
1. Compaction equipment in confined areas shall be accomplished by hand operated vibratory equipment or mechanical tampers as approved by the Soils Inspector.
 2. Fill layers shall not be left in an uncompacted state at the close of a day's operations. Prior to terminating operations for the day, the final layer of fill, after compaction, shall be rolled with a smooth-wheeled roller to eliminate ridges of soil left by tractors, trucks and compaction equipment. Slope all fill to drain at termination of work day.
 3. The Contractor shall not place a layer of compacted fill on snow, ice or soil that was permitted to freeze prior to compaction. Removal of these unsatisfactory materials will be required as direct by the Soils Representative.
 4. Each lift of placed and compacted material shall be tested by the Soils Representative. Do not proceed with additional lifts until authorized by the Soils Representative. See paragraph 3.7 for requirements.

3.4 Grading

- A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
- B. Grading Under Walkways: Grade areas under walkways to slope away from granite wall at 1/16" per foot. Finish surface shall be free from irregular surface changes.
- C. Grading Outside Walkways: Grade areas outside walkways to slope away from walkways and towards catch basin at station 53 offset 17.9' right.
- D. Compaction: After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

3.5 Field Quality Control

- A. All operations under this Section of the Specification will be subject to the continuous observation of the Engineer and of a soils testing laboratory, engaged and paid directly by the Owner except as described herein. The Engineer or the laboratory will determine conformance of materials and workmanship, particularly compaction, to the requirements of this Specification.
 - 1. The laboratory shall make such tests of materials and compaction as the Engineer directs. Costs of such test shall be borne by the Contractor only when they indicate noncompliances of materials or compaction to the requirements of this Specification. Cost of tests shall be borne by the Owner when they indicate compliance of materials or compaction to the requirement of the Specification.
 - 2. The laboratory will defer testing of an area until the Contractor states that he has reached the specified compaction on the particular area. The laboratory will make a reasonable number of tests or visual examinations of materials proposed for fill at no charge to the Contractor, but the Owner reserves the right to make charges for such tests where Contractor repeatedly proposed marginal materials for test or examination.
 - 3. Areas for which tests indicate insufficient compaction shall be re-compacted and retested until the areas conform to the requirement of Specification.

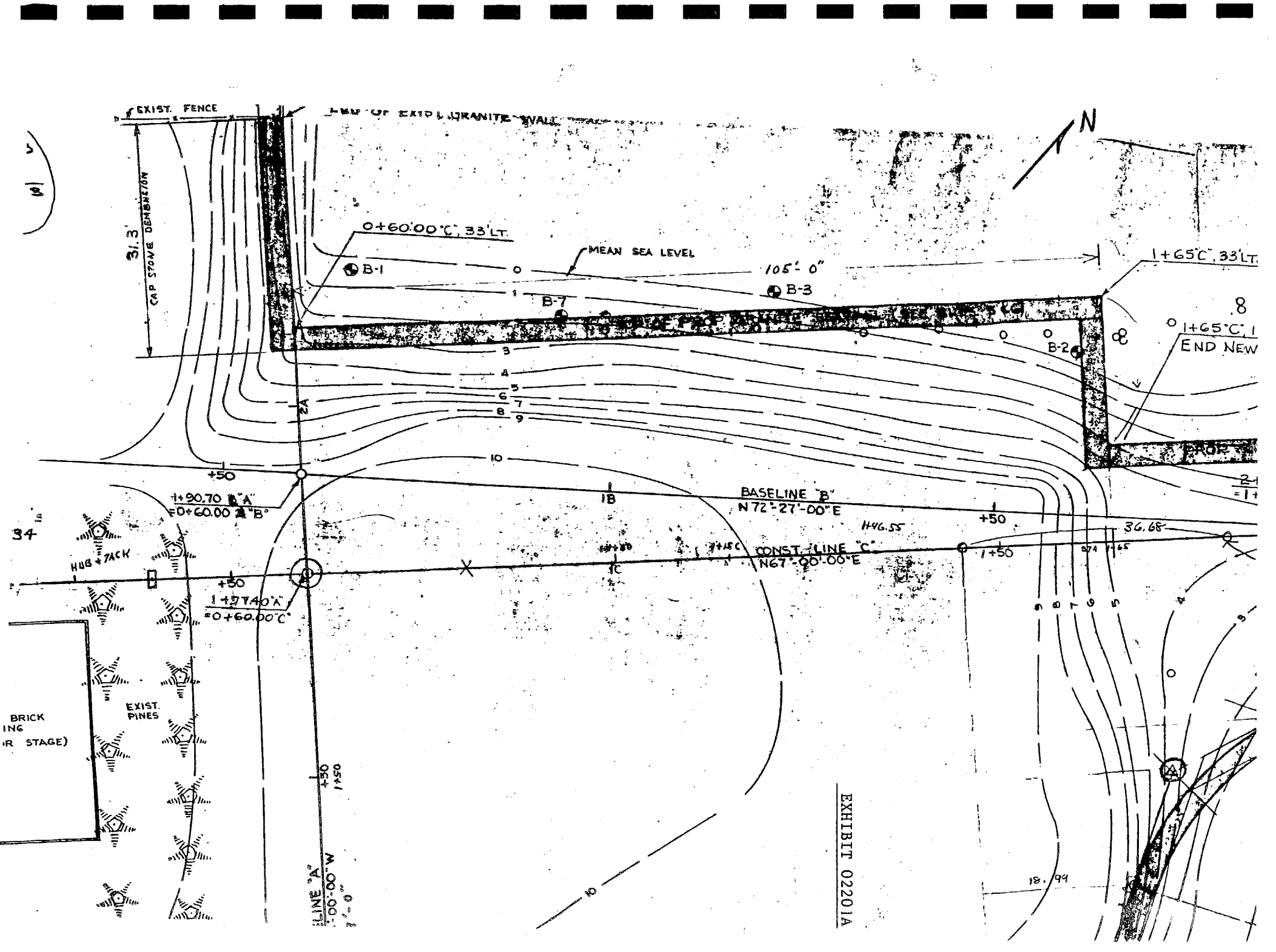
3.6 Maintenance

- A. Protection of graded areas: Protect newly graded areas from traffic and erosion and keep free of trash and debris.
 - 1. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerance.
- B. Reconditioning compacted areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

3.7 Disposal Of Excess And Waste Materials

- A. Removal to designated areas on Owners's property:
 - 1. Remove excess materials, including excavated backfill material and unsuitable material from the Owner's property and legally dispose of it.

END OF SECTION



10

34

EXIST. FENCE

31.3'
CAP STONE DEMONSTRATION

1-MY OF EXIST. GRANITE WALL

0+60.00'C, 33 LT.

MEAN SEA LEVEL

105° 0"

B-1

B-7

B-3

1+65'C, 33 LT.

1+65'C, 1
END NEW

1+90.70 B'A
0+60.00 A'B°

1+37.40'A
0+60.00'C

BASELINE B'
N72°27'00"E

CONST. LINE C'
N67°00'00"E

146.55

36.68

BRICK LING
(R STAGE)

EXIST. PINES

LINE A'
S. 00° 00' W.
0.00-00.00'

EXHIBIT 02201A

N

1

GRD. EL. 0.3

0'		
1'		5
		1
		0
		1
		0
	BLACK MUCK, SILT & CLAY	0
		2
		3
		3
		10
		8
13'		24
		49
		54
	SILT & CLAY	75
		87
		103
		67
22'		100
	FINE SAND	83
		91
25'		

BOTTOM OF HOLE

2

GRD. EL. -1.1

0'		
1'		10
		58
		1
		3
		0
		0
		0
	BLACK MUCK, STONES, WOOD, SILT & CLAY	127 (WOOD)
		15
		1
		0
		0
		9
15'		3
		14
		11
		16
		12
		14
		26
	SILT & CLAY	29
		38
		41
		57
		45
29'		
		70
		73
	FINE SAND	114
		109
		127
35'		

BOTTOM OF HOLE

3

GRD. EL. -1.4

0'		
1'		19
		8
		0
		0
		1
	BLACK MUCK, STONES, SILT & CLAY	2
		0
		0
		0
		1
		3
		10
14'		16
		19
		14
		14
	SILT & CLAY	18
		23
		27
		24
		22
		31
27'		43
		47
	FINE SAND	58
		79
		111
33'		

BOTTOM OF HOLE

NOTE:
 FIGURES IN RIGHT HAND COLUMN INDICATE
 NUMBER OF BLOWS REQUIRED TO DRIVE A
 2" SAMPLE SPOON ONE FOOT, USING 140 LB.
 WEIGHT FALLING 30 INCHES.

7

GRD. EL. 0.8

0'		
1'		3
		4
		1
		7
		32
		5
		0
		0
		1
		0
		4
		1
14'		8
		17
		17
		19
		23
		20
		21
		25
		31
25'		39
		43
		51
		114
		98
30'		

BOTTOM OF HOLE

BLACK MUCK,
WOOD, BRICK,
STONES, SILT
& CLAY

SILT & CLAY

FINE SAND

SECTION 02223
TRENCH EXCAVATION - EARTH

PART 1 - GENERAL

1.1 Description

A. Work Included:

1. Trench excavation work in earth includes the removal of sand, gravel, existing sewers and manholes, ashes, loam, clay, swamp muck, trolley tracks, soft or disintegrated rock or hard pan, stumps, existing sewers and manholes which can be removed with a backhoe, or a combination of such materials, and boulders measuring less than one cubic yard for the installation of pipes and appurtenant structures.
2. All trench excavation shall be classed as earth or ledge.

B. Related Work Specified Elsewhere (When Applicable):

1. Traffic regulation is specified in Division 1.
2. Clearing, removal and replacement of paving, trench excavation - ledge, material, manholes, and catch basins, when applicable, are specified in the appropriate Sections in this Division.
3. Pipe and pipe fittings, valves, gates, and hydrants, when applicable, are specified in this Division.

1.2 Job Conditions

A. Utilities:

1. The locations of known buried water lines, sewer lines, telephone cables, storm drains, culverts, gas mains, electric conduits, and other utilities are shown on the Drawings. No guarantee is made as to the correctness of the locations shown and to the completeness of the information given.
2. Discontinue excavation by machinery when the excavation approaches pipes, conduits, or other underground structures of which the approximate locations are known. Use manual excavation methods to locate the obstructions.

B. Existing Structures;

1. Perform excavation in such a manner that will prevent any possibility of undermining and disturbing the foundations of any existing structures and any work previously completed under this Contract.
2. Where existing buildings and other structures are in close proximity to the proposed construction, exercise extreme caution and utilize sheeting, bracing, and whatever other precautionary measures that may be required.

C. Repairing Damage: Repair, or have repaired, all damage to existing utilities, structures, lawns, other public and private property which results from construction operations, at no additional expense to the Owner, to the complete satisfaction of the Engineer, the utility company and the property owner.

PART 2 - PRODUCTS2.1 Materials

- A. The Contractor shall not have any right of property in any suitable materials taken from any excavation. Do not remove any such materials from the construction site without the approval of the Engineer. This provision shall in no way relieve the Contractor of his obligations to remove and dispose of any material determined by the Engineer to be unsuitable for backfilling.
- B. Unsuitable Material:
1. If, in the opinion of the Engineer, the material encountered above the indicated grade shown on the Drawings for excavation is unsuitable material, remove the material to the widths and depths as directed by the Engineer. Replace this material as specified in the "Backfilling, Compaction, Control and Testing" Section of this Division.
 2. If, in the opinion of the Engineer, the material encountered at or below the indicated grade shown on the Drawings for excavation is unstable material, remove the material to the full width of the trench and to a minimum depth of 12-inches below the pipe. Replace this material with thoroughly compacted, suitably screened gravel or crushed stone bedding material.
 3. All excavated materials designated by the Engineer as unsuitable shall become the property of the Contractor and disposed of at locations acceptable to or designated by the Owner, at no additional cost to the Owner.
- C. Embankment Material: Obtain prior approval and instructions from the Engineer prior to undertaking the excavation for pipe placement of any fill material that has been in an embankment less than one year.

PART 3 - EXECUTION3.1 Performance

- A. General:
1. Unless otherwise specifically directed or permitted by the Engineer, begin excavation at the low end of sewer lines and proceed upgrade.
 2. Perform excavation for sewers and drains in a logical sequence.
- B. Amount of Excavation:
1. Trench Width: As shown on the Drawings.
 2. Trench Depth: As shown on the Drawings.
 3. Open Excavation:
 - a) The extent of open excavation shall be controlled by prevailing conditions.
 - b) Open excavation shall, at all times, be confined to the limits prescribed by the Engineer.
 4. Unauthorized Excavation:
 - a) Backfill to the specified grade any excavation beyond the limits stated above and as shown on the Drawings (unless specifically ordered by the Engineer) with thoroughly compacted crushed stone or screened gravel.
 - b) Backfilling unauthorized excavation shall be at no additional cost to the Owner.

Part 3 - Execution (Continued)

- C. Shoring and Bracing: As the excavation progresses, install such shoring and bracing necessary to prevent caving and sliding and to meet the requirements of the State and OSHA safety standards.

END OF SECTION

SECTION 02401

DEWATERING

PART 1 - GENERAL

1.1 Description

- A. Work Included: Furnish, operate and maintain dewatering equipment for the control, collection and disposal of ground and surface water entering trenches and excavations.
- B. Related Work Specified Elsewhere (When Applicable): Trench excavation - earth, trench excavation - ledge, structural excavation, and backfilling, compaction, control and testing are specified in the appropriate Sections in this Division.

PART 2 - PRODUCTS

2.1 Materials

- A. Provide, operate, and maintain a dewatering system to remove all water from excavations and trenches containing pumps, drains, wellpoints, piping and any other facilities necessary to keep the excavations and trenches free of water, including spare units available for immediate use in the event of equipment breakdowns.

PART 3 - EXECUTION

3.1 Performance

- A. General:
 - 1. Keep excavations and trenches dry until the structures, pipes, and appurtenances to be build therein have been completed to such an extent that they will not be damaged.
 - 2. Perform dewatering work when necessary at no additional cost to the Owner.
- B. Disposal of Water:
 - 1. Dispose of water pumped or drained from the construction site in a suitable manner to avoid public nuisance, injury to public health, damage to public and private property, and damage to the work completed or in progress.
 - 2. Provide suitable temporary channels for water that may flow along or across the construction site.
- C. Damage:
 - 1. All damage resulting from the dewatering operations, or the failure of the Contractor to maintain the work in a suitable dry condition shall be repaired by the Contractor, to the satisfaction of the Engineer, at no additional cost to the Owner.

- D. Cofferdams:
1. Design, construct, maintain, and remove cofferdams where necessary for the dewatering, control, and diversion of water to keep excavations and trenches free of water.
 2. Design and construct cofferdams to withstand all imposed loads to prevent injury to persons and property. Construct cofferdams to depths to permit a reasonable change in depths of the work, of sufficient height to prevent flooding, and of such dimensions to give sufficient clearance for construction and inspection.
 3. Remove cofferdams, including all sheeting and bracing, after the completion or permanent construction.
- E. Temporary Underdrains:
1. When necessary, lay temporary underdrains in the excavation.
 2. Excavate trenches to suitable dimensions to provide space for the underdrains and surrounding gravel.
 3. Install underdrains a distance of at least 3 inches below the bottom of the pipe or structure and the top of the bells of the underdrain pipes, unless otherwise permitted by the Engineer.
 4. Underdrain pipe shall be vitrified clay, concrete or P.V.C. pipe of standard thickness. Sewer pipe of the qualify known as "seconds" will be acceptable.
 5. Entirely surround the underdrain and fill the space between the underdrain and the pipe or structure with screened gravel or crushed stone.
 6. Compact the gravel or crushed stone, if necessary, and leave the surface suitable for laying the pipe or building the structure.
- F. Wellpoint System:
1. If required, dewater the excavations and trenches by an efficient drainage wellpoint system to drain the soil and prevent saturated soil from flowing into the excavated area.
 2. Use wellpoints designed for dewatering work.
 3. Use pumping units designed to be used with wellpoints, capable of maintaining high vacuums, and capable of handling large volumes of air and water at the same time.

End Of Section

SECTION 02648

LAWNS

PART I - GENERAL

1.1 Description

- A. Work Included - Perform the following items of work required to complete the work of this Section, as shown on the Drawings and specified herein.
 - 1. Spread loam and establish lawns in all areas where excavation or temporary stockpiles have destroyed lawns.
- B. Related Work Specified Elsewhere:
 - 1. Contractor shall coordinate this work with all work in related Sections of this specification.

1.2 Scope

- A. The work of this Section consists of all Lawn and Fine Grading work and related items as indicated on the Drawings and/or as specified herein and includes, but is not limited to, the following:
 - 1. Fine grading and Loaming
 - 2. Fertilizer and seeding
 - 3. Maintenance and protection

1.3 Samples

- A. Prior to ordering the below listed materials, submit representative samples of Architect for selection and approval, in accordance with requirements of General Conditions and Supplementary General Conditions as follows. Do not order materials until Architect's approval has been obtained. Delivered materials shall closely match the approved samples.
 - 1. Loam Borrow: The Contractor shall provide representative samples for testing and approval as directed by the Architect. Contractor shall deliver samples to testing laboratory, having testing report sent directly to the Architect and pay all costs.
 - a. Mechanical and chemical (pH soluble salts) analysis shall be by a public extension service agency or a certified private testing laboratory in accordance with the current "standards" of the Association of Official Agriculture Chemists".
 - b. Report shall be submitted at least one month before any loaming is done. Soil tests shall be tested for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium Aluminum, Soluble Salts and show acidity of the soil.

2. Seed: Submit a manufacturer's Certificate of Compliance to the Specifications with each shipment of each type of seed. These certificates shall include the guaranteed percentage of purity, weed content and germination of the seed and also the net weight and date of shipment. No seed may be sown until the Contractor has submitted the certificates.

1.4 Certificate Of Acceptance

- A. The Architect will inspect all work upon the written request of the Contractor received at least ten days before the anticipated date of inspection.
- B. Seeded fine lawns shall be maintained until all areas have a close stand of grass which has received three mowings, have no bare spots greater four inches in diameter and at least 80% of the grass established is permanent grass species. Seeded field grass areas shall be mowed to height of 4 inches following one(1) full growing season prior to acceptance.
- C. Furnish full and complete written instructions for maintenance of the lawns to the Owner at the time of acceptance.
- D. Architect's inspection shall determine whether maintenance shall continue in any part.
- E. After all necessary corrective work and clean-up has been completed and maintenance instructions have been received by the Owner, the Architect will certify in writing the acceptance of the lawns. The contractor's responsibility for maintenance of lawns or parts of lawns shall cease on receipt of the Certificates of Acceptance.

1.5 Inspection

- A. All areas to be fine graded and seeded shall be inspected by the Contractor before starting work. Any defects such as incorrect grading, etc., shall be reported to the Architect prior to beginning this work. The commencement of work by the Contractor shall indicate his acceptance of the areas to be fine graded and seeded and he shall assume full responsibility for the work of this Section.

PART 2 - PRODUCTS

2.1 Loam

- A. Loam shall be a "fine sandy loam" or a "sandy loam" determined by mechanical analysis and based on the "U.S.D.A. classification system". It shall be of uniform composition, without a mixture of subsoil. It shall be free of stones greater than one inch, lumps, plants and their roots, debris and other extraneous matter over one inch in diameter or excess quantities of smaller pieces of the same materials as determined by the Architect. It shall not contain toxic substances harmful to plant growth. It shall be obtained from naturally well drained areas which have never been stripped before and have a history of satisfactory vegetative growth.

- B. Loam shall have an acidity range of pH 5.8 to pH 7.0 and shall contain not less than 4% nor more than 20% organic matter as determined by the loss of ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230°F. plus or minus 9°.
- C. The topsoil stripped and stockpiled on the site may be used provided that, after testing and addition of necessary additives, it meets the above specification. The Contractor shall provide additional loam as required to obtain the volume called for on the Drawings.

2.2 Soil Additives

- A. Commercial fertilizer, peat, humus or other additives shall be used to counteract soil deficiencies as recommended by the soil analysis and as directed by the Architect.
 - a. Commercial fertilizer shall be a product complying with the State and United States fertilizer laws. Deliver to the site in the original unopened containers which shall bear the manufacturer's certificate of compliance covering analysis which shall be furnished to the Architect. At least 50% by weight of the nitrogen content shall be derived from organic materials. Fertilizer shall contain not less than the percentages of weight of ingredients as follows or as recommended by the soil analysis:

Nitrogen	Phosphorus	Potash
10%	6%	4%

- B. Humus shall be natural humus, reed peat or sedge peat. It shall be free from excessive amounts of zinc, low in wood content, free from hard lumps and in a shredded or granular form. According to the methods of testing of A.O.A.C., latest edition. The acidity range shall be approximately 5.5 pH to 7.5 pH and the organic matter shall be not less than 85% as determined by loss on ignition. The minimum water absorbing ability shall be 200% by weight on an oven-dry basis.
- C. Limestone
 - 1. Ground limestone shall be an approved agricultural limestone containing not less than 85% of total calcium or magnesium carbonates. Limestone shall be ground to such fineness that 50% will pass a 100 mesh sieve and 95% will pass through a 20 mesh sieve.
- D. Superphosphate
 - 1. Superphosphate shall be composed of fine ground phosphate rock as commonly used for agricultural purposes containing not less than 18% available phosphoric acid.

2.3 Seeds

- A. Seed mixture shall be fresh, clean, new crop seed. Grass shall be of the previous year's crop and in no case shall the weed seed content exceed 1% by weight. The seed shall be furnished and delivered in the proportion specified below in new, clean, sealed and properly labeled containers. All seed shall comply with State and Federal seed laws. Submit manufacturer's Certificates of Compliance. Seed which has become wet, moldy or otherwise damaged shall not be acceptable. No seed shall be sown until the Contractor has submitted the certificates.
- B. Grass shall be of the previous year's crop and in no case shall the weed seed content exceed one percent (1%) by weight. Grass seed shall conform to the requirements of the following tables:

	Proportion	Germination Minimum	Purity Minimum
<u>For Fine Lawns</u>			
Creeping Red Fescue or Chewing's Fescue	50%	85%	95%
Kentucky Bluegrass	20%	85%	90%
Manhattan Perennial Rye	20%	90%	90%
Red Top	10%	85%	92%
<u>For Field Grass</u>			
Creeping Red Fescue or Chewing's Fescue	40%	85%	95%
Kentucky Bluegrass	25%	85%	90%
Kentucky 32 Fescue	20%	85%	95%
Red Top	10%	85%	92%
White Clover	5%	85%	96%

- C. Seed may be mixed by an approved method on the site or may be mixed by a dealer. If the seed is mixed on the site, each variety shall be delivered in the original containers which shall bear the dealer's guaranteed analysis. If the seed is mixed by a dealer, the Contractor shall furnish the Architect the dealer's guaranteed statement of the composition of the mixture.

2.4 Equipment

- A. Suitable water, hose and other watering watering equipment required for the execution of this work and maintenance shall be provided by the Contractor. Water shall be free from impurities injurious to vegetation.

2.4 Mulch

- A. After the areas to be loamed have been brought to grade and immediately prior to dumping and spreading the loam, the subgrade shall be loosened by disking or rototilling to a depth of at least four inches to permit bonding of the loam to the subsoil. Remove all stones greater than two inches and all debris or rubbish. Such material shall be removed from the site.
- B. Loam shall be placed and spread over approved areas to a depth sufficiently greater than six inches so that after natural settlement and light rolling the completed work will conform to the lines, grades and elevations indicated. Supply additional loam, after testing and approval, as may be needed to give the specified depths and finished grades under the contract without additional cost to the Owner.
- C. Disturbed areas outside the limit of seeding shall be spread with six inches of loam to the finished grade.
- D. No subsoil or loam shall be handled in any way if it is in a wet or frozen condition.
- E. Sufficient grade stakes shall be set for checking the finished grades. Stakes must be set in the bottom of swales and at the top of slopes. Grades shall be established which are accurate to 1/10th of a foot either way. Connect contours and spot elevations with an even slope.
- F. After loam has been spread, it shall be carefully prepared by scarifying or harrowing and hand raking. All large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter and stones over one inch in diameter shall be removed from the loam. Loam shall also be free of smaller stones in excessive quantities as determined by the Architect.
- G. The whole surface shall then be rolled with a hand roller weighing not more than 100 lbs per foot of width. During the rolling, all depressions caused by settlement of rolling shall be filled with additional loam and the surface shall be regraded and rolled until presenting a smooth and even finish to the required grade.
- H. Contractor shall obtain Architect's written approval of fine grading and bed preparation before doing any seeding.

3.2 Seeding

- A. Limit of work line shall be limit of seeding unless otherwise indicated on the Drawings. Areas on the plan are to be loamed and seeded after written approval of the finished grading or as directed by the Architect. All disturbed areas outside the limit of seeding shall be seeded.

- B. Seeding shall be done only during the period from April 1 to June 1 or August 15 to October 15. The actual planting of seed shall be done, however, only during periods within this season which are normal for such work as determined by weather conditions and by accepted practice in this locality. At his option and on his responsibility, the Contractor may plant seed under unseasonable conditions without additional compensation, but subject to Architect's approval of time and methods.
- C. Soil additives shall be spread and thoroughly incorporated into the layer of loam and the upper one inch of the underlying subsoil by harrowing or other methods approved by the Architect. The following soil additives shall be incorporated:
 - 1. Spread ground limestone as required by soil analysis to achieve a pH of 6.0 to 6.5, but the maximum amount applied shall be one pound per square yard.
 - 2. Spread fertilizer at the rate of 25 lbs per 1,000 square feet, or more, as recommended by the soil analysis.
 - 3. Spread superphosphate at the rate of 20 lbs per 1,000 square feet.
 - 4. Spread humus as required by soil analysis.
- D. Seed only when the bed is in a firable condition, not muddy or hard.
- E. Seeding shall be done in two directions at right angles to each other. Sow the seed with approved seeding device at the rate of five lbs per 1,000 square feet. No seeding shall be done in windy weather.
- F. If covering and rolling is not properly accomplished by the seeding machine, the seed shall be lightly raked into the ground, after which the ground shall be rolled with a five hundred pound roller and thoroughly and evenly watered with a fine spray to penetrate the soil to a depth of at least two inches.

3.3 Hydroseeding

- A. Limit of work line shall be limit of hydroseeding unless otherwise indicated on the Drawings. Areas on the plan are to be loamed and hydroseeded after written approval of the finished grading or as directed by the Architect. All disturbed areas outside the limit of hydroseeding shall be hydroseeded.
- B. Seeding shall be done only during the period from April 1 to June 1 or August 15 to October 15. The actual planting of seed shall be done, however, only during periods within this season which are normal for such work as determined by weather conditions and by accepted practice in this locality. At his option and on his responsibility, the Contractor may plant seed under unseasonable conditions without additional compensation but subject to Architect's approval of time and methods.
- C. For construction methods conform to Hydraulic Method requirements specified in the Standard Specifications for Road and Bridge Construction, State of New Hampshire, Section 644, Paragraph 3.5.2 and as specified herein.

- D. Prior to the start of work, the Architect shall be furnished with a with a certified statement for approval as to the number of pounds of material to be used per 100 gallons of water. This statement shall also specify the number of square feet of seeding that can be covered with the quantity of solution in the hydroseeder.
- E. Fertilizer shall be added to the hydroseeding slurry at the rate of 25 pounds per 1,000 square feet, or more, as recommended by the soil analysis.
- F. Limestone shall be added to the hydroseeding slurry as required by soil analysis to achieve a pH of 6.0 to 6.5, but at a maximum rate of one pound per square yard.
- G. Seed shall be added to the hydroseeding slurry at the rate of 5 pounds per 1,000 square feet.
- H. A mobile tank with a capacity of at least 500 gallons is to be filled with water, seed, a fertilizer, in quantities so they may be sprayed in the specified proportions per unit of area to be seeded. The slurry must be thoroughly mixed by means of a centrifical pump using the turret or hose application technique from the mobile tank. The hose or turret shall be equipped with a seeding nozzle of a proper design to insure even distribution of the seed and fertilizer solution over the area to be seeded and shall be operated by a person thoroughly familiar with this type of seeding operation.
- I. Straw mulch shall be applied within a minimum of (1/2) one half hour of hydroseeding at the rate of 2 tones per acre.

3.4 Maintenance And Protection

- A. Maintenance shall begin immediately after any area is seeded or hydroseeded and shall continue until acceptance. In the event that seeding operations are completed too late in the Fall for adequate germination and growth of grass, then maintenance shall continue into the following Spring until acceptance.
- B. Maintenance shall include reseeding, rehydroseeding, mowing, watering, weeding and fertilizing.
- C. Watering of Seeded Areas
 - 1. First Week: The Contractor shall provide all labor and arrange for all watering necessary to establish an acceptable lawn. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of at least two inches.
 - 2. Second and Subsequent Weeks: The Contractor shall water the lawn as required to maintain adequate moisture, in the upper two inches of soil, necessary for the promotion of deep root growth.
 - 3. Watering shall be done in a manner which will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment. The Contractor shall furnish sufficient watering equipment to apply one complete coverage to the seeded areas in an eight hour period.

- D. Protection
1. Seeded areas shall be protected by a three foot high barrier constructed of two by four stakes or iron pipes, set eighteen inches in the ground at ten foot intervals and connected by #10 wire. Flags of white cloth shall be secured to the wire at center points between stakes.
 2. Barriers must be raised immediately after seeding and shall be maintained until acceptance.
- E. After the grass in seeded areas has appeared, all areas and parts of areas which, in the opinion of the Architect, fail to show a uniform stand of grass, for any reason whatsoever, shall be reseeded or rehydroseeded and such areas and parts of areas shall be seeded repeatedly until all areas are covered with a satisfactory growth of grass. Reseeding together with necessary grading, fertilizing and trimming shall be done at the expense of the Contractor who shall spread the seed by a method approved by the Architect and during an approved season.
- F. Mowing
1. The Contractor shall keep fine lawn areas mowed until acceptance of the contract by cutting to a height of 2 1/2 inches when growth reaches six inches or as directed by the Architect.
 2. The Contractor shall mow the field grass areas to a height of 4" at the end of the growing season or as directed by the Architect. Fieldgrass areas shall be mowed at least once prior to acceptance of the Contract.

END OF SECTION

SECTION 02653

FILTER FABRIC

PART 1 - GENERAL

- A. Work Included: Furnish and install mira drain drainage panels with filter fabric on one side only of the type and in the location as shown on the Drawings and specified herein.
- B. Acceptable Manufacturers:
1. Mirafi Inc.

PART 2 - PRODUCT

A. Materials:

1. The filter fabric shall consist of continuous filament fibers which are formed into a sheet by heat bonding. It shall be tear resistant and be capable of conducting water.
2. The fabric shall retain its durability and strength when it is wet.
3. The fabric shall not decompose under all soil conditions such as high acidity, alkalinity, or salinity.
4. The drainage core shall have a minimum compressive strength of 4000 psf.

PART 3 - EXECUTION

A. Installation:

1. Trench shall be clean and free from sharp objects such as roots and stones.
2. The filter fabric shall be lapped a minimum of 6-inches when joining two pieces together.
3. Care shall be taken when dropping backfill into the trench.
4. Filter fabric damaged during or prior to installation shall be removed and replaced at no additional cost to the Owner.
5. Tips shall be cut off of core dimples to drain into weep holes.
6. Installation shall be according to manufacturers recommendations.

END OF SECTION

SECTION 02660

EROSION CONTROL

Description

1.1 This work shall consist of furnishing and placing mulch on surfaces prepared and seeded under other items, at locations shown on the plans or ordered.

Materials

2.1 Mulch shall consist of late cut, matured, and cured hay. When air-dried in the loose state for 24 hours, the contents of a representative bale shall lose not more than 15 percent of the original weight of the bale. It shall be free from primary noxious weed seeds and rough or woody materials.

Construction Requirements

3.1 Mulch

3.1.1 Mulching shall be done immediately after each area has been properly prepared. When seed for erosion control is sown prior to placing the mulch, the mulch shall be placed on the seeded areas within 48 hours after seeding. Hay that has been thoroughly fluffed shall be applied at approximately, but not to exceed 3 tons per acre unless ordered. Blowing chopped mulch will be permitted when authorized. Authorization will be given when it can be determined that the mulch fibers will be of such length and applied in such a manner that there will be a minimum amount of matting that would retard the growth of plants. Matted mulch or bunches shall be removed or otherwise taken care of to the satisfaction of the Engineer.

3.1.2 In order to prevent its being blown away, after the mulch has been spread to the required depth, a light covering of loose branches, a system of pegs and strings, or other approved method shall be employed. Unless otherwise ordered, such means of control shall be removed prior to the acceptance of the project.

3.2 Maintenance

3.4.1 The Contractor shall maintain areas mulched with no extra compensation, until the completion of the contract.

END OF SECTION

SECTION 02694

FOOTING DRAINS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work included in this Section:
Furnish and install PVC Footing Drain Pipe and fittings of type and size specified herein.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Pipe and Fittings
1. Heavy wall perforated PVC. All pipe to be 2" diameter. Couplings and fittings shall be of the same materials as the pipes.
 2. Filter fabric (surrounding the drainage panel) shall be recommended by drainage panel manufacturer.

PART 3 - EXECUTION

3.01 PLACING OF PIPE

- A. Pipe shall be bedded in a 1 1/2" layer of mortar and shall pitch to drain to the river. Do not install defective pipe. Lay pipe in accordance with manufacturer's recommendations as approved by the Architect/Engineer.

END OF SECTION

SECTION 02701

SIDEWALKS - BRICK

Description

1.1 This work shall consist of the construction of sidewalks as shown on the plans or ordered.

Materials

2.1 Bricks shall conform to AASHO M114, Grade SW

2.2 Portland Cement Concrete shall be Class A conforming to 911.

2.3 Steel Mesh shall conform to AASHO M 55.

2.5 Cement Mortar shall conform to BOCA Section 1114 1984 Edition.

Construction Requirements

3.1 Brick Sidewalk

3.1.1 Subgrade and base. The subgrade shall be carefully graded and compacted. The base concrete shall be poured to the cross-section shown on the plans. The surface shall be pitched at 1/16" per foot away from granite wall.

3.1.2 Mortar. After concrete base has set spread 1/2 inch of mortar. The mortar shall be proportioned in accordance with BOCA Table 1114.2.1 for Type S mortar.

3.1.3 Setting the brick. The brick shall be set in the wet mortar in a standard pattern. The bricks shall be wetted before use. Set the bricks firmly in place, leaving a 1/2" joint between them and tamp into them mortar. After the brick have been set for 24 hours, sweep fine sand into the joints.

3.2 Concrete Base

3.2.1 Excavation shall be made to the required depth and to a width that will permit the installation and bracing of the forms. The foundation shall be shaped and compacted to a firm, even surface conforming to the section shown on the plans. All soft and yielding material shall be removed and replaced with acceptable material.

3.2.2 Forms shall be of wood or metal and shall extend for the full depth of the concrete. All forms shall be straight, free from warp, and of sufficient strength to resist the pressure of the concrete without springing. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal.

3.2.3 The foundation shall be thoroughly moistened immediately prior to the placing of the concrete. The proportioning, mixing, and placing of the concrete shall be in accordance with _____.

3.2.4 Polypropylene fiber reinforcing shall be thoroughly mixed into the concrete in accordance with the manufacturers recommendations.

3.2.5 The concrete base shall be placed in alternate slabs 30 feet in length except as otherwise ordered.

3.2.6 Concrete shall be moisture cured for at least seven days. Curing shall be by means of moist burlap or mats or by other approved methods. During the curing period, all traffic, both pedestrian and vehicular, shall be excluded. Vehicular traffic shall be excluded for such additional time as the Engineer may direct.

END OF SECTION

SECTION 02901

GRANITE BLOCKS

PART 1 - GENERAL

1.1 Description

Granite blocks are on site and are to be reset as shown and directed on the plans.

END OF SECTION

DIVISION 3

CONCRETE

Scope of Work

Furnish, install, and test all concrete work and appurtenant work in complete accordance with the Drawings and Specifications.

Contractor's Duties

Except as specifically noted, provide and pay of all labor, materials, equipment, tools, machinery, water, heat, other facilities, and services necessary for proper execution and completion of the work.

Contents of Division

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SECTION 03000

CONCRETE - GENERAL

PART 1 - GENERAL

1.1 Description

- A. Work Included: Furnish and install all concrete work of the type(s) and size(s) and in the locations shown on the Drawings and as specified herein.
- B. Related Work Specified Elsewhere (When Applicable)
 - 1. Cast-in-place concrete finishing and curing, construction and expansion joints, concrete formwork, concrete reinforcement, and concrete testing are specified in the appropriate Sections of this Division.
 - 2. Concrete accessories and grout are specified in the appropriate sections of this Division.
- C. Other Trades: Cooperate with all other trades whose work is to be coordinated with concrete work.

1.2 Quality Assurance

- A. Testing
 - 1. Have tests conducted as specified in the Concrete Testing Section of this Division.
 - 2. Perform all concrete work in accordance with the latest ACI Code and Manual.

1.3 Submittals to the Engineer

- A. Shop Drawings
 - 1. Submit shop drawings in accordance with the General Conditions of the Construction Contract.
 - 2. Submit schedules and detailed setting diagrams for all reinforcing steel.
 - 3. Submit copies of test results on all aggregates and on all mix design proportions for concrete strengths specified in this Division.
- B. Informational Data
 - 1. Have informational data available on the site at all times as a standard of reference when applicable.
 - 2. Informational data shall consist of:
 - a. ACI Field Reference Manual SP-15.
 - b. PCA Manual of Concrete Mix Design, latest edition.

1.4 Delivery, Storage, and Handling

- A. Deliver, store and handle materials to prevent damage of any nature.
- B. Store cement in undamaged condition with seals and labels intact as packaged by the manufacturer.
- C. Store cement in weathertight bins or buildings and keep cement dry at all times.
- D. Store aggregate in separate piles or bins and handle in a manner that will minimize segregation and prevent contamination.
- E. Protect anchors, ties, reinforcement, and other hardware from the elements.

1.5 Job Conditions

- A. Wet Weather Protection
 - 1. Do not place concrete during rain, sleet, or snow unless adequate protection is provided and/or approval is obtained from the Engineer.
 - 2. Do not allow rain water or other weather conditions to damage the surface finish.
- B. Cold Weather Protection
 - 1. Do not place concrete in an ambient air temperature below 40°F., except by written permission from the Engineer.
 - 2. When work is permitted by the Engineer in temperatures below 40°F., make approved provisions for heating materials and the completed work in accordance with ACI 306 and the Concrete Finishing and Curing Section of this Division.
 - 3. The minimum temperature of concrete as placed shall be 50°F.
- C. Hot Weather Protection
 - 1. During hot weather conditions, place concrete in accordance with ACI 305 and the Concrete Finishing and Curing Section of this Division.
 - 2. Place concrete at a temperature which will not cause difficulty from loss of slump, flash set, or cold joints, usually somewhat less than 90°F.
- D. Metal Protection: Metal in contact with mortar, concrete or other masonry materials shall be painted with alkali-resistant coatings such as heavy bodied bituminous paint.

1.6 Acceptance of Structure

- A. Work which meets all applicable requirements will be accepted without qualification.
- B. Work which fails to meet one or more requirements, but which has been repaired to bring it into compliance, will be accepted without qualification.
- C. Work which fails to meet one or more requirements and which cannot be brought into compliance may be accepted or rejected as determined by the Engineer.

- D. Concrete failing to meet the strength requirements as specified in the Concrete Testing Section of this Division, may require additional curing as directed by the Engineer. Modifications may be required in the concrete mix design for the remaining concrete work, at the Contractor's expense.

1.6 Acceptance of Structure (Continued)

- E. Formed surfaces larger or smaller than dimensional tolerances specified in this Division may be rejected. If the Engineer permits the Contractor to correct the error, such correction shall be as directed and in such a manner as to maintain the strength, function, and appearance of the structure.
- F. Concrete members cast in the wrong location may be rejected and shall be removed at the Contractor's expense if the strength, appearance or function of the structure is adversely affected.
- G. The strength of the structure in place will be considered potentially deficient if it fails to comply with any of the following requirements:
 - 1. Low concrete strength as evaluated by the requirements of this Division.
 - 2. Reinforcing steel size, quantity, strength, position, or arrangement at variance with the Drawings.
 - 3. Concrete which differs from the required dimensions or locations in such a manner as to reduce the strength.

PART 2 - PRODUCTS

2.1 Materials

- A. Materials are specified in the following Sections in this Division.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART - GENERAL

1.1 Description

- A. Work Included - Furnish and install the following, as shown on the Drawings and specified herein:
1. Cast-in-place concrete, including walls and slabs and other concrete work shown on the DRAWINGS. Refer to the Site Drawings for details of site improvement items fabricated from concrete.
 2. Formwork for cast-in-place concrete.
 3. Reinforcing steel for cast-in-place concrete.
 4. Waterstops and moisture barriers.
 5. Do all cutting, patching and repairing of concrete which may be required for proper completion of the work.
 6. Control joints in slabs.
 7. Expansion joint filler at perimeter and other locations of slabs.
 8. Install the following items furnished under the designated SECTIONS:
 - a. Sleeves, inserts and other items required to be built into the concrete: By trade requiring same.

1.2 Reference Specifications

- A. "Specifications for Structural Concrete for Building" by the American Concrete Institute (ACI-301 Specification for Structural Concrete for buildings.
- B. "Building Code Requirements for Reinforced Concrete" (ACI-318-83).

1.3 Shop Drawings

- A. Submit complete shop drawings as required by the GENERAL CONDITIONS and the SUPPLEMENTARY CONDITIONS.
- B. Provide shop drawings for fabricating and placing reinforcing steel. Show all required information for cutting, bending and placing reinforcing bars and show all accessories and support bars on placing drawings. Indicate suitable marks for placing bars.
- C. Fabrication of any material or performing of any work prior to the final review of the shop drawings will be entirely at the risk of the Contractor.

1.4 Testing And Control For Concrete

- A. The Contractor shall furnish copies of test results from the concrete supplier as listed below. Tests shall be at the expense of the concrete supplier by an independent testing laboratory and shall have been made within the past six months.
1. Standard gradation analysis meeting these specifications.
 2. Mix design proportions and additives used for concrete specified herein and for concrete of similar proportions types and strengths furnished to other projects.
- B. Tests occasioned by changes or materials of mix proportions shall be at the expense of the Contractor.
- C. Tests for slump shall be made at place of deposit and in accordance with ASTM C143 by the General Contractor. Tests shall be made for each 5 cu. yds., more or less, as approved by and in the presence of the Engineer or his representative.
- D. The Contractor shall make, in accordance with ASTM C31, four test cylinders for each 50 cu. yds., or one day's pour, whichever is less. Tests shall be made in accordance with method of "Test for Compressive Strength of Molded Concrete Cylinders -- ASTM C39". Cylinders shall be delivered by the General Contractor to the testing laboratory designated by the Engineer. The fourth cylinder shall be used for additional tests as necessary, being retained at laboratory for necessary period as approved by Engineer.
- E. Tests for air content will be made in accordance with ASTM C94, using ASTM C231 method of test. Intermediate Chase Meter tests will be made on each load of concrete or as considered necessary by the Engineer's Office.
1. Results shall be sent to the Engineer's Office within three (3) days after tests are made; notify at once when tests show low test results.
- F. Additional Tests: Tests necessary to resolve disputes will be made by an Independent Testing Laboratory designated by the Engineer. If work is found to be deficient, testing cost shall be paid by the Contractor. If work is satisfactory, testing cost will be paid by the Owner.

1.5 Notification Of Related Trades

- A. Notify all other trades responsible for installing inserts, sleeves, anchors, etc., when ready for such installation and for final checking immediately before concrete is placed. Cooperate with such trades to obtain proper installation.

PART 2 - PRODUCTS2.1 Materials For Concrete

- A. Cement - Portland Cement - ASTM Specification C-150, Type II, or Type II modified.
- B. Aggregates
 - 1. Coarse aggregate shall be hard, durable, uncoated crushed stone or gravel conforming to ASTM Specification C-33. Coarse aggregate shall pass through sieves 1-1/2 inch.
 - 2. Fine aggregate shall be sand, clean, hard, durable, uncoated grains free from silt, loam and clay, to meet ASTM Specification C33.
- C. Water - Water shall be from the local municipal supply.
- D. Admixtures
 - 1. Water reducing agent: "Sonotard WR" by Sonneborn Building Products, "WRDA" by W. R. Grace & Company, "Pozzolith 100" by Master Builders Co. or equal as approved by the Engineer and conforming with ASTM 494 Type A. Water reducing agent must be by same manufacturer as air-entraining agent.
 - 2. Air-entraining agent: "Aerolith" by Sonneborn Building Products, "Darex" by W. R. Grace & Company, "MB-VR" by Master Builders Company, or equal approved by the Engineer conforming to ASTM C-260. To be used to obtain percent air-entrainment specified unless obtained by cement used.
 - 3. Nother admixtures may be used without Engineer approval. Calcium chloride will not be permitted.
- E. Concrete Reinforcement
 - 1. Reinforcing steel shall conform to ASTM Specification A-615, Grade 60.
 - 2. Welded wire fabric shall conform to ASTM Specification A-185.
 - 3. Fiber reinforcement shall conform to manufacturer's recommendations.
 - 4. Bar supports, metal accessories and other devices necessary for proper assembly of concrete reinforcing shall be of standardized factory made wire bar supports. Wire for tying shall be 18 gauge black annealed wire conforming to ASTM Specification A-82.
- F. Formwork
 - 1. Forms - Concrete surfaces without special finish shall be "plyform" Class 1, B-B. EXT-DFPA or as approved by the Architect.
 - 2. Form Oil - Oil shall be of a non-staining type, specifically manufactured for concrete forms.

3. Form Ties - Factory fabricated, removable or snap back of approved design. Wire shall be at least back 1 1/2 inch from the surface and leave a hole less than 1 inch in diameter after snapped. Furnish with removable wooden or plastic cones of approved sizes where called for on the Drawings.
- G. Joint filler at slab perimeters - 1/4 inch thick asphalt impregnated board, of same depth as slab less 3/4 inch for sealer, by Burke, W. R. Meadows, Johns Manville or Hohmann and Barnard.

2.2 Storage Of Materials

- A. All materials shall be stored to prevent damage from the elements and other caused.
- B. Cement and aggregates shall be stored in such a manner as to prevent deterioration or instruction of foreign matter. Any materials which have deteriorated, or which have been damaged, shall not be used for concrete.
- C. Store reinforcement steel on wood skids to protect if from weather, or, earth and damage from trucking or other construction operations. Reinforcement shall be free from loose mill scale, rust, from oil, concrete spatter and other extraneous coating at the time it is embedded in the concrete.
- D. All forms shall be stored in a neat manner and orderly fashion. protected from the weather and abuse.
- E. Materials which are judged not acceptable for this project shall not be stored on the site, but shall be immediately removed from the site.

2.3 Proportioning and Design of Mixes

- A. Prepare design mixes for each type of concrete. Use an independent testing facility acceptable to the Engineer for preparing and reporting proposed mix designs.
- B. Proportion mixes by either laboratory trial batch or field experience methods, using materials to be employed on the project for each class of concrete required, complying with ACI 211.1 for normal weight concrete, and report to the Engineer the following data:
 1. Complete identification of aggregate source of supply.
 2. Tests of aggregates for compliance with specified requirements.
 3. Scale weight of each aggregate.
 4. Absorbed water in each aggregate.
 5. Brand, type, and composition of cement.
 6. Brand, type, and amount of each admixture.
 7. Amounts of water used in trial mixes.
 8. Proportions of each material per cu. yd.

9. Gross weight and yield per cu. yd. of trial mixtures.
 10. Measured slump.
 11. measured air content.
 12. Compressive strength developed at 7 days and 28 days, from not less than 3 test cylinders cast for each 7- and 28-day test, and for each design mix.
- C. Submit written reports to the Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by the Engineer.
- D. Laboratory Trial Batches: When laboratory trial batches are used to select concrete proportions, prepare test specimens in accordance with ASTM C 192 and conduct strength tests in accordance with ASTM C 39, as specified in ACI 301.
- E. Field Experience Method: When field experience methods are used to select concrete proportions, establish proportions specified in ACI 301.
- F. Water-Cement Ratio Methods: If suitable data from field experience or laboratory trial batches cannot be obtained, concrete proportions may be established by use of the water-cement ratio limits table, and the limiting restrictions of ACI 301.
- G. Adjustments of Concrete Mixes: Mix design adjustments may be requested by the Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to the Owner and as accepted by the Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by the Architect before using in the work.
- H. Admixtures:
1. Use air-entraining admixture in all concrete, unless otherwise shown or specified. Add air-entraining admixture at the manufacturer's prescribed rate to result in concrete at the point of placement having air content within the following limits:
 - a. Concrete structures and slabs exposed to freezing and thawing or subjected to hydraulic pressure:

<u>Nominal Max. Size of Coarse Aggregate</u>	<u>Total Air Content</u>
3/4"	4% to 8%
1"	3.5% to 6.5%
1-1/2"	3% to 6%
 - b. All other concrete: 2% to 4% air.
 2. Use water-reducing admixtures in strict compliance with the manufacturer's directions. Admixtures to increase cement dispersion, or to provide increased workability for low-slump concrete, may be used at the Contractor's option subject to the Architect's acceptance.

I. Classification of Concrete:

	<u>Ultimate Strength</u>	<u>Regular Aggregate</u>	<u>Aggregate Size</u>	<u>Slump</u>
Wall	3000 psi	Stone Gravel	3/4"-1-1/2"	1" to 3"
Slab	3000 psi	Stone Gravel	3/4"-1"	3" to 4"

5. If a pumping process is utilized to convey concrete, established concrete mixtures may require increased proportion of cement and fine aggregate and a decreased proportion of coarse aggregate, but these mixtures may not be altered more than:

Cement	plus 20 lbs./cu. yd.
Fine Aggregate	plus 50 lbs./cu. yd.
Coarse Aggregate	minus 50 lbs./cu. yd.

PART 3 - EXECUTION3.1 Forming

- A. Formwork shall conform to ACI 347.
- B. Forms shall be constructed to conform to shapes, lines and dimensions shown, plumb and straight and shall be maintained sufficiently rigid to prevent deformation under load. Forms shall be sufficiently tight to prevent the leakage of grout. Securely brace and shore forms to prevent displacement and to safely support the construction loads.
- C. Treat forms and form linings with a form release agent applied according to the manufacturer's instructions, by roller, brush or spray to produce a uniform thin film without bubbles or streaks. Apply the release agent in two coats for the first use of the form and in one for each additional use.
- D. Removal:
1. Formwork for wall and slabs must remain a minimum of 3 days after the placement of the concrete.

3.2 Mixing Process: Use ready-mix process, ACI 301-72 Par. 7.1.

3.3 Fabrication And Placing Reinforcing

- A. Fabricate rebars to the following requirements:
1. Stirrups and ties ± 1 inch
 2. All other bends ± 1 inch
- B. Place bars to the following tolerances:
1. Concrete cover to formed surfaces $\pm 1/4$ inch
 2. Minimum spacing between bars $\pm 1/4$ inch
 3. Top bars in slabs and beams
 - a. Members 8 in. deep or less $\pm 1/4$ inch
 - b. Crosswise of members - spaced evenly within 2 in overall.
 - c. Lengthwise of members ± 2 inch
- C. If the number of bars is shown on drawings the number given shall govern over the spacing.
- D. Bars may be moved up to one bar diameter for conduits, pipes or embedded items. If moved more, the arrangement must be approved by the Architect/Engineer.
- E. Splicing of bars and details not covered herein shall be in accordance with the recommendations of "Manual of Standard Practice for Detailing Reinforced Concrete Structures" ACI 315.
- F. Supports on grade may be concrete brick or block. All other supports shall be specified in 2.1E.3 of this SECTION.
- G. Lap WWF mats not less than one full cross wire spacing. Use same type supports as for re-bars.
- H. Obtain Engineer's approval of all splices not shown on the project drawings.
- I. Do not bend reinforcement partially embedded in hardened concrete.

3.4 Embedded Items

- A. Comply with ACE 318, Chapter 6, Pipes Embedded in Concrete.
- B. Coordinate the installation of all inserts required by other trades. Such inserts normally are to be in place prior to the placing of reinforcing steel.

3.5 Joints

- A. Provide construction and control joints as shown on the Drawings, but in any case limit the maximum dimensions for placement of concrete in any one pour as follows:
 1. Wall: 40 feet. Stagger section pours of all walls within minimum of 3-day delays.
 2. Slabs-on-grade: 30 feet. Stagger section pours of all slabs with minimum of 3 day delays between pours.
 3. Tooled controlled joints in slabs: 15'.

- B. Construction joint shall be formed with keyed bulkheads. Reinforcement shall continue through the joint and additional reinforcement shall be placed if indicated on the Drawings.

3.6 Placing

- A. Notify Engineer at least 24 hours prior to each placement.
- B. Do not place concrete until soil bottoms, reinforcing steel and inserts, sleeves and other work to be built into the concrete have been inspected and approved by the Engineer and by all trades concerned.
- C. Conveying - Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients and in a manner which will assure that the required quality of the concrete is retained.
- D. Depositing - Delivery and placement of concrete shall be programmed so that the time lapse between batching and placement shall not exceed 1-1/2 hours. Concrete shall not be allowed a free fall of over 4 feet. Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing.
- E. Concrete shall be deposited continuously, in horizontal layers of such thickness (not deeper than 18 inches) that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section. Placing shall be carried out at such a rate that the concrete which is being integrated with fresh concrete is still plastic. Concrete which has partially hardened or has been contaminated for foreign materials shall not be deposited. No horizontal construction joints will be allowed in foundation walls.
- F. Concrete shall be compacted thoroughly by vibrating to produce a dense, homogeneous mass without voids or pockets. Vibrators should be placed in concrete rapidly so as to penetrate approximately 3 inches to 4 inches into the preceding lift so as to blend the two layers. Vibrating techniques must assure that when the coarse aggregate reaches the form it stops and the matrix fills the voids.
- G. Place concrete as nearly as practicable to its final position to avoid segregation due to rehandling or flowing. Concrete should flow over no more than 10 feet in either direction from point of discharge.

3.7 Floor And Other Flatwork Finishes

- A. Use a "troweled finish" * ACI 302, Sections 7.2.1 - 7.2.1-, except where notes otherwise, including tops of exposed walls.

- B. All floors shall be screeded to the established elevations, then steel troweled level, with allowable tolerance not exceeding 1/8 inch in any direction when tested with a 10-foot long straightedge, where floors contain drains, in which case the floors shall be pitched to drains as indicated. If either or both of the above requirements are not met, the Contractor shall, at his own expense, correct the conditions by grinding and filling, as direct by the Engineer, using materials and methods which will be compatible with all finish and surfacing materials to be installed on floors.

*Recommended Practice for Concrete Floor and Slab Construction ACI 302-69

3.8 Curing And Protection

- A. Protect newly placed concrete against low and high temperature effects and against rapid loss of moisture. Moist cure all concrete for at least seven days at a temperature of at least 50 degrees F by curing methods approved by the Engineer.
- B. For vertical or near vertical surfaces, moist cure by keeping the form in contact with the concrete, or by other effective means approved by the Architect/Engineer. Intermittent wetting and drying does not provide acceptable curing. Liquid curing compound as approved may be used.
- C. Cure floor slabs if exposed to sun and warm weather by covering with sisal or other waterproof curing paper conforming to ASTM Specifications C 171, lapped 4 inches at edges and sealed with tape at least 3 inches wide.
- D. In hot weather, be adequately prepared to protect the concrete from the adverse influence of heat before the placement of any concrete. Take special precautions to avoid cracking of the concrete due to rapid drying during placement of concrete when the air temperature exceeds 70 degrees F, particularly when the work is exposed to direct sunlight. Follow "Recommended Practice for Hot Weather Concreting" (ACI 305-72)
1. Cool forms by fog spraying with water or by protecting them from the direct rays of the sun.
 2. If requested by the Contractor, deemed advisable by the Testing Engineer and approved by the Engineer, a retardant may be used to delay the initial set of the concrete.
- E. In cold weather, be adequately prepared to protect the concrete from the adverse influence of cold before placement of any concrete and follow the "Recommended Practice for Cold Weather Concreting" (ACI-306 latest edition)
1. After placement, maintain all concrete at a temperature of at least 50 degrees F for seven days.

2. Where concrete is to be placed on hardened concrete, all laitance and foreign matter shall be removed and the surface saturated with water. A mortar cushion shall be provided against which the new concrete is to be placed. This mortar cushion shall be made with the same water content as the concrete with a slump of 6". Mortar shall be placed to a thickness of 1/2 to 1 inch and well worked into irregularities of the hard surface.

3.9 Surface Repairs

- A. Remove all honeycombed and other defective concrete down to sound concrete. Dampen area to be patched and area around it to prevent absorption of water from patching mortar. Areas concealed in the finished work may be filled with trowel.
- B. Make patching mixture of same sand and cement used in concrete. Mix not more than 1/2 to 1. Use white cement as necessary to match color of existing concrete as determined by trial patches in exposed areas.
- C. Limit amount of mixing water to that necessary for handling and placing. Mix mortar in advance, allow to stand with frequent manipulation with a trowel, without addition of water, until it has reached the stiffest consistency that will permit placing.
- D. After surface water has evaporated from the area to be patched, brush area with neat cement grout, let set until grout loses its sheen and apply the patching mortar. Pack mortar thoroughly into place, strike off to leave the patch slightly higher than surrounding surfaces to permit initial shrinkage. Leave undisturbed for at least 1 hour before finally finished. Keep patched area damp for 7 days. Finish exposed surfaces of patch to match adjacent surfaces.
- E. After cleaning and thoroughly dampening, fill tie holes with patch mortar. Finish off as above specified for all exposed areas. Tie holes not exposed in the finish work may be filled with asphalt roofing cement troweled into holes.

3.10 Cutting Of Holes

- A. Cut holes required by other trades in any cast-in-place concrete which did not receive sleeves. Use a core drilling process or sawing process which produces clean sharp edges and the minimum hole size which accommodates the piping, conduit, or equipment requiring the opening.
- B. Obtain approval of Architect/Engineer before cutting any holes for any trades.

3.11 Evaluation

- A. Strength: Strength of concrete shall be considered satisfactory if the average of any five consecutive strength tests of the laboratory cured specimens representing each strength of concrete is equal to or greater than the specified strength and if not more than 20 percent of the strength tests have values less than specified.

B. Additional Tests

1. If concrete shown by laboratory strength tests is defective, the Contractor may, at his own expense, conduct such testing as he may deem necessary. Test results so obtained, unless properly calibrated and correlated with other test data, shall not be used as a basis for acceptance or rejection.
2. If cores are taken for such determination they shall be in accordance with ASTM C42. Testing shall be by an independent laboratory approved by the Engineer.
3. At least three cores shall be taken from each potentially deficient area. Locations will be determined by the Engineer. Damaged cores may be replaced.
4. Strength of cores from each member or area shall be considered satisfactory if their average is equal to or greater than 90% of the specified strength.
5. Core holes shall be plugged solid with grout specified in this Specification.

3.12 Acceptance

- A. Work which meets all applicable requirements of 3.17 following will be accepted without qualification.
- B. Work which fails to meet one or more requirements of 3.17 following but which has been repaired to bring it into compliance will be accepted without qualification.
- C. Work which fails to meet one or more requirements and which cannot be brought into compliance may be accepted or rejected as determined by the Architect/Engineer.
- D. Concrete failing to meet the strength requirements of this Section may be required to undergo additional curing as specified by the Engineer. Modifications may be required to the concrete mix design for the remaining concrete work, at the expense of the Contractor.
- E. Formed surfaces that are not within the tolerances specified may be rejected. If permission is granted to correct the error, such correction shall be directed and in such a manner as to maintain the strength, function and appearance of the structure.
- F. Concrete members cast in the wrong location may be rejected if the strength appearance or function of the structure is adversely affected.
- G. Inaccurately formed surfaces exposed to view may be rejected and shall be repaired or removed and replaced if required by the Engineer.
- H. Finished flatwork exceeding specified tolerances may be repaired by grinding high spots or by patching low spots with an approved epoxy grout.
- I. Concrete exposed to view with defects which adversely affect the appearance of the structure may be repaired if possible. If, in the opinion of the Engineer, the defects cannot be repaired, the concrete may be accepted or rejected in accordance with the decision of the Engineer.

3.13 Strength Of Structure

- A. The strength of the structure in place will be considered potentially deficient if it fails to comply with any requirements which control the strength of the structure, as outlined below:
 - 1. Low concrete strength as evaluated by the requirements of this Section.
 - 2. Reinforcing steel size, quantity, strength, position or arrangement at variance with the project drawings.
 - 3. Concrete which differed from the required dimension or locations in such a manner as to reduce the strength.

- B. The work will be accepted or rejected as the work is produced by the Engineer or his authorized representative.

END OF SECTION

SECTION 03380

CEMENT MORTAR

PART 1 - DESCRIPTION

1.1 Cement mortar shall consist of either portland cement or masonry cement, mortar sand, and water.

PART 2 - MATERIALS

2.1 PORTLAND CEMENT shall conform to 03300, 2.1A of these specifications.

2.2 MASONRY CEMENT shall be as portland-cement base cement meeting all the requirements of the AASHO M 150, Type II; with the additional requirement that final set shall be attained within 12 hours.

2.3 MORTAR SAND. Sand for mortar shall consist of hard, strong, durable uncoated mineral or rock particles, free firm injurious amounts of organic or other deleterious substances, and shall be uniformly graded from fine to coarse within the following limits:

Sieve Size	Percentage by Weight Passing
No. 8	100
No. 16	60 - 100
No. 50	15 - 35
No. 100	2 - 15
No. 200	0 - 5

2.3.1 TEST FOR IMPURITIES. Mortar sand subjected to the test for organic impurities described in the AASHO T 21, and producing a color darker than the standard shall be rejected, except as provided below.

2.3.1.1 Sand for mortar failing in this test may be used, provided that, when tested for mortar making properties in the manner described in the AASHO T 71, the mortar develops a compressive strength at 7 and 28 days of not less than 95 percent of that developed by a similar mortar made from another portion of the same sample which has been washed in a 3 percent solution of sodium hydroxide followed by a thorough rinsing in water. The treatment shall be sufficient so that the washed material produces a color lighter than standard.

2.3.2 TEST FOR STRENGTH. Sand for mortar shall be of such quality that a mortar made up in a manner as described in AASHO T 71 shall develop a compressive mortar specified in that method as the basis of comprison.

2.4 WATER shall meet the requirements of 03300, 2.1C of these specifications.

PART 3 - PROPORTIONS AND PROCEDURES

3.1 Cement mortar shall be composed of 1 part, by volume, of either portland cement or masonry cement, (except as specified under 3.4) combined with not more than 2 parts, by volume, of damp loose mortar sand with water as necessary to obtain the required consistency.

3.2 Within these above limits, the exact proportion may be determined by the mason for best workability.

3.3 Mixing shall be as follows:

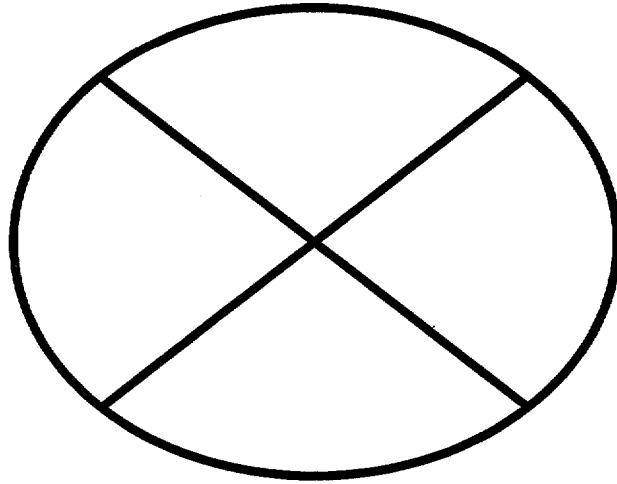
- (a) To prepare a hand mixed mortar, the dry sand and cement shall be thoroughly mixed in a clean tight mortar box until the mixture is of uniform color. Water shall be added in such quantity as to form a mortar of the consistency of stiff paste.
- (b) Machine mixed mortar shall be mixed in an approved mixer for not less than 3 minutes. The consistency shall be the same as (a).

3.4 The cement in cement mortar for ashlar or for mortar squared stone masonry shall consist of portland cement only. In mortar for brick or block masonry, hydrated lime may be substituted for 10 percent, by weight, of portland cement to obtain better workability, or masonry cement may be used instead of the portland cement-lime mixture.

3.5 Mortar shall be used within 2-1/2 hours after original mixing when the air temperature is 80°F or higher and within 3-1/2 hours when the air temperature is below 80°F. Mortar not used within these time limits shall be discarded.

END OF SECTION

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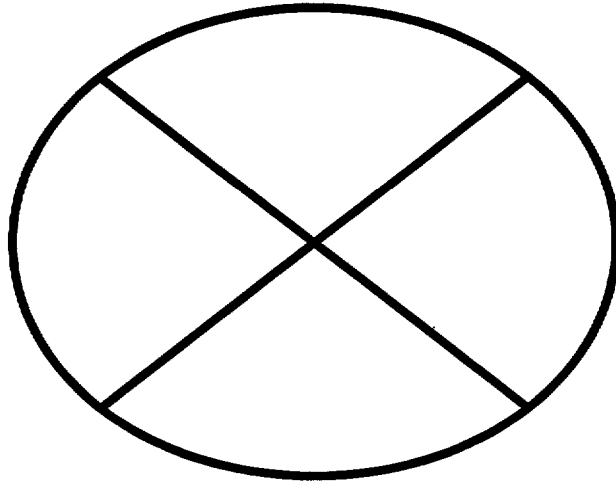


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Doc- Project Manual for the Rehabilitation
of the Prescott Park Seawall

Page #: after 03380-2



NORMANDEAU ASSOCIATES, INC.

ENVIRONMENTAL SCIENTISTS,
ENGINEERS & PLANNERS

25 NASHUA ROAD, BEDFORD, N.H. 03102

(603) 472-5191

May 15, 1986

Mr. Robert Snover
Kimball Chase Company, Inc.
40 Bridge Street
Portsmouth, NH 03801

Dear Mr. Snover:

The enclosed represents our assessment of potential impacts related to rehabilitation of the granite seawall in Prescott Park for the City of Portsmouth. The assessment describes the action to be taken, the existing environment, the potential impacts, and mitigation suggested to lessen impacts related to this program.

Sincerely,

NORMANDEAU ASSOCIATES, INC.

Peter C. Kinner
Assistant Vice President
Piscataqua Marine Laboratory
7 Pickering Avenue
Portsmouth, NH 03801
603/431-5270

PCK:ksp

1.0 PROJECT PURPOSE AND NEED

Prescott Park is an urban waterfront park located on the Piscataqua River in the City of Portsmouth, NH. This park is heavily utilized by city residents and tourists as a recreational area. In the summer, the Prescott Park Arts Festival brings thousands of people to the park for nightly performances. The park has various types of retaining walls along its river side (see attached location plans). The material behind these walls is fill material that is capped by grass and walkways.

A 120-linear foot section (approximately) of seawall has exhibited excessive rotations and translations over the past ten years. This section is in the vicinity of the wooden fishing pier in the middle of the park. The movement of this section of wall has caused concern for its structural stability in addition to the aesthetic quality of this area of the park. The consulting firm of Kimball Chase Company, Inc. has performed an engineering assessment of the section of seawall and drawn up plans and specifications for the rehabilitation of the seawall.

The construction, in summary, will require the first three courses of granite block to be removed and reset, the drainage system be rehabilitated, and a concrete diaphragm wall be installed. All work can be performed from land and with little disturbance to the marine or landside environment, if standard construction practices are followed.

2.0 PROJECT ALTERNATIVES

The alternatives for this project are: 1) no action alternative; and 2) rehabilitate the section of granite seawall as proposed by Kimball Chase Company, Inc. The design shown under the preferred alternative represents the best solution that addresses the requirements of the City of Portsmouth.

2.1 NO ACTION ALTERNATIVE

This action would leave the damaged seawall in place. Progressive rotations and translations are expected if no action is taken. At some point, the wall will become unstable and become a safety hazard. In addition, if no action is taken, local subsidence of abutting sidewalks is expected to continue causing unacceptable public walkways, and these walks will become a safety hazard. Under the no action alternative, there will be a greater chance for fill material behind the wall being released to the marine environment as the structure becomes less stable.

2.2 PREFERRED ALTERNATIVE

Under the preferred alternative, the City of Portsmouth proposes to rehabilitate the section of seawall and the abutting walkways. Design plans and specifications have been developed by Kimball Chase Company, Inc. for the City (see attached drawings). These plans indicate that resetting the granite blocks in grout, constructing a concrete diaphragm wall, and rehabilitating the drainage system will restore the wall to its correct location and impede any future tendencies for the seawall to translate and rotate out of place.

3.0 EXISTING ENVIRONMENT

Prescott Park is in the City of Portsmouth and is bordered to the north by the Piscataqua River. The Piscataqua River is 13 miles long and drains approximately 1,000 square miles. The river is tidal with a mean tidal range in the harbor of 8.4 feet (ACOE, 1984). The lower Piscataqua River and Portsmouth Harbor display one of the fastest tidal flows in the northeastern United States. The average velocity ranges from 2.6 to 4.0 knots.

Water quality in the Piscataqua River meets New Hampshire Class B standards, suitable for bathing, recreation, and fish habitat. The Piscataqua River biotic communities are similar to other northeast estuaries (NAI, 1979). The system supports both a healthy benthic and plankton community. A number of fish species, such as winter flounder, Atlantic silversides, Atlantic tomcod, mummichog and killifish are nearshore resident species. Other anadromous species such as smelt, blueback herring, alewife and stocked coho salmon pass up the river to spawning areas in fresh water.

Lobsters and Cancer crabs inhabit the river including areas off Prescott Park. Both lobsters and Cancer crabs are taken commercially throughout the river including areas near the project site (ACOE, 1984).

The terrestrial habitat is consistent with other such recreational parks. Grass, flower beds and walkways are maintained for the enjoyment of visitors. Terrestrial animals consist of squirrels, small rodents, such as deer mice, meadow voles and Norway rats, along the shoreline. Songbirds utilize the areas and are generally acclimated to people and activity.

4.0 ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED PROJECT

4.1 MARINE IMPACTS

The impacts on the marine environment will be limited to turbidity caused by sediment being washed out while the granite wall is removed for repair. The potential for the impact will be limited to high tides exceeding +4.4' MHW. The increased turbidity will be of short duration. It is anticipated that the high flushing rate and current velocity will cause rapid dispersion of suspended and dissolved solids. Increased turbidity would be expected to impact zooplankton and fish larvae most, by clogging feeding apparatus or gill structures.

However, the local nature of this action and the dispersion capabilities of the river will make these effects negligible.

Operational considerations will also further mitigate any effects of the construction. Filter fabric will be utilized to cover exposed sediments during operations. This will substantially reduce any loss of sediment to the water column. Proper engineering supervision and use of best engineering practices will eliminate any other disposal of material overboard.

4.2 TERRESTRIAL IMPACTS

The terrestrial environment will be impacted by the movement of machinery (cranes and trucks) to the project site as well as the placement and stockpiling of materials. The grass, flower beds and walkways will be replaced according to the engineering specifications in the rehabilitation plan (Kimball Chase Company, Inc. 1986). The construction activity will result in additional noise in the park as well as reduce the area for recreation. Both the noise and the reduced recreation area will be of short (1-2 month) duration and should not be a major problem. These impacts could be further mitigated if the construction activity is undertaken in the early spring or late fall; these are periods of much reduced activity in the park. The period of June-August would cause the greatest impact as this is the greatest period of utilization by tourists, fishermen and the Prescott Park Arts Festival.

The disposal of any unacceptable fill material removed from behind the wall (see Kimball Chase Company, Inc., 1986) will be the responsibility of the contractor. This material should be removed from the site and disposed of in a proper manner in accordance with the type of material encountered.

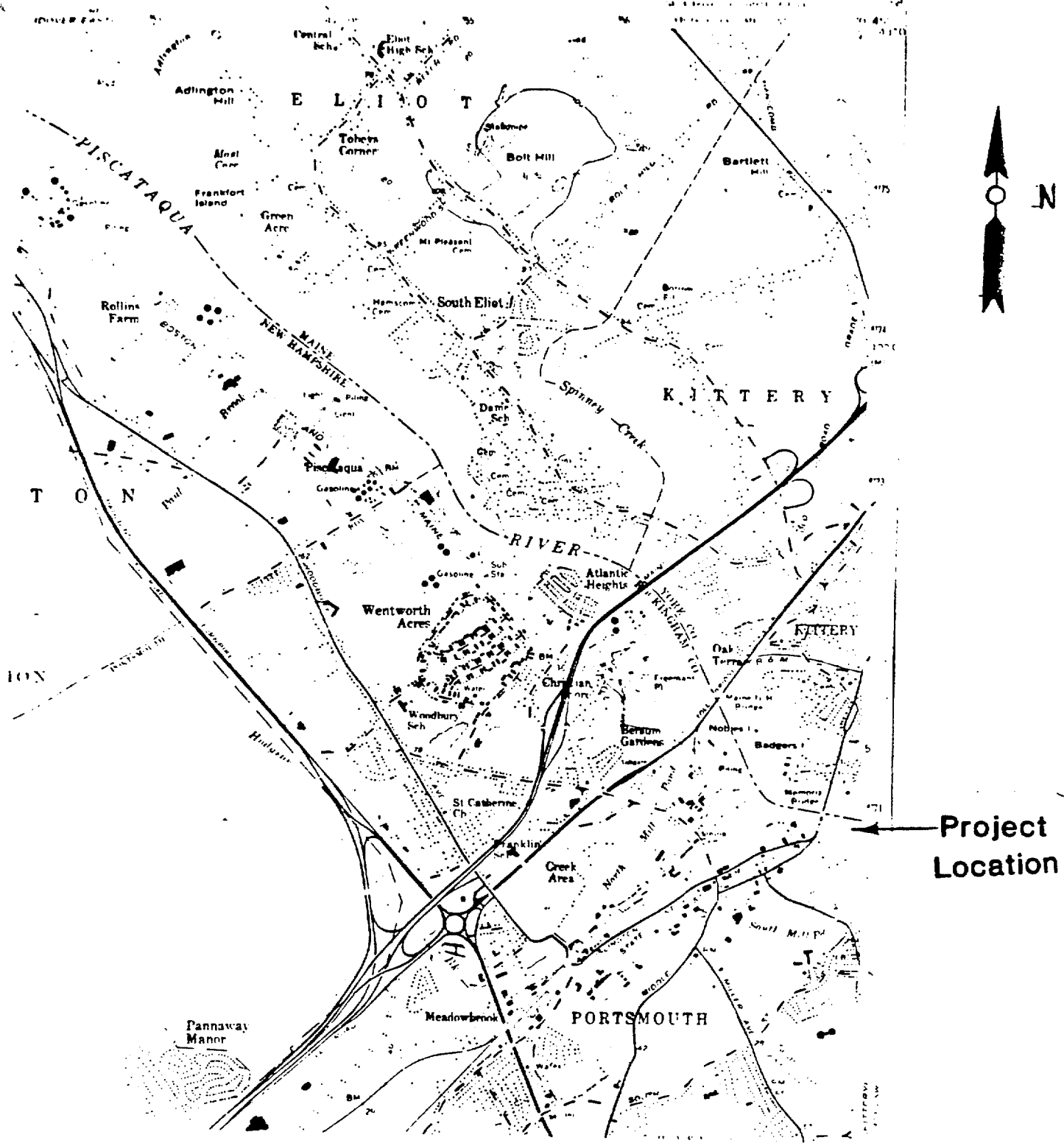
5.0 REFERENCES CITED

Kimball Chase Company, Inc. 1986. Project Manual for Rehabilitation of the Prescott Park Seawall. Prepared for the City of Portsmouth, New Hampshire.

Normandeau Associates, Inc. 1979. Newington Generating Station 316 demonstration. Vol. I. 316(a) demonstration. Prepared for Public Service Co. of New Hampshire. 398 p.

U.S. Army Corps of Engineers. 1984. Feasibility report for improvements to the existing federal deep-draft navigation project. April, 1983 (revised March, 1984).

PORTSMOUTH QUAD (PART)
NEW HAMPSHIRE MAP
7.5 MINUTE SERIES (TOPOGRAPHIC)

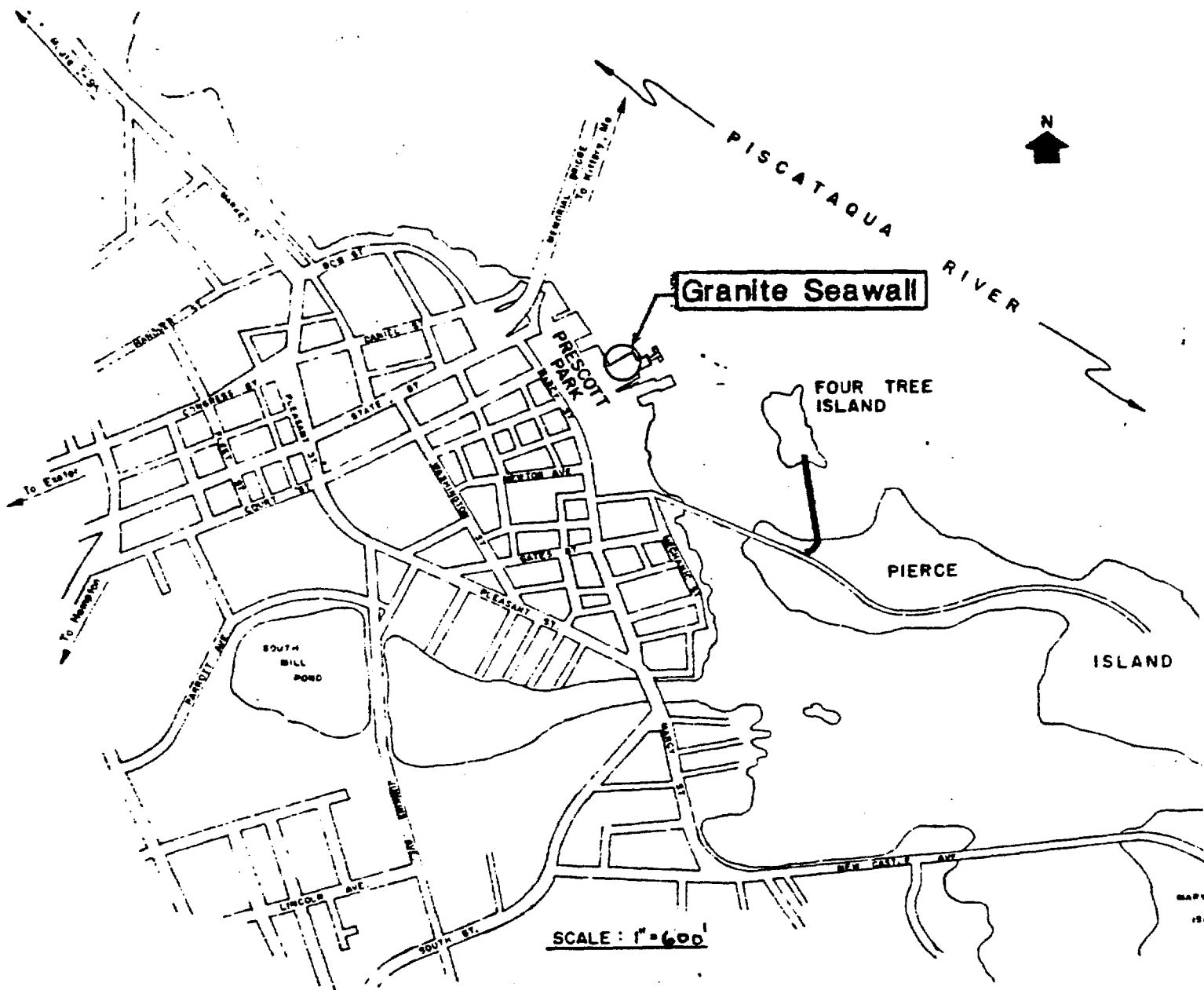


Project Location

KIMBALL CHAS
company

Engineers
Development
Consultants

40 Bridge Street
Portsmouth
New Hampshire
603 431-2520

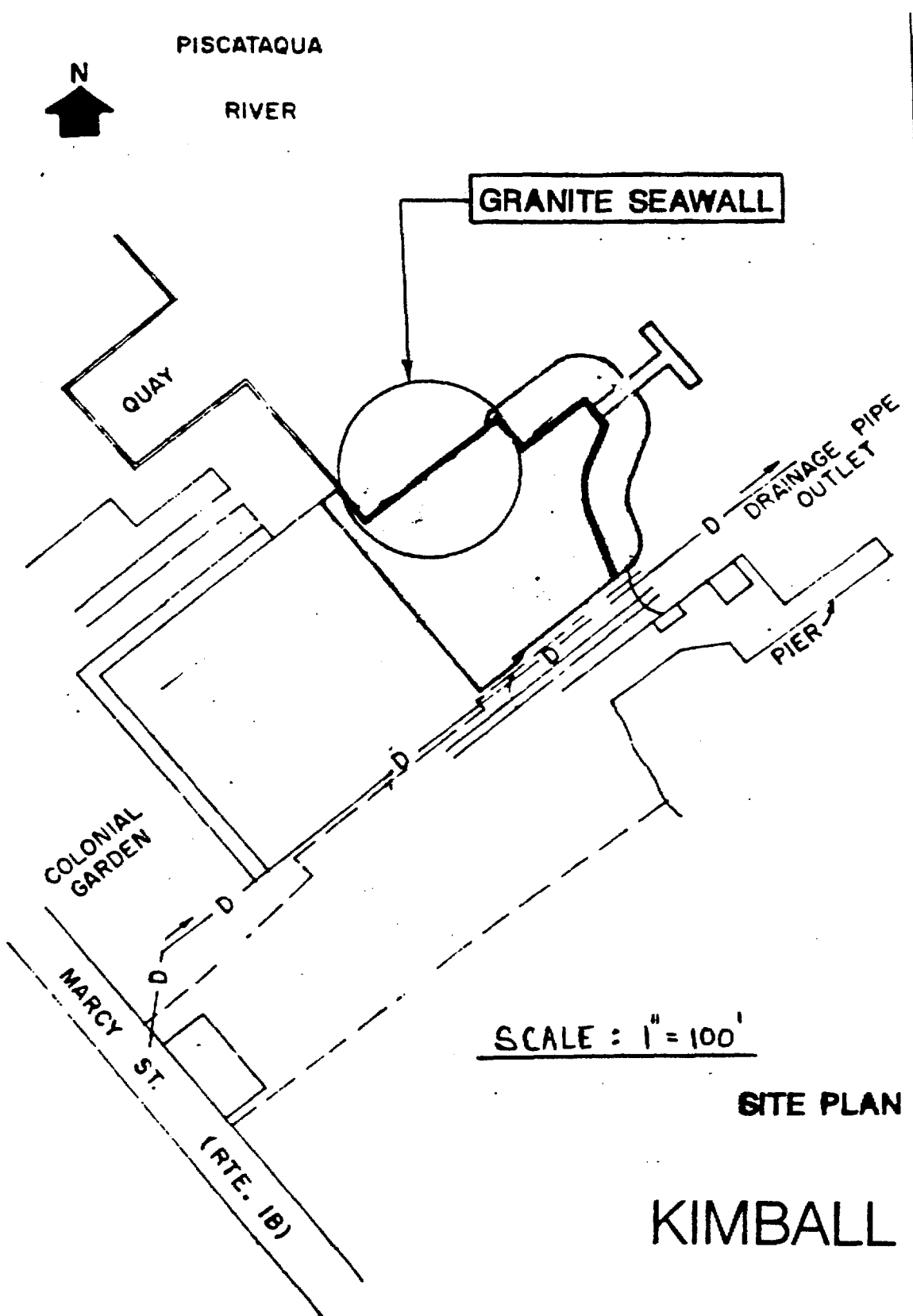


LOCATION PLAN

KIMBALL CHASE
company, inc.

Civil
Environmental
Engineers

40 Bridge Street
Portsmouth
New Hampshire 03801
803-431-2520

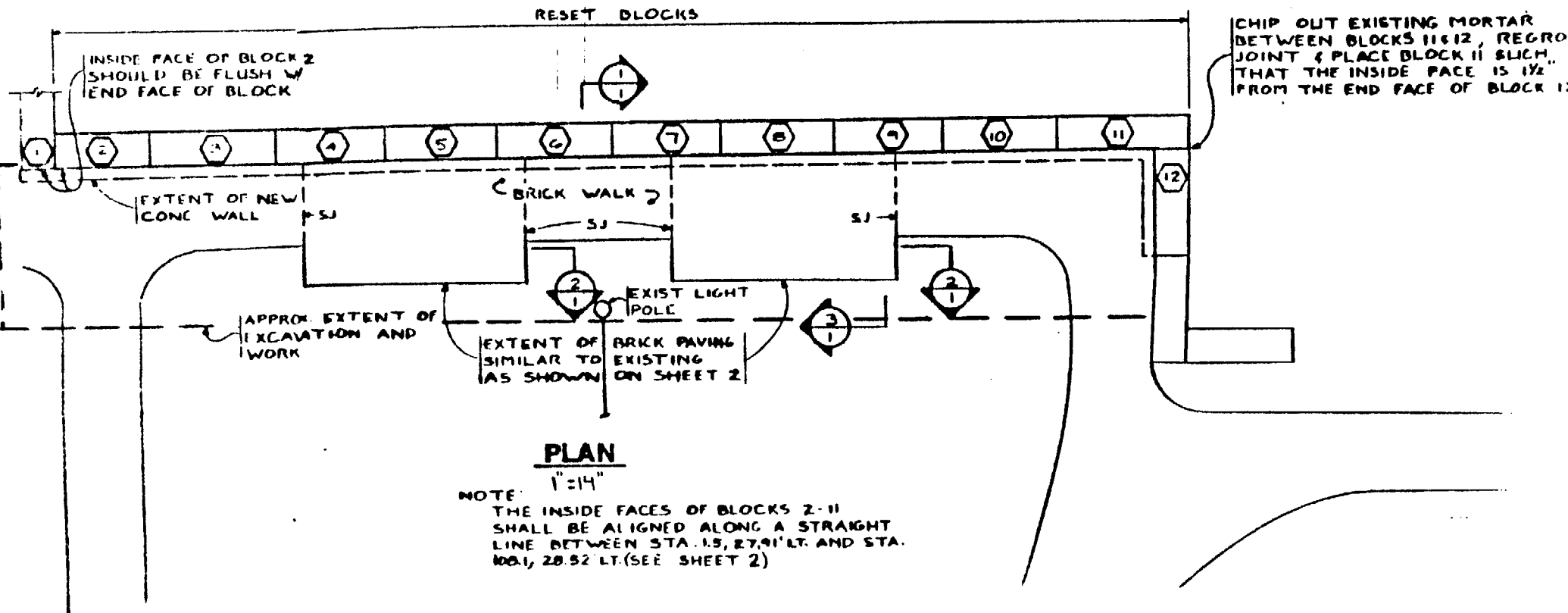


SITE PLAN

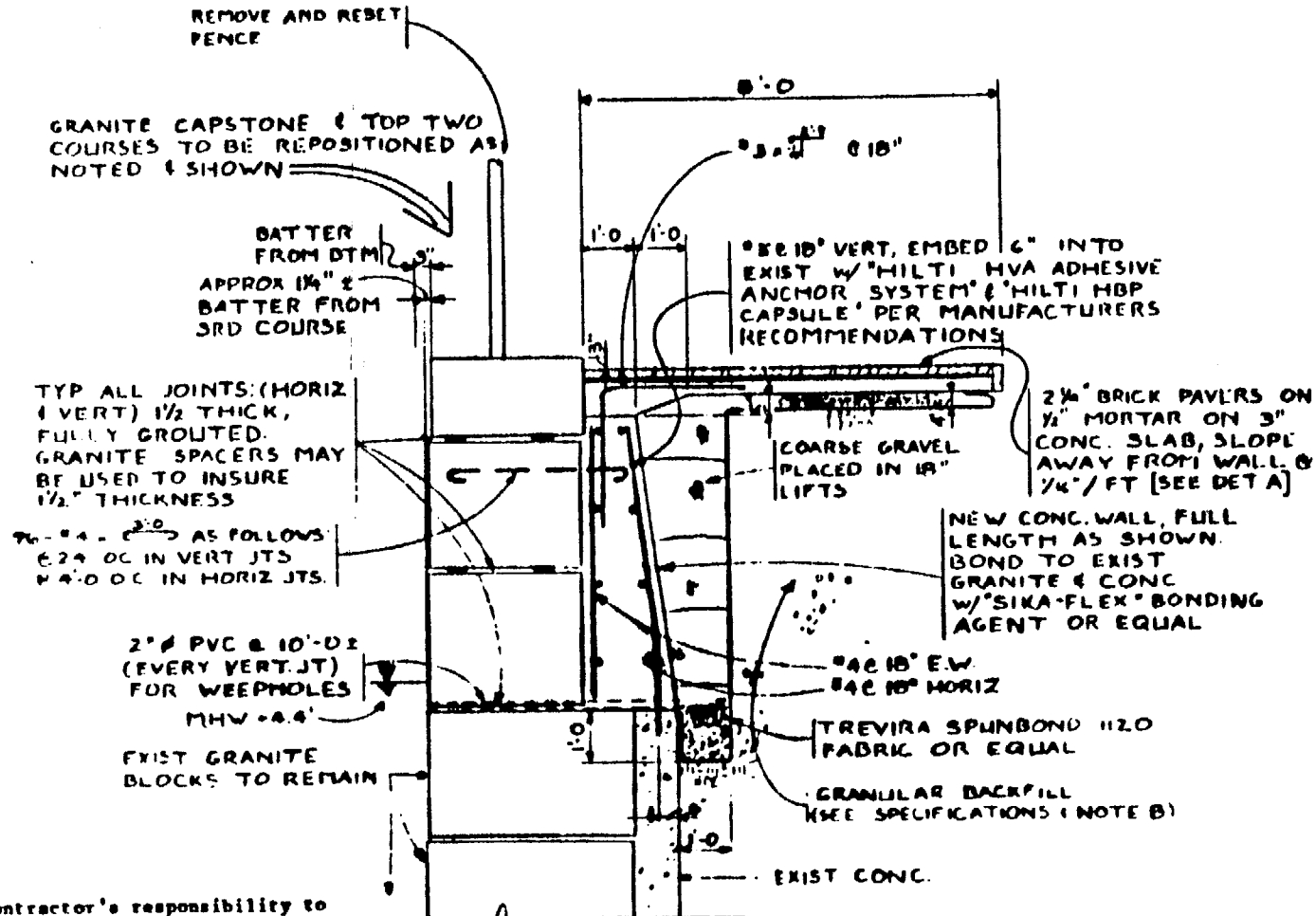
KIMBALL CHASE
company, inc

Civil
Environmental
Engineers

40 Bridge Street
Portsmouth
New Hampshire 038
603-431-2520

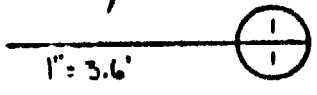


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company, inc.

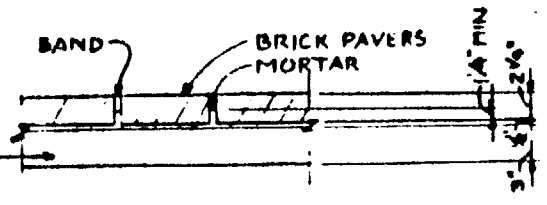


NOTE:

- A. It is the Contractor's responsibility to maintain stable excavations during all phases of construction. Care should be taken in locating equipment, temporary storage of granite blocks and excavated materials.
- B. All existing granular material excavated for the installation of drainage system, concrete diaphragm wall and resetting of granite blocks must be replaced in compacted lifts of not more than 18 inches each. Any material excavated that does not meet the criteria in the specifications for granular backfill must be replaced with new material that does meet the specifications.
- C. Contractor will be compensated for additional granular backfill material supplied, based on a predetermined unit cost basis.



3" CONC. REINF. W/
"FIBERMESH" POLY
PROPYLENE FIBERS
PER MANUF. RECOM-
MENDATIONS TYP



DETAIL A

KIMBALL CHASE
company, inc