PROJECT MANUAL

CONTRACT DOCUMENTS AND SPECIFICATIONS

FOR THE

LAKE BRUCE ASSOCIATION, INC.

LAKE BRUCE ENHANCEMENT PROJECT

AUGUST, 1995

Prepared By:

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LAKE BRUCE ASSOCIATION, INC.

LAKE BRUCE ENHANCEMENT PROJECT

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DIVISION 0

BIDDING AND CONTRACT REQUIREMENTS

ADVERTISEMENT FOR BIDS

LAKE BRUCE ASSOCIATION, INC.

LAKE BRUCE ENHANCEMENT PROJECT

FULTON COUNTY, INDIANA

NOTICE IS HEREBY GIVEN that the Lake Bruce Association, Inc., Fulton County, Indiana, by and through its Board of Directors, hereinafter referred to as the OWNER, will receive sealed proposals for the construction of the Lake Bruce Enhancement Project in Fulton County, Indiana.

Sealed proposals are invited and may be forwarded by registered mail addressed to the Lake Bruce Association, Inc., Board of Directors, Route 1, Kewanna, Indiana 46939, or delivered in person to the bid opening, and will be considered by the OWNER at a public meeting called to receive and open such proposals, provided that same shall have been received not later than _____ P.M. (E.S.T.) on DAY, MONTH DATE, 1995 at the _____, _____, Indiana 46939. Proposals received after such hours may be returned unopened.

The Project shall consist of, but is not limited to, a constructed wetland filtration system including two (2) hydraulic control structures, earthen berms, earthen baffles, two (2) sediment traps and wetland vegetation, and all other work as described in the Specifications and shown on the Plans.

Plans and Specifications for the Project are on file and may be examined at the following location:

J. F. New and Associates, Inc. Walkerton, Indiana

Copies of the Plans and Specifications may be obtained upon payment of a non-refundable fee of Seventy Five Dollars ($75.00) in the form of a check or money order made payable to J. F. New and Associates, Inc., 708 Roosevelt Road, Walkerton, Indiana 46574. Requests for Plans and Specifications must also include a return street address; post office box numbers are not acceptable. Partial sets of Plans and/or Specifications are not available. Copies of any and all addenda which may be issued for this Project shall be included with the purchased documents or shall be forwarded to all Plan and Specification holders.

The work to be performed and the proposal to be submitted shall include sufficient and proper sums for all General Construction, Mechanical Installation, Labor, Materials, Tools, Equipment, Taxes (both Federal and State), Permits, Licenses, Insurance, Service Costs,

and so forth incidental to and required for the construction of the Project.

Each proposal shall be accompanied by a certified check or acceptable bidder' s bond made payable to the OWNER, in a sum of not less than five percent (5%) of the total amount of the highest aggregate proposal, which check or bond will be held by the OWNER as evidence that the bidder will, if awarded the Contract, enter into the same with the OWNER upon notification from him to do so within ten (10) days of said notification.

Approved performance and payment bonds guaranteeing faithful and proper performance of the work and materials, to be executed by an acceptable surety company, will be required of the Contractor at the time he executes his contract. The bonds will be in the amount of 100% of the Contract Price and must be in full force and effect for a period of 12 months from the date of acceptance of and final payment for the work. Failure to execute a contract and to furnish a Performance Bond as hereinafter set out will be cause for forfeiture to the Owner of the amount of money represented by the Certified Check or Bidders Bond, as and for liquidated damages.

The OWNER reserves the right to reject any proposal, or all proposals, or to accept any proposal or proposals, or to make such combination of proposals as may seem desirable, and to waive any and all informalities in bidding. Any proposal may be withdrawn prior to the above scheduled time for the opening of proposals or authorized postponement thereof. Any proposal received after the time and date specified shall not be considered. NO proposal may be withdrawn after the scheduled closing time for receipt of bids for at least ninety (90) days.

A conditional or qualified Bid will not be accepted.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Project throughout.

Proposals shall include Indiana Form 96, provided by and executed by the bidder. Proposals shall include all information requested by Indiana Form 96 (Revised, 1987). The OWNER may make such investigations as deemed necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any Bid if the evidence submitted by, or investigation of such Bidder fails to satisfy the OWNER that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the work contemplated therein.

Each Bidder is responsible for inspecting the Project site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to its Bid.

Wage rates on this Project shall not be less than the prescribed scale of wages determined in accordance with Chapter 319 of the Acts of the Indiana General Assembly for the year 1935, now IC-516-7-1, and all acts amendatory thereof and supplemental thereto.

LAKE BRUCE ASSOCIATION, INC.

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS.

Terms used in these Instructions to Bidders which are defined in the Standard General Conditions of the Construction Contract (No. 1910-8, 1990 ed.) have the meanings assigned to them in the General Conditions. The term "Bidder" means one who submits a Bid directly to Owner, as distinct from a sub-bidder, who submits a bid to a Bidder. The term "Successful Bidder" means the lowest qualified, responsible, and responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award. The term "Bidding Documents" includes the Advertisement to Bid, Instructions to Bidders, the Bid Form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids.)

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 For Bids may be obtained from the Owner.

2.2 Complete sets of Bidding Documents must 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.

Each Bid shall include form 96-A, Standard Questionnaire, and Financial Statement for Bidders, provided and executed by the Bidder, as required by State Statute. Each Bid must contain evidence of Bidder's qualification to do business in the state where the Project is located or convenient to obtain such qualification prior to award of contract.

4. EXAMINATION OF CONTRACT DOCUMENTS AND SITE.

4.1 It is the responsibility of each Bidder before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site to become familiar with local conditions that may affect cost, progress, performance or furnishing of the Work, (c) consider federal, state, and local Laws and

Regulations that may affect cost, progress, performance, or furnishing of the Work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Engineer of all conflicts, errors or discrepancies in the Contract Documents.

4.2 Information and data reflected in the Contract Documents with respect to Underground Facilities at/or contiguous to the site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities or others, and Owner does not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary Conditions.

4.3 Before submitting a Bid, each Bidder will be responsible to make or obtain such explorations, tests, and data concerning physical conditions (surface, subsurface, and Underground Facilities) at or contiguous to the site, or otherwise which may affect cost progress, performance or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and determining the Work in accordance with the time, price, and other terms and conditions of the Contract Documents.

4.4 On request in advance, Owner will provide each Bidder access to the site to conduct such exploration and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, clean up, and restore the site to its former condition upon completion of such explorations.

4.5 The lands upon which the Work is to be performed, rights-of-way, and easements for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by Contractor. Easement for permanent structures or permanent changes in existing structures are to be obtained and paid for by Owner unless otherwise provided in the Contract documents.

4.6 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing methods, techniques, sequences, or procedures of construction, as may be indicated in or required by the Contract Documents, and that Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

5. INTERPRETATIONS AND ADDENDA.

5.1 All questions about the meaning or intent of the Contract Documents are to be directed to Engineer. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parses recorded by Engineer as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

5.2 Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner or Engineer.

6. BID SECURITY.

6.1 Each Bid must be accompanied by Bid security 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 the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within fifteen days after 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 other Bidders 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 or the forty-sixth day after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.

7. CONTRACT TIME.

The numbers of days within which, or the dates by which, the Work is to be substantially completed and also completed and ready for final payment (the Contract Time) are set forth in the Bid Form, the Agreement and in latter sections of these Instructions to Bidders.

8. LIQUIDATED DAMAGES.

Provisions for liquidated damages, if any, are set forth in the Agreement and in the latter sections of these Instructions to Bidders.

9. SUBSTITUTE OR "OR-EQUAL" ITEMS.

The contract if awarded, will be on the basis of materials 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 submission of any such application by Contractor and consideration by Engineer is set forth in Paragraphs 6.7.1, 6.7.2, and 6.7.3 of the General Conditions and may be supplemented in the General Requirements.

10. SUBCONTRACTORS, SUPPLIERS, AND OTHERS.

10.1 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, and other persons and organizations (including those who are to furnish the principal items of material and equipment) to be submitted to Owner in advance of the specified date prior to the Effective Date of the Agreement the apparent Successful Bidder, and any other Bidder so requested, shall within seven days after the Bid opening submit to Owner a list of all such Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, person, or organization if requested by Owner. If Owner or Engineer after due investigation has reasonable objection to any proposed Subcontractor, Supplier, other person, or organization, either may before the Notice of Award is given, request the apparent Successful Bidder to submit an acceptable substitute without an increase in Bid price. If apparent Successful Bidder declines to make any such substitution, Owner may award the contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, and other persons and organizations. The declining to make requested substitutions will not constitute grounds for sacrificing the Bid security of any Bidder. Any Subcontractor, Supplier, other person or organization 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,

subject to revocation of such acceptance after the effective Date of the Agreement as provided in Paragraph 6.8.2 of the General Conditions.

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, Supplier, other person or organization against whom Contractor has reasonable objection.

11. BID FORM.

11.1 The Bid Form is included with the Bidding Documents; additional copies may be obtained from Engineer (or the issuing office).

11.2 All blanks on the Bid Form must be completed in ink or by typewriter.

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 must 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 must be filled in on the Bid Form).

11.7 The address and telephone number for communications regarding the Bid must be shown.

12. SUBMISSION OF BIDS.

12.1 Bids shall be submitted at the time and place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope, marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted) 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 of it.

12.2 It is the intent of the Owner to open Bids immediately after the designated time in the Advertisement for Bids. However, the Owner reserves the right to delay the Bid opening process in the event of unforeseen circumstances as determined by the Owner that may be a factor in delaying a Bidder from delivering a Bid on time. No Bid will be received or opened after the Bid opening has begun.

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 its Bid, that Bidder may withdraw its Bid and the Bid security will be returned. Thereafter, that Bidder will be disqualified from further bidding on the Work to be provided under the Contract Documents.

14. OPENING OF BIDS.

Bids will be opened and (unless obviously non-responsive) read aloud publicly. A copy of the certified bid tabulation sheet(s) will be furnished to each Bidder sometime after the tentative awards have been made.

15. AWARD OF CONTRACT.

15.1 Owner reserves the right to reject any and all Bids, to waive any and all informalities not involving price, time or changes in the Work, and to negotiate contract terms with the Successful Bidder, and the right to disregard all nonconforming, not responsive, unbalanced, or conditional Bids. Also, Owner reserves the right to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner.

Discrepancies in the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

15.2 In evaluating Bids, Owner will consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid form or prior to the Notice of Award.

15.3 Owner may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions. Owner also may consider the operating costs, maintenance requirements, performance data, and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.

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

15.5 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. CONTRACT SECURITY.

Paragraph 5.1 of the General Conditions and the Supplementary Conditions set forth Owner's requirements as to performance and payment bonds. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by the required performance and payment Bonds.

17. SIGNING OF AGREEMENT.

When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within fifteen days thereafter Contractor shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds.

Within ten days thereafter, Owner shall deliver one fully signed counterpart to Contractor.

18. LETTER FROM SURETY.

In addition to the Bid Bond, the Bidder shall submit a letter or statement from the Bidder's surety company that it will execute and deliver a one hundred percent surety bond.

19. SECURITY FOR FAITHFUL PERFORMANCE.

Simultaneously with the delivery of the executed contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the Project under this contract and furnishing materials in connection with this contract as specified in the General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the Owner.

20. POWER OF ATTORNEY.

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

21. LAWS AND REGULATIONS.

The Bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the contract throughout, and they will be deemed to be included in the Contract the same as though herein written out in full.

22. SAFETY STANDARDS AND ACCIDENT PREVENTION.

With respect to all work performed under this Contract the Contractor shall:

22.1 Comply with the safety standards provisions of applicable laws, building and construction codes, and the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act of 1970 (Public Law 91-596), and the requirements of Title 29 of the Code of Federal Regulations, Section 1518 as published in the "Federal Register", Volume 36, No.75, Saturday, April 17, 1971.

22.2 Exercise every precaution at all times for the prevention of accidents and

the protection of persons (including employees) and property.

22.3 Maintain at his office or other well-known place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or a doctor's care of persons (including employees), who may be injured on the job site. In no case shall employees be permitted to work at a job site before the employer has made a standing arrangement for removal of injured persons to a hospital or a doctor's care.

23. TAX EXEMPTIONS.

The Indiana Department of Revenue requires that the Contractor or Subcontractors engaged in a contract with a governmental agency must submit an exemption certificate for construction contractors (Form SP 134) to each supplier for each exempt Project. The Owner will cooperate with the Contractor in filing the necessary forms with the Indiana Department of Revenue, but the Contractor shall be responsible for the initiation of these proceedings. The contract price will be based upon a complete exemption from this tax, and if later determined that a tax must be paid by the Owner, the contract price will be adjusted to reflect this liability to Owner.

24. ESCROW ACCOUNT(S).

The establishment of an escrow account between the Owner and the Successful Bidder(s) for the retainage will be left to the sole discretion of the Successful Bidder(s).

25. BIDS TO REMAIN OPEN.

All Bids shall remain open for ninety (90) days after the day of the bid opening. The Owner may release any Bid and return the Bid security prior to that date.

26. COMPLETION TIME AND LIQUIDATED DAMAGES.

Bidder agrees to commence work on or before the date to be specified in the written Notice to Proceed by Owner. Bidder further agrees that the Work will be substantially complete **one hundred and twenty two** (**122**) consecutive calendar days after the date when Contract Time commences to run and completed and ready for final payment within **one hundred and fifty two** (**152**) consecutive calendar days after the date when Contract Time commences to run. Bidder also agrees to pay as liquidated damages, the sum of one hundred dollars ($100.00) for each consecutive calendar day thereafter.

27. EXCEPTIONS TO LIQUIDATED DAMAGES PROVISION.

It is further agreed that time is of the essence of each and every portion of this Agreement and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where, under the CONTRACT DOCUMENTS an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be the essence of this Agreement. Provided, that the CONTRACTOR shall not be charged with liquidated damages or any excess cost when the Owner determines that the CONTRACTOR is without fault and the CONTRACTOR'S reasons for the time extension are acceptable to the OWNER; provided further, that the CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

1. To any preference, priority or allocation order duly issued by any governmental entity;

2. To unforeseeable cause beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another contractor in the performance of a contract with the OWNER.

28. FAMILIARITY WITH PROJECT SITE.

All Bidders are required to examine the site prior to the preparation of their Bids.

29. WAGE RATES.

Davis-Bacon does not apply to this project. Contractors will be required, however, to pay wage rates according to the State of Indiana wage rate decision enclosed in this Project Manual.

30. LIABILITY INSURANCE.

The Successful Bidder shall provide proof of liability insurance in the amount of one million dollars ($1,000,000.00) as set forth in Article 5.3 of the General Conditions and amended in the Supplementary Conditions.

31. LUMP SUM CONTRACT.

Unit prices shall be submitted as a part of the bid; however, unit prices are indicated only to establish unit prices in the event that quantities may be changed by agreement between the Owner and the Contractor. The Bidder shall satisfy himself as to the accuracy of the established quantities and accept lump sum

payment for the completed project. Payment shall be according to Article 14 of the General Conditions.

32. REFERENCES.

As a part of the Bid Package each Bidder shall include references for previous similar projects. The references shall contain the following information:

1 Name of person or agency contracted with
2. Address of person or agency
3. Contact person
4. Phone number
5. Brief description of Project

33. ALTERNATE BIDS.

Bidders must bid on all alternate bids if alternate bids are included in the Bid Form.

34. SUMMARY OF ITEMS TO BE SUBMITTED WITH BID.

1. Bid Form - Completely executed and signed.
2. Bid Security - Acceptable bid bond or cashier's check in an amount not less than 5% of the total bid price From 96, Contractors Bid for Public Works including fully executed Non-Collusion Affidavit
3. Proof of Insurance
4. References

BID
LAKE BRUCE ENHANCEMENT PROJECT
LAKE BRUCE ASSOCIATION, INC.

TO: Lake Bruce Association, Inc.
Route 1
Kewanna, Indiana 46939

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the Contact Documents.

2. BIDDER accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid Security. This Bid will remain open for thirty (30) days after the day of Bid opening. BIDDER will sign the Agreement and submit the Contract Security and other Documents required by the Contract Documents within fifteen (15) days after of OWNER's Notice of Award.

3. In submitting his Bid, BIDDER represents, as more fully set forth in the Agreement that:

   a. BIDDER has examined copies of all the Contract Documents, Advertisement For Bids and the Instructions to Bidders, and BIDDER has examined copies of (receipt of all of which are hereby acknowledged) Addenda Nos. _____.

   b. BIDDER has familiarized itself with the nature and extent of the Contract Documents, Work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost progress, performance, or furnishing of Work.

   c. BIDDER has studied carefully all reports and drawings of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in Paragraph 4.2 of the General Conditions, and accepts the determination set forth in Paragraph SC-4.2 of the Supplementary Conditions of the extent of the technical data contained in such reports and drawings upon which BIDDER is entitled to rely.

   d. BIDDER has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, and studies, (in addition to or to supplement those

referred to in c. above) which pertain to the subsurface or physical conditions at the site or otherwise may affect the cost, progress, performance, or furnishing of the Work as BIDDER considers necessary for the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, or similar information or data are or will be required by BIDDER for such purpose.

e. BIDDER has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, or similar information of data in respect of said Underground Facilities are or will be required by BIDDER in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Paragraph 4.3 of the General Conditions.

f. BIDDER has correlated the results of all such observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents.

g. BIDDER has given ENGINEER written notice of all conflicts, errors, or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER.

h. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm, or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

4. OWNER will base the Award of Contract on the base bid work and/or a combination of the alternative bid (if requested) which results in the lowest total bid price. The Owner reserves the right to reduce the scope of work, as defined by the price of the base bid items, of the lowest bidder so that the Owner is financially capable of constructing the Project.

5. BIDDER will complete the work for the following prices:

BASE LUMP SUM BID

$ _____
(Total Price In Words)

$ _____
(Total Price In Numbers)

6. BIDDER shall complete the attached Base Bid Schedule. Where unit and unit price figures are used as part of the Bid, they will be used in computing the Contractor's payments. BIDDER shall complete itemized unit prices and extensions and forward the total for the Bid to this page. Quantities are not guaranteed. Final payment will be based upon the actual quantities placed in the Work.

7. The following documents are attached to and made a condition of this Bid:
   a. Bid Form - Completely executed and signed
   b. Bid security - Acceptable bid bond or cashier's check in an amount not less than 5% of the total bid price
   c. Form 96, Contractors Bid for Public Works including fully executed Non-Collusion Affidavit
   d. Proof of Insurance
   e. Certification of Non-Segregated Facilities
   f. References

8. The terms used in this Bid which are defined in the General Conditions of the Construction Contract included as part of the Contract Documents have the meanings assigned to them in the General Conditions.

9. Submitted on _____, 19_.

By: Contractor
(Corporation __) (Partnership __) (Individual __)

(SEAL)

By _____

_____
(Name & Title of Person Authorized to Sign)

Business Address _____

_____

LAKE BRUCE ASSOCIATION, INC.
LAKE BRUCE ENHANCEMENT PROJECT
BASE BID SCHEDULE

Item No.	Unit	Item Description	Total Price in Words	Total Price in Numbers
1	L.S.	Earthwork (02120, 02200 & 02244)	_____	$_____
2	L.S.	Erosion Control (02250)	_____	$_____
3	L.S.	Steel Sheeting & Cap (02411 & 05100)	_____	$_____
4	L.S.	Geotextile (02545)	_____	$_____
5	L.S.	Gabions (02765)	_____	$_____
6	L.S.	Rip Rap (02766)	_____	$_____
7	L.S.	Seeding (02820)	_____	$_____
8	L.S.	Wetland Seeding (02830 & 02246)	_____	$_____
9	L.S.	EmergentWetland Planting (02860)	_____	$_____
10	L.S.	Walkways, Stairs & Handrailing (05100 & 05530)	_____	$_____
11	L.S.	Slide Gates	_____	$_____

Item No.	Unit	Item Description	Total Price in Words	Total Price in Numbers
12	L.S.	Mobilization & DIVISION 1 Requirements	_____	$_____

TOTAL BASE BID, ITEMS 1-12 _____

_____ *

(In Words)

TOTAL BASE BID, ITEMS 1-12 _____ *

(In Figures)

* Total Must Agree With Amount on Page B/3.

AGREEMENT BETWEEN OWNER AND CONTRACTOR

THIS AGREEMENT is by and between the Lake Bruce Association, Inc. (hereinafter called OWNER) and _____ (hereinafter called CONTRACTOR). **OWNER** and **CONTRACTOR,** in consideration of the mutual covenants hereinafter set forth, agrees as follows:

ARTICLE 1. WORK

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

the Project shall consist of, but is not limited to, a constructed wetland filtration system including two (2) hydraulic control structures, earthen berms, earthen baffles, two (2) sediment traps and wetland vegetation, and all other work as described in the Specifications and shown on the Plans.

ARTICLE 2. ENGINEER

The Project has been designed by J. F. New and Associates, Inc., Walkerton, who is hereinafter called ENGINEER and who is to act as OWNER'S representative, assume all duties and responsibilities and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3. CONTRACT TIME

3.1 The Work will be substantially completed within 122 consecutive calendar days from the date when the Contract Time commences to run as provided in Paragraph 2.3 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.13 of the General Conditions within 152 consecutive calendar days from the date when the Contract Time commences to run. Contract Time shall commence on or about _____ __, 19__.

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 completed within the times specified in Paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. Contractor agrees to pay as liquidated damages a sum of one hundred dollars ($100.00) per day for each consecutive calendar day thereafter.

ARTICLE 4. CONTRACT PRICE

4.1 OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents, in current funds, as follows: $_____. This Contract Price

includes _____.

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 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 _th day of each month during the progress of Work measured by the schedule of values established in Paragraph 2.9 of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.

5.1.1 Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below, but in each case, less the aggregate of payments previously made and less such amounts as ENGINEER shall determine, or OWNER may withhold, in accordance with Paragraph 14.7 of the General Conditions.

Ninety-five percent (95%) of Work completed.

Ninety-five percent (95%) of material and equipment not incorporated in the work (but delivered, suitably stored and accompanied by documentation satisfactory to OWNER as provided in paragraph 14.2 of the General Conditions.

5.1.2 Upon Substantial Completion, in an amount sufficient to increase total payments to CONTRACTOR to 98% of the Contract Price, less such amounts as Engineer shall determine, or OWNER may withhold, 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 as provided in Article 14 of the General Conditions may 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 itself with the nature and extent of the Contract

Documents, Work, site, locality, and all local conditions, and Laws and Regulations that in any manner may affect cost, progress, performance, or furnishing of the Work.

7.2 CONTRACTOR has studied carefully all reports of explorations and tests of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in Paragraph 4.2 of the General Conditions, and accepts the determination set forth in Paragraph SC-4.2 of the Supplementary Conditions of the extent of the technical data contained in such reports and drawings upon which CONTRACTOR is entitled to rely.

7.3 CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports, and studies (in addition to or to supplement those referenced to in Paragraph 7.2 above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work as CONTRACTOR considers necessary Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies, or similar information or data are or will be required by CONTRACTOR for such purposes.

7.4 CONTRACTOR has reviewed and checked all information and data shown or indicated on Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibilities for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, studies, or similar information or data in respect of said Underground Facilities are or will be required by CONTRACTOR in order to perform and furnish the work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Paragraph 4.3 of the General Conditions.

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

7.6 CONTRACTOR has given ENGINEER written notice of all conflicts, errors, or discrepancies that he has discovered in the Contract Documnent and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

ARTICLE 8. CONTRACT DOCUMENTS

The Contract Documents which comprise the entire agreement between OWNER and CONTRACTOR concerning the Work consist of the following:

8.1 This Agreement (pages 1 to 5, inclusive).

8.2 Performance and Payment bonds per the Project Manual.

8.3 Certificates of Insurance per the Project Manual.

8.4 Notice of Award.

8.5 The Project Manual including the General Conditions, Supplementary Conditions, any and all special requirements and/or provisions, specifications, construction standards, and all other sections of the Project Manual except the Bid Documents.

8.6 Drawings (Plans), consisting of sheets numbered 1 through 6, inclusive.

8.7 Addenda Number(s) _____

8.8 CONTRACTOR'S BID (pages B/1 to B/5, inclusive).

8.9 Other documentation submitted by CONTRACTOR prior to Notice of Award (insert name and date or other documentation, if applicable: if none, insert N/A). _____
_____.

8.10 The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying or supplementing the Contract Document pursuant to Paragraphs 3.4 and 3.5 of the General Conditions.

There are no Contract Documents other than those listed above in this Article 8. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraphs 3.4 and 3.5 of the General Conditions. The documents listed in Paragraphs 8.2 eg. seq. above are not attached to this Agreement but are to be maintained as a matter of record and reference at the office of the ENGINEER, CONTRACTOR, and OWNER.

ARTICLE 9. MISCELLANEOUS

9.1 Terms used in this Agreement which are defined in Article I of the General Conditions will 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 itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect of all covenants, agreements, and obligations contained in the Contract Documents.

IN WITNESS WHEREOF, OWNER and CONTRACTOR 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_ (Date to be inserted by OWNER, not CONTRACTOR.)

CONTRACTOR	**OWNER**
_____	_____
(Company Name)	
By _____	_____
(Name and Title)	
Address for Giving Notices	By _____
_____	_____
_____	_____
_____	_____

Agent and Address for Service of Process: Attest:

_____	_____
_____	_____
_____	_____
_____	_____

NOTICE OF AWARD

Date: _____, 19_

To Contractor:

_____

_____

_____

_____

PROJECT: (Insert name of Contract as it appears in the Bid Documents)

_____

_____

You are hereby notified that your Bid dated _____, 19_, has been evaluated and you are the apparent successful bidder. You have been awarded a contract for (insert description of work including which, if any, alternate bids)

_____

_____

_____

The Contract Price of your contract is $ _____.

Three copies of the proposed Agreement (Contract) accompany this Notice of Award, that is by _____, 19_.

1. You must deliver to the Owner three (3) fully executed counterparts of the agreement (Contract). Each of the Agreements must bear your signature.
2. Your must deliver the Contract Securities (Performance & Payment Bonds) as specified in the Instructions to Bidders, General Conditions and Supplementary Conditions.

3. You must deliver the Certificates of Insurance as specified in the General Conditions and Supplementary Conditions (Paragraph S.C. 5.3).
4. (List other conditions, if applicable):

_____

_____

_____

_____

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 (10) days after you comply with these conditions, OWNER will return to you one fully signed counterpart of the Agreement for your records.

_____
(OWNER)

By _____
Title _____

NOTICE TO PROCEED

Date: _____, 19__

To Contractor:

_____

_____

_____

_____

PROJECT: (Insert name of Contract as it appears in the Bid Documents)

_____

_____

You are hereby notified to proceed with the above referenced project and that Contract Time for the above contract will commence to run on _____, 19__. No later than that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 3 of the Agreement (Contract), the dates of Substantial Completion and Final Completion are _____,19__, and _____, 19__, respectively.

Before you may start any Work at the site, Paragraph 2.7 of the General Conditions provides that you deliver to us Certificates of Insurance (with a copy sent to the Engineer) per the Contract Documents.

_____
(OWNER)

By _____

Title _____

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

_____
(Name of Contractor)

_____
(Address of Contractor)

a _____, hereinafter called Principal, and
(Corporation, Partnership, or Individual)

_____
(Nane of Surety)

_____
(Address of Surety)

hereinafter **called** Surety, are held and firmly bound unto _____

_____
(Name of Owner)

_____
(Address of Owner)

hereinafter called OWNER, in the penal sum of _____

_____ Dollars, $(_____)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____ 19__, a copy of which is hereto attached and made a part hereof for the construction of:

_____

_____

_____

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that it is expressly agreed that the BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the CONTRACT as so amended. The term "Amendment", wherever used in this BOND, and whether referring to this BOND, the Contract or the Loan Documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied. The OWNER is the only beneficiary hereunder.

IN WITNESS WHEREOF, this instrument is executed in _____ (Number) counterparts, each one of one of which shall be deemed an original, this the _____ day of _____ 19 ___.

ATTEST:

_____

_____ Principal

By _____ (s)

(SEAL)

_____ _____

(Witness as to Principal) (Address)

_____ _____

(Address)

_____ _____

Surety

ATTEST:

_____

(Surety) Secretary

(SEAL)

_____ By _____

(Witness as to Surety) Attorney-in-Fact

_____ _____

(Address) (Address)

_____ _____

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

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the PROJECT is located.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that

_____
(Name of Contractor)

_____
(Address of Contractor)

a _____, hereinafter called PRINCIPAL, and
(Corporation, Partnership, or Individual)

_____
(Name of Surety)

_____
(Address of Surety)

hereinafter called SURETY are held and firmly bound unto _____

_____
(Name of Owner)

_____
(Address of Owner)

hereinafter called OWNER, in the penal sum of _____

_____ Dollars, $(_____)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION is such that whereas, the PRINCIPAL entered into a certain contract with the OWNER, dated the _____ day of _____, 19__, a copy of which is hereto attached and made a part hereof for the construction of:

_____

_____

_____

NOW, THEREFORE, if the PRINCIPAL shall promptly make payment to all persons, firms, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extensions or modifications thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and for all labor cost incurred in such WORK including that by a SUBCONTRACTOR, and to any mechanic or materialman lienholder whether it acquires its lien by operation of State or Federal law; then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, that beneficiaries or claimants hereunder shall be limited to the SUBCONTRACTORS, and persons, firms and corporations having a direct contract with the PRINCIPAL or its SUBCONTRACTORS.

PROVIDED, FURTHER, that the said SURETY for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that 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 written notice to any two of the following: The PRINCIPAL, the OWNER, or the SURETY above named within ninety (90) days 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 or 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 in which the aforesaid project is located, save that such service need not be made by a public officer. (b) After the expiration of one (1) year following the date of which PRINCIPAL ceased work on said CONTRACT, is being understood, however, that if any limitation embodied in the 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.

PROVIDED, FURTHER, that it is expressly agreed that the BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the CONTRACT as so amended. The term "Amendment", wherever used in this BOND, and whether referring to this BOND, the Contract or the Loan Documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied. The OWNER is the only beneficiary hereunder.

IN WITNESS WHEREOF, this instrument is executed in _____ (Number) counterparts, each one of one of which shall be deemed an original, this the _____ day of _____ 19___.

ATTEST:

_____
Principal

_____

BY _____ (s)

Certificate of Owner's Attorney.

I, the undersigned, _____ , the duly

authorized and acting legal representative of _____

_____, do hereby certify as follows:

I have examined the attached contract(s) and performance and payment bond(s) and contractor's Certificate of Insurance and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements are adequate, and have been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions, and provisions thereof.

_____

Date: _____

NOTE: Delete phrase "performance and payment bonds" when not applicable.

CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT .....

DATE OF ISSUANCE .....

OWNER .....

OWNER's Contract No. .....

CONTRACTOR ..... ENGINEER .....

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. The items in the tentative list shall be completed or corrected by CONTRACTOR within _____ days of the above date of Substantial Completion.

EJCDC No. 1910-8-D (1990 Edition)
Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America.

From the date of Substantial Completion the responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities, insurance and warranties and guarantees shall be as follows:

RESPONSIBILITIES:

OWNER: _____

_____

_____

CONTRACTOR: _____

_____

_____

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

[For items to be attached see definition of Substantial Completion as supplemented and other specifically noted conditions precedent to achieving Substantial Completion as required by Contract Documents.]

This certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of CONTRACTOR's obligation to complete the Work in accordance with the Contract Documents.

Executed by ENGINEER on ..... , 19 .....

.....
ENGINEER

By: .....
(Authorized Signature)

CONTRACTOR accepts this Certificate of Substantial Completion on ..... , 19 .....

.....
CONTRACTOR

By: .....

OWNER accepts this Certificate of Substantial Completion on ..... , 19 .....

.....
OWNER

By: .....
(Authorized Signature)

CHANGE ORDER

Order No. _____

Date: _____

Agreement Date: _____

NAME OF PROJECT: _____

_____

CONTRACTOR: _____

The following changes are hereby made to the CONTRACT DOCUMENTS:

Justification:

Change to CONTRACT PRICE:

Original CONTRACT PRICE $ _____

Current CONTRACT PRICE adjusted by previous CHANGE ORDER $ _____

The CONTRACT PRICE due to this CHANGE ORDER will be (increased)

(decreased) by: $ _____

The new CONTRACT PRICE including this CHANGE ORDER will be $ _____

Change to CONTRACT TIME:

The CONTRACT TIME will be (increased) (decreased) by _____ calendar days.

The date for completion of all work will be _____ (Date).

Approvals Required:
To be effective this Order must be approved by the Federal agency if it changes the scope or objective of the PROJECT, or as may otherwise be required by the SUPPLEMENTAL GENERAL CONDITIONS.

Requested by: _____

Recommended by: _____

Ordered by: _____

Accepted by: _____

Federal Agency Approval **(where applicable)**_____

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) (1990 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) (1986 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. 1910-17) (1990 Edition). When bidding is involved, the Standard Form of Instructions to Bidders (No. 1910-12) (1990 Edition) may be used.

EJCDC No. 1910-8 (1990 Edition)
Reprinted 5/91

© 1990 National Society of Professional Engineers
1420 King Street, Alexandria, VA 22314

American Consulting Engineers Council
1015 15th Street, N.W., Washington, DC 20005

American Society of Civil Engineers
345 East 47th Street, New York, NY 10017

Construction Specifications Institute
601 Madison St., Alexandria, VA 22314

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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:

1.1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the Bidding Requirements or the Contract Documents.

1.2. *Agreement*—The written contract 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.

1.3. *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 be accompanied by such supporting documentation as is required by the Contract Documents.

1.4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

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

1.6. *Bidding Documents*—The advertisement or invitation to Bid, instructions to bidders, the Bid form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

1.7. *Bidding Requirements*—The advertisement or invitation to Bid, instructions to bidders, and the Bid form.

1.8. *Bonds*—Performance and Payment bonds and other instruments of security.

1.9. *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 Times, issued on or after the Effective Date of the Agreement.

1.10. *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 Notice to Proceed, 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 Written Amendments, Change Orders, Work Change Directives, Field Orders and ENGINEER's written interpretations and clarifications issued pursuant to paragraphs 3.5, 3.6.1, and 3.6.3 on or after the Effective Date of the Agreement. Shop Drawing submittals approved pursuant to paragraphs 6.26 and 6.27 and the reports and drawings referred to in paragraphs 4.2.1.1 and 4.2.2.2 are not Contract Documents.

1.11. *Contract Price*—The moneys payable by OWNER to CONTRACTOR for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.9.1 in the case of Unit Price Work).

1.12. *Contract Times*—The numbers of days or the dates stated in the Agreement: (i) to achieve Substantial Completion, and (ii) to complete the Work so that it is ready for final payment as evidenced by ENGINEER's written recommendation of final payment in accordance with paragraph 14.13.

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

1.14. *defective*—An adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, in that it 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).

1.15. *Drawings*—The drawings which show the scope, extent and character of the Work to be furnished and performed by CONTRACTOR and which have been prepared or approved by ENGINEER and are referred to in the Contract Documents. Shop drawings are not Drawings as so defined.

1.16. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

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

1.18. *ENGINEER's Consultant*—A person, firm or corporation having a contract with ENGINEER to furnish services as ENGINEER's independent professional associate or consultant with respect to the Project and who is identified as such in the Supplementary Conditions.

1.19. *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 Times.

1.20. *General Requirements*—Sections of Division 1 of the Specifications.

1.21. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

1.22. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes and orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.

1.23. *Liens*—Liens, charges, security interests or encumbrances upon real property or personal property.

1.24. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

1.25. *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.

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

1.27. *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.

1.28. *Partial Utilization*—Use by OWNER of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

1.29. *PCBs*—Polychlorinated biphenyls.

1.30. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Wastes and crude oils.

1.31. *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.

1.32. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

1.33. *Resident Project Representative*— The authorized representative of ENGINEER who may be assigned to the site or any part thereof.

1.34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

1.35. *Shop Drawings*—All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the Work.

1.36. *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.

1.37. *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.

1.38. *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 no such certificate is issued, when the Work is complete and ready for final payment as evidenced by ENGINEER's written recommendation of final payment in accordance with paragraph 14.13. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

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

1.40. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman or vendor having a direct contract with CONTRACTOR or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by CONTRACTOR or any Subcontractor.

1.41. *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.

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

1.43. *Work*—The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents.

1.44. *Work Change Directive*—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 6.23. A Work Change Directive will not change the Contract Price or the Contract Times, but is evidence that the parties expect that the change directed or documented by a Work Change Directive 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 Times as provided in paragraph 10.2.

1.45. *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 construction-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 Times; Notice to Proceed:

2.3. The Contract Times 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 Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

Starting the Work:

2.4. CONTRACTOR shall start to perform the Work on the date when the Contract Times commence to run, but no Work shall be done at the site prior to the date on which the Contract Times commence 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, ambiguity 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, ambiguity or discrepancy in the Contract Documents, unless CONTRACTOR knew or reasonably should 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. a preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2.6.2. a preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing and processing such submittal;

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.

2.7. Before any Work at the site is started, CONTRACTOR and OWNER shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which CONTRACTOR and OWNER respectively are required to purchase and maintain in accordance with paragraphs 5.4, 5.6 and 5.7.

Preconstruction Conference:

2.8. Within twenty days after the Contract Times start to run, but before any Work at the site is started, a conference

attended by CONTRACTOR, ENGINEER and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in paragraph 2.6, procedures for handling Shop Drawings and other submittals, processing Applications for Payment and maintaining required records.

Initially Acceptable Schedules:

2.9. Unless otherwise provided in the Contract Documents, 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 review for acceptability to ENGINEER as provided below the schedules submitted in accordance with paragraph 2.6. CONTRACTOR shall have an additional ten days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to CONTRACTOR until the schedules are submitted to and acceptable to ENGINEER as provided below. The progress schedule will be acceptable to ENGINEER as providing an orderly progression of the Work to completion within any specified Milestones and the Contract Times, but such acceptance will neither impose on ENGINEER responsibility for the sequencing, scheduling or progress of the Work nor interfere with or relieve CONTRACTOR from CONTRACTOR's full responsibility therefor. CONTRACTOR's schedule of Shop Drawing and Sample submissions will be acceptable to ENGINEER as providing a workable arrangement for reviewing and processing the required submittals. CONTRACTOR's 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 or from prevailing custom or trade usage as being required to produce the intended result will be furnished and performed whether or not specifically called for. When words or phrases which have a well- known technical or construction industry or trade meaning are used to describe Work, materials or equipment, such words or phrases shall be interpreted in accordance with that meaning. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in paragraph 9.4.

3.3. Reference to Standards and Specifications of Technical Societies; Reporting and Resolving Discrepancies:

3.3.1. Reference to standards, 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 in the Contract Documents.

3.3.2. If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such Law or Regulation applicable to the performance of the Work or of any such standard, specification, manual or code or of any instruction of any Supplier referred to in paragraph 6.5, CONTRACTOR shall report it to ENGINEER in writing at once, and, CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency as authorized by paragraph 6.23) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in paragraph 3.5 or 3.6; provided, however, that CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any such conflict, error, ambiguity or discrepancy unless CONTRACTOR knew or reasonably should have known thereof.

3.3.3. Except as otherwise specifically stated in the Contract Documents or as may be provided by amendment or supplement thereto issued by one of the methods indicated in paragraph 3.5 or 3.6, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity or discrepancy between the provisions of the Contract Documents and:

3.3.3.1. the provisions of any such standard, specification, manual, code or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

3.3.3.2. the provisions of any such Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

No provision of any such standard, specification, manual, code or instruction shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR or ENGINEER, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to OWNER, 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 inconsistent with the provisions of paragraph 9.13 or any other provision of the Contract Documents.

3.4. 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, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in 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 9.13 or any other provision of the Contract Documents.

Amending and Supplementing Contract Documents:

3.5. 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:

3.5.1. a formal Written Amendment,

3.5.2. a Change Order (pursuant to paragraph 10.4), or

3.5.3. a Work Change Directive (pursuant to paragraph 10.1).

3.6. 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:

3.6.1. a Field Order (pursuant to paragraph 9.5),

3.6.2. ENGINEER's approval of a Shop Drawing or Sample (pursuant to paragraphs 6.26 and 6.27), or

3.6.3. ENGINEER's written interpretation or clarification (pursuant to paragraph 9.4).

Reuse of Documents:

3.7. CONTRACTOR, and any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with OWNER (i) shall not 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 or ENGINEER's Consultant, and (ii) shall not reuse any of such Drawings, Specifications, other documents or copies on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaption by ENGINEER.

ARTICLE 4—AVAILABILITY OF LANDS; SUBSURFACE AND 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. Upon reasonable written request, OWNER shall furnish CONTRACTOR with a correct statement of record legal title and legal description of the lands upon which the Work is to be performed and OWNER's interest therein as necessary for giving notice of or filing a mechanic's lien against such lands in accordance with applicable Laws and Regulations. OWNER shall identify any encumbrances or restrictions not of general application but specifically related to use of lands so furnished with which CONTRACTOR will have to comply in performing the Work. 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 and OWNER are unable to agree on entitlement to or the amount or extent of any adjustments in the Contract Price or the Contract Times as a result of any delay in OWNER's furnishing these lands, rights-of-way or easements, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.2. *Subsurface and Physical Conditions:*

4.2.1. *Reports and Drawings:* Reference is made to the Supplementary Conditions for identification of:

4.2.1.1. *Subsurface Conditions:* Those reports of explorations and tests of subsurface conditions at or contiguous to the site that have been utilized by ENGINEER in preparing the Contract Documents; and

4.2.1.2. *Physical Conditions:* Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) that have been utilized by ENGINEER in preparing the Contract Documents.

4.2.2. *Limited Reliance by CONTRACTOR Authorized; Technical Data:* CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any claim against OWNER, ENGINEER or any of ENGINEER's Consultants with respect to:

4.2.2.1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto, or

4.2.2.2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings, or

4.2.2.3. any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such data, interpretations, opinions or information.

4.2.3. *Notice of Differing Subsurface or Physical Conditions:* If CONTRACTOR believes that any subsurface or physical condition at or contiguous to the site that is uncovered or revealed either:

4.2.3.1. is of such a nature as to establish that any "technical data" on which CONTRACTOR is entitled to rely as provided in paragraphs 4.2.1 and 4.2.2 is materially inaccurate, or

4.2.3.2. is of such a nature as to require a change in the Contract Documents, or

4.2.3.3. differs materially from that shown or indicated in the Contract Documents, or

4.2.3.4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents; then

CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as permitted by paragraph 6.23), notify OWNER and ENGINEER in writing about such condition. CONTRACTOR shall not further disturb such conditions or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

4.2.4. *ENGINEER's Review:* ENGINEER will promptly review the pertinent conditions, determine the necessity of OWNER's obtaining additional exploration 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 Contract Documents Change:* If ENGINEER concludes that a change in the Contract Documents is required as a result of a condition that meets one or more of the categories in paragraph 4.2.3., a Work Change Directive or a Change Order will be issued as provided in Article 10 to reflect and document the consequences of such change.

4.2.6. *Possible Price and Times Adjustments:* An equitable adjustment in the Contract Price or in the Contract Times, or both, will be allowed to the extent that the existence of such uncovered or revealed condition causes an increase or decrease in CONTRACTOR's cost of, or time required for performance of, the Work; subject, however, to the following:

4.2.6.1. such condition must meet any one or more of the categories described in paragraphs 4.2.3.1 through 4.2.3.4, inclusive;

4.2.6.2. a change in the Contract Documents pursuant to paragraph 4.2.5 will not be an automatic authorization of nor a condition precedent to entitlement to any such adjustment;

4.2.6.3. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of paragraphs 9.10 and 11.9; and

4.2.6.4. CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Times if:

4.2.6.4.1. CONTRACTOR knew of the existence of such conditions at the time CONTRACTOR made a final commitment to OWNER in respect of Contract Price and Contract Times by the submission of a bid or becoming bound under a negotiated contract; or

4.2.6.4.2. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test or study of the site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment; or

4.2.6.4.3. CONTRACTOR failed to give the written notice within the time and as required by paragraph 4.2.3.

If OWNER and CONTRACTOR are unable to agree on entitlement to or as to the amount or length of any such equitable adjustment in the Contract Price or Contract Times, a claim may be made therefor as provided in Articles 11 and 12. However, OWNER, ENGINEER and ENGINEER's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses or damages sustained by CONTRACTOR on or in connection with any other project or anticipated project.

4.3. *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. The cost of all of the following will be included in the Contract Price and CONTRACTOR shall have full responsibility for: (i) reviewing and checking all such information and data, (ii) locating all Underground Facilities shown or indicated in the Contract Documents, (iii) coordination of the Work with the owners of such Underground Facilities during construction, and (iv) the safety and protection of all such Underground Facilities as provided in paragraph 6.20 and repairing any damage thereto resulting from the Work.

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, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by paragraph 6.23), identify the owner of such Underground Facility and give written notice to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence of the Underground Facility. If ENGINEER concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued as provided in Article 10 to reflect and document such consequences. 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 Times, 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 that CONTRACTOR did not know of and could not reasonably have been expected to be aware of or to have anticipated. If OWNER and CONTRACTOR are unable to agree on entitlement to or the amount or length of any such adjustment in Contract Price or Contract Times, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12. However, OWNER, ENGINEER and ENGINEER's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses or damages incurred or sustained by CONTRACTOR on or in connection with any other project or anticipated project.

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, 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.

4.5. Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material:

4.5.1. OWNER shall be responsible for any Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material uncovered or revealed at the site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work and which may present a substantial danger to persons or property exposed thereto in connection with the Work at the site. OWNER shall not be responsible for any such materials brought to the site by CONTRACTOR, Subcontractor, Suppliers or anyone else for whom CONTRACTOR is responsible.

4.5.2. CONTRACTOR shall immediately: (i) stop all Work in connection with such hazardous condition and in any area affected thereby (except in an emergency as required by paragraph 6.23), and (ii) notify OWNER and ENGINEER (and thereafter confirm such notice in writing). OWNER shall promptly consult with ENGINEER concerning the necessity for OWNER to retain a qualified expert to evaluate such hazardous condition or take corrective action, if any. CONTRACTOR shall not be required to resume Work in connection with such hazardous condition or in any such affected area until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR special written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (ii) specifying any special conditions under which such Work may be resumed safely. If OWNER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of such Work stoppage or such special conditions under which Work is agreed by CONTRACTOR to be resumed, either party may make a claim therefor as provided in Articles 11 and 12.

4.5.3. If after receipt of such special written notice CONTRACTOR does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then OWNER may order such portion of the Work that is in connection with such hazardous condition or in such affected area to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a claim therefor as provided in Articles 11 and 12. OWNER may have such deleted portion of the Work performed by OWNER's own forces or others in accordance with Article 7.

4.5.4. To the fullest extent permitted by Laws and Regulations, OWNER shall indemnify and hold harmless CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's

Consultants and the officers, directors, employees, agents, other consultants and subcontractors of each and any of them from and against all claims, costs, losses and damages arising out of or resulting from such hazardous condition, provided that: (i) any such claim, cost, loss or damage 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 (ii) nothing in this subparagraph 4.5.4 shall obligate OWNER to indemnify any person or entity from and against the consequences of that person's or entity's own negligence.

4.5.5. The provisions of paragraphs 4.2 and 4.3 are not intended to apply to Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material uncovered or revealed at the site.

ARTICLE 5—BONDS AND INSURANCE

Performance, Payment 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 provided otherwise by Laws or Regulations 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 form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall 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 Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's 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 ten days thereafter substitute another Bond and surety, both of which must be acceptable to OWNER.

5.3. *Licensed Sureties and Insurers; Certificates of Insurance:*

5.3.1. All Bonds and insurance required by the Contract Documents to be purchased and maintained by OWNER or CONTRACTOR shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue Bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.3.2. CONTRACTOR shall deliver to OWNER, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by OWNER or any other additional insured) which CONTRACTOR is required to purchase and maintain in accordance with paragraph 5.4. OWNER shall deliver to CONTRACTOR, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by CONTRACTOR or any other additional insured) which OWNER is required to purchase and maintain in accordance with paragraphs 5.6 and 5.7 hereof.

CONTRACTOR's Liability Insurance:

5.4. CONTRACTOR shall purchase and maintain such 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, any Subcontractor or Supplier, or 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:

5.4.1. claims under workers' compensation, disability benefits and other similar employee benefit acts;

5.4.2. claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR's employees;

5.4.3. claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees;

5.4.4. claims for damages insured by customary personal injury liability coverage which are sustained: (i) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (ii) by any other person for any other reason;

5.4.5. 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; and

5.4.6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

The policies of insurance so required by this paragraph 5.4 to be purchased and maintained shall:

5.4.7. with respect to insurance required by paragraphs 5.4.3 through 5.4.6 inclusive, include as additional insureds (subject to any customary exclusion in respect of professional liability) OWNER, ENGINEER, ENGINEER's Consultants and any other persons or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers and employees of all such additional insureds;

5.4.8. include the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

5.4.9. include completed operations insurance;

5.4.10. include contractual liability insurance covering CONTRACTOR's indemnity obligations under paragraphs 6.12, 6.16 and 6.31 through 6.33;

5.4.11. 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 CONTRACTOR and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the CONTRACTOR pursuant to paragraph 5.3.2 will so provide);

5.4.12. remain in effect at least until final payment and at all times thereafter when CONTRACTOR may be correcting, removing or replacing *defective* Work in accordance with paragraph 13.12; and

5.4.13. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and CONTRACTOR shall furnish OWNER and each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued evidence satisfactory to OWNER and any such additional insured of continuation of such insurance at final payment and one year thereafter).

OWNER's Liability Insurance:

5.5. In addition to the insurance required to be provided by CONTRACTOR under paragraph 5.4, OWNER, at OWNER's option, may purchase and maintain at OWNER's expense OWNER's own liability 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 in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

5.6.1. include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and any other persons or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

5.6.2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework and Work in transit and shall insure against at least the following perils fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, and such other perils as may be specifically required by the Supplementary Conditions;

5.6.3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

5.6.4. cover materials and equipment stored at the site or at another location that was agreed to in writing by OWNER prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by ENGINEER; and

5.6.5. be maintained in effect until final payment is made unless otherwise agreed to in writing by OWNER, CONTRACTOR and ENGINEER with thirty days written notice to each other additional insured to whom a certificate of insurance has been issued.

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, ENGINEER's Consultants and any other persons or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

5.8. All the policies of insurance (and 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 OWNER and CONTRACTOR and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with paragraph 5.11.

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 identified in the Supplementary Conditions. The risk of loss within such identified 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 policies provided under paragraphs 5.6 or 5.7, 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.

5.11. *Waiver of Rights:*

5.11.1. OWNER and CONTRACTOR intend that all policies purchased in accordance with paragraphs 5.6 and 5.7 will protect OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and all other persons or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds in such policies and will provide primary coverage for all losses and damages caused by the perils covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. OWNER and CONTRACTOR waive all rights against each other and their respective officers, directors, employees and agents for all losses and damages caused by, arising out of or resulting from any of the perils covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, ENGINEER, ENGINEER's Consultants and all other persons or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by OWNER as trustee or otherwise payable under any policy so issued.

5.11.2. In addition, OWNER waives all rights against CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and the officers, directors, employees and agents of any of them, for:

5.11.2.1. loss due to business interruption, loss of use or other consequential loss extending beyond direct physical loss or damage to OWNER's property or the Work caused by, arising out of or resulting from fire or other peril, whether or not insured by OWNER; and

5.11.2.2. loss or damage to the completed Project or part thereof caused by, arising out of or resulting from fire or other insured peril covered by any property insurance maintained on the completed Project or part thereof by OWNER during partial utilization pursuant to paragraph 14.10, after substantial completion pursuant to paragraph 14.8 or after final payment pursuant to paragraph 14.13.

Any insurance policy maintained by OWNER covering any loss, damage or consequential loss referred to in this paragraph 5.11.2 shall contain provisions to the effect that in the event of payment of any such loss, damage or consequential loss the insurers will have no rights of recovery against any of CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and the officers, directors, employees and agents of any of them.

Receipt and Application of Insurance 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 fiduciary 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 fiduciary 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 fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, OWNER as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, OWNER as fiduciary shall give bond for the proper performance of such duties.

Acceptance of Bonds and Insurance; Option to Replace:

5.14. If either party (OWNER or CONTRACTOR) has any objection to the coverage afforded by or other provisions of the Bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within ten days after receipt of the certificates (or other evidence requested) required by paragraph 2.7. OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the Bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent Bonds or insurance to protect such other party's interests at the expense of the party who was

required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

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 any 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 permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6—CONTRACTOR'S RESPONSIBILITIES

Supervision and Superintendence:

6.1. CONTRACTOR shall supervise, inspect 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 specification of a specific means, method, technique, sequence or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed 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 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, lay out and construct the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the site. Except as otherwise required for 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. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of OWNER. 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 instructions of the applicable Supplier, except as otherwise provided in the Contract Documents.

Progress Schedule:

6.6. CONTRACTOR shall adhere to the progress schedule established in accordance with paragraph 2.9 as it may be adjusted from time to time as provided below:

6.6.1. CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.9) proposed adjustments in the progress schedule that will not change the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

6.6.2. Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of paragraph 12.1. Such adjustments may only be made by a Change Order or Written Amendment in accordance with Article 12.

6.7. *Substitutes and "Or-Equal" Items:*

6.7.1. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be accepted by ENGINEER under the following circumstances:

6.7.1.1. *"Or-Equal":* If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by ENGINEER as an "or-equal" item, in which case review and approval of the proposed item may, in ENGINEER's sole discretion, be accomplished without compliance with some or all of the requirements for acceptance of proposed substitute items.

6.7.1.2. *Substitute Items:* If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR does not qualify as an "or-equal" item under subparagraph 6.7.1.1, it will be considered a proposed substitute item. CONTRACTOR shall submit sufficient information as provided below to allow ENGINEER to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. The procedure for review by the ENGINEER will include the following as supplemented in the General Requirements and as ENGINEER may decide is appropriate under the circumstances. Requests for review of proposed substitute items of material or 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 first 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 in substance to that specified and be suited to the same use as that specified. The application will state the extent, if any, to which the evaluation and acceptance of the proposed substitute will 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 or credits 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 will be considered by ENGINEER in evaluating the proposed substitute. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute.

6.7.1.3. *CONTRACTOR's Expense:* All data to be provided by CONTRACTOR in support of any proposed "or-equal" or substitute item will be at CONTRACTOR's expense.

6.7.2. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence or procedure of construction is shown or indicated in and expressly required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, technique, sequence or procedure of construction acceptable to ENGINEER. CONTRACTOR shall submit sufficient information to allow ENGINEER, in ENGINEER's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in subparagraph 6.7.1.2.

6.7.3. *Engineer's Evaluation:* ENGINEER will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to paragraphs 6.7.1.2 and 6.7.2. ENGINEER will be the sole judge of acceptability. No "or-equal" or 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 "or-equal" or substitute. ENGINEER will record time required by ENGINEER and ENGINEER's Consultants in evaluating substitutes proposed or submitted by CONTRACTOR pursuant to paragraphs 6.7.1.2 and 6.7.2 and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER accepts a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluating each such proposed substitute item.

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 or 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 adjusted 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.

6.9.1. 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 for the benefit of any such Subcontractor, Supplier or other person or organization 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.

6.9.2. CONTRACTOR shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR. CONTRACTOR shall require all Subcontractors, Suppliers and such other persons and organizations performing or furnishing any of the Work to communicate with the ENGINEER through CONTRACTOR.

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 or Supplier will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in paragraph 5.6 or 5.7, the agreement between the CONTRACTOR and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against OWNER, CONTRACTOR, ENGINEER, ENGINEER's Consultants and all other additional insureds for all losses and damages caused by, arising out of or resulting from any of the perils covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, CONTRACTOR will obtain the same.

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. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants and the officers, directors, employees, agents and other consultants of each and any of them from and against all claims, costs, losses and damages arising out of or resulting from 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.

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 performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, CONTRACTOR shall bear all claims, costs, losses and damages caused by, arising out of or resulting therefrom; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve CONTRACTOR of CONTRACTOR's obligations under paragraph 3.3.2.

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 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 adjacent land or areas, resulting from the performance of the Work. Should any claim be made by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultant and anyone directly or indirectly employed by any of them from and against all claims, costs, losses and damages arising out of or resulting from any claim or action, legal or equitable, brought by any such owner or occupant against OWNER, ENGINEER or any other party indemnified hereunder to the extent caused by or based upon 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. CONTRACTOR shall leave the site clean and ready for occupancy by OWNER at Substantial Completion of the Work. 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 Change Directives, 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 completion 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 persons on the Work site or who may be affected by the Work;

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 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 ENGINEER's Consultant or anyone employed by any of them or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR or any Subcontractor, Supplier or other person or organization directly or indirectly employed by any of them). CONTRACTOR's duties and responsibilities for safety and for 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).

Safety Representative:

6.21. CONTRACTOR shall designate a qualified and experienced safety representative at the site whose duties and

responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

Hazard Communication Programs:

6.22. CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the site in accordance with Laws or Regulations.

Emergencies:

6.23. 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 OWNER or ENGINEER, 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 by CONTRACTOR in response to such an emergency, a Work Change Directive or Change Order will be issued to document the consequences of such action.

6.24. *Shop Drawings and Samples:*

6.24.1. CONTRACTOR shall submit Shop Drawings to ENGINEER for review and approval in accordance with the accepted schedule of Shop Drawings and Sample submittals (see paragraph 2.9). All submittals will be identified as ENGINEER may require and in the number of copies specified in the General Requirements. 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 show ENGINEER the materials and equipment CONTRACTOR proposes to provide and to enable ENGINEER to review the information for the limited purposes required by paragraph 6.26.

6.24.2. CONTRACTOR shall also submit Samples to ENGINEER for review and approval in accordance with said accepted schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended and otherwise as ENGINEER may require to enable ENGINEER to review the submittal for the limited purposes required by paragraph 6.26. The numbers of each Sample to be submitted will be as specified in the Specifications.

6.25. *Submittal Procedures:*

6.25.1. Before submitting each Shop Drawing or Sample, CONTRACTOR shall have determined and verified:

6.25.1.1. all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar information with respect thereto,

6.25.1.2. all materials with respect to intended use, fabrication, shipping, handling, storage, assembly and installation pertaining to the performance of the Work, and

6.25.1.2. all information relative to CONTRACTOR's sole responsibilities in respect of means, methods, techniques, sequences and procedures of construction and safety precautions and programs incident thereto.

CONTRACTOR shall also have reviewed and 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. Each submittal will bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contact Documents with respect to CONTRACTOR'S review and approval of that submittal.

6.25.3. At the time of each submission, CONTRACTOR shall give ENGINEER specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, such notice to be in a written communication separate from the submittal; and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to ENGINEER for review and approval of each such variation.

6.26. ENGINEER will review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals accepted by ENGINEER as required by paragraph 2.9. ENGINEER's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. ENGINEER's review and approval will not extend to means, methods, techniques, sequences or procedures of construction (except where a particular means, method, technique, sequence or procedure of construction is specifically and expressly called for 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 6.25.3 and ENGINEER has given written approval of each such variation by 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 complying with the requirements of paragraph 6.25.1.

6.28. Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submissions accepted by ENGINEER as required by paragraph 2.9, any related Work performed prior to ENGINEER's review and approval of the pertinent submittal will be at 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 OWNER and CONTRACTOR may otherwise agree in writing.

6.30. ***CONTRACTOR's General Warranty and Guarantee:***

6.30.1. CONTRACTOR warrants and guarantees to OWNER, ENGINEER and ENGINEER's Consultants that all Work will be in accordance with the Contract Documents and will not be *defective*. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by:

6.30.1.1. abuse, modification or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors or Suppliers; or

6.30.1.2. normal wear and tear under normal usage.

6.30.2. CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents:

6.30.2.1. observations by ENGINEER;

6.30.2.3. recommendation of any progress or final payment by ENGINEER;

6.30.2.3. the issuance of a certificate of Substantial Completion or any payment by OWNER to CONTRACTOR under the Contract Documents;

6.30.2.4. use or occupancy of the Work or any part thereof by OWNER;

6.30.2.5. any acceptance by OWNER or any failure to do so;

6.30.2.6. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by ENGINEER pursuant to paragraph 14.13;

6.30.2.7. any inspection, test or approval by others; or

6.30.2.8. any correction of *defective* Work by OWNER.

Indemnification:

6.31. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants and the officers, directors, employees, agents and other consultants of each and any of them from and against all claims, costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) caused by, arising out of or resulting from the performance of the Work, provided that any such claim, cost, loss or damage: (i) 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 (ii) is caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, any Supplier, 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 caused in part by any negligence or omission of a person or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such person or entity.

6.32. In any and all claims against OWNER or ENGINEER or any of their respective consultants, agents, officers, directors or employees by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, 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 6.31 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, Supplier or other person or organization under workers' compensation acts, disability benefit acts or other employee benefit acts.

6.33. The indemnification obligations of CONTRACTOR under paragraph 6.31 shall not extend to the liability of ENGINEER and ENGINEER's Consultants, officers, directors, employees or agents caused by the professional negligence, errors or omissions of any of them.

Survival of Obligations:

6.34. All representations, indemnifications, warranties and guarantees made in, required by or given in accordance with

the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the Work and termination or completion of the Agreement.

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, or let other direct contracts therefor which shall contain General Conditions similar to these, or have other work performed by utility owners. If the fact that such other work is to be performed was not noted in the Contract Documents, then: (i) written notice thereof will be given to CONTRACTOR prior to starting any such other work, and (ii) CONTRACTOR may make a claim therefor as provided in Articles 11 and 12 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 amount or extent thereof.

7.2. CONTRACTOR shall afford each other contractor who is a party to such a direct contract and each utility owner (and 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 other work and shall properly connect and coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, 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. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of ENGINEER and the others whose work will be affected. 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 the proper execution or results of any part of CONTRACTOR's Work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to ENGINEER in writing any delays, defects or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of CONTRACTOR's Work. CONTRACTOR's failure so to report will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's Work except for latent or nonapparent defects and deficiencies in such other work.

Coordination:

7.4. If OWNER contracts with others for the performance of other work on the Project at the site, the following will be set forth in Supplementary Conditions:

7.4.1. the person, firm or corporation who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified;

7.4.2. the specific matters to be covered by such authority and responsibility will be itemized; and

7.4.3. the extent of such authority and responsibilities will be provided.

Unless otherwise provided in the Supplementary Conditions, OWNER shall have sole authority and responsibility in respect of such coordination.

ARTICLE 8—OWNER'S RESPONSIBILITIES

8.1. Except as otherwise provided in these General Conditions, 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.

8.3. OWNER shall furnish the data required of OWNER under the Contract Documents promptly and shall make payments to CONTRACTOR promptly when 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 drawings of physical conditions in existing structures at or contiguous to the site that have been utilized by ENGINEER in preparing the Contract Documents.

8.5. OWNER's responsibilities in respect of purchasing and maintaining liability and property insurance are set forth in paragraphs 5.5 through 5.10.

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.

8.9. The OWNER shall not supervise, direct or have control or authority over, nor be responsible for, CONTRACTOR's means, methods, techniques, sequences or procedures of construction or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the Work. OWNER will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

8.10. OWNER'S responsibility in respect of undisclosed Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Materials uncovered or revealed at the site is set forth in paragraph 4.5.

8.11. If and to the extent OWNER has agreed to furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER's obligations under the Contract Documents, OWNER's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

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 as ENGINEER deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. Based on information obtained during such visits and observations, ENGINEER will endeavor for the benefit of OWNER 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 generally to the Contract Documents. On the basis of such visits and on-site observations, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against *defective* Work. ENGINEER's visits and on-site observations are subject to all the limitations on ENGINEER's authority and responsibility set forth in paragraph 9.13, and particularly, but without limitation, during or as a result of ENGINEER's on-site visits or observations of CONTRACTOR's Work ENGINEER will not supervise, direct, control or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the Work.

Project Representative:

9.3. If OWNER and ENGINEER agree, ENGINEER will furnish a Resident Project Representative to assist ENGINEER in providing more continuous observation of the Work. The responsibilities and authority and limitations thereon of any such Resident Project Representative and assistants will be as provided in paragraph 9.13 and in the Supplementary Conditions. If OWNER designates another representative or agent to represent OWNER at the site who is not ENGINEER's Consultant, agent or employee, the responsibilities and authority and limitations thereon 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 the intent of and reasonably inferable from Contract Documents. Such written clarifications and interpretations will be binding on OWNER and CONTRACTOR. If OWNER or CONTRACTOR believes that a written clarification or interpretation justifies an adjustment in the Contract Price or the Contract Times and the parties are unable to agree to the amount or extent thereof, if any, OWNER or CONTRACTOR may make a written 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 Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by 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 OWNER or CONTRACTOR believes that a Field Order justifies an adjustment in the Contract Price or the Contract Times and the parties are unable to agree as to the amount or extent thereof, OWNER or CONTRACTOR may make a written 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*, or

that ENGINEER believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. ENGINEER 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 authority as to Shop Drawings and Samples, see paragraphs 6.24 through 6.28 inclusive.

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

9.9. In connection with ENGINEER's authority as to Applications for Payment, 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 the 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 decision 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 and to ENGINEER written notice of intention to appeal from ENGINEER's decision and: (i) an appeal from ENGINEER's decision is taken within the time limits and in accordance with the procedures set forth in Exhibit GC-A, "Dispute Resolution Agreement," entered into between OWNER and CONTRACTOR pursuant to Article 16, or (ii) if no such Dispute Resolution Agreement has been entered into, a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction to exercise such rights or remedies as the appealing party may have with respect to ENGINEER's decision, unless otherwise agreed in writing by OWNER and CONTRACTOR. Such appeal will not be subject to the procedures of paragraph 9.11.

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 Times will be referred initially to ENGINEER in writing with a request for a formal decision in accordance with this paragraph. Written notice of each such claim, dispute or 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 start of the occurrence or event giving rise thereto, and written supporting data will be submitted to ENGINEER and the other party within sixty days after the start of such occurrence or event unless ENGINEER allows an additional period of time for the submission of additional or more accurate data in support of such claim, dispute or other matter. The opposing party shall submit any response to ENGINEER and the claimant within thirty days after receipt of the claimant's last submittal (unless ENGINEER allows additional time). ENGINEER will render a formal decision in writing within thirty days after receipt of the opposing party's submittal, if any, in accordance with this paragraph. ENGINEER's written decision on such claim, dispute or other matter will be final and binding upon OWNER and CONTRACTOR unless: (i) an appeal from ENGINEER's decision is taken within the time limits and in accordance with the procedures set forth in EXHIBIT GC-A, "Dispute Resolution Agreement," entered into between OWNER and CONTRACTOR pursuant to Article 16, or (ii) if no such Dispute Resolution Agreement has been entered into, a written notice of intention to appeal from ENGINEER's written decision is delivered by OWNER or CONTRACTOR to the other and to ENGINEER within thirty days after the date of such decision and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction to exercise such rights or remedies as the appealing party may have with respect to such claim, dispute or other matter in accordance with applicable Laws and Regulations within sixty days of the date of such decision, unless otherwise agreed in writing by OWNER and CONTRACTOR.

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 or 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 14.15) 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 pursuant to Article 16.

9.13. ***Limitations on ENGINEER's Authority and Responsibilities:***

9.13.1. Neither ENGINEER's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise or performance of any authority or responsibility by ENGINEER shall create, impose or give rise to any duty owed by ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them.

9.13.2. ENGINEER will not supervise, direct, control or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the Work. ENGINEER will not be responsible for CONTRACTOR's failure to perform or furnish the Work in accordance with the Contract Documents.

19.13.3. 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.

9.13.4. ENGINEER's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds and certificates of inspection, tests and approvals and Other documentation required to be delivered by paragraph 14.12 will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests and approvals that the results certified indicate compliance with, the Contract Documents.

9.13.5. The limitations upon authority and responsibility set forth in this paragraph 9.13 shall also apply to ENGINEER's Consultants, Resident Project Representative and assistants.

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. Such additions, deletions or revisions will be authorized by a Written Amendment, a Change Order, or a Work Change Directive. 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 adjustment in the Contract Price or an adjustment of the Contract Times that should be allowed as a result of a Work Change Directive, 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 Times with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraphs 3.5 and 3.6 except in the case of an emergency as provided in paragraph 6.23 or in the case of uncovering Work as provided in paragraph 13.9.

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

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

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

10.4.3. changes in the Contract Price or Contract Times 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 Times) 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 CONTRACTOR's 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 adjustment 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 start of the occurrence or 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 the start of such occurrence or event (unless ENGINEER allows additional time for claimant to submit additional or more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the adjustment claimed covers all known amounts to which the claimant is entitled as a result of said occurrence or 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 adjustment in the Contract Price will be determined as follows:

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

11.3.2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 11.6.2);

11.3.3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under paragraph 11.3.2, 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 paragraph 11.6).

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. Such employees shall include without limitation superintendents, foremen and other personnel employed full- time at the site. 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' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. 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 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 or furnished by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to OWNER who will then determine, with the advice of ENGINEER, which bids, if any, will be accepted. If any 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 and fee shall be determined in the same manner as CONTRACTOR's Cost of the Work and fee as provided in paragraphs 11.4, 11.5, 11.6 and 11.7. 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 the 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) caused by damage to the Work, not compensated by insurance 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.

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, expediters, 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.

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

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

11.6.2. if a fixed fee is not agreed upon, then 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;

11.6.2.3. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of paragraphs 11.4.1, 11.4.2, 11.4.3 and 11.6.2 is that the Subcontractor who actually performs or furnishes the Work, at whatever tier, will be paid a fee of fifteen percent of the costs incurred by such Subcontractor under paragraphs 11.4.1 and 11.4.2 and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

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

11.6.2.5. the amount of credit to be allowed by CONTRACTOR to OWNER for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in CONTRACTOR's fee by an amount equal to five percent of such net decrease; and

11.6.2.6. 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 11.6.2.5, inclusive.

11.7. Whenever the cost of any Work is to be determined pursuant to paragraphs 11.4 and 11.5, CONTRACTOR will establish and maintain records thereof in accordance with generally accepted accounting practices and 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 furnished and performed for such sums as may be acceptable to OWNER and 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 and no demand for additional payment on account of any of the foregoing 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.

11.9. *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 price 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. OWNER or CONTRACTOR may make a claim for an adjustment in the Contract Price in accordance with Article 11 if:

11.9.3.1. 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

11.9.3.2. there is no corresponding adjustment with respect to any other item of Work; and

11.9.3.3. if CONTRACTOR believes that CONTRACTOR is entitled to an increase in Contract Price as a result of having incurred additional expense or OWNER believes that OWNER is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12—CHANGE OF CONTRACT TIMES

12.1. The Contract Times (or Milestones) may only be changed by a Change Order or a Written Amendment. Any claim for an adjustment of the Contract Times (or Milestones) 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 Times (or Milestones) 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 Times (or Milestones) will be valid if not submitted in accordance with the requirements of this paragraph 12.1.

12.2. All time limits stated in the Contract Documents are of the essence of the Agreement.

12.3. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost due to such delay if a claim is made therefor as provided in paragraph 12.1. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions or acts of God. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

12.4. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay. In no event shall OWNER be liable to CONTRACTOR, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from (i) delays caused by or within the control of CONTRACTOR, or (ii)

delays beyond the control of both parties including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.

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

13.1. *Notice of Defects:* Prompt notice of all *defective* Work of which OWNER or ENGINEER have actual knowledge will be given to CONTRACTOR. All *defective* Work may be rejected, corrected or accepted as provided in this Article 13.

Access to Work:

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

Tests and Inspections:

13.3. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

13.4. OWNER shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

13.4.1. for inspections, tests or approvals covered by paragraph 13.5 below;

13.4.2. that costs incurred in connection with tests or inspections conducted pursuant to paragraph 13.9 below shall be paid as provided in said paragraph 13.9; and

13.4.3. as otherwise specifically provided in the Contract Documents.

13.5. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests or approvals, pay all costs in connection therewith, and furnish ENGINEER the required certificates of inspection, or approval. CONTRACTOR shall also be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests or approvals required for OWNER's and ENGINEER's acceptance of materials or equipment to be incorporated in the Work, or of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work.

13.6. If any Work (or the work of others) that is to be inspected, tested or approved is covered by CONTRACTOR without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation.

13.7. Uncovering Work as provided in paragraph 13.6 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.

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 pay all claims, costs, losses and damages caused by, arising out of or resulting from such uncovering, exposure, observation, inspection and testing and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); 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 Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement 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 surety or 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 Work that is not *defective*. CONTRACTOR shall pay all claims, costs, losses and damages caused by or resulting from such correction or removal (including but not limited to all costs of repair or replacement of work of others).

13.12. *Correction Period:*

13.12.1. 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: (i) correct such *defective* Work, or, if it has been rejected by OWNER, remove it from the site and replace it with Work that is not *defective*, and (ii) satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. 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 claims, costs, losses and damages caused by or resulting from such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

13.12.2. 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.

13.12.3. Where *defective* Work (and damage to other Work resulting therefrom) has been corrected, removed or replaced under this paragraph 13.12, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

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 pay all claims, costs, losses and damages attributable to OWNER's evaluation of and determination to accept such *defective* Work (such costs to be approved by ENGINEER as to reasonableness). 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 from ENGINEER 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. In connection with such 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, OWNER's other contractors and ENGINEER and ENGINEER's Consultants access to the site to enable OWNER to exercise the rights and remedies under this paragraph. All claims, costs, losses and damages incurred or sustained by OWNER in exercising such rights and remedies will be charged against CONTRACTOR 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 claims, costs, losses and damages will include but not be limited to all costs of repair or 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 Times (or Milestones) because of any delay in the 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 the date established for each progress payment (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 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 to OWNER 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 executed Work as an experienced and qualified design professional and on ENGINEER's review of the Application for Payment and the accompanying data and schedules, that to the best of ENGINEER's knowledge, information and belief:

14.5.1. the Work has progressed to the point indicated,

14.5.2. the quality of the Work is generally 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

14.5.3. the conditions precedent to CONTRACTOR's being entitled to such payment appear to have been fulfilled in so far as it is ENGINEER's responsibility to observe the Work.

However, by recommending any such payment ENGINEER will not thereby be deemed to have represented that: (i) 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 (ii) that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or entitle OWNER to withhold payment to CONTRACTOR.

14.6. ENGINEER's recommendation of any payment, including final payment, shall not mean that ENGINEER is responsible for CONTRACTOR's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of Work, or for any failure of CONTRACTOR to perform or furnish Work in accordance with the Contract Documents.

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 the representations to OWNER referred to in paragraph 14.5. 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. ENGINEER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 15.2.1 through 15.2.4 inclusive.

OWNER may refuse to make payment of the full amount recommended by ENGINEER because:

14.7.5. claims have been made against OWNER on account of CONTRACTORs performance or furnishing of the Work,

14.7.6. Liens have been filed in connection with the Work, except where CONTRACTOR has delivered a specific Bond satisfactory to OWNER to secure the satisfaction and discharge of such Liens,

14.7.7. there are other items entitling OWNER to a set-off against the amount recommended, or

14.7.8. OWNER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.7.1 through 14.7.3 or paragraphs 15.2.1 through 15.2.4 inclusive;

but OWNER must give CONTRACTOR immediate written notice (with a copy to ENGINEER) stating the reasons for such action and promptly pay CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by OWNER and CONTRACTOR, when CONTRACTOR corrects to OWNER's satisfaction 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 and guarantees. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER in writing 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 at OWNER's option of any substantially completed part of the Work which: (i) has specifically been identified in the Contract Documents, or (ii) OWNER, ENGINEER and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by OWNER for its intended purpose 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 that such part of the Work is substantially complete, CONTRACTOR will certify to OWNER and ENGINEER that such 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. 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 complete such Work or remedy such deficiencies.

Final Application for Payment:

14.12. After CONTRACTOR has completed all such corrections to the satisfaction of ENGINEER and delivered in accordance with the Contract Documents all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance required by paragraph 5.4, certificates of inspection, marked-up record documents (as provided in paragraph 6.19) and other documents, CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by subparagraph 5.4.13, (ii) consent of the surety, if any, to final payment, and (iii) complete and legally effective releases or waivers (satisfactory to OWNER) of all Liens arising out of or filed in connection with the Work. In lieu of such releases or waivers of Liens and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full and an affidavit of CONTRACTOR that: (i) the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and (ii) all payrolls, material and equipment bills and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such 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 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. At the same time ENGINEER will also give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.15. 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 the 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.

Waiver of Claims:

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

14.15.1. 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, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and

14.15.2. 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. At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than ninety days by notice in writing to CONTRACTOR and ENGINEER which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such 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 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 adjusted from time to time pursuant to paragraph 6.6);

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

15.2.2. if CONTRACTOR disregards the authority of ENGINEER; or

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

OWNER may, after giving CONTRACTOR (and the surety, if any,) seven days' written notice 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 all claims, costs, losses and damages sustained by OWNER arising out of or resulting from completing the Work such excess will be paid to CONTRACTOR. If such claims, costs, losses and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such claims, costs, losses and damages incurred by OWNER will be reviewed by ENGINEER as to their reasonableness and when so approved by ENGINEER incorporated in a Change Order, provided that when exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

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 of OWNER, elect to terminate the Agreement. In such case, CONTRACTOR shall be paid (without duplication of any items):

15.4.1. for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

15.4.2. for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

15.4.3. for all claims, costs, losses and damages incurred in settlement of terminated contracts with Subcontractors, Suppliers and others; and

15.4.4. for reasonable expenses directly attributable to termination.

CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

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, and provided OWNER or ENGINEER do not remedy such suspension or failure within that time, terminate the Agreement and recover from OWNER payment on the same terms as provided in paragraph 15.4. In lieu of terminating the Agreement and without prejudice to any other right or remedy, if ENGINEER has failed to act on an Application for Payment within thirty days after it is submitted, or OWNER has failed for thirty days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may upon seven day's written notice to OWNER and ENGINEER stop the Work until payment of all such amounts due CONTRACTOR, including interest thereon. The provisions of this paragraph 15.5 are not intended to preclude CONTRACTOR from making claim under Articles 11 and 12 for an increase in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to CONTRACTOR's stopping Work as permitted by this paragraph.

ARTICLE 16—DISPUTE RESOLUTION

If and to the extent that OWNER and CONTRACTOR have agreed on the method and procedure for resolving disputes between them that may arise under this Agreement, such dispute resolution method and procedure, if any, shall be as set forth in Exhibit GC-A, "Dispute Resolution Agreement," to be attached hereto and made a part hereof. If no such agreement on the method and procedure for resolving such disputes has been reached, and subject to the provisions of paragraphs 9.10, 9.11, and 9.12, OWNER and CONTRACTOR may exercise

such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.

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 Times:

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 will constitute a day.

Notice of Claim:

17.3. Should OWNER or CONTRACTOR suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim 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.

Cumulative Remedies:

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 6.12, 6.16, 6.30, 6.31, 6.32, 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.

Professional Fees and Court Costs Included:

17.5. Whenever reference is made to "claims, costs, losses and damages," it shall include in each case, but not be limited to, all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs.

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SUPPLEMENTARY CONDITIONS

The Supplementary Conditions amend and supplement the General Conditions of the Construction Contract (No. 1910-8), and other provisions of the Contract Documents as indicated in these supplementary Conditions. All provisions which are not so amended or supplemented remain in full force and effect.

Paragraph numbering of these supplementary Conditions shall be prefixed by the letters "SC" which represent Supplementary Conditions. Reference to the General Conditions is made by the letters "GC" and the appropriate paragraph number.

SC-GC-1 Definitions

The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract (No. 1910-8, 1990 edition) have the meanings assigned to them in the General Conditions.

SC-GC-2.2 Copies of Documents

Amend the first sentence of paragraph 2.2 of the General Conditions to read as follows:

The Owner shall furnish to the selected Contractor up to five copies of the Contract Documents. Additional copies will be provided for the cost listed in the Advertisement for Bids.

SC-GC-2.3 Commencement of Contract Time; Notice to Proceed

Delete paragraph 2.3 of the General Conditions in its entirety and insert the following in its place:

The Contract Time shall commence to run on the date indicated in the Notice to Proceed.

SC-GC-4.3.1.2 Underground Facilities

The Contractor's attention is directed to the underground water, sewer, gas and telephone utilities and services within the project work area. The Contractor shall be responsible for protection and to pay for damages to any utilities damaged through his operations; except for any facilities which are specifically noted for "Relocation By Others" on the Plans.

SC-GC-4.4 Reference Points

The Owner shall provide only the reference points shown by the Drawings. The

Contractor shall provide all required detailed layout and elevation control as required by Section 01050, Construction Engineering of the DIVISION 1 - GENERAL REQUIREMENTS and as incidental to the work.

SC-GC-5.1 Performance and Other Bonds

The Contractor's specific attention is invited to the requirements of paragraph 5.1 of the General Conditions which require two separate bonds, one for performance and one for payment, each in an amount at least equal to the Contract Price. Standard form bonds are provided in DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS.

SC-GC-5.3 AND 5.4 Contractor's Liability Insurance

The limits of liability for the insurance required by paragraphs 5.3 AND 5.4 of the General Conditions shall provide coverage for not less than the following amount or greater where required by law:

5.4 of Worker's Compensation, etc. under paragraphs 5.4.1 and 5.4.2 of the General Conditions:

1) State	Statutory.
2) Applicable Federal	Statutory.
3) Employer's Liability	$100,000.

5.4 Comprehensive General Liability (under paragraphs 5.4, 5.4.1 through 5.4.13 of the General Conditions):

1) Bodily Injury:

$ 500,000	Each Occurrence.
$1,000,000	Annual Aggregate, Products & Completed Operations.

2) Physical Damage:

$ 500,000	Each Occurrence.
$ 500,000	Annual Aggregate.

3) Property Damage liability insurance will provide Explosion, Collapse and Underground coverages where applicable.

4) Personal Injury, with employment exclusion deleted:

$1,000,000	Annual Aggregate.

5.4.6 Comprehensive Automobile Liability:

1) Bodily Injury:

$ 500,000	Each Person.
$1,000,000	Each Accident.

2) Property Damage:

$ 500,000	Each Occurrence.

5.4.7 Comprehensive Umbrella Liability or Catastrophe Liability:

$1,000,000	$10,000 Self Retention Excess over Primary.

SC-GC-5.4 Contractual Liability Insurance

The Contractual Liability required by paragraph 5.4 of the General Conditions shall provide coverage for not less than the following amounts:

5.4.2 Bodily Injury:

$ 500,000	Each Occurrence.
$1,000,000	Annual Aggregate.

5.4.5 Property Damage:

$ 500,000	Each Occurrence.
$1,000,000	Annual Aggregate

SC-GC-6.13 Permits

The Owner shall acquire any necessary permits from the State and Federal agencies. All other permits are to be acquired by the Contractor. The Special Requirements in DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS list all permits the owner has acquired.

SC-GC-6.15 Taxes

Add the following language at the end of paragraph 6.15 of the General Conditions:

The Owner is exempt of local and state sales tax, and shall make this tax exemption available to the Contractor for this contract work. The Owner shall provide a letter of sales tax exemption upon request.

SC-GC-6.19 Record Documents

Modify this paragraph per the requirements of Section 01720, Project Record Drawings of the DIVISION 1 - GENERAL REQUIREMENTS. The requirements of Section 01720 must be fulfilled before final payment is made.

SC-GC-6.3 Overtime Payment

Add the following language at the end of paragraph 6.3 of the General Conditions:

All premium overtime expense incurred by the Engineer and/or his representatives on account of the Contractor's construction forces working beyond forty (40) hours per week, Saturdays, Sundays and/or Holidays shall be paid by the Contractor to the Engineer. Payments shall be made monthly based on the Engineer's detailed invoice to the Contractor. If the Contractor fails to make any payments due the Engineer within thirty (30) days from the date of the Engineer's invoice, then the Engineer shall be entitled to interest at the rate of 1-1/2%. per month (but not exceeding the maximum rate allowable by Indiana law) from said 30th day. No night or Sunday work requiring the presence of the Engineer or the Resident Project Representative will be permitted unless the Engineer has been given seven (7) days written notice.

SC-GC-6.30 General Warranty and Guarantee

Add the following language at the end of paragraph 6.30 of the General Conditions:

The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of SUBSTANTIAL COMPLETION. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of SUBSTANTIAL COMPLETION of the WORK that the completed WORK is free from all defects due to faulty materials or workmanship and the CONTRACTOR shall promptly make such corrections as may be necessary by reason of such defects including the repairs of the damage of other parts of the WORK resulting from such defects. The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The Performance BOND shall remain in full force and effect through the guarantee period.

In addition to all materials and workmanship, all sod, seed, trees, shrubs, bushes, flowers, etc., which are placed, sowed, planted or replanted by the Contractor to replace same destroyed or damaged by his operations, shall be guaranteed for a period of one year from the date of the Certificate of Substantial Completion of the work under this Contract. Should any of the above die or fail to grow, it shall be replaced, resown, or

replanted at no cost to the Owner.

SC-GC-6.7.2 Established Construction Techniques

Add the following language at the end of paragraph 6.7.2 of the General Conditions:

All construction techniques and specialized equipment used to complete the work under this Contract shall be only those established as suitable and effective by extensive prior use in similar work. Unproven or experimental techniques shall be allowed only with written permission from the Engineer. Upon receipt of written request from the Engineer, the Contractor shall submit detailed documentation to establish the qualifications of any technique or specialized equipment being employed to complete the work. Minimum documentation shall include not less than three (3) references where the procedure has been employed in similar work and under similar circumstances. Each reference shall include the location, date, project owners name and address and the name and telephone number of a person to contact for a technical reference. Techniques and/or equipment adjudged by the Engineer to be unsuitable and/or unproven shall be immediately discontinued. Work performed utilizing these techniques shall be reworked by the Contractor at his expense and as directed by the Engineer.

SC-GC-9.3 Project Representative

The following paragraphs amplify and/or revise paragraphs GC-9.3:

The Resident Project Representatives employed by the Owner may be stationed on the work to:

A. Keep the Engineer informed as to the progress of the work and the manner in which it is being done.

B. Report whenever it appears that the materials furnished and the work performed **by** the Contractor fail to fulfill the requirements of the Specifications and Contract.

C. Call to the attention of the Contractor any deviation from or infringement upon the Plans and Specifications.

D. Check and verify that Contractor is keeping and maintaining Project As-Built Drawings.

Resident Project Representatives shall be authorized to inspect all work done and materials furnished and to exercise such additional authority as may be delegated to them in writing by the Engineer. Such inspection may extend to all or any part of the work done and material furnished. They shall have authority to reject defective material and to suspend any work that is being done improperly, subject to the final decisions of

the Engineer.

Such inspection shall not relieve the Contractor from any obligation to furnish acceptable materials or to perform all work strictly in accordance with the requirements of the Plans and Specifications.

Resident Project Representatives shall not be authorized to revoke, alter, enlarge, relax or release any requirements of the Specifications, nor to approve or accept any portion of the work, nor to issue instructions contrary to the Plans and Specifications. They shall, in no case act as foremen or perform other duties for the Contractor nor interfere with the management of the work by the latter. Any advice which inspectors may give the Contractors shall in no way be construed as binding the Engineer or the Owner in any way, or releasing the Contractor from the fulfillment of the terms of the Contract.

The Owner, the Engineer and his authorized representatives will at all times have access to the WORK, to determine if the WORK is proceeding in accordance with the Contract Documents. If in the opinion of the Owner, the Engineer and his authorized representatives, the WORK is not proceeding in accordance with the Contract Documents, or the Contractor is utilizing undesirable construction practices, the Owner, the Engineer and/or through his authorized representatives, may direct the Contractor to cease WORK and correct all defective work and undesirable construction practices. The Contractor will bear all expenses for correcting defective work, and will bear any and all monetary losses and expenses relating to and resulting from ceasing of WORK because of defective work. Such expenses to also include compensation to the Owner for non-productive inspection expenses during the time lost while correcting defective work, the Contractor will not be granted an extension of the project scheduled completion time.

SC-GC-2.6, 2.8-2.9 and 14.1 and DIVISION 1- GENERAL REQUIREMENTS, Section 01370 - Schedule of Values

The following paragraphs amplify and/or revise paragraphs GC-2.6, 2.8-2.9 and 14.1 and DIVISION 1- GENERAL REQUIREMENTS, Section 01370 - Schedule of Values:

The Contractor shall furnish the Engineer reasonable facilities for obtaining such information as he may desire respecting the progress and execution of the work and the character of materials. The Contractor shall, upon request, furnish the Engineer with copies of expense bills for transportation charges, materials and equipment. In the event of cost-plus limited work as authorized in writing by the Owner, the Contractor shall submit daily payrolls and equipment ownership/rental charges in addition to the cost of materials.

Except in cases where unit prices form the basis of payment under the Contract, the Contractor shall; within ten (10) days of receipt of the Notice of Award, submit a

replanted at no cost to the Owner.

SC-GC-6.7.2 Established Construction Techniques

Add the following language at the end of paragraph 6.7.2 of the General Conditions:

All construction techniques and specialized equipment used to complete the work under this Contract shall be only those established as suitable and effective by extensive prior use in similar work. Unproven or experimental techniques shall be allowed only with written permission from the Engineer. Upon receipt of written request from the Engineer, the Contractor shall submit detailed documentation to establish the qualifications of any technique or specialized equipment being employed to complete the work. Minimum documentation shall include not less than three (3) references where the procedure has been employed in similar work and under similar circumstances. Each reference shall include the location, date, project owners name and address and the name and telephone number of a person to contact for a technical reference. Techniques and/or equipment adjudged by the Engineer to be unsuitable and/or unproven shall be immediately discontinued. Work performed utilizing these techniques shall be reworked by the Contractor at his expense and as directed by the Engineer.

SC-GC-9.13 Resident Project Representative

The following paragraphs amplify and/or revise paragraphs GC-9.13:

The Resident Project Representatives employed by the Owner may be stationed on the work to:

A. Keep the Engineer informed as to the progress of the work and the manner in which it is being done.

B. Report whenever it appears that the materials furnished and the work performed **by** the Contractor fail to fulfill the requirements of the Specifications and Contract.

C. Call to the attention of the Contractor any deviation from or infringement upon the Plans and Specifications.

D. Check and verify that Contractor is keeping and maintaining Project As-Built Drawings.

Resident Project Representatives shall be authorized to inspect all work done and materials furnished and to exercise such additional authority as may be delegated to them in writing by the Engineer. Such inspection may extend to all or any part of the work done and material furnished. They shall have authority to reject defective material and to suspend any work that is being done improperly, subject to the final decisions of

SPECIAL REQUIREMENTS

1. Application of Special Requirements

Items listed in these Special Requirements are specific to this project. They replace, add-to or amend the Information for Bidders, General Conditions, Supplementary Conditions and/or the General Construction Specifications. Whenever conditions as set forth in any of the Specifications conflict with conditions of other Sections of the Specifications, the following order of precedence shall apply:

a. Special Requirements
b. Supplementary Conditions
b. General Conditions
c. Information for Bidders
d. Construction Specifications

2. Definitions

In the case of this Project, the Owner is the Bruce Lake Association, Fulton County, Indiana, and the Engineer is J. F. New & Associates, Inc., of Walkerton, Indiana.

3. Federal Grants and Loans

This Project will be financed in part by a grant from the Indiana Department of Natural Resources and in part by local funds.

4. Use of Chemicals

All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in conformance with instructions.

5. Existing Utilities

Existing utilities in the Project site are as follows:

There are no known existing utilities within the Project site.

6. Hazard Communication Standard

Pursuant to the Code of Federal Regulations, 29 CFR Part 1926, as may be amended, all Contractors, Subcontractors and materials suppliers on this Project shall provide access to all, persons on the job site at all times, the Material Safety Data Sheets (MSDS) for all hazards of all chemicals per the Federal Regulations.

In addition, contractors, sub-contractors and material suppliers shall provide training to their employees on the MSDS pursuant to the Federal Regulations.

7. Excavation Safety Requirements

It shall be the duty and responsibility of the Contractor and all of its Subcontractors to be familiar and comply with all requirements of Public Law 91-596 29 U.S.C., Sections 651 et. seq., the Occupational Safety and Health Act of 1970 (OSHA) and all amendments thereto and to enforce and comply with all of the provisions of the Act. In addition and as required by Indiana State Law, HB 2071, Section 14. of IC 4-13.6-5-12, the Contractor and all of its Subcontractors shall comply with Subpart P of 29 CFR 1926 dated October 31, 1989 as may be amended.

Costs of all Excavation Protection shall be paid for as a separate pay item or be included in the pay item of the principal work with which the safety systems are associated as required by the Bid Proposal Documents.

8. Confined Space Access

For projects which include construction activities within "confined spaces" as defined in Title 29 CFR Part 1910.146, the Contractor is hereby advised that he must fully comply with all pertinent requirements as delineated in this regulation and as interpreted by OSHA. The Contractor shall have and maintain all necessary safety and testing equipment at all times during the course of the construction activity. In addition it shall be the Contractor's responsibility to make this equipment available for use by the Owner or the Owner's Representative on the project site. If the Owner or the Owner's Representative requires the use of this equipment during the course of observing or verifying the construction, it shall be made available in a timely fashion. If the owner or the Owner's Representative is unable to observe or verify a portion of the construction due to a lack of the necessary safety or testing equipment, any resulting delays and/or expenses shall be the responsibility of the Contractor.

This equipment shall include a gas monitor capable of detecting oxygen, combustibles, and toxics including carbon monoxide and hydrogen sulfide. A metal oxide (broad based) sensor may be used in lieu of the individual carbon

monoxide and hydrogen sulfide sensors. Contractor shall provide gas monitor calibration certifications to Engineer to verify proper maintenance.

9. Use Of Crawler Equipment On Roads

The Contractor shall not use or operate tractors, bulldozers, or other power - operated equipment the treads or wheels of which are so shaped as to cut or otherwise injure such surfaces, on paved surfaces unless pavement is sufficiently protected in a manner satisfactory to the Engineer. All surfaces which have been injured by the Contractor's operations shall be restored to a condition at least equal to that in which they were found immediately before work was begun. Suitable materials and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable and shall not be left until the end of the construction period.

10. Dust, Noise And Working Hours

Dust shall be minimized by use of water and deliquescent salts. Noise shall be minimized by use of properly constructed and maintained equipment provided with suitable mufflers, snubbers, and other sound attenuating devices and supports. Unless specifically approved by the Owner, all work will be restricted to daylight hours.

11. Project Site Erosion Control

The Contractor shall be responsible to comply with all aspects of 327 IAC 15-5, Rule 5, "Storm Water Run-Off Associated with Construction Activity". The Contractor shall submit all necessary fees and documents to the Indiana Department of environmental Management (IDEM) prior to any construction activity. The Contractor shall be responsible for compliance with this Law throughout the construction period and shall pay any and all fines resulting from any violation, suit or penalty for non-compliance. See DIVISION 2 - SITEWORK, Section 02250 - Erosion Control.

12. Soils Report

The Owner has acquired for its use, certain information relating to the character of materials and earth foundations below the surface of the ground at the locations of the proposed work. This information which may affect the cost, progress and performance of the work has been relied on by the Engineer in the preparation of the Contract Documents and is on file at the office of the Engineer. Bidders may examine this information for whatever value they consider it worth but this information is not guaranteed as to accuracy and completeness and is not part of the Contract Documents.

13. Permits

The following list of Permits have been included with these Special Provisions to insure that all requirements of the Permits are known by the Contractor prior to bidding. Any provision of these Permits which conflicts with the Plans and Specifications must be adhered to.

1. Indiana Department of Natural Resources approval of work within the flood way
2. Corps of Engineers - Section 404
3. Fulton County Drainage Board

The Contractor shall comply with all provisions of these permits. The Contractor shall obtain and pay for all other permits, licenses and other authorizations required for the prosecution of the work, including the cost of all work performed in compliance with the terms and conditions of such permits, licenses and authorizations, whether by himself or others.

14. Wage Scale

The following Wage Scale, immediately following this Section, shall apply for this Project.

DIVISION 1

GENERAL REQUIREMENTS

SECTION 01010

SUMMARY OF THE WORK

PART I - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. The work includes, but is not limited to, a constructed wetland filtration system including two (2) hydraulic control structures with steel sheet piling, slide gates, structural steel, rip rap, gabions and penetreated lumber, earthen berms, earthen baffles, two (2) sediment traps, erosion control, seeding and wetland vegetation, and all other work as described in the Project Manual and shown on the Plans.

B. Related requirements specified elsewhere include, but are not limited to the following:

1. Progress Schedules: Section 01310.
2. Schedule of Values: Section 01370.
3. Temporary Facilities: Section 01510.

C. Contractor's Duties:

1. Except as specifically noted, provide and pay for:

a. Labor, materials and equipment.
b. Tools, construction equipment and machinery.
c. Water, heat, and utilities required for construction.
d. Other facilities and services necessary for proper execution and completion of Work.

1.2 CONTRACTS:

A. Construct Work under single lump sum contract.

1.3 CONTRACTORS USE OF PREMISES:

A. Confine operations at site to areas permitted by:

1. Site limits shown on the Drawing and as noted outside of the limits on the Drawings.
2. Owner's written permission for all other locations.

B. Do not unreasonably encumber site with materials or equipment.

C. Assume full responsibility for protection and safekeeping of products stored on premises,

D. Move any stored products which interfere with operations of Owner or land owners.

E. Obtain and pay for use of additional storage or work areas needed for operations at no additional cost to the Owner.

F. Use of site: exclusive and complete, for execution of work, except:

1. Where Contractor's activity may interfere with work of land owners of Fulton County personnel.
2. As designated by the Owner.

1.4 UTILITIES

A. All existing utility systems which conflict with the construction of the work herein shall be relocated or temporarily removed and replaced as required. Such relocating or temporary removal and replacement shall be accomplished at the expense of the Contractor, and the work shall be done by the utility unless the utility approves in writing that the work may be done by the Contractor.

B. The Contractor shall make all necessary applications and arrangements and pay all fees and charges for electrical energy for power and light required for construction of this contract during its entire progress.

1.5 EARLY OCCUPANCY BY OWNER

A. Owner and/or the Engineer will occupy all areas for the purposes of observation and testing.

B. Contractor shall provide:

1. Access for Owner's personnel.
2. Access for the Engineer.
3. Access for all local, State and Federal agency employees while performing Work in their capacity as representative of cognizant authority.
4. Access for other contractors, if required.

1.6 SECURITY

A. The Contractor is responsible for the security of his equipment and work. See the General Conditions for requirements.

1.5 PEST CONTROL

A. The Contractor is responsible for the pest control that is required for him to execute his work.

1.6 CONSTRUCTION SITE ACCESS

A. The Contractor shall be responsible for maintaining access along all public right-of-way and to the existing construction site. All pavement that is damaged by construction traffic shall be removed and replaced in a manner that is acceptable to the Engineer. The cost of this work shall be included in the Lump Sum Project Bid.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01045

CUTTING AND PATCHING

PART I - GENERAL

1.1 DESCRIPTION

A. Related requirements specified elsewhere:

1. Summary of Work: Section 01010.

B. Execute Cutting (including Excavating), fitting or patching of work, required to:

1. Make several parts fit properly.
2. Uncover work to provide for installation of ill-timed work.
3. Remove and replace defective work.

C. In addition to Contract requirements, upon written instructions of Engineer:

1. Uncover work to provide for Engineer's observation of covered work.
2. Remove samples and install materials for testing.
3. Remove work to provide for alteration of existing work.

D. Perform no cutting or altering which may endanger any part of the work.

E. Do not cut or alter work of another contractor without written consent of the Engineer.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.3 SUBMITTALS

A. Prior to the commencement of any cutting, which affects the structural safety of the project or work of another contractor, submit written notice to Engineer requesting consent to proceed. Included in such a request shall be:

1. Identification of project.
2. Description of affected work.
3. Necessity for cutting.

4. Effect on other work or structural integrity of the project.
5. Description of proposed work, designating:
   a. Scope of cutting and patching
   b. Contractor and trade to execute work
   c. Products proposed to be used
   d. Extent of refinishing
   e. Methods to maintain traffic flow and plant operations
6. Alternative to cutting and patching.
7. Designation of party responsible for cost of cutting and patching.
8. Coordinate work with plant operators.

B. Submit cost estimate prior to cutting and patching done on the construction site that is not under the scope of the specified work at the request of the Project Engineer.

C. Should conditions of work or schedule indicate change of material or methods, submit written recommendations to Engineer, including:

1. Conditions indicating change to recommendations for alternative materials or methods.
2. Submittal as required for substitutions.

D. Submit written notice to Engineer designating the work will be uncovered to provide for observation.

1.4 RESPONSIBILITY OF PAYMENT FOR COSTS

A. Costs caused by defective work or work not conforming to Contract Documents including costs for additional services of the Engineer shall be paid by the party responsible for the rejected or nonconforming work.

B. Costs of work done on instructions of the Engineer and not covered under the scope of these Specifications shall be borne by the Owner.

PART 2 - PRODUCTS

2.1 Materials for replacement of work removed shall comply with the Specifications for type of work to be done.

2.2 Where existing concrete or bituminous pavement or concrete sidewalk is cut and removed, the pavement or sidewalk shall be replaced as shown in the plans. All existing pavement or sidewalk cut and removed, not covered by details in the plans, shall be replaced in kind to the shape, depth and grade of the existing item removed. All work under this item shall be in accordance with the Standard Specifications.

PART 3 - EXECUTION

3.1 INSPECTION

A. Inspect existing conditions of work, including elements subject to movement or damage during:

1. Cutting and patching
2. Excavating and backfilling

B. After uncovering, inspect conditions affecting installation of new products.

3.2 PREPARATION PRIOR TO CUTTING

A. Apply shoring, bracing and support as required to maintain structural integrity of Project facilities.

B. Apply protection for other portions of work.

C. Apply protection from weather.

D. Barriers required to protect pedestrian and vehicular traffic.

3.3 PERFORMANCE

A. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances and finishes.

B. Execute cutting and demolition by methods which prevent damage to other work and provide proper services to receive installation and repairs and new work.

C. Execute excavating and *backfilling as specified.

D. Restore work which has been cut or removed, install new parts provided to complete the work in accordance with the requirements of Contract Documents.

E. Refinish entire surfaces as necessary to provide an even finish.

1. Continue new finish on surfaces to nearest change of material or direction.

PART 4 - PAYMENT

4.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01050

CONSTRUCTION ENGINEERING

PART I - GENERAL INFORMATION

1.1 DESCRIPTION

A. Under this item the Contractor shall perform the Construction Engineering, including layout to complete the work specified in the Contract Documents.

1.2 QUALITY REQUIREMENTS

A. Accuracy: The layout of control points, centerlines, benchmarks and other items shall be consistent with standard engineering practices. All surveys, not covered by other sections of these specifications, required for the layout of the work specified in the Contract Documents shall be of second-order class 1, or better, as defined in "Classification, Standards of Accuracy, and General Specifications of Geodetic Control Surveys" prepared by the Federal Geodetic Control Committee for the U.S. Department of Commerce.

PART 2 - MATERIALS

2.1 FIELD BOOKS AND PAPER

A. The field books shall be the standard six (6) ring field book (6 1/2" X 8") normally used in surveying.

B. The paper shall be the standard six (6) hole paper (5 1/2" X 7 1/4") normally used in surveying.

PART 3 - EXECUTION

3.1 REQUIREMENTS

A. The Contractor shall perform all necessary construction engineering, including layout, to insure that the work conforms to the lines, locations, grades, and elevations shown on the Contract Documents. The construction engineering shall include establishing all necessary lines, points, corners, etc. with adequate references for the recovery of said items during construction, running a level circuit to establish additional benchmarks for use during construction, setting

stakes for structures, slopes, subgrade, paving, and any other stakes required for control lines and grades.

B. The Contractor shall furnish all equipment personnel, and materials including stakes, templets, straightedges, and other devices necessary for performing the construction engineering.

C. Field notes shall be kept in standard field notebooks supplied by the Contractor in a clear, orderly, and neat manner consistent with standard engineering practices and procedures. The field books shall be available for inspection by the Engineer at all times and shall become the property of the Owner on completion of the work.

D. When staking culverts or inlets, the Contractor shall perform the necessary checking to establish the proper location and grade to fit best the conditions on the site. The Engineer shall approve the location of each structure prior to the installation of the culvert of inlet.

E. The Engineer may check the accuracy of the construction engineering as necessary, but will assume no responsibility for the accuracy of engineering layout or the final result of construction accuracy.

F. The supervision of the Contractors construction engineering personnel shall be the responsibility of the Contractor and any errors resulting from the operations of such personnel shall be connected at the expense of the Contractor and at no additional cost to the Owner.

PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT

A. There will be no measurement of construction engineering.

4.2 BASIS OF PAYMENT

A. There will be no separate payment for construction engineering. The cost of this work is to be included by the Contractor in the total cost of the contract.

allowable under AREA specifications, latest revision, and the load carried per linear inch of knife-edged bearing shall not exceed 5,000 pounds.

2. The scale platform shall be of such length and width as to accommodate conveniently any truck containing materials which need to be weighed. The entire truck load shall rest on the scale platform and be weighed as one draft.
3. If material is weighed on truck-scales, weigh tickets showing the net weight of each load of material delivered shall be supplied to the Engineer for his use in computing quantities.
4. The tickets shall be prepared at the weighing site by the Contractor or his representative under the observation of the Owner's Representative and shall contain the following information: Ticket serial number, date, contract number, source of supply, material designation (size or type), truck number, time weighed, gross weight (DR entered here if scale is direct reading type), tare, net weight, and moisture content (if applicable). A space shall be provided on each ticket for signature of the Owner's Representative. A duplicate ticket may be furnished by the Contractor for his records. The original and duplicate (if furnished) tickets shall be signed by the Project Engineer at the point of incorporation into the work.
5. The cost of furnishing, maintaining and operating scales shall be borne by the Contractor.
6. The weight of materials weighed outside the State of Indiana and intended for use by the Contractor in the work may be determined on scales tested and approved by the proper governmental unit having authority where the scales are located. In such case, the Contractor shall furnish the Owner a certified copy of such inspection and approval which, to be acceptable, shall have been made within one year prior to the time of such weighing. In general, out-of-state truck-scales used shall comply with all pertinent provisions as they apply to truck-scales accepted within the State of Indiana. They shall be subject to review by the Project Engineer and to the requirements applicable to such scales located within the state.
7. If materials are shipped by rail, the car weight may be accepted, provided payment is made for only the actual weight of the materials. Car weights will not be acceptable for material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty at such times as the Project Engineer directs. Each truck shall bear a plainly legible identification mark.

C. Measurement by Volume: Materials to be measured by volume in the -hauling, vehicle shall be hauled in approved vehicles and measured therein at the point of delivery. Vehicles for this purpose may be of any size or acceptable type, provided the body is of such shape that the actual contents may be determined readily and accurately. All vehicles shall be loaded to at least their water level capacity, and all loads shall be leveled when the vehicles arrive at the point of delivery.

1. When requested by the Contractor and approved in writing, material specified to be measured by the cubic yard may be weighed and such weights will be converted to cubic yards for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Project Engineer and shall be agreed to by the Contractor. In computing volumes of excavation, the average end area method or other acceptable, methods will be used.
2. If excavation is measured by cross sections, the following will apply:
   a. Unless otherwise provided, where sodded areas are involved, the cross sections will be considered as located at the surface of the sod.
   b. If the cost of excavation is specifically included in the payment for any item of work, the final sections will be taken at the finished surface of the work.
   c. If the cost of excavation is not specifically included in the payment for any item of work, the final sections will be taken at the limits of the authorized excavation.
   d. If the Contractor exceeds the authorized excavation or embankment limits, the cross-sections will be closed at the neat lines indicated on the plans.
3. Unauthorized wastage of material will be deducted, and only such quantities as are actually incorporated into the completed work will be included.

D. Measurement of Bituminous Materials: If a bituminous material is to be paid for directly, it shall, except as hereinafter provided, be weighed and paid for by the ton. If the Engineer decides that weighing is not feasible, the bituminous material may be measured by volume (as hereinafter set out) and converted to tons, the conversion to be based on the unit weight as determined in the laboratory.

1. When bituminous material is to be measured by volume, it shall be measured in gallons in tank cars, distributor tanks, tanks, or drums. The Contractor shall furnish certified calibration of tank cars, distributor tanks, tanks, and certified quantities in drums in which bituminous materials are delivered or stored.
2. If bituminous material is furnished in drums, the amount in each drum shall be stenciled plainly on the drumhead by the producer. The amount so indicated will be accepted as the quantity furnished except the amount in each drum may be checked at any time in accordance with the provisions set out herein.
3. Tank-car deliveries will be measured by volume and converted to tons.
4. Volumes will be measured at 60 degrees F or will be corrected to the volume at 60 degrees F in accordance with ASTM D 1250 for asphalts or ASTM D 633 for tars.
5. Net certified scale weights or weights based on certified volumes in the case of rail shipments will be used as a basis of measurement, subject to correction when bituminous material has been lost from the car or the distributor, wasted, or otherwise not incorporated in the work.

E. Measurement of Cement: Cement will be measured by the barrel or the sack. The term barrel will mean 376 pounds or four sacks of cement. The cement content of concrete will be determined by the following method in accordance with AASHTO T 121 as modified in 501.03(a).

1. The weight of a known volume of fresh concrete will be determined. Then the yield (or barrels of cement per cubic yard of concrete produced per batch) will be calculated from the relation that the amount of cement per cubic yard is to the amount of cement per batch as the weight of the concrete per cubic yard is to the weight of the batch.

a. A = Weight of concrete per cubic foot
b. B = Total weight of batch
c. C = Pounds of cement per batch

d. $\frac{C}{376}$ = Barrels of cement per batch

e. $\frac{B}{27A}$ - Cubic yards of concrete per batch

f. $\frac{C}{376} \times 27 \frac{A}{B}$ - Barrels of cement per cubic yard

g. $0.0718 \times \frac{AC}{BB}$ - Barrels of cement per cubic yard

F. Measurement of Aggregates: Unless otherwise provided, all aggregates for which measurements are obtained by the cubic yard will be measured at the truck loading point in truck beds that have been measured, stenciled and approved; or they may be weighed and converted to cubic yards by a conversion factor computed at sufficient intervals to insure correct yardage.

1. Free water in all aggregates for which payment is made as a separate item on a tonnage basis shall be drained prior to weighing and selection of samples. Samples for determination of moisture content shall be taken immediately prior to the time the material is to be weighed. The number of moisture tests will be governed by conditions. Moisture contents shall be determined on the basis of oven dry weight by drying samples to constant weight at 110 degrees C ±5 degrees, except if ovens are not available for drying samples, other methods which give equivalent results may be used. Moisture content shall be computed to the nearest 0.5% in accordance with the following formula:

   Percent of Moisture (M) =

   $$\frac{\text{Wet weight of sample - Dry weight of sample}}{\text{Dry weight of sample}} \times 100$$

2. The percent of moisture shall be noted on each weight ticket.
3. The wet weight will be used for the basis of payment, if the percent of moisture is determined to be less than 6% for Aggregate Size No. 10 or "B" borrow; 9% or optimum moisture content, as determined in accordance with AASHTO T 99 as modified in 203.24 of the Standard Specifications, whichever is greater, for Size No. 53 or No. 73 aggregates or modifications thereof when specified; or 4% for aggregates of all other specified sizes including sand.
4. If the percent of moisture exceeds the limitations set out above, the weight to be paid for will be the gross weight of aggregate minus the weight of the excess moisture computed as follows:

   $$\text{Weight to be paid for} = G \times \frac{(100 + m)}{(100 + M)}$$

   In which:
   G = Gross weight of material (wet)
   M = Percent of moisture in the aggregate to the nearest 0.5% based on oven dry weight

m = Percent of moisture permitted in the wet aggregate to be paid for based on oven dry weight

G. Measurement of Timber or Lumber: Timber or lumber will be measured by the thousand feet (board measure, M.F.B.M.) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.

H. Manufactured Items: When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe, conduit, etc., and these items are identified by gage, unit weight, section dimensions, etc., such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01210

PRE-CONSTRUCTION CONFERENCE

PART I - GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Summary of Work: Section 01010.

B. Progress Schedules: Section 01310.

C. Shop Drawings, Product Data & Samples: Section 01340.

D. Project Record Documents: Section 01720.

1.2 PRE-CONSTRUCTION MEETING

A. The Engineer will schedule and administer a pre-construction conference. The Engineer will:

1. Prepare the agenda;
2. Distribute written notice of the meeting;
3. Make physical arrangements for the meeting;
4. Preside at the meeting;
5. Record the meeting minutes; and
6. Distribute copies of the minutes to the Contractor.

B. The Engineer will schedule the pre-construction conference in accord with Paragraph 2.8 of the General Conditions.

C. The following persons will attend the pre-construction conference:

1. The Owner's Representative;
2. The Contractor and its major subcontractors; and
3. Representatives of governmental and other regulatory agencies as necessary.

D. At a minimum, the agenda will include distribution and discussion of:

1. The list of major subcontractors;
2. The items required to be addressed by paragraph 2.8 of the General Conditions;
3. The identification of personnel responsible for on-site and emergency situations;
4. The processing of Field Orders, Work Directive Changes and Change Orders;
5. Procedures for maintaining Record Documents;
6. Coordination of the Contractor's work with the work of the Owner's personnel;
7. Security procedures;

8. Housekeeping procedures;
9. Use of premises;
10. Major equipment deliveries and priorities; and
11. Critical work sequencing.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01220

PROGRESS MEETINGS

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Summary of Work: Section 01010.

B. Progress Schedules: Section 01310.

C. Shop Drawings, Product Data & Samples: Section 01340.

D. Project Record Documents: Section 01720.

1.2 PROGRESS MEETINGS

A. The Engineer or his representative will schedule and administer a preconstruction conference. The Engineer or his representative will:

1. Prepare the agenda;
2. Distribute written notice of the meeting;
3. Make physical arrangements for the meeting;
4. Preside at the meeting;
5. Record the meeting minutes; and
6. Distribute copies of the minutes to the Contractor within ten (10) days after each meeting.

B. Regular bi-weekly meetings will be scheduled at a time mutually agreed upon by the Contractor and Engineer.

C. The Engineer shall call special meetings as progress of Work dictates.

D. Meetings will be held in the Contractor's construction trailer, or as directed by the Engineer.

E. The following persons will attend the progress meetings:

1. The Owner's Representative;
2. The Contractor;
3. Subcontractors as pertinent to agenda; and
4. Representatives of governmental and other regulatory agencies having jurisdiction as required.

F. At a minimum, the agenda will include:

1. Review of the previous meetings;
2. Review of the work progress since last meeting;

3. Discussion of field observations, problems and decisions;
4. Identification of problems which impede planned progress;
5. Review of any off-site fabrication problems;
6. Discussion of corrective measures and procedures to regain planned schedule;
7. Review of the progress schedule as indicated;
8. Plan progress during next work period;
9. Review submittal schedules and expedite as required to maintain schedule;
10. Review the maintenance of quality and work standards;
11. Review any changes proposed by the Owner; and
12. Complete other current business.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01310

PROGRESS SCHEDULES

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Suumary of Work: Section 01010.

B. Shop Drawings, Product Data & Samples: Section 01340.

C. Schedule of Values: Section 01370.

1.2 PROGRESS SCHEDULE

A. The Contractor shall provide the Engineer with a progress schedule as required by paragraphs 2.6 and 2.9 of the General Conditions.

B. The schedule shall be updated monthly by the Contractor to indicate progress and shall be resubmitted to the Engineer monthly.

1.3 CONTENTS OF PROGRESS SCHEDULE

A. The progress schedule shall show in detail the proposed sequence of the Work and the estimated date of starting and completing each stage of the Work in order to complete the Work within the Contract Time.

B. For Work with a bid of less than $3 million, a horizontal bar chart, the Critical Path Method (CPM), or the Program Evaluation and Review Technique (PERT) may be used. For Work with a bid equal to or greater than $3 million, the Critical Path Method (CPM) or Program Evaluation and Review Technique (PERT) shall be used as appropriate.

C. The format for the horizontal bar chart shall:

1. Include a separate horizontal bar for each work activity;
2. Order the bar chart to correspond with the Table of Contents of the Specifications;
3. Identify each bar by each major work activity for each building, structure, and/or sitework item;
4. Provide a horizontal time scale in one (1) week units;
5. Provide a space for updating;
6. Be provided on reproducible size 24" x 36" sheets.

D. Any progress schedule, whether it is a horizontal bar chart, CPM or PERT, must include the following information:

1. For each construction activity:
   a. Identify submittal dates and the dates by which reviewed submittals are needed for shop drawings and samples;
   b. Identify project procurement and delivery dates; and
   c. Identify dates for the beginning and completion of each activity, for example:
      i. Concrete placement
      ii. Subcontractor work
      iii. Equipment installation

1.4 UPDATING THE PROGRESS SCHEDULE

A. The Contractor shall provide an updated progress schedule to the Engineer monthly reflecting the status of work as required in Subsection 1.2 of this Section.

B. The Contractor shall submit two (2) copies of the updated progress schedule for the Engineer, plus the number required by the Contractor.

C. The updated progress schedule shall show all changes occurring since the previous submission.

D. The updated progress schedule shall reflect revised estimates of the duration of the various activities.

E. The updated progress schedule shall be accompanied by a detailed description of the work to be accomplished in the succeeding month.

F. The updated progress schedule shall be accompanied by a written report, prepared by the Contractor, which:
   1. Discusses problem areas, including current and anticipated delay factors and their impact;
   2. Delineates corrective action taken or proposed and its effect; and
   3. Describes the effect of problems or corrective action on other contractors.

1.5 REVIEW & DISTRIBUTION OF UPDATED PROGRESS SCHEDULES

A. Within ten (10) days after receipt of the updated progress schedule, the Engineer shall review and return the schedules.

B. If the Engineer requires a resubmittal, the Contractor must comply within seven (7) days of receipt of reviewed schedule.

C. The Contractor shall distribute copies of the reviewed schedules to:

1. The job site file;
2. Its subcontractors and appropriate suppliers; and
3. Other parties agreed to by the Contractor and Engineer.

D. Upon distributing copies of the reviewed schedules to the recipients, the Contractor must request the recipients to immediately report to the Contractor any inability to comply with the schedule, provide a detailed explanation of the inability and suggest solutions.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01340

SHOP DRAWINGS, PRODUCT DATA & SAMPLES

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Progress Schedules: Section 01310.

B. Project Record Documents: Section 01720.

C. The schedule of Shop Drawings submissions required by paragraph 2.6.2 of the General Conditions must include a schedule of sample submissions.

D. The Contractor shall submit to the Engineer all Shop Drawings and samples required by the Contract Documents in accord with this Section and the other provisions of the Contract Documents.

1.2 GENERAL SUBMITTAL REQUIREMENTS

A. Each submittal must be made to the Engineer at least thirty (30) days before the reviewed submittal is needed by the Contractor.

B. Whenever the Contractor makes a submittal under this Section, he shall compile all material for the submittal into sets by stapling, punching or binding. Two (2) or more sheets or prints must be stapled three (3) times along the left edge. Smaller (8 1/2" x 11") sheets should be stapled two (2) or three (3) times along the left margin; and if submitted with a print, must be stapled to the upper left corner of the print. The submittals must be bound in a manner that all items may be easily opened and visible to review.

C. The Contractor may not use highlighter type markers when making notes on submittals. Any handwritten notes must be made with a pen that reproduces when the document is copied on either a duplication machine or a diazo machine.

D. Copies may be opaque diazo prints, blueprints, or when applicable, xerox copies. Acceptable reproducibles are of vellum, sepia or mylar. Reproducibles shall be of such quality that crisp, legible copies can be produced.

E. Each shop drawing or sample submittal shall be accompanied by appropriate product data as required by the Contract Documents.

1.3 SHOP DRAWING SUBMITTALS

A. Shop drawing submittals shall be made as required by the Drawings and Specifications.

B. Shop drawings of various components of systems which relate to each other shall be submitted at the same time for proper review. For example, shop drawings of a pump, motor and speed control shall be submitted at the same time, under separate Contractor's Submittal Transmittal Forms.

C. Each shop drawing submittal shall include five (5) copies of the Shop Drawing and shall:

1. Be prepared by a qualified detailer;
2. Identify details by reference to sheet and detail numbers shown on the drawings and/or the section number of the Specifications;
3. Show the original drawing date and revision dates;
4. Show the project name, location of site and project number;
5. Provide the names of the Engineer, Contractor, subcontractor, supplier, manufacturer, and, if pertinent, separate detailer;
6. Show its relation to adjacent structure or materials;
7. Show field dimensions, clearly identified as such;
8. Identify applicable Specification section or Drawing sheet number;
9. Identify applicable standards, such as ASTM number or Federal Specification; and
10. Provide a blank 4" x 4" space for the Engineer's stamp.

1.4 SAMPLE SUBMITTALS

A. Sample submittals shall be made as required by the Drawings and Specifications.

B. Each sample shall be labeled with tags provided by the Engineer. Small items or several items for one sample submittal may be submitted in a *3turdy envelope or plastic bag. The tags shall:
1. Show the project name, location of site and project number;
2. Provide the names of the Engineer, Contractor, Subcontractor, Supplier and Manufacturer;
3. Identify the applicable Specification section or Drawing sheet number;
4. Identify the applicable standards such as ASTM number or Federal Specification; and
5. Provide space for the Engineer's stamp.

1.5 CONTRACTOR'S RESPONSIBILITY

A. Where Shop Drawings prepared by one trade require cross-checking with the Shop Drawings of some other trade or trades, the Contractor shall assemble the Shop Drawings of all interdependent trades, cross-check and coordinate them himself, require corrections as necessary from the various trades, and then present the corrected drawings in the submission. As an alternate to this procedure, the Contractor may make composite drawings showing the interrelation of the concerned trades and subsequent Shop Drawings of these trades shall be required to conform to these reviewed composite drawings. Fragmentary or piecemeal transmittals of Shop Drawings for individual trades in violation of this requirement will be returned to the Contractor unchecked and will not be accepted.

B. The Contractor shall distribute copies of the submittals subsequent to the Engineer's review.

1.6 RESUBMISSION REQUIREMENTS

A. Shop Drawings:

1. The Contractor is not required to resubmit Shop Drawings which are marked "No Exception Taken" (NET) or "Make Corrections Noted" (MCN) by the Engineer. Shop drawings which are returned to the Contractor marked "Revise and Resubmit", "Submit Specified Item" or "Rejected" are to be resubmitted. The Contractor shall submit new copies, not the ones which were marked up by the Engineer.

2. The Contractor shall indicate on the Shop Drawings any changes, including those requested by the Engineer, by an identifying symbol, initial and date.

B. Product Data and Samples: The Contractor shall submit new data and samples as required for the initial submittal.

C. Each submittal, regardless of the action taken, will count as one (1) submittal.

1. 7 ADDITIONAL SUBMITTALS

A. The Contractor shall attempt to make complete submittals. However, if it is necessary to submit additional material for a Shop Drawing where review has not yet been completed by the Engineer, another CST form shall be completed with the same Reference Number as the original submittal and shall be clearly marked "Additional Information".

1.8 REVISED SUBMITTALS

A. If the Contractor wishes to submit revisions after the Shop Drawing has been reviewed and returned, the revised shop drawing shall be submitted with the same description as on the previous submittal and noting which portions/pages of the submittal have been revised.

1.9 VOIDED SUBMITTALS

A. If the Contractor voids a submittal, he shall notify the Engineer in writing that the submittal has been voided. In addition, if the voided submittal has been replaced by another submittal, the Contractor shall state the PDE Reference Number of that submittal.

1.10 ENGINEER'S DUTIES

A. The Engineer shall affix stamp and initials or signature indicating the review of the submittal.

B. Disposition by the Engineer will be one of the following: "No Exception Taken" (NET), "Make Corrections Noted" (MCN), "Rejected", "Revise and Resubmit", or "Submit Specified Item".

C. The Engineer will return two (2) copies of the reviewed submittals to the Contractor for distribution. If additional copies are needed by the Contractor, then the Contractor shall so request in writing and increase the number of submittal copies to the Engineer over the five (5) specified, by the number of additional copies needed.

D. If the Engineer requires additional information from the Contractor before he can complete the review of and take action on a submittal, the Engineer will request that information by the use of a D/R form (Justification for Delaying Return of Shop Drawing and/or Request for Additional Information from the Contractor Form). The use of the D/R form interrupts the submittal review time until the required additional information is provided to the Engineer.

E. All submittals may be reviewed twice, if necessary. After a submittal has been reviewed the second time, additional review not caused by the fault of the Owner or the Engineer may cause extra engineering costs to be billed to the Owner, who may pass on such costs to the Contractor.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01341

MANUFACTURER'S RECOMMENDATIONS

PART 1 - GENERAL

1.1 GENERAL

A. Whenever and wherever these Contract Documents indicate that the performance of a particular task shall be done in accordance with the manufacturer's recommendations and/or specifications or manufacturer's printed instructions, said recommendations and/or specifications shall be submitted in conformance with the requirements of Section 01340.

1.2 CONTRACTOR'S RESPONSIBILITIES

A. The Contractor is responsible for reviewing and approving the specific manufacturer's recommendations and/or specifications and submitting same for the Engineer's review.

B. In the event that the Contractor wishes to use a manufacturer that has no specific. recommendations and/or specifications for a particular application, the Contractor shall be responsible for developing such a set of criteria based upon standard practice within the industry. This development shall be limited to points of procedure and cannot be extended to cover specific technical information relating to a particular manufacturer's product. Once these criteria are developed, the Contractor shall submit them to the Engineer for his review. This submittal shall clearly differentiate between those elements developed by the Contractor and those developed by the specific manufacturer.

C. Should the Contractor be unable to develop the appropriate recommendations and/or specifications which are in conformance with the Contract Documents, he will be required to substitute a different product which already has the appropriate recommendations and/or specifications or which facilitates their development.

D. The Contractor's responsibility for errors and omissions in submittals is not relieved by Engineer's review of submittals.

E. The Contractor's responsibility for deviations in submittals from requirements of the Contract Documents is not relieved by the Engineer's review of submittals. The Contractor may submit specific deviations to the Engineer for review, but such deviations will require the

manufacturer's and/or supplier's written approval for the specific deviation as a prerequisite to the Engineer's consideration or approval.

F. The Contractor's shall notify the Engineer, in writing at the time of submission, of deviations in submittals from requirements of the Contract Documents.

G. The Contractor shall not begin work which requires submittals until return of the submittals.

1.3 ENGINEER'S DUTIES

A. The Engineer shall attempt to review submittals within thirty (30) days from receipt of submission. The Contractor will be notified if additional time is required.

B. The Engineer's review is only for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. The Contractor is responsible for information that pertains solely to fabrication processes and to techniques for construction. Each action shown is subject to the requirements of the Contract Documents.

C. The Engineer shall return the submittals to the Contractor for distribution.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01350

OPERATION AND MAINTENANCE DATA

PART I - GENERAL

1.1 SCOPE

A. The Contractor shall provide operation and maintenance data as specified below for all items listed below.

1. Equipment of all types
2. All valves, cocks, gates, actuators and related accessories
3. All instruments and control devices
4. All electronic and major electrical equipment
5. Processes

1.2 DEFINITIONS

A. Operation and Maintenance Data:

1. The term "operation and maintenance data" includes all product related information and documents which are required for preparation of the plant operation and maintenance manual or which must accompany said manual as directed by current regulations of the United States Environmental Protection Agency and supplemental regulations promulgated by agencies of the State of Indiana.
2. Required operation and maintenance data include, but are not limited to, the following:
   a. The Contractor shall provide a separate directory for equipment, valves/gates and spare parts. Each directory shall include all items of the category provided for the project. The directories shall include the following information:
      1) Term, name, or identifier used in the Contract Documents for the item listed.
      2) Detailed description of the item.
      3) Location of the item using terms for such locations identical to those used in the Contract Documents.
      4) Full nameplate information for each item provided including serial numbers, model number, H.P., voltage, etc.
      5) Manufacturer's name and address.
      6) Manufacturer's local representative's name and address.
      7) Owner's assigned equipment or valve number.

b. Complete, detailed written (in the English language) operating instructions for each product or piece of equipment, valve and/or electronic equipment. All control panels shall be fully explained (operation, sequences, etc.). NOTE: If the data supplied contains information on options or equipment not provided (not job specific), the data shall be clearly marked to identify the items provided. Optionally, such superfluous information may be deleted by neatly marking out such data.
c. Complete nameplate identification data include serial number and model numbers of equipment where applicable.
d. Complete, detailed written preventive maintenance instructions as defined in paragraph 1.2.B of this Section.
e. All recommended spare parts lists on the manufacturer's letterhead. In addition, the Contractor shall submit a listing of those spare parts and/or consumables which are to be provided for each equipment item.
f. Written explanations of all safety considerations relating to operation or maintenance procedures.
g. Wiring diagrams
h. Piping schematics
i. Complete parts lists showing parts, catalog numbers and generic description.

B. Preventive Maintenance Instructions:

1. The term "preventive maintenance instructions" includes all information and instructions required by plant personnel to keep a product or piece of equipment properly lubricated, adjusted and otherwise maintained so that the item functions economically throughout its full design life.
2. Preventive maintenance instructions include, but are not limited to, the following:
   a. A written explanation with illustrations as required for each preventive maintenance task, including finishes.
   b. Recommended intervals for. execution of preventive maintenance tasks.
   c. Lubrication and other consumables charts.
   d. Table of alternate lubricants.
   e. Troubleshooting instructions.
   f. List of required maintenance tools and equipment. The Contractor shall provide all special purpose maintenance tools and equipment specified by the manufacturer as necessary for the proper operation,

calibration and maintenance of the item provided.

3. If a manufacturer's recommendations are that no maintenance is required, then the Contractor shall submit a letter on the manufacturer's letterhead so stating.
4. The Contractor shall submit a detailed directory listing all manufacturer's recommended preventive maintenance and lubrication tasks and schedules for these activities.

1.3 SUBMITTALS

A. General: In order that the Owner may satisfy the requirements of the US EPA, the Contractor shall submit operation and maintenance data to the Engineer within sixty (60) days after review of shop drawings. The Contractor's failure to adhere to this schedule may result in withholding of progress payments. If updated operation and maintenance data becomes available after these dates, these data, as available, shall be submitted to the Engineer. All operation and maintenance data must be submitted and accepted prior to start-up of the facility.

B. The Contractor shall also submit all revisions of manufacturer's literature and operation and maintenance data to the Engineer within sixty (60) days after manufacturer makes such revisions.

C. The Contractor shall ensure that all operation and maintenance data submissions match approved shop drawings in scope of equipment provided as well as configuration, model number, etc.

D. Number of Copies: 6 of each item.

E. Letter of Transmittal: Provide a letter of transmittal with each submittal and include the following in the letter:

1. Date of submittal.
2. Contract title and number.
3. Contractor's name and address.
4. A list of the attachments, the specification sections and identification of equipment to which they relate.
5. Reference to, or explanation of, any related submittals previously submitted or to be submitted at a future date.

F. Format Requirements:

1. Use 8 1/2-inch by 11-inch paper of high rag content and good quality. Larger drawings or illustrations

are acceptable if neatly folded to the specified size in a manner which will permit easy unfolding without removal from a binder.

2. All text shall be legible, typewritten or machine-printed originals or high quality copies of same.
3. Each page must have a binding margin of approximately 1 1/4 inches and must be punched for placement in a 3-ring looseleaf or triple post binder.
4. Use dividers between major categories of information such as "Operating Instructions". "Preventive Maintenance Instructions", etc.
5. Provide a table of contents for each submittal.
6. Identify products by their functional names in the table of contents and at least once in each chapter or section. Thereafter, abbreviations and acronyms may be used if their meaning is explained in a table in the back of each submittal. Use of model or catalog numbers or letters for identification is not acceptable.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

A. There will be no separate payment for work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01370

SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Progress Schedules: Section 01310.

1.2 SCOPE OF PAYMENT

A. When specifically permitted by the Specifications, payment for undelivered specifically manufactured items or equipment (excluding off-the-shelf or catalog items), will be made as work on them progresses. Payment for these items will be made only when:

1. The equipment to be specifically manufactured for the Work could not be readily utilized on nor diverted to another job; and
2. A fabrication period of more than six (6) months is anticipated,

B. Payments for work on undelivered specifically manufactured items are conditional upon the submission by the Contractor of paid invoices to the Engineer which establish the Owner's interest including applicable insurance, all of which will be satisfactory to the Owner. Progress payments for specifically manufactured equipment or items shall be limited to the following:

1. A first payment upon submission by the Contractor of shop drawings for the equipment or items in an amount not exceeding fifteen percent (15%) of the contract or item price plus applicable higher tier costs; and
2. Subsequent to the Owner's release or approval for manufacture, additional payments, not more frequently than monthly thereafter, up to seventy-five percent, (75%) of the contract or item price plus applicable higher tier costs.

C. Submission of any request for a progress payment under Subsection B of this Section must be accompanied by a certification furnished by the fabricator of the equipment or item that the amount of the first progress payment claimed constitutes not more than fifteen percent (15%) of the contract or item price quoted by the fabricator, and what the cumulative amount claimed in subsequent progress payments does not exceed seventy-five percent (75%) of the contract or item price quoted by the fabricator.

D. Applicable higher tier costs, as used in Subsection *B of this Section include all expenses of contract performance which are reasonable, allowable to the contract, consistent with sound and generally accepted accounting principles and practices consistently applied, and which are not excluded by contract.

E. The Contractor shall provide transportation and reasonable living expenses for a representative of the Engineer to travel to the place of manufacture of such equipment or material to observe the progress for each billing.

F. Payment for work executed under the Agreement is based upon lump sum and/or unit prices. Subject to the limitations listed herein, progress payments for lump sum items shall be based upon percentage of completion at the time of request for such payments as determined by the Engineer, while progress payments for unit priced items shall be made for estimated quantities of such items completed and in place. The method for calculating estimated quantities shall be based upon reasonable engineering methods for such estimates as agreed upon by the Contractor and Engineer.

G. Retainage may not be reduced until the Contractor provides the Owner 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. work, equipment bills, and other indebtedness connected with the Work for which Owner or his 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, manufacturer, fabricator, supplier or distributor fails to furnish a release or receipt in full, Contractor may furnish a Bond or other collateral satisfactory to Owner to indemnify Owner against any lien.

1.3 PROGRESS PAYMENT PROCEDURE

A. The Contractor shall, in accordance with paragraphs 2.6 and 14. 1 of the General Conditions, submit to the Engineer a Schedule of Values for the various parts of the Work. The Schedules of Values shall:

1. Be in such form as the Contractor and Engineer mutually agree upon; and
2. Consist of an amount for each Section of the Specifications, each of which shall include its

proper share of overhead, insurance, profit and other general charges so that the sum of the amounts equals the Contract Price.

The schedule of values shall be used as the basis for the Contractor's application for progress and final payments.

B. Before the first application for payment, the Contractor shall select a monthly billing date, within twenty (20) days prior to the last progress meeting of the month, upon which he will terminate his accumulation of charges.

C. Upon the monthly date agreed to by the Contractor and the Engineer, the Contractor shall submit to the Engineer an itemized Application for Progress Payment in accord with paragraph 14.2 of the General Conditions.

1.4 LUMP SUM PROVISIONS

A. The term Lump Sum when used as an item of payment will mean complete payment for each item so designated in the Contract Documents.

1.5 UNIT PRICE PROVISIONS

A. If the Contract Documents require that a unit price cover and be considered compensation for certain work or material essential to the item, this same work or material will not also be measured or paid for under any other provision.

B. If the Contractor and Owner agree, in writing, that the quantities of certain items or portions of items of work, as set forth in the Contract Documents, are in substantial agreement with actual quantities of work performed, compensation therefor will be based on the quantities as set forth in the Contract Documents without measurement thereof upon completion of the Work. Compensation based on Contract Document quantities as agreed shall be accepted as full payment for such items or portions of items.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01381

VIDEO TAPED INVENTORY CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION

A. This work consists of, prior to the beginning of construction, video taping, with audio sound, the entire project site and any off-site areas used for hauling, dumping, storage, etc. The limits of video taping shall be determined by the Owner and the Engineer. The Owner and the Engineer shall be present during this video taping work. Upon completion of construction, the same areas shall be again video taped with audio sound.

B. The video tape shall provide a complete record of the physical conditions of the entire project before and after construction.

C. The video tapes shall become the property of the Owner, but retained by the Engineer who shall maintain same for viewing by the Owner and the Contractor for a period not to exceed one (1) year after completion of the project.

PART 2 - PRODUCTS

2.1 The video tape shall be one-half inch (1/2") color, cassette type, VHS series and of broadcast quality.

PART 3 - EXECUTION

3.1 When applicable, the video tape shall be cataloged by automobile odometer readings taken in one-tenth (1/10) of a mile increments.

3.2 The video tape shall clearly show all physical features along the route.

3.3 The camera shall be a high quality color unit.

PART 4 - PAYMENT

4.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide testing and inspecting, complete, as described in this Section and elsewhere in the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

B. Requirements for testing may be described in various Sections of these Specifications.

1.3 QUALITY ASSURANCE

A. Provide the services of an independent soil engineer and an independent testing laboratory approved by the Engineer.

B. The Engineer, after reviewing the qualifications of the independent testing laboratory, reserves the right to disapprove said laboratory and to instruct the Contractor to obtain the services of another laboratory.

C. Upon completion of each test and/or inspection, promptly distribute copies of test or inspection reports to the Engineer, to governmental agencies requiring submission of such reports, and to such other persons as directed by the Engineer.

PART 2 - PRODUCTS

2.1 SPECIFIC TESTS AND INSPECTIONS

A. Provide all tests and inspections required by governmental agencies having jurisdiction, required by provisions of the Contract Documents, and such other tests and inspections as are directed by the Engineer.

B. Tests include, but are not necessarily limited to, those described in detail in Part 3 of this Section.

PART 3 - EXECUTION

3.1 TAKING SPECIMENS

A. Except as may be specifically otherwise approved by the Engineer, have the testing laboratory secure and handle all samples and specimens for testing.

3.2 COOPERATION WITH TESTING LABORATORY

A. Provide access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.

3.3 SOIL INSPECTING AND TESTING

A. Make required inspections and tests including, but not necessarily limited to:

1. Visually inspect on-site and imported fill and backfill, making such tests and retests as are necessary to determine compliance with the Contract requirements and suitability for the proposed purpose;
2. Make field density tests on samples from in-place material as required;
3. As pertinent, inspect and test the scarifying and recompacting of cleaned subgrade; inspect the progress of excavating, filling, and grading; make 90% density tests at fills and backfills; and verify compliance with provisions of the Contract Documents and governmental agencies having jurisdiction.

B. Make and distribute necessary reports and certificates.

3.4 CONCRETE INSPECTING AND TESTING

A. Portland cement:

1. Secure from the cement manufacturer Certificates of Compliance delivered directly to the concrete producer for further delivery directly to the testing laboratory.
2. Require the Certificates of Compliance to positively identify the cement as to production lot, bin or silo number, dating and routing of shipment, and compliance with the specified standards.
3. If so required by the Engineer, promptly provide such other specific physical and chemical data as requested.

B. Aggregate:

1. Provide one test unless character of material changes, material is substituted, or additional test is requested by the Engineer.
2. Sample from conveyor belts or batching gates at the ready-mix plant:

    a. Sieve analysis to determine compliance with specified standards and grading;
    b. Specific gravity test for compliance with specified standards.

C. Laboratory design mix:

1. After approval of aggregate, and whenever character or source of materials is changed, provide mix design in accordance with ACI 613.
2. Provide designs for all mixes prepared by a licensed civil engineer.

D. Molded concrete cylinders:

1. Provide three test cylinders for each 150 cu. yds., or fraction thereof, of each class of concrete of each day's placement.
2. Test one cylinder at seven days, one at 28 days, and one when so directed.
3. Report the mix, slump, gage, location of concrete in the structure, and test results.
4. Take specimens and make tests in accordance with the applicable ASTM standard specifications.

E. Core tests:

1. Provide only when specifically so directed by the Engineer because of low cylinder test results.
2. Cut from locations directed by the Engineer, securing in accordance with ASTM C42, and prepar*e and test in accordance with ASTM C39.

F. Placement inspections:

1. On concrete over 2000 psi, provide continuous or other inspection as required by governmental agencies having jurisdiction.
2. Throughout progress of concrete placement, make slump tests to verify conformance with specified slump.
3. Using all required personnel and equipment, throughout progress of concrete placement verify that finished concrete surfaces will have the level or slope that is requircd by the Contract Documents.

3.5 CONCRETE REINFORCEMENT INSPECTING AND TESTING

A. Prior to use, test all reinforcement steel bars for compliance with the specified standards.

1. Material identified by mill test reports, and certified by the testing laboratory, does not require additional testing. Require the supplier to furnish mill test reports to the testing laboratory for certification.
2. Tag identified steel at the supplier's shop. When steel arrives at the job site without such tags, test it as unidentified steel.

B. Unidentified steel:

1. Have the testing laboratory select samples consisting of two pieces, each 18" long, of each size.
2. Have the testing laboratory make one tensile test and one bend test for each 2-1/2 tons or fraction thereof of each size of unidentified steel.

C. Provide,continuous inspection for all welding of reinforcement steel.

3.6 STRUCTURAL STEEL INSPECTING AND TESTING

A. Prior to use, test all structural steel for compliance with the specified standards.

1. Material identified by mill test reports, and certified by the testing laboratory, does not require additional testing. Require the supplier to furnish mill test reports to the laboratory for certification.
2. Tag identified steel at the supplier's shop. When steel arrives at the job site without such tags, test it as unidentified steel.

B. Unidentified steel:

1. Have testing laboratory make one tensile test and one bend test for each five tons or fraction thereof of each shape and size of unidentified structural steel.

C. Shop welding:

1. Provide qualified testing laboratory inspector.
2. On single pass welds, inspect after completion of welding and prior to painting.
3. On multiple pass welds, and on butt welds with cover pass on the back side, provide continuous inspection.

3.7 ROOFING AND WATERPROOFING INSPECTING AND TESTING

A. Prior to start of membrane waterproofing and membrane roofing installation, conduct a job site meeting attended by representatives of the installing subcontractors, the Contractor's field superintendent, the testing laboratory inspector, and the Engineer, to agree upon procedures to be followed.

B. Prior to start of installation, verify that materials at the job site comply with the specified standards, that the subcontractor is qualified to the extent specified, and that the installing personnel are fully informed as to procedures to be followed.

C. During installation, verify that materials are installed in strict accordance with the manufacturers' recommendations as approved by the Engineer.

D. When so directed by the Engineer, make test cuts to verify conformance with the specified requirements.

3.8 WAIVER OF INSPECTION AND/OR TESTS

A. Specified inspections and/or tests may be waived only by the specific approval of the Engineer, and such waivers will be expected to result in credit to the Owner equal to normal cost of such inspection and/or test.

PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

A. No measurement will be made for testing laboratory services.

B. Include within the Contract Sum an amount sufficient to cover all testing and inspecting required under this Section of these Specifications, and to cover all testing and inspecting required by governmental agencies having jurisdiction.

C. The Owner will pay for all testing and inspecting specifically requested by the Engineer over and above those described in Paragraph 2.1-A above.

D. When initial tests requested by the Engineer indicate non-compliance with the Contract Documents, costs of initial tests associated with that non-compliance will be deducted by the Owner from the Contract Sum, and subsequent retesting occasioned by the non-compliance shall be performed by the same testing laboratory and the costs thereof shall be paid by the Contractor.

SECTION 01510

TEMPORARY FACILITIES

PART I - GENERAL

1.1 DESCRIPTION

A. Work included: Provide temporary facilities and controls needed for the Work, including but not necessarily limited to:

1. Temporary utilities such as heat, water, electricity, and telephone;
2. Field office for the Engineer's personnel;
3. Sanitary facilities;
4. Enclosures such as tarpaulins, barricades, and canopies;
5. Temporary fencing of the construction site.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division I of these Specifications.
2. Except that equipment furnished by subcontractors shall comply with requirements of pertinent safety regulations, such equipment normally furnished by the individual trades in execution of their own portions of the Work are not part of this Section.
3. Permanent installation and hookup of the various utility lines are described in other Sections.

C. The Contractor shall maintain access for deliveries of supplies and equipment, operators' vehicles and maintenance equipment to the wastewater treatment plant. The Contractor shall include in his Bid all expenses necessary to maintain this access from start to completion of this project.

D These procedures are included only as a guide and do not relieve the Contractor from any costs necessary to provide and maintain any or all temporary facilities, labor or equipment necessary to maintain plant operation during the construction period. With the approval of the Engineer, the Contractor may use other procedures than those set forth herein.

1.2 TEMPORARY UTILITIES

A. Water:

1. Provide necessary temporary piping and water supply and, upon completion of the Work, remove such temporary facilities.
2. Provide and pay for water used in construction.

B. Electricity:

1 Provide necessary temporary wiring and, upon completion of the Work, remove such temporary facility.
2. Provide area distribution boxes so located that the individual trades may furnish and use 100 ft. maximum length extension cords to obtain power and lighting at points where needed for work, inspection, and safety.
3. Provide and pay for electricity used in construction.

C. Heating: Provide and maintain heat necessary for proper conduct of operations needed in the Work.

D. Telephone:

1. Make necessary arrangements and pay costs for installation and operation of telephone service to the Engineer's office at the site.

E. Field Office: The Contractor shall provide a field office for the use of and to be located as directed by the Engineer. The building or trailer furnished for a field office shall meet the following requirements:

1. Minimum dimensions shall be: 8-foot width, 7-foot height with a minimum area of 120 square feet.
2. There shall be at least two operable windows.
3. There shall be at least one door. Doors shall have satisfactory lock.
4. Doors and windows shall be provided with satisfactory screens.
5. It shall be provided with satisfactory lighting, heating and air conditioning equipment.
6. It shall contain a built-in work table with a tilt-top suitable for drafting purposes and at least two drawers, one of which shall be provided with a lock.
7. A telephone shall be provided.
8. Suitable toilet facilities shall be provided.
9. One class 1-A or higher rated fire extinguisher shall be provided and shall be conspicuously located where it will be readily accessible and immediately available.

1.3 ENCLOSURES

A. Provide and maintain for the duration of construction all scaffolds, tarpaulins, canopies, warning signs, steps, platforms, bridges, and other temporary construction necessary for proper completion of the Work in compliance with pertinent safety and other regulations.

1.4 TEMPORARY FENCING

A. Provide and maintain, as necessary, for the duration of construction temporary fencing of design and type needed to prevent entry onto the Work by the public.

1.5 MAINTENANCE AND REMOVAL

A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the Work.

B. Remove such temporary facilities and controls as rapidly as progress of the Work will permit, or as directed by the Engineer.

C. Material and equipment which will become a permanent part of the treatment facilities shall be installed in strict accordance with the plans and applicable sections of this project manual.

1.6 ACCESS

A. The Contractor shall construct temporary drives as necessary to provide access to existing facilities. Temporary drives shall be capable of passage of fully loaded semi-trailers without assistance from other vehicles. Said drives shall be maintained by the Contractor.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01519

TEMPORARY CONSTRUCTION

PART I - GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE:

A. Summary of the Work: Section 01010.

B. Cutting and Patching: Section 01045.

C. Temporary Facilities: Section 01510.

D. Earthwork: Section 02200.

E. Trenching, Backfilling and Embankments: Section 02221.

1.2 DESCRIPTION:

A. The work under this Section includes but is not limited to the following:

1. Compacted granular material excavation covering; and
2. Asphalt concrete binder excavation covering.

1.3 RESPONSIBILITY:

A. The CONTRACTOR is responsible for backfilling all trenches and excavation immediately after the structures are built therein, unless otherwise specified.

B. Trenches and excavation shall be maintained by the CONTRACTOR until settlement has ceased and the disturbed area remains level with the adjacent area.

C. In all disturbed roadway, driveway and/or parking areas, the CONTRACTOR shall maintain a relatively smooth surface for traffic until the disturbed areas are ready for permanent resurfacing.

PART 2 - PRODUCTS

2.1 GRANULAR MATERIAL:

A. Granular material shall conform to Type 53 as defined by the Indiana State Highway Standard specifications.

2.2 BITUMINOUS BINDER:

A. Bituminous binder shall be hot asphalt concrete binder using coarse aggregate size no. 9 complying with Articles 403.02, 403.03 and 403.04 of the Indiana State Highway

Standard Specifications and associated Articles referred to therein.

PART 3 - EXECUTION

3.1 Unless otherwise specified, the CONTRACTOR shall use compacted granular material to maintain a relatively smooth surface for traffic.

3.2 If specifically specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall apply a temporary bituminous surface to disturbed areas of roads as follows:

A. Apply three (3) inches of bituminous binder over the backfilled areas to provide a relatively smooth, temporary surface for traffic.

B. After consolidation of the backfill and after recommendation by the ENGINEER, temporary pavement shall be removed and all disturbed areas shall be permanently resurfaced to match and blend with the grade and alignment of the original pavement.

PART 4 - PAYMENT

4.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01620

PRODUCT DELIVERY, STORAGE & PROTECTION

PART I - GENERAL

1.1 APPLICABILITY

A. This Section applies to all products furnished under this Agreement. Shipments of equipment or materials to be used by the Contractor or its subcontractors shall be delivered to the site only during regular working hours. All shipping papers and shipments shall be addressed and consigned to the Contractor giving the name of the Project with address. Under no circumstances will Owner accept shipments directed to it or the Engineer unless otherwise specified.

1.2 DELIVERY

A. Products shall not be delivered to the Owner or the Engineer.

B. Products shall not be delivered to the project site until related shop drawings have been reviewed by the Engineer.

C. Products shall not be delivered to the project site until appropriate storage facilities are in place.

D. Products shall be delivered to the site in manufacturer's original, unopened, labeled containers.

E. The Contractor shall not drop, roll or skid products off delivery vehicles. Hand carry or use suitable materials-handling equipment.

F. The Contractor is responsible for receiving, unloading, freight and demurrage of products.

1.3 STORAGE AND PROTECTION

A. General:

1. The Contractor shall store and protect products in accordance with the manufacturer's recommendations and the requirements specified herein. No on-site existing storage facilities are available for use by the Contractor. All on-site facilities for storage shall be furnished by the Contractor.
2. The Contractor shall not block or restrict the use of public right-of-way, access roads or private property with stored materials.

3. The Contractor shall not store products where they will interfere with operations of the Owner or other contractors.
4. The Contractor shall protect all products from damage or deterioration by weather.
5. The Contractor shall not store any products directly on the ground.
6. The Contractor shall not store any products in drainage ditches or areas where water may stand.
7. The Contractor shall label containers to identify materials inside using the terminology found in these Specifications.

B. Uncovered Storage:

1. The following types of materials may be stored out of doors without cover:
   a. Masonry units
   b. Reinforcing steel
   c. Piping
   d. Precast concrete items
   e. Castings

2. The above mentioned materials shall be stored on wood blocking.

C. Covered Storage:

1. The following types of materials may be stored out of doors if covered with material impervious to water: Rough Lumber
2. The Contractor shall tie down covers with rope and slope to prevent accumulation of water on covers.
3. The Contractor shall store materials on wood blocking.

D. Fully Protected Storage:

1. The Contractor shall store all products not named above in buildings or trailers which have a concrete or wooden floor, a roof; and fully enclosed walls on all sides.
2. The Contractor shall provide heated storage space for materials which would be damaged by freezing.
3. The Contractor shall protect mechanical and electrical equipment from being contaminated by dust and dirt.
4. The Contractor shall maintain temperature and humidity at levels recommended by manufacturer(s) for electrical and electronic equipment.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01630

SUBSTITUTIONS AND PRODUCT OPTIONS

PART I - GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Schedule of Values: Section 01370.

B. Shop Drawings, Product Data and Samples: Section 01340.

C. Product Delivery, Storage & Protection: Section 01620.

1.2 PRODUCTS LIST

A. Within thirty (30) days after the effective date of the Agreement, the Contractor shall submit to the Engineer a complete list of the products and their manufacturers which it proposes for the Work. Whenever the Contractor is required to submit a manufacturer's list with its bid, or prior to the effective date of the Agreement, the remaining products and their manufacturers must be submitted within the 30-day period.

B. For each product, the list shall indicate the Section of the Contract Documents which requires the product.

1.3 SUBSTITUTION PROCEDURE

A. The Contractor's application for a substitution shall be supported by the following documentation:

1. For products consisting of materials or equipment, the Contractor shall submit:
   a. An itemized comparison of the proposed substitute with the product specified;
   b. Product identification, including the manufacturer's name and address, the trade name of the product, and the model or catalog designation;
   c. Manufacturer's literature for the product including:
      i. Product description, including but not limited to dimensions, weights and utility requirements;
      ii. Performance and test data; and
      iii. Associated ASTM standards as appropriate.
   d. Samples, as appropriate; and
   e. The name and address of similar projects on which the product was used, and the date of installation.
2. In addition, for systems, the Contractor shall submit:
   a. A detailed description of the proposed system; and
   b. Drawings illustrating the system.

3. Each substitution submittal shall bear the Contractor's stamp, initialed or signed; certifying that the Contractor has reviewed the submittal for compliance with this Section and paragraphs 6.7.1 and 6.7.3 of the General Conditions.

B. The Owner may require the Contractor to bear all costs incurred as a result of the submission of the substitution and, if approved, the use of the substitution. These costs include, but are not limited to: costs incurred by other contractors, redesign costs, application costs, permit costs, license and use fees, and royalties.

C. The Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Engineer in considering a substitution proposed by the Contractor or by reason of the failure of the Engineer to approve a substitution proposed by the Contractor.

D. Substitutions will not be allowed if they are indicated or implied on shop drawing submittals or project data submittals without a proper formal request.

1.4 DEFINITIONS

A. For purposes of this Section: "Product" means materials or equipment, or a system.

PART 2 - PAYMENT

2.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01710

CLEANING

PART I - GENERAL

1.1 DESCRIPTION

A. Work included: Throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this Section.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. In addition to standards described in this Section, comply with requirements for cleaning as described in pertinent other Sections of these Specifications.

1.2 QUALITY ASSURANCE

A. Conduct daily inspection, and more often if necessary, to verify that requirements for cleanliness are being met.

B. In addition to the standards described in this Section, comply with pertinent requirements of governmental agencies having jurisdiction.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS AND EQUIPMENT

A. Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.2 COMPATIBILITY

A. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

A. General:

1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

B. Site:
1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Restack, tidy, or otherwise service arrangements to meet the requirements of subparagraph 3.1-A-1 above.
3. Maintain the site in a neat and orderly condition at all times.

C. Structures:
1. Weekly, and more often if necessary, inspect the structures and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
2. Weekly, and more often if necessary, sweep interior spaces clean.
   a. "Clean," for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.
3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.
4. Following the installation of finish floor materials, clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials are installed. "Clean," for the purpose of this subparagraph, shall be interpreted as meaning free from foreign material which, in the opinion of the Engineer, may be injurious to the finish floor material.

3.2 FINAL CLEANING

A. "Clean" for the purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.

B. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.1 above.

C. Site:
   1. Unless otherwise specifically directed by the Engineer, broom clean paved areas on the site and public paved areas adjacent to the site.
   2. Completely remove resultant debris.

D. Structures:
   1. Exterior:
      a. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
      b. Remove all traces of splashed materials from adjacent surfaces.
      c. If necessary to achieve a uniform degree of cleanliness, hose down the exterior of the structure.
      d. In the event of stubborn stains not removable with water, the Engineer may require light sandblasting or other cleaning at no additional cost to the Owner.
   2. Interior:
      a. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
      b. Remove all traces of splashed material from adjacent surfaces.
      c. Remove paint droppings, spots, stains, and dirt from finished surfaces.
   3. Glass: Clean inside and outside.
   4. Polished surfaces: To surfaces requiring routine application of buffed polish, apply the polish recommended by the manufacturer of the material being polished.

E. Schedule final cleaning as approved by the Engineer to enable the Owner to accept a completely clean Work.

3.3 CLEANING DURING OWNER'S OCCUPANCY

A. Should the Owner occupy the Work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final

cleaning shall be as determined by the Engineer in accordance with the General Conditions of the Contract.

PART 4 - PAYMENT

4.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 01720

PROJECT RECORD DOCUMENTS

PART I - GENERAL

1.1 DESCRIPTION

A. Work included:

1. Throughout progress of the Work, maintain an accurate record of changes in the Contract Documents, as described in Article 3.1 below.
2. Upon completion of the Work, transfer the recorded changes to a set of Record Documents, as described in Article 3.2 below.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Other requirements affecting Project Record Documents may appear in pertinent other Sections of these Specifications.

1.2 QUALITY ASSURANCE

A. Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff as approved by the Engineer.

B. Accuracy of records:

1. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
2. Accuracy of records shall be such that future search for items shown in the Contract Documents may rely reasonably on information obtained from the approved Project Record Documents.

C. Make entries within 24 hours after receipt of information that the change has occurred.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. The Engineer's approval of the current status of Project Record Documents may be a prerequisite to the Engineer's approval of requests for progress payment and request for final payment under the Contract.

C. Prior to submitting each request for progress payment, secure the Engineer's approval of the current status of the Project Record Documents.

D. Prior to submitting request for final payment, submit the final Project Record Documents to the Engineer and secure his approval.

1.4 PRODUCT HANDLING

A. Maintain the job set of Record Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer of all recorded data to the final Project Record Documents.

B. In the event of loss of recorded data, use means necessary to again secure the data to the Engineer's approval.
   1. Such means shall include, if necessary in the opinion of the Engineer, removal and replacement of concealing materials.
   2. In such case, provide replacements to the standards originally required by the Contract Documents.

PART 2 - PRODUCTS

2.1 RECORD DOCUMENTS

A. Job set: Promptly following receipt of the Owner's Notice to Proceed, secure from the Engineer at no charge to the Contractor one complete set of all Documents comprising the Contract.

B. Final Record Documents: At a time nearing the completion of the Work, secure from the Engineer at no charge to the Contractor one complete set of sepia transparencies of all Drawings in the Contract.

PART 3 - EXECUTION

3.1 MAINTENANCE OF JOB SET

A. Immediately upon receipt of the job set described in Paragraph 2.1-A above, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET."

B. Preservation:

1. Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set to the approval of the Engineer.
2. Do not use the job set for any purpose except entry of new data and for review by the Engineer, until start of transfer of data to final Project Record Documents.
3. Maintain the job set at the site of Work as that site is designated by the Engineer.

C. Making entries on Drawings:

1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required.
2. Date all entries.
3. Call attention to the entry by a "cloud" drawn around the area or areas affected.
4. In the event of overlapping changes, use different colors for the overlapping changes.

D. Make entries in the pertinent other Documents as approved by the Engineer.

E. Conversion of schematic layouts:

1. In some cases on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, is shown schematically and is not intended to portray precise physical layout.
   a. Final physical arrangement is determined by the Contractor, subject to the Engineer's approval.
   b. However, design of future modifications of the facility may require accurate information as to the final physical layout of items which are shown only schematically on the Drawings.
2. Show on the job set of Record Drawings, by dimension accurate to within one inch, the centerline of each run of items such as are described in subparagraph 3.1-E-1 above.
   a. Clearly identify the item by accurate note such as "cast iron drain," "galv. water," and the like.
   b. Show, by symbol or note, the vertical location of the item ("under slab," "in ceiling plenum," "exposed," and the like).

c. Make all identification sufficiently descriptive that it may be related reliably to the Specifications.

3. The Engineer may waive the requirements for conversion of schematic layouts where, in the Engineer's judgment, conversion serves no useful purpose. However, do not rely upon waivers being issued except as specifically issued in writing by the Engineer.

3.2 FINAL PROJECT RECORD DOCUMENTS

A. The purpose of the final Project Record Documents is to provide factual information regarding all aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.

B. Approval of recorded data prior to transfer:

1. Following receipt of the transparencies described in Paragraph 2.1-B above, and prior to start of transfer of recorded data thereto, secure the Engineer's approval of all recorded data.
2. Make required revisions.

C. Transfer of data to Drawings:

1. Carefully transfer change data shown on the job set of Record Drawings to the corresponding transparencies, coordinating the changes as required.
2. Clearly indicate at each affected detail and other Drawing a full description of changes made during construction, and the actual location of items described in subparagraph 3.1-E-1 above.
3. Call attention to each entry by drawing a "cloud" around the area or areas affected.
4. Make changes neatly, consistently, and with the proper media to assure longevity and clear reproduction.

D. Transfer of data to other Documents:

1. If the Documents other than Drawings have been kept clean during progress of the Work, and if entries thereon have been orderly to the approval of the Engineer, the job set of those Documents other than Drawings will be accepted as final Record Documents.
2. If any such Document is not so approved by the Engineer, secure a new copy of that Document from the Engineer at the Engineer's usual charge for reproduction and handling, and carefully transfer

the change data to the new copy to the approval of the Engineer.

E. Review and submittal:

1. Submit the completed set of Project Record Documents to the Engineer as described in Paragraph 1.3-D above.
2. Participate in review meetings as required.
3. Make required changes and promptly deliver the final Project Record Documents to the Engineer.

3.3 CHANGES SUBSEQUENT TO ACCEPTANCE

A. The Contractor has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.

PART 4 - PAYMENT

4.1 BASIS OF PAYMENT

A. There will be no separate payment work addressed in this section. The cost of this work is to be included by the Contractor in the total cost of the project.

DIVISION 2

SITEWORK

SECTION 02120

CLEARING AND GRUBBING

PART I - GENERAL INFORMATION

1.1 DESCRIPTION

A. This work shall consist of clearing, grubbing, removing, and disposing of all vegetation and debris within the limits of the right-of-way and the construction limits of this project except those objects that are designated to remain or are to be removed in accordance with other sections of these specifications. This work shall include the prevention of injury or defacement of all vegetation or other objects designated to remain.

PART 2 - CONSTRUCTION REQUIREMENTS

2.1 GENERAL

A. Right-of-way lines and construction lines will be established. Trees, shrubs, plants, and other things to remain will be designated and shall be preserved by the Contractor.

B. Any damage to natural terrain, vegetation, trees, shrubs, plants, or other objects, designated to remain shall be repaired with no additional payment. Tree wound dressing for cut or scarred surfaces of trees or shrubs shall be in accordance with Section 913.09 (c) of Indiana Department of Highways Specifications (1988 or latest edition).

C. Dressing for treating tree wounds or cuts shall be one of the following:
   1. An approved black asphaltum base antiseptic paint.
   2. An approved black paint consisting of Bordeaux Mixture, raw linseed oil, and lampblack.
   3. An approved black paint consisting of zinc oxide, raw linseed oil, and lampblack.

2.2 CLEARING AND GRUBBING

A. Surface objects, trees, stumps, roots, rocks, and other protruding objects not designated to remain shall be cleared and grubbed. Undisturbed sound stumps, roots, and nonperishable solid objects may be left provided that they are a minimum of three (3)feet below the subgrade or final grade on slopes and embankments. The Contractor shall not be permitted to bury cleared materials on the project site.

B. Burning of perishable materials shall be done only in accordance with local and state laws and ordinances.

C. Perishable materials and debris shall be removed from the project site and disposed of at locations off the site. Written permission shall be obtained from the property owner on whose property the materials and debris are to be placed. Materials and debris shall not be disposed of in low lying areas or wetlands.

PART 3 - PAYMENT

3.1 METHOD OF MEASUREMENT

A. There will be no measurement of clearing and grubbing.

3.2 BASIS OF PAYMENT

A. There will be no separate payment for clearing and grubbing. The cost of this work is to be included by the Contractor in the various other items of the contract.

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. Excavation, hauling, embankment construction and compaction not covered by other items. The construction shall be in accordance with the Specifications and in reasonably close conformance with the lines, grades, thickness, and typical cross sections shown on the Drawings or established by the Owner's Representative. All excavation will be classified as hereafter described.

1.2 CLASSIFICATION

A. Uniformity Coefficient: Used in this Specification as defined by ASTM D-2487-69.

B. Plasticity Index: Used in this Specification as defined by ASTM D-424.

C. Zone of Influence: Used in this Specification to delineate the boundaries of a soil mass beneath a soil supported element which contributes to the support of the element. The zone of influence is defined by imaginary lines extending outward and downward on a one (vertical) to one (horizontal) slope from a line five feet outside the base perimeter of the supported element.

D. Topsoil Excavation: Excavation of sandy loam, sandy clay loam or clay loam from within the slope-stake limits that is suitable for use as topsoil.

E. Unsuitable Material Excavation: Mass excavation of unsuitable materials from within the zone of influence that are not suitable for the support of foundations, floor slabs and other elements.

F. Common Excavation: All excavation not otherwise classified including existing flexible type pavement.

G. Rock Excavation: Rock excavation shall consist of igneous, metamorphic, and sedimentary rock which cannot be excavated without blasting; or the use of a modern power shovel of no less than one cubic yard capacity, properly used, having adequate power and in good running condition; or the use of other equivalent powered equipment. It shall also include all boulders or other detached stones each having a volume of 1/2 cubic yard or more.

H. Structural Fill: Approved borrow material required for backfilling and embankment construction within the zone of influence and meeting the specified material requirement.

I. General Fill: Approved material obtained from common excavation, unsuitable material excavation, and off-site borrow locations if necessary for backfilling and embankment construction in all areas not within the zone of influence and meeting the specified material requirements.

1.3 QUALITY ASSURANCE

A. Testing and inspection services to be provided by the Contractor. Tests shall include proof-rolling inspections, hand auger probing and penetrometer testing to verify the soil bearing pressures, field density tests for verifying the degree of compaction of backfill, and excavation inspections to determine the limits of unsuitable material to be removed.

1.4 REFERENCES

A. ASTM D-424 Plastic Limit and Plasticity Index of Soils.

B. ASTM D-1556 Density of Soil in Place by the Sand Cone Method.

C. ASTM D-1557 Moisture - Density Relations of Soils Using 10-lb. Rammer and 18-inch Drop.

D. ASTM D-2167 Density of Soil in Place by the Rubber Balloon Method.

E. ASTM D-2922 Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

F. ASTM D-3017 Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

G. Indiana Department of Transportation (INDOT) Publication: Standard Specifications dated 1993.

PART 2 - MATERIALS

2.1 FILL

Except as otherwise noted herein, the following materials shall be provided as specified in this section.

A. Structural backfill material shall be:

1. Sand and gravel or crushed stone with two (2) inch maximum particle size and containing no more than eight (8) percent by weight passing a no. 200 sieve.
2. In addition, the uniformity coefficient shall be greater than four (4).
3. The liquid limit shall not be greater than 25 and the plasticity index not more than 6.

B. General fill material is defined as a soil material which conforms to the following:

1. Contains no more than five (5) percent organic material and is free of trash, rubble, or other man-made objects.

2. Contains no particles larger than four (4) inches.

3. The plasticity index of the fraction passing the No. 40 sieve is not more than 25.

C. "B" borrow shall be clean granular material complying with Article 211.02 of the INDOT Standard Specifications.

PART 3 - EXECUTION

3.1 DEWATERING

A. Where the excavation extends below the groundwater table, the Contractor shall provide, operate and maintain dewatering equipment necessary to maintain a dry excavation unless otherwise allowed by the Engineer. The dewatering method shall be activated to lower the water level below the established excavation level before the excavation reaches that level. The dewatering method shall not disturb the density of the subgrade soils. Dewatering shall be continued until all work below the groundwater table is completed and it is assured that the cessation of dewatering will have no detrimental effect on any aspect of the project or until upon the written request of the Contractor, the Engineer gives written consent to cease dewatering operations. Dewatering shall then be discontinued gradually at a rate not to exceed 25 percent of the pumping capacity every three days or equivalent until all dewatering has ceased unless otherwise allowed in writing by the Engineer.

3.2 GENERAL

A. Excavations and embankments shall be finished to reasonably smooth and uniform surfaces. No materials shall be wasted without permission. Excavation

operations shall be conducted so that material outside the limits of slopes will not be disturbed. Prior to beginning excavation, grading, and embankment operations in any area, all necessary clearing and grubbing in that area shall have been performed in accordance with Section 02120 of these Specifications.

1. All spongy and yielding material which will not readily compact when approximately dry, and all vegetation shall be removed from within slope-stake limits and to such depths as ordered. None of this removed material shall be used in embankments.

B. The embankments shall be kept well drained at all times by keeping the center higher than the sides and uniformly graded. If necessary, temporary drainage ditches shall be provided as directed.

3.3 EXCAVATION

A. Sufficient quantities of available excavation suitable for the growth of vegetation shall be preserved from within the planned excavation area and used for the encasement of all slopes that are to be mulch seeded or sodded and as required in planting beds.

B. Excavation slopes shall be maintained in a stable condition at all times and shall not be steeper than 1.5 horizontal level to 1 vertical unless proper precautions, as stipulated by OSHA, are taken.

C. The base of the excavation will be inspected by the Engineer to determine the actual extent of the excavation. The base of the excavation shall be protected against any damage which affects the strength and compressibility characteristics of the exposed soil. Factors which may damage the exposed excavation are freezing, groundwater seepage inflow, equipment traffic, etc.

D. The Contractor shall excavate rock, if encountered, to the lines and grades indicated on the drawings or as directed, shall dispose of the excavated material, and shall furnish acceptable material for backfill in place of the excavated rock. Rock excavation shall be in accordance with Article 203.15 of the INDOT Standard Specifications.

E. Surplus common excavation material shall be disposed of at locations as shown on the Drawings or as directed by the Owner's Representative.

F. Excavated rock shall be disposed off the site limits unless otherwise directed by the Engineer.

3.4 BLASTING

A. Only experienced, skillful and trustworthy workmen shall be employed in the handling and use of explosives, or have access thereto. All blasting operations shall be conducted in strict accordance with existing ordinances, regulations and specifications relative to rock blasting and the storage and use of explosives.

B. The Contractor shall keep explosives on the site only in such quantity as may be needed for the work under way and only during such time as they are being used. He shall notify the Engineer, in advance, of his intention to store and use explosives. Explosives shall be stored in a secure manner and separate from all tools. Caps or detonators shall be safely stored at a point over 100 feet distant from the explosives. When the need for explosives has ended, all such materials remaining on the site shall be promptly removed from the premises.

C. In addition to observing all municipal ordinances and state and federal laws relating to the transportation, storage, handling, and use of explosives, the Contractor shall conform to any further regulations which the Engineer may think necessary in this respect. In the event that any of the above mentioned laws, ordinances, or regulations require a licensed blaster to perform or supervise the work of blasting, said licensed blaster shall, at all times, have his license on the work and shall permit examination thereof by the Engineer or other officials having jurisdiction.

D. All operations involving explosives shall be conducted with all possible care to avoid injury to persons and property.

3.5 EMBANKMENT AND COMPACTION

A. Embankments and berms shall be constructed true to within 0.1 foot of the lines and grades shown or specified. Embankments and berms shall be constructed using suitable job-excavated material.

B. Embankment construction shall consist of constructing all embankments, including preparation of the areas upon which they are to be placed; the placing and compacting of approved material within embankment areas; and the placing and compacting of embankment material in holes, pits, and other depressions within the embankment area. Only approved materials shall be used in the construction of embankment backfill.

C. After the embankment area has been cleared and before embankment is placed, all pronounced depressions left in the original ground surface by removal of objectionable material from within embankment limits shall be refilled with suitable material well compacted to the same density as required for the above embankment. The upper 6 inches of the original ground shall be compacted with a 3-wheel roller weighing no less than 10 tons, or with other approved compacting equipment to the same density as required for the above embankment, unless otherwise directed by the Engineer.

D. Before embankment is placed on hillsides or slopes flatter than a 4:1, the existing ground surface shall be plowed or deeply scarified. On slopes 4:1 and steeper, benches shall be cut in the original ground surface before embankment construction is started. The benches shall have typical dimensions of approximately five to ten feet horizontally and a vertical rise as determined by the slope.

E. Frozen materials, stumps, roots, all or parts of trees, brush, weeds, or other perishable materials shall not be placed in any embankment. Stones greater than 4 inches in any dimension shall not be left within 6 inches of the finished subgrade. The original ground surface or the surface of any lift in place shall not be frozen and shall be free from objectionable quantities of snow, ice, or mud.

F. Each embankment lift shall extend transversely over the entire area and shall be kept smooth. If a dragline or similar equipment deposits material in large unit masses onto embankment, the material so cast shall be moved from its place of deposit and spread out in layers as specified herein for uniform lifts.

G. The embankment material shall be placed in uniform level layers, left properly shaped as set out above, and compacted with approved compacting equipment.

H. Each lift shall be disked or treated by some other mechanical means which will insure the breaking up of any existing lumps and clods.

I. The loose depth of each lift shall be such that the required compaction can be obtained, but in no case shall it exceed 8 inches. Where a tamping roller is used, the loose depth of lift shall not exceed the length of the tamper feet. The surface area of the end of each foot of the tamping roller shall be no less than 5 1/2 square inches.

J. When the material is so granular in nature it is impracticable to make compaction tests the Contractor

may, if approved by the Engineer, compact such material with crawler-tread equipment which has a bearing of at least 6 pounds per square inch of tread, or with approved vibratory equipment, or both. The material shall be placed in lifts not to exceed 6 inches, loose measurement, and each lift compacted thoroughly by successive trips back and forth with the tread areas overlapping enough on each trip so that all portions will be compacted uniformly.

K. In, places inaccessible to the above compacting equipment the required compaction shall be obtained with approved mechanical tamps or vibrators, in which case the depth of lifts, loose measurement shall not exceed 6 inches.

L. If the embankment material is too wet and the compaction is not satisfactory, the material shall be aerated to remove excess moisture. Excess moisture shall be that which is above optimum moisture except for silts and loessial type soils, in which case it shall be that which is above optimum moisture minus one percentage point. When the material is too wet, the Contractor shall make sufficient moisture tests to determine the amount of excess moisture to be removed by aeration and to further determine that the excess moisture has been removed. In addition to the density requirements set out herein, all embankments shall be constructed satisfactorily.

M. Only structural backfill material shall be used beneath footings, floor slabs and other foundation and shall extend outward away from the base of the foundation element at a 1:1 slope. Structural backfill material shall be placed adjacent to all structural walls for a minimum horizontal distance of two feet from the exterior of the wall. Structural backfill material shall be placed adjacent to walls to an elevation eighteen inches below finished grade. Structural backfill material shall be placed to a minimum depth of twelve inches beneath footings, floor slabs and other foundation elements.

N. General fill material can be used in areas not defined in Item L., above, unless otherwise noted on the drawings.

O. No fill shall be placed against any structure until placed concrete has been allowed to cure for at least 3 days. Backfill shall be placed in such a manner that the structure will not be damaged by shock from falling earth. Special precautions shall be taken to prevent wedging action of filling material against structures. Heavy equipment for spreading and compacting shall not operate closer to foundation walls than set forth as follows:

1. Fill placed adjacent to vertical or near vertical walls (within a zone defined by imaginary lines

extending horizontally away from the base of the wall for a distance of 3 feet and thence upward and outward on a 1 to 1 slope to the elevation of the top of the wall) shall be compacted to the specified density with light equipment not exceeding 1500 pounds in static weight or dynamic rated impact.

P. All fill material shall be an approved material starting on an approved subgrade. Each lift shall be compacted to a dry density not less than the following percentage of maximum dry density determined by the Modified Proctor Test (ASTM D-1557):

Usage	Compaction %
General fill embankment or berm	95
Beneath footings, foundation slabs (limit based upon 5 feet from footing or foundation slab and extruding outward at a 45 degree angle to natural ground surface)	97
Beneath piping	95
Upper 2 feet of subgrade beneath pavements	95
Upper haunches and up to springline of pipe	95
General site fill, beneath sidewalks and pavements (except upper 2 feet of subgrade)	92
Adjacent to and over piping	90
Adjacent to (or behind) vertical walls	90
Landscaping fill	85

Q. Traffic over the work during construction of embankments shall, as far as practicable, be distributed to cover the maximum areas of the surface of each layer.

3.6 PROTECTION AND MAINTENANCE

A. General: Protect newly graded areas from the actions of the elements. Any settlement or washing that occurs prior to acceptance of the work, shall be repaired, and grades reestablished to the required elevations and slopes. Fill to required subgrade levels in areas where settlement occurs.

B. Maintain all of the work of this section as needed until the work has been accepted by the Owner.

C. It shall be the Contractor's responsibility to comply with all state and local erosion control ordinances and the requirements set out in these specifications.

D. At the completion of the project all areas outside the work limits, disturbed by the Contractor during the execution of his work, shall be returned to as near its original condition as possible.

3.7 COMPACTION TESTING

A. Sampling and testing shall be the responsibility of the Contractor and he performed at no additional cost to the Owner. Tests shall be performed by an approved commercial testing laboratory or may be tested with approved facilities furnished by the Contractor. Testing services shall comply with the requirements of Section 01410.

B. Laboratory tests for moisture-density relations shall be determined in accordance with ASTM D-1557. A minimum of one test shall be performed on each different type of material used for backfill.

C. Field In-Place Density Tests:

1. Shall be performed in sufficient numbers to ensure that the specified compaction is being obtained. A minimum of one test per lift of backfill for every 3000 square feet of pavement or structure area, but not less than one test per lift for each structure, shall be performed. Locations for performing the density tests will be designated by the Engineer.

2. Shall be determined in accordance with ASTM D-1556, ASTM D-2167 or ASTM D-2922. When ASTM D-2922 is used, the calibration curves shall be checked and adjusted using only the sand cone method as per ASTM D-1556. ASTM D-2922 results in a wet unit weight of soil and when using this method, ASTM D-3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gages shall be checked along with density calibration checks as described in ASTM D-3017. The calibration checks of both the density and moisture gages shall be made at the beginning of a job, on each different type of material encountered and at intervals as directed by the Engineer. Copies of calibration curves and results of calibration tests shall be furnished to the Engineer.

D. All test results shall be submitted to the Engineer as per the requirements of Section 01410.

E. Embankment improperly compacted shall be excavated to the depth directed by the Owner's Representative and then refilled and compacted to the density specified at no additional cost to the owner. Field in-place density tests shall also be repeated for improperly compacted embankments that are excavated, refilled and recompacted at no addition cost to the Owner. A minimum of one repeat test per lift of backfill in accordance with paragraph 3.7.C.1 of this Section shall be performed.

PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT

A. There will be no measurement of earthwork.

4.2 BASIS OF PAYMENT

A. There will be no separate payment for earthwork. The cost of topsoil stripping, excavating, transporting, placing and compacting embankment material shall be included in the lump sum Contract Items and no separate payment will be made thereof.

SECTION 02244

FINISHING DITCHES AND SLOPES

PART I - GENERAL INFORMATION

1.1 DESCRIPTION

A. This work shall consist of the final shaping and dressing of ditches and slopes by hand or by machine methods, or both, to the required smoothness in accordance with these specifications and in close conformance with the elevations, grades, typical cross sections, and cross sections shown on the plans or on the construction standards.

PART 2 - PRODUCTS

2.1 FINISHING DITCHES

A. Ditches shall be finished to the lines and grades shown on the plans, typical cross sections and cross sections or as otherwise directed by the Engineer. The edges shall be parallel to the pavement unless it is necessary to have the ditch gradient different from that of the pavement in order to obtain proper drainage.

2.2 FINISHING SLOPES

A. All cut and fill slopes shall be constructed to the typical cross sections and cross sections shown on the plans or to revised sections where cuts are widened to obtain additional material or fills widened to utilize excess. Cut and fill slopes shall be finished to the degree ordinarily obtained by a blade grader, scraper, or hand shovel.

PART 3 - PAYMENT

3.1 METHOD OF MEASUREMENT

A. Finishing of ditches and slopes will not be measured.

3.2 BASIS OF PAYMENT

A. There will be no separate payment for finishing of ditches and slopes. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 02246

GROUND PREPARATION FOR WETLAND PLANTING

PART I - GENERAL INFORMATION

1.1 DESCRIPTION

A. This work shall consist of the preparation of the wetland areas after clearing and grubbing has been performed. This work shall include stockpiling of topsoil from the site, excavation, soil modification if necessary, re-introduction of the stockpiled topsoil and preparation of the planting bed.

PART 2 - PRODUCTS

2.1 MATERIAL REQUIREMENTS

A. Materials shall be in accordance with the following:

1. **SUBSTRATE SOIL** shall consist of a clay loam which has a clay content of 27-35 percent and a permeability of 0.20 inches per hour or less. Commercial bentonite may be added to the soil mixture if needed to meet the percent clay or permeability standards.

2. **TOPSOIL** shall consist of loose friable soil, free of refuse, stumps and large roots, rocks over 2 inches in diameter, brush, weeds, or other material which would be detrimental to the proper development of vegetative growth.

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 OVEREXCAVATION

A. The wetland planting areas will be over-excavated and lined with six inches of an approved low permeability substrate soil if the native soil does not meet the requirements for substrate soil. The stockpiled topsoil will then be backfilled over the substrate soil.

3.2 FINAL GRADING

A. The final grade in the bottom of the wetland will be left somewhat irregular to maximize the microhabitat diversity. Areas to be covered with topsoil shall be

tilled to a depth of 2-3 inches. This loosening is to assure bond of the topsoil with the surface on which it is put. The topsoil shall then be spread to a sufficient depth to produce a layer 6-7 inches thick after it has been spread evenly. The final grades after topsoil spreading shall correspond to the plans within a tolerance of ± 0.25 feet. After the topsoil has been placed, the top surface of the soil shall be loosened to a depth of 6 inches. In areas where the above method of preparation is impracticable, a different method may be approved.

PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT

A. Ground preparation for wetland planting areas will not be measured.

4.2 BASIS OF PAYMENT

A. There will be no separate payment for ground preparation for wetland planting areas. The cost of this work is to be included by the Contractor in the total cost of the project.

SECTION 02250

EROSION CONTROL

PART I - GENERAL INFORMATION

1.1 DESCRIPTION

A. Erosion control is required for all work. Soil erosion control consists of mechanical and vegetative type measures taken by the Contractor to prevent erosion of soil during the construction process. It shall be the responsibility of the Contractor during construction to prevent such detrimental soil erosion from occurring during the prosecution of the work.

B. All erosion control measures are to be considered only temporary and will not substitue for subsequent landscaping, final seeding or other plantings.

C. The Contractor shall be responsible to comply with all aspects of 327 IAC 15-5, Rule 5, "Storm Water Run-Off Associated with Construction Activity". The Contractor shall submit all necessary fees and documents to the Indiana Department of environmental Management (IDEM) prior to any construction activity. The Contractor shall be responsible for compliance with this Law throughout the construction period and shall pay any and all fines resulting from any violation, suit or penalty for non-compliance.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

A. Clearing and Grubbing: Section 02120.

B. Excavation: Section 02220.

C. Backfill, Fills and Embankments: Section 02221.

D. Finishing, Shoulders, Ditches and Slopes: Section 02244.

E. Seeding: Section 02820.

1.3 GENERAL

A. The soil erosion control measures may include grading only those areas going into immediate construction, as opposed to grading the entire site. On large tracts of land, to avoid leaving a large area bare and unprotected, units of workable size shall be graded one at a time-as construction is completed on one unit, grading proceeds to the next.

approved materials. Netting should be coarse, open-mesh, web-like material.

C. Where hydroseeding is used instead of seed and straw mulch, the Contractor shall provide means of holding the seed and mulch mixture in place until the permanent vegetation has been established.

3.2 SEASON LIMITATIONS FOR VEGETATION

A. November 1 thru February 28

Major land grading during this period should be curtailed. If construction must be done during this period, then temporary debris and sediment basins, mulches, temporary seeding should be applied to trap and control runoff.

B. March 1 thru April 15

Soil exposed during this time period shall have a temporary seeding of 30 pounds per acre of annual ryegrass or 1-1/2 bushel per acre of seed oats to hold soil until permanent seeding can be applied.

C. April 15 thru June 1

If construction is not complete and ready for permanent vegetation mixture, then exposed soil areas during this time period should be temporarily seeded with 1-1/2 bushel per acre of seed oats.

D. June 1 thru August 15

Construction during this time period should be temporarily seeded to 30 pounds per acre of annual ryegrass or 1-1/2 bushel of seed oats to hold the soil until the permanent seeding season.

E. August 15 thru September 15

The ideal seeding period for most permanent vegetation occurs during this time period. All areas not previously seeded to permanent vegetation shall be done during this time period. Also, all areas where permanent vegetation seedings have failed will be reseeded and mulched during this time period. Permanent seeding should replace all temporary seeding during this time period.

F. September 15 thru November 1

Permanent seeding during this time may have questionable success, depending upon seasonal temperatures and precipitation. Permanent seeding mixtures may be tried during this time period, however, a nurse crop must be

applied along with the permanent seed mixture. The nurse crop shall consist of 1 1/2 bushels per acre of wheat or rye.

PART 4 - PAYMENT

4.1 BASIS OF PAYMENT

A. No measurement will be made for Soil Erosion Control measures required in this specification. Measurement will be made of materials for compliance to the specification only. There will be no payment for Soil Erosion Control measures taken by the Contractor. Payment for erosion control is considered incidental, and the Contractor shall include such costs in the other items of this contract.

SECTION 02411

STEEL SHEETING

PART I - GENERAL INFORMATION

1.1 DESCRIPTION

A. This work shall include materials and installation of steel sheet piling in accordance with these specifications and in conformance with the Drawings (plans), cross sectons, typical cross sectons and construction standards, unless otherwise directed by the engineer.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.

C. Comply with requirements of all governmental agencies having jurisdiction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel sheet piling used in weir construction shall be Sections PZ27 as manufactured by Bethleham Steel or equal.

B. Sheet piling shall be manufactured with the following physical characterisfics:

1. Material - Steel, ASTM-A328.
2. Finish width - 1.5' per sheet.
3. Thickness - 0.375 in.
4. Depth - 12 in.
5. Weight - 27 lbs. per sq. foot.
5. Section Modulus - 30.2 cubic inches per foot.
6. Moment of Inertia - 276.3 $in.^4$

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 CONSTRUCTION REQUIREMENTS

A. Steel sheet piling installation shall be in accordance with the manufacturer's recommendations.

PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT

A. Steel sheet piling will be measured on a square foot basis for the size, type, and gauge indicated on the plans or construction standards. Measurement will be made of the sheet piling in place only.

4.2 BASIS OF PAYMENT

A. There will be no separate payment for sheet piling. The cost of this work is to be included in the total cost of the contract.

SECTION 02545

GEOTEXTILE FABRIC CONSTRUCTION

PART I - GENERAL INFORMATION

1.1 DESCRIPTION

A. Geotextile fabric construction shall consist of storage and handling, protection from sunlight, excavation, grading, preparation of the surface to receive the fabric, placement of the fabric, joining, overlapping, pinning, and all other incidentals needed to complete the work. Geotextile fabric construction shall be in accordance with this specification and in close conformance with the fines, grades, elevations, and materials shown on the drawings or further specified in the notes on the Drawings.

1.2 QUALITY ASSURANCE

A. The Contractor shall provide samples of the Geotextile Fabric to the Engineer and Owner before construction. Deliver sample and manufacturer's specifications for installation to Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Geotextile fabric shall consist of strong, rot resistant chemically stable long-chain synthetic polymer material dimensionally stable with distinct and measurable openings. The plastic or yarn fibers used in the geotextile shall consist of any longchain synthetic polymer composed of at least 85 percent by weight of polyefins, polyesters, or polyamides, and shall contain stabilizers and inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and heat exposure. The geotextile shall be calendared or otherwise finished so that the yams or fibers will retain their relative position with respect to each other.

B. For further information on the type and/or manufacturers nature of the geotextile fabric to be used on this project, see the Drawings or the Special Requirements.

C. Geotextile fabric shall meet the requirements specified in Section 912.18 (Geotextile for Use Under Riprap) of the Standard Specifications (1988) of the Indiana Department of Highways.

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 GEOTEXTILE STORAGE, PROTECTION AND HANDLING

A. Storage and handling of the geotextiles shall be in accordance with the manufacturer's recommendations, except that in no case shall the geotextile be exposed to direct sunlight ultraviolet rays, water, temperature greater than 140 degrees F, mud, dirt, dust and debris, to the extent that its strength, toughness or permeability are diminished. Each geotextile roll shall be labeled or tagged to provide product identification sufficient for inventory and quality control and quality assurance purposes. Exposure of geotextile fabrics to the elements between laydown and cover shall be a minimum of 14 days. At the time of installation, the geotextile shall be rejected and replaced with no additional payment if defects, rips, flaws, deterioration, or damage incurred during manufacture, transportation, storage or installation (construction) is evident.

3.2 GEOTEXTILE CONSTRUCTION

A. The surface to receive the geotextile fabric shall be prepared to a smooth condition free of obstruction, depressions and debris. The surface shall be excavated, graded and prepared to the lines, grades, and elevations shown on the Drawings and/or Construction Standards.

B. Geotextiles used along channels shall be placed with the machine direction of the geotextile parallel to the channel. Successive geotextile sheets shall be overlapped in such a manner that the upstream sheet is placed over the downstream sheet and the upslope sheet over the downslope sheet.

C. Geotextiles used for two to one slopes or greater shall be place with the machine direction of the geotextile sheets perpendicular to the toe of slope. The geotextile sheets shall be overlapped in the direction of the anticipated movement of the water.

D. Adjacent pieces of geotextile may be joined by sewing or by overlapping and pinning. The minimum overlap shall be 18 inches except when placed under water. When placed under water the overlap shall be a minimum of 3 feet. Securing pins shall be steel, 3/16 of an inch in diameter, 18 inches long, pointed at one end and fabricated with a head to retain a steel washer having an outside diameter of no less than 1.5 inches. Securing pins with washers shall be inserted through both strips of overlapped geotextile at spacing intervals as indicated in Table I below. Securing pins shall be along a fine through the midpoint of the overlap. The

geotextile strip shall be placed so that the lower strip will be overlapped by the next higher strip. Pins shall be driven until the washer bears against the geotextiles and secures it **firmly** to the ground.

TABLE I
SECURING PINS SPACING INTERVALS
FOR GEOTEXTILE FABRIC OVERLAP

Slope (Horizontal-Vertical)	Pin Spacing per Row (Center-Center)
steeper than 3:1	2 ft.
3:1 to 4:1	3 ft.
4:1 or flatter	5 ft.

Whether the fabric is joined by sewing or pinning, additional pins shall be installed as necessary to prevent any slippage of the fabric regardless of location.

E. The geotextile shall be placed in such a manner that placement of the overlaying materials will not excessively stretch or tear the geotextile and will not pull the required overlap or seam apart. Construction equipment will not be allowed on the exposed geotextile.

F. Placement of the riprap or stone shall start from the base of the slope, moving upslope from the center outward. Riprap shall not be allowed to roll downslope and the height drop for riprap shall be kept to less than one foot.

PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT

A. Geotextile fabric shall be measured on a square yard basis in place. No measurement will be made of the overlap areas. No movement will be made of sewing, pins, and other appurtenances necessary for construction.

4.2 BASIS OF PAYMENT

A. There will be no separate payment for geotextile fabric. The cost of this work is to be included in the total cost of the contract.

B. Payment for geotextile fabric will include storage, handling, protection from sunlight excavation (unless there is a separate pay item for excavation), grading (unless there is a separate pay item for grading), preparation of the surface to receive the fabric,

placement overlapping, sewing, or pinning and all other items necessary to complete construction. If it becomes necessary for the contractor to replace geotextile fabric because of failure to meet the conditions of this geotextile fabric construction specification, no additional payment will be made.

SECTION 02765

GABIONS

PART I - GENERAL INFORMATION

1.1 DESCRIPTION

A. Gabions are heavy duty rectangular baskets made of heavily galvanized steel wire mesh of triple twist hexagonal weave having a mesh opening of 3.25 inches by 4.5 inches. Each gabion is subdivided into cells of equal size by diaphragms.

B. Gabion construction shall include the excavation grading, supply, delivery, assembly, placement, fill material (riprap or stone as shown on the plans), filling, led closing, adjustment and all other items needed to complete the work. Gabion construction shall be in accordance with this specification and in close conformance to the lines, grades, elevations, size, thickness, typical cross sections, cross sections, and materials shown on the Drawings (plans) and construction Standards.

LOOK @ SPECIFIED COST FOR GABION PLACE HERE

C. Gabion construction shall be in conformance to manufacture's instruction for assembly and erection. At the construction site they are unfolded and assembled by lacing the edges together and the diaphragms to the sides. Gabion units are laced together and filled with stone from 4 to 8 inches in diameter. The lids are then closed and wired to the top edges of the gabions.

1.2 QUALITY ASSURANCE

A. The Contractor shall supply the name of the supplier and copies of Gabion manufacture's material specifications to the Owner and the Engineer. Contractor shall keep copies of the manufacturer's "Instructions for Assembly and Erection" at the job site for use by the Contractor and review by the Owner and Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wire Specifications. All steel wire used in the gabions shall be heavily galvanized with a zinc coating exceeding Federal Specifications QQ-W-461g, class 3 which call for a minimum weight of 0.80 oz. per sq. foot. The hot dipped galvanizing shall be done before the weaving of the gabion wire.

B. Galvanized Gabions. The mesh steel wire diameter for the galvanized gabions shall not be less than 0.1181 inch (U.S. gauge no. 11). The mesh edge wire and selvedge wire shall not be less than 0. 1 535 inch (U.S. gauge no. 9). The lacing wire for binding the gabion units together shall not be less than 0.0866 inch (U.S. gauge no. 13.5).

C. PVC Coated Gabions. The mesh steel wire diameter for the PVC coated gabions shall not be less than 0. 1063 inch (U.S. gauge no. 12). The mesh edge wire and selvedge wire shall not be less than 0. 1 338 inch (U.S. gauge no. I 0). The lacing wire for binding shall not be less than 0.0866 inch (U.S. gauge no. 13.5). PVC coating shall be 0.4 mm (0.015 inch) for PVC bonded to the wire, the weight of the zinc coating shall be 0.10 oz. per sq. foot.

D. Stone fill for gabions shall be no less than 4 inches in average diameter and no greater than 8 inches in average diameter. Stone fill shall be either native stone or limestone riprap. Native stone shall be of the same general size and density as limestone riprap. Limestone riprap shall be in general conformance to Indiana Department of Highways Standard Specifications (1988) for Revetment Riprap unless Stone fill type, size, and shape are specified otherwise on the plans, bid proposal, or construction standards.

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 SUPPLY AND DELIVERY

A. Gabions shall be supplied folded flat, tied in pairs and packed in bundles. Gabions shall be identified by color coding and/or labels that indicate their size and dimensions.

3.2 GABION ASSEMBLY

A. Gabion assembly shall be in accordance with the manufacturer's "Instruction for Assembly and Erection" and in general shall be as follows:

1. Remove a single gabion from the bundle and proceed to unfold it on a hard, flat surface. Stretch the gabion and stamp out all kinks.

2. Fold the front and back panels to a right angle by stepping on the base along the crease. Fold up the end panels and diaphragms and fasten them to the front and back panels using the heavy gauge wire projecting from the upper corners of each panel.

This procedure shall assure properly squared baskets with the tops of all panels even.

3. Securely lace all vertical edges of ends and diaphragms of the gabion basket. Use galvanized lacing wire as supplied by gabion manufacturer. No substitution of common wire will be permitted. The lacing procedure is as follows:

   a. Cut a length of lacing wire approximately one and one-half (1.5) times the distance to be laced but not exceeding 5 feet.
   b. Secure the wire terminal at the comer by looping and twisting, then proceed lacing with single and double loops at approximately five (5) inch intervals.
   c. Securely fasten the other lacing wire terminal.

3.3 GABION INSTALLATION

A. Before placing the gabion, the Contractor shall make the ground surface relatively smooth, even, and free of obstructions. The base for the gabions shall be stable.

B. The assembled gabions shall be carried to the installation site and placed in their proper location. It is convenient to place the gabions front to front and back to back in order to facilitate and expedite the stone filling and lid lacing operation.

C. For structural integrity, the adjacent gabions must be laced along the perimeter of all contact surfaces. To facilitate this operation it may be easier for the Contractor to construct subassembly in the yard or a staging area consisting of as many gabions as can be handled at one time. The sub-assembly is then placed at the job site and laced along the perimeter of all contact surfaces.

D. The base of the empty gabion placed on top of a completed row must also be tightly wired to adjoining baskets.

E. The following method applied to three (3) foot high gabions:

   1. Gabions should be placed empty and laced for the complete stretch of baskets (up to approximately 100 linear feet). The first gabion shall be firmly anchored and tension shall be applied to the other end with a come-a-long or other means, in order to achieve the proper alignment. Anchoring can be accomplished by partially filling the first gabion with stone.

F. While gabions are being stretched inspect all comers for open "V's" which will result if comers were not property secured. Such "V's" must be closed by re-lacing.

G. Keep gabions in tension while being filled. Leave the last gabion empty to allow for easily lacing the subsequent sub-assembly.

3.4 GABION FILLING

A. The fill material shall consist of hard, durable, clean stone (4 to 8 inches in diameter in size) or as specified otherwise on the plans, bid proposal, or construction standards.

B. Gabions shall be filled in three lifts, one foot at a time. Two connecting wires are placed between each lift in each cell of all exposed faces. This operation is repeated until gabions are filled.

C. To protect the vertical panels from being bent during the filling operation, rebars may be temporarily placed and laced along the upper edges. Another method is to bend a length of pliable metal and place it over the vertical panels.

D. Gabions may be filled by almost any type of earth-handling equipment; payloader, gradall, crane, conveyor, or backhoe. Some manual stone adjustment during the filling operation is required to prevent undue voids.

E. The exposed face(s) should be hand-placed using selected stone. This hand-placing will add to the appearance of the structure by preventing the gabions from bulging. The last lift of stone should be level with the top of the gabion to properly close the lid and provide an even surface for the next course.

3.5 GABION LID CLOSING

A. Fold the lid down along the hinge line so that the lid and gabion edges meet closely without gaps. To assist in closing and lacing the lids, a pinch bar closer may be used.

B. Secure the lid at the corners with the wire projecting from the lid. Lace the lid shut, starting with the front face and then the ends and diaphragms. A tight joint must be achieved during the lacing operation, adjacent lids may be wired to the vertical panels in one operation.

3.6 OTHER GABION CONSTRUCTION

A. Gabions may be readily cut or bent to form regular shapes to fit the dimensions shown on the plans or to fit bridge piers, culverts, etc. Part of the mesh may also be cut to allow installation of pipe and other penetrations. Where this is done, the cut or bent edges of the mesh shall not be left loose but shall be fastened securely to another part of the structure.

PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT

A. Gabions shall be measured on a square yard basis in place based upon the required height (or thickness) of the gabion. No measurement will be made of the stone fill or other items necessary for a complete construction unless listed as a separate pay item.

4.2 BASIS OF PAYMENT

A. There will be no separate payment for gabions. The cost of this work is to be included in the total cost of the contract.

B. Payment for gabions will include excavation, grading, supply, delivery, assembly, placement, fill material, filling, securing, lacing, lid closing, adjustment and all other items needed to complete the work. No extra or separate payment will be made for the stone (or riprap) fill material.

SECTION 02766

RIPRAP

PART I - GENERAL INFORMATION

1.1 DESCRIPTION

A. This work shall include materials and installation of riprap in accordance with these specifications and in conformance with the Drawings (plans), cross sections, typical cross sections, and construction standards, unless otherwise directed by the engineer.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.

C. Comply with requirements of all governmental agencies having jurisdiction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Limestone or gravel riprap material shall comply with all applicable paragraphs of Section 616, **RIPRAP AND SLOPEWALL** of the **Indiana Department of Highways Standard Specifications**, 1993 edition.

B. **Dumped riprap** shall consist of broken concrete, masonry, or stone removed from an old structure; broken pieces removed from an old structure; broken pieces removed from concrete pavement base, or monolithic brick pavement; broken rock from class X, class Y, unclassified excavation, or solid rock excavation; or it may be material similar in nature produced from sources outside the right-of-way. The material shall be broken into pieces which can be handled conveniently.

IS THIS A COMMON PRACTICE

C. The gradation of **Revetment Riprap** material shall be such that:

1. No individual piece weighs more than 120 pounds,
2. 90 to 100 percent of the material passes a 12 inch sieve,

3. 20 to 60 percent of the material passes a 6 inch sieve, and
4. Not more than 10 percent of the material passes a 1 1/2 inch sieve.

Reasonable care shall be taken in loading to obtain a similar gradation for consecutive loads.

D. **Hand laid riprap** aggregate shall consist of pieces, except spalls, no less than 1/3 of a cubic foot in volume and 3 inches in the least dimension. The width of these pieces shall be no less than 6 inches for 6 inch hand laid riprap, nor less than 12 inches for 12 inch hand laid riprap. When material removed from an old structure or other removed masonry item is to be used as hand laid riprap, any of these requirements which are inconsistent with the character of the material may be waived.

E. **Grouted riprap aggregate** shall be in accordance with the requirements for hand laid riprap. The mortar shall be composed of one part portland cement to 4 parts No. 23 fine aggregate. The cement and fine aggregate may be dry-mixed in an approved mixer or by hand in a watertight box until the color of the mixture becomes uniform. Water shall be added as the mixing continues until the grout attains a consistency which will allow it to flow into the joints.

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 CONSTRUCTION REQUIREMENTS

A. **Dumped riprap** shall be placed at locations shown on the plans or as directed. It shall be placed to produce a surface of approximate regularity but need not necessarily be hand placed. The finished surface shall vary no more than 9 inches from a true plane. The thickness perpendicular to its surface shall be no more than 2 feet nor less than one foot unless otherwise directed. Overhaul will not be paid. Hauling the material more than 2000 feet from its origin will not be required if obtained from on the right-of-way.

B. **Revetment riprap** may be placed by dumping and shall be placed to the required thickness at the locations shown on the plans or as directed.

C. When placing **hand laid riprap**, the thickness of hand laid riprap shall be no less than that specified, measured perpendicular to the slope. For 6 inch hand laid riprap this thickness shall be no less than 6 inches, and for 12 inch no less than 12 inches. Unless otherwise directed, the slope upon which this riprap is to be placed shall be in accordance with the cross section shown on the plans.

Laying shall begin in a trench below the toe of the slope. It shall progress upward with each piece being laid by hand perpendicular to the slope. It shall be firmly embedded against the slope and the adjoining piece with the sides in contact and with well broken joints. The spaces between the larger pieces shall be filled with spalls of suitable size which shall be thoroughly rammed into place. The finished surface shall present an even tight surface true to line, grade, and section. Broken concrete pavement used for 6 inch hand laid riprap shall be placed with the smooth side up.

D. The aggregate, preparation of the slope, and method of placing the riprap aggregate for grouted riprap shall be in accordance with construction requirements for placing hand laid riprap. After the aggregate has been placed and accepted, all interstices shall be completely filled with the cement grout. The finished surface shall be smooth, solid, and true to line, grade, and section.

PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT

A. Dumped riprap, revetment riprap, hand laid riprap and grouted riprap will be measured in square yards of the specified depth parallel to slope.

4.2 BASIS OF PAYMENT

A. There will be no separate payment for providing and placing riprap. The cost of this work is to be included in the total cost of the contract.

SECTION 02820

SEEDING

PART I - GENERAL INFORMATION

1.1 DESCRIPTION

A. Work included: provide either or both plain and mulch seeding and broadcast seeding. It includes furnishing and placing seed, fertilizer and mulch in a prepared seedbed. Seeding also includes all necessary watering.

1.2 QUALITY ASSURANCE

A. It is the intent of this Seeding Specification to require the Contractor to water the seeded areas as many times as necessary, as required by weather conditions, to insure a good, growing finished product at the completion of the project.

B. If necessary, the watering of the seed shall continue until germination has been achieved and a satisfactory growth of new grass is achieved.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials shall conform to the following requirement as specified in the following subsections of the Indiana Department of Highways Standard Specifications (1993).

Top Soil	914.01
Fertilizers	914.03
Grass Seed	914.04
Water	914.09(a)
Leguminous Inoculants	914.06
Mulch	914.05(a),(c),(d),(e)

2.2 SEED MIXTURE

A. All seed mixtures shall be per Section 621.05 of the Indiana Department of Highways Standard Specifications (1993) unless otherwise specified.

B. The following seed mixtures shall be used for the listed situations:

1. Earthen berms - **Seed Mixture CS (not INDOT)**

2. Disturbed waterways and earthen baffles - **Seed Mixture D**
3. All other disturbed areas - **Seed Mixture R**

C. **Seed Mixture CS** - This seed mixture shall be used on all 3 to one or steeper slopes. It shall consist of adding 15 pounds of Common Switchgrass per acre to the **Seed Mixture R.**

D. **Seed Mixture D.** This seed mixture is intended for ditch situations which experience seasonal to chronic saturated soils. This mixture shall be applied at the rate of 14 pounds 12 ounces per acre. The mix shall be composed of one ounce (28 grams) Fowl Mana Grass, 3 ounces wetland Carex species, 2 ounces Rice Cut Grass, 2 ounces Bulrush, 2 ounces Leptochloa fasicularis, 2 ounces Barnyard Grass, 2 ounces Prairie Wild Rye, 10 pounds perennial ryegrass, 2 pounds Jasper Red Fescue, 2 ounces "Fults" Puccinella Distans and one pound Redtop. If certain species in this mix are unavailable, substitutions maybe submitted for approval. The mix shall be applied as specified per acre. The method of planting shall be by means of hydroseeding or by means of a hand method with a minimal amount of mulch applied in a separate operation. Fertilizer shall not be added to this seed mixture.

E. **Seed Mixture R** - This is a general purpose seed mixture. It shall be applied at the rate of 170 pounds per acre. The mixture shall consist of 95 pounds of Kentucky 31 Fescue or approved equal, 65 pounds perennial ryegrass, and 10 pounds Jasper Red Fescue or approved equal.

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 PREPARATION OF GROUND BEFORE SEEDING

A. The area to be seeded shall be made smooth and uniform and shall conform with the finished grade and cross section shown on the plans. It shall have been given final trimming. No soil to be seeded shall be filled when in a wet or muddy condition.

B. The seedbed, if not loose, shall be loosened to a minimum depth of three (3) inches before fertilizer and seed is applied. Where soil is highly subject to erosion and will receive erosion control blankets only one (1) inch depth of tillage is required.

3.2 FERTILIZING, SEEDING, AND MULCHING

A. Fertilizer shall be applied and spread uniformly over the

area to be seeded and sodded at a rate of 800 pounds per acre. **If necessary, agricultural limestone shall be applied at a rate of 1,000 pounds per acre over all areas to receive seeding or sod.** Fertilizer and limestone shall be mixed into the top two (2) inches of the soil prior to seeding or sodding.

B. Seed may be drilled in or mixed with water and the mixture sprayed over the area to be seeded. An approved mechanical method to place the seed in direct contact with the soil may be used.

C. Seeded areas shall be thoroughly mulched by a method approved by the Engineer. Mulching material shall be applied uniformly in a continuous blanket at a rate of two (2) tons per acre, except wood cellulose fiber mulch shall be applied at a rate of 1,500 pounds per acre. The percent of moisture in the mulch shall be determined in accordance with standard Indiana Department of Highways Specifications Section 621.12 (b) (1993).

D. Mulching material shall be punched into the soil so that it is partially covered. The punching operation shall be performed longitudinally with a mulch tiller. The tool used for punching purposes shall be discs that are notched and have a minimum diameter of sixteen (16) inches. The discs shall be flat or uncupped such as notched coulters commonly used on moldboard plows. Discs shall be placed a maximum of eight (8) inches apart along the axle or shaft. Shaft or axle sections of discs shall not exceed eight (8) feet in length.

E. The mulch tiller for punching shall be constructed so that weight may be added or hydraulic force from the tractor may push the puncher into the ground. If heavy weights are not used, several trips over the area may be necessary to work part of the mulch into the soil. Care shall be exercised to obtain a reasonable even distribution of mulch incorporated into the soil.

F. On slopes steeper than 3 to 1, or when specified or shown on the plans, erosion control blankets, shall be used for mulching.

G. The mulching material shall be maintained in place satisfactorily until final completion and acceptance of the project.

H. The Contractor shall water as needed and as required by weather conditions. Watering shall be done in such a manner as to not displace the seed, sod, or soil underneath it.

3.3 SEASONAL LIMITATIONS

A. Seeding will be permitted only from April 1 to October 15. Seeding without mulch shall not be done between May 1 and August 15. During other periods, the time of sowing shall be determined by the Engineer, whose decisions will be based upon soil moisture and weather conditions.

3.4 LIMITS OF SEEDING

A. The limits of seeding shall be all those areas on the project site that are disturbed due to construction and are not designated to be planted with wetland species vegetation. The areas to be seeded shall be done only after approval by the Engineer, and any disturbed areas outside these limits shall be required at the Contractors expense.

PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT

A. Seeding will be measured by the square yard. Seeding and mulch will be measured by the square yard. No measurement will be made of fertilizer and inoculants. If measurements are made of poundage of seed, fertilizer and limestone, it will be in order to check the application rates of these items.

4.2 BASIS OF PAYMENT

A. There will be no separate payment for seeding. The cost of this work is to be included by the Contractor in the total cost of the contract.

B. No separate payment will be made for fertilizer, limestone, inoculants, and water.

C. It is the intent of this specification to require the Contractor to provide to the Owner good, live, growing grass areas at the completion of the project. The Contractor shall reseed all areas so designated by the Owner's representative at no additional expense to the Owner. If required to provide good, live, growing grass areas, the Contractor shall provide all necessary watering to meet this intent.

SECTION 02830

WETLAND SEEDING

PART I - GENERAL INFORMATION

1.1 DESCRIPTION

A. This work shall consist of furnishing, delivering, and seeding wetland areas in accordance with this specification and in conformance with the plans, or as directed by the Engineer.

1.2 GUARANTEE

A. At least 50 % of all individual species planted shall be present as live plants at the end of the first growing season. Aerial coverage of the seeded areas will be at least 70% with no large bare spots. No more that 10% (by aerial cover) of the seeded area will be dominated by perennial weedy species. If these standards are not met, the Contractor will be responsible for supplemental seedings as approved by the Engineer. Losses due to animal depredation, extremes in weather or precipitation, or lack of water control shall not be covered under this warranty.

1.3 QUALITY INSURANCE

A. The Contractor shall use qualified workmen who are experienced with commercial landscaping work or preferably have previously planted wetland plant seeds.

PART 2 - PRODUCTS

2.1 MATERIALS REQUIREMENTS

A. Delivery of seed shall be timed to coordinate closely with the planting time. If seed needs to be held for more than one day, it shall be stored in a cool, dry place until such a time as it can be used. In no case

shall seed be held over from one year to the next. All seed used shall be scarified and/or cold/moist stratified as recommended for each particular species specified.

2.2 ACCEPTABLE PLANTS

A. The seed species and seeding rates that shall be used shall be as shown on the plans.

B. Where the plans and specifications call for tree and shrub wetland plantings and/or sedge meadow with flowers mix, a nurse crop shall be shall be planted with the species and rates as shown on the plans.

2.3 SEED SUPPLIERS AND/OR QUALIFIED PLANTING SUBCONTRACTORS

A. Seeds used should be obtained from local sources if possible or from the following suppliers:

J. F. New and Associates
708 Roosevelt Road
Walkerton, IN 46574
219-586-3400

or equal.

PART 3 - CONSTRUCTION REQUIREMENTS

3.1 PLANTING INSTRUCTIONS

A. The ground shall be prepared according to specification section 02246 before seeding is begun.

B. In the event that inclement weather or unsuitable soil conditions delay seeding, causing the establishment of undesirable species, a limited program of site specific herbicide application using Round-up herbicide shall be made. The herbicide shall be spot sprayed where necessary to allow the planting schedule to resume in a timely manner.

C. Seed application may be no-till drilling or drop seeder

but shall not be covered with more than 1/4 inch of soil. If the seed is broadcast, an approved mechanical method which shall place the seed in direct contact with the soil may be used. In places inaccessible to mechanical equipment, or where the area to be seeded is small, a hand operated cyclone seeder or other approved equipment may be used.

PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT

A. Seeding will be measured by the square yard.

4.2 BASIS OF PAYMENT

A. There will be no separate payment for the work described in this section. The cost of this work is to be included by the Contractor in the total cost of the contract.

DIVISION 5

METALS

SECTION 05100

STRUCTURAL STEEL

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work under this Section consists of providing all labor, materials and equipment necessary or required for the complete fabrication and erection of all structural steel as detailed on the Structural Drawings and as specified herein.

B. Other Work furnished: Anchor bolts and other connection components.

1.2 QUALITY ASSURANCE

A. The latest editions of the following standard specifications shall govern the fabrication and erection of the structural steel, except as modified by the design drawings or this specification:

1. AISC "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings".
2. AISC: Code of Standard Practice for Steel Buildings and Bridges", except that Section 4.2.1 is specifically excluded.
3. AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts".
4. AWS "Structural Welding Code D1.1".
5. Steel Structures Painting Council Specifications SSPC.

B. All welders in both shop and field shall be certified under AWS "Standard Qualification Procedure" for the type or types of welding being performed and shall have been continuously engaged in such welding.

C. Fabricator and erector shall have continuous business operation for at least 5 years and by evidence of past projects indicate capability of conducting work of a similar nature; have sufficient well maintained equipment to perform the work; maintain an adequate stockpile of materials; qualified labor to fabricate or erect without delay the materials required for this project.

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1.3 SUBMITTALS

A. SHOP DRAWINGS

1. Shop Drawings shall be submitted to the Engineer for review. Shop Drawings shall include erection plans and framing elevations, all shop and erection details including copes, connections,threaded fasteners, and welds. No fabrication shall begin until shop drawings have been reviewed.
2. Provide setting drawings, templates and directions for installation of anchor bolts and other devices.

B. CERTIFICATIONS

1. Provide certification for all welders used in field and shop work.

C. TEST REPORTS

1. Submit all test reports regarding welding, bolting, and headed studs per Section 3.03.

1.4 PRODUCT HANDLING

A. Exercise care in handling, storing and erection of structural steel to avoid damage to pieces, welds, joints and paint. Secure pieces against displacement in transit.

B. Structural steel members which are stored at the job site shall be stored above ground on platforms, skids or other supports. Protect with weatherproof cover held in place.

C. Clean members which have become soiled before erecting.

D. Anchor bolts and other anchorage devices which are embedded in cast-in-place concrete shall be delivered to the project site in time to be installed before the start of concrete operations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel Shapes, Bars and Plates: ASTM A36 unless noted otherwise on the Structural Drawings. High strength steel is designated on the Structural Drawings by using the yield point strength parenthetically as a suffix, thus (50), high strength steel shall conform to the requirements of ASTM A572.

B. Structural steel tubing: ASTM A500, Grade B, Fy = 46 ksi.

C. Structural steel pipe: ASTM A53, Type E or S, Grade B, Fy = 35 ksi or ASTM A501, Fy = 36 ksi.

D. Connection bolts: ASTM A325N (bearing bolts).

E. Anchor bolts: ASTM A36.

F. Drilled-in anchors (expansion bolts): KWIK-Bolt stud anchor by Hilti Fastening Systems (or approved equal).

G. Welding rods: AWS E70XX for A36 and Grade 50 steel.

H. Headed studs (used as anchor studs or as shear connectors): ASTM A108.

KSM Fastening Systems, Omark Industries
Nelson Stud Welding, TRW Nelson Division
Blue Arc Welding Studs, Erico Products

I. Deformed bar anchors: ASTM A496.

KSM Fastening Systems, Omark Industries
Nelson Stud Welding, TRW Nelson Division

The use of manually welded anchors, rods, bars, straps, or reinforcing bars is <u>not</u> acceptable as a substitute for headed studs or deformed bar anchors.

J. Malleable Iron Wedge Inserts: Hohman-Barnard (or approved equal).

2.2 FABRICATION

A. Fabricate structural steel in accordance with the AISC "Specifications for Design, Fabrication, and Erection of Structural Steel for Buildings" with the modifications and additional requirements specified in this Section.

B. Shop connections shall be welded or bolted with A325 bolts.

C. Use only low hydrogen electric arc electrodes. Manual welding shall be accomplished with shielded arc electrodes of E70XX series or the strength equivalent of flux cored arc weld. Submerged arc process welding shall be grade SAW-2.

D. Connections:

1. Unless otherwise noted, beam connections shall be simple connections.
2. The steel supplier shall design the connections for at least the reactions indicated on the framing

plans, but never less than 50% of the total allowable uniform load on the span.

3. Connection angles shall be 5/16" in thickness (Minimum).
4. Minimum connection strength shall not be less than that of two 3/4" diameter A325 bolts.
5. Beam connections shall consist of double web angles unless detailed otherwise on the drawings.

E. Welds shall be tested as outlined in Section 3.03. The correction of faulty welds shall be in accordance with AWS "Structural Welding Code D1.1".

F. Steel members of different grades but of the same size and length shall be marked and detailed to prevent misplace- ment during erection. Varying connection gages between grades of steel is an acceptable means of prevention.

2.3 SHOP PAINTING

A. Shop paint all structural steel except the following:

1. Contact surfaces in connections using high strength friction bolts,
2. Surfaces to be field welded,
3. Structural steel that will receive sprayed-on fire-proofing,
4. Steel encased in concrete,
5. Embedded steel items (surfaces in contact with concrete),
6. The top surface of the top flange for all composite beams,
7. Crane rails.

B. Shop Primer:

1. Material: 37-77 Tnemec Primer or equal
2. Volume solids: 55.0 ± minimum
3. Shop primer shall be compatible with the specified finish paint.

C. Surface Preparation:

1. SSPC - SP6 Commercial Blast Cleaning

D. Application:

1. Structural steel shall receive one coat of shop paint except surfaces inaccessible after assembly shall receive a second coat.
2. Dry film thickness: 2.0 mils minimum.
3. Follow coating manufacturer's printed directions.

PART 3 - EXECUTION

3.1 ERECTION

A. Erect in accordance with the AISC "Specifications for Design, Fabrication and Erection of Structural Steel for Buildings".

B. Field connections shall be made using A325 high strength bolts, bearing type, except where welded connections are called for on the Drawings.

C. Bolt Tightening:

1. High Strength Bolts shall be "friction" type fasteners when used in the following connections.

   a. Connections subjected to loosening.
   b. Connections subject to fatigue due to vibrations.
   c. Connections subject to stress reversals.
   d. Wind bracing connections.
   e. Fasteners in oversized, short or long slotted holes.

   "Friction" type fasteners shall be tensioned in accordance with Table 3 of the "Specification for Structural Joints using ASTM A325 or A490 Bolts". The contact surfaces in a "friction" type connection shall be left unpainted as noted in section 2.3, A, 1.

2. High Strength bolts shall be designed as "bearing" type fasteners and tensioned in accordance with Table 3 of the "Specification for Structural Joints using ASTM A325 or A490 Bolts" when used in the following connections.

   a. Connections subject to tension loads.
   b. Column splices in structures over 100 feet in height.
   c. Beam to Column connections in structures over 125 feet in height.

3. High strength bolts that are not covered by sections 3.01, C, 1 & 2 shall be "bearing" type fasteners. These fasteners need only be tighten to a "snug-tight" condition. "Snug-tight" shall be as defined in the "Specification for Structural Joints using ASTM A325 or A490 Bolts.

4. High strength bolts described by sections 3.01, C, 1 & 2 may be tightened by any method found acceptable by the "Specification for Structural Joints using ASTM A325 or A490 Bolts" unless otherwise noted on the drawings.

D. Set all structural steel accurately to lines and grades. Connect temporarily with sufficient high strength bolts to insure complete safety of the structure until permanent connections are made. Erection tolerances shall be in accordance with the AISC Code of Standard Practice.

E. Provide temporary guy lines, bracing, and shoring as required, to maintain stability and alignment until the entire system (including metal deck erection) is erected, permanently connected, braced and set.

F. Any and all misfits shall be reported to the Engineer for resolution. Burning of new or unfair holes or cutting with a torch will not be permitted without the approval of the Engineer. Reamers, twist drills and saws shall be employed where burning is prohibited.

G. Any member that has assumed a bend or buckle in its final position due to forced fit shall have one or both ends and any intermediate connections unbolted and re-drilled or reamed to relieve such bowing to the satisfaction of the Engineer.

H. No piece that has been bent, broken, twisted or otherwise damaged shall be incorporated into the work. Such pieces shall be repaired or corrected on the ground to the satis-faction of the Engineer or replaced with a new piece. Failure to observe this will be cause for rejection of the piece in place.

I. Prior to the erection of any steel, the Contractor shall verify the location, elevation and plumbness of all anchor bolts and concrete surfaces. The Contractor shall report immediately to the Engineer in writing any condition which he finds unacceptable or that would prevent erection of the structural steel within AISC tolerance for plumbness and elevation. The Contractor shall be responsible for all corrections, and all corrections shall be made in a manner acceptable to the Engineer.

J. The erector shall acquaint himself with all conditions at the site which can affect his methods and sequence of operations. Abide by Owner's regulations concerning traffic, parking and construction material delivery.

K. FIELD TOUCH-UP BY STEEL ERECTOR: Field bolts, field welds and abrasions to the shop coat shall be repaired and painted by the structural steel erector using the same paint and care as for shop coat. All such surfaces shall be washed with a suitable degreasing solvent. This contractor shall also remove any and all accumulations of mud, clay, rust, scale, grease, etc. that have been acquired, for any reason, during shipment, storage and

erection and the shop coat restored to its original condition.

L. Sub-base (levelling) plates under column base plates will not be permitted.

M. Install headed studs using manufacturer approved equipment in accordance with the manufacturer's instructions.

N. Furnish all anchor bolts for anchorage of structural steel at an advance date for incorporation into the concrete foundation by others. Provide heavy hex nuts and washers for each bolt. Anchor bolts shall not be installed until shop drawings have been reviewed.

O. Observe all federal, state and local laws and area trade rules in the erection and handling of structural steel.

3.2 CLEANING UP

A. Upon completion of erection, promptly remove all tools, equipment and rubbish caused by or resulting from the erection work.

3.3 TESTING

A. All testing shall be by a testing agency approved by the Engineer, performed by registered/qualified technicians. The Contractor will employ the testing agency.

B. Test shop and field welds as indicated below:

1. All complete penetration welds shall be tested for 100% of the total weld length using ultrasonic testing apparatus.
2. All partial penetration welds shall be tested for 50% of the total weld length using the magnetic particle method.
3. 20% of all fillet welds shall be tested using the magnetic particle method.
4. All welds shall be visually inspected.

C. Inspect and test bolted connections; (see Section WM21.1, 3.01C). A minimum of 10 per cent of the bolts (and no less than 2 bolts in each connection) that are tightened per paragraph 3.01C, 2 shall be tested.

D. Inspect and test headed anchor studs and shear connector studs in accordance with the provisions for quality control of shear connectors, "Structural Welding Code", AWS D1.1.

E. Test reports shall be prepared by the testing agency giving the following:

1. The type and location of test conducted.
2. The test results.
3. Interpretation of the test results stating whether they comply with the Specification requirements.
4. Procedure taken if the test results are not acceptable.
5. Test results of re-tests after corrective measures have been completed. The cost of all re-testing of faulty welds shall be borne by the Contractor.

PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT

A. There will be no measurement for structural steel fabrication and erection.

4.2 BASIS OF PAYMENT

A. There will be no separate payment for structural steel fabrication and erection.

SECTION 05530

GRATINGS AND STAIRS TREADS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work under this Section consists of providing all labor, materials and equipment necessary or required for the complete fabrication and erection of all floor gratings and stair treads as detailed on the plans and as specified herein.

B. The grating and stair treads shall be made of either steel, aluminum or FRP noted on the plans.

1.2 QUALITY ASSURANCE

A. Requirements of regulatory agencies: grating and stairs shall meet or exceed requirements of the Uniform Building Code and the OSHA and IOSHA requirements.

B. Welding procedures, welders, welding operations and tackers shall be qualified in accordance with AWS Building Code.

1.3 SUBMITTALS

A. Shop Drawings: The Contractor shall submit shop drawings in accordance with Section 01340 for the Grating to be furnished as specified herein. Shop drawing submittals shall include the following:

1. Product data to include:
   a. Deflection calculation for specified design loadings.
   b. A certification letter from the manufacturer stating that the inspections. and all applicable tests required in the referenced ASTM Standards have been made and the results thereof comply with the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 GENERAL

A. All grating shall be furnished in lengths to fit the spans. Panel widths shall not exceed four (4) feet.

Where openings are required for the passage of pipes, gate stems, equipment, or other purpose they shall be provided and the grating reinforced where necessary to preserve its strength. All openings shall be banded to the full depth of the grating with three sixteenths (3/16) inch thick bands of same material as the grating. Bands shall be welded to all intersecting members.

B. Take field measurements to verify and supplement dimensions indicated on drawings.

C. Remove burrs and sharp edges from finished units.

2.2 STEEL GRATING

A. Steel grating shall consist of straight copper-bearing steel bars at least three sixteenths (3/16) inch thick spaced not more than one and one fourth (1 1/4) inches on centers tied with transverse copper bearing steel bars spaced not more than four (4) inches on centers.

B. All steel grating furnished shall be hot dipped galvanized after fabrication.

C. Unless otherwise shown on the plans or specified, all steel grating shall be furnished with bar size and minimum weight according to clear bar bearing spans as follows:

Bearing Bar Size	Min. Wt. of Grating Lbs./Sq. Ft.	Span From	Span To
1" x 3/16"	7.6	2'-6" and Less	
1 1/4" x 3/16"	9.2	2'-7"	4'-3"
1 1/2" x 3/16"	10.9	4'-4"	5'-3"
1 3/4" x 3/16"	11.6	5'-4"	6'-0"
2" x 3/16"	14.3	6'-1"	7'-10"

2.3 ALUMINUM GRATING

A. Unless otherwise shown on the plans aluminum grating shall be made using rectangular shaped or I-shaped bearing bars with minimum dimensions and weight according to clear span as follows:

Rectangular Bar Type		I-Bar Type			
Bearing Bar Size	Wt. Lbs./ Sq. Ft.	Bearing Bar Size	Wt. Lbs./ Sq. Ft.	Span From	Span To
1" x 3/16"	2.6	1"x 1/4"	1.8	2'-6"and Less	
1 1/4" x 3/16"	3.2	1 1/4" x 1/4"	2.2	2'-7"	3'-9"
1 1/2" x 3/16"	3.9	1 1/2" x 1/4"	2.7	3'-10"	4'-9"

1 3/4" x 3/16"	4.5	1 3/4" x 1/4"	3.1	4'-10"	5'-6"
2" x 3/16"	5.1	2" x 1/4"	3.6	5'-7"	6'-6"

B. Aluminum gearing bars shall be spaced not more than one and three sixteenths (1 3/16) inch on centers and pressure locked or riveted with transverse bars spaced not more than four (4) inches on centers. Bearing bars shall be made of aluminum alloy 6061-T6 in conformance with ASTM Specification B221-62. Cross or transverse bars shall be aluminum alloy 6063-T42 or 6063-T5. The symmetrically shaped panels made up of I-shaped gearing bars shall be reversible for both positive and negative bending moment, and the top and bottom surface of the bars shall be serrated to provide positive traction. The Contractor shall furnish and install isolators where aluminum grating is to contact dissimilar metals. Isolation method shall be continuous and of a permanent type.

C. The rectangular bar type grating shall be equal to that manufactured by Klemp Metal Grating Company, Borden Metal Products Company, or Irving Subway Grating Company, or equal. I-bar grating as specified shall be equal to that manufactured by Liskey Aluminum, Inc., Reliance Steel Products Co., or equal.

2.4 FIBERGLASS REINFORCED PLASTIC (FRP) GRATING

A. The grating shall be fiberglass woven reinforced polyester, constructed to provide complete wetting of the glass by the resin. The grating shall be made in a mold and of single piece construction so the reinforcing glass of the bearing bars are interwoven with the glass of the cross bars. Resin content shall be a minimum of 60% and glass a maximum of 40% by weight.

B. The tops of the bearing bars and cross members shall be in the same plane. The grating shall be translucent to enable inspection for defects, air bubbles and thorough glass wetting.

C. The resin shall be a chemical grade polyester such as CP-84 or equal. Grating bars shall be tapered to provide for self cleaning. Angular silica particles shall be integrally embedded (1/8" minimum) in laminate as nonskid surface on walking areas. All cut or sanded surfaces shall be coated with resin with air inhibiting additives.

D. Bearing bars shall be a minimum of one (1) inch high by one fourth (1/4) inch wide on one (1) inch centers; cross bars shall be the same height and width as the bearing bars and on four (4) inch centers. The grating shall be

supplied such that maximum deflection to span ratio shall be 1/360 for either a uniform loading of one hundred (100) pounds per square foot, or concentrated load of two hundred ninety (290) pounds covering an area of twelve by three (12 x 3) inches.

E. Where 1.5-inch grating is required, the bearing bar shall be 1.5-inch high by 3/8-inch wide on 1.5-inch spacing. Cross bars shall be the same height by 5/8-inch wide on 6-inch spacing.

F. Grating shall be fabricated in the shop to the width as shown on the plans and in lengths as long as practical but not less than two (2)feet. No one (1) panel of grating shall weigh more than fifty (50) pounds.

2.5 STAIR TREADS

A. Each stair tread shall be a complete all-welded, pressure located or riveted unit with punched and slotted carrier angles attached ready to bolt to stringers. Bearing bars shall be three sixteenths (3/16) inch thick spaced not more than one and one fourth (1 1/4) inches on centers with transverse bars at not more than four (4) inches centers. Depth of bearing bars shall be not less than one (1) inch for tread lengths of three (3) feet or less, and shall be not less than one and one fourth (1 1/4) inches for tread lengths between three (3) feet one (1) inch and four (4) feet six (6) inches. Width of treads shall be as shown on plans. Each stair tread shall be furnished with abrasive nosing.

B. Treads shall be made of aluminum, FRP or steel as noted on the plans. All steel grating shall be hot dipped galvanized after fabrication.

PART 3 - EXECUTION

3.1 ERECTION

A. The grating shall be erected in place on the supports as shown on the plans. Individual panels shall either be left loose or locked securely in place by approved devices as ordered by the Engineers. The grating shall be left with a smooth and uniform surface. Grating shall be installed such that there is no rocking motion when loaded or unloaded. Grating shall be manufactured to dimensions obtained by field measurements of the openings to be covered.

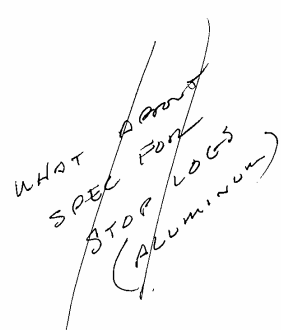
PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT

A. There will be no measurement for grating and stair tread fabrication and erection.

4.2 BASIS OF PAYMENT

A. There will be no separate payment for grating and stair tread fabrication and erection.



DIVISION 6

WOOD AND PLASTICS

SECTION 06350

PENETREATED LUMBER

PART I - GENERAL INFORMATION

1.1 DESCRIPTION

A. This specification is intended to cover the general requirements of the penetreated wood to be used on this project. Penetreated lumber (wood) shall mean lumber which is preservative treated by pressure processes in accordance with American Wood Preservers Association (AWPA) standards.

1.2 QUALITY ASSURANCE

A. The Contractor shall provide samples of the penetreated lumber to the Owner and the Engineer. The samples shall be delivered to the project site or to an agreed upon site (if the Contractor has not started construction). The samples shall consist of lumber purchased from the supplier selected by the Contractor for this project. The samples shall include typical boards and posts of the size, length and type that will be used for this project.

B. The Contractor shall supply certification(s) from the supplier indicating the type of pressure treated preservative used for the penetreated lumber and the AWPA standard pressure process that was used. All penetreated lumber shall be marked with the appropriate American Wood Preservers Bureau (AWPB) Quality Control Mark.

PART 2 - MATERIALS

2.1 MATERIALS

A. Penetreated lumber shall be pressure applied preservative treated lumber. The wood preservative treatment shall be clean, odorless, safe to handle, non-leachable, easily painted or stained, lumber with a preservative treatment that protects from decay and termites.

B. The preservative treatment shall be applied by the penetreated lumber manufacturer with a pressure process that impregnates and penetrates throughout the entire piece of wood.

C. All penetreated lumber shall be pressure treated with an Environmental Protection Agency registered pesticide containing chromated copper arsenate (CCA). Penetreated lumber shall be as manufactured by Hoover Treated Wood

Products (penetreated lumber product called "Dixie CCA") or equal.

D. All penetreated lumber shall meet the requirements of the following specifying agencies:

1. Federal Specification TT-W-550 (latest revision)
2. Federal Specification TT-W-571 (latest revision)
3. American Wood Preservers Association (AWPA) Standards P5, C1, C2, C3, C4, C5, C9, C14, C16, C18, C23
4. American Wood Preservers Bureau (AWPB) Standards LP-2.LP-22, FDN, MLP
5. American Association of State Highway Officials (AASHO)

E. All pressure treated lumber shall be southern pine ("Dixie CAA" or equal), pressure impregnated in accordance with the recommended practices of the AWPA. All penetreated lumber shall carry the AWPB LP Quality Control mark indicating compliance with the appropriate AWPB Quality Control Standard.

1. <u>For above ground use</u>
All penetreated lumber shall be treated to a net retention of 0.25 lbs. per cubic foot of wood and each piece shall bear the American Wood Preservers Bureau (AWPB) Quality Mark, LP-2 "Above Ground Use".

2. <u>For ground contact use</u>
For use in contact with ground, all penetreated lumber shall be treated to a minimum net retention of 0.40 lbs. per cubic foot of wood and each piece shall bear the AWPB Quality Mark, LP-22 "Ground Contact Use".

3. <u>For use in contact with water or permanent wood foundations</u>
All penetreated lumber shall be pressure treated to a minimum net retention of 0.60 lbs. per cubic foot of wood and shall bear the AWPB Quality Control Mark, "FDN" for use in permanent wood foundations.

F. Nails, screws, bolts, connectors, fasteners and other accessories (all related hardware) shall be hot-dipped zinc-coated or otherwise rustproofed.

PART 3 - EXECUTION

3.1 STANDARDS

A. All penetreatcd lumber construction shall be performed by the contractor according to accepted basic carpentry

industry standards. In the event that there is a disagreement between the Contractor and the Owner or Engineer about the quality of the penetreated lumber construction techniques, disagreements will be settled by referring to the booklet entitled "Basic Carpentry Illustrated" by Sunset. (This booklet is typically available at Furrows or other lumber yards or suppliers.)

3.2 CONSTRUCTION TECHNIQUES.

A. All penetreated lumber construction shall be in close conformance to the lines, grades, lengths, details as indicated on the plans and construction standards. In addition, the contractor shall follow the following construction techniques:

1. Reduce and eliminate splitting by pre-drilling a pilot hole for all fasteners. The diameter of the pilot hole shall be 3/4 of the diameter of the fastener.
2. Place no fasteners closer to the edge of a board than 3/4 inch.
3. Place no fasteners closer to the end of a board than one and one-half inch.
4. Bevel all top sides of posts and other upright structural members in order to facilitate drainage and minimize moisture absorption. (30 degree bevel unless indicated otherwise on plans).
5. Use galvanized or otherwise rustproofed deck screws instead of nails (unless otherwise indicated on plans, see construction standards, construction details or notes on drawings).

PART 4 - PAYMENT

4.1 METHOD OF MEASUREMENT

A. Measurement of penetreated lumber construction will be made on a per structure basis. No measurement will be made of individual posts, boards, fasteners, connectors, and other appurtenances.

4.2 BASIS OF PAYMENT

A. There will be no separate payment for penetreated lumber. The cost of this work is to be included in the total cost of the contract.

DIVISION 11

EQUIPMENT

SECTION 11285

SLIDE GATES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work under this Section includes, but is not limited to, the following:

1. Slide Gates

1.2 QUALITY ASSURANCE

A. All equipment shall be of the latest and most modern design. All similar components shall be manufactured and furnished by one manufacturer unless specifically approved by the Project Engineer.

1.3 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01340 for the equipment and systems furnished hereinunder. Shop drawings submittals shall include the following:

1. Drawings showing plan, elevation and appropriate section views of the equipment. The drawings shall show critical dimension, pipe connections, details of installation and construction materials.

2. Product data to include:

(a) Equipment data sheets
(b) Descriptive literature and bulletins

3. Manufacturer's installation instructions.

B. Operations and Maintenance Manuals shall be in conformance with Section 01350.

1.4 WARRANTY

A. Equipment and installation warranties shall comply with the warranty requirements specified in the General Conditions.

PART 2 - PRODUCTS

2.1 ALUMINUM SLIDE GATES WITH OPERATORS

A. Gates shall be self-contained, rising stem with the guides designed to mount on the face of the concrete or self-contained, weir type with the disc arranged to lower to open and with the guides designed to mount on the face of the concrete as shown on the contract drawings.

B. The guides for self-contained rising stem gates shall be of extruded aluminum incorporating a dual slot design. The primary slot shall accept the plate of the disc and the secondary slot shall be sufficiently wide to accept the reinforcing ribs of the disc. The guides shall be designed for maximum rigidity, shall have a weight of not less than 3 lbs. per foot and will be provided with keyways to lock it into the concrete for gates to be cast in the wall, or shall be provided with holes for anchor bolts every 18 inches for gates to be surface mounted. The invert of the frame shall be an angle welded to the lower ends of the guides to form a seating surface for the resilient seal mounted on the disc. The guides for wall opening applications shall have a plate or bar mounted at the top of the opening to form a top seat.

C. The guides for self contained weir type gates shall be of extruded aluminum incorporating a dual slot design. The primary slot shall accept the plate of the disc and the secondary slot shall be sufficiently wide to accept the reinforcing ribs of the disc. The guides shall be designed for maximum rigidity, shall have a weight of not less than 3 lbs. per foot and will be provided with holes for anchor bolts every 18 inches. The guides shall extend beneath the opening a sufficient amount to support the disc in the fully down or open position. An aluminum angle shall be welded to the guides across the invert of the opening and up both sides. A hollow bulb J-seal shall be attached to this angle with stainless steel strips and attaching bolts. The seal shall be arranged so that it will deflect a minimum of 1/16".

D. Where the guides extend above the operating floor, they shall be sufficiently strong so that no further reinforcing will be required. The yoke to support the operating benchstand shall be formed by two angles welded at the top of the guides to provide a one piece rigid frame. The arrangement of the yoke shall be such that the disc and stem can be removed without disconnecting the yoke.

E. The disc or sliding member shall be of aluminum plate reinforced with "U" shaped aluminum extrusions welded to the plate not more than 16 inches apart. The disc shall not deflect more than 1/360 of the span of the gate under

the design head. Reinforcing ribs shall extend into the guides so that they overlap the seating surface of the guide. For rising stem gates a specially molded resilient seal shall be mounted on the bottom of the disc to provide flush bottom closure. The shape of the seal shall produce a seating surface having a minimum width of 3/4" and the seal shall extend into the secondary slot of the guide. The vertical face of the seal shall be in contact with the seating surface of the guide to provide a proper seal at the corners.

F. All parts of the gate shall have a minimum thickness of 1/4".

G. Operation of the gate shall be by means of a handwheel or crank operated benchstand mounted on the yoke of the gate. The benchstand shall be fully enclosed, equipped with roller bearings above and below the operating nut and with a mechanical seal around the operating nut. On a crank operated benchstand, the pinnion shaft shall be cadmium plated and supported on roller bearings. A mechanical seal shall be provided around the pinnion shaft where it extends from the hoist enclosure. The operating stem shall be Type 303 or Type 304 stainless steel designed to have an L/r or less than 200, to withstand at least twice the rated output of the benchstand and to have a minimum diameter of 1-1/2". The stem shall be connected to the disc by means of a cast aluminum stem connector threaded and bolted to the stem and welded to the disc.

H. All necessary attaching bolts and anchor bolts shall be stainless steel, Type 304, and shall be furnished by the slide gate manufacturer.

I. Pipe covers shall be provided for stems and shall provide positive gate position indication.

2.3 ACCEPTABLE MANUFACTURERS

A. Golden Harvest

B. Waterman Industries, Inc.

C. or Equal

PART 3 - EXECUTION

3.1 INSTALLATION

A. All aluminum surface places in contact with steel shall be coated with bitumastic prior to installation.

B. All gates shall be installed level and plumb.

PART 3 - PAYMENT

3.1 BASIS OF PAYMENT

A. There will be no separate payment for furnishing and installing slide gates. The cost of this work is to be included by the Contractor in the total cost of the project.