

***Contract Documents and Specifications***

**STATE OF INDIANA  
DEPARTMENT OF ADMINISTRATION**

**FOR**

**INDIANA DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF WATER**

**LAKE MANITOU DAM**

**OUTLET STRUCTURE AND DAM REPAIR**

**FULTON COUNTY, INDIANA**

**PUBLIC WORKS PROJECT NO. E06-0068**

**AUGUST, 2016**



**LAWSON-FISHER ASSOCIATES P.C.  
CONSULTING ENGINEERS**

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PH: (574) 234-3167 FAX: (574) 236-1330

**CONTRACT DOCUMENTS AND SPECIFICATIONS**

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**PREPARED BY:**

**LAWSON-FISHER ASSOCIATES P.C.  
525 West Washington Avenue  
South Bend, Indiana 46601**



Sky K. Medors  
Sky K. Medors, P.E.

August 19, 2016  
Date



Thomas J. McNicholas  
Thomas J. McNicholas, P.E.

August 19, 2016  
Date



Breagan P. Eicher  
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August 19, 2016  
Date

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## INSTRUCTIONS TO BIDDERS

PROJECT ESTIMATED BY DEPARTMENT OF ADMINISTRATION, PUBLIC WORKS DIVISION  
TO BE BID AT ONE HUNDRED FIFTY THOUSAND DOLLARS (\$150,000) AND ABOVE

### 01 GENERAL

- A. This project is estimated by the Public Works Division, Indiana Department of Administration (the Owner), as stated in the Notice to Bidders, at One Hundred Fifty Thousand Dollars (\$150,000) and above.
- B. QUALIFICATION BY THE CERTIFICATION BOARD IS REQUIRED FOR THIS PROJECT PRIOR TO BID OPENING DATE. For information and procedure contact Executive Secretary, Certification Board, Indiana Department of Administration, 402 W. Washington St., Room W467, Indianapolis, Indiana 46204 or phone (317) 232-3005.

02 PROJECT NUMBER, DESCRIPTION AND LOCATION is as stated in the Notice to Bidders.

### 03 TITLE AND DEFINITIONS

Said building and/or land upon which it stands is the property of the State of Indiana. All references to the title owner of said property hereinafter will be by the term "State" and all references to the person, firm, or corporation awarded the contract for the project will be by the term "Contractor". All references to Designer shall refer to the consulting person or firm employed to contract with the Public Works Division, Indiana Department of Administration to provide architectural, engineering or other consulting services for the project, or to the Public Works Division. The preparation and issuance of contracts for this project are the responsibility of the Commissioner of the Indiana Department of Administration acting with approval of the Governor.

Contract: A written agreement between two or more parties enforceable by law.

Contractor: A person who has entered into or seeks to enter into a contract with Public Works Division.

Prime Contractor: A person or business which is primarily responsible for providing goods and service or performing a specific service, etc. under contract. A prime contractor can also be a Minority Business Enterprise.

Subcontractor: A person or a business who has a direct contract with a prime contractor who is under contract to provide goods and services or perform a specific service.

Joint Venture: An association of two or more businesses to carry out a single business enterprise for profit for which purpose they combine their property, capital, efforts, skills and knowledge.

Manufacturer: A supplier that produces goods from raw materials or substantially alters them before resale.

Minority or Women Business Enterprise (M/WBE): A business concern which is certified as at least fifty-one percent (51%) owned and controlled by a woman or women or, one or more of the individuals classified as a minority group which includes: African Americans, Hispanic Americans, Asian Americans, and other racial minorities.

Supplier: Any person or entity engaged to furnish goods, materials and/or equipment, but no on-site labor, is capable of furnishing such goods, materials and/or equipment either directly from its own stock or by ordering materials and/or equipment directly from a manufacturer, and is engaged to furnish such goods, materials and/or equipment directly to a prime contractor or one of its subcontractors.

### 04 PRE-BIDDING, BIDDING AND POST BIDDING REQUIREMENTS

- A. The Director, Public Works Division will authorize the Designer to issue bidding documents, construction documents and addenda to bidders.
- B. It is recommended that all Bidders visit the site prior to submitting bid, and become thoroughly familiar with the existing site conditions and work to be performed, as indicated in the bidding documents, construction documents and addenda. Extra compensation or extension of time will not be allowed for failure to examine the site prior to bidding.
- C. During the bidding period, should questions arise as to the meaning of any part of the bidding documents, construction documents or addenda that may affect the Bidder, the Bidder shall contact the Designer and/or Public Works Division and submit a written request for clarification. The Designer and/or Public Works Division will make such clarification only by written Addendum that will be mailed to each document holder or may be obtained at the office of the Designer and/or Public Works Division. By submitting a bid, the Bidder acknowledges procurement of all Addenda. No written request for clarification will be accepted by the Designer and/or Public Works Division later than fourteen (14) calendar days prior to the scheduled bid date.



- D. Bid as described in Contractor's Bid (DAPW 13) shall include Base Bid (in figures and in words) and Alternates as specified in Section entitled Alternates. In verifying bids, word amounts shall have precedence over figure amounts.
- E. Alternate amount(s) shall be listed where indicated. Add Alternates are not to be included in the Base Bid Scope of Work. Deduct Alternates are to be included in the Base Bid Scope of Work. The bid form must be signed. Note that by signing the bid document, the Bidder is acknowledging the procurement of all addenda and is certifying that the bid recognizes all items in all addenda.
- F. A bid by a corporation shall be in the legal name of the corporation followed by the word "by" and the signature of the president. The secretary of the corporation shall sign indicating his/her authority to sign. A Certificate of Corporate Resolution (DAPW 41) is required with and as a part of the bid if anyone other than the president of the corporation is signing bid documents.
- G. *The Form 96A-Questionnaire and Financial Statement is no longer required to be submitted.* The Director, Public Works Division reserves the right to request additional financial information or contractor experience as a basis for rejection of bid or award of contract.
- H. Each Bidder must file with his bid a Non-Collusion Statement (DAPW-121) signed by the same authorized person(s) who signed the bid.
- I. Each Bidder must file with his bid a completely filled in and executed Bid Bond (DAPW 15A) in accordance with IC 4-13.6-7-5. The bid bond penal sum shall be the minimum amount of five percent (5%) of the bid including all additive alternates.
- J. Each Bidder must file with his bid a completed M/WBE Participation Plan and Good Faith Effort Work Sheet (DAPW 26SUP2). Refer to the Supplement to the General Conditions for M/WBE Participation Policy (DAPW 26SUP1) for specific requirements.
- K. Each Bidder must file with his bid, the completed Contractor's Affidavit of Subcontractors Employed (DAPW 12) only if he proposes to perform any work with a subcontract amount of \$150,000.00 or more.
- L. Each bidder must file with his bid an Employee Drug Testing Plan (DAPW 150A) in accordance with IC 4-13-18 (P.L. 160-2006), or evidence that the contractor is subject to a collective bargaining agreement containing drug testing requirements that comply with IC 4-13-18.
- M. Each Bidder must include his Federal ID number or Social Security number on page 1 of 3 of the Bid Form (DAPW 13). All required bid documents must contain original hand written signatures.
- N. All documents required by statute, rule or these instructions to be included in the bid, must be submitted together in a single sealed envelope, plainly marked with the Name of Bidder, Project Identification, Project Number, Bid Time and Bid Date. Bids shall be rejected if all required documents are not in the single sealed envelope.
- O. A Bidder with proper identification may withdraw his bid at any time prior to the scheduled time for receipt of the bids; however, no bid may be withdrawn without written consent of the Director, Public Works Division for a *period of sixty (60) days after the date of the bid opening*, or unless extended in accordance with IC 4-13.6-6-4. Bids received after the designated due time for any reason, shall be rejected and returned unopened to the Bidder. The Director, Public Works Division reserves the right to reject any or all bids.
- P. Subcontractors whose work will equal or exceed One Hundred Fifty Thousand Dollars (\$150,000.00) must attain a Certificate of Qualification by the Certification Board before commencing any work on this project. Note paragraph 01. (B) above.
- Q. All Bidders (corporations) must be in good standing with the Indiana Secretary of State.

**05**     SIGNATURE AFFIDAVIT

- A. A Signature Affidavit (DAPW-14) containing the Bidder's authorized signature(s), properly notarized, may be submitted as a signature supplement to all other bid documents, except the bid bond, including:
  - 1. Contractor's Bid (DAPW 13)
  - 2. Non-Collusion Statement (DAPW-121)
  - 3. Contractor's Affidavit of Subs Employed (DAPW 12)
  - 4. M/WBE Participation Plan and Good Faith Effort Work Sheet (DAPW 26 SUP 2)
- B. All documents herein before required with the bid may be unsigned if the signature affidavit is submitted, except for the BID BOND. BIDDER MUST SIGN THE BID BOND.

NOTE: SIGNING THE SIGNATURE AFFIDAVIT OR BID FORM IS ACKNOWLEDGMENT OF PROCUREMENT OF ALL ADDENDA AND CERTIFICATION BY BIDDER THAT THE BID RECOGNIZES ALL ITEMS IN ALL ADDENDA.

06      WORK BY CONTRACTOR

The Contractor shall perform a minimum of 15% of the value of work (measured in dollars of the total contract price) with his own forces, and not more than 85% of the value of work is to be subcontracted.

07      SUBSTITUTIONS

The materials, products, systems and equipment described in the bidding documents, construction documents and addenda establish a standard or required function, dimension, appearance and quality that shall also be met by any proposed substitution. No substitution by manufacturer, or trade name of product named, or of a quality specified will be considered unless written request for approval has been submitted by the Bidder and has been received by the Designer and/or Public Works Division at least fourteen (14) calendar days prior to the date for receipt of bids. Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the proposer. The Designer and/or Public Works Division decision of approval or disapproval of the proposed substitution shall be final. Products, materials or systems not specified or approved prior to bidding, shall not be accepted for use in this project. All such substitutions accepted shall be acknowledged by addendum. See paragraph. 04 (C).

08      NONDISCRIMINATION

Pursuant to IC 22-9-1-10, the Contractor and subcontractors, if any, shall not discriminate against any employee or applicant for employment, to be employed in the performance of this contract, with respect to his hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment, because of his race, religion, color, sex, disability, national origin, or ancestry. Breach of this covenant may be regarded as a material breach of the contract. Pursuant to IC 5-16-6-1, the contractor agrees:

- A. that in the hiring of employees for the performance of work under this contract or any subcontract hereunder, no contractor, or subcontractor, nor any person acting on behalf of such contractor or subcontractor shall, by reason of race, religion, color, sex, disability, national origin or ancestry, discriminate against any citizen of the State of Indiana who is qualified and available to perform the work to which the employment relates; and
- B. that no contractor, subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this contract on account of race, religion, color, sex, national origin or ancestry; and
- C. that there may be deducted from the amount payable to the contractor by the State of Indiana or by any municipal corporation thereof, under this contract, a penalty of five dollars (\$5.00) for each person for each calendar day during which such person was discriminated against or intimidated in violation of the provisions of the contract; and
- D. that this contract may be canceled or terminated by the State of Indiana or by any municipal corporation thereof, and all money due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this section of the contract.

09      EMPLOYMENT ELIGIBILITY VERIFICATION

The Contractor affirms under the penalties of perjury that he/she/it does not knowingly employ an unauthorized alien.

The Contractor shall enroll in and verify the work eligibility status of all his/her/its newly hired employees through the E-Verify program as defined in IC 22-5-1.7-3. The Contractor is not required to participate should the E-Verify program cease to exist. Additionally, the Contractor is not required to participate if the Contractor is self-employed and does not employ any employees.

The Contractor shall not knowingly employ or contract with an unauthorized alien. The Contractor shall not retain an employee or contract with a person that the Contractor subsequently learns is an unauthorized alien.

The Contractor shall require his/her/its subcontractors, who perform work under this contract, to certify to the Contractor that the subcontractor does not knowingly employ or contract with an unauthorized alien and that the subcontractor has enrolled and is participating in the E-Verify program. The Contractor agrees to maintain this certification throughout the duration of the term of a contract with a subcontractor.

The State may terminate for default if the Contractor fails to cure a breach of this provision no later than thirty (30) days after being notified by the State.

The contractor shall submit, before work begins the E-Verify case verification number for each individual who is required to be verified under IC 22-5-1.7. An individual who is required to be verified under IC 22-5-17 whose final case result is final nonconfirmation may not be employed on the public works project.

A contractor may not pay cash to any individual employed by the contractor for work done by the individual on the public works project.

A contractor must be in compliance with the federal Fair Labor Standards Act of 1938, as amended (29 U.S.C. 201-209) and IC 22-2-2-1 through IC 22-2-2-8. A contractor must be in compliance with IC 22-3-5-1 and IC 22-3-7-34. A contractor must be in compliance with IC 22-4-1 through IC 22-4-395. A contractor must be in compliance with IC 4-13-18-1 through IC 4-13-18-7.

## 10 NOTICE OF AWARD

- A. Prior to execution of the Contract, in accordance with IC 4-13.6-5-2, the Director of Public Works may require additional submittals from Bidder/s to clarify contractor's experience and plans for performing the proposed work. Submittals which may be required include a critical path construction schedule which coordinates all significant tasks sequences and durations; schedule of values, and documentation of efforts to include minority and woman owned businesses in the proposed work. The Director may require Bidder/s to provide a comprehensive list of subcontractors and suppliers within 24 hours of receipt of bids.
- B. Prior to execution of the Contract, the successful Bidder shall furnish a completed Domestic Steel Affidavit (DAPW-11) to Public Works Division, Indiana Department of Administration as part of the contract. The Domestic Steel Affidavit is included for Bidder's review but need not be submitted at the time of the bid opening. Definition of Steel Products:  
"Steel products" means products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated, or otherwise similarly processed, or processed by a combination of two (2) or more of such operations, from steel made in the United States by the open hearth, basic oxygen, electric furnace, Bessemer or other steel making process.
- C. Prior to execution of the Contract, the successful Bidder shall furnish a completed Contractor's Bond for Construction (DAPW 15) (combined performance and payment bond) to Public Works Division, Department of Administration as part of the contract. The Bond form is included for Bidder's review but need not be submitted at the time of the bid opening.
- D. Prior to execution of the Contract, the successful Bidder shall furnish a completed Contractor's Certificate of Insurance (DAPW 16) to Public Works Division, Department of Administration as part of the contract. The Insurance form is included for Bidder's review but need not be submitted at the time of the bid opening.
- E. Prior to execution of the Contract, the State of Indiana will issue to the successful Bidder a letter stating that his bid was the lowest responsible and responsive bid and that the enclosed contract document is submitted to him for his consideration. If he finds it in accordance with the bid documents, it is to be returned to Public Works Division by certified mail or in person within ten (10) calendar days after receipt for further execution and with the caution that a contract will not exist until it is signed by all signatories required. Failure to execute the proper contract and furnish the ancillary documents shall constitute reason to surrender the bid bond.
- F. Concurrent with execution of the Contract, the successful Bidder may be required to furnish executed copies of Contractor-Subcontractor agreements as required in Article 5 of the General Conditions.

11 SUMMARY

All required bid documents must contain original hand written signatures. Complete documents to be submitted with this bid:

- A. The Bid Bond (DAPW-15A) must be signed by both the Bidder and Bonding Company. The Bonding Company must also attach a Power of Attorney. Bid bond information, may be on the Bonding Company's standard form.
- B. The Contractor's Bid (DAPW-13)
  - Page 1: State the amount of the bid in figures and words.
  - Page 2: State the amount of the alternate(s), indicate add, deduct or no change (READ CAREFULLY).
  - Page 3: Authorized signature of the Company. If the signature affidavit is completed and submitted with the bid, this page must be submitted but need not be signed or notarized.
- C. The Signature Affidavit (DAPW-14) must contain the completed authorized signatures properly notarized and submitted with the bid as a supplement.

This Signature Affidavit shall fulfill all of the signature requirements. NOTE: The Signature Affidavit does not apply to the Bid Bond (DAPW 15A). The Bid Bond document must be fully completed with all required signatures and submitted with the bid.
- D. The Non-Collusion Statement (DAPW-121) must be signed by the same authorized person(s) who signed the bid documents. If the signature affidavit is completed and submitted with bid, this form shall be submitted, but need not be signed.
- E. For corporations, if anyone other than the president of the corporation signs, a Certificate of Corporate Resolution (DAPW 41) giving signature authority for the signer must be included.
- F. M/WBE Participation Plan and M/WBE Good Faith Effort Work Sheet (DAPW 26SUP2) must be completed and signed by the same authorized person who signed the bid documents.
- G. The completed Contractor's Affidavit of Subcontractors Employed (DAPW-12) whose subcontract amount will be \$150,000.00 or more.
- H. The completed plan for Contractor's Employee Drug Testing Plan (or statement of collective bargaining agreement).
- I. One copy only of the Bid Documents is required. Bidders may remove and use the Documents included in the project specifications or use reproductions of the Documents.

12 INDIVIDUAL BIDS SHALL BE REJECTED BY THE DIRECTOR, PUBLIC WORKS DIVISION FOR THE FOLLOWING REASONS (IC 4-13.6-5-2; IC 4-13.6-6-1; 25 IAC 2-6-5)

- A. If the bid envelope is not sealed at the time of submission; if the envelope does not clearly identify the project number and description; if the name of the Bidder is not clearly indicated on the outside of the envelope and/or if the envelope is not date and time stamped by Public Works Division prior to the stated time for receipt of bids.
- B. If the estimated base bid cost exceeds \$150,000.00 and the bidding contractor is not certified by Public Works Certification Board to offer bids in one of the specified categories.
- C. If the bidding contractor is under suspension by the Director of Public Works or by the Public Works Certification Board.
- D. If the bidding contractor is a trust and does not identify all beneficiaries and empowered settlors of the trust.
- E. If the contractor's drug plan is not included in the bid documents pursuant to and complies with IC 4-13-18

13 INDIVIDUAL BIDS MAY BE REJECTED BY THE DIRECTOR, PUBLIC WORKS DIVISION FOR THE FOLLOWING REASONS (25 IAC 2-6-5)

- A. If the Contractor's Bid (DAPW 13) Non-Collusion Statement (DAPW 121) and/or Bid Bond (DAPW 15A) are not signed and notarized as required by these instructions, or the Signature Affidavit (DAPW 14) and the Bid Bond (DAPW 15A) are not signed and notarized as allowed as an alternative.
- B. If all required bid or alternate(s) amounts, or unit prices are not submitted with the bid when specifically called for by the specifications issued for the project.

- C. When the Bidder adds any provision reserving the right to accept or reject the award, or if the Bidder adds conditions or alternates to his bid not requested (voluntary alternates), or if there are unauthorized additions or irregularities of any kind which tend to make the proposal incomplete, indefinite or ambiguous as to its meaning or amount.
- D. When no bids received are under or within funds that can be appropriated, or within the Designer's estimate or when situations develop which make it impossible or not practical to proceed with the proposed work.
- E. If, subsequent to the opening of the bids, facts exist which would disqualify the Bidder, or that such Bidder is not deemed by the Director, Public Works Division to be responsive or responsible.
- F. If an out-of-state contractor is not registered with the Indiana Secretary of State or if any bidding contractor is not in good standing with the Secretary of State.



GENERAL BID FOR PUBLIC WORKS

CONTRACTOR'S BID

For \_\_\_\_\_  
(Insert class of work)

Project Number \_\_\_\_\_

Project Description (Title) \_\_\_\_\_

\_\_\_\_\_

Date \_\_\_\_\_

To: Department of Administration, Public Works Division  
Room W467  
402 West Washington Street  
Indianapolis, Indiana 46204

Pursuant to notices given, the undersigned proposes to furnish and install work  
in accordance with the construction documents prepared by:

\_\_\_\_\_  
(Designer Name, Address, Telephone)

-----

for the sum of \_\_\_\_\_  
(State amount in words)

\_\_\_\_\_ \$ \_\_\_\_\_  
(State amount in figures)

If required add attachment for all unit prices called for in the Specifications.

\_\_\_\_\_ Federal I.D. Number or Social Security Number

Contractor's Email address \_\_\_\_\_  
(Contract and Purchase Order will be sent to email address provided)

Bidder ID Number \_\_\_\_\_

(If you do not have an Indiana Department of Administration Bidder ID Number, please obtain one online at:  
<http://www.in.gov/idoa/2464.htm> )

ALTERNATE BIDS

Add Alternates Are Not to be included as part of the Base Bid Scope of Work.

Deduct Alternates are items of work that Are to be included in the Base Bid Scope of Work, and deducted from the project as described herein.

The work shall be as described in Section, ALTERNATES.

Bidder shall provide a response to each alternate specified. Response must indicate the amount to be ADDED to the base bid, DEDUCTED from the base bid, or that there is NO CHANGE.

Failure to respond to all alternates may cause the bid to be rejected.

BIDDER SHALL CHECK APPLICABLE BOX for each listed alternate.

Alternate No. \_\_\_ ADD \_\_\_ DEDUCT \_\_\_ NO CHANGE \_\_\_ AMOUNT \$ \_\_\_\_\_

Alternate No. \_\_\_ ADD \_\_\_ DEDUCT \_\_\_ NO CHANGE \_\_\_ AMOUNT \$ \_\_\_\_\_

Alternate No. \_\_\_ ADD \_\_\_ DEDUCT \_\_\_ NO CHANGE \_\_\_ AMOUNT \$ \_\_\_\_\_

Alternate No. \_\_\_ ADD \_\_\_ DEDUCT \_\_\_ NO CHANGE \_\_\_ AMOUNT \$ \_\_\_\_\_

Alternate No. \_\_\_ ADD \_\_\_ DEDUCT \_\_\_ NO CHANGE \_\_\_ AMOUNT \$ \_\_\_\_\_

Alternate No. \_\_\_ ADD \_\_\_ DEDUCT \_\_\_ NO CHANGE \_\_\_ AMOUNT \$ \_\_\_\_\_

Ethics Compliance. The Contractor and its agents shall abide by all ethical requirements that apply to persons who have a business relationship with the State, as set forth in Indiana Code § 4-2-6 et seq., the regulations promulgated there under, and Executive Order 04-08, dated April 27, 2004. If the Contractor is not familiar with these ethical requirements, the Contractor should refer any questions to the Indiana State Ethics Commission, or visit the Indiana State Ethics Commission website at <<<<http://www.in.gov/ethics/>>>>. If the Contractor or its agents violate any applicable ethical standards, the State may, in its sole discretion, terminate this contract immediately upon notice to the Contractor. In addition, the Contractor may be subject to penalties under Indiana Code § 4-2-6-12.

Pursuant to IC 22-9-1-10, the Contractor and subcontractors, if any, shall not discriminate against any employee or applicant for employment, to be employed in the performance of this contract, with respect to his hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment, because of his race, religion, color, sex, disability, national origin, or ancestry. Breach of this covenant may be regarded as a material breach of the contract.

-----  
IN TESTIMONY WHEREOF, the Bidder (a sole proprietor) has hereunto set his hand  
this \_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Proprietorship (Company Name)

(INDIVIDUAL)

\_\_\_\_\_  
Bidder (Owner)

-----  
IN TESTIMONY WHEREOF, the Bidder (a partnership) has hereunto set their hands  
this \_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Partner

\_\_\_\_\_  
Partner

-----  
IN TESTIMONY WHEREOF, the Bidder (a corporation) has caused this proposal to be signed by its  
President or other authorized signatory and Secretary this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Corporation Name

\_\_\_\_\_  
By President or Other Authorized Signatory

\_\_\_\_\_  
Secretary

If the bid is signed by other than the President, a Corporation Resolution designating other authorized signatory shall be submitted with this bid unless already on file with the Certification Board of the Public Works Division.

-----  
BY SIGNING THIS BID THE BIDDER ACKNOWLEDGES PROCUREMENT OF ALL ADDENDA AND  
CERTIFIES THAT THIS BID RECOGNIZES ALL ITEMS IN ALL ADDENDA.



BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we \_\_\_\_\_  
(Contractor's Name and Address)

as Principal, hereinafter called the Principal, and the \_\_\_\_\_  
(Bonding Company Name)

a corporation duly organized under the laws of the State of \_\_\_\_\_  
as Surety, hereinafter called the Surety, are held and firmly bound unto Public Works Division/Department of  
Administration, State of Indiana, as Obligee, hereinafter called the Obligee,

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

WHEREAS, the Principal has submitted a bid for: (insert State Project Number, Description and Location)

Project No. \_\_\_\_\_

Project Description: \_\_\_\_\_

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

NOW THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a contract  
with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the  
bidding or contract documents with good and sufficient surety for the faithful performance of such contract and for  
the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the  
Principal to enter such contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference  
not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the  
Obligee may in good faith contract with another party to perform the work covered by said bid, then this obligation  
shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
(Witness)

\_\_\_\_\_  
(Principal)

By: \_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Surety)

\_\_\_\_\_  
Witness)

\_\_\_\_\_  
(Attorney-in-fact)

**I. MINORITY AND WOMEN'S BUSINESS ENTERPRISES PARTICIPATION PLAN**

A Respondent is expected to submit in each response a Minority and Women's Business Enterprises Participation Plan in accordance with IC 4-13-16.5 and 25 IAC 5. The Plan must show that there are, participating in the proposed contract, Minority Business Enterprises (MBE) and Women Business Enterprises (WBE) listed in the Minority and Women's Business Enterprises Division (MWBD) directory of certified firms. Respondents must indicate the name of the MBE and WBE with which it will work, the contact name and phone number at the firm(s), the service supplied by the firm(s), the specific dollar amount from this contract that will be directed toward each firm, and the approximate date these products and/or services will be utilized. If participation is met through use of vendors who supply products and/or services, the Respondent must also indicate the vendor's tax ID number as well as provide a description of products and/or services provided to the Respondent that are directly related to this proposal and the cost of direct supplies for this proposal. All prime contractors, including MBE and WBE prime contractors, must meet the contract goals through use of subcontractors. MBE and WBE prime contractors will get no credit toward the contract goal for the use of its own workforce. The State does not accept national plans.

Failure to meet these requirements will affect the evaluation of your Proposal. The Department reserves the right to verify all information included in the Plan.

Respondents are encouraged to contact and work with MWBD to design a plan to meet established goals. MWBD's website address is [www.IN.gov/idoa/minority/](http://www.IN.gov/idoa/minority/) and contains a complete list of all the Department's certified MBE's and WBE's.

**Minority & Women's Business Enterprises Participation  
Letter of Commitment**

A signed letter(s), on company letterhead, from the MBE and/or WBE must accompany the Plan. This letter(s) shall state and will serve as acknowledgement from the MBE and/or WBE of its amount of participation, the scope of products and/or services, and approximate date these products and/or services will be utilized.

By submission of the Proposal, the Respondent acknowledges and agrees to be bound by the regulatory processes involving the State's M/WBE Program. Questions involving the regulations governing the Plan should be directed to MWBD's Compliance Unit at 317/232-3061

**MBE/WBE PARTICIPATION PLAN**

RFP # / Bid # / Quote # \_\_\_\_\_ DUE DATE \_\_\_\_\_

(Circle One)

RFP / BID / QUOTE NAME \_\_\_\_\_

(Circle One)

RESPONDENT \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY/STATE/ZIP \_\_\_\_\_

PHONE ( ) \_\_\_\_\_

The following MBE and/or WBE's listed in the MWBD directory will be participating in the contract:

**MBE/WBE   P HONE   COMPANY NAME   SCOPE OF PRODUCTS/SERVICES   UTILIZATION DATE   AMOUNT**

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\*If additional room is necessary, indicate here \_\_\_\_\_. Please attach a separate page.

**THIS DOCUMENT MUST BE INCLUDED IN YOUR RESPONSE**

**Indiana Department of Administration  
Public Works and State Office Building Commission  
GOOD FAITH EFFORTS WORKSHEET**

BIDDER \_\_\_\_\_ BID/PROJECT NUMBER \_\_\_\_\_

CONTRACT GOALS    7% MBE        5% WBE

List the M/WBEs contacted and complete the following information for each. Copies of all communications to and from each vendor should be maintained.

Company Name and Address	MBE	WBE	Type of Contact	Date of Contact	Date Response Due	Goods Or Services Requested	Result (Include Price Quote)

Indicate **Good Faith Efforts** made to utilize MWBEs. Check and explain all that apply or should be considered. Please provide evidence of the efforts that you want to be considered. A complete description of each criteria may be found in the **Indiana Department of Administration Public Works and State Office Building Commission MWBE Participation Policy**.

<b>MBE and WBE Barrier Assistance</b>	Describe
<b>Advertisement</b>	Describe
<b>Agency Assistance</b>	Describe
<b>Other Criteria</b>	Describe

CERTIFICATE OF CORPORATE RESOLUTION

I, \_\_\_\_\_, do hereby certify that I am the Secretary  
of \_\_\_\_\_, a corporation duly organized and  
existing under and by virtue of the Laws of the State of Indiana;

Type Name

I further certify that a regular/special meeting of the members of the Board of Directors of said corporation, duly called held and convened in conformity with the Charter and By Laws of said corporation, on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_, a quorum being present and voting thereon, the following resolution was duly adopted, to-wit:

I further certify that the foregoing resolution is a full, true, and complete copy as the same appears on record in the Minute Record Book of said corporation of which I am the legal custodian; that the same has not been altered, amended or repealed and is now in full force and effect.

In Witness Whereof, I have hereunto set my hand for said corporation this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

By: \_\_\_\_\_  
(Signature)

(must be signed by principal of organization)

STATE OF                    }  
                                  } SS:  
COUNTY OF                }

personally appeared before me, a Notary Public, in and for said County and State, this day of \_\_\_\_\_, 20\_\_\_\_\_, after being duly sworn upon his oath, says that the facts alleged in the foregoing affidavit are true.

My Commission Expires:

\_\_\_\_\_  
NOTARY PUBLIC - SIGNATURE

(SEAL)

\_\_\_\_\_  
NOTARY PUBLIC PRINTED NAME

NON-COLLUSION STATEMENT

The undersigned attests, subject to the penalties for perjury, that the undersigned is the Contractor, or that the undersigned is the properly authorized representative, agent, member or officer of the Contractor. Further, to the undersigned's knowledge, neither the undersigned nor any other member, employee, representative, agent or officer of the Contractor, directly or indirectly, has entered into or been offered any sum of money or other consideration for the execution of this Contract other than that which appears upon the face hereof. **Furthermore, if the undersigned has knowledge that a state officer, employee, or special state appointee, as those terms are defined in IC 4-2-6-1, has a financial interest in the Contract, the Contractor attests to compliance with the disclosure requirements in IC 4-2-6-10.5.**

---

Signature

---

Printed Name

---

Title

---

Company



**CONTRACTOR'S BOND FOR CONSTRUCTION**

KNOW ALL MEN BY THESE PRESENT, that \_\_\_\_\_  
(Contractor)

\_\_\_\_\_ of \_\_\_\_\_  
(Address) (City, State)

as principal and \_\_\_\_\_  
(Bonding Company)

\_\_\_\_\_ (Address) (City, State) (Zip Code)

as surety, are firmly bound unto the State of Indiana in the penal sum of \$ \_\_\_\_\_ Dollars, for the payment of which, well and truly to be made, we bind ourselves, jointly and severally, and our joint and several heirs, executors, administrators and assigns, firmly by these present, this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

THE CONDITIONS OF THE ABOVE OBLIGATION ARE SURE, THAT, WHEREAS the State of Indiana acting by and through the Commissioner, Department of Administration, has entered into a certain written contract dated \_\_\_\_\_ of \_\_\_\_\_

\_\_\_\_\_ (Project Number and Description)

\_\_\_\_\_ situated in \_\_\_\_\_  
Indiana, in accordance with the construction documents approved and adopted by said Commissioner, Department of Administration, which are made a part of this bond.

NOW THEREFORE, if the said \_\_\_\_\_  
(Contractor)

\_\_\_\_\_, shall well and faithfully do and perform the same in all respects according to the plans and specifications adopted by said Commissioner, Department of Administration, and according to the time, terms and conditions specified in said contract and incurred by him or any subcontractor in the prosecution of said work, including labor, service and materials furnished, then this obligation shall be void; otherwise to remain in full force, virtue and effect. This bond shall adhere to the requirements of IC 4-13.6-7-6 and IC 4-13.6-7-7.

IN WITNESS WHEREOF, we hereunto set our hands and seals this \_\_\_\_\_ day  
of \_\_\_\_\_, 20\_\_\_\_\_.

By: \_\_\_\_\_ (Seal)  
(Contractor)

By: \_\_\_\_\_ (Seal)  
(Bonding Company)

By: \_\_\_\_\_  
(Attorney-in-fact)

## CONTRACTOR'S CERTIFICATE OF INSURANCE

This certifies to the addressee shown below that the following described policies, subject to their terms, conditions, and exclusions, have been issued to:

NAME AND ADDRESS OF INSURED: \_\_\_\_\_

COVERING (show State project number, name and location) \_\_\_\_\_

ADDRESSEE: **PUBLIC WORKS DIVISION/DEPARTMENT OF ADMINISTRATION** \_\_\_\_\_

DATE: \_\_\_\_\_

TYPE OF INSURANCE	POLICY NUMBER	EFFECTIVE DATE	EXPIRATION DATE	LIMITS	
1. General Liability  a. Bodily Injury Including Personal Injury				Each Person - Premises and Operations	\$ _____
				Each Person - Elevators	\$ _____
				Each Person - Independent Contractor	\$ _____
				Each Person - Products Completed Including Operations	\$ _____
				Each Person - Contractual	\$ _____
				Each Occurrence -	\$ _____
				Aggregate - Products Completed Including Operations	\$ _____
					\$ _____
b. Property Damage				Each Occurrence - Premises and Operations	\$ _____
				Each Occurrence - Elevators	\$ _____
				Each Occurrence - Independent Contractor	\$ _____
				Each Occurrence - Products Completed Including Operations	\$ _____
				Each Occurrence - Contractual	\$ _____
				Aggregate -	\$ _____
				Aggregate - Operations Protective Products and Contractual	\$ _____
2. Automobile Liability  a. Bodily Injury b. Property Damage				Each Person	\$ _____
				Each Occurrence	\$ _____
				Each Accident	\$ _____
3. Excess Liability Umbrella					\$ _____
4. a. Workmen's Compensation b. Employer's Liability				Statutory Workmen's Compensation	\$ _____
				One Accident And Aggregate Disease	\$ _____
5. Builder's Risk					\$ _____

**UNDER GENERAL LIABILITY POLICY OR POLICIES**

YES      NO

1. Does Property Damage Liability Insurance shown include coverage for **XC** and **U** hazards? .....  YES     NO
2. Is Occurrence Basis Coverage provided under Property Damage Liability? .....  YES     NO
3. Is Broad Form Property Damage Coverage provided for this Project? .....  YES     NO
4. Is Personal Injury Coverage included? .....  YES     NO
5. Is coverage provided for Contractual Liability (including indemnification provision) assumed by insured? .....  YES     NO

**UNDER AUTOMOBILE LIABILITY POLICY OR POLICIES**

1. Does coverage shown above apply to non-owned and hired automobiles? .....  YES     NO
2. Is Occurrence Basis Coverage provided under Property Damage Liability? .....  YES     NO

In the event of cancellation, fifteen (15) days written notice shall be given to the party to whom this certificate is addressed.

\_\_\_\_\_  
NAME OF INSURANCE COMPANY

\_\_\_\_\_  
ADDRESS

\_\_\_\_\_  
SIGNATURE OF AUTHORIZED REPRESENTATIVE

## CONTRACTOR'S EMPLOYEE DRUG TESTING

IC 4-13-18 IS ADDED TO THE INDIANA CODE AS A NEW CHAPTER TO READ AS FOLLOWS [EFFECTIVE JULY 1, 2006]:

### Chapter 18. Drug Testing of Employees of Public Works Contractors

Sec. 1. This chapter applies only to a public works contract awarded after June 30, 2006.

Sec. 2. As used in this chapter, "bid" includes a quotation.

Sec. 3. (a) As used in this chapter, "contractor" refers to a person who:

- (1) submits a bid to do work under a public works contract; or
- (2) does any work under a public works contract.

(b) The term includes a subcontractor of a contractor.

Sec. 4. As used in this chapter, "public works contract" refers to:

- (1) a public works contract covered by IC 4-13.6;
- (2) a public works contract covered by IC 5-16 and entered into by a state agency; or
- (3) a state highway contract covered by IC 8-23-9;

when the estimated cost of the public works project is one hundred fifty thousand dollars (\$150,000) or more.

Sec. 5. (a) A solicitation for a public works contract must require each contractor that submits a bid for the work to submit with the bid a written plan for a program to test the contractor's employees for drugs.

(b) A public works contract may not be awarded to a contractor whose bid does not include a written plan for an employee drug testing program that complies with this chapter.

(c) A contractor that is subject to a collective bargaining agreement shall be treated as having an employee drug testing program that complies with this chapter if the collective bargaining agreement establishes an employee drug testing program that includes the following:

- (1) The program provides for the random testing of the contractor's employees.
- (2) The program contains a five (5) drug panel that tests for the substances identified in section 6(a)(3) of this chapter.

(3) The program imposes disciplinary measures on an employee who fails a drug test. The disciplinary measures must include at a minimum, all the following:

- (A) The employee is subject to suspension or immediate termination.
- (B) The employee is not eligible for reinstatement until the employee tests negative on a five (5) drug panel test certified by a medical review officer.
- (C) The employee is subject to unscheduled sporadic testing for at least one (1) year after reinstatement.

(D) The employee successfully completes a rehabilitation program recommended by a substance abuse professional if the employee fails more than one (1) drug test.

A copy of the relevant part of the collective bargaining agreement constitutes a written plan under this section.

Sec. 6. (a) A contractor's employee drug testing program must satisfy all of the following:

(1) Each of the contractor's employees must be subject to a drug test at least one (1) time each year.

(2) Subject to subdivision (1), the contractor's employees must be tested randomly. At least two

percent (2%) of the contractor's employees must be randomly selected each month for testing.

(3) The program must contain at least a five (5) drug panel that tests for the following:

- (A) Amphetamines.
- (B) Cocaine.
- (C) Opiates (2000 ng/ml).
- (D) PCP.
- (E) THC.

(4) The program must impose progressive discipline on an employee who fails a drug test. The discipline must have at least the following progression:

(A) After the first positive test, an employee must be:

- (i) suspended from work for thirty (30) days;
- (ii) directed to a program of treatment or rehabilitation; and
- (iii) subject to unannounced drug testing for one (1) year, beginning the day the employee

returns to work.

(B) After a second positive test, an employee must be:

- (i) suspended from work for ninety (90) days;
- (ii) directed to a program of treatment or rehabilitation; and
- (iii) subject to unannounced drug testing for one (1) year, beginning the day the employee

returns to work.

(C) After a third or subsequent positive test, an employee must be:

- (i) suspended from work for one (1) year;
- (ii) directed to a program of treatment or rehabilitation; and
- (iii) subject to unannounced drug testing for one (1) year, beginning the day the employee

returns to work.

The program may require dismissal of the employee after any positive drug test or other discipline more severe than is described in this subdivision.

(b) An employer complies with the requirement of subsection (a) to direct an employee to a program of treatment or rehabilitation if the employer does either of the following:

(1) Advises the employee of any program of treatment or rehabilitation covered by insurance provided by the employer.

(2) If the employer does not provide insurance that covers drug treatment or rehabilitation programs, the employer advises the employee of agencies known to the employer that provide drug treatment or rehabilitation programs.

Sec. 7. (a) The public works contract must provide for the following:

(1) That the contractor implement the employee drug testing program described in the contractor's plan.

(2) Cancellation of the contract by the agency awarding the contract if the contractor:

- (A) fails to implement its employee drug testing program during the term of the contract;
- (B) fails to provide information regarding implementation of the contractor's employee drug testing program at the request of the agency; or

(C) provides to the agency false information regarding the contractor's employee drug testing program.

(b) The provisions of the public works contract relating to cancellation of the contract by the agency awarding the contract apply to cancellation of the public works contract under this section.

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STATE OF INDIANA  
GENERAL CONDITIONS

ARTICLE 1 CONTRACT DOCUMENTS

1.1 Definitions

1.1.1 The Contract Documents

The Contract Documents consist of the Agreement, the Instructions to Bidders, the Contractor's Proposal (Bid), the Conditions of the Contract (General and Supplementary), Drawings, Specifications, and Addenda issued prior to bidding, Change Orders, any written interpretation issued as a field order by the Designer pursuant to Article 1.2, and all field orders for minor changes in the Work by the Designer pursuant to Article 12.3.

1.1.2 The Contract

The Contract Documents form the Contract for construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral.

1.1.3 The Work

All labor, material, equipment, systems and services necessary to produce the result called for in the Contract Documents.

1.1.4 The Project

The Project is the total construction designed by the Designer of which the Work performed under the Contract Documents may be the whole or a part.

1.2 Execution, Correlation, Intent and Interpretations

1.2.1 The Contract Documents shall be signed by the Owner and the Contractor. The signature process may be done electronically at the discretion of the Owner.

1.2.2 By executing the Contract the Contractor represents that he has visited the site and correlated his observations with the requirements of the Contract Documents, and has no major question pertaining thereto.

1.2.3 The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. The intention of the Documents is to include all labor, equipment, supervision and materials, for the proper execution and completion of the Work, and also to include those things that may be reasonably inferable from the Contract Documents as being necessary to produce the intended results. Words that have a well-known technical or trade meaning are used herein, in accordance with such recognized meaning.

1.2.4 Written interpretations necessary for the proper execution of the Work, in the form of drawings or otherwise will be issued with reasonable promptness by the Designer. Such interpretations shall be consistent with and reasonably inferable from the Contract Documents, and may be issued by field order subject to Owner's approval.

1.3 Copies Furnished and Ownership

1.3.1 The Contractor will be furnished 5 copies of drawings and specifications and any other information necessary for the execution of the Work.

1.3.2 All drawings, specifications, and copies thereof furnished by the Designer are his property. They are not to be used on any other Project, and, with the exception of one Contract set for each party to the Contract, are to be returned on request to the Designer at the completion of the Work.

ARTICLE 2 DESIGNER

2.1 Definition

2.1.1 The Designer is the person or organization identified as Designer of the Project, and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The terms Designer, Engineer, Architect, (and in certain projects Director, Public Works Division or his authorized representative), shall mean the Designer.

## 2.2 Administration of the Contract

2.2.1 The Designer will provide general administration of the Contract, including the functions hereinafter described.

2.2.2 Unless stated otherwise, the Designer shall be the Owner's representative during the construction phase. He shall have authority to act on behalf of the Owner only to the extent expressly provided in the Contract Documents or otherwise in writing, which will be shown to the Contractor. The Designer will advise and consult with the Owner and all of the Owner's instructions to the Contractor shall be issued through the Designer.

2.2.3 The Designer shall have access to the Work at all times wherever it is in storage, preparation and progress. The Contractor shall provide facilities for such access so that the Designer and Owner's Site Representative may perform their functions under the Contract Documents.

2.2.4 The Designer will make no less than weekly visits to the site when work is in progress to familiarize himself generally with the progress and quality of the Work and to determine in general if the Work is proceeding in accordance with the Contract Documents. He will not be required to make exhaustive or continuous on-site inspection to check the quality or quantity of the Work. On the basis of his on-site observations as Designer, he will keep the Owner informed of the progress of the Work, and will endeavor to guard the Owner against defects and deficiencies in the Work of the Contractor.

2.2.5 Based on such observation and the Contractor's applications for payment, the Designer will determine the amount owed to the Contractor and will issue Certificates for Payment in such amounts.

2.2.6 The Designer will be, in the first instance, the interpreter of the requirements of the Contract Documents and the judge of the performance thereunder. He will promptly render such interpretations as he may deem necessary for the proper execution or progress of the Work.

2.2.7 All interpretations and decisions of the Designer will be consistent with the intent of the Contract Documents. He will exercise his best efforts to insure faithful performance by the Contractor.

2.2.8 Claims, disputes and other matters in question relating to the execution or progress of the Work or interpretation of the Contract Documents shall be referred initially to the Designer for decision and be subject to written appeal within fifteen (15) days by the Contractor. The Designer shall submit his decision promptly in writing to the Director, Public Works Division, who shall have full authority to render the final and binding decision.

2.2.9 The Designer will have responsibility to recommend to the Owner the rejection of work that does not conform to the Contract Documents. Whenever the Designer considers it necessary or advisable, he shall recommend to the Owner the stoppage of the Work or any portion thereof, and to recommend special examination or testing of the Work (whether or not fabricated, installed, or completed).

2.2.10 The Designer will review and approve or take other appropriate action upon the Contractor's submittals such as shop drawings, product data and samples, but only for conformance with the design concept of the Work and with the information given in the Contract Documents. Such action shall be taken with reasonable promptness so as to cause no delay. The Designer's approval of a specific item shall not indicate approval of all assembly of which the item is a component.

2.2.11 The Designer will prepare change orders in accordance with Article 12.

2.2.12 The Designer will conduct reviews to determine the dates of Substantial Completion and Final Completion, will receive and forward to the Owner for the Owner's review written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final Certificate for Payment upon compliance with the requirements of Article 9.7.

2.2.13 The Designer, together with representatives from the Contractor and the Owner will conduct a review of the Work nine (9) months after the date of substantial completion to determine any work not in compliance with the Contract Documents at that time. A list of items to be corrected or completed will be forwarded to the Contractor for corrective action prior to the expiration of the one year warranty period.

2.2.14 The duties, responsibilities and limitations of authority of the Designer as the Owner's representative during construction as set forth in Articles 1 through 14 of these General Conditions shall not be modified or extended without written consent of the Owner.

2.2.15 The Designer will not be responsible for the acts or omissions of the Contractor, Subcontractor, or any of their superintendents, supervisory staffs, agents or employees, or any other persons performing any of the Work.

2.2.16 In case of the termination of the employment of the Designer, the Owner shall appoint a Designer against whom the Contractor makes no reasonable objections, whose status under the Contract shall be that of Designer.

## ARTICLE 3 OWNER

### 3.1 Definition

3.1.1 The Owner is the State of Indiana, represented by the Commissioner; Department of Administration acting through the Director, Public Works Division and the Director's designated project manager.

### 3.2 Information and Service Required of the Owner

3.2.1 The Owner will furnish, through the Designer, surveys, describing known physical characteristics, legal limits and utility locations for the property on which the Project is to be erected, if in the Owner's possession.

3.2.2 Information or services under the Owner's control shall be furnished by the Owner with promptness to avoid delay in the orderly progress of the Work.

3.2.3 The Owner shall issue all instructions to the Contractor through the Designer unless specified elsewhere in these documents.

3.2.4 If the Contractor fails to correct defective work as required by Article 13 or persistently fails to carry out the Work in accordance with the Contract Documents, the Owner, by a written order may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the Owner to stop the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Article 6.1.

### 3.3 Owner's Site Representative

3.3.1 Notwithstanding the obligations of the Designer as Owner's representative during construction, the Owner may employ an on-site representative to observe the progress of the Work.

3.3.2 The Owner's Site Representative shall function as an observer only. He shall report his findings to the Designer for review and any required further action. The Owner's Site Representative is not authorized to make changes in the Work or to interpret the Contract Documents.

3.3.3 The Owner's Site Representative shall have at all times access to the Work wherever it is in storage, preparation and progress. He may attend meetings at the site and he may review and approve the Contractor payment requests.

## ARTICLE 4 CONTRACTOR

### 4.1 Definition

4.1.1 The Contractor is the person or organization identified as such in the Agreement. He is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative.

### 4.2 Review of Contract Documents

4.2.1 The Contractor shall carefully study and compare the Contract Documents and shall at once report to the Designer and the Owner any error, inconsistency or omission he may discover. The Contractor shall perform no portion of the Work at any time without Contract Documents or, where required, approved shop drawings, product data or samples for such portion of the Work.

### 4.3 Supervision and Construction Procedures

4.3.1 The Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for the quality of the Work and for all construction techniques, sequences, and procedures, and for coordinating all portions of the Work.

4.3.2 The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Designer in administration of the Contract, or by inspections, tests or approvals required or performed under Paragraph 7.9 by persons other than the Contractor.

### 4.4 Labor and Materials

4.4.1 Unless otherwise specified in Division 1, the Contractor shall provide and pay for all labor, material, equipment, tools, construction equipment, machinery, transportation, and other facilities and services necessary for the proper execution of the Work.

4.4.2 Unless otherwise specified in Division 1, the Contractor shall provide and pay for all electric current, water, heat, and telephone services and shall maintain necessary discipline to prevent waste.

4.4.3 If any item of work shall be the subject of a jurisdictional dispute as to the craft to be used for said work, the Contractor shall aid in such inter-craft resolution and if arbitrated, abide by the decision, holding the Owner free of involvement in the dispute, and if time is lost by the dispute, extra work days will only be considered through the provisions of Article 12.2. He will do whatever he can to eliminate any embarrassment to the Owner caused by picketing, etc.

4.4.4 The Contractor shall at all times enforce strict discipline and good order among his employees, and shall not employ on the Work any unfit person or any one employee unskilled in the Work assigned to him or unqualified as a tradesman in the trade involved.

#### 4.5 Warranty and Guarantee

4.5.1 The Contractor warrants and guarantees that all materials and equipment incorporated in the Project shall be new unless otherwise specified, and all work will be of the highest quality, free from faults and defects, and in strict conformance with the Contract Documents for a period of one year from the date of substantial completion. All work not so conforming to the Contract Documents may be considered defective. If required by the Designer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. The warranties and guarantees provided in this Article and elsewhere in the Contract Documents shall be in addition to and not in limitation of any other warranty or guarantee or remedy called for the Contract Documents or otherwise prescribed by law. The Contractor, together with the Designer and representatives from the Owner, shall review the Work nine (9) months after the date of substantial completion to determine any work not in compliance with the Contract Documents. The Contractor shall correct such non-complying work prior to the expiration of the one year warranty.

#### 4.6 Permits, Fees and Notices

4.6.1 The Contractor shall secure and pay for all permits, fees and licenses necessary for the execution of the Work.

4.6.2 The Contractor and Subcontractors must submit an "Exemption Certificate for Construction Contractors" (Form ST-105) to each supplier in order to obtain exemption from the Indiana Gross Tax (i.e., sales and use tax).

4.6.3 The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations, and orders of any public authority bearing on the conduct of the Work. If he observes that any of the Contract Documents are at variance therewith in any respect, he shall promptly notify the Designer in writing, and any necessary changes shall be adjusted by change order. If he performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Designer, he shall bear all cost arising from such non-conformance.

#### 4.7 Cash Allowances

4.7.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. These allowances cover the net cost of the materials and equipment delivered and unloaded at the site which cost shall be determined by the Owner through proper procedures for receiving quotes or bids as required by law. The Contractor's handling costs on the site, labor, installation costs, overhead, profit, and other expenses shall be included in the Contract sum and not in the allowance. The Contractor shall cause the Work required by these allowances to be performed by such persons as the Designer may direct, but he will not be required to employ persons against whom he has a reasonable objection. If the net cost above, when determined, is more than or less than the allowance, the Contract Sum will be adjusted accordingly by change order.

#### 4.8 Superintendent

4.8.1 The Contractor shall keep on the Project, during the entire contract time, a competent superintendent and necessary assistants, all satisfactory to the Designer and the superintendent shall not be changed, except with the consent of the Owner, unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employ. The superintendent shall represent the Contractor and shall have full authority to act on his behalf. All communications given the superintendent shall be as binding as if given by the Contractor. Important communications shall be confirmed in writing.

#### 4.9 Responsibility for Those Performing the Work

4.9.1 The Contractor shall be responsible for the quality of the Work, for acts and omissions of all the Subcontractors, their superintendents, their supervisory staffs, agents, or employees and of all other persons performing any of the Work under a Contract with the Contractor.

#### 4.10 Progress Schedule

4.10.1 Unless otherwise indicated in Division 1, the Contractor, immediately after being awarded the Contract, shall prepare and submit for the Designer's approval a progress schedule for the Work in relation to the entire Project. This schedule in bar graph form, or other form approved by the Owner, shall indicate the dates for the starting and completion of the various stages of construction, and in addition, will state the contractual completion date. The contract completion date, based on the construction period stated in the notice to bidders, shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by change order. A more detailed schedule may be required elsewhere in the documents.

#### 4.11 Record Documents at the Site

4.11.1 The Contractor shall maintain for the Owner as part of the Contract one record copy of all drawings, specifications, addenda, shop drawings, change orders and other modifications at the site in good order, and marked to record all changes made during construction. These shall be available to the Designer and the Owner's Site Representative at all times while Work is in progress. All changes made during construction shall be recorded monthly and reviewed by the Designer before approval of each partial progress payment. The record documents shall be submitted to the Designer prior to the Contractor's final payment.

#### 4.12 Shop Drawings and Samples

4.12.1 Shop drawings are all drawings, diagrams, illustrations, schedules, brochures, and other data, which are prepared by the Contractor, or any Subcontractor, manufacturer, supplier, or distributor, and which illustrate the Work.

4.12.2 The Contractor shall submit all shop drawings and samples required by the Contract or by the Designer in a timely manner, allowing sufficient time for the Designer's review so as not to cause any delay in the Work or in work by any other Contractor.

4.12.3 At the time of such submission, the Contractor shall furnish or verify all field measurements, field construction criteria, materials, catalog numbers, and the like and shall individually check, coordinate and stamp with his approval each submission, and shall in writing call the Designer's attention to any deviations in the shop drawings or samples from the requirements of the Contract Documents.

4.12.4 The Designer will check and approve, with reasonable promptness so as to cause no delay, these shop drawings and samples only for conformance with the design concept of the Project, and with the information given in the Contract Documents. The Designer's approval of a separate item will not indicate approval of the assembly in which the item functions.

4.12.5 The Designer's approval of shop drawings or samples shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents unless the Contractor has in writing called the Designer's attention to such deviation at the time of submission and the Designer has given written approval to the specific deviation, nor shall this relieve the Contractor from errors or omissions in the shop drawings or samples.

4.12.6 No work requiring a shop drawing or sample submission shall be commenced until the submission has been approved by the Designer. All such work shall be in accordance with approved shop drawings and samples.

#### 4.13 Use of Premises

4.13.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents, and shall not unreasonably encumber the premises with any materials or equipment.

#### 4.14 Cutting and Patching

4.14.1 The Contractor shall do all cutting, fitting or patching of his work that may be required to make its several parts come together properly and shall not endanger any work by cutting, excavating, or otherwise altering the Work or any part of it. Costs caused by defective or ill-timed work shall be borne by the party responsible therefore.

#### 4.15 Cleaning Up

4.15.1 The Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the Work, he shall remove all waste material and rubbish from and about the building as well as all his tools, scaffolding and surplus materials. Contractor shall clean all glass surfaces, lights and fixtures, ceilings, walls and shall leave the Work dusted, swept and wet mopped clean, unless more exactly specified.

4.15.2 In case of dispute the Owner may remove the rubbish and charge the cost to the several Contractors as the Designer shall determine to be just.

## ARTICLE 5 SUBCONTRACTORS

### 5.1 Definition

As used in this article "contractor tier" refers collectively to the following classes of contractors on a public works project:

- (1) "Tier 1 contractor" includes each person that has a contract with the public agency to perform some part of the work on, supply some of the materials for, or supply a service for, a public works project. A person included in this tier is also known as a "prime contractor" or a "general contractor".
- (2) "Tier 2 contractor" includes each person that has a contract with a tier 1 contractor to perform some part of the work on, supply some of the materials for, or supply a service for, a public works project. A person included in this tier is also known as a "subcontractor".
- (3) "Tier 3 contractor" includes each person that has a contract with a tier 2 contractor to perform some part of the work on, supply some of the materials for, or supply a service for, a public works project. A person included in this tier is also known as a "sub-subcontractor".
- (4) "Lower tier contractor" includes each person that has a contract with a tier 3 contractor or lower tier contractor to perform some part of the work on, supply some of the materials for, or supply a service for, a public works project. A person included in this tier is also known as a "lower tier subcontractor".

A Subcontractor is a person or entity who has a direct Contract with the Contractor to perform any of the Work at the site. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative. The term Subcontractor does not include any separate Contractor or his Subcontractors.

### 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

5.2.1 Unless otherwise required by the Contract, the Contractor shall furnish to the Owner, with his bid on the prescribed form, the names of all persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work with an installed value of \$150,000.00 or more. The Designer will promptly reply to the Contractor in writing stating whether or not the Owner or the Designer, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner or Designer to reply within fourteen (14) days shall constitute notice of no reasonable objection.

5.2.2 The Contractor shall not subcontract with any such proposed person or entity to which the Owner or the Designer has made reasonable objection. The Contractor shall not be required to subcontract with anyone to whom he has a reasonable objection.

5.2.4 If the Owner or the Designer has reasonable objection to any such proposed person or entity, the Contractor shall submit a substitute to whom the Owner or the Designer has no reasonable objection.

5.2.5 The Contractor shall make no substitution of any Subcontractor, person or entity previously selected, if the Owner or Designer makes reasonable objection to such substitution.

5.2.3 The Contractor and his subcontractors shall employ only licensed plumbers and shall provide to the Owner the names and license numbers of all plumbers engaged in the Work. The Contractor shall submit this documentation with any monthly progress payment request that includes plumbing labor.

### 5.3 Subcontractual Relations

5.3.1 By an appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assumes toward the Owner. Said agreement shall preserve and protect the rights of the Owner under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Documents, has against the Owner. Provisions of Article 9 for progress payments, retainage and payment for stored material shall be incorporated without modification in all Contractor-Subcontractor agreements. The Contractor shall require each Subcontractor to enter into similar agreements with his Sub-subcontractors. Prior to execution of the Contractor-Subcontractor agreement, the Contractor shall provide all Subcontractors a complete copy of all proposed Contract Documents for the Project to which the Subcontractor will be bound by this Paragraph 5.3. Each Subcontractor shall similarly make available to his Sub-Subcontractors copies of such Documents. Executed copies of all agreements shall remain on file with the Contractor and be available for review by the Owner at the Owner's discretion.

## ARTICLE 6 SEPARATE CONTRACTS

### 6.1 Owner's Right to Let Separate Contracts

6.1.1 The Owner reserves the right to let other contracts in connection with other portions of the Project under these or similar General Conditions.

6.1.2 When separate contracts are awarded for different portions of the Project, "the Contractor" in the Contract Documents in each case shall be the Contractor who signs each separate contract with the Owner.

6.1.3 When separate contracts are awarded for portions of the Project, the General Construction Contractor shall be responsible for the overall coordination of all separate contracts for the Project.

### 6.2 Mutual Responsibility of Contractors

6.2.1 The Contractor shall afford each other Contractor reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and each shall properly connect and coordinate his work with all others as coordinated by the General Contractor.

6.2.2 If any part of the Contractor's work depends on proper execution or results upon the work of any other separate Contractor, the Contractor shall inspect and promptly report to the Designer any discrepancies or defects that shall cause his work to fail or be non-conforming. Failure of the Contractor to so inspect and report shall constitute an acceptance of the other Contractor's work as fit and proper for the reception of his work.

6.2.3 Should the Contractor cause damage to any separate Contractor on the Project, the General Contractor agrees, upon due notice, to settle with such other Contractor by agreement, if at all possible without involving the Owner. The Owner will be involved only after evidence is presented that sureties cannot settle the problem.

6.2.4 Any costs caused by defective or ill-timed work shall be borne by the party responsible.

## ARTICLE 7 MISCELLANEOUS PROVISIONS

7.1 Delinquent State Taxes (IC. 4-13-2-14.5). The Public Works Division may allow the Department of State Revenue access to the name of each person who is either:

- (1) Bidding on a Contract to be awarded under this chapter; or
- (2) A Contractor or Subcontractor under this chapter.

If the Public Works Division is notified by the Department of State Revenue that a bidder is on the most recent tax warrant list, a Contract may not be awarded to that bidder until the bidder provides a statement from the Department of State Revenue that the Bidder's delinquent tax liability has been satisfied. The Department of State Revenue may notify:

- (1) The Department of Administration; and
- (2) The Auditor of State;

that a Contractor or Subcontractor under this chapter is on the most recent tax warrant list, including the amount owed in delinquent taxes. The Auditor of State shall deduct from the Contractor's or Subcontractor's payment the amount owed in delinquent taxes. The Auditor of State shall remit this amount to the Department of State Revenue and pay the remaining balance to the Contractor or Subcontractor.

### 7.2 Choice of Law

7.2.1 The Contract shall be governed by the laws of the State of Indiana.

### 7.3 Assignment

7.3.1 The Contractor shall not assign the Contract or sublet it as a whole without the written consent of the Owner, nor shall the Contractor assign any monies due or to become due to him hereunder, without the previous written consent of the Owner.

### 7.4 Written Notice

7.4.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or to an officer of the corporation for whom it was intended, or sent by registered or certified mail to the last business address known to him who gives the notice.

## 7.5 Claims for Damages

7.5.1 Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the other party or any of his employees, agents or others for whose acts he is legally liable, claim shall be made in writing to such other party within seven (7) days of the first observance of such injury or damage.

## 7.6 Performance Bond and Labor and Material Payment Bond

7.6.1 For projects advertised with an estimated base bid amount of One Hundred Fifty Thousand Dollars (\$150,000) or more, the Contractor shall furnish and pay for an approved one hundred percent (100%) combination performance and payment bond (Contractor's Bond for Construction, Public Works Division Form DAPW 15). This bond shall adhere to the requirements of IC. 4-13.6-7-6 and IC. 4-13.6-7-7 as amended and shall cover the faithful performance of the Contract and the payment of all obligations arising thereunder, including reimbursement for any stored materials paid for but returned to materialmen, with such sureties as the Owner may approve. The combination bond shall remain in effect throughout the entire construction period and in addition for a period of one year from the date of final acceptance. The Contractor shall deliver the required bonds to the Owner prior to execution of the Contract by the Owner unless authorized to the contrary in writing by the Owner. All bonds must be issued by bonding companies, which are licensed and approved by the Indiana Insurance Commission.

## 7.7 Owner's Right to Carry Out the Work

7.7.1 If the Contractor should default or neglect to carry out the Work properly or fail to perform any provision of the Contract, the Owner may, after giving seven (7) days written notice to the Contractor, without prejudice to any other remedy it may have, make good such deficiencies. In such case, an appropriate change order shall be issued deducting the cost thereof including the cost of the Designer's additional service made necessary by such default, neglect or failure of the Contractor, from the payments then or thereafter due the Contractor, provided, however, that the Designer shall approve both such action and the amount charged to the Contractor. If such payments due to the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

## 7.8 Royalties and Patents

7.8.1 The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from liability of any nature or kind including costs and expenses for or on account of any patented or unpatented invention, process, article or appliance manufactured or used in the performance of this Contract, including its use by the Owner.

## 7.9 Tests & Substitution of Materials

7.9.1 If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any work to be inspected, tested, or approved, the Contractor will give the Designer timely notice of its readiness and of the date fixed for such inspection, testing, or approval so that the Designer may observe the same. The Contractor shall bear all cost of such inspections, tests, and approvals unless otherwise provided.

7.9.2 If, after the commencement of the Work, the Designer, with approval of the Owner in writing, determines that the Work requires special inspection, testing, or approval for which subparagraph 7.9.1 does not provide, he will, upon written authorization from the Owner, order such special inspection, testing or approval. If such special inspection or test reveals a failure of the Work to fulfill the requirements of the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, the Contractor shall bear all costs thereof; otherwise the Owner shall bear such costs. An appropriate change order shall be issued.

7.9.3 Required certificates of inspection, testing or approval shall be secured by the Contractor and promptly delivered by him to the Designer.

7.9.4 Observations by the Designer of the inspections, tests, or approvals required by Article 7 will be promptly made, and where practicable at the source of supply at no additional cost to the Owner.

7.9.5 Neither the observations of the Designer in his administration of the Contract, nor inspections, tests or approvals by persons other than the Contractor shall relieve the Contractor from his obligations to perform the Work in accordance with the Contract Documents.

7.9.6 All building construction and work, alterations, repairs, plumbing, mechanical, and electrical installations and appliances connected therewith, shall comply with the Rules and Regulations of the Department of Fire and Building Services, State Board of Health, local ordinances, Rules for Licensure of Building Trades, and other statutory provisions pertaining to this class of work; such rules and regulations and local ordinances to be considered as a part of these specifications.

7.9.7 Where in these specifications, one or more certain materials, trade names, or articles of certain manufacture are mentioned, it is done for the express purpose of establishing a basis of durability and efficiency and not for the purpose of limiting competition. Approval of other acceptable products for those specified may be obtained by requesting to the Designer no later than fourteen (14) days in advance of bid date with all documentation required for the Designer to evaluate any approval. If approval is granted, the subject product will be added by addendum.

7.9.8 Should there be a reason for change of materials after award of the Contract, the following criteria shall apply:

- a. Original material no longer manufactured,
- b. Delivery not possible within time specified for job, and/or
- c. Unavailability due to causes beyond the control of the Contractor.

7.9.9 After agreement by the Designer and the Owner that a change is necessary, the Contractor shall present a request for substitution to the Designer. The burden of proof of the merit of the proposed substitute is upon the proposing party. The decision of the Designer and the Owner regarding the substitution shall be final.

7.10 Certificate of Qualification

7.10.1 In accordance with IC. 4-13.6-4 as amended, all Contractors and Subcontractors performing work for the State of Indiana on projects estimated to be in excess of one hundred fifty thousand dollars (\$150,000.00), must hold a valid Certificate of Qualification issued by the Public Works Certification Board. The Instructions to Bidders define the procedure for certification and bidding.

7.10.2 The Contractor must perform at least fifteen (15) percent of the total Contract Sum of the Work with his own forces. The Contractor shall submit copies of his payroll records, if requested by the Owner, showing the hours, rates and total costs for all personnel on his payroll detailed to the degree to ensure compliance with this paragraph and any Wage Determination provisions.

7.11 Appropriation

7.11.1 The Contract specifically limits payments to be made in accordance with appropriations made and funds made available under laws of the State of Indiana.

7.12 Federal Wage Determination if required

7.12.1 If a Davis-Bacon wage determination is included in the Contract Documents, it shall be used as the minimum wage and benefits to be paid for the trades indicated.

7.12.2 Contractor shall submit a schedule of hourly wages to be paid to each employee (including those of his subcontractors) engaged in work on the site. This submittal shall be on Contractor's letterhead stationery and shall be signed by the Contractor and notarized. A copy of this submittal shall be conspicuously posted at the site.

7.12.3 Said rates shall in no case be less than those set out in the Davis-Bacon wage schedule a copy of which is herein bound or is on file with the Owner if it is required.

7.12.4 The Contractor shall provide (and require each Subcontractor to provide) weekly payroll records listing employees engaged in work on the site for the week and the hourly rates for base pay and benefits paid to each employee listed. The payroll record form shall include a statement by the Contractor/Subcontractor certifying the accuracy and completeness of the information provided. Payroll records shall be maintained by the Contractor during the course of the Work until the end of the required warranty period.

7.13 Out-of-State Contractors

7.13.1 Proof of payment by Out-of-State Contractors of Indiana Gross Income Tax, as provided in IC. 6-2.1-5-1.1 (b) and 6-2.1-5-1.1 (a) (d) as amended shall be submitted before final payment will be approved.

7.13.2 Out-of-State Corporations must be authorized to do business in the State, IC. Title 23 prior to submitting bids. Forms may be obtained by contacting the Secretary of State, State of Indiana, Indianapolis, Indiana.

7.14 Material Delivery

7.14.1 Shipments of material to be used by the Contractor or any Subcontractor under this Contract should be delivered to the job site only during the regular working hours of the Contractor or Subcontractor. If a delivery is made during other than the normal working hours of the Contractor or Subcontractor, his authorized agent must be on duty to receive such material. No employee of the Owner is authorized to receive any shipments designated for the Contractor or Subcontractor.

## 7.15 Weather

7.15.1 The Contractor shall at all times provide protection against weather, rain, wind, storms, frost or heat, so as to maintain all work, materials, apparatus and fixtures free from injury or damage. At the end of the day's work, all new work likely to be damaged shall be covered.

7.15.2 During cold weather, the Contractor shall protect all work from damage. If low temperature makes it impossible to continue operations safely, in spite of cold weather precaution, the Contractor shall cease work and shall so notify the Owner and Designer.

7.15.3 Any work damaged by failure to provide protection above required, shall be removed and replaced with new work at the Contractor's expense.

7.15.4 The Contractor shall provide and maintain on the premises, where directed, watertight storage shed (or sheds) for storage of all materials, which might be damaged by exposure to weather.

## 7.16 Fire Hazards

7.16.1 Wherever and whenever any burning, welding, cutting or soldering operation is in progress, or equipment is in use, or any work involving a fire hazard, is performed, the Contractor responsible for such operation shall have at all times acceptable fire extinguisher or protection within five (5) feet of the operation.

## 7.17 Dismissal

7.17.1 Any foreman or workman employed by the Contractor or by any Subcontractor who, in the opinion of the Director, Public Works Division and/or the Designer, does not perform his work in a proper and skillful manner, or is disrespectful, intemperate, disorderly, intoxicated or otherwise objectionable shall at the written request of either of the above, be forthwith discharged by the Contractor or Subcontractor employing such foreman or workman and he shall not be employed again on any portion of the Work without the written consent of the Director of the Division of Public Works and the Designer. Should the Contractor fail to furnish suitable and sufficient machinery, equipment or personnel for the proper prosecution of the Work, the Owner or Designer may withhold all payments that are or may become due, or may suspend the Work until such orders are upheld.

## ARTICLE 8 TIME

### 8.1 Definitions

8.1.1 Unless otherwise provided, the Contract Time is the period of time allotted in the Contract Documents for Substantial Completion of the Work as defined herein, including authorized adjustments thereto.

8.1.2 The date of commencement of the Work is the date established in a notice to proceed. If there is no notice to proceed, it shall be the date of the Governor's signature on the Owner-Contractor Agreement or such other date as may be established therein.

8.1.3 The Date of Substantial Completion of the Work, or designated portion thereof, is the date certified by the Director, Public Works Division when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner may occupy or utilize the Work, or designated portion thereof, for the use for which it is intended.

8.1.4 The term day as used in the Contract Documents shall mean calendar day unless otherwise specifically designated.

### 8.2 Progress and Completion

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

8.2.2 The Contractor shall begin the Work on the date of commencement as defined herein. He shall carry the Work forward expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

8.2.3 The Owner fully expects the Contractor to employ any and all means necessary to complete the Work within the Contract Time. Conduct of the Owner's affairs, such as unforeseen site conditions or delay in processing change orders, shall not be viewed as justification for delaying the Project unless the Owner can be shown to have breached the Contract. Contractor must employ all reasonable means to execute the Project in a timely manner and in conformance with the Contract Documents even if the Contractor or Designer seeks legal remedy against the Owner for claim of damage.

### 8.3 Delays and Extensions of Time

8.3.1 If the Contractor is delayed at any time in the progress of the Work by any act or neglect of the Owner or the Designer, or by any employee of either, or by any separate Contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in transportation, adverse weather conditions not reasonable to anticipate, unavoidable casualties, or

any causes beyond the Contractor's control, or by delay authorized by the Owner pending arbitration, or by any other cause which the Designer determines may justify the delay, then the Contract Time shall be extended by a Change Order for such reasonable time as the Designer may determine.

8.3.2 Claims for extension of time shall be made in writing to the Designer. In case of a continuing delay only one claim is necessary. The Contractor shall provide an estimate of the probable effect of such delay on the progress of the Work.

8.3.3 If no agreement is made stating the dates upon which interpretations as provided in Article 2.2 shall be furnished, then no claim for delay shall be allowed on account of failure to furnish such interpretations until fifteen days after written request is made for them, and not unless such claim is reasonable.

8.3.4 This Paragraph 8.3 does not exclude the recovery of damages for delay by either party under other provisions of the Contract Documents.

## ARTICLE 9 PAYMENTS AND COMPLETION

### 9.1 Contract Sum

9.1.1 The Contract Sum is the total amount payable by the Owner for the performance of the Work under the Contract Documents.

### 9.2 Schedule of Values

9.2.1 Before the first application for payment, the Contractor shall submit to the Owner a schedule of various parts of the Work, including quantities if required by the Owner, aggregating the total Contract Sum, divided so as to facilitate payments to Subcontractors in accordance with Article 5.3, made out in such form as the Owner and the Contractor may agree upon, and supported by such data to substantiate its correctness as the Owner may require. Each item in the Schedule of Values shall include its proper share of overhead, profit, and other general charges. This schedule, when approved by the Owner, shall be used as a basis for the Contractor's Applications for Progress and Final Payments.

### 9.3 Progress Payments

9.3.1 Completed work: The Contractor shall submit to the Designer an itemized Application for Payment, supported by such data substantiating the Contractor's right to payment as the Designer may direct. The Owner shall make payments on account of the Contract, upon issuance of Certificates of Payment certified by the Designer and the Owner's Representative, for labor and materials incorporated into the Work at the rate of ninety four (94%) percent of such value until fifty (50%) percent of the value of the Work is completed. After that fifty (50%) percent, no further retainage will be deducted. The Director, Public Works Division has the option to require that three (3%) percent of the value of the Work be retained throughout the duration of the entire Contract. The retainage schedule shall be determined prior to award of Contract. Retainage may be paid with final payment at the discretion of the Director, Public Works Division, but shall not be paid in any event until a minimum of sixty one (61) days after all work is completed.

9.3.2 Materials Stored: Payments may be made on account for materials or equipment not incorporated in the Work, but delivered and suitably stored at the site. With written approval of the Owner, materials may be stored at another location other than the Work site if properly identified as the property of the Owner and properly protected. Storage of material at the place of business of the vendor is not acceptable (25 IAC 2-9-2). Such payments shall be conditional upon the submission by the Contractor of one of the following: 1) receipts marked by the supplier as paid; 2) supplier's final waiver of lien listing specific materials involved; 3) invoice with copy of canceled check showing payment; or 4) such other evidence of payment as the Owner may require in lieu thereof to establish ownership of all items except those listed as miscellaneous materials below. For the aggregate of miscellaneous stored materials for which payment is requested and above proof of payment is not available, a complete list will be provided along with the affidavit of payment. Upon certification by the Owner's representative that the listed materials are suitably stored, payment can be made. Miscellaneous materials are defined as pipe, fittings, wire, conduit, etc., normally stored as stock items in Contractor's warehouse. For materials stored other than at the construction site applicable insurance and transportation to the site shall be provided by the Contractor.

9.3.3 As stored materials are incorporated into the Work, the value shall be removed from the total value of stored materials requested in successive payments. Proof of ownership through one of the above methods will be required for additional materials. When, in the judgment of the Owner, retainage for completed work is not sufficient in relation to excessive amounts requested for stored materials or equipment, the Owner may elect to place the retainage for such materials or equipment in escrow. This retainage shall apply as a credit toward retainage due to be held for completed work on future payments.

9.3.4 The Contractor warrants that title to all work, materials and equipment covered by an Application for Payment will pass to the Owner either by incorporation in the construction or upon the receipt by the Contractor of payment, whichever occurs first, free and clear of all liens, claims, security interest or encumbrances, hereinafter referred to in this Article 9 as "liens"; and that no Work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest

therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

9.3.5 The Contractor shall accompany each application for payment request with a certification that he paid to all Subcontractors (fabricators) within ten (10) days of receipt of payment that pro rata amount of funds he has received from the Owner for the value of work or services (fabricated materials or equipment) performed by the Subcontractor (supplied by fabricator) contained in previous progress payments. The Contractor's inclusion of a value of subcontract work in his progress pay estimate is prima facie evidence of acceptance of work having such a value; therefore, if the Owner receives a certification from a Subcontractor that he has not been paid such amounts as were included in the Contractor's partial billing and subsequently paid to the Contractor by the Owner, then the Owner will hold all subsequent partial payment requests until satisfactory evidence is received from the Subcontractor that he has been paid such amounts presented to the Owner by the Contractor, paid to the Contractor by the Owner, and not distributed by the Contractor to the Subcontractor. The making of an incorrect certification of either partial payment or final payment may be considered by the Owner to be a breach of contract, and it may exercise all of its prerogatives set out in the Contract in addition to the remedies for falsifying an affidavit. Such an action could result in a suspension of qualification with the State Certification Board for a period of up to two (2) years.

#### 9.4 Certificates for Payment

9.4.1 When the Contractor has made application for payment as above, the Designer will issue a Certificate of Payment to the Owner for such amount as he determines to be properly due, or state in writing his reasons for withholding a certificate as provided in Articles 9.5.1.

9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Designer to the Owner, based on the Designer's observations at the site as provided in Article 2.2.4 and the data comprising the Application for Payment, that the Work has progressed to the point indicated, and that, to the best of his knowledge, information and belief, the quality of work is in accordance with the Contract Documents subject to an evaluation of the Work as a functioning whole upon substantial completion, to the results of any subsequent tests called for in the Contract documents, to minor deviations correctable prior to the next certificate for payment and to any specific qualifications stated in his certificate, and that the Contractor is entitled to payment in the amount certified.

9.4.3 The Designer's final Certificate for Payment will constitute a further representation that the conditions precedent to the Contractor's being entitled to final payment as set forth in Article 9.7 have been fulfilled. However, by issuing a Certificate, the Designer shall not thereby be deemed to represent that he has made any examination to ascertain how or for what purpose the Contractor has used the monies paid on account of the Contract Sum.

9.4.4 The Owner shall make payment as soon as the fiscal procedure of the State can process same after receipt from the Designer of the Certificate for Payment. The fiscal procedure by the State can include, but not be limited to, review by the Owner's using agency, verification of the Certificate by the Owner's Site Representative, review for accuracy of form and calculation by the Owner's accountant, review by the Owner's project management and execution by the Director, Public Works Division and others.

9.4.5 No certificate for a progress payment or progress payment for partial or entire occupancy of the Project by the Owner shall constitute an acceptance of work not in accordance with the Contract Documents.

9.4.6 Pursuant to IC. 4-13.6-7-2 all Contract awards of One Million Dollars (\$1,000,000) or above, if elected by the Contractor, an escrow agent will be selected by the State with whom the retainage funds for this Contract will be deposited and held until receipt of notice from the Director, Public Works Division (Escrow Form DAPW 32A) and from all other necessary parties as specified in and in accordance with the procedures and provisions of said Act.

#### 9.5 Payments Withheld

9.5.1 The Designer (or Owner) will not approve an application in whole or in part, if in his opinion, he is unable to make representations to the Owner as provided in Article 9.4. The Designer (or Owner) will not approve Application for Payment or, because of subsequent inspections, may nullify the whole or any part of the Certificate for Payment previously issued to such extent as may be necessary in his opinion to protect the Owner from loss because of:

- A. defective work not remedied,
- B. claim filed or reasonable evidence indicating probable filing of claims,
- C. failure of the Contractor to make payments properly to Subcontractors or for materials, equipment or labor,
- D. reasonable doubt that the Contract can be completed for the unpaid balance,
- E. damage to another Contractor,
- F. reasonable indication that the Owner may be damaged by delay in receiving use of the Work as scheduled, or,
- G. unsatisfactory prosecution of the Work by the Contractor.

9.5.2 When the above grounds are removed, payment shall be processed for amounts withheld.

## 9.6 Failure of Payment

9.6.1 If the Designer should fail to issue any Certificate for Payment, through no fault of the Contractor, or if the Owner should fail to pay the Contractor in a reasonable time considering the fiscal procedures of the State for processing same after receipt from the Designer the amount certified by the Designer, then the Contractor may, after seven (7) additional days, give written notice to the Owner and Designer, that work will stop until payment of the amount owing has been received.

## 9.7 Substantial Completion and Final Payment

9.7.1 When advised by the Contractor that the Work or a designated portion thereof is substantially complete, the Designer; the Director, Public Works Division, and the Contractor shall determine jointly by inspection that the Work is substantially complete. If they determine that the Work is substantially complete, the Contractor shall then prepare a Certificate of Substantial Completion with an accompanying list of incomplete items of work (punch list), and submit it to the Designer for his signature and subsequent forwarding for approval by the Director, Public Works Division. The Certificate shall fix the date of Substantial Completion and shall state the responsibilities of the Owner and the Contractor for maintenance, heat, utilities and insurance.

9.7.2 Upon approval of the above, and notice that the Work is ready for final acceptance, the Designer, the Contractor and Owner will promptly make final review, and when they find the Work acceptable under the Contract and the Contract fully performed, the Contractor shall promptly submit the final Certificate for Payment with all other required documents, showing that the Work has been completed in accordance with the terms and conditions of the Contract, and that the entire balance in said final certificate, is due and payable.

9.7.3 Neither the final payment nor any part of the retained percentage shall become due until the Contractor shall submit to the Designer releases or waivers of all liens arising out of the Contract; an affidavit that the releases and waivers include all the labor, materials, and equipment for which a lien could be filed and that all payrolls, material bills, and other indebtedness connected with the Work for which the Owner or its property might in any way be responsible have been paid or otherwise satisfied; and such other data establishing payment or satisfaction of all such obligations as the Owner may require. If any such lien or claim remains unpaid, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such lien or claim, including all costs.

9.7.4 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor, and the Designer so confirms, the Owner shall, upon certification by the Designer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted, or such portion as may be available from funds not already released to an escrow agent pursuant to IC 4-13.6-7. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

9.7.5 The making of final payment shall constitute a waiver of all claims by the Owner except those arising from:

- A. unsettled liens,
- B. faulty work appearing after Substantial Completion,
- C. failure of the Work to comply with the requirements of the Contract Documents,
- D. terms of any special guarantees required by the Contract Documents.

9.7.6 If upon Substantial Completion of the Work there are any remaining uncompleted minor items, the Owner shall withhold, until those items are completed, an amount equal to two hundred percent (200%) of the value of each item as determined by the Designer or Owner.

9.7.7 The acceptance of final payment shall constitute a waiver of all claims by the Contractor, except those previously made in writing and still unsettled and covered by other agreed arrangements.

## ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

### 10.1 Safety Precautions and Programs

10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work.

### 10.2 Safety of Person and Property

10.2.1 The Contractor shall take all necessary precautions for the safety of, and will provide all necessary protection to prevent damage, injury, or loss to:

- A. all employees on the Project and all other persons who may be affected thereby,
- B. all the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, and,
- C. other property at the site or adjacent thereto, including trees, shrubs, lawns, pavements, roadways, structures and

utilities not designated for removal, relocation or replacement in the course of construction.

10.2.2 The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss. He shall erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent utilities.

10.2.3 All damage or loss to all property specified herein caused directly or indirectly, in whole or in part, by the Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, shall be remedied by the Contractor, except damage or loss attributable solely to faulty Contract Documents or to the acts or omissions of the Owner, or Designer or their employees, or for those whose acts either of them may be liable.

10.2.4 The Contractor shall designate a responsible member of his organization on the Work whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent, unless otherwise designated in writing by the Contractor to the Owner and the Designer.

10.2.5 When the use or storage of explosives or other hazardous materials or equipment is necessary for the prosecution of the Work, the Contractor shall carry on such activities under the supervision of properly qualified personnel.

10.2.6 The Contractor shall not overload, or permit any part of the Work to be loaded so as to endanger its safety.

10.2.7 All excavations creating a trench of five (5) or more feet in depth shall strictly adhere to the shoring and other safety requirements called for and described under Indiana OSHA Regulation 29 C.F.R. 1926, Subpart "P", for trench safety systems.

### 10.3 Emergencies

10.3.1 In an emergency affecting the safety of persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor because of emergency work shall be determined as provided for in Article 12, Changes in the Work, and he shall notify the Owner of such a decision within seven (7) days of the event giving rise to such claim.

## ARTICLE 11 INSURANCE

### 11.1 General Requirements for Insurance

11.1.1 The Contractor will be required to furnish to the Owner, evidence that he has complied with all items of insurance listed herein. All insurance policies/certificates shall be on file with the Owner prior to release of the signed Contract and commencement of work.

11.1.2 The Contractor shall purchase and maintain, with a company or companies licensed to do business in Indiana, such insurance as will protect him from claims set forth below, arising out of or resulting from the Contractor's operations under the Contract, whether such operations be by the Contractor or by any Subcontractor or by anyone directly or indirectly employed by any of them:

- A. claims under Workmen's Compensation Acts and other employee benefit acts;
- B. claims for damages because of bodily injury, personal injury, occupational sickness or disease, or death of his employees;
- C. claims for damages because of bodily injury, personal injury, sickness, disease or death of any person other than his employees;
- D. claims for damages to tangible property, including loss of use thereof.

11.1.3 This insurance shall be written for not less than any limits of liability specified herein, or required by law, whichever is greater. Policies or certificates of insurance, acceptable to the Owner, shall be filed with the Owner prior to execution of the Contract. These Certificates shall contain a provision that coverages afforded under the policies will be for the life of the Work.

11.1.4 Policies (certificates) shall show name and complete address of the Company, expiration date or dates, and policy number or numbers. Policies shall not be canceled until at least thirty (30) days prior written notice has been given to the Owner and acknowledged by the Owner in writing.

## 11.2 Property Insurance

11.2.1 The Contractor shall furnish and maintain, at the Contractor's expense, Fire, Extended Coverage, Vandalism, and Malicious Mischief Insurance (Builder's Risk), in the sum of 100% of the Contract amount. Builder's Risk insurance shall cover the structure on/in which the Work of this Contract is to be done including items of labor and material connected therewith, whether in or adjacent to the structure insured; material in place or to be used as part of the permanent construction, including surplus materials; shanties, protective fences, bridges, or temporary structures; miscellaneous materials and supplies incident to the Work; scaffolding, staging, towers, forms, and equipment, if included in the cost of the Work. This insurance need not cover any tools owned by mechanics, or any tools, equipment, scaffolding, staging, towers, and forms owned or rented by the Contractor, the capital value of which is not included in the cost of the Work.

11.2.3 Any loss under this Article 11.2 is to be adjusted with the Owner, and made payable to the Owner as trustee for the insured, as their interests may appear.

## 11.3 Liability Insurance

11.3.1 The Contractor and their subcontractors (if any) shall secure and keep in force during the term of this Contract the following insurance coverages (if applicable) covering the Contractor for any and all claims of any nature which may in any manner arise out of or result from Contractor's performance under this Contract:

- A. Commercial general liability, including contractual coverage, and products or completed operations coverage (if applicable), with minimum liability limits not less than \$700,000 per person and \$5,000,000 per occurrence unless additional coverage is required by the State. The State is to be named as an additional insured on a primary, non-contributory basis for any liability arising directly or indirectly under or in connection with this Contract.
- B. Automobile liability for owned, non-owned and hired autos with minimum liability limits of \$700,000 per person and \$5,000,000 per occurrence. The State is to be named as an additional insured on a primary, non-contributory basis.
- C. The Contractor shall provide proof of such insurance coverage by tendering to the undersigned State representative a certificate of insurance prior to the commencement of this Contract and proof of workers' compensation coverage meeting all statutory requirements of IC §22-3-2. In addition, proof of an "all states endorsement" covering claims occurring outside the State is required if any of the services provided under this Contract involve work outside of Indiana.
- D. The Contractor's insurance coverage must meet the following additional requirements:
  1. The insurer must have a certificate of authority or other appropriate authorization to operate in the state in which the policy was issued.
  2. Any deductible or self-insured retention amount or other similar obligation under the insurance policies shall be the sole obligation of the Contractor.
  3. The State will be defended, indemnified and held harmless to the full extent of any coverage actually secured by the Contractor in excess of the minimum requirements set forth above. The duty to indemnify the State under this Contract shall not be limited by the insurance required in this Contract.
  4. The insurance required in this Contract, through a policy or endorsement(s), shall include a provision that the policy and endorsements may not be canceled or modified without thirty (30) days' prior written notice to the undersigned State agency.
  5. The Contractor waives and agrees to require their insurer to waive their rights of subrogation against the State of Indiana.
- E. Failure to provide insurance as required in this Contract may be deemed a material breach of contract entitling the State to immediately terminate this Contract. The Contractor shall furnish a certificate of insurance and all endorsements to the State before the commencement of this Contract.
- F. Boiler and Machinery Explosion Insurance shall be required when the Work includes boiler, other pressure

vessels or steam piping installation or repair.

- G. After June 30, 2015, this entire Article will apply to any contractor that will be on the construction site pursuant to IC 5-16-13 and an acceptable certificate of insurance will be provided by each and every contractor

## ARTICLE 12 CHANGES IN THE WORK

### 12.1 Change Orders

12.1.1 The Owner, without invalidating the Contract, may order changes in the Work consisting of additions, deletions, or modifications, with the Contract Sum and the Contract Time being adjusted accordingly. All such changes in the Work shall be authorized by Change Order, and shall be executed under the applicable conditions of the Contract Documents.

12.1.2 A Change Order is a written order to the Contractor compiled and reviewed by the Designer, prepared by the Owner and then signed by the Owner and the Contractor. The order is issued after the execution of the Contract authorizing a change in the Work, and documenting any adjustment in the Contract Sum and/or the Contract Time. The Contract Sum may be changed only by change order.

12.1.3 The value of any work involved in a change in the Work shall be determined in one or more of the following ways, in order of priority listed:

- A. by mutual acceptance of a lump sum. For all amounts over \$500, the Contractor shall provide a complete listing of quantities and unit prices of materials, hours of labor with cost per hour, and separate agreed percentages for any overhead and profit. The maximum aggregate increase for overhead and profit (including all home office and field office overhead) for any Subcontractor or for the Contractor performing his own work is fifteen (15%) percent; the maximum increase for a Contractor on work performed by a Subcontractor is five (5%) percent. If the cost of performance and payment bond(s) is shown as a separate line item in the Contractor's schedule of values for the project, then an increase will be permitted to provide for the additional cost of the bond(s). If the cost of the bond(s) is not indicated on the Contractor's schedule of values for the Project, any increase in cost for bond(s) shall be included in the Contractor's allowed overhead. For listings under \$500, list lump sum for each item, or,
- B. by unit prices named in the Contract or subsequently agreed upon, or,
- C. by cost plus a mutually acceptable fixed or percentage fee.

12.1.4 Should conditions be encountered below the surface of the ground that are:

- A. at variance with the conditions indicated by the Contract Documents, and
- B. different than could be expected after a reasonable viewing of the site by the bidders, and
- C. not evident from available soil samples,

then the Contract sum may be equitably adjusted by Change Order upon claim by Contractor made within a reasonable time after the first observance of the conditions.

12.1.5 If the Contractor claims that a written interpretation issued pursuant to Article 1.2 or a written order for a minor change issued pursuant to Article 12.3 involves additional cost or time, the Contractor shall make such claim as provided in Article 12.2.

### 12.2 Claims for Additional Cost or Time

12.2.1 If the Contractor wishes to make a claim under the provisions of the Contract Documents for an increase in the Contract Sum or an extension in the Contract Time, he shall give the Designer written notice thereof within fifteen (15) days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor and authority received in writing from the Owner before proceeding to execute the Work, except in an emergency endangering life or property. No such claim shall be valid unless so made. Any approved change in the Contract Sum or Contract Time resulting from such claim shall be incorporated in a Change Order, initiated by the Designer and executed by the Owner. If the Designer does not initiate or the Owner execute a Change Order within a reasonable time in response to the request, such lack of action shall be construed as prima facie evidence of rejection of the request. For the purpose of this section "reasonable time" is expected not to exceed 30 days after receipt by the Owner.

### 12.3 Minor Changes in the Work

12.3.1 The Designer shall have authority, with Owner's approval, to order minor changes in the Work not involving an increase in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such change may be affected by written field order, with copy transmitted to the Owner. Such minor changes need not be approved in writing by the Owner; however, the Owner may provide written approval of any substitution of significant materials or equipment.

### 12.4 Field Orders

12.4.1 The Designer may issue written field orders, which interpret the Contract Documents in accordance with Article 1.2.4 without change in Contract Sum or Contract Time. The Contractor shall carry out such field orders promptly. The Designer shall

transmit copies of field orders to the Owner.

## ARTICLE 13 EXAMINATION AND CORRECTION OF WORK

### 13.1 Examination of Work

13.1.1 If any portion of the Work should be covered contrary to the request of the Designer or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Designer, be uncovered for his observation and shall be replaced at the Contractor's expense.

13.1.2 Examination of questioned work may be ordered by the Designer with the approval of the Owner, and if so ordered the Work must be uncovered by the Contractor. If such work were found in accordance with the Contract Documents, the cost of re-examination and replacement shall, by appropriate change order, be charged to the Owner. If such work be found not in accordance with the Contract Documents, the Contractor shall pay such costs, unless it is found that the defect in the Work was caused by a separate Contractor employed as provided in Article 6 and in that event, the separate Contractor shall pay such costs.

### 13.2 Correction of Work before Substantial Completion

13.2.1 The Contractor shall promptly remove from the site all work rejected by the Designer as failing to conform to the Contract Documents, whether or not incorporated in the Project, and the Contractor shall promptly replace and re-execute his own work in accordance with the Contract Documents and without cost to the Owner and shall bear the cost of repair to or replacement of all work of separate Contractors destroyed or damaged by such removal or replacement.

13.2.2 If the Contractor does not remove such rejected work within a reasonable time, fixed by written notice from the Designer, the Owner may remove and store the material at the expense of the Contractor. If the Contractor does not agree to pay or credit the Contract with the cost of such removal within ten days thereafter, the Owner may acquire a lien upon such property and materials. If proceeds of lien foreclosure do not cover all costs, which the Owner has then borne, the difference shall be deducted from the amount to be paid to the Contractor.

### 13.3 Correction of Work after Substantial Completion

13.3.1 The Contractor shall correct all faults and deficiencies in the Work which appear within one year of the date of substantial completion or such longer period of time as may be prescribed by the terms of any special guarantees called for by the Contract Documents, and he shall pay for all damage to other work caused thereby. The Contractor shall remove all defective work where necessary.

13.3.2 If the Contractor does not correct such faulty or defective work and remove defective work where necessary, within a reasonable time fixed by the Designer in writing, the Owner may do the corrective work and remove the defective work, as described in Article 13.2 above.

13.3.3 All costs attributable to correcting and removing faulty or defective work shall be borne by the Contractor.

13.3.4 The obligations of the Contractor under this Article 13.3 shall be in addition to and not a limitation of any obligations imposed upon him by special guarantees called for by the Contract Documents or otherwise prescribed by law.

## ARTICLE 14 TERMINATION OF THE CONTRACT

### 14.1 Termination by the Contractor

14.1.1 If the Work is stopped for a period of thirty days under an order of any court or other public authority through no act of fault of the Contractor or of anyone employed by the Contractor, or if the Work should be stopped for a period of thirty days by the Contractor for the Designer's failure to issue a Certificate for payment as provided in Article 9.6, or for the Owner's failure to make payment thereon as provided in said Article, then the Contractor may, upon seven days' written notice to the Owner and the Designer, terminate the Contract and recover from the Owner, in satisfaction of all claims of the Contractor, payment for all work executed, except those items involved in Designer's failure to issue Certificate, or Owner's failure to make payment.

### 14.2 Termination by the Owner

14.2.1 If the Contractor should be adjudged bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if he should fail to make prompt payment to Subcontractors for materials or labor, or persistently disregard laws, ordinances, rules, regulations or orders of any public authority or otherwise be guilty of a substantial violation of a provision of the Contract Documents, then the Owner, upon certification by the Designer that sufficient cause exists to justify such action, may without prejudice to any right or remedy against the Contractor or his surety and after giving the Contractor and his surety seven days written notice, terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor and finish the Work by whatever method the Owner

deems expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is completed, and an accounting made as set out below.

14.2.2 If the unpaid balance of the Contract sum exceeds the cost of finishing the Work, including compensation for the Designer's additional services such excess shall be paid to the Contractor. If such cost exceeds such unpaid balance, the Contractor shall pay the difference to the Owner. The Designer shall certify the cost incurred by the Owner as herein provided.

END

# Indiana Department of Administration M/WBE Participation Policy for Construction Projects

## I. Introduction

The Indiana Department of Administration (“IDOA”) in its commitment to Minority and Women participation in the state’s procurement and contracting process, will require MBE and WBE participation or a best-efforts waiver as a specification in bids for construction services \$150,000 and over with subcontracting opportunities effective January 1, 2006. *See* Indiana Code 5-22-7, 5-22-7-2, 5-22-7-4.

## II. Definitions

“Application for MBE and WBE Program Waiver” means documents submitted by Bidder for relief from contract goal after demonstrating all reasonable good faith efforts were made by the Bidder for the purpose of fulfilling the contract goal. The Application for MBE and WBE Program Waiver may be submitted prior to the bid due date or included in the bid package response.

“Certification” means verification by the Indiana Department of Administration, Minority and Women's Business Enterprises Division (“MWBED”) or an organization accepted by MWBED with respect to the authenticity of a minority or women owned business enterprise.

“Commercially useful function” Determination that an enterprise performs a commercially useful function will be made based on the following considerations:

(1) An MBE or a WBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the MBE or WBE must also be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself. To determine whether an MBE or a WBE is performing a commercially useful function, one must evaluate the following:

- (A) The amount of work subcontracted.
- (B) Industry practices.
- (C) Whether the amount the enterprise is to be paid under the contract is commensurate with the work it is actually performing.
- (D) The credit claimed for its performance of the work.
- (E) Other relevant factors.

(2) An MBE or a WBE does not perform a commercially useful function if its role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of MBE or WBE participation. In determining whether an MBE or a WBE is such an extra participant, one must examine similar transactions, particularly those in which MBEs or WBEs do not participate.

(3) In the case of construction contracts, if:

- (A) an MBE or a WBE does not perform or exercise responsibility for at least the agency’s requisite percent of the total cost of its contract with its own workforce; or
- (B) the MBE or WBE subcontracts a greater portion of the work of a contract than would be expected on the basis of normal industry practice for the type of work involved;

it is presumed that the enterprise is not performing a commercially useful function.

“Letter of Commitment” means a letter obtained from the MBE and WBE’s by the Bidders. The Letter of Commitment is a signed letter(s), on company letterhead, from the minority and/or women certified business. It must be produced no later than 24 hours after the bid due date and time. This letter(s) shall state and will serve as acknowledgement from the minority and/or women certified business of their level of participation in this solicitation, the dollar amount of the commitment, the scope of service or product to be provided and the anticipated dates of utilization.

“Minority and Women Business Enterprises Division (MWBED)” means the Division which acts on behalf of the state to actively promote, monitor, and enforce the MBE AND WBE program. The final authority on all matters pertaining to the maintenance and administration of the MBE AND WBE program and compliance thereto.

“Minority/Woman Business Enterprise (MBE and WBE)” means an individual, partnership, corporation, limited liability company, or joint venture of any kind that is at least fifty-one percent (51%) owned and controlled by one (1) or more persons who are United States citizens and a member(s) of a minority group. The MBE and WBE must meet the eligibility requirements of 25 IAC 5.

“Participation Plan” means the IDOA prescribed document that sets forth the MBE and WBE subcontractors that will perform work under the contract.

### **III. Minority and Women Business Enterprise Certification**

MBE and WBEs must be listed on the IDOA directory of certified firms at the time the bid is submitted to be eligible to meet the contract goals. The bidder should verify that a firm is certified before the bid is submitted.

Questions regarding Certification should be addressed to the following:

Indiana Department of Administration  
Minority and Women's Business Enterprises Division  
402 West Washington Street, Room W469  
Indianapolis, IN 46204  
(317) 232-3061  
[www.buyindiana.in.gov](http://www.buyindiana.in.gov)  
[mwbe@idoa.in.gov](mailto:mwbe@idoa.in.gov)

### **IV. Bidding Process**

IDOA will review projects for viable subcontracting opportunities. All projects will be governed by this policy unless otherwise stated.

A representative from MWBED will attend most pre-bid meetings to discuss and answer questions related to the MBE and WBE participation requirement. The MWBED will be available to assist Bidders in locating MBE and WBE firms to engage in the contract.

The 2007-2008 Contract Goals for construction projects are 7% for MBE’s and 5% for WBE’s.

Effective January 1, 2006, the following procedures will be implemented in the acceptance and evaluation of responsive and responsible bids.

Bidders must produce a Participation Plan on the approved form listing the utilization of MBE and WBE subcontractors who will be providing a commercially useful function on the project. Letter of Commitment from MBE and WBE firms they plan to engage in the contract if successful on the bid

Per 25 IAC 5-6-2(d), all prime contractors, including MBE and WBE prime contractors, must meet the sub-contracting goals through use of businesses found in the IDOA directory of certified firms. MBE and WBE prime contractors will get no credit toward the contract goal for the use of their own workforce.

If the bidder can not achieve the Contract Goals established for the bid package, the bidder shall submit a Waiver Application on the form supplied by MWBED. Bidders may submit waiver applications to MWBED up to two business days in advance of the bid due date to obtain advance approval of the waiver, or the application may be submitted without advance approval with the bid package. Bidders who submit a Participation Plan that will achieve the Contract Goals are not required to submit a Waiver Application.

If a partial waiver is being requested, a Participation Plan listing the MBE and WBE certified firms that will be used to satisfy the portion of the goal that will be met, must be included. Partial waivers may be requested using the waiver application process discussed above. A faxed copy of the Letter of Commitment for each MBE and WBE firm that is listed in the Participation Plan must be provided by the Low Bidder to the appropriate department no later than 24 hours after the bid due date and time. The original letter(s) must be provided upon receipt.

MWBED will review Applications for MBE and WBE Program Waivers and make a determination as to the bidder's responsiveness and good faith efforts. Evidence of efforts should be included with the waiver form. Any combination of the following criteria may be utilized in determining whether good faith efforts have been made:

- A. Notice to MBE and WBEs. Whether and when the bidder provided written notice, by mail, hand delivery, facsimile or electronic transmission to all qualified MBE and WBEs that perform the type of work to be subcontracted and advising the MBE and WBEs:
  - 1. of the subject work the bidder intends to subcontract;
  - 2. that their interest in Subcontracts is being solicited;
  - 3. how to obtain information for the review and inspection of Contract plans and specifications; and
  - 4. how to bid on the subcontracting opportunities and deadlines.
  
- B. Economically Feasible Subcontract. Whether the bidder selected economically feasible portions of the work to be performed by an MBE and WBE, including, when appropriate, breaking Subcontracts into smaller pieces or combining elements of work into economically feasible units. The ability of the bidder to perform the work with its own forces will not excuse the bidder from making positive efforts to meet the MBE and WBE goals.

- C. Consideration of all MBE and WBE Quotations. Whether the bidder considered all quotations received from MBE and WBEs and, for those quotations not accepted, an explanation of why the MBE and WBE will not be used during the course of the Project. Receipt of a lower quotation from a non-MBE and WBE will not, in itself, excuse bidder's failure to meet the MBE and WBE goals. Price alone does not constitute an acceptable basis for rejecting MBE and WBE subcontractor bids unless the bidder can demonstrate that a reasonable price was not obtained from an MBE and WBE.
- D. MBE and WBE Barrier Assistance. Whether the bidder provided assistance to interested MBE and WBE firms: in reviewing the Contract plans and specifications or addressing other barriers to subcontracting.
- E. Advertisement. Whether the bidder advertised to search for prospective MBE and WBEs to participate in the Contract.
- F. Agency Assistance. Whether the bidder contacted any of the following agencies for the purpose of locating prospective MBE and WBEs:
1. Indiana Department of Administration  
Minority and Women's Business Enterprises Division  
402 West Washington Street, Room W469  
Indianapolis, IN 46204  
(317) 232-3061  
[mwbe@idoa.in.gov](mailto:mwbe@idoa.in.gov)
  2. Indiana Business Diversity Council, Inc.  
2126 North Meridian Street  
Indianapolis, IN 46202  
(317) 921-2678  
[mdhouse@inbdc.org](mailto:mdhouse@inbdc.org)
- G. Research Participation Areas. Whether the bidder made efforts to research other possible areas of participation including supplying, shipping, engineering and any other role that may contribute to the production and delivery of the products or services needed to fulfill the Contract.
- H. Response Time. The time the bidder allowed for a meaningful response to its solicitations.
- I. Documentation of Statements from MBE and WBEs. Any documentation or statements received from MBE and WBEs who have been listed as having been contacted by the bidder.
- J. Availability of MBE and WBEs. The availability of MBE and WBEs to perform the work and the availability, or lack of availability, of MBE and WBEs in the location where the work is to be performed.
- K. Other Criteria. Any other criteria deemed appropriate by MWBED.

This list is not intended to be exclusive or exhaustive. The bidder may also submit documentation of other types of efforts that they have taken which reflect the quality, quantity and intensity of those efforts.

When evaluating Waiver Applications, MWBED reserves the right to verify that any information supplied on the Participation Plan and Waiver Application is accurate. By the submittal of a bid, the bidder acknowledges the right of MWBED to ensure compliance with the Participation Program and thereby agrees to provide, upon request, earnest, diligent and prompt cooperation in MWBED's verification process.

In cases where MWBED concludes the bidder's Participation Plan and the Waiver Application is deficient through no fault of the bidder, the bidder may be instructed to submit a modified Participation Plan within five (5) working days from the date of such notice. Failure to submit the modified Participation Plan within the specified period of time, may result in the bid being considered non-responsive and may be rejected.

In cases where MWBED concludes that the Participation Plan and Waiver Application is deficient or in cases where MWBED has determined that the bidder has not cooperated with its efforts to verify the submitted documentation, a bid may be considered non-responsive and may be rejected.

If the established Contract Goals are not achieved but the Waiver Application is granted, the bid will be considered responsive. If the established Contract Goals are not achieved and the Waiver Application is denied, a bid may be considered non-responsive and may be rejected.

Failure to provide the Participation Plan and/or a Waiver Application accounting for the total participation goal set for the project will result in the bid being considered non-responsive and the bid may be rejected.

By submission of a bid, a bidder thereby acknowledges and agrees to be bound by the regulatory process set forth in 25 IAC 5.

A bidder who knowingly or intentionally misrepresents the truth about either the status of a firm that is being proposed as an MBE and WBE or who misrepresents the level of the nature of the amount to be subcontracted to the MBE and WBE may suffer penalties pursuant to Indiana Code 5-16-6.5-5.

A Contractor who knowingly or intentionally misrepresents the truth about his/her status as an MBE and WBE or who misrepresents the level or the nature of the amount subcontracted to his/her firm may suffer penalties pursuant to Indiana Code 35-44-2-1.

## **V. Compliance**

Contractors shall contract with all MBE and WBE firms listed on the Participation Plan. The subcontract or purchase order shall be for an amount that is equal to, or greater than, the total dollar amount listed on the form.

Contractors shall notify MWBED immediately if any firm listed on the Participation Plan refuses to enter into a subcontract or fails to perform according to the requirements of the subcontract.

The Contractor's proposed MBE and WBE Contract Goals will become incorporated into and a requirement of the Contract. Contractors shall not substitute, replace or terminate any MBE and WBE firm without prior written authorization from MWBED and the Owner.

Contractors shall cooperate and participate in compliance reviews as determined necessary by MWBED. Contractors shall provide all necessary documentation to show proof of compliance with the requirements as requested by MWBED.

## **VI. Non Compliance**

A bid governed by this policy that does not meet the participation goals or does not receive an approved waiver will NOT be considered.

After the bid is awarded and if it is determined by MWBED that the Contractor is not in compliance with this Participation Program, MWBED will notify the Contractor within ten (10) days after the initial compliance review or the site visit and identify the deficiencies found and the required corrective action that should be taken to remedy the deficiencies within a specific time period.

If a Contractor is found non-compliant, the Contractor must submit, in writing, a specific commitment, in writing, to correct the deficiencies. The commitment must include the precise action to be taken and the date for completion.

If MWBED determines the Contractor has failed to comply with the provisions of this Participation Program, Contractor's Utilization Statement or 25 IAC 5, IDOA may impose any or all of the following sanctions:

- a. Withholding payment on the Contract until such time that satisfactory corrective measures are made.
- b. Adjustment to payments due or the permanent withholding of retainages of the Contract.
- c. Suspension or termination of the specific Contract in which the deficiency is known to exist. In the event this sanction is employed, the Contractor will be held liable for any consequential damages arising from the suspension or termination of the Contract, including damages caused as a result of the delay or from increased prices incurred in securing the performance of the balance of the work by other Contractors.
- d. Recommendation to the certification board to revoke the contractor's certification status with the Public Works Division of IDOA. This recommendation may result in the suspension or revocation of the contractor's ability to perform on future state contracts for a period no longer than thirty-six (36) months.
- e. Continued non-compliance may be deemed a material breach of the agreement between MWBED and Contractor, whereupon MWBED shall have all the rights and remedies available to it under the Contract or at law.
- f. Suspension, revocation, or denial of the MBE or WBE certification and eligibility to participate in the MBE or WBE program for a period of not more than thirty-six (36) months.

## **VII. Forms and Attachments**

Minority Participation Plan  
Good Faith Efforts Worksheet

**STATE OF INDIANA'S  
STANDARD CONTRACT FOR PUBLIC WORKS CONSTRUCTION PROJECT  
(for projects estimated more than \$150,000)  
WORKS PROJECTNUMBER XXXXX  
[INSERT] PROJECT DESCRIPTION  
[INSERT] INSTITUTION/DEPARTMENT**

**THIS IS A PUBLIC WORKS CONSTRUCTION CONTRACT** ("Contract"), entered into by and between the Indiana Department of Administration's Public Works Division ("State") and XXXXXXXXXX ("Contractor"), executed pursuant to the terms and conditions set forth herein and is governed by Indiana Code 4-13.6, *et seq.*

**1. Definitions.** The following definition applies throughout this Contract:

For purposes of the State's Public Works Project Number XXXXX ("Project"), the term "Contract Documents" shall mean and include the following: this Contract and the Project Bid Package, which includes the Contractor's Application for Pre-Qualification, the Public Work's Solicitation for Quotation (DAPW 30), Bid Documentation, Pre-Contract Document, General Conditions (DAPW 26), Supplementary Conditions, Instructions to Bidders, Drawings, Specifications, and Addenda issued by the State in connection with the Project and prior to the submission of the Contractor's Proposal.

Subject to Section 39, *Order of Precedence, Incorporation by Reference*, of this Contract, Contract Documents shall also consist of the Contractor's Proposal and Response, as well as any other documentation submitted by it in response to the Project (hereinafter collectively referred to as "Contractor's Proposal").

Additionally, Contract Documents shall include any subsequent amendments, change orders and any written interpretations issued as field orders by the Designer pursuant to General Conditions, Article 1.2 (DAPW 26) and all field orders for minor changes by the Designer pursuant to General Conditions, Article 12.3 (DAPW 26). Change orders and amendments shall be executed in the manner authorized by Section 35, *Merger and Modification*, of this Contract.

When applicable, Contract Documents shall include the Performance Bond and/or the Labor and Materials Payment Bond, as required by IC 4-13.6-7-6 and IC 4-13.6-7-7, and fully described and captured in the General Conditions (DAPW 26).

The Contract Documents are specifically and collectively incorporated herein by reference.

**2. Duties of Contractor.** The Contractor shall furnish all labor and materials, perform all of the work, and otherwise fulfill all of its obligations in conformance with the Contract Documents. These duties are described and captured in the Contract Documents. The Contractor agrees that not less than fifteen percent (15%) of the work, measured in dollar volume, will be performed by its own forces. Any subcontractor employed for any part of this Contract awarded in excess of One Hundred Fifty Thousand Dollars (\$150,000.00) shall be qualified with the State of Indiana's Public Works Division Certification Board and shall have a valid Certificate of Qualification in the prime classification of work for this Contract.

**3. Consideration.** All payments provided herein are subject to appropriations made and funds allocated as provided by laws of the State of Indiana. The State shall pay the Contractor for performance of this Contract in current funds as follows:

BASE BID: \$XXXXXX.00  
ALTERNATE(S):  
TOTAL CONTRACT PRICE: \$XXXXXX.00

**4. Term.** The work to be performed under this Contract shall commence within ten (10) days of the last signatory to this Contract. The work shall be completed within XXX calendar days.

**5. Conflict of Interest.** As used in this section:

“Immediate family” means the spouse, partner, housemate or the unemancipated children of an individual, as defined by 42 Indiana Administrative Code 1-3-13.

“Interested party,” means:

1. The individual executing this Contract;
2. An individual who has an ownership interest of three percent (3%) or more of the Contractor, if the Contractor is not an individual; or
3. Any member of the immediate family of an individual specified under Subdivision 1 or 2.

“State” means the Indiana Department of Administration.

“State employee” means a state employee, a special state appointee or a state officer, as defined by IC 4-2-6-1(a)(9), (a)(18) and (a)(19), respectively.

- A. The Contractor covenants that it neither has, nor will it have, a direct or indirect financial interest by way of an interested party in any other contract connected or associated with this Contract. The Contractor further represents and warrants that no state employee, who is an interested party of the Contractor as sole proprietor, or who serves as an officer, director, trustee, partner or employee of the Contractor as a legal business entity, participated in any decision or vote of any kind in the award of this Contract. As such and by the execution of this Contract, the Contractor represents and warrants that the result of this Contract does not and will not create a conflict of interest under IC 4-2-6-9 or IC 4-2-6-10.5.
- B. The State may cancel this Contract, without recourse by the Contractor, if an interested party is a state employee and a violation of IC 4-2-6-9 or IC 4-2-6-10.5 has occurred.
- C. The State will not exercise its right of cancellation under Section B above, if the Contractor provides the State an opinion from the State Ethics Commission indicating that the existence of this Contract and the employment by the State of the interested party does not violate any statute or rule relating to ethical conduct of state employees. The State may take action, including cancellation of this Contract, consistent with an opinion of the State Ethics Commission obtained under this Section.
- D. The Contractor has an affirmative obligation under this Contract to disclose to the State when an interested party is or becomes a state employee. The obligation under this section extends only to those facts that the Contractor knows or reasonably should know.

**6. Licensing Standards.** The Contractor and its employees and subcontractors shall comply with all applicable licensing standards, certification standards, accrediting standards and any other laws, rules or regulations governing services to be provided by the Contractor pursuant to this Contract. The State shall not be required to pay the Contractor for any services performed when the Contractor, its employees or

subcontractors are not in compliance with such applicable standards, laws, rules or regulations. If licensure, certification or accreditation expires or is revoked, or if disciplinary action is taken against the applicable licensure, certification or accreditation, the Contractor shall notify the State immediately and the State, at its option, may immediately terminate this Contract.

**7. Escrow Agreement.** Contemporaneously with the execution of this Contract, the parties may provide for the escrow of retained portions of payments to the Contractor by entering into a separate Escrow Agreement, pursuant to IC 4-13.6-7, with an escrow agent described in IC 4-13.6-7-2(b). Should the Contractor elect to escrow retainage, the Escrow Agreement will become a part of this contract as if fully contained herein.

**8. Contractor's Certification.** The Contractor certifies that it has been pre-qualified by the State of Indiana's Public Works Division Certification Board to perform the work and furnish the services required by this Project. The Contractor further certifies that all information and documentation submitted by it in its Application for Prequalification Certification, the Contractor's Proposal and submitted in response to the Project, is true, accurate and complete as of the date of this Contract's effectiveness. The Contractor shall immediately notify the State of any material change to such information. The Contractor shall immediately notify the State if, during the course of performance of this Contract, it or any of its principals are proposed for debarment or ineligibility, or become debarred or declared ineligible, from entering into contracts with the federal government or any department, agency or political subdivision of the State.

**9. Contractor Employee Drug Testing.** Pursuant to IC 4-13-18, the Contractor shall implement the employee drug testing program submitted as part of its Contractor's Proposal. The State may cancel this Contract if it determines that the Contractor:

- A. Has failed to implement its employee drug testing program during the term of this Contract;
- B. Has failed to provide information regarding implementation of the Contractor's employee drug testing program at the request of the State; or
- C. Has provided to the State false information regarding the Contractor's employee drug testing program.

**10. Access to Records.** The Contractor and its subcontractors, if any, shall maintain all books, documents, papers, accounting records, and other evidence pertaining to all costs incurred under this Contract. They shall make such materials available at their respective offices at all reasonable times during this Contract, and for three (3) years from the date of final payment under this Contract, for inspection by the State or its authorized designees. Copies shall be furnished at no cost to the State if requested.

**11. Assignment; Successors.** The Contractor binds its successors and assignees to all the terms and conditions of this Contract. The Contractor shall not assign or subcontract the whole or any part of this Contract without the State's prior written consent. The Contractor may assign its right to receive payments to such third parties as the Contractor may desire without the prior written consent of the State, provided that the Contractor gives written notice (including evidence of such assignment) to the State thirty (30) days in advance of any payment so assigned. The assignment shall cover all unpaid amounts under this Contract and shall not be made to more than one party.

**12. Assignment of Antitrust Claims.** As part of the consideration for the award of this Contract, the Contractor assigns to the State all right, title and interest in and to any claims the Contractor now has, or

may acquire, under state or federal antitrust laws relating to the products or services which are the subject of this Contract.

**13. Audits.** The Contractor acknowledges that it may be required to submit to an audit of funds paid through this Contract. Any such audit shall be conducted in accordance with IC §5-11-1, *et seq.*, and audit guidelines specified by the State.

The State considers the Contractor to be a “vendor” for purposes of this Contract. However, if required by applicable provisions of the Office of Management and Budget Circular A-133 (Audits of States, Local Governments, and Non-Profit Organizations), following the expiration of this Contract the Contractor shall arrange for a financial and compliance audit of funds provided by the State pursuant to this Contract. Such audit is to be conducted by an independent public or certified public accountant (or as applicable, the Indiana State Board of Accounts), and performed in accordance with Indiana State Board of Accounts publication entitled “Uniform Compliance Guidelines for Examination of Entities Receiving Financial Assistance from Governmental Sources,” and applicable provisions of the Office of Management and Budget Circulars A-133 (Audits of States, Local Governments, and Non-Profit Organizations). The Contractor is responsible for ensuring that the audit and any management letters are completed and forwarded to the State in accordance with the terms of this Contract. Audits conducted pursuant to this paragraph must be submitted no later than nine (9) months following the close of the Contractor’s fiscal year. The Contractor agrees to provide the Indiana State Board of Accounts and the State an original of all financial and compliance audits. The audit shall be an audit of the actual entity, or distinct portion thereof that is the Contractor, and not of a parent, member, or subsidiary corporation of the Contractor, except to the extent such an expanded audit may be determined by the Indiana State Board of Accounts or the State to be in the best interests of the State. The audit shall include a statement from the Auditor that the Auditor has reviewed this Contract and that the Contractor is not out of compliance with the financial aspects of this Contract.

If Federal Funds are involved in this Contract, the State also considers the Contractor to be a “Contractor” under 2 C.F.R. 200.330 for purposes of this Contract. However, if required by applicable provisions of 2 C.F.R. 200 (Uniform Administrative Requirements, Cost Principles, and Audit Requirements), Contractor shall arrange for a financial and compliance audit, which complies with 2 C.F.R. 200.500 *et seq.*

**14. Authority to Bind Contractor.** The signatory for the Contractor represents that he/she has been duly authorized to execute this Contract on behalf of the Contractor and has obtained all necessary or applicable approvals to make this Contract fully binding upon the Contractor when his/her signature is affixed, and accepted by the State.

**15. Changes in Work.** The Contractor shall not commence any additional work or change the scope of the work until authorized in writing by the State. The Contractor shall make no claim for additional compensation in the absence of a prior written approval and amendment executed by all signatories hereto. This Contract may only be amended, supplemented or modified by a written document executed in the same manner as this Contract.

**16. Compliance with Laws.**

- A. The Contractor shall comply with all applicable federal, state, and local laws, rules, regulations, and ordinances, and all provisions required thereby to be included herein are hereby incorporated by reference. The enactment or modification of any applicable state or federal statute or the promulgation of rules or regulations thereunder after execution of

this Contract shall be reviewed by the State and the Contractor to determine whether the provisions of this Contract require formal modification.

- B. The Contractor and its agents shall abide by all ethical requirements that apply to persons who have a business relationship with the State as set forth in IC §4-2-6, *et seq.*, IC §4-2-7, *et seq.*, the regulations promulgated thereunder, and Executive Order 04-08, dated April 27, 2004. **If the Contractor has knowledge, or would have acquired knowledge with reasonable inquiry, that a state officer, employee, or special state appointee, as those terms are defined in IC 4-2-6-1, has a financial interest in the Contract, the Contractor shall ensure compliance with the disclosure requirements in IC 4-2-6-10.5 prior to the execution of this contract.** If the Contractor is not familiar with these ethical requirements, the Contractor should refer any questions to the Indiana State Ethics Commission, or visit the Inspector General's website at <http://www.in.gov/ig/>. If the Contractor or its agents violate any applicable ethical standards, the State may, in its sole discretion, terminate this Contract immediately upon notice to the Contractor. In addition, the Contractor may be subject to penalties under IC §§4-2-6, 4-2-7, 35-44-1-3, and under any other applicable laws.
- C. The Contractor certifies by entering into this Contract that neither it nor its principal(s) is presently in arrears in payment of taxes, permit fees or other statutory, regulatory or judicially required payments to the State of Indiana. The Contractor agrees that any payments currently due to the State of Indiana may be withheld from payments due to the Contractor. Additionally, further work or payments may be withheld, delayed, or denied and/or this Contract suspended until the Contractor is current in its payments and has submitted proof of such payment to the State.
- D. The Contractor warrants that it has no current, pending or outstanding criminal, civil, or enforcement actions initiated by the State, and agrees that it will immediately notify the State of any such actions. During the term of such actions, the Contractor agrees that the State may delay, withhold, or deny work under any supplement, amendment, change order or other contractual device issued pursuant to this Contract.
- E. If a valid dispute exists as to the Contractor's liability or guilt in any action initiated by the State or its agencies, and the State decides to delay, withhold, or deny work to the Contractor, the Contractor may request that it be allowed to continue, or receive work, without delay. The Contractor must submit, in writing, a request for review to the Indiana Department of Administration (IDOA) following the procedures for disputes outlined herein. A determination by IDOA shall be binding on the parties. Any payments that the State may delay, withhold, deny, or apply under this section shall not be subject to penalty or interest, except as permitted by IC §5-17-5.
- F. The Contractor warrants that the Contractor and its subcontractors, if any, shall obtain and maintain all required permits, licenses, registrations, and approvals, and shall comply with all health, safety, and environmental statutes, rules, or regulations in the performance of work activities for the State. Failure to do so may be deemed a material breach of this Contract and grounds for immediate termination and denial of further work with the State.
- G. The Contractor affirms that, if it is an entity described in IC Title 23, it is properly registered and owes no outstanding reports to the Indiana Secretary of State.

H. As required by IC §5-22-3-7:

- (1) The Contractor and any principals of the Contractor certify that:
  - (A) The Contractor, except for de minimis and nonsystematic violations, has not violated the terms of:
    - (i) IC §24-4.7 [Telephone Solicitation Of Consumers];
    - (ii) IC §24-5-12 [Telephone Solicitations]; or
    - (iii) IC §24-5-14 [Regulation of Automatic Dialing Machines];in the previous three hundred sixty-five (365) days, even if IC §24-4.7 is preempted by federal law; and
  - (B) The Contractor will not violate the terms of IC §24-4.7 for the duration of the Contract, even if IC §24-4.7 is preempted by federal law.
- (2) The Contractor and any principals of the Contractor certify that an affiliate or principal of the Contractor and any agent acting on behalf of the Contractor or on behalf of an affiliate or principal of the Contractor, except for de minimis and nonsystematic violations,
  - (A) Has not violated the terms of IC §24-4.7 in the previous three hundred sixty-five (365) days, even if IC §24-4.7 is preempted by federal law; and
  - (B) Will not violate the terms of IC §24-4.7 for the duration of the Contract, even if IC §24-4.7 is preempted by federal law.

**17. Condition of Payment.** All services provided by the Contractor under this Contract must be performed to the State's reasonable satisfaction, as determined at the discretion of the undersigned State representative and in accordance with all applicable federal, state, local laws, ordinances, rules and regulations. The State shall not be required to pay for work found to be unsatisfactory, inconsistent with this Contract or performed in violation of and federal, state or local statute, ordinance, rule or regulation.

**18. Confidentiality of State Information.** The Contractor understands and agrees that data, materials, and information disclosed to the Contractor may contain confidential and protected information. The Contractor covenants that data, material, and information gathered, based upon or disclosed to the Contractor for the purpose of this Contract will not be disclosed to or discussed with third parties without the prior written consent of the State.

The parties acknowledge that the services to be performed by Contractor for the State under this Contract may require or allow access to data, materials, and information containing Social Security numbers maintained by the State in its computer system or other records. In addition to the covenant made above in this section and pursuant to 10 IAC 5-3-1(4), the Contractor and the State agree to comply with the provisions of IC §4-1-10 and IC §4-1-11. If any Social Security number(s) is/are disclosed by Contractor, Contractor agrees to pay the cost of the notice of disclosure of a breach of the security of the system in addition to any other claims and expenses for which it is liable under the terms of this Contract.

**19. Continuity of Services.**

- A. The Contractor recognizes that the service(s) to be performed under this Contract are vital to the State and must be continued without interruption and that, upon Contract expiration, a successor, either the State or another contractor, may continue them. The Contractor agrees to:
  - 1. Furnish phase-in training; and
  - 2. Exercise its best efforts and cooperation to effect an orderly and efficient transition to a successor.
  
- B. The Contractor shall, upon the State's written notice:
  - 1. Furnish phase-in, phase-out services for up to sixty (60) days after this Contract expires; and
  - 2. Negotiate in good faith a plan with a successor to determine the nature and extent of phase-in, phase-out services required. The plan shall specify a training program and a date for transferring responsibilities for each division of work described in the plan, and shall be subject to the State's approval. The Contractor shall provide sufficient experienced personnel during the phase-in, phase-out period to ensure that the services called for by this Contract are maintained at the required level of proficiency.
  
- C. The Contractor shall allow as many personnel as practicable to remain on the job to help the successor maintain the continuity and consistency of the services required by this Contract. The Contractor also shall disclose necessary personnel records and allow the successor to conduct on-site interviews with these employees. If selected employees are agreeable to the change, the Contractor shall release them at a mutually agreeable date and negotiate transfer of their earned fringe benefits to the successor.
  
- D. The Contractor shall be reimbursed for all reasonable phase-in, phase-out costs (i.e., costs incurred within the agreed period after contract expiration that result from phase-in, phase-out operations).

**20. Debarment and Suspension.**

- A. The Contractor certifies by entering into this Contract that neither it nor its principals nor any of its subcontractors are presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from entering into this Contract by any federal agency or by any department, agency or political subdivision of the State of Indiana. The term "principal" for purposes of this Contract means an officer, director, owner, partner, key employee or other person with primary management or supervisory responsibilities, or a person who has a critical influence on or substantive control over the operations of the Contractor.
  
- B. The Contractor certifies that it has verified the state and federal suspension and debarment status for all subcontractors receiving funds under this Contract and shall be solely responsible for any recoupment, penalties or costs that might arise from use of a suspended or debarred subcontractor. The Contractor shall immediately notify the State if any subcontractor becomes debarred or suspended, and shall, at the State's request,

take all steps required by the State to terminate its contractual relationship with the subcontractor for work to be performed under this Contract.

**21. Default by State.** If the State, sixty (60) days after receipt of written notice, fails to correct or cure any material breach of this Contract, the Contractor may cancel and terminate this Contract and institute measures to collect monies due up to and including the date of termination.

**22. Disputes.**

- A. Should any disputes arise with respect to this Contract, the Contractor and the State agree to act immediately to resolve such disputes. Time is of the essence in the resolution of disputes.
- B. The Contractor agrees that, the existence of a dispute notwithstanding, it will continue without delay to carry out all of its responsibilities under this Contract that are not affected by the dispute. Should the Contractor fail to continue to perform its responsibilities regarding all non-disputed work, without delay, any additional costs incurred by the State or the Contractor as a result of such failure to proceed shall be borne by the Contractor, and the Contractor shall make no claim against the State for such costs.
- C. If the parties are unable to resolve a contract dispute between them after good faith attempts to do so, a dissatisfied party shall submit the dispute to the Commissioner of the Indiana Department of Administration for resolution. The dissatisfied party shall give written notice to the Commissioner and the other party. The notice shall include (1) a description of the disputed issues, (2) the efforts made to resolve the dispute, and (3) a proposed resolution. The Commissioner shall promptly issue a Notice setting out documents and materials to be submitted to the Commissioner in order to resolve the dispute; the Notice may also afford the parties the opportunity to make presentations and enter into further negotiations. Within 30 business days of the conclusion of the final presentations, the Commissioner shall issue a written decision and furnish it to both parties. The Commissioner's decision shall be the final and conclusive administrative decision unless either party serves on the Commissioner and the other party, within ten business days after receipt of the Commissioner's decision, a written request for reconsideration and modification of the written decision. If the Commissioner does not modify the written decision within 30 business days, either party may take such other action helpful to resolving the dispute, including submitting the dispute to an Indiana court of competent jurisdiction. If the parties accept the Commissioner's decision, it may be memorialized as a written Amendment to this Contract if appropriate.
- D. The State may withhold payments on disputed items pending resolution of the dispute. The unintentional nonpayment by the State to the Contractor of one or more invoices not in dispute in accordance with the terms of this Contract will not be cause for the Contractor to terminate this Contract, and the Contractor may bring suit to collect these amounts without following the disputes procedure contained herein.
- E. With the written approval of the Commissioner of the Indiana Department of Administration, the parties may agree to forego the process described in subdivision C. relating to submission of the dispute to the Commissioner. This paragraph shall not be construed to abrogate provisions of Ind. Code 4-6-2-11 in situations where dispute

resolution efforts lead to a compromise of claims in favor of the State as described in that statute. In particular, releases or settlement agreements involving releases of legal claims or potential legal claims of the state should be processed consistent with Ind. Code 4-6-2-11, which requires approval of the Governor and Attorney General.

- F. This paragraph shall not be construed to abrogate provisions of Ind. Code 4-6-2-11 in situations where dispute resolution efforts lead to a compromise of claims in favor of the State as described in that statute. In particular, releases or settlement agreements involving releases of legal claims or potential legal claims of the state should be processed consistent with Ind. Code 4-6-2-11, which requires approval of the Governor and Attorney General.

**23. Drug-Free Workplace Certification.** As required by Executive Order No. 90-5 dated April 12, 1990, issued by the Governor of Indiana, the Contractor hereby covenants and agrees to make a good faith effort to provide and maintain a drug-free workplace. The Contractor will give written notice to the State within ten (10) days after receiving actual notice that the Contractor, or an employee of the Contractor in the State of Indiana, has been convicted of a criminal drug violation occurring in the workplace. False certification or violation of this certification may result in sanctions including, but not limited to, suspension of contract payments, termination of this Contract and/or debarment of contracting opportunities with the State for up to three (3) years.

In addition to the provisions of the above paragraph, if the total amount set forth in this Contract is in excess of \$25,000.00, the Contractor certifies and agrees that it will provide a drug-free workplace by:

- A. Publishing and providing to all of its employees a statement notifying them that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the Contractor's workplace, and specifying the actions that will be taken against employees for violations of such prohibition;
- B. Establishing a drug-free awareness program to inform its employees of (1) the dangers of drug abuse in the workplace; (2) the Contractor's policy of maintaining a drug-free workplace; (3) any available drug counseling, rehabilitation and employee assistance programs; and (4) the penalties that may be imposed upon an employee for drug abuse violations occurring in the workplace;
- C. Notifying all employees in the statement required by subparagraph (A) above that as a condition of continued employment, the employee will (1) abide by the terms of the statement; and (2) notify the Contractor of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after such conviction;
- D. Notifying the State in writing within ten (10) days after receiving notice from an employee under subdivision (C)(2) above, or otherwise receiving actual notice of such conviction;
- E. Within thirty (30) days after receiving notice under subdivision (C)(2) above of a conviction, imposing the following sanctions or remedial measures on any employee who is convicted of drug abuse violations occurring in the workplace: (1) taking appropriate personnel action against the employee, up to and including termination; or (2) requiring such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a federal, state or local health, law enforcement, or other appropriate agency; and

- F. Making a good faith effort to maintain a drug-free workplace through the implementation of subparagraphs (A) through (E) above.

**24. Employment Eligibility Verification.** As required by IC §22-5-1.7, the Contractor swears or affirms under the penalties of perjury that:

- A. The Contractor does not knowingly employ an unauthorized alien.
- B. The Contractor shall enroll in and verify the work eligibility status of all his/her/its newly hired employees through the E-Verify program as defined in IC §22-5-1.7-3. The Contractor is not required to participate should the E-Verify program cease to exist. Additionally, the Contractor is not required to participate if the Contractor is self-employed and does not employ any employees.
- C. The Contractor shall not knowingly employ or contract with an unauthorized alien. The Contractor shall not retain an employee or contract with a person that the Contractor subsequently learns is an unauthorized alien.
- D. The Contractor shall require his/her/its subcontractors who perform work under this Contract to certify to the Contractor that the subcontractor does not knowingly employ or contract with an unauthorized alien and that the subcontractor has enrolled and is participating in the E-Verify program. The Contractor agrees to maintain this certification throughout the duration of the term of a contract with a subcontractor.

The State may terminate for default if the Contractor fails to cure a breach of this provision no later than thirty (30) days after being notified by the State.

**25. Employment Option.** If the State determines that it would be in the State's best interest to hire an employee of the Contractor, the Contractor will release the selected employee from any non-competition agreements that may be in effect. This release will be at no cost to the State or the employee.

**26. Force Majeure.** In the event that either party is unable to perform any of its obligations under this Contract or to enjoy any of its benefits because of natural disaster or decrees of governmental bodies not the fault of the affected party (hereinafter referred to as a "Force Majeure Event"), the party who has been so affected shall immediately give notice to the other party and shall do everything possible to resume performance. Upon receipt of such notice, all obligations under this Contract shall be immediately suspended. If the period of nonperformance exceeds thirty (30) days from the receipt of notice of the Force Majeure Event, the party whose ability to perform has not been so affected may, by giving written notice, terminate this Contract.

**27. Funding Cancellation.** When the Director of the State Budget Agency makes a written determination that funds are not appropriated or otherwise available to support continuation of performance of this Contract, this Contract shall be canceled. A determination by the Director of State Budget Agency that funds are not appropriated or otherwise available to support continuation of performance shall be final and conclusive.

**28. Governing Law.** This Contract shall be governed, construed, and enforced in accordance with the laws of the State of Indiana, without regard to its conflict of laws rules. Suit, if any, must be brought in the State of Indiana.

**29. HIPAA Compliance.** If this Contract involves services, activities or products subject to the Health Insurance Portability and Accountability Act of 1996 (HIPAA), the Contractor covenants that it will appropriately safeguard Protected Health Information (defined in 45 CFR 160.103), and agrees that it is subject to, and shall comply with, the provisions of 45 CFR 164 Subpart E regarding use and disclosure of Protected Health Information.

**30. Indemnification.** The Contractor agrees to indemnify, defend, and hold harmless the State, its agents, officials, and employees from all claims and suits including court costs, attorney's fees, and other expenses caused by any act or omission of the Contractor and/or its subcontractors, if any, in the performance of this Contract. The State shall not provide such indemnification to the Contractor.

**31. Independent Contractor; Workers' Compensation Insurance.** The Contractor is performing as an independent entity under this Contract. No part of this Contract shall be construed to represent the creation of an employment, agency, partnership or joint venture agreement between the parties. Neither party will assume liability for any injury (including death) to any persons, or damage to any property, arising out of the acts or omissions of the agents, employees or subcontractors of the other party. The Contractor shall provide all necessary unemployment and workers' compensation insurance for the Contractor's employees, and shall provide the State with a Certificate of Insurance evidencing such coverage prior to starting work under this Contract.

**32. Information Technology Enterprise Architecture Requirements.** If the Contractor provides any information technology related products or services to the State, the Contractor shall comply with all IOT standards, policies and guidelines, which are online at <http://iot.in.gov/architecture/>. The Contractor specifically agrees that all hardware, software and services provided to or purchased by the State shall be compatible with the principles and goals contained in the electronic and information technology accessibility standards adopted under Section 508 of the Federal Rehabilitation Act of 1973 (29 U.S.C. 794d) and IC §4-13.1-3. Any deviation from these architecture requirements must be approved in writing by IOT in advance. The State may terminate this Contract for default if the Contractor fails to cure a breach of this provision within a reasonable time.

### **33. Insurance**

- A. The Contractor and their subcontractors ( if any) shall secure and keep in force during the term of this Contract the following insurance coverages (if applicable) covering the Contractor for any and all claims of any nature which may in any manner arise out of or result from Contractor's performance under this Contract:
1. Commercial general liability, including contractual coverage, and products or completed operations coverage (if applicable), with minimum liability limits not less than \$700,000 per person and \$5,000,000 per occurrence unless additional coverage is required by the State. The State is to be named as an additional insured on a primary, non-contributory basis for any liability arising directly or indirectly under or in connection with this Contract.
  2. Automobile liability for owned, non-owned and hired autos with minimum liability limits of \$700,000 per person and \$5,000,000 per occurrence. The State is to be named as an additional insured on a primary, non-contributory basis.

3. The Contractor shall secure the appropriate Surety or Fidelity Bond(s) as required by the state department served or by applicable statute.
  4. The Contractor and their subcontractors shall provide proof of such insurance coverage by tendering to the undersigned State representative a certificate of insurance prior to the commencement of this Contract and proof of workers' compensation coverage meeting all statutory requirements of IC §22-3-2. In addition, proof of an "all states endorsement" covering claims occurring outside the State is required if any of the services provided under this Contract involve work outside of Indiana.
- B. The Contractor's insurance coverage must meet the following additional requirements:
1. The insurer must have a certificate of authority or other appropriate authorization to operate in the state in which the policy was issued.
  2. Any deductible or self-insured retention amount or other similar obligation under the insurance policies shall be the sole obligation of the Contractor.
  3. The State will be defended, indemnified and held harmless to the full extent of any coverage actually secured by the Contractor in excess of the minimum requirements set forth above. The duty to indemnify the State under this Contract shall not be limited by the insurance required in this Contract.
  4. The insurance required in this Contract, through a policy or endorsement(s), shall include a provision that the policy and endorsements may not be canceled or modified without thirty (30) days' prior written notice to the undersigned State agency.
  5. The Contractor waives and agrees to require their insurer to waive their rights of subrogation against the State of Indiana.
- C. Failure to provide insurance as required in this Contract may be deemed a material breach of contract entitling the State to immediately terminate this Contract. The Contractor shall furnish a certificate of insurance and all endorsements to the State before the commencement of this Contract.

**34. Key Person(s).**

- A. If both parties have designated that certain individual(s) are essential to the services offered, the parties agree that should such individual(s) leave their employment during the term of this Contract for whatever reason, the State shall have the right to terminate this Contract upon thirty (30) days' prior written notice.
- B. In the event that the Contractor is an individual, that individual shall be considered a key person and, as such, essential to this Contract. Substitution of another for the Contractor shall not be permitted without express written consent of the State.

Nothing in Sections A and B, above shall be construed to prevent the Contractor from using the services of others to perform tasks ancillary to those tasks which directly require the expertise of the key person.

Examples of such ancillary tasks include secretarial, clerical, and common labor duties. The Contractor shall, at all times, remain responsible for the performance of all necessary tasks, whether performed by a key person or others.

Key person(s) to this Contract is/are:

**35. Merger & Modification.** This Contract constitutes the entire agreement between the parties. No understandings, agreements, or representations, oral or written, not specified within this Contract will be valid provisions of this Contract. This Contract may not be modified, supplemented, or amended, except by written agreement signed by all necessary parties.

**36. Minority and Women's Business Enterprises Compliance.** Award of this Contract was based, in part, on the Minority and/or Women's Business Enterprise ("MBE" and/or "WBE") participation plan. The following certified MBE or WBE subcontractors will be participating in this Contract:

<u>MBE/WBE</u>	<u>PHONE</u>	<u>COMPANY NAME</u>	<u>SCOPE OF PRODUCTS and/or SERVICES</u>	<u>UTILIZATION DATE</u>	<u>PERCENT</u>
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*Terms for participation are as provided in the Contractor's Proposal to the State's request for participation, which are described and captured in the Contract Documents.*

A copy of each subcontractor agreement must be submitted to IDOA's MBE/WBE Division within thirty (30) days of the effective date of this Contract. Failure to provide a copy of any subcontractor agreement will be deemed a violation of the rules governing MBE/WBE procurement, and may result in sanctions allowable under 25 IAC 5-7-8. Failure to provide any subcontractor agreement may also be considered a material breach of this Contract. The Contractor must obtain approval from IDOA's MBE/WBE Division before changing the participation plan submitted in connection with this Contract.

The Contractor shall report payments made to MBE/WBE Division subcontractors under this Contract on a monthly basis. Monthly reports shall be made using the online audit tool, commonly referred to as "Pay Audit." MBE/WBE Division subcontractor payments shall also be reported to the Division as reasonably requested and in a format to be determined by Division.

**37. Nondiscrimination.** Pursuant to the Indiana Civil Rights Law, specifically including IC §22-9-1-10, and in keeping with the purposes of the federal Civil Rights Act of 1964, the Age Discrimination in Employment Act, and the Americans with Disabilities Act, the Contractor covenants that it shall not discriminate against any employee or applicant for employment relating to this Contract with respect to the hire, tenure, terms, conditions or privileges of employment or any matter directly or indirectly related to employment, because of the employee's or applicant's race, color, national origin, religion, sex, age, disability, ancestry, status as a veteran, or any other characteristic protected by federal, state, or local law ("Protected Characteristics"). Contractor certifies compliance with applicable federal laws, regulations, and executive orders prohibiting discrimination based on the Protected Characteristics in the provision of services. Breach of this paragraph may be regarded as a material breach of this Contract, but nothing in this paragraph shall be construed to imply or establish an employment relationship between the State and any applicant or employee of the Contractor or any subcontractor.

The State is a recipient of federal funds, and therefore, where applicable, Contractor and any subcontractors shall comply with requisite affirmative action requirements, including reporting, pursuant to 41 CFR Chapter 60, as amended, and Section 202 of Executive Order 11246 as amended by Executive Order 13672.

**38. Notice to Parties.** Whenever any notice, statement or other communication is required under this Contract, it shall be sent to the following addresses, unless otherwise specifically advised.

- A. Notices to the State shall be sent to: Public Works Divisions, Director  
Indiana Department of Administration  
402 W Washington St Room W467  
Indianapolis, IN 46204
- B. Notices to the Contractor shall be sent to: **[INSERT CONTRACTOR NAME]**  
**[INSERT CONTRACTOR ADDRESS]**
- C. As required by IC 4-13-2-14.8, payments to the Contractor shall be made via electronic funds transfer in accordance with instructions filed by the Contractor with the Indiana Auditor of State.

**39. Order of Precedence; Incorporation by Reference.** Any inconsistency or ambiguity in this Contract shall be resolved by giving precedence in the following order: (1) this Contract, (2) the Project Bid Package, (3) attachments prepared by the State; (4) Contractor's Proposal; and (5) attachments prepared by the Contractor. All of the foregoing are incorporated fully by reference. All attachments, and all documents referred to in this paragraph are hereby incorporated fully by reference.

**40. Ownership of Documents and Materials.**

A. All documents, records, programs, applications, data, algorithms, film, tape, articles, memoranda, and other materials (the "Materials") not developed or licensed by the Contractor prior to execution of this Contract, but specifically developed under this Contract shall be considered "work for hire" and the Contractor hereby transfers and assigns any ownership claims to the State so that all Materials will be the property of the State. If ownership interest in the Materials cannot be assigned to the State, the Contractor grants the State a non-exclusive, non-cancelable, perpetual, worldwide royalty-free license to use the Materials and to use, modify, copy and create derivative works of the Materials.

B. Use of the Materials, other than related to contract performance by the Contractor, without the prior written consent of the State, is prohibited. During the performance of this Contract, the Contractor shall be responsible for any loss of or damage to the Materials developed for or supplied by the State and used to develop or assist in the services provided while the Materials are in the possession of the Contractor. Any loss or damage thereto shall be restored at the Contractor's expense. The Contractor shall provide the State full, immediate, and unrestricted access to the Materials and to Contractor's work product during the term of this Contract.

**41. Payments.**

- A. All payments shall be made 35 days in arrears in conformance with State fiscal policies and procedures and, as required by IC §4-13-2-14.8, the direct deposit by electronic funds transfer to the financial institution designated by the Contractor in writing unless a specific waiver has been obtained from the Indiana Auditor of State. No payments will be made in advance of receipt of the goods or services that are the subject of this Contract except as permitted by IC §4-13-2-20.

- B. The State Budget Agency and the Contractor acknowledge that Contractor is being paid in advance for the maintenance of equipment and / or software. Pursuant to IC §4-13-2-20(b)(14), Contractor agrees that if it fails to perform the maintenance required under this Contract, upon receipt of written notice from the State, it shall promptly refund the consideration paid, pro-rated through the date of non-performance.

**42. Penalties/Interest/Attorney's Fees.** The State will in good faith perform its required obligations hereunder and does not agree to pay any penalties, liquidated damages, interest or attorney's fees, except as permitted by Indiana law, in part, IC §5-17-5, IC §34-54-8, IC §34-13-1 and IC § 34-52-2-3.

Notwithstanding the provisions contained in IC §5-17-5, any liability resulting from the State's failure to make prompt payment shall be based solely on the amount of funding originating from the State and shall not be based on funding from federal or other sources.

**43. Progress Reports.** The Contractor shall submit progress reports to the State upon request. The report shall be oral, unless the State, upon receipt of the oral report, should deem it necessary to have it in written form. The progress reports shall serve the purpose of assuring the State that work is progressing in line with the schedule, and that completion can be reasonably assured on the scheduled date.

**44. Public Record.** The Contractor acknowledges that the State will not treat this Contract as containing confidential information, and will post this Contract on its website as required by Executive Order 05-07. Use by the public of the information contained in this Contract shall not be considered an act of the State.

**45. Renewal Option.** This Contract may be renewed under the same terms and conditions, subject to the approval of the Commissioner of the Department of Administration and the State Budget Director in compliance with IC §5-22-17-4. The term of the renewed contract may not be longer than the term of the original contract.

**46. Severability.** The invalidity of any section, subsection, clause or provision of this Contract shall not affect the validity of the remaining sections, subsections, clauses or provisions of this Contract.

**47. Substantial Performance.** This Contract shall be deemed to be substantially performed only when fully performed according to its terms and conditions and any written amendments or supplements.

**48. Taxes.** The State is exempt from most state and local taxes and many federal taxes. The State will not be responsible for any taxes levied on the Contractor as a result of this Contract.

**49. Termination for Convenience.** This Contract may be terminated, in whole or in part, by the State, which shall include and is not limited to the Indiana Department of Administration and the State Budget Agency whenever, for any reason, the State determines that such termination is in its best interest. Termination of services shall be effected by delivery to the Contractor of a Termination Notice at least thirty (30) days prior to the termination effective date, specifying the extent to which performance of services under such termination becomes effective. The Contractor shall be compensated for services properly rendered prior to the effective date of termination. The State will not be liable for services performed after the effective date of termination. The Contractor shall be compensated for services herein provided but in no case shall total payment made to the Contractor exceed the original contract price or shall any price increase be allowed on individual line items if canceled only in part prior to the original termination date. For the purposes of this paragraph, the parties stipulate and agree that the Indiana Department of Administration shall be deemed to be a party to this agreement with authority to terminate

the same for convenience when such termination is determined by the Commissioner of IDOA to be in the best interests of the State.

**50. Termination for Default.**

- A. With the provision of thirty (30) days notice to the Contractor, the State may terminate this Contract in whole or in part if the Contractor fails to:
  - 1. Correct or cure any breach of this Contract; the time to correct or cure the breach may be extended beyond thirty (30) days if the State determines progress is being made and the extension is agreed to by the parties;
  - 2. Deliver the supplies or perform the services within the time specified in this Contract or any extension;
  - 3. Make progress so as to endanger performance of this Contract; or
  - 4. Perform any of the other provisions of this Contract.
  
- B. If the State terminates this Contract in whole or in part, it may acquire, under the terms and in the manner the State considers appropriate, supplies or services similar to those terminated, and the Contractor will be liable to the State for any excess costs for those supplies or services. However, the Contractor shall continue the work not terminated.
  
- C. The State shall pay the contract price for completed supplies delivered and services accepted. The Contractor and the State shall agree on the amount of payment for manufacturing materials delivered and accepted and for the protection and preservation of the property. Failure to agree will be a dispute under the Disputes clause. The State may withhold from these amounts any sum the State determines to be necessary to protect the State against loss because of outstanding liens or claims of former lien holders.
  
- D. The rights and remedies of the State in this clause are in addition to any other rights and remedies provided by law or equity or under this Contract.

**51. Travel.** No expenses for travel will be reimbursed unless specifically permitted under the scope of services or consideration provisions. Expenditures made by the Contractor for travel will be reimbursed at the current rate paid by the State and in accordance with the State Travel Policies and Procedures as specified in the current Financial Management Circular. Out-of-state travel requests must be reviewed by the State for availability of funds and for appropriateness per Circular guidelines.

**52. Indiana Veteran’s Business Enterprise Compliance.** Award of this Contract was based, in part, on the Indiana Veteran’s Business Enterprise (“IVBE”) participation plan. The following IVBE subcontractors will be participating in this Contract:

VBE	PHONE	COMPANY NAME	SCOPE OF PRODUCTS and/or SERVICES	UTILIZATION	DATE	PERCENT
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N/A

A copy of each subcontractor agreement must be submitted to IDOA within thirty (30) days of the effective date of this Contract. Failure to provide any subcontractor agreement may also be considered a material breach of this Contract. The Contractor must obtain approval from IDOA’s MBE/WBE Division before changing the participation plan submitted in connection with this Contract.

The Contractor shall report payments made to IVBE subcontractors under this Contract on a monthly basis. Monthly reports shall be made using the online audit tool, commonly referred to as "Pay Audit." IVBE subcontractor payments shall also be reported to IDOA as reasonably requested and in a format to be determined by IDOA.

**53. Waiver of Rights.** No right conferred on either party under this Contract shall be deemed waived, and no breach of this Contract excused, unless such waiver is in writing and signed by the party claimed to have waived such right. Neither the State's review, approval or acceptance of, nor payment for, the services required under this Contract shall be construed to operate as a waiver of any rights under this Contract or of any cause of action arising out of the performance of this Contract, and the Contractor shall be and remain liable to the State in accordance with applicable law for all damages to the State caused by the Contractor's negligent performance of any of the services furnished under this Contract.

**54. Work Standards.** The Contractor shall execute its responsibilities by following and applying at all times the highest professional and technical guidelines and standards. If the State becomes dissatisfied with the work product of or the working relationship with those individuals assigned to work on this Contract, the State may request in writing the replacement of any or all such individuals, and the Contractor shall grant such request.

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**Non-Collusion and Acceptance**

The undersigned attests, subject to the penalties for perjury, that the undersigned is the Contractor, or that the undersigned is the properly authorized representative, agent, member or officer of the Contractor. Further, to the undersigned's knowledge, neither the undersigned nor any other member, employee, representative, agent or officer of the Contractor, directly or indirectly, has entered into or been offered any sum of money or other consideration for the execution of this Contract other than that which appears upon the face hereof. **Furthermore, if the undersigned has knowledge that a state officer, employee, or special state appointee, as those terms are defined in IC 4-2-6-1, has a financial interest in the Contract, the Contractor attests to compliance with the disclosure requirements in IC 4-2-6-10.5.**

**IN WITNESS WHEREOF**, the Contractor and the State have, through their duly authorized representatives, entered into this Contract for Public Works Project Number **XXXXXX**. The parties, having read and understood the foregoing terms of this Contract, do by their respective signatures dated below agree to the terms thereof.

XXXXXXXXXXXX  
[Contractor]

Department of Administration  
Public Works Division

By: \_\_\_\_\_  
Printed Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

By: \_\_\_\_\_  
Martin Hurford, Director DAPW  
*For IDOA Commissioner if less than \$1,000,000*  
Date: \_\_\_\_\_

**Approved by:**  
Department of Administration

**Approved by:**  
State Budget Agency

By: \_\_\_\_\_  
Jessica Robertson, Commissioner

By: \_\_\_\_\_  
Brian E. Bailey, Director

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

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

**Approved as to Form and Legality:**  
*Form approval has been granted by the Office  
of the Attorney General pursuant to  
IC 4-13-2-14.3(e) on August 27, 2015.  
FA 15-36*

This Instrument was prepared by: [INSERT NAME] on XX/XX/XXXX

Legal counsel: \_\_\_\_\_ (initials)

## **SUPPLEMENTARY CONDITIONS**

These "Supplementary Conditions" supplement the "Instructions To Bidders" and the "General Conditions". The paragraph numbers correspond to the "Instructions To Bidders" and the "General Conditions" paragraph to which they are supplemental.

The Indiana Department of Transportation Standard Specifications (2016 Edition) with all Supplements to the date of bidding are hereby incorporated into these Contract Documents by reference, and will hereafter be referred to as the Standard Specifications. The bidder shall secure his own copies of the Standard Specifications and Supplements thereto and INDOT Standard Sheets listed by the Plans.

Where paragraph or section reference numbers are quoted in the Detailed Specifications, or are shown by the Plans, said numbers refer to the paragraph or section numbers of the Standard Specifications.

The General Conditions of the contract and special provisions are to take precedence over the INDOT Standard Specifications.

### **IB-04 – Pre-Bidding, Bidding and Post Bidding Requirements – Section B**

A Geotechnical Report was prepared by Earth Exploration, Inc. and is included in Appendix "A" of these specifications. The report was prepared for the Engineer's use in design and is available for the bidder's information.

### **IB-04 – Pre-Bidding, Bidding and Post Bidding Requirements – Section D**

Bid as described in Contractors Bid (DAPW) shall include a lump sum Base Bid (in figures and words). In verifying bids, word amounts shall have precedence over figure amounts. There will be Two (2) Alternates that shall be provided with the Base Bid. The Alternates are noted on the Project Plans.

The cost for all items required to complete the work as shown on the Plans and noted in the Specifications shall be included in the lump sum base bid and noted alternates.

### **GC-1.3.1 – Copies Furnished and Ownership**

Owner shall furnish to Contractor up to five copies 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.

### **GC-2.1.1 – Definition of Designer**

The firm of Lawson-Fisher Associates P.C. is the Designer and Engineer for this project.

**GC-4.6 – Permits, Fees and Notices**

The construction permits or approvals, if required, from the Indiana Department of Natural Resources (IDNR), Indiana Department of Transportation (INDOT), Indiana Department of Homeland Security, the IDNR Division of Historic Preservation & Archaeology, the Indiana Department of Environmental Management, the Indiana State Department of Health and the U.S. Army Corps of Engineers, will be obtained by the Owner.

All other permits or approvals pertaining to the proposed work, if any, shall be obtained and paid for by the Contractor.

**GC-4.7.1 – Remediation Allowance**

- A. Contractor shall include an allowance of \$25,000 in the Base Bid for remediation of unforeseen constraints.
- B. Such constraints may include, but are not necessarily limited to, unforeseen subsurface conditions particular to this construction site; obstruction of or delays to reasonable work sequences by the Property, or the Owner; uncommon adverse weather or site conditions; and, conflict within or omissions from the Contract Documents.
- C. All remediation work shall be proposed to and authorized by the Director of Public Works Division prior to execution, jointly documented by Contractor and Designer, and recorded in Contractor's "as-builts" and Designer's project record documents.
- D. As an example: The Contractor believes he can do the job for \$500,000, independent of the remediation allowance. His submitted bid would then be  $\$500,000 + \$25,000 = \$525,000$ .
- E. If there are no problems or Change Orders encountered during the job, the Contract would closeout at \$500,000 and the remediation allowance would not be used or paid.

**GC-4.12 – Shop Drawings**

Six copies of shop drawings shall be submitted to the Designer to be distributed as follows:

Two sets for the Owner, two sets for the Designer, and two sets to be returned to the Contractor.

In lieu of paper submittals, the Contractor may submit the shop drawings to the Designer electronically.

**GC-4.15 – Cleaning-Up**

Unless otherwise noted, all disturbed areas are to be restored with materials to match existing surface conditions.

The Contractor shall be responsible for the protection of all existing facilities during the entire period of construction. Any damage to the existing facilities caused by the Contractor shall be repaired by the Contractor at his expense and in a manner approved by the Designer.

The Contractor shall, at all times, keep the premises free from accumulation of waste materials or rubbish caused by his employees or work. At the completion of the work, he shall remove all accumulated rubbish, tools and surplus materials from and about the job site, and shall leave the premises in a neat, clean and orderly condition.

**GC-8.2 – Progress and Completion**

The contract time for substantial completion shall be 75 calendar days from the date of the Notice to Proceed.

**SUPPLEMENTAL UNIT PRICES**

The Contractor shall prepare his lump sum bid based on the estimated dimensions and quantities provided in the Plans and Specifications. The Contractor agrees to accept the following unit prices to adjust the amount, more or less, of the contract, if actual quantities required differ from that which was estimated. Any net additional to the contract amount shall be applied against the amount defined in Section 4.7.1 of the Supplementary Conditions

Item No. 6      Deep Injection of HPD Stabilization and Lift of Pavement  
Structures, Underground Infrastructures and Soil  
Compaction (Est. 675 CF).....\$ \_\_\_\_\_/CF

COMPANY NAME: \_\_\_\_\_

SIGNATURE OF BIDDER \_\_\_\_\_

DATE: \_\_\_\_\_

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## **DETAILED SPECIFICATIONS**

### **WORK ITEM 1 – MOBILIZATION AND DEMOBILIZATION**

#### **DESCRIPTION**

The Contractor shall furnish all necessary equipment, labor and materials for movement of equipment and personnel to and from the project site. The work shall be in accordance with Section 110 of the INDOT Standard Specifications.

#### **MATERIALS**

As needed.

## **WORK ITEM 2 - CONSTRUCTION ENGINEERING**

### **DESCRIPTION**

The Contractor shall provide all materials, equipment and personnel necessary to complete the detailed construction engineering, detailed staking and layout for installation of the Contract work.

### **MATERIALS**

As required.

### **CONSTRUCTION REQUIREMENTS**

The Contractor shall be responsible for all construction engineering as outlined in Section 105.08 of the INDOT Standard Specifications. The Contractor shall be responsible for locating all utilities within the construction limits.

The Engineer shall furnish only the vertical and horizontal control data shown by the Plans. The Contractor shall preserve and/or reference horizontal control points and property corner markers.

## WORK ITEM 3 - MATERIAL APPROVAL AND SYSTEM TESTING

### DESCRIPTION

The Contractor shall employ a qualified, professional testing laboratory to provide all material testing, approval testing and system testing. There will be no testing performed by the Owner's staff or the Engineer. The tests to be provided and the frequency of testing shall be as required for the INDOT Standard Specifications for highway materials and approvals unless modified in this section.

Two copies of all test reports are to be submitted to the Engineer. All reports are to be certified by a Professional Engineer registered in the State of Indiana who is not an employee of the Owner or Engineer. Results shall be submitted within 72 hours.

**If a supplier of materials has a current "immediate usage" approval by INDOT, testing for source approval will not be required.**

The areas of testing are:

1. Earthwork (Alternates 1 and 2):

Maximum density shall be determined by AASHTO T-99 as modified by Section 203.24 of the INDOT Standard Specifications using Method A for soil and Method C for granular material.

The minimum soil compaction requirements for backfill material and headcutting Alternates 1 and 2 subgrade shall be 100% Standard Proctor (95% Modified Proctor).

Soil placed over headcutting protection (Alternates 1 and 2) shall be tracked in.

2. Compaction Testing Frequency:

- a. A minimum of one (1) Compaction Test per lift of earth fill or subgrade.
- c. Location of the Compaction Tests will be selected by the Engineer or the Owner's representative.
- d. Unless there is a reason to believe that aggregates do not meet the requirements of the latest Standards of the Indiana Department of Transportation, a certification from the supplier certifying that the material does meet said specifications will be acceptable. However, if tests are required, the customary physical and chemical tests must be made.

3. Portland Cement Concrete:

Air content test, slump test, 7-day compression cylinders and/or cubes (minimum of three (3) shall be provided for each concrete or grout pour. If the same mix design and material supplier are used for multiple pours, one (1) set of tests is permitted to satisfy the requirements of this specification. If either the mix design or material supplier changes, another set of tests are required.

The number of individual tests completed will not be counted for payment.

4. Any other test incidental to the performance of the work and required for demonstrating the quality of material and workmanship.
5. Where results of required inspection or test of similar service are unsatisfactory (do not indicate compliance of related work with requirements of Contract Documents, retests are the responsibility of the Contractor. Retesting of work revised or replaced by the Contractor is the Contractor's responsibility.

**WORK ITEM 4 – CLEARING, GRUBBING AND OBSTRUCTION REMOVAL**

**DESCRIPTION**

The Contractor shall furnish all necessary equipment, labor and materials required to complete Clearing, Grubbing and Obstruction Removal within the construction limits including pavement removal and any other items required to be removed to complete the proposed work.

**MATERIALS**

All materials shall conform to applicable requirements of Section 201 of the INDOT Standard Specifications.

**CONSTRUCTION REQUIREMENTS**

The Contractor shall have all underground utilities field located before start of construction.

Construction shall conform to the applicable provisions of Sections 201 and 202 of the INDOT Standard Specifications.

The Contractor shall visit the site to familiarize himself or herself with the nature of the clearing and removal operation.

All debris shall be disposed of at an acceptable off-site location provided by the Contractor.

Removal, careful storage and reinstallation of any item required for the performance of the work shall be considered incidental to this work item and will not be paid for separately.

## **WORK ITEM 5 – DEWATERING & PROTECTION OF EXISTING STRUCTURES**

### **DESCRIPTION**

The Contractor shall provide all materials, equipment and personnel necessary to complete the dewatering and protection of existing structure activities for the purposes of constructing the dam repairs shown on the project Plans. The Contractor shall construct and maintain all necessary temporary and permanent diversion and protective works; shall furnish all materials required therefore; and shall furnish, install, maintain and operate all equipment required for the removal of water from the various parts of the work and for maintaining the integrity of adjacent structures from damage and displacement or settling throughout the life of the project construction.

### **MATERIALS**

The Contractor shall be responsible for providing all materials necessary for the dewatering and protection of existing structures including diversion of flow as required to perform the work. The Contractor may divert flow by using steel sheets, sand bags or other acceptable methods that do not pollute the receiving stream.

### **CONSTRUCTION REQUIREMENTS**

The Contractor shall submit a Dewatering and Protection of Existing Structures Plan to the Owner and Engineer for review prior to beginning any work affected by the control of ground water or the diversion/retention of the stream/lake and protection of existing structures. The plan shall include drawings, calculations and descriptions as necessary to clearly describe the nature of the methods to be used by the Contractor. The plan must be prepared, signed and sealed by a professional engineer registered in the State of Indiana, who is experienced in dewatering techniques and support of structures and hydraulic loadings. The plan must be submitted, reviewed and comments addressed adequately before the start of construction. The responsible professional engineer shall supervise and monitor the installation and operation of the dewatering/protection of existing structures elements. The Contractor shall have full responsibility for the adequacy of the dewatering methods of the diversion/retention systems used, and for protection of the existing dam and associated structures.

The Contractor will not be allowed to artificially drawdown or raise the Lake Manitou water level. Water shall be diverted through the existing spillway structure, pumped, siphoned, etc. to keep the lake near normal levels during the construction of the work as detailed in the Contractor's Dewatering and Protection of Existing Structures Plan.

Foundations and all other parts of the construction site shall be dewatered and kept free of standing water and muddy conditions, as necessary, for the proper execution of the work. The Contractor shall install, maintain, and operate all cofferdams, channels, flumes, sumps, and other temporary diversion and protective works needed to divert flow and other surface water through and around the construction site. Since the work will be performed in a residential area, all continuously operating equipment such as pumps and generators must be muffled and enclosed in noise dampening structures so as not to cause a nuisance to nearby residences.

Control of surface water shall be continuous during the period of construction so that damage to the work shall not occur. Unless otherwise specified or approved, the diversion outlet shall be into the same drainage-way that the water would have reached if not diverted. Removal of water from the construction site shall be performed so that erosion and the transporting of sediment and other pollutants are minimized.

When temporary works used for dewatering are no longer needed, the Contractor shall remove them and return the area to a condition similar to that which existed prior to construction.

**WORK ITEM 6 – DEEP INJECTION OF HDP STABILIZATION AND LIFT OF PAVEMENT, STRUCTURES, UNDERGROUND INFRASTRUCTURES AND SOIL COMPACTION**

**DESCRIPTION**

This work shall consist of soil compaction to repair base and sub-base soils under the Principal Spillway Concrete Slab as well as any void fill as required by furnishing and injecting polyurethane material through multiple holes, while monitoring at the surface, beneath the slab and beneath the base soils.

URETEK or approved equal is the source for the below listed application under the following U.S. Patents

Composition and method for preparing polyurethanes and polyurethane foams (Patent No. 6,521,673).

**MATERIALS**

The material used shall be URETEK 486 STAR, or approved equal.

The material shall be a two-part, one-to-one ratio by volume, closed cell, hydro-insensitive, high density polyurethane system.

The material shall have a minimum free rise density of 3.8 lbs/cubic foot with a maximum of 4.2 lbs/cubic foot.

The material shall have a minimum compressive strength per ASTM 1621 of 60 psi.

The material shall have a minimum tensile strength per ASTM 1622 of 60 psi.

The material shall reach 90% compressive strength in 15 minutes such that construction operations can continue after 15 minutes of last injection of materials.

The material shall be a polyurethane-forming mixture, having a water insoluble diluent, which permits the formation of polyurethanes in excess water.

**EQUIPMENT REQUIREMENTS**

The Contractor shall provide at a minimum, the following equipment

1. A truck-mounted pumping unit capable of injecting the high density polyurethane material beneath the slab through tubes to the depths required. The pumping unit shall be capable of controlling the rate of flow of material as required to densify soils and prevent slab heaving. The unit shall be equipped with two certified flow meters to measure each component of the high density polyurethane injected at each location. The certified flow meters shall have a digital output in both pounds and gallons.
2. Pressure and temperature control devices capable of maintaining proper temperature and proportionate mixing of the polyurethane component materials.
3. Pneumatic or electric drills capable of efficiently drilling 5/8" to 3/4" diameter injection holes through the slab without damaging the structural integrity of the existing slab.

4. Laser levels or dial indicator devices capable of monitoring movement at the surface of the slab to verify that the injected base and sub-base soils have been properly densified.
5. A portable Dynamic Cone Penetrometer (DCP) for on-site soils investigation to assist in location of weak sub-base soils and determination of injection pattern through tubes to densify weak soils.
6. All necessary light towers, electric generators, compressors, heaters, hoses, containers, valves and gauges to efficiently conduct and control the work.

## **CONSTRUCTION REQUIREMENTS**

The Contractor shall provide documentation of 10 prior Deep Injection projects (injecting expandable materials into soils through more than one entry point while monitoring at the surface) including 5 prior Deep Injection projects with flowing water present, minimum of 5 years of experience and have a paid engineer on staff.

The Contractor shall provide a slab profile from laser level measurements of each area where the slab structure requires attention. Each profile shall be reviewed by the Engineer prior to performing the work at the project location.

Dynamic cone penetrometer testing may be required as directed by the Engineer on each project line to confirm existing sub-grade soil conditions.

For soil densification and compaction or unconsolidated base soils, stabilization of the concrete slab, a series of 5/8" – 3/4" holes (as required for tube placement) shall be drilled at approximately 4 foot spaced intervals through the pavement above the area requiring soil remediation. The polyurethane material shall then be injected through injection tubes inserted into the drilled holes to the proper depth or depths as required. An injection depth ranging between 2 to 6 feet is anticipated. The exact location, spacing, hole size and depth shall be selected by the Contractor and reviewed by the Engineer. The rate and amount of material injected shall be determined by the Contractor to obtain proper densification of the base and sub-base soils and fill all voids under the existing slab.

Continuous laser level or dial indicator micrometer reading shall be in place and monitored by the Contractor during injection to determine sufficient material usage, soils densification, and voids filled as indicated by slab movement of 1/4" or 6 mm. The Monitoring Plan shall be submitted by the Contractor for review by the Engineer.

## **MEASUREMENT AND PAYMENT**

Deep injection of HDP will be measured by the cubic yard. The estimated volume used for bidding assumes 3 inch voids under 80% of the slab.

The accepted quantities of HDP will be paid for at the contract unit price per cubic yard of deep injection if HDP.

The mobilization and demobilization shall be paid for under Work Item #1 and not this work item.

## **WORK ITEM 7 – REVETMENT RIPRAP ON GEOTEXTILE**

### **DESCRIPTION**

The Contractor shall furnish all necessary equipment, labor and material to install all Revetment Riprap and Geotextile at the locations shown on the project plans.

### **MATERIALS**

The riprap shall be clean, hard, durable, preferably native to the vicinity of the work and shall be subject to the Engineer's approval. Stone containing shale, unsound sandstone, or other material that will disintegrate readily, shall not be used. The material shall conform to the INDOT standard specification for Revetment Riprap (Section 904.04).

Prior to delivery of the Riprap, the Contractor shall designate in writing the source from which the rock material will be obtained and provide certification satisfactory to the Engineer that the material meets the contract requirements.

The Geotextile shall be Carthage 15% Woven by Carthage Mills – (800) 543-4430, or approved equal.

### **CONSTRUCTION REQUIREMENTS**

The subgrade shall be cut or filled and graded to the lines as shown on the Plans. The riprap and geotextile shall not be placed before the surface has been inspected.

The geotextile shall be installed per manufacturer's recommendations in the locations shown on the Plans. The riprap shall be placed to a depth of 18-inches and in such a manner to avoid damaging the geotextile or displacing underlying material. Construction equipment will not be allowed on the exposed geotextile. The placement of riprap shall start from the base of the slope moving upslope.

## **WORK ITEM 8 – TEMPORARY EROSION AND SEDIMENT CONTROL**

### **DESCRIPTION**

Contractor shall provide temporary erosion and sediment control for the project as needed and as shown on the plans including temporary access drives.

The Contractor shall furnish all necessary equipment, labor and materials required for the Temporary Erosion and Sediment Control.

### **MATERIALS**

All materials shall conform to the applicable requirements of Section 205 of the INDOT Standard Specifications.

### **CONSTRUCTION**

Construction shall conform to the applicable requirements of Section 205 of the INDOT Standard Specifications.

The Contractor shall inspect the project site after every rain event and perform maintenance as needed to provide a fully functional erosion and sediment control plan.

## **WORK ITEM 9 – TOPSOIL**

### **DESCRIPTION**

The Contractor shall furnish all necessary equipment, labor and material required to complete topsoil dressing of the areas to be seeded and mulched.

### **MATERIALS**

All materials shall be salvaged from the site or brought in from an approved source as needed, and shall meet the topsoil requirements of Section 621 and 914 of the INDOT Standard Specifications.

### **CONSTRUCTION REQUIREMENTS**

Construction shall conform to the applicable provisions of Section 621 of the INDOT Standard Specifications.

## **WORK ITEM 10 – SEEDING**

### **DESCRIPTION**

The Contractor shall furnish all necessary equipment, labor and material required to seed those areas disturbed during construction.

### **MATERIALS**

The mixture shall be INDOT Seed Mixture R per INDOT Standard Specifications 621.06

Seed shall be purchased from sources of supply that have been sampled, tested, and reported by the State Seed Commissioner, Purdue University, West Lafayette, Indiana, and found to be satisfactory.

Fertilizer shall be standard commercial fertilizer with an analysis of 12-0-12. Tests will not be required, but fertilizer standards shall be governed by the rulings of the Indiana State Seed Commissioner.

Mulch for seeding shall consist of straw; excelsior mulch, wood cellulose fiber mulch, net free excelsior blanket or paper mat.

### **CONSTRUCTION REQUIREMENTS**

No hydroseeding or drilling shall be allowed. The seed application shall be hand operated.

The area to be seeded shall be smooth and uniform. The seed bed, if not loose, shall be loosened to a minimum depth of 3 inches before fertilizer or seed is applied. Fertilizer shall be spread uniformly over the area to be seeded.

The mixture shall be applied over the area to be seeded. An approved 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.

Mulching material shall be applied uniformly in a continuous blanket. Mulch shall be placed within 24 hours after seeding. The 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.

After procedures for holding the mulch in place have been completed, the mulch shall be watered thoroughly. The seed or soil beneath the mulch shall not be displaced. The mulching material shall be maintained in place satisfactorily until final completion and acceptance of the contract. When seeding is performed between June 1 and August 15, a second thorough watering shall be applied approximately 21 days after seeding.

**WORK ITEM 11 – ARTICULATING CONCRETE BLOCK OVERTOPPING PROTECTION**  
**(ALTERNATE NO. 1)**

**DESCRIPTION**

The contractor shall furnish all labor, materials, equipment, and incidentals required for, and perform all operations in connection with, the installation of the Articulating Concrete Block (ACB) system in accordance with the lines, grades, design and dimensions shown on the Contract Drawings and as specified herein.

**MATERIALS**

**A. General**

All ACB mats shall be prefabricated as an assembly of concrete blocks having specific hydraulic capacities, and laced with revetment cables. The ACB system may also be assembled on-site by hand-placing the individual units either with or without subsequent insertion of cables.

Individual units in the system shall be staggered and interlocked for enhanced stability. The mats shall be constructed of open cell units only as shown on the contract drawings. The open cell units have two (2) vertical openings of rectangular cross section with sufficient wall thickness to resist breakage during shipping and installation. The open cell units have an open area of 18-23% as measured from the base of the mat. Parallel strands of cable shall extend through a minimum of two (2) cable ducts in each block allowing for longitudinal binding of the units within the mat and subsequent ability of the blocks to move freely along the cable. Each row of units shall be laterally offset by one-half of a block width from the adjacent row so that any given block is cabled to four other blocks (two in the row above and two in the row below).

Each block shall incorporate interlocking surfaces that minimize lateral displacement of the blocks within the mats when they are lifted by the longitudinal revetment cables. The interlocking surfaces must not protrude beyond the perimeter of the blocks to such an extent that they reduce the flexibility or articulation capability of the mats or become damaged or broken when the mats are lifted during shipment or placement. Once the mats are in place, the interlocking surfaces shall minimize the lateral displacement of the blocks even if the cables should become damaged or removed. The mats must be able to flex a minimum of 18° between any given row or column of blocks in the uplift direction and a minimum of 45° in the downward direction.

The cables inserted into the mats shall form lifting loops at one end of the mat with the corresponding cable ends spliced together to form a lifting loop at the other end of the mat. The Engineer shall approve appropriate sleeves for use in order to splice the lifting loop. The cables shall be inserted after sufficient time has been allowed for the concrete to complete the curing process.

The ACB mats shall be placed on a filter fabric as specified herein. Under no circumstances shall the filter fabric be permanently affixed or otherwise adhered to the blocks or mats; i.e., the filter fabric shall be independent of the block system.

**Certification (Overtopping Flow):** ACB mats will only be accepted when accompanied by documented hydraulic performance characteristics that are derived from tests under controlled flow conditions. Testing shall conform to ASTM D 7277, Standard Test Method for Performance Testing of Articulating Concrete Block (ACB) Revetment Systems for Hydraulic Stability in Open

Channel Flow, as amended and updated from time to time. Note that all hydraulic performance testing shall be performed in a 2H:1V flume, and that the tested length be long enough that the test flows achieve normal depth in all cases. Analysis and interpretation of the test data shall conform to the guidance contained in ASTM D 7276, Standard Guide for Analysis and Interpretation of Test Data for Articulating Concrete Block (ACB) Revetment Systems in Open Channel Flow, as amended and updated.

**Performance (Overtopping Flow):** The design of the ACB mats shall be in accordance with the Factor-of-Safety design methodology as described in "Erosion and Sedimentation" by Pierre Julien, Cambridge University Press, Second Ed. 2010. The minimum designed safety factor shall be 1.5 by utilizing the following equation.

$$SF = ((l_2 / l_1) \alpha \theta) / ((1 - \alpha \theta_2) 0.5 \cos \beta + \eta (l_2 / l_1) + (l_3 F_d \cos \delta + l_4 F_l') / l_1 W_s)$$

The analysis shall be performed based upon the stability of the ACBs due to gravity forces alone, neglecting conservative forces added by cabling, mechanical anchorage, contact with adjacent blocks, or other restraints not attributable to gravity based forces. The analysis must be in accordance with ASTM D 6884, Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems.

**All design calculations submitted must be based upon the smallest block utilized in the mats. Partial "half blocks" must be analyzed separately.**

In order to analyze the performance of the unit, the hydraulic information listed below is required:

**TABLE 1. ACB HYDRAULIC INFORMATION**

Velocity (ft/sec)	10.72
Shear Stress (lb/ft <sup>2</sup> )	3.85
Friction or Bed Slope (ft/ft)	0.1667 (6:1)
Allowable Unit Protrusion (in)	0.5 for Uniform Units & 0.0 for 0.5 inch Tapered Units

**B. Articulating Concrete Blocks**

This specification covers ACB mats used for general erosion control, spillway armoring, steep channel armoring, channel protection and other high-velocity applications.

**Note 1** - Concrete units covered by this specification are made from lightweight or normal weight aggregates, or both.

**Note 2** - The values stated in U.S. customary units are to be regarded as the standard.

**Materials**

Cementitious Materials - Materials shall conform to the following applicable ASTM specifications:

- a. Portland Cements - Specification C 150, for Portland Cement.

- b. Blended Cements - Specification C 595, for Blended Hydraulic Cements.
- c. Hydrated Lime Types - Specification C 207, for Hydrated Lime Types.
- d. Pozzolans - Specification C 618, for Fly Ash and Raw or Calcined Natural Pozzolans for use in Portland Cement Concrete.
- e. Aggregates – Specification C 33, for Concrete Aggregates, except that grading requirements shall not necessarily apply.

**Casting**

The concrete units shall be produced by a dry cast method. The dry cast units obtain strength in a shorter duration as well as an increase in the durability and overall quality of product.

**Physical Requirements**

At the time of delivery to the work site, the units shall conform to the physical requirements prescribed in Table 2 listed below.

**TABLE 2. PHYSICAL REQUIREMENTS**

<i>Compressive Strength Net Area</i> <i>Min. psi (mPa)</i>		<i>Water Absorption</i> <i>Max. lb/ft<sup>3</sup> (kg/m<sup>3</sup>)</i>	
Average. of units	Individual Unit	Average of units	Individual Unit
4,000 (27.6)	3,500 (24.1)	9.1 (160)	11.7 (192)

When applicable, the manufacturer shall meet all requirements pertaining to a concrete unit’s durability pertaining to a freeze-thaw environment.

Units shall be sampled and tested in accordance with ASTM D 6684, Standard Specification for Materials and Manufacture of Articulating Concrete Block (ACB) Revetment Systems.

**Visual Inspection**

All units shall be sound and free of defects that would interfere with either the proper placement of the unit or impair the performance of the system. Surface cracks incidental to the usual methods of manufacture, or surface chipping resulting from customary methods of handling in shipment and delivery, shall not be deemed grounds for rejection.

Cracks exceeding 0.25 inches (.635 cm) in width and/or 1.0 inch (2.54 cm) in depth, or chipping resulting in a weight loss exceeding 10% of the average weight of a concrete unit shall be deemed grounds for rejection.

Blocks rejected prior to delivery from the point of manufacture shall be replaced at the manufacturer's expense. Blocks rejected at the job site shall be repaired with structural grout or replaced at the expense of the contractor.

**Sampling and Testing**

The purchaser (or their authorized representative) shall be accorded access to the relevant manufacturing facility or facilities, if desired, in order to inspect and/or sample the ACB units from lots ready for delivery prior to release for delivery to the job site. Such inspections are at the sole expense of the requesting entity.

Field installation shall be consistent with the way the system was installed in preparation for hydraulic testing pursuant to ASTM D 7277, Standard Test Method for Performance Testing of Articulating Concrete Block (ACB) Revetment Systems for Hydraulic Stability in Open Channel Flow. Any external restraints, anchors, or other ancillary components (such as synthetic drainage mediums) shall be employed as they were during testing; e.g., if the hydraulic testing installation utilized a drainage layer, then the field installation must also utilize a drainage layer. This does not preclude the use of other section components for other purposes, e.g., a geogrid for strengthening the subgrade for vehicular loading, or an intermediate filter layer of sand to protect very fine-grained native soils.

Hydraulic testing shall be conducted on the thinnest block in a "family" of similar blocks (i.e., same footprint but different thicknesses), with the tested critical shear value then converted to a critical shear at 0° before extrapolation to thicker blocks within the same family. Such extrapolation may not be made from a thicker block to a thinner block. The extrapolation method is detailed in the National Concrete Masonry Association (NCMA) "Design Manual for Articulated Concrete Block (ACB) Revetment Systems", section 4.2.

Purchaser may request additional testing other than that provided by the manufacturer as needed. Such requested testing will extend any stated lead times for manufacturing and delivery, if the results of such testing are a prerequisite to approval (i.e., approval for release to manufacturing). Costs associated with such testing shall be borne by the purchaser.

**Manufacturer**

The individual blocks comprising the mat shall have the nominal characteristics, such as the unit weight, density and open area as listed by the manufacturer.

The articulating concrete block mat shall be ULTRAFLEX® Open Cell, ARMORFLEX® Open Cell, or approved equal, as represented by:

<b>NATIONALLY ULTRAFLEX®</b> SUBMAR, INC. 805 Dunn Avenue Houma, Louisiana 70360 Phone: (800) 978-2627 Fax: (985) 851-0108 www.submar.com	<b>ARMORFLEX®</b> ARMORTEC; A CONTECH COMPANY 9025 Center Point Dr. Suite 400 West Chester, OH 45069 Phone: (513) 645-7000 Fax: (513) 645-7993 www.conteches.com
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**C. Revetment Cable and Fittings**

**Galvanized Steel Revetment Cable and Fittings.** Revetment cable shall be constructed of preformed galvanized aircraft cable (GAC). The cables shall be made from individual wires and strands that have been formed during the manufacture into the shape they have in finished cable.

Cable shall consist of a core construction comprised of seven (7) wires wrapped within seven (7) or nineteen (19) wire strands. The size of the revetment cable shall be selected such that the minimum acceptable strength is at least five (5) times that required for lifting of the mats.

The revetment cable shall exhibit resistance to mild concentrations of acids, alkalis, and solvents. Fittings such as sleeves and stops shall be aluminum, and the washers shall be galvanized steel or plastic. Furthermore, depending on material availability, the cable type (7x7 or 7x19) can be interchanged while always ensuring the required factor of safety for the cable.

Selection of cable and fittings shall be made in a manner that insures a safe design factor for mats being lifted from both ends, thereby forming a catenary. Consideration shall be taken for the bending of the cables around hooks or pins during lifting. Revetment cable splicing fittings shall be selected so that the resultant splice shall provide a minimum of 75% of the minimum rated cable strength.

**E. Filter Fabric**

The geotextile filter fabric shall meet the minimum physical requirements listed in Table No. 3 of these Specifications. Consultation with the manufacturer is recommended. Geotextile shall be Carthage Mills 6%- (800)543-4430 or approved equal.

The geotextile must be permitted to function properly by allowing relief of hydrostatic pressure; therefore concrete shall not be allowed to clog the filter fabric.

The geotextile fiber shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of propylene, ethylene, ester, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic, if necessary, to make the filaments resistant to deterioration due to ultraviolet and heat exposure. The edges of the geotextile shall be finished to prevent the outer fiber from pulling away from the geotextile.

The Contractor shall furnish the Engineer, in duplicate, manufacturer's certified test results showing actual test values obtained when the physical properties are tested for compliance with the Specifications.

During all periods of shipment and storage, the filter fabric shall be protected from direct sunlight, ultraviolet rays and temperatures greater than 140 degrees Fahrenheit. To the extent possible, the fabric shall be maintained wrapped in its protective covering. The geotextile shall not be exposed to sunlight, ultraviolet rays until the installation process begins.

**TABLE 3. PHYSICAL REQUIREMENTS**

<b>Physical Property</b>	<b>Test Procedure</b>	<b>Minimum Value</b>
Grab Tensile Strength (Unaged Geotextile)	ASTM D4632	200 Lbs. (in any principal direction)
Breaking Elongation (Unaged Geotextile)	ASTM D4632	30% max. (in any principal direction)
Burst Strength	ASTM D3786	400 psi
Puncture Strength	ASTM D4833	115 lbs.
A.O.S., U.S. Std. Sieve	ASTM D4751	see Design Manual
% Open Area	CWO-22125-86	5%
Permittivity	ASTM D4491	0.28 – 0.5 sec-1

Final acceptance of the filtration geotextile by the Engineer shall be dependent upon the geotextile performance when tested in accordance with ASTM D5105, Standard Test Method for Measuring the Soil-Geotextile System Clogging by the Gradient Ratio test or the Hydraulic Conductivity Ratio test. Soil characteristics such as grain size analysis, and plasticity shall be determined for every 200,000 square feet of geotextile installed, or for each source of borrow material used during construction. Significant differences in soil characteristics shall require further performance testing by either the Gradient Ratio or the Hydraulic Conductivity Ratio tests at the discretion of the Engineer. The locations for which the material to be tested is extracted shall be approved by the Engineer. The Contractor shall provide the site-specific soil and modified proctor curves for the site-soil, at his own expense, to the manufacturer. The manufacturer shall be responsible for the performance of the test by a certified independent laboratory experienced in performing such test. The test shall be performed under the actual field soil conditions or as otherwise required by the Engineer.

At the time of installation, the filter fabric shall be rejected if it has been removed from its protective cover for over 72 hours or has defects, tears, punctures, flow deterioration, or damage incurred during manufacture, transportation or storage. With the acceptance of the Engineer, placing a filter fabric patch over the damaged area prior to placing the mats shall repair a torn or punctured section of fabric. The patch shall be large enough to overlap a minimum of three (3) feet in all directions.

In the event pre-assembled panels of fabric are required, the panels of filter fabric shall be sewn together at the manufacturer or another approved location.

#### **F. Geogrid**

The geogrid shall be Tensar or an approved equal meeting the following specifications:

**Description:** The geogrid shall be a regular grid structure of polymeric material and shall have aperture geometry, rib and junction cross-sections sufficient to permit significant mechanical interlock and retain the underlying material. The geogrid shall impart a) high resistance to loss of load capacity or structural integrity when the geogrid is subjected to mechanical stress during installation, b) high resistance to deformation when the geogrid is subjected to applied force in use, and c) high resistance to loss of load capacity or structural integrity when the geogrid is subjected to all forms of ultraviolet, biological or chemical degradation normally encountered in earthwork construction.

**Construction Requirements:** All areas immediately beneath the installation area for the geogrid shall be prepared properly as shown on the plans, as specified, or as directed by the Engineer. The geogrid shall be installed in accordance with the manufacturer's recommendations. Only that amount of geogrid required for immediately pending work shall be placed to prevent undue exposure or damage to the geogrid. The geogrid shall be placed taut prior to concrete block placement. After a layer of geogrid has been placed, suitable means shall be used to anchor the geogrid in position until the concrete blocks can be placed. Adjacent rolls of geogrid shall be overlapped by 12 inches minimum.

#### **G. Size of Articulating Concrete Block Mats**

**General.** The concrete blocks, cables and fittings shall be fabricated at the manufacturer or another approved location into mats with a width of up to eight (8) feet and a length up to forty (40) feet, which is approved by the Engineer. The maximum mat length may be shorter for heavier blocks.

**Mat Length:** The ACB mats shall have the ability for fabrication in various lengths, widths, and in combinations of length and/or widths. Special mats are a combination of two opposing dimensions either in the longitudinal or transverse direction of the mats. The special mats are available in various dimensions that allow for a custom fit to a site-specific project. Obstructions, such as manholes, pipe outfalls, or other fixed structures, will be accommodated to the extent that accurate information is provided about them prior to the preparation of mat layout drawings.

## **CONSTRUCTION REQUIREMENTS**

### **A. Foundation Preparation**

**General.** Areas on which filter fabric and ACBs are to be placed shall be constructed to the lines and grades shown on the Contract Drawings and to the tolerances specified in the Contract Documents, and approved by the Engineer. All subgrade preparation shall be performed in accordance with ASTM D 6884, Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems, as updated and amended.

**Grading.** The slope shall be graded to a smooth plane surface to ensure that intimate contact is achieved between the slope face and the geotextile (filter fabric). All slope deformities, roots, grade stakes, and stones which project normal to the local slope face must be re-graded or removed. No holes, "pockmarks", slope board teeth marks, footprints, or other voids greater than 1.0 inch in depth normal to the local slope face shall be permitted. No grooves or depressions greater than 0.5 inches in depth normal to the local slope face with a dimension exceeding 1.0 foot in any direction shall be permitted. Where such areas are evident, they shall be brought to grade by placing compacted homogeneous material. The slope and slope face shall be uniformly compacted, and the depth of layers, homogeneity of soil, and amount of compaction shall be as required by the Engineer.

Excavation and preparation for anchor trenches, side trenches, and toe trenches or aprons shall be done in accordance to the lines, grades and dimensions shown in the Contract Drawings. The anchor trench hinge-point at the top of the slope shall be uniformly graded so that no dips or bumps greater than 0.5 inches over or under the local grade occur. The width of the anchor trench hinge-point shall also be graded uniformly to assure intimate contact between all ACBs and the underlying grade at the hinge-point.

**Inspection.** Immediately prior to placing the filter fabric and ACB, the prepared subgrade shall be inspected by the Engineer as well as the owner's representative. No fabric or blocks shall be placed thereon until that area has been approved by each of these parties.

### **B. Placement of Geotextile Filter Fabric, Drainage Medium and Geosynthetic Mesh**

**General.** Filter Fabric, or filtration geotextile, as specified elsewhere, shall be placed within the limits shown on the Contract Drawings. All placement and preparation should be performed in accordance with ASTM D 6884, Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems, as updated and amended.

**Placement.** The filtration geotextile shall be placed directly on the prepared area, in intimate contact with the subgrade, followed by a 6-inch thick granular drainage layer consisting of INDOT No. 2 Coarse Aggregate. The geotextile shall be free of folds or wrinkles prior to placement of the granular drainage layer. The geotextile will not be walked on or disturbed when the result is a loss

of intimate contact between the ACB and the geotextile or between the geotextile and the subgrade. The geotextile filter fabric will be placed so that the upstream strip of fabric overlaps the downstream strip. The longitudinal and transverse joints will be overlapped at least one and a half (1.5) feet for dry installations and at least three (3) feet for below-water installations. The geotextile will extend at least one (1) foot beyond the top and bottom revetment termination points, or as required by the Engineer.

### C. Placement of ACBs/Mats

**General.** ACB placement and preparation should be performed in accordance with ASTM D 6884, Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems, as amended and updated.

ACB block/mats, will be constructed within the specified lines and grades shown on the Contract Drawings.

**Placement.** The articulating concrete block mats shall be placed on a minimum 6-inch thick granular drainage layer. No individual block within the plane of placed concrete blocks shall protrude more than one-half inch or as otherwise specified by the Engineer. ACBs should be flush and develop intimate contact with the drainage layer confinement geogrid, as approved by the Engineer. Proposed hand placing is only to be used in limited areas, specifically identified by the Engineer or manufacturers' mat layout drawings, as approved by the Engineer.

If assembled and placed as large mattresses, the ACB mats will be attached to a spreader bar or other approved device to aid in the lifting and placing of the mats in their proper position by the use of a crane or other approved equipment. The equipment used should have adequate capacity to place the mats without bumping, dragging, tearing or otherwise damaging the underlying fabric. The mats will be placed side-by-side, so that the mats abut each other, and/or end-to-end. Mat seams or openings between mats greater than two (2) inches will be backfilled with 4000 p.s.i. non-shrink grout, concrete or other material approved by the Engineer. Whether placed by hand or in large mattresses, distinct changes in grade that results in a discontinuous revetment surface in the direction of flow will require backfill at the grade change location so as to produce a continuous surface.

Termination trenches will be backfilled and compacted flush with the top of the blocks. The integrity of the trench backfill must be maintained so as to ensure a surface that is flush with the top surface of the ACBs for its entire service life. Termination trenches will be backfilled as shown on the Contract Drawings. Backfilling and compaction of trenches will be completed in a timely fashion. No more than 500 linear feet of placed ACBs with non-completed termination trenches will be permitted at any time.

**Finishing.** The cells or openings in the ACBs will be backfilled and compacted with suitable material, as specified by the Engineer. Backfilling and compaction will be completed in a timely manner so that no more than 500 feet of exposed mats exist at any time. Finishing requirements are explicitly at the discretion of the Engineer.

**Consultation.** The manufacturer of the ACBs/mats shall provide design and construction advice during the design and initial installation phases of the project when required. A representative of the manufacturer shall be present during all ACB mat placement.

## **SUBMITTALS**

The Contractor shall submit to the Engineer an appropriate geotextile, selected for the site being protected on the basis of the gradation and permeability of the surface soils, which information shall have been provided by the Engineer or the designated geotechnical engineer.

The Contractor shall furnish manufacturer's certificates of compliance for ACBs/mats, revetment cable, geotextile, and any revetment cable fittings and connectors. The Contractor shall also furnish the manufacturer's specifications, literature, preliminary shop drawings for the layout of the mats, installation and safety instructions, and any recommendations, if applicable, that are specifically related to the project. If a color has been specified for the block, the Contractor shall submit a color chart indicating the specified standard color.

Alternative materials from qualified suppliers may be considered; to qualify, proposed alternative suppliers must own and operate their own manufacturing facility, and shall directly employ a minimum of five (5) registered Professional Engineers. Full documentation consistent with the foregoing must be submitted in writing to the Engineer a minimum of twenty (20) business days prior to bid date, and must be pre-approved in writing as an addendum to the bid documents and drawings by the Engineer at least ten (10) business days prior to bid date. Submittal packages must also include, as a minimum, the following:

1. Evidence of satisfactory full-scale laboratory testing in accordance with ASTM D 7277, Standard Test Method for Performance Testing of Articulating Concrete Block (ACB) Revetment Systems for Hydraulic Stability in Open Channel Flow, performed on behalf the submitting manufacturer on a qualifying test flume of sufficient length for the test flows to achieve normal depth in all cases, and associated engineered calculations quantifying the Factor of Safety of the proposed ACB system under the design conditions of the specific project, stamped and signed by a registered Professional Engineer residing in and licensed to practice in the state where the project is located;
2. A list of 5 comparable projects, in terms of size and applications, in the United States, where the satisfactory performance of the specific alternate ACB system can be verified after a minimum of five (5) years of service life;
3. Information about, or certifications of, all materials associated with the ACB system as detailed above, including (but not limited to) cable, fittings, geotextile, and any other materials required for satisfactory installation in accordance with ASTM D 6884, Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems;
4. The names and contact information (phone numbers and e-mail addresses, at a minimum) for the suppliers' representatives, for technical, production or logistics questions, at least one of whom must reside in the state where the project is located.

**WORK ITEM 12 – FLEXAMAT EROSION CONTROL MAT (ALTERNATE NO. 2)**

**DESCRIPTION**

Furnish and install Flexamat Erosion Control Mats.

Provide shop drawings to indicate the means and methods necessary to place the mats in accordance with this specification and the plans. Describe the size and location of mats and placement and details explaining how the mats are tied together. Provide the Engineer with any manufacturer’s recommendations that are specifically related to this project.

**MATERIALS**

**Flexamat** is manufactured from individual concrete blocks tied together with high strength polypropylene bi-axial geogrid. Each block is tapered, beveled and interlocked and includes connections that prevent lateral displacement of the blocks within the mats when they are lifted for placement.

**Blocks:** Furnish blocks manufactured with concrete conforming to the cement requirements of ASTM C150 and to the aggregate requirements of ASTM C33. Meet a minimum compressive strength of 4,000 psi at 28 days. Furnish blocks that have a minimum weight of 3 lb. per block. Blocks shall be placed no further than 2 inches apart.

**Polypropylene Bi-Axial Geogrid:** Provide revetment mat that is constructed of a high tenacity, low elongating and continuous filament polypropylene fibers that is securely cast into and embedded within the base of the concrete blocks and obtains connection strength greater than that of the geogrid. Ensure the geogrid meets the requirements of Table 1:

**Table 1  
Polypropylene Geogrid**

<b>Description</b>	<b>Requirement</b>
UV Stabilization	2% Carbon Black
Ultimate Tensile Strength	2,000 lb./ft.

**Backing Materials** Three backing options:

- Flexamat Plus – Includes both Curlex® and Recyclex TRM-V

The backing material shall be packaged in roll of Flexamat.

**Curlex® II:**

Curlex II erosion control blanket (ECB) consists of a specific cut of naturally seed free Great Lakes Aspen curled wood excelsior with 80% six-inch fibers or greater fiber length. It is of consistent thickness with fibers evenly distributed throughout the entire area of the blanket. The top and bottom of each blanket is covered with degradable polypropylene netting.

<b><u>Index Property</u></b>	<b><u>Test Method</u></b>	<b><u>Value</u></b>
Thickness	ASTM D 6525	0.418 in (10.62mm)
Light Penetration	ASTM D 6567	34.6% Resiliency
Resilience	ASTM D 6524	64%
Mass per Unit Area	ASTM D 6475	0.57 lb/yd <sup>2</sup> (309 g/m <sup>2</sup> )
MD-Tensile Strength Max.	ASTM D 6818	127.0 lb/ft (1.9 kN/m)
TD-Tensile Strength Max.	ASTM D 6818	50.9 lb/ft (0.7 kN/m)
MD-Elongation	ASTM D 6818	28.64%
TD-Elongation	ASTM D 6818	29.84%
Swell	ECTC Procedure	89%
Water Absorption	ASTM D 1117/ECTC	199%
Bench-Scale Rain Splash	ECTC Method 2	SLR = 6.84 @ 2 in/hr <sup>2,3</sup>
Bench-Scale Rain Splash	ECTC Method 2	SLR = 7.19 @ 4 in/hr <sup>2,3</sup>
Bench-Scale Rain Splash	ECTC Method 2	SLR = 7.56 @ 6 in/hr <sup>2,3</sup>
Bench-Scale Shear	ECTC Method 3	2.6 lb/ft <sup>2</sup> @ 0.5 in soil loss <sup>3</sup>
Germination Improvement	ECTC Method 4	645%

<sup>1</sup> Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen excelsior is 22%.

<sup>2</sup> SLR is the Soil Loss Ratio, as reported by NTPEP/AASHTO. <sup>3</sup> Bench-scale index values should not be used for design purposes.

**Recyclex® TRM:**

Recyclex TRM – V is a permanent non-degradable Turf Reinforcement Mat (TRM), consists of 100% post-consumer recycled polyester (green or brown bottles) with 80% five-inch fibers or greater fiber length. It is of consistent thickness with fibers evenly distributed throughout the entire area of the TRM. The top and bottom of each TRM is covered with heavy duty polypropylene net. Fibers are tightly crimped and curled to allow fiber interlock, and to retain 95% memory of the original shape after loading by hydraulic events. Fibers have a specific gravity greater than 1.0; therefore, the blanket will not float during hydraulic events. Recyclex TRM – V meets Federal Government Executive Order initiatives for use of products made from, or incorporating, recycled materials. Recyclex TRM – V shall be manufactured in the U.S.A. and the fibers shall be made from 100% recycled post-consumer goods.

<b><u>Index Property</u></b>	<b><u>Test Method</u></b>	<b><u>Value</u></b>
Thickness	ASTM D 6525	0.294 in (7.47 mm)
Light Penetration	ASTM D 6567	57%
Resiliency	ASTM D 6524	86%
.Mass per Unit Area	ASTM D 6566	0.50 lb/yd <sup>2</sup> (271 g/m <sup>2</sup> )
MD-Tensile Strength Max.	ASTM D 6818	295.2 lb/ft (4.32 kN/m)
TD-Tensile Strength Max.	ASTM D 6818	194.4 lb/ft (2.85 kN/m)
MD-Elongation	ASTM D 6818	32.2%
TD-Elongation	ASTM D 6818	40.8%
Swell	ECTC Procedure	8%
Water Absorption	ASTM D 1117/ECTC	33.8%
Specific Gravity	ASTM D 792	1.21
UV Stability	ASTM D 4355 (1,000 hr)	80% minimum

<u>Index Property</u>	<u>Test Method</u>	<u>Value</u>
Porosity	Calculated	97.5%
Bench-Scale Rain Splash	ECTC Method 2	SLR = 4.13 @ 2 in/hr <sup>1,2</sup>
Bench-Scale Rain Splash	ECTC Method 2	SLR = 4.97 @ 4 in/hr <sup>1,2</sup>
Bench-Scale Rain Splash	ECTC Method 2	SLR = 5.99 @ 6 in/hr <sup>1,2</sup>
Bench-Scale Shear	ECTC Method 3	2.40 lb/ft <sup>2</sup> @ 0.5 in soil loss <sup>2</sup>
Germination Improvement	ECTC Method 4	353%

<sup>1</sup> SLR is the Soil Loss Ratio, as reported by NTPEP/AASHTO. <sup>2</sup> Bench-scale index values should not be used for design purposes

Cover the mat or otherwise protect it during long periods of storage to protect against degradation of the backing material as recommended by the manufacturer.

Mats will be rolled for shipment and are packaged with handling straps. These handling straps shall only be used for lifting below 2 ft. as a means to place heavy duty lifting straps under rolls. Upon delivery, rolls may be left exposed for up to 30 days. If exposure will exceed 30 days, cover or tarp the rolls to minimize UV exposure.

All mats to be inspected upon delivery. Assure that all units are sound and free of defects that would interfere with the proper placing of the unit or impair the strength or permanence of the construction.

Chipping or missing concrete resulting in a weight loss exceeding 15% of the average weight of a concrete unit is grounds for rejection by the engineer. Replace, repair or patch the damaged areas per the manufacturer's recommendations.

## **EQUIPMENT**

Provide the proper equipment to place the mat that will not damage the mat material or disturb the top soil subgrade and seed bed.

## **CONSTRUCTION**

Prior to installing Flexamat, prepare the subgrade as detailed in the plans. All subgrade surfaces to be smooth and free of all rocks, stones, sticks, roots, and other protrusions or debris of any kind that would result in an individual block being raised more than 3/4 in. above the adjoining blocks. When seeding is shown on the plans, provide subgrade material that can sustain growth.

Ensure the prepared subgrade provides a smooth, firm, and unyielding foundation for the mats.

When vegetation is required, distribute seed on the prepared topsoil subgrade before installation of the concrete mats in accordance with the specifications. The location of Flexamat to be placed on topsoil and seeded is shown on the Plans.

Install mats to the line and grade shown on the plans and according to the manufacturer's guidelines. The manufacturer or authorized representative will provide technical assistance during the slope preparation and installation of the concrete block mats as needed.

Provide a minimum 18 in. deep concrete mat embedment toe trench at all edges exposed to concentrated flows. Recess exterior edges subject to sheet flow a minimum of 3 in.

When needed, provide fastening or anchoring as recommended by the manufacturer or engineer for the site conditions.

For seams parallel to the flow line in ditch or channel applications, center a minimum 3 ft. wide strip of soil retention blanket under the seam. Fasten along the seam at 5 ft. maximum spacing. Parallel seams in the center of the ditch shall be avoided when possible.

Shingle seams perpendicular to the flow line with the downstream mat recessed a minimum of 2 blocks under the upstream mat and fastened together along the seam at 2 ft. maximum spacing if required by manufacturer or engineer.

## **WORK ITEM NO. 13 – REINFORCING STEEL**

### **DESCRIPTION**

The Contractor shall furnish all necessary equipment, labor and material to install all reinforcing steel for cast-in-place concrete, including bars, welded wire fabric, ties, supports, and anchor bolts per Plan details and as directed.

### **MATERIALS**

Reinforcing Steel shall be Grade 60 (ASTM A615)

### **CONSTRUCTION REQUIREMENTS**

The Contractor shall comply with the requirements of the following codes and standards:

1. American Welding Society, AWS D1.4 “Structural Welding Code-Reinforcing Steel”.
2. Concrete Reinforcing Steel Institute, “Manual of Standard Practices.”
3. American Concrete Institute, ACI 318 “Building Code Requirements for Reinforced Concrete.”

Before reinforcement is placed, the surface of the bars and fabric shall be cleaned to remove any loose, flaky rust, mill scale, oil, grease, or undesirable coatings or foreign substances. After placement, the reinforcement shall be maintained in a clean and serviceable condition until it is completely encased within concrete.

Reinforcement shall be accurately placed and secured in position to prevent displacement during the placement of concrete. Tack welding of bars is not permitted. Metal chairs, metal hangers, metal spacers, and concrete chairs may be used to support the reinforcement, but shall be placed in such a manner that they are not exposed in the finished concrete surface.

Reinforcement shall not be placed until the prepared site has been inspected and approved. After placement of the reinforcement, concrete shall not be placed until the reinforcement has been inspected by the Owner’s Representative.

Steel reinforcement stored at the work site shall be protected from damage and/or corrosion.

## **WORK ITEM NO. 14 – PORTLAND CEMENT CONCRETE**

### **DESCRIPTION**

The work shall consist of furnishing all material, labor and equipment necessary to furnish and install the Reinforced Concrete Items, including field drilled holes on concrete and chemical anchor system.

### **MATERIALS**

Concrete shall conform to INDOT Standard Specifications Section 702, Class "A" Concrete. Limestone coarse aggregate shall be used, 1-1/2" maximum.

Concrete shall conform to all provisions of the latest edition of the American Society for Testing Materials (ASTM) and the American Concrete Institute (ACI) noted within this specification, except as modified in the Supplementary Conditions.

At least 15 days prior to the placement of concrete, the Contractor shall provide the Owner's Representative with full documentation to support each job mix and any admixtures to be used in compliance with INDOT Class A Mix Design. After a job mix has been reviewed by the Owner's Representative, neither source, character, or gradation of the aggregate nor type of cement or admixtures shall be changed without prior notice to the Owner's Representative.

Chemical anchor systems shall conform to INDOT Standard Specifications Section 702 and be selected from INDOT's approved chemical anchor systems list.

Testing shall be as described with Item #3.

### **CONSTRUCTION METHODS**

Construction shall comply with the provisions of the following code specifications and standards, except as otherwise shown or specified:

1. ACI 301 "Specifications for Structural Concrete for Buildings"
2. ACI 311 "Recommended Practice for Concrete Inspection"
3. ACI 318 "Building Code Requirements for Reinforced Concrete"
4. ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete"
5. ACI 305 "Hot Weather Concreting"
6. ACI 306 "Cold Weather Concreting"
7. Concrete Reinforcing Steel Institute, "Manual of Standard Practice"
8. Comply with Building Code Requirements which are more stringent than above.

9. INDOT Standard Specifications.

The Contractor is responsible for the correction of concrete work that does not conform to the specified requirements, including, but not limited to, strength, tolerances, and finishes. The extent of the area to be corrected will be determined by the Owner's Representative. Removal and repair activities shall only be performed when the Owner's Representative is present.

The Contractor shall save all concrete delivery tickets and deliver such tickets to the Owner's Representative when requested. Failure to provide the tickets as specified below shall be cause for rejection of concrete work. Concrete delivery tickets for each batch of delivered concrete shall include the following information in accordance with ASTM C-94. All quantities shall be the total quantity batched in the delivery vehicle.

1. Quantity of Cement
2. Quantity of Fine Aggregate
3. Quantity of Coarse Aggregate
4. Quantity and Type of Fly Ash
5. Quantity of each Admixture
6. Sufficient information to determine the Total Quantity of Free Water.
7. Time Loaded
8. Time Departed
9. Time Arrived

Concrete mix designs shall be submitted to the Owner's Representative at least 15 days prior to planned use. Submittals shall include the following information:

1. Source of Cement
2. Source of Aggregate
3. Source and Type of Fly Ash
4. Brand of each Admixture

The Contractor shall submit laboratory test results for the concrete materials and mix design tests. If permitted by the Owner, material certificates may be provided in lieu of material laboratory tests. The Contractor shall submit samples of materials as requested by the Owner's Representative.

Ready-Mix Concrete shall comply with the requirements of ASTM C94 and specified herein. During hot weather or under conditions contributing to the rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required. When the air temperature is between 85°F and 90°F, reduce the mixing and delivery time from 1½-hours to 75 minutes, and when the air temperature is above 90°F, reduce the mixing and delivery time to 60 minutes. Addition of water, onsite, to the batch will not be permitted.

Before placing concrete, the Contractor shall notify the Owner's Representative 24 hours before the scheduled concrete placement and shall not place concrete until the bearing surfaces have been inspected by the Owner's Representative. Prior to placement, the Contractor shall remove all ice, debris, and other deleterious material from the forms and placement area.

The Contractor shall remove all free water from the area of concrete placement where a tremie is not used.

All form bolts, metal ties and similar forming restraints shall be removed to a depth of 1-inch below the surface of the concrete and their cavities repaired unless otherwise specified. Small cavities, large air holes,

minor honeycombed areas and other superficial imperfections shall be patched as directed by the Owner's Representative.

The Contractor shall repair or replace concrete that does not meet the requirements of the Specifications. Prior to beginning any repair or replacement work, the Contractor shall prepare a written plan for the repair or replacement.

Field Drilled holes in concrete and chemical anchor systems shall conform with INDOT Standard Specifications Section 702.25.

## **WORK ITEM NO. 15 – STEEL SHEET PILING**

### **DESCRIPTION**

The extent of steel sheet piling walls is shown on the drawings.

The work includes the mobilization of pile driving equipment and the furnishing, driving, splicing and cut-off of steel sheet piles to the penetrations and elevations shown on the Plans. Temporary sheeting, shoring and bracing is not included in this item.

### **QUALITY ASSURANCE**

The Installer shall examine the subgrade and the conditions under which the steel sheet piling are to be driven and notify the Contractor in writing of unsatisfactory conditions. The Installer shall not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Contractor.

Codes and Standards: Comply with the requirements of the INDOT Standard Specifications Section 910.21, Installation Specifications for Driven Piles (PDCA Specification 103.07) and the Structural Welding Code, ANSI/AWS D1.1, American Welding Society.

### **SUBMITTALS**

Manufacturer's Data: Steel Sheet Piling

- a. For information only, submit 2 certified copies of mill test reports indicating conformance with material standards specified.

Delivery, Handling and Storage:

- a. Deliver steel sheet piling to the project site bundled, tagged and marked. Use metal tags or painted markings on piling to indicate piling size, length and other information corresponding to the markings on the drawings.
- b. Piles should be stored on level ground, if possible, or the lower series of blocking should be laid so that the piling will be level. Blocking should be positioned so that there will not be excessive sag in sheeting. Blocking between lifts should be directly over each preceding blocking series. Overhang at the end of the piles should not exceed two feet. Lifts as stored should not be heavier than those shipped. When lifting piles, slings should be positioned so that the weight will not be concentrated at any one point.

### **MATERIALS**

Steel Sheet Piling: INDOT Standard Specification Section 910.21.

Steel Sheet Piling shall be continuous ball and socket interlock type.

**FABRICATION**

Provide sheet piling sections with standard handling holes.

Provide special corners as required.

Provide temporary sheet piling connections as required.

**INSTALLATION**

Sheet piling shall be installed in conformance with the provisions of the PDCA Specification 103-07, Installation Specification for Driven Piles.

## WORK ITEM NO. 16 – REMOVAL/REPLACEMENT OF CHAIN LINK FENCE

### **DESCRIPTION**

This work shall consist of the removal of existing chain link fence and re-installing of the old fence or the installation of a replacement fence with material comparable to the fence which was removed.

### **MATERIALS**

**Tension Wire:** Tension wire intended for use on the top or bottom of steel chain link fence specified shall be spring coil or crimped steel wire with an initial diameter of  $0.177 \pm 0.005$  of an inch and a minimum breaking load of 1,950 lb and a coating of either zinc or aluminum.

**Stretcher Bars, Truss Rods and Turnbuckles.** Stretcher bars shall be  $3/16$  in. by  $3/4$  in. flat bars. These bars, truss rods, turnbuckles and necessary fittings shall be of good commercial quality steel, malleable iron or wrought iron. They shall be galvanized in accordance with ASTM A 153 after fabrication. The turnbuckles shall be made from drop forged malleable iron. They shall have a minimum take up of 4 in. The fittings may be pressed or rolled steel, forged steel, cast steel or malleable iron.

**Braces.** Braces shall be made of steel pipe with bolted steel couplings or connections. Steel pipe shall be in accordance with ASTM F1083. They shall be galvanized as set out therein. Fabrication or manipulation that causes minor damage to the galvanized coating shall be corrected by approved application of high zinc dust-zinc oxide paint.

### **CONSTRUCTION REQUIREMENTS**

The Chain Link Fence and Posts shall be installed in accordance with applicable provision of Section 603 of the 2016 INDOT Standard Specifications.

## **WORK ITEM NO. 17 – HIGH PERFORMANCE TURF REINFORCEMENT MAT**

### **DESCRIPTION**

The Contractor shall supply all necessary equipment, labor and materials required to complete the installation of the High Performance Turf Reinforcement Mat (HPTRM) at the locations shown on the project Plans.

### **MATERIALS**

The HPTRM shall be North American Green VMAX SC250 Reinforcement Mat or approved equal.

### **CONSTRUCTION REQUIREMENTS**

The HPTRM shall be installed in accordance with the manufacturer's recommendations, including proper overlap/embedment at the ends. The areas shall be stripped of existing vegetation and 4-inches of topsoil and seed shall be placed prior to the installation of the mat.

The HPTRM shall be installed using standard wire staples per the manufacturer's recommendation.

***APPENDIX A***  
***GEOTECHNICAL REPORT***

**GEOTECHNICAL EVALUATION  
LAKE MANITOU DAM AND  
SPILLWAY IMPROVEMENTS  
ROCHESTER, INDIANA**

**Prepared for**

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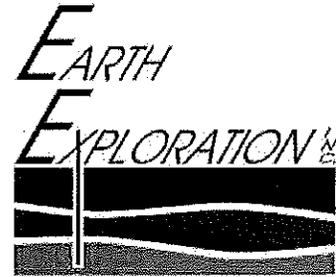
**By**

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**November 17, 2015**

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Re: Geotechnical Evaluation  
Lake Manitou Dam and Spillway Improvements  
Rochester, Indiana  
EEI Project No. 1-15-324

Dear Sky:

We have completed our geotechnical evaluation of Lake Manitou Dam and Spillway in Rochester. This report presents the results of our exploratory field and laboratory testing programs. In addition, this report includes an analysis of the existing conditions and discussion and recommendations for making improvements from a geotechnical perspective. Our scope was established with the understanding that the Indiana Department of Natural Resources (IDNR) had retained Lawson-Fisher Associates P.C. (LFA) to complete a hydrologic and hydraulic (H&H) analysis and prepare contract documents to make improvements to the facility. Other than information provided by the IDNR related to improvements made in the early 1990's, no other documented historical information was available. Based on our conversations and known deficiencies at that time, we anticipated that the need for improvement would primarily be at the principal spillway. Currently, we understand you are in the process of making the H&H analyses and preparing preliminary plans. As those plans become available, we anticipate additional geotechnical recommendations and discussion will occur.

We appreciate the opportunity to provide our services to you. If you should have any questions or require further assistance with the project, feel free to contact our office.

Sincerely,

**EARTH EXPLORATION, INC.**

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**GEOTECHNICAL EVALUATION  
LAKE MANITOU DAM AND SPILLWAY IMPROVEMENTS  
ROCHESTER, INDIANA  
EEI PROJECT NO. 1-15-324**

**1. INTRODUCTION**

**1.1 General**

We understand that the IDNR is planning to make dam and spillway improvements at Lake Manitou in Rochester. This report presents the results of our exploratory field and laboratory testing programs necessary to provide supportive information for making the improvements. In addition, this report includes an analysis of the existing conditions and discussion and recommendations for making improvements from a geotechnical perspective. Our scope was established with the understanding that the IDNR had retained LFA to complete a hydrologic and hydraulic (H&H) analysis for the facility and prepare contract documents for the improvements. Other than information provided by the IDNR related to previous improvements made in the early 1990's, no other documented historical information was available. Based on our conversations and known deficiencies, we anticipated that improvements would primarily be at the principal spillway. Currently, we understand you are in the process of making the H&H analysis and preparing preliminary plans. As those plans become available, we anticipate additional geotechnical recommendations and discussion will occur.

**1.2 Brief Background Information & Site Observations**

The impoundment was created by the damming of Mill Creek reportedly circa 1827, and the energy created was used to power a mill. Based on a review of the IDNR file, no record information is available prior to 1990 other than a few photographs of the spillway taken during previous inspection as early as 1981. No other information is known.

An improvements project in the early 1990's included, in general, reconstruction of the downstream end of the principal spillway (which included new sheet pile wing walls), construction of an earthen auxiliary spillway near the right abutment, removal of pipe culverts located near the right abutment, removal of a concrete structure anticipated to have been the former headworks for the mill race near the left abutment, and flattening of the downstream slope to no steeper than about 5H:1V. In addition, a sheet pile cut-off wall/weir was installed across the auxiliary spillway and across the location of the removed pipe culverts. We understand that the sheet piling at the

auxiliary spillway was extended south to the principal spillway in order to control seepage and dewatering risks during construction for the wing walls. However, the portion of the principal spillway structure constructed prior to 1990 was left intact and is suspected to contain void space below the slab.

The present-day facility consists of a 550-ft long and 10-ft high earthen embankment with the aforementioned concrete principal spillway and earthen auxiliary spillway. Based on the information taken from a recent inspection report, the impoundment is approximately 775 ac in size at normal pool (El. 778.4) and drains about 44 sq mi. In addition, the facility is considered to be a significant hazard based on IDNR criteria. As mentioned, the hydrologic and hydraulic characteristics are being evaluated by LFA.

Based on observations of the concrete at the principal spillway and our conversations with the IDNR and LFA, voids are suspected below the slab. In addition, seepage was observed along the left abutment of the principal spillway likely entering from open cracks in the wall at the upstream end of the spillway. Due to thick brush, observations of possible seepage along the right abutment of the spillway were not made. In general, much of the risk at the facility is associated with the principal spillway structure.

### **1.3 Purpose and Scope of Services**

The purpose of our services was to: 1) provide an evaluation of the subsurface conditions at the principal spillway and embankment; 2) provide an analysis of these conditions; and 3) provide discussion and recommendations for improvements. Specifically, our scope of work included:

1. Review of historical information available in the IDNR file;
2. Completing ground penetrating radar (GPR) and eight concrete cores on the principal spillway floor;
3. Performing and sampling eight exploratory test borings (designated B-1 through B-8) to depths of about 16 to 30 ft;
4. Performing a laboratory testing program including visual soil classification, natural moisture content, Atterberg limits determinations, grain size analysis, and loss-on-ignition; and
5. Preparing a technical report which summarizes the results of our exploratory field and laboratory testing programs and provides discussion and recommendations for making improvements.

## **2. GENERAL SITE CONDITIONS**

### **2.1 General Geology and Seismic Considerations**

The project is an area mapped as glacial outwash fan deposits consisting primarily of granular-type soils with a thickness ranging from about 5 to 150 ft. In addition, the underlying bedrock is identified as the Wabash formation. According to the Indiana Geological Survey, the Wabash formation consists of four principal lithologies: Mississinewa Shale, Liston Creek Limestone, Kenneth Limestone and Kokomo Limestone. Generally, the Wabash is light colored gray to brown silty dolomite/limestone, dolomitic limestone and bluish-gray carbonate mudstone. The lower portion of the Wabash is occupied by the Mississinewa Shale member and generally consists of gray, dense to fine grained calcareous silty dolomite and dolomitic silty limestone. The upper portion of the Wabash is primarily occupied by the Liston Creek Limestone which is comprised of light-colored, finely granular limestone, dolomitic limestone and dolomite

We understand that no evaluations of seismicity were available for the facility. Based on publicly available information compiled by the United States Geological Survey (USGS), the peak ground acceleration (PGA; at the bedrock surface) for the site is estimated to be about 0.04g considering a 7½ percent probability of exceedence in a 75-yr period. In addition, based on our evaluation (discussed later), the subsurface conditions most closely resemble a Site Class D according to International Building Code and AASHTO specifications. Considering the Site Class effects, an acceleration at the ground surface of 0.06g was estimated.

### **2.2 Physical Setting**

As mentioned, the facility is located on Mill Creek on the east side of Rochester. The spillways and embankment are oriented in a general north-to-south alignment. The area surrounding the facility serves as a city park.

## **3. EXPLORATORY FIELD AND LABORATORY TESTING PROGRAMS**

### **3.1 General**

Conditions on and immediately below the principal spillway floor were explored by performing a GPR survey and completing eight cores of the concrete at locations shown on Figure 1 – GPR Contour Map in Appendix B. In addition, eight exploratory test borings were completed on the embankment and downstream of the embankment at the locations shown on the Test Boring Location Plan (Drawing No. 1-15-324.B1) in Appendix C. The exploratory program was prepared by

EEI in conjunction with LFA and the IDNR. The test boring locations were staked in the field by EEI personnel, and the ground surface elevation at the test boring locations was provided by LFA.

### **3.2 Exploratory Methods and Sample Collection**

#### **3.2.1 Ground Penetrating Radar and Concrete Cores**

At the time of the GPR survey, approximately 3 in. of water was flowing over the surface of the spillway. In order to better utilize equipment and reduce the volume of water to be controlled, the spillway was surveyed in four sections that were later combined during post-processing. For water control, we utilized sandbags and erosion control socks to divert the water away from the individual survey areas. We then utilized a pressurized water spray, squeegees and brushes to remove standing water, algae and debris on the surface of the spillway. The use of the pressurized water spray was suspended when it became apparent that the action was removing pieces of concrete surface.

GPR data were collected using a Sensors & Software Noggin® Smart Cart™ and a 1,000-megahertz (Mhz) monostatic antenna. The GPR recording length was set at 57 nanoseconds, yielding a maximum imaging depth of approximately 2½ ft, with a sampling rate at 360 samples/trace and 50 traces/ft. Void thickness estimates are limited by the radar frequency/wavelength characteristics. With a 1,000-Mhz antenna, minimum layer thickness resolution is approximately 2 in. That is, the system is not able to image individual layers (e.g., void space) that are less than 2 in. apart/in thickness. Following the survey, the GPR data was reviewed on-site for quality, and the concrete core locations were selected to further evaluate anomalous areas (i.e., ground truthing). The data was digitally recorded for post-processing at our office.

EKKO\_Project© and EKKO Mapper© software by Sensors & Software Incorporated was used to display the GPR file and interpret anomalous areas. Low-cut frequency filtering “dewow”, gain adjustment and frequency filtering were performed to accentuate geophysical anomalies, and velocity analysis by diffraction migration and actual core thickness was used to provide an estimate of the depths of anomalies. A time slice at the interpreted base of concrete was exported to Surfer12 software by Golden Software for contouring and creation of Figure 1 (Appendix B). Selected profiles are included to depict specific examples of anomalies as shown in Figure 2 – GPR Profiles (Appendix B).

In the GPR profile images, high-amplitude reflections appear as black or white shades in a grayscale color scheme, depending on whether the reflections were positive or negative. If

present, voids would be expected to exhibit a similar high-amplitude reflection anomaly. Conditions other than voids can also cause high amplitude reflections. This may include, but not be limited to, water-saturated soil or concrete, buried debris or objects, pipes, foundation elements, or other objects.

### **3.2.2 Exploratory Test Borings**

The exploratory test borings were performed by EEI during the period of August 26 through 28, 2015, using 3¼-in. I.D. hollow stem augers to advance the boreholes. Relatively disturbed samples of the soil strata were obtained at continuous intervals with a split-spoon sampler using Standard Penetration Test (SPT) procedures (ASTM D 1586). Following the completion of the field activities, each borehole was backfilled with cement-bentonite grout. Further details of the drilling and sampling procedures are provided in Appendix A.

### **3.3 Laboratory Observations and Testing**

Soil classifications on the logs are according to the Unified Soil Classification System (USCS; ASTM D 2488). Further details of the classification system are provided for review in Appendix A. Tests on representative soil samples were performed in general accordance with ASTM specifications and included natural moisture content (W%; ASTM D 2216), loss on ignition (a measure of organic content; LOI% by mass; ASTM D 2974), Atterberg limits determinations (LL% [liquid limit], PL% [plastic limit]; ASTM D 4318), and grain size analysis (ASTM D 422). After a review of the samples and test results, boring logs were then prepared. These results are provided in the body of the report and on the boring logs and/or on laboratory reports in Appendix C. The boring logs represent our interpretation of the individual samples and field logs. Stratification lines on the boring logs represent the approximate boundary between soil types; although the transitions may actually be gradual.

## **4. SUBSURFACE CONDITIONS**

### **4.1 Principal Spillway Floor**

From our exploratory work, the floor of the principal spillway consisted of Portland cement concrete with a thickness in the range of 6¼ to 9½ in. As suspected from our site observations and GPR survey, void space was exposed below the concrete at many of the core locations. The thickness of the void space was about 1 to 4 in. at the locations of Cores PC-1, PC-2, PC-6, and

PC-7. The soil below the void space (or below the concrete where a void was not present) consisted of sandy gravel with cobbles below a depth of 12 in. In addition, mussel shells and root fibers were observed below the concrete at some of the core locations. It should also be noted that water from below the concrete was observed rising up to the surface of the concrete at the locations of Cores PC-3 and PC-4. Refer to the Summary of Concrete Cores in Appendix B for additional information.

As mentioned earlier, the limitations of the GPR survey are such that void space less than 2 in. in thickness is difficult to interpret. As interpreted in Figure 1 (and confirmed via the cores), however, void development in excess of 2 in. in thickness is anticipated to be present below a significant portion of the spillway floor. In addition, reinforcing steel was present in the concrete, and from observations of two of the cores, the steel was about ½ in. in diameter. Of possible interest as well is that the spacing of the reinforcing steel was observed to change from approximately every 2 ft in the upstream portion of the floor to about every 1 ft nearer to the downstream end. Where diffractors in the GPR information were observed below 12 in., we interpret that to likely be the cobbles present in the sandy gravel subgrade.

## **4.2 Soil Conditions**

### **4.2.1 General**

For informational purposes as it relates to the discussion in this section, the USCS differentiates coarse-grained (granular) and fine-grained (typically cohesive) soils by the percent (by mass) of particles passing the No. 200 sieve ( $P_{200}$ ). Soils containing more than 50 percent fine-grained particles (i.e., more than 50 percent passing the No. 200 sieve) are typically described as "cohesive," and less than 50 percent as "granular." In addition, the Atterberg limits are commonly used to define the various states of fine-grained soil (typically cohesive) and/or the fraction of fine-grained soil within a coarse-grained (granular) stratum. Specifically, the liquid limit (LL) is the moisture content that defines the limit between a "liquid state" and a "plastic state," and the plastic limit (PL) is the moisture content that defines the limit between a "plastic state" and a "semi-solid state." The PI is the difference between the LL and the PL and is an indicator of the workability and sensitivity to moisture in addition to deformational characteristics.

The soil conditions representing that used to construct the embankment (i.e., the fill) and the naturally-occurring profile consisted of granular soils that extended to the maximum depth explored. The granular soils described as fill included silty sand (SM) and sand (SP-SM), and the naturally occurring granular soils were "cleaner" sands of various gradations (SP, SW-SM, and SP-SM;

cleaner meaning sands with less than 15 percent silt and clay content). The embankment fill was observed to extend to about 7 ft in depth at Borings B-1 and B-2 (El. 773) and about 3 ft (El. 778) at Boring B-3. In addition, seams and layers of organic and/or marly soil were exposed at Borings B-1, B-2, and B-5, with the more substantial thickness of these conditions being at Boring B-2. At Borings B-1 and B-2, the organic soil was observed near a depth of 7 ft and is anticipated to be representative of the original ground surface. The seam of organic soil was exposed at Boring B-5 near a depth of 6 ft. The soil above the organic seam at Boring B-5 was described as possible fill and could be representative of the former creek alignment or an otherwise previously existing low area. The reader should refer to the boring logs in Appendix C for additional details of the subsurface conditions at each of the boring locations.

#### **4.2.2 Engineering Characteristics**

The relative density of the granular fill was typically very loose to loose, and the naturally-occurring profile was observed to be loose to medium dense based on SPT N-values. Based on the relative density of the fill, the presence of organic and marly conditions, and the timeframe of construction (the early 1800's), the embankment was likely constructed without regard to moisture and density control (uncontrolled fill).

The "fines" content (i.e., silt and clay content;  $P_{200}$ ) of the fill and naturally occurring soil was in the range of 6 to 18 percent except for the organic silty sand at Boring B-2 which had a fines content of 30 percent. The organic content of the soil at Boring B-1, B-2, and B-5 was determined to be in the range of about 3 to 16 percent, and the moisture content of those layers was in the range of 20 to 110 percent.

#### **4.3 Groundwater Conditions**

"Groundwater" level observations made during the field activities are noted at the bottom of the boring logs. The observations at those borings located on the crest are indicative of seepage through the embankment (i.e., the phreatic surface) and not the naturally occurring piezometric condition. The level of the lake at the time of our field activities was near normal pool (El. 778.4). The following table provides a summary of the depth to and corresponding elevation of the groundwater:

**TABLE 1. SUMMARY OF GROUNDWATER OBSERVATIONS**

<b>Boring Location</b>	<b>Depth (ft)</b>	<b>Elevation</b>
B-1	6	774
B-2	7	774
B-3	9	772
B-4	3	772
B-5	2	773
B-6	3	771
B-7	3	771
B-8	4	769

The lake level was estimated near normal pool (El. 778.4) during the exploratory field activities.

## **5. ANALYSIS MODELS AND RESULTS**

### **5.1 Rationale**

Stability analyses were performed based on representative geometry and soil conditions at a section taken through Borings B-2, B-4, and B-6 (as shown in Drawing No. 1-15-324.B1). Given the granular soil forming the embankment and the naturally occurring profile, the effects of seepage are of most concern from a geotechnical viewpoint. For this condition (i.e., seepage), stability of the downstream face was evaluated as well; albeit at a 5H:1V, the slope wasn't anticipated to be of concern even with the presence of organic and marly soil. The stability was analyzed using estimated soil parameters and the observed water levels, and the soil parameters are summarized in Table 2 below. Given the presence of granular soils within the embankment and foundation, an effective stress approach is considered to be appropriate for evaluating the existing conditions. In addition, due to the low acceleration predicted in the event of ground shaking (0.06g), an effective stress approach was considered appropriate for evaluating stability under seismic loading, as well. Any instability of the downstream slope is anticipated to be of a shallow rotational mechanism and be progressive due to the granular nature of the embankment.

The models evaluated the stability of the existing conditions under various loading conditions. Conditions under normal pool were evaluated both under steady-state loading and under a seismic loading event (0.06g). In addition, a seepage and stability analysis under high pool conditions (i.e., El. 780, based on the topography of the auxiliary spillway and crest of the dam) was evaluated as well. Furthermore, an evaluation of the potential for piping at the toe under high pool conditions was performed. Because of the lack of a draw-down structure at the facility, the potential of instability as a result of rapid draw-down was not evaluated.

**TABLE 2: SOIL PARAMETERS FOR ANALYSIS**

Soil Type	Effective Stress		Unit Weight	Permeability
	c (psf)	$\phi$ (degrees) <sup>a</sup>	$\gamma_{sat}$ (pcf)	k (ft/sec)
Embankment Fill	0	30	120	$10^{-3}$
Silty Sand	0	28	110	$10^{-4}$
Sand	0	30	120	$10^{-2}$
Dense Sand	0	32	120	$10^{-2}$

<sup>a</sup> Based on relative density estimated from SPT N-values

For our analysis, a suite of software created by GeoStudio was utilized for stability (i.e., Slope/W) and seepage (i.e., Seep/W) analyses. Slope/W was developed to assess the general stability of a slope using methods anticipated to yield the lowest factor of safety (i.e., the most-likely slip surface). Pore pressures used in the stability analyses were estimated based the results of seepage analyses performed via Seep/W. The value of the factor of safety obtained by these limiting equilibrium procedures are considered reasonable. Results of the analyses are provided in Appendix D. For a facility of this type, the following factors of safety are considered to be the minimum tolerable values:

1. Steady-state seepage at normal pool (minimum factor of safety 1.5);
2. Steady-state seepage with seismic forces (minimum factor of safety 1.1); and
2. Steady-state seepage at high pool (minimum factor of safety 1.1).

**5.2 Liquefaction Potential**

The granular soils forming the embankment and the foundation soils are susceptible to liquefaction if subjected to sudden or rapidly applied loads such as those caused by earthquakes and certain construction activities. With regard to earthquakes, the site is located in a relatively "inactive" seismic zone, and for that reason, the potential for liquefaction is anticipated to be low. In addition, based on empirical correlations, the factors of safety against liquefaction as a result of an earthquake loading at different depths of the potentially liquefiable stratum were determined to be no less than 3½. The factors of safety were computed using low peak ground acceleration (i.e., 0.06g) and empirical correlations based on "standardized" SPT N-values. As a general guideline, acceptable factors of safety range from about 1.25 to 1.5. In our opinion, there is a greater risk of local liquefaction of the ground due to construction activities such as sheet pile installation.

### 5.3 Analysis Results

Based on the results of the stability analysis, the factors of safety are shown in the table below.

**TABLE 3. RESULTS OF STABILITY ANALYSIS**

Condition	Factor of Safety
Steady Seepage at Normal Pool	2.3
Earthquake (0.06g)	1.7
Steady Seepage at High Pool	1.7

As tabulated, factors of safety for the existing conditions exceed the generally accepted minimums. The stability results are based on the existing geometry, subsurface information from the test boring locations, estimated shear strength characteristics, and visual (site) observations. Given the age of the facility and the relatively flat downstream slope, we do not have concern regarding the presence of organic and marly soil as it relates to the existing conditions. In addition, the factor of safety against piping at the toe for ht existing conditions was evaluated to be about 6. This is generally considered to be an acceptable level when evaluating the factor of safety against piping.

## 6. DISCUSSION AND RECOMMENDATIONS

### 6.1 Existing Conditions

As mentioned earlier and demonstrated in our analysis of the embankment, it is our opinion that most of the risk at this facility is associated with the principal spillway structure. Based on our observations and exploratory effort at the principal spillway, water is likely entering below the slab and behind the abutment walls (at least the left abutment) via cracks in the concrete. (It is possible that the sheet piling installed between the auxiliary and principal spillways is providing a level of seepage control at the right abutment of the principal spillway.) It is not known if a cut-off element, such as sheet piling, was installed at the upstream end of the principal spillway. As noted at two of our concrete core locations, water was observed flowing from the subgrade (below the concrete) and up into the core hole through the floor. That observation indicates that head levels below the spillway floor are similar to the lake level. We anticipate that head levels comparable to the head level of the lake are present at the downstream headwall of the principal spillway. Albeit, the total

head is less than 10 ft, this condition provides little in the way of redundancy in the event that the downstream wall cracks, becomes distressed, or has some level of “failure.”

## **6.2 Making Improvements**

From our conversation on October 21<sup>st</sup>, we understand that improvement alternatives at the principal spillway include rehabilitation of the existing structure and reconstruction with a new spillway. We anticipate that a component of the decision to rehabilitate or reconstruct will be, in part, dependent on the conclusions of the H&H analysis and the owner's risk tolerance and budget approach.

As noted earlier, pieces of the concrete spillway floor were observed “flaking up” when we used pressurized water spray to clean the surface for our GPR survey. When we noticed the condition, we stopped using the spray. In our opinion, the decision to rehabilitate or reconstruct should include the risk and consideration of the integrity of the concrete itself. As you are aware, the age of the concrete is not known.

In our opinion in light of the presence of substantial voids and potentially poor concrete quality, an improvement alternative that includes replacement of the floor is preferred versus attempting to grout the void space. Removal of the floor will allow for actual observations of the subgrade and void development to be made and the condition corrected accordingly. In this case, replacement of the floor would also provide for a longer service life for the facility before future improvements are required. Due to inherent uncertainties of grouting (i.e., certainty of execution), it will be difficult to confidently determine if the void space has been entirely filled. As you are aware, it is important to address the void space so that the risk of unimpeded lake-level head conditions at the downstream head wall of the spillway is reduced. If left in place, the existing concrete floor will be a frequent and recurring maintenance issue related to sealing of the existing cracks. At a minimum, we recommend replacement of the upstream apron and control-section area of the spillway where the cracks and open joints are more frequent.

For either alternative (reconstruct or rehabilitate), we recommend that a cut off wall be constructed across the upstream end of the spillway and extend beyond the abutments of the spillway a distance of at least 20 ft. If installed early in the contract, the cut off wall would also serve to reduce the risk of construction dewatering and lake level control. In our opinion, 15-ft long sheets will be sufficient for cut off purposes. We recommend that the sheeting be from hot-rolled sections with a section modulus of no less than 18 cu in. for constructability purposes and to provide for a more durable design. It should be noted that additional lengths of sheeting may be necessary to

address any temporary construction loading/condition.

In addition, we recommend that the soil against the left abutment be removed and replaced. This will allow for observations to be made of the suspected seepage path present behind the wall and address any void development that has occurred. Anticipating the existing backfill to be in a very loose condition (similar to the embankment fill), removal and replacement will also provide the opportunity to establish the backfill in a compacted (engineered) manner as a means to reduce future risks associated with seepage. We recommend that a more-detailed inspection of the right abutment be made to evaluate if seepage is present behind the wall at that location, too. During our site visit, trees and brush obstructed our ability to make that observation in any detail.

Due to concerns of thin sheet piling being used during the 1990's improvements project, we understand that the IDNR would like to replace the downstream wingwalls with a more durable material such as thicker sheet piling or concrete. As plans progress and preliminary details become available for the wing walls, we should be contacted for detailed recommendations. In general, we recommend active earth pressures be used to evaluate bending and/or overturning stresses. For preliminary considerations, an active earth pressure coefficient of 0.35 is anticipated to be reasonable anticipating backfill being placed in an engineered manner. It may be necessary to include hydrostatic loads as well depending on your drainage details. We recommend that drainage (via appropriate gradations of granular soil and pipes) be provided behind the walls but only down to a level that will not be frequently inundated with backwater conditions.

As your H&H analysis progresses, we understand that there could be head-cut risks at the auxiliary spillway. If that is a predicted issue, we can assist as you see fit to mitigate the risk via sheet piling.

## **7. CONCLUDING REMARKS**

In closing, this evaluation has been completed in accordance with generally accepted geotechnical engineering practices. The conclusions contained in this report are based on the subsurface information from the few, widely-spaced exploratory borings and cores. It is important to recognize that subsurface conditions can vary over relatively short distances. We anticipate additional recommendations and discussion will be necessary as plans for improvement are prepared. Furthermore, if conditions other than those explicitly stated are known to exist or become apparent in the future, we recommend that EEI be retained to re-evaluate the conclusions contained in this report.

## **APPENDIX A**

Important Information About This Geotechnical-Engineering Report

Inherent Limitations of Geophysical Surveys and Evaluations

Field Methods for Exploration and Sampling Soils

Unified Soil Classification System/General Notes

# Important Information about This

# Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

## Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply this report for any purpose or project except the one originally contemplated.*

## Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

## Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an

assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

## Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by:* the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

## Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

## A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

## A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

### **Do Not Redraw the Engineer's Logs**

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

### **Give Constructors a Complete Report and Guidance**

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

### **Read Responsibility Provisions Closely**

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help

others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

### **Environmental Concerns Are Not Covered**

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

### **Obtain Professional Assistance To Deal with Mold**

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold-prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical-engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

### **Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance**

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your GBC-Member geotechnical engineer for more information.



8811 Colesville Road/Suite G106, Silver Spring, MD 20910  
Telephone: 301/565-2733 Facsimile: 301/589-2017  
e-mail: [info@geoprofessional.org](mailto:info@geoprofessional.org) [www.geoprofessional.org](http://www.geoprofessional.org)

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## **Inherent Limitations of Geophysical Surveys and Evaluations**

EEI has developed these geophysical interpretations based on our professional knowledge of the methods used and their limitations, our knowledge of the site-specific conditions at the time of the survey, and the results obtained using these methods in similar conditions. However, site conditions (i.e., soil type, moisture content, interferences from other objects, etc.) will ultimately dictate the validity of the interpretations. Geophysical methods rely on the indirect measurements of the physical properties and geometries of subsurface materials, which can result in non-unique datasets and interpretations. Consequently, all geophysical methods are inherently subject to error. Because of these inherent limitations, EEI does not guarantee that the geophysical surveys have detected all subsurface objects that are present, or that the interpreted identities, locations, or depths are in fact correct or exact.

## FIELD METHODS FOR EXPLORING AND SAMPLING SOILS AND ROCK

### A. Boring Procedures Between Samples

The boring is extended downward, between samples, by a hollow stem auger, continuous flight auger, driven and washed-out casing, or rotary boring with drilling mud or water.

### B. Standard Penetration Test and Split-Barrel Sampling of Soils

(ASTM\* Designation: D 1586)

This method consists of driving a 2-in. outside diameter split-barrel sampler using a 140-lb weight falling freely through a distance of 30 in. The sampler is first seated 6 in. into the material to be sampled and then driven 12 in. The number of blows required to drive the sampler the final 12 in. is recorded on the Log of Test Boring and known as the Standard Penetration Resistance or N-value. Recovered samples are first classified as to texture by the field personnel. Later in the laboratory, the field classification is reviewed by a geotechnical engineer who observes each sample.

### C. Thin-walled Tube Sampling of Soils

(ASTM\* Designation: D 1587)

This method consists of hydraulically pushing a 2-in. or 3-in. outside diameter thin wall tube into the soil, usually cohesive types. Relatively undisturbed samples are recovered.

### D. Soil Investigation and Sampling by Auger Borings

(ASTM\* Designation: D 1452)

This method consists of augering a hole and removing representative soil samples from the auger flight or bucket at 5-ft intervals or with each change in the substrata. Relatively disturbed samples are obtained and its use is therefore limited to situations where it is satisfactory to determine approximate subsurface profile.

### E. Diamond Core Drilling for Site Investigation

(ASTM\* Designation: D 2113)

This method consists of advancing a hole in rock or other hard strata by rotating downward a single tube or double tube core barrel equipped with a cutting bit. Diamond, tungsten carbide, or other cutting agents may be used for the bit. Wash water is used to remove the cuttings. Normally, a 3-in. outside diameter by 2-in. inside diameter coring bit is used unless otherwise noted. The rock or hard material recovered within the core barrel is examined in the field and laboratory. Cores are stored in partitioned boxes and the length of recovered material is expressed as a percentage of the actual distance penetrated.

\* American Society for Testing and Materials, Philadelphia, PA



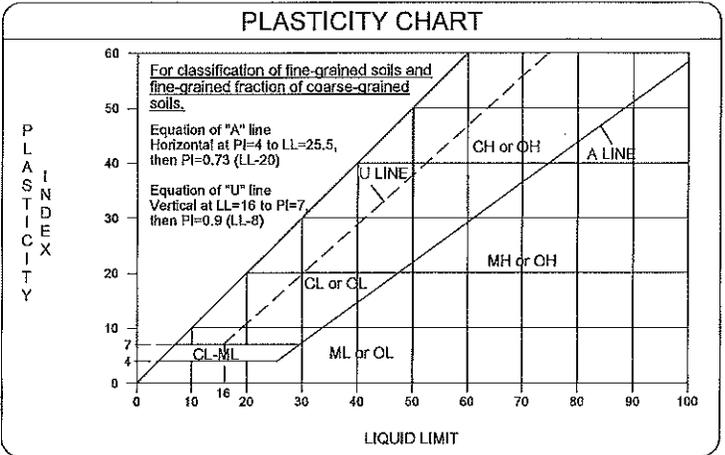
## UNIFIED SOIL CLASSIFICATION SYSTEM / GENERAL NOTES

FINE-GRAINED SOILS		COARSE-GRAINED SOILS		RELATIVE PROPORTIONS		ORGANIC CONTENT BY COMBUSTION METHOD	
CONSISTENCY	UNCONFINED STRENGTH (tsf)	RELATIVE DENSITY	N-VALUE* (Blows/ft)	TERM	DEFINING RANGE BY % OF WEIGHT	SOIL DESCRIPTION	LOI
Very Soft	<0.25	Very Loose	0 - 4	Trace	0 - 5	Trace Organic Matter	0 - 5%
Soft	0.25 - 0.5	Loose	4 - 10	Little	5 - 12	Little Organic Matter	5 - 12%
Medium	0.5 - 1.0	Medium Dense	10 - 30	Some	12 - 35	Organic Silt/Clay	12 - 35%
Stiff	1.0 - 2.0	Dense	30 - 50	And	35 - 50	Sedimentary Peat	35 - 50%
Very Stiff	2.0 - 4.0	Very Dense	50+			Fibrous and Woody Peat	50%±
Hard	>4.0						

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART				
MAJOR DIVISIONS		SYMBOLS & DESCRIPTIONS		
COARSE-GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS	GW WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
		Little or no fines	GP POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
		GRAVELS WITH FINES	GM SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	
		Appreciable amount of fines	GC CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES	
	SAND AND SANDY SOILS	CLEAN SANDS	SW WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
		Little or no fines	SP POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
		SANDS WITH FINES	SM SILTY SANDS, SAND-SILT MIXTURES	
		Appreciable amount of fines	SC CLAYEY SANDS, SAND-CLAY MIXTURES	
FINE-GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	ML INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SAND OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
		OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
		LIQUID LIMIT GREATER THAN 50	MH INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILT	
	SILTS AND CLAYS	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
		HIGHLY ORGANIC SOILS		PT PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENT
		NOTE: DUAL SYMBOLS USED FOR BORDERLINE CLASSIFICATIONS		

GRAIN SIZE TERMINOLOGY		
SOIL FRACTION	PARTICLE SIZE	US STANDARD SIEVE SIZE
Boulders	Larger than 12-in.	Larger than 12-in.
Cobbles	3 to 12-in.	3 to 12-in.
Gravel	Coarse	3/4 to 3-in.
	Fine	4.75 mm to 3/4-in.
Sand	Coarse	#10 to #40
	Med	#40 to #100
	Fine	#100 to #200
Silt	0.075 to 0.005 mm	Smaller than #200
Clay	Smaller than 0.005 mm	Smaller than #200

Plasticity characteristics differentiate between silt and clay.



EXPLORATORY SAMPLING ABBREVIATIONS	
AS - Auger Sample	PID - Photo-Ionization Detector
BF - Backfilled Upon Completion	PMT - Borehole Pressuremeter Test
BS - Bag Sample	PT - 3-in. O.D. Piston Sample
C - Casing: Size 2 1/2-in., NW; 4-in., HW	PTS - Peat Sample
COA - Clean-Out Auger	RB - Rock Bit
CS - Continuous Sampler	RC - Rock Core
CW - Clear Water	REC - Recovery
DC - Driven Casing	RQD - Rock Quality Designation
DM - Drilling Mud	RS - Rock Sounding
FA - Flight Auger	S - Soil Sounding
FT - Fish Tail	SS - 2-in. O.D. Split-Spoon Sample
HA - Hand Auger	ST - Thin-Walled Tube Sample
HSA - Hollow Stem Auger	VS - Vane Shear Test
NW - No Water Encountered	WPT - Water Pressure Test

LABORATORY TEST ABBREVIATIONS	
qp	- Hand Penetrometer Reading, tsf
qu	- Unconfined Compressive Strength, tsf
W	- Moisture Content, %
LL	- Liquid Limit, %
PL	- Plastic Limit, %
PI	- Plasticity Index, %
SL	- Shrinkage Limit, %
LOI	- Loss on Ignition, %
%	- Dry Unit Weight, pcf
pH	- Hydrogen-Ion Concentration
P <sub>200</sub>	- Percent Passing a No. 200 Sieve

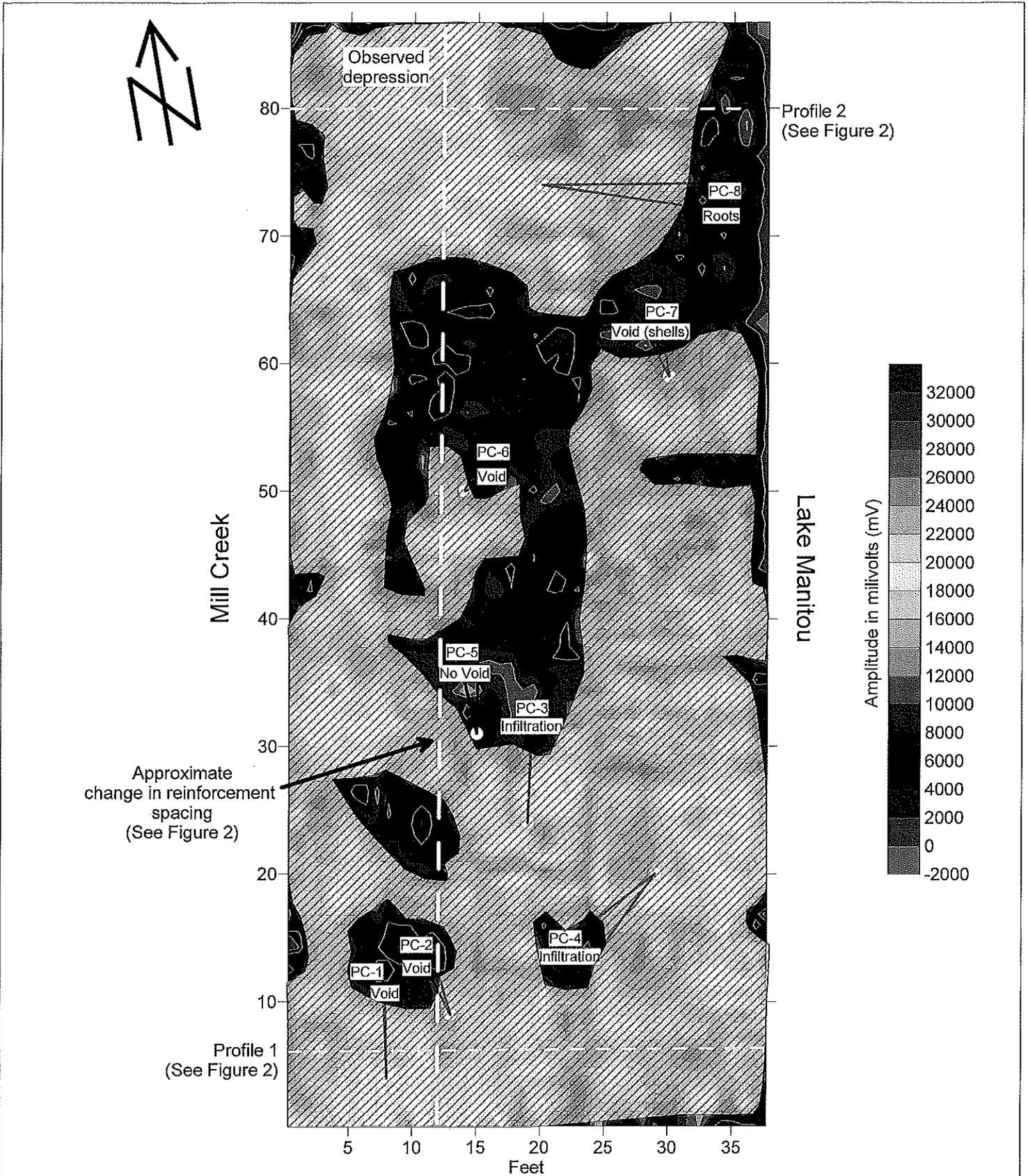
\*The penetration resistance, N, is the summation of the number of blows required to effect two successive 6" penetrations of the 2" O.D. split-spoon sampler. The sampler is driven with a 140 lb weight falling 30" and is seated to a depth of 6" before commencing the standard penetration test.

## **APPENDIX B**

Figure 1 – GPR Contour Map

Figure 2 – GPR Profiles

Summary of Concrete Cores

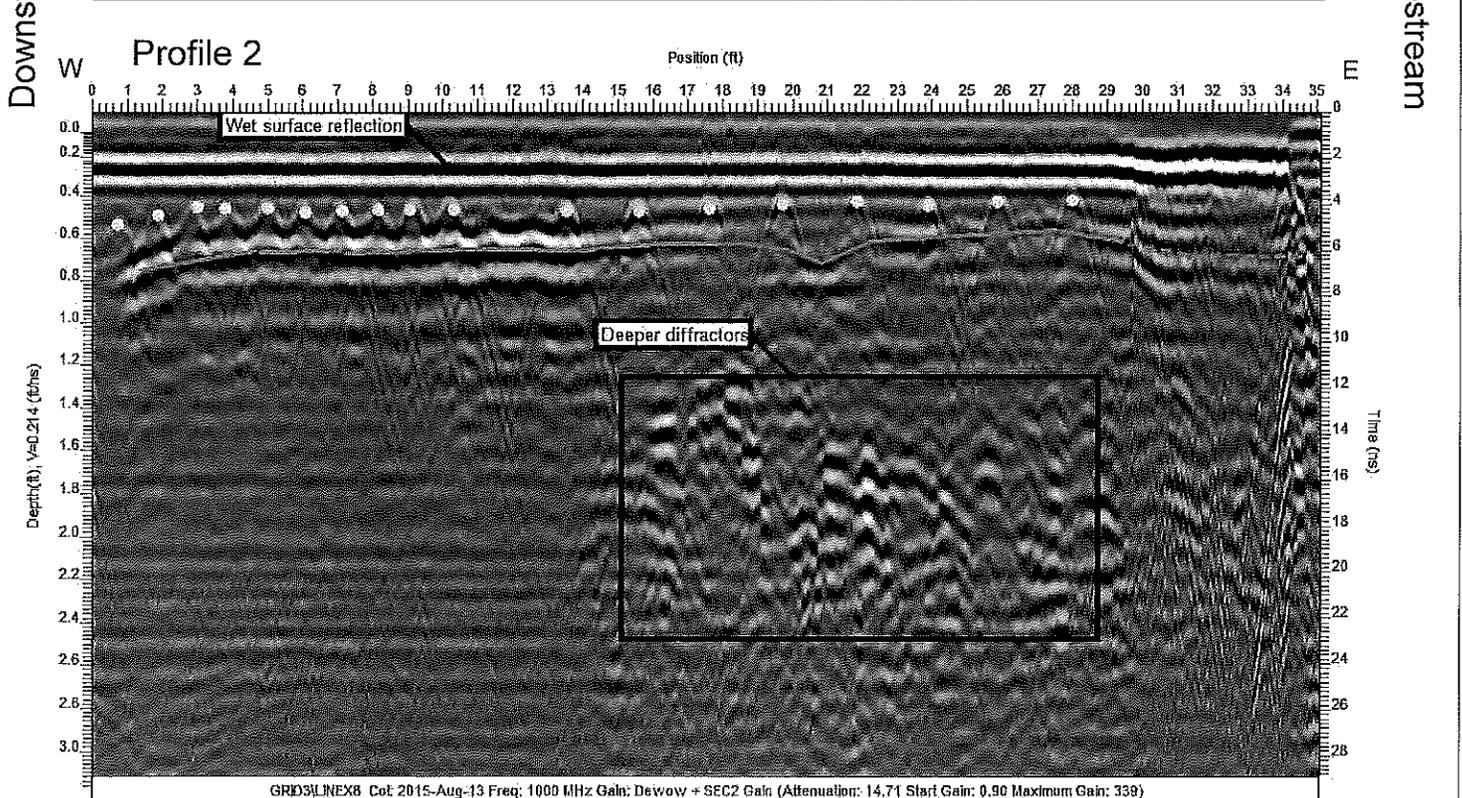
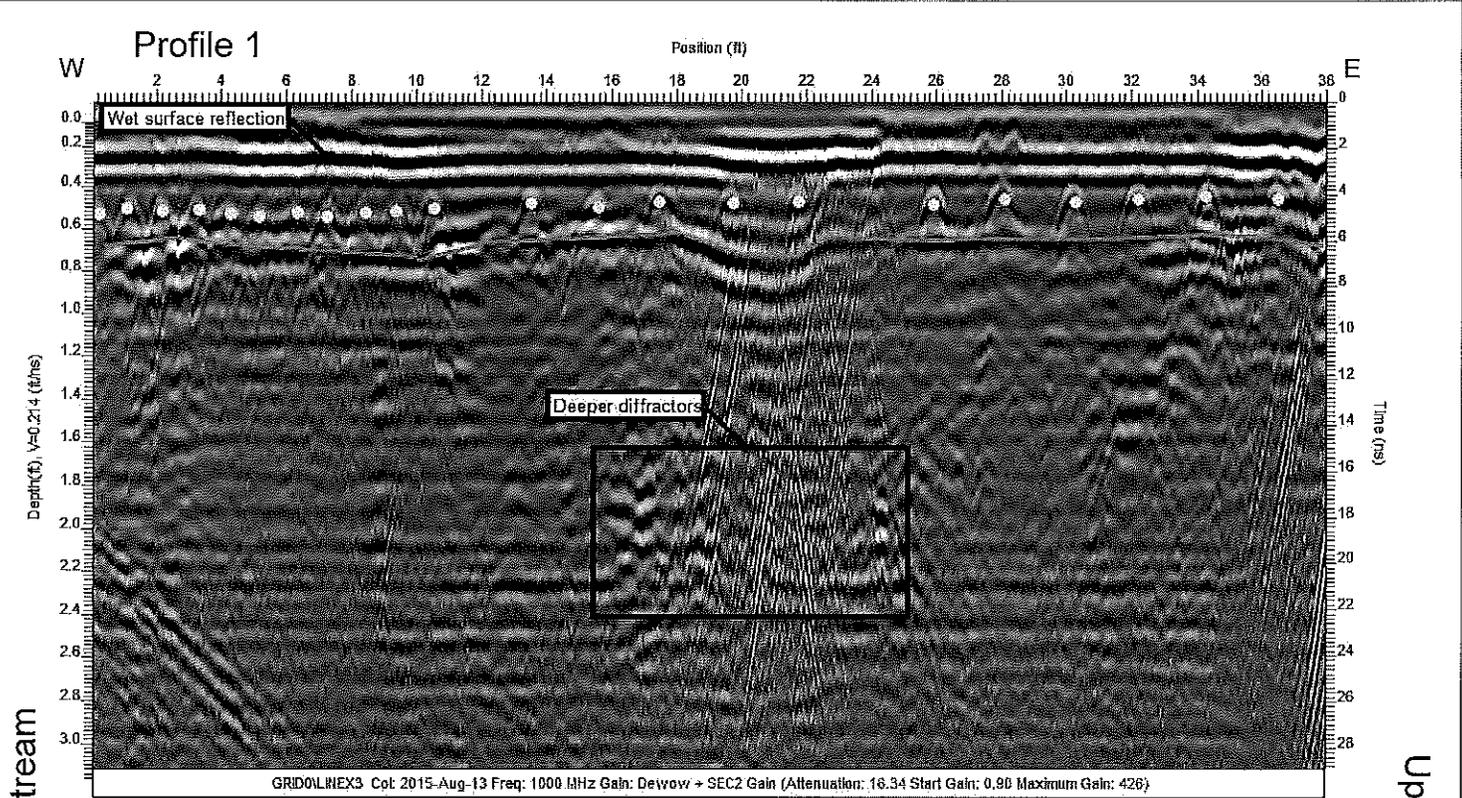


Legend	
	Approximate core location and designation
	Potential void development area

Notes
1. Data acquired by EEI on August 13, 2015
2. Map Scale 1 inch = 10 feet

Figure 1 - GPR Contour Map
Project: Lake Manitou Dam and Spillway Improvements
Client: Lawson-Fisher Associates P.C
Location: Rochester, IN
EEI Project No.: 1-15-324
Date: November 10, 2015

7770 Wood River York Street  
 Indianapolis, IN 46214-2094  
 317-273-1590 (FAX) 317-273-2290



Legend	Notes	Figure 2 - GPR Profiles
<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; border-radius: 50%; margin-right: 5px;"></span> Reinforcement</li> <li><span style="display: inline-block; width: 10px; border-bottom: 1px solid black; margin-right: 5px;"></span> Estimated base of concrete</li> </ul>	<ol style="list-style-type: none"> <li>1. Data acquired by EEI on August 13, 2015</li> <li>2. Profiles not to scale.</li> </ol>	<p>Project: Lake Manitou Dam and Spillway Improvements</p> <p>Client: Lawson-Fisher Associates P.C</p> <p>Location: Rochester, IN</p> <p>EEI Project No.: 1-15-324</p> <p>Date: November 10, 2015</p> <div style="text-align: right;">  <p>7770 West New York Street Indianapolis, IN 46214-2083 317-273-1990 (FAX) 317-270-3259</p> </div>

## SUMMARY OF CONCRETE CORES

**Project:** Lake Manitou Dam and Spillway Improvements  
**Location:** Rochester, Indiana  
**Client:** Lawson-Fisher Associates P.C.  
**EEl Project No.:** 1-15-324

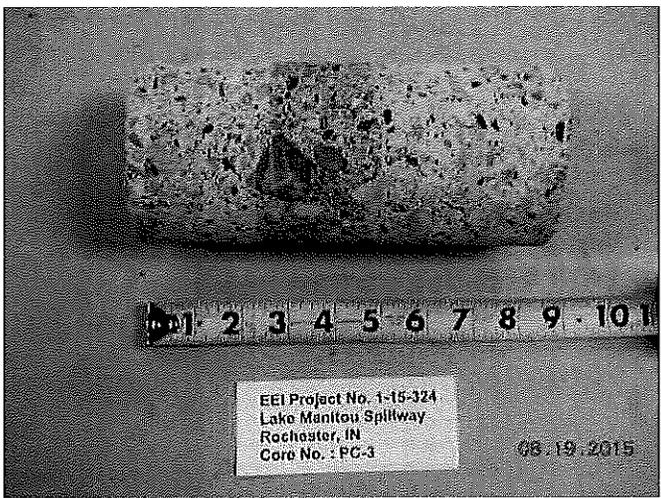
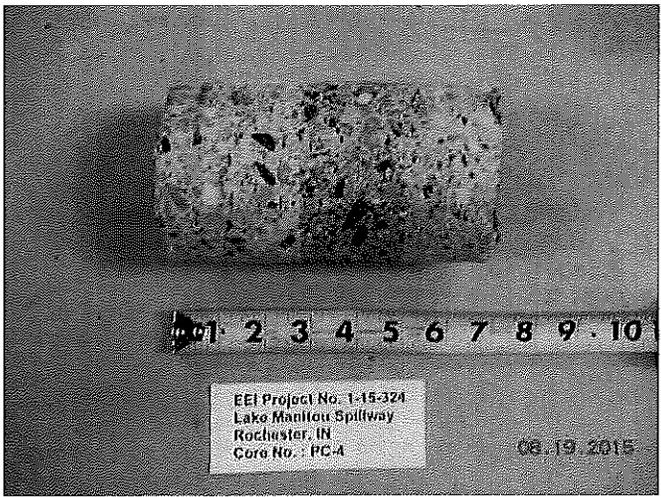
Page 1 of 4

Core Designation, Location and Description (in.)	Photograph
<p style="text-align: center;"><b>PC-1</b></p> <p>           0-7¼ Portland Cement Concrete            7¼ -11¼ Void            11¼- Sandy gravel with cobbles         </p>	 <p style="text-align: center;">           EEl Project No. 1-15-324            Lake Manitou Spillway            Rochester, IN            Core No. : PC-1         </p> <p style="text-align: right;">08.19.2015</p>
<p style="text-align: center;"><b>PC-2</b></p> <p>           0-8¼ Portland Cement Concrete            8¼-10¼ Void            10¼ - Sandy gravel with cobbles         </p>	 <p style="text-align: center;">           EEl Project No. 1-15-324            Lake Manitou Spillway            Rochester, IN            Core No. : PC-2         </p> <p style="text-align: right;">08.19.2015</p>

## SUMMARY OF CONCRETE CORES

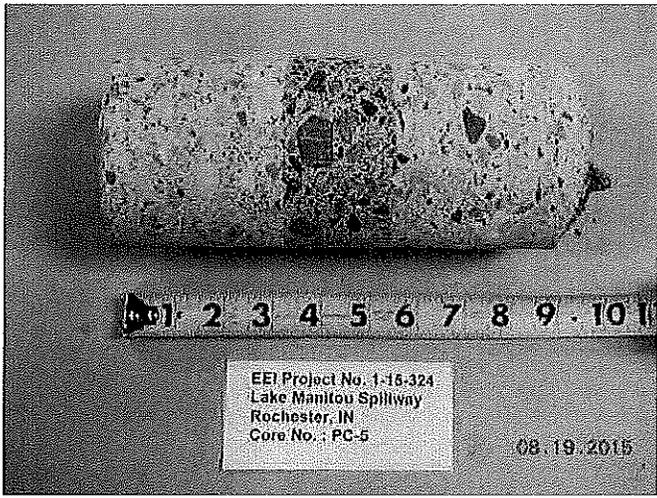
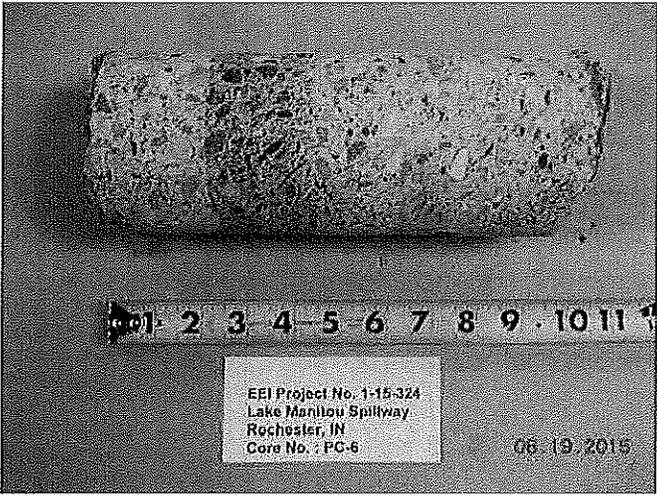
**Project:** Lake Manitou Dam and Spillway Improvements  
**Location:** Rochester, Indiana  
**Client:** Lawson-Fisher Associates P.C.  
**EEl Project No.:** 1-15-324

Page 2 of 4

Core Designation, Location and Description (in.)	Photograph
<p style="text-align: center;"><b>PC-3</b></p> <p>0-8 Portland Cement Concrete 8- Sandy gravel with cobbles near 12 in.</p> <p>Note: Water in core hole coming up from sandy gravel</p>	
<p style="text-align: center;"><b>PC-4</b></p> <p>0-6¼ Portland Cement Concrete 6¼- Sandy gravel with cobbles near 12 in.</p> <p>Note: Water in core hole coming up from sandy gravel</p>	

## SUMMARY OF CONCRETE CORES

**Project:** Lake Manitou Dam and Spillway Improvements  
**Location:** Rochester, Indiana  
**Client:** Lawson-Fisher Associates P.C.  
**EEl Project No.:** 1-15-324

Core Designation, Location and Description (in.)	Photograph
<p style="text-align: center;"><b>PC-5</b></p> <p>0-8¼ 8¼-</p> <p>Portland Cement Concrete Sandy gravel with cobbles near 12 in.</p>	
<p style="text-align: center;"><b>PC-6</b></p> <p>0-9½ 9½ -11 11-</p> <p>Portland Cement Concrete with 0.5 in. diameter rebar at 7 in. Void Sandy gravel</p>	

## SUMMARY OF CONCRETE CORES

**Project:** Lake Manitou Dam and Spillway Improvements  
**Location:** Rochester, Indiana  
**Client:** Lawson-Fisher Associates P.C.  
**EEl Project No.:** 1-15-324

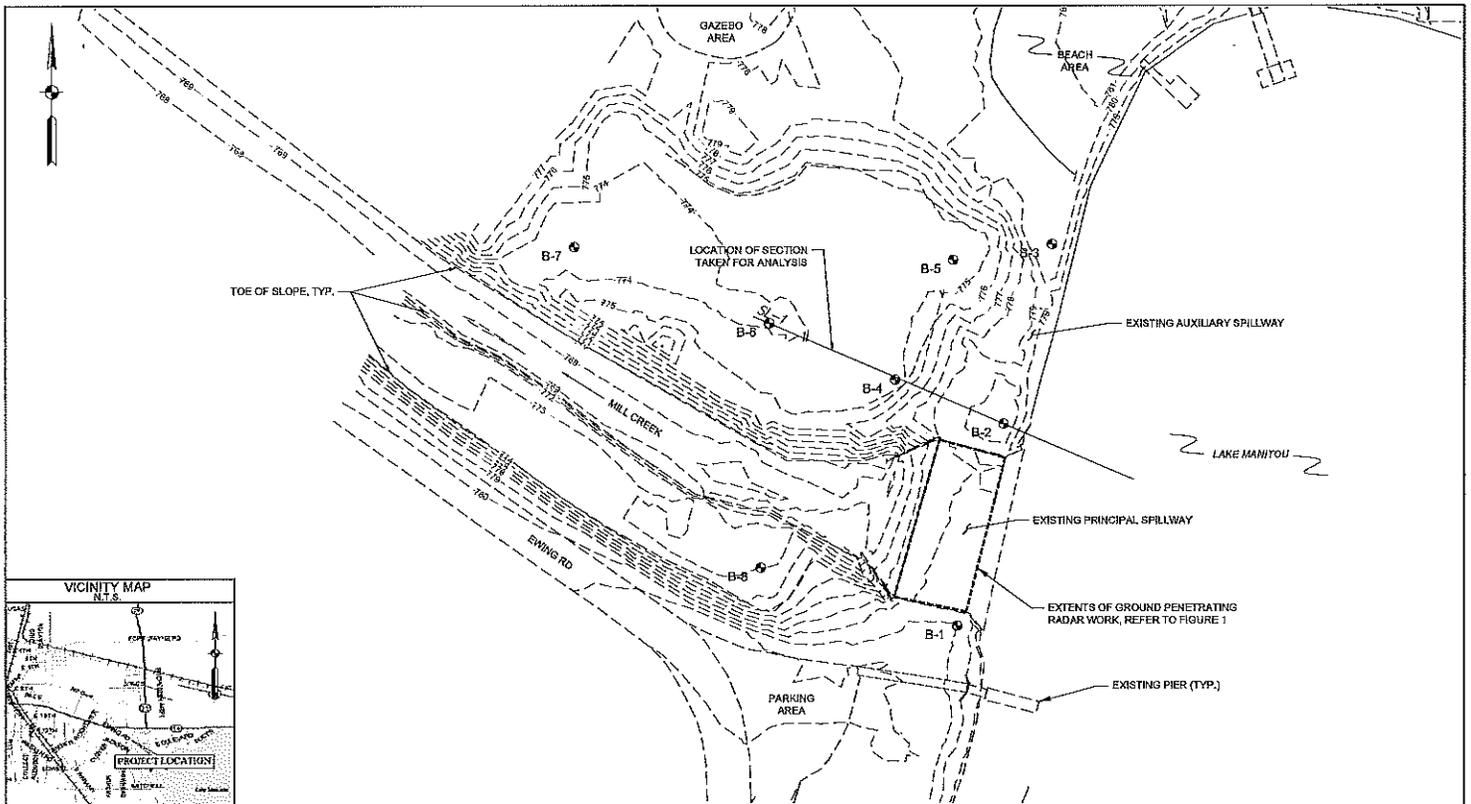
Core Designation, Location and Description (in.)	Photograph
<p style="text-align: center;"><b>PC-7</b></p> <p>           0-7½ Portland Cement Concrete            7½-8½ Void            8½- Sandy gravel         </p> <p>Note: Mussel shells observed attached to bottom of core</p>	 <p style="font-size: small; text-align: center;">           EEl Project No. 1-15-324            Lake Manitou Spillway            Rochester, IN            Core No. : PC-7            08.19.2015         </p>
<p style="text-align: center;"><b>PC-8</b></p> <p>           0-7½ Portland Cement Concrete with 0.5 in. diameter rebar near 5.5 in. and cobble embedded into concrete            7½- Sandy gravel         </p> <p>Note: Roots observed on bottom of core</p>	 <p style="font-size: small; text-align: center;">           EEl Project No. 1-15-324            Lake Manitou Spillway            Rochester, IN            Core No. : PC-8            08.19.2015         </p>

## **APPENDIX C**

Test Boring Location Plan  
(Drawing No. 1-15-324.B1)

Log of Test Boring (8)

Grain Size Distribution Curve (9)



<p><b>LEGEND</b></p>	<p><b>NOTES</b></p>	<p><b>TEST BORING LOCATION PLAN</b></p>	<p>PROJECT ENG: SEB APPROVED BY: MSW DRAWN BY: JSP DATE AND TIME: 9/9/15 DRAWING NO.: 1-15-324.B1</p>
<p>B-1  Test Boring Location and Designation</p>	<ol style="list-style-type: none"> <li>1. Base map developed from an electronic file provided by Lawson-Fisher Associates P.C. on September 8, 2015.</li> <li>2. Vicinity map generated using commercially-available software by DeLorme (Street Atlas USA ver. 8.0).</li> <li>3. Borings were located in the field by Earth Exploration, Inc. on August 13, 2015.</li> <li>4. Horizontal and vertical location of the test borings were obtained by Lawson-Fisher Associates P.C.</li> </ol>	<p>PROJECT: Lake Manitou Dam and Spillway Improvements LOCATION: Rochester, Indiana CLIENT: Lawson-Fisher Associates P.C. EEI PROJECT NO.: 1-15-324 SCALE: 1" = 50'</p>	 <small>1175 Madison Ave., Suite 100 Rochester, IN 47401 317.251.4400 www.lfa.com</small>



# LOG OF TEST BORING

Project **Lake Manitou Dam & Spillway Improvements**  
 Location **Rochester, Indiana**  
 Client **Lawson-Fisher Associates P.C.**  
 7770 West New York Street - Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)

Boring No. **B-1**  
 Elevation **779.8**  
 Datum **NAVD 88**  
 EEI Proj. No. **1-15-324**  
 Sheet **1** of **1**

Project No. --- Station --- Weather **Partly Cloudy** Driller **C.H.**  
 Struct. No. --- Offset --- Temp. --- Inspector ---

SAMPLE				Depth ft Elev	DESCRIPTION/CLASSIFICATION and REMARKS	SOIL PROPERTIES										
No.	Typ	Rec %	Blow Counts			$q_p$ tsf	$q_u$ tsf	LOI %	W %	LL %	PL %	PI %				
SS-1	X	65	15-12-9-7		SP-SM, FINE TO MEDIUM SAND, trace gravel, medium dense, moist, brown (fill)											
SS-2	X	65	5-6-4-4		SM, SILTY SAND, trace gravel, loose, moist, brown, $P_{200} = 15.2$ percent (fill)					NP	NP	NP				
SS-3	X	65	2-2-2-2	5 775	SP-SM, FINE TO MEDIUM SAND, trace gravel, very loose, moist, brown, $P_{200} = 9.0$ percent (fill)					NP	NP	NP				
SS-4	X	65	2-2-8-6		SM, SILTY SAND, trace gravel, very loose, wet, dark gray, with organic matter			5.7	19.3							
SS-5	X	65	1-3-1-1	10 770						NP	NP	NP				
SS-6	X	65	1-3-6-6													
SS-7	X	65	5-8-8-7													
SS-8	X	65	3-4-9-9	15 765	SW-SM, FINE TO MEDIUM SAND, trace gravel, medium dense, wet, brown, with gravel and cobbles near 18 ft, SS-7: $P_{200} = 11.9$ percent											
SS-9	X	65	5-7-6-6													
SS-10	X	65	10-9-8-7	20 760												
SS-11	X	65	10-6-9-9													
SS-12	X	65	5-8-6-11													
SS-13	X	65	8-8-11-12	25 755	SP, SAND, and gravel, medium dense, wet, brown											
SS-14	X	65	6-6-8-12													
SS-15	X	65	13-11-11-11	30 750												
					End of Boring at 30 ft											

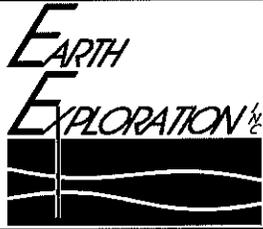
## WATER LEVEL OBSERVATIONS

## GENERAL NOTES

Depth ft	▽ While Drilling	▼ Upon Completion	▽ 22 hrs After Drilling
To Water	<u>6</u>	<u>7</u>	<u>6</u>
To Cave-in		<u>11½</u>	<u>7½</u>

Start 8/26/15 End 8/26/15 Rig CME 750  
 Drilling Method 3¼" I.D. HSA ATV  
 Remarks Backfilled with bentonite gel and  
Portland cement slurry above cave in depth.  
Capped with auger cuttings.

The stratification lines represent the approximate boundary between soil/rock types and the transition may be gradual.



# LOG OF TEST BORING

Project **Lake Manitou Dam & Spillway Improvements**  
 Location **Rochester, Indiana**  
 Client **Lawson-Fisher Associates P.C.**  
 7770 West New York Street - Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)

Boring No. **B-2**  
 Elevation **780.5**  
 Datum **NAVD 88**  
 EEI Proj. No. **1-15-324**  
 Sheet **1** of **1**

Project No. --- Station --- Weather **Partly Cloudy** Driller **C.H.**  
 Struct. No. --- Offset --- Temp. --- Inspector ---

SAMPLE					DESCRIPTION/CLASSIFICATION and REMARKS	SOIL PROPERTIES						
No.	Log	Rec %	Blow Counts	Depth ft Elev		q <sub>p</sub> tsf	q <sub>u</sub> tsf	LOI %	W %	LL %	PL %	PI %
SS-1		65	14-17-11-6	780	SP-SM, FINE TO MEDIUM SAND, some gravel, medium dense, moist, brown (fill)							
SS-2		65	12-9-6-6		SP-SM, FINE TO MEDIUM SAND, trace gravel, medium dense, moist, brown (fill)							
SS-3		65	2-5-4-5	775	SM, SILTY SAND, trace gravel, loose to very loose, moist, brown, P <sub>200</sub> = 18.0 percent (fill)					NP	NP	NP
SS-4		65	1-1-1-1	770	SM, ORGANIC SILTY SAND, trace gravel, very loose to loose, wet, dark gray, with organic matter, with peat and marl layers from 7 to 10 ft, SS-5: P <sub>200</sub> = 32.5 percent			15.7	28.5			
SS-5		65	1-1-1-1					15.2	32.9	NP	NP	NP
SS-6		65	1-2-5-5	770				9.8	109.9			
SS-7		65	5-6-9-9		SW-SM, FINE TO MEDIUM SAND, some gravel, medium dense, wet, gray			2.9	32.0			
SS-8		65	3-4-7-7	765								
SS-9		65	2-4-6-6									
SS-10		65	3-4-5-5									
SS-11		65	4-6-7-7	760								
SS-12		65	6-7-9-9									
SS-13		65	9-12-14-12	755								
SS-14		65	4-8-10-11									
SS-15		65	4-9-8-10	30								
					End of Boring at 30 ft							

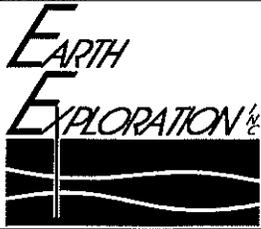
## WATER LEVEL OBSERVATIONS

Depth ft	White Drilling	Upon Completion	20 hrs After Drilling
To Water	12½	7	8
To Cave-in		11	8½

## GENERAL NOTES

Start **8/26/15** End **8/26/15** Rig **CME 750**  
 Drilling Method **3¼" I.D. HSA ATV**  
 Remarks **Backfilled with bentonite gel and Portland cement slurry above cave in depth.**  
**Capped with auger cuttings.**

The stratification lines represent the approximate boundary between soil/rock types and the transition may be gradual.



# LOG OF TEST BORING

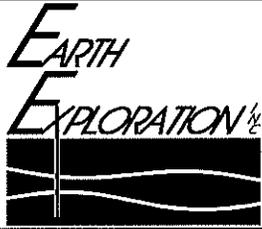
Project **Lake Manitou Dam & Spillway Improvements**  
 Location **Rochester, Indiana**  
 Client **Lawson-Fisher Associates P.C.**  
 7770 West New York Street - Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)

Boring No. **B-3**  
 Elevation **780.7**  
 Datum **NAVD 88**  
 EEI Proj. No. **1-15-324**  
 Sheet **1** of **1**

Project No. --- Station --- Weather **Partly Cloudy** Driller **C.H.**  
 Struct. No. --- Offset --- Temp. --- Inspector ---

SAMPLE					DESCRIPTION/CLASSIFICATION and REMARKS	SOIL PROPERTIES						
No.	Type	Rec %	Blow Counts	Depth ft Elev		q <sub>p</sub> tsf	q <sub>u</sub> tsf	LOI %	W %	LL %	PL %	PI %
SS-1		65	14-14-18-10	780	<b>TOPSOIL</b> SM, SILTY SAND, some gravel, medium dense, moist, brown (possible fill)							
SS-2		65	5-6-9-12		SM, SILTY SAND, trace gravel, medium dense to loose, moist, brown, SS-4T: P <sub>200</sub> = 13.6 percent							
SS-3		65	4-5-5-8	5							NP	NP
SS-4		65	3-4-3-2	775								
SS-5		65	1-2-2-6									
SS-6		65	3-2-4-4	10								
SS-7		65	3-3-4-6	770								
SS-8		65	5-4-4-5	15								
SS-9		65	4-4-4-5	765								
SS-10		65	4-4-3-5		SW-SM, FINE TO MEDIUM SAND, some gravel, loose to medium dense, moist to wet, gray							
SS-11		65	5-5-6-8	20								
SS-12		65	5-10-9-9	760								
SS-13		65	5-8-10-12	25								
SS-14		65	9-8-7-16	755								
SS-15		65	5-5-8-9	30								
					End of Boring at 30 ft							

WATER LEVEL OBSERVATIONS				GENERAL NOTES	
Depth ft	While Drilling	Upon Completion	18 hrs After Drilling	Start	End
To Water	8½	7	NW	8/26/15	8/26/15
To Cave-in		9	8½	Rig	CME 750
The stratification lines represent the approximate boundary between soil/rock types and the transition may be gradual.				Drilling Method	3¼" I.D. HSA
				ATV	
				Remarks	Backfilled with bentonite gel and Portland cement slurry above cave in depth.
					Capped with auger cuttings.



# LOG OF TEST BORING

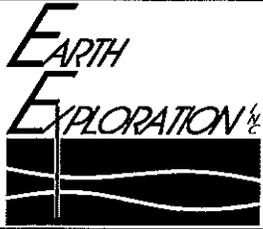
Project **Lake Manitou Dam & Spillway Improvements**  
 Location **Rochester, Indiana**  
 Client **Lawson-Fisher Associates P.C.**  
 7770 West New York Street - Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)

Boring No. **B-4**  
 Elevation **774.7**  
 Datum **NAVD 88**  
 EEI Proj. No. **1-15-324**  
 Sheet **1** of **1**

Project No. --- Station --- Weather --- Driller **C.H.**  
 Struct. No. --- Offset --- Temp. --- Inspector ---

SAMPLE				DESCRIPTION/CLASSIFICATION and REMARKS	SOIL PROPERTIES								
No.	T V G %	Rec %	Blow Counts		Depth ft	Elev	q <sub>p</sub> tsf	q <sub>u</sub> tsf	LOI %	W %	LL %	PL %	PI %
SS-1		65	5-4-4-5										
SS-2		65	3-2-2-3										
SS-3		65	2-2-2-2	5	770								
SS-4		65	3-6-2-3										
SS-5		65	3-5-4-3										
SS-6		65	2-3-3-7	10	765								
SS-7		65	4-4-5-6										
SS-8		65	2-3-5-9	15	760								
SS-9		65	3-5-9-11										
SS-10		65	4-6-6-10	20	755								
				End of Boring at 20 ft									

WATER LEVEL OBSERVATIONS					GENERAL NOTES	
Depth ft	▽	While Drilling	▼	Upon Completion	▽	After Drilling
To Water		2 1/2		3		BF
To Cave-in				*		
The stratification lines represent the approximate boundary between soil/rock types and the transition may be gradual.					Start <u>8/27/15</u> End <u>8/27/15</u> Rig <u>CME 750</u> Drilling Method <u>3 1/4" I.D. HSA</u> <u>ATV</u> Remarks <u>*Backfilled using tremie from bottom of boring using bentonite gel and Portland cement slurry. Capped with auger cuttings.</u>	



# LOG OF TEST BORING

Project **Lake Manitou Dam & Spillway Improvements**  
 Location **Rochester, Indiana**  
 Client **Lawson-Fisher Associates P.C.**  
 7770 West New York Street - Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)

Boring No. **B-5**  
 Elevation **774.6**  
 Datum **NAVD 88**  
 EEI Proj. No. **1-15-324**  
 Sheet **1** of **1**

Project No. --- Station --- Weather --- Driller **J.S.**  
 Struct. No. --- Offset --- Temp. --- Inspector ---

SAMPLE					DESCRIPTION/CLASSIFICATION and REMARKS	SOIL PROPERTIES						
No.	Type	Rec %	Blow Counts	Depth ft Elev		$q_p$ tsf	$q_u$ tsf	LOI %	W %	LL %	PL %	PI %
SS-1		65	3-2-2-2		SM, SILTY SAND, trace to little gravel, very loose, moist, brown							
SS-2		65	1-1-1-1								NP	NP
SS-3		65	1-1-1-1	5 770	SP-SM, FINE TO MEDIUM SAND, trace gravel, very loose, wet, dark gray, with organic matter near 6 ft, SS-2: $P_{200} = 8.9$ percent (possible fill to near 6 ft)			3.6	73.7			
SS-4		35	1-2-2-2									
SS-5		65	4-3-5-4	10 765								
SS-6		65	3-4-3-4		SW-SM, FINE TO MEDIUM SAND, some gravel, loose to medium dense, wet, gray, with cobbles near 18 ft							
SS-7		65	4-3-4-5									
SS-8		65	4-5-6-6	15 760								
SS-9		65	4-4-4-6									
SS-10		50	4-7-7-9	20 755								
End of Boring at 20 ft												

## WATER LEVEL OBSERVATIONS

## GENERAL NOTES

Depth ft	∇ While Drilling	▼ Upon Completion	∇ After Drilling
To Water	2½	2	BF
To Cave-in		*	

Start **8/28/15**... End **8/28/15**... Rig **CME 750**  
 Drilling Method **3¼" I.D. HSA**... **ATV**  
 Remarks... **\*Backfilled using tremie from bottom of boring using bentonite gel and Portland cement slurry. Capped with auger cuttings.**

The stratification lines represent the approximate boundary between soil/rock types and the transition may be gradual.



# LOG OF TEST BORING

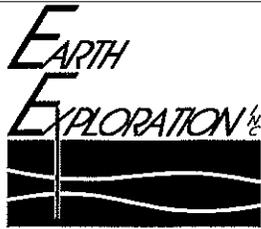
Project **Lake Manitou Dam & Spillway Improvements**  
 Location **Rochester, Indiana**  
 Client **Lawson-Fisher Associates P.C.**  
 7770 West New York Street - Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)

Boring No. **B-6**  
 Elevation **773.9**  
 Datum **NAVD 88**  
 EEI Proj. No. **1-15-324**  
 Sheet **1** of **1**

Project No. --- Station --- Weather **Sunny** Driller **J.S.**  
 Struct. No. --- Offset --- Temp. --- Inspector ---

SAMPLE				DESCRIPTION/CLASSIFICATION and REMARKS	SOIL PROPERTIES								
No.	LOG	Rec %	Blow Counts		Depth ft	Elev	q <sub>p</sub> tsf	q <sub>u</sub> tsf	LOI %	W %	LL %	PL %	PI %
SS-1		65	2-2-2-2										
SS-2		65	1-2-1-4		770						NP	NP	NP
SS-3		65	2-2-6-8	5									
SS-4		65	3-5-5-6										
SS-5		65	5-4-4-6		765								
SS-6		65	6-12-14-6	10									
SS-7		65	7-5-6-6		760								
SS-8		65	3-7-7-6	15									
End of Boring at 16 ft													

WATER LEVEL OBSERVATIONS				GENERAL NOTES	
Depth ft	▽ While Drilling	▼ Upon Completion	▽ After Drilling	Start	End
To Water	3 1/2	2 1/2	BF	8/28/15	8/28/15
To Cave-in		*		Drilling Method	3 1/4" I.D. HSA ATV
The stratification lines represent the approximate boundary between soil/rock types and the transition may be gradual.				Remarks: *Backfilled using tremie from bottom of boring using bentonite gel and Portland cement slurry. Capped with auger cuttings.	



# LOG OF TEST BORING

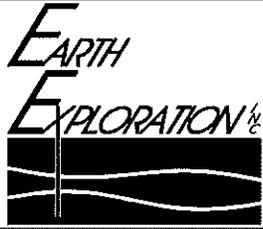
Project **Lake Manitou Dam & Spillway Improvements**  
 Location **Rochester, Indiana**  
 Client **Lawson-Fisher Associates P.C.**  
 7770 West New York Street - Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)

Boring No. **B-7**  
 Elevation **773.6**  
 Datum **NAVD 88**  
 EEI Proj. No. **1-15-324**  
 Sheet **1** of **1**

Project No. --- Station --- Weather **Sunny** Driller **J.S.**  
 Struct. No. --- Offset --- Temp. --- Inspector ---

SAMPLE					DESCRIPTION/CLASSIFICATION and REMARKS	SOIL PROPERTIES						
No.	Type	Rec %	Blow Counts	Depth ft Elev		$q_p$ tsf	$q_u$ tsf	LOI %	W %	LL %	PL %	PI %
SS-1		65	2-1-1-1		SM, SILTY SAND, trace gravel, very loose, moist, brown to gray below 1 ft, with organic matter below 1 ft							
SS-2		40	1-2-6-5	770								
SS-3		65	2-3-3-4	5	SP-SM, MEDIUM SAND, some gravel, loose to medium dense, wet, gray, SS-3: $P_{200} = 5.8$ percent					NP	NP	NP
SS-4		65	3-3-3-4									
SS-5		65	2-4-9-8	765								
SS-6		40	3-3-7-6	10								
SS-7		65	4-5-6-7	760								
SS-8		40	2-4-4-6	15								
End of Boring at 16 ft												

WATER LEVEL OBSERVATIONS					GENERAL NOTES	
Depth ft	▽ While Drilling	▽ Upon Completion	▽ After Drilling		Start	End
To Water	<u>6</u>	<u>2½</u>	<u>BF</u>		<u>8/28/15</u>	<u>8/28/15</u>
To Cave-in		*			Drilling Method	Rig
					<u>3¼" I.D. HSA</u>	<u>CME 750</u>
The stratification lines represent the approximate boundary between soil/rock types and the transition may be gradual.					Remarks: <u>*Backfilled using tremie from bottom of boring using bentonite gel and Portland cement slurry. Capped with auger cuttings.</u>	



# LOG OF TEST BORING

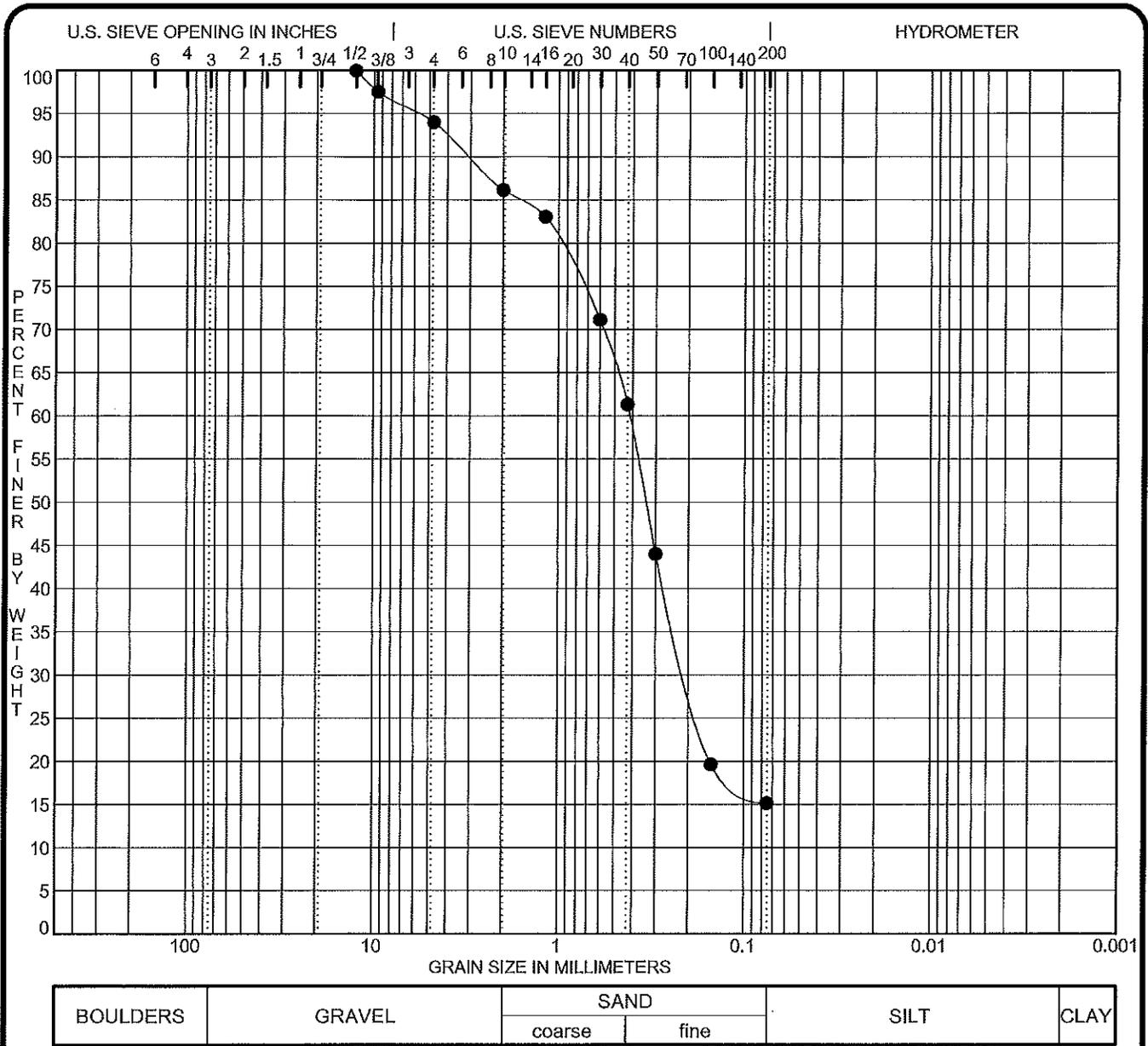
Project **Lake Manitou Dam & Spillway Improvements**  
 Location **Rochester, Indiana**  
 Client **Lawson-Fisher Associates P.C.**  
 7770 West New York Street - Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)

Boring No. **B-8**  
 Elevation **773.0**  
 Datum **NAVD 88**  
 EEI Proj. No. **1-15-324**  
 Sheet **1** of **1**

Project No. --- Station --- Weather **Partly Cloudy** Driller **C.H.**  
 Struct. No. --- Offset --- Temp. --- Inspector ---

SAMPLE					DESCRIPTION/CLASSIFICATION and REMARKS	SOIL PROPERTIES						
No.	Type	Rec %	Blow Counts	Depth ft Elev		q <sub>p</sub> tsf	q <sub>u</sub> tsf	LOI %	W %	LL %	PL %	PI %
SS-1		65	2-2-2-2		<b>SM, SILTY SAND</b> , trace gravel, very loose, moist, with organic matter  <b>SP-SM, FINE TO MEDIUM SAND</b> , some gravel, very loose to medium dense, wet, gray							
SS-2		65	2-2-1-1	770								
SS-3		40	1-2-1-1	5								
SS-4		65	2-4-3-1									
SS-5		65	2-3-3-4									
SS-6		65	6-6-5-12	10								
SS-7		65	5-6-5-5	760								
SS-8		65	5-6-6-11	15								
SS-9		65	5-7-8-8	755								
SS-10		65	7-4-5-8	20								
End of Boring at 20 ft												

WATER LEVEL OBSERVATIONS					GENERAL NOTES	
Depth ft	▽ While Drilling	▼ Upon Completion	▽ After Drilling		Start	End
To Water	4	---	BF		8/26/15	8/26/15
To Cave-in		*			Rig	CME 750
The stratification lines represent the approximate boundary between soil/rock types and the transition may be gradual.					Drilling Method	3 1/4" I.D. HSA
					ATV	
					Remarks: *Backfilled using tremie from bottom of boring using bentonite gel and Portland cement slurry. Capped with auger cuttings.	



BOULDERS	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Sample Identification	Station / Offset / Line	Depth, ft.	Elevation, USCGS
B-1 SS-2	---	2.0 - 4.0	777.8 -

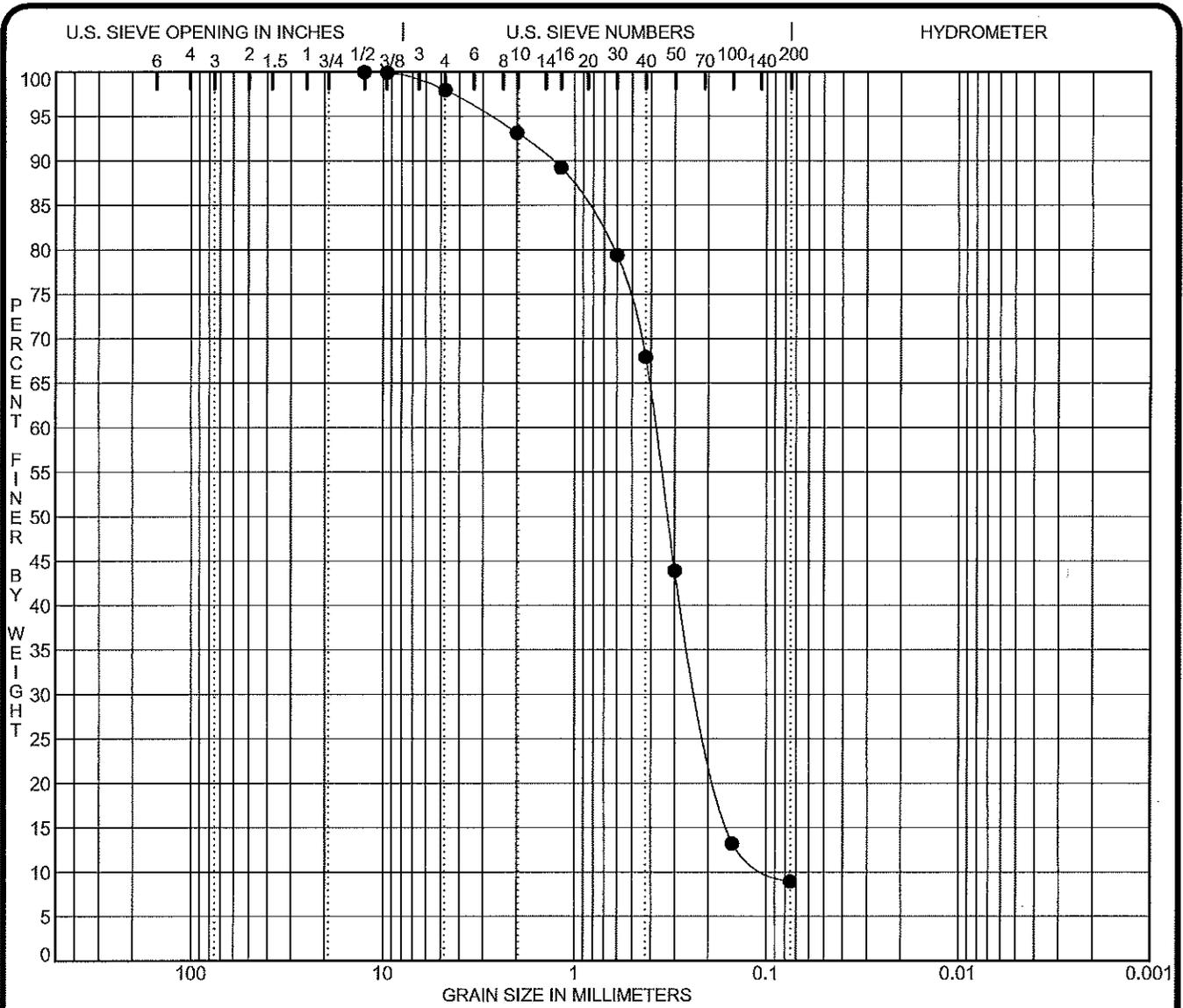
Lab No.	Classification	pH	%Gravel	%Sand	%Silt	%Clay	MC%	LL	PL	PI
	SM, Silty Sand, trace gravel	8.7	13.8	71.0	15.2			NP	NP	NP

Remarks:

	Project No. ---	Project Lake Manitou Dam & Spillway Improvements
	Structure No. ---	Location Rochester, Indiana
	EEL Proj. No. 1-15-324	Client Lawson-Fisher Associates P.C.

### GRAIN SIZE DISTRIBUTION CURVE

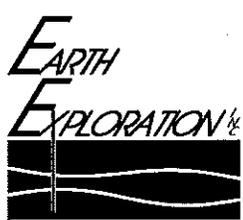
Earth Exploration, Inc.  
 7770 West New York Street Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)



BOULDERS	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

<b>Sample Identification</b>		<b>Station / Offset / Line</b>		<b>Depth, ft.</b>	<b>Elevation, USCGS</b>					
● B-1	SS-3	---		4.0 - 6.0	775.8 -					
<b>Lab No.</b>	<b>Classification</b>	<b>pH</b>	<b>%Gravel</b>	<b>%Sand</b>	<b>%Silt</b>	<b>%Clay</b>	<b>MC%</b>	<b>LL</b>	<b>PL</b>	<b>PI</b>
	SP-SM Fine-Medium Sand, trace gravel	6.8	6.8	84.2	9.0			NP	NP	NP

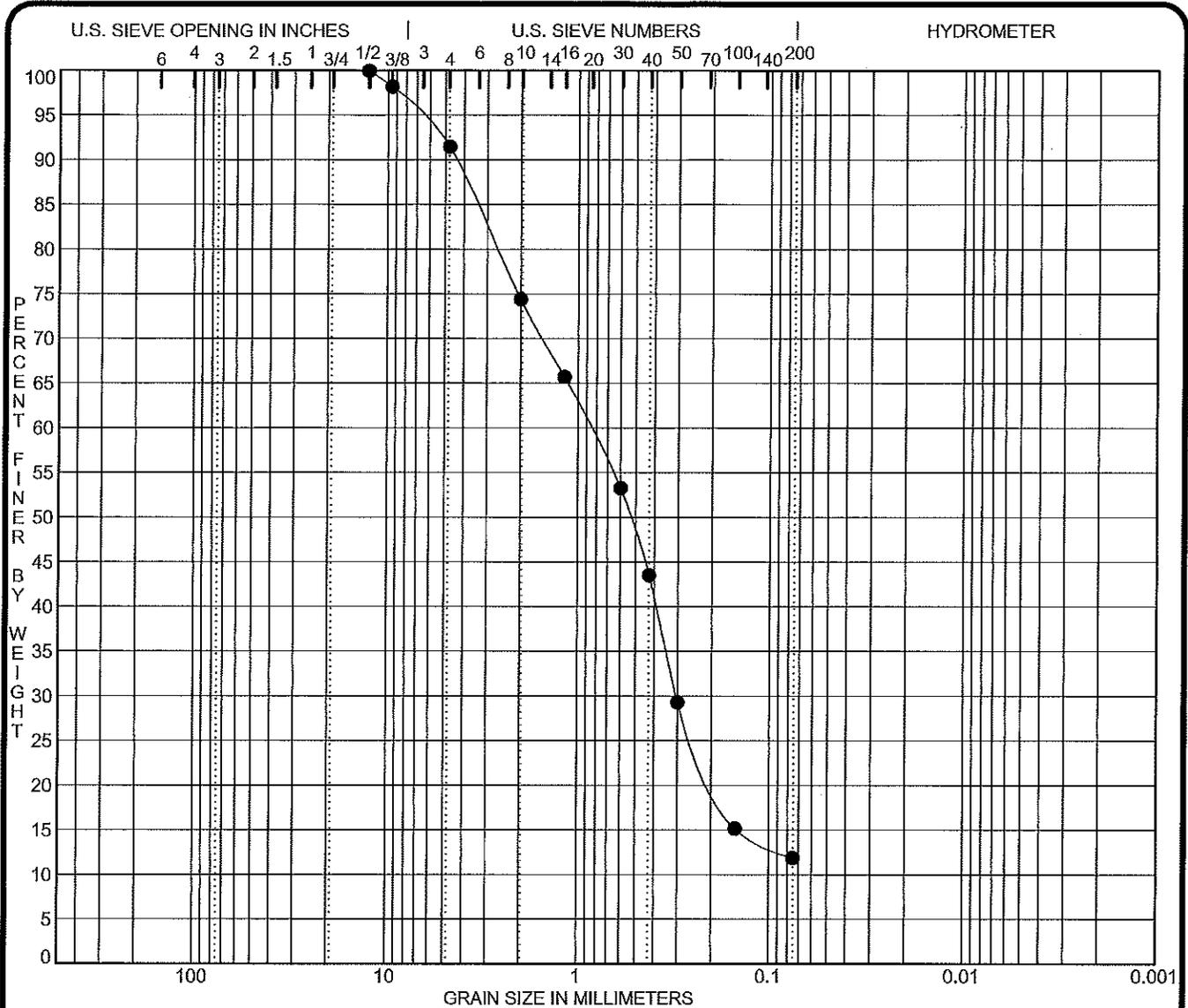
Remarks:



Project No. ---      Project Lake Manitou Dam & Spillway Improvements  
 Structure No. ---      Location Rochester, Indiana  
 EEI Proj. No. 1-15-324      Client Lawson-Fisher Associates P.C.

**GRAIN SIZE DISTRIBUTION CURVE**

Earth Exploration, Inc.  
 7770 West New York Street Indianapolis, Indiana 46214  
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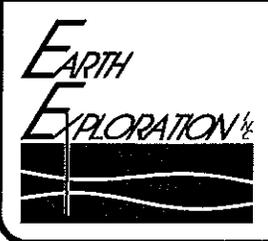


BOULDERS	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Sample Identification	Station / Offset / Line	Depth, ft.	Elevation, USCGS
B-1 SS-7	---	12.0 - 14.0	767.8 -

Lab No.	Classification	pH	%Gravel	%Sand	%Silt	%Clay	MC%	LL	PL	PI
	SW-SM, Sand, trace gravel		25.6	62.6	11.9			NP	NP	NP

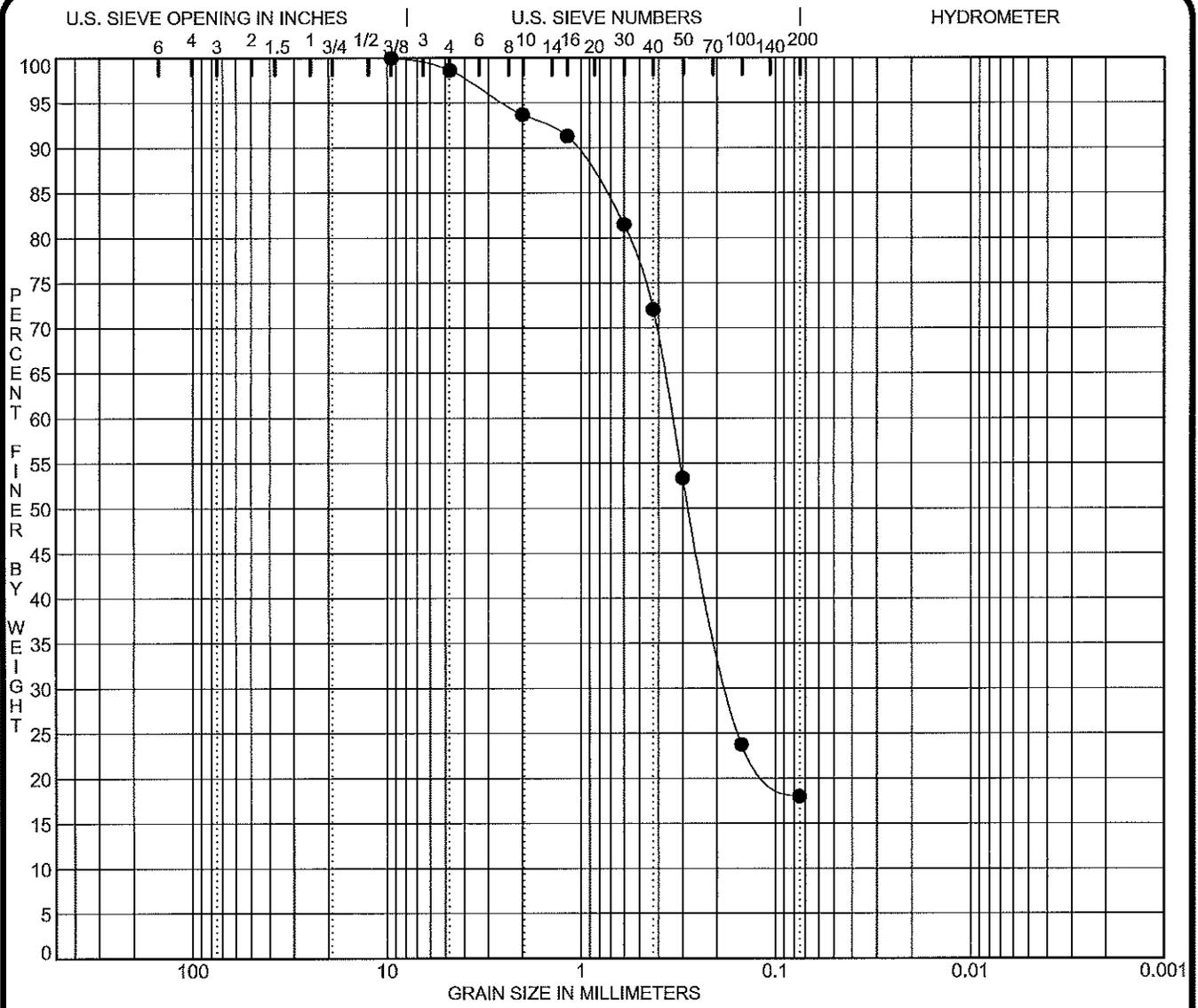
Remarks:



**Project No.** --- **Project** Lake Manitou Dam & Spillway Improvements  
**Structure No.** --- **Location** Rochester, Indiana  
**EEI Proj. No.** 1-15-324 **Client** Lawson-Fisher Associates P.C.

### GRAIN SIZE DISTRIBUTION CURVE

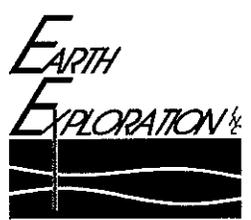
Earth Exploration, Inc.  
 7770 West New York Street Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)



BOULDERS	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Sample Identification		Station / Offset / Line		Depth, ft.	Elevation, USCGS					
B-2	SS-3	---		4.0 - 6.0	776.5 -					
Lab No.	Classification	pH	%Gravel	%Sand	%Silt	%Clay	MC%	LL	PL	PI
	SM, Silty Sand, trace gravel		6.3	75.7	18.0		13.9	NP	NP	NP

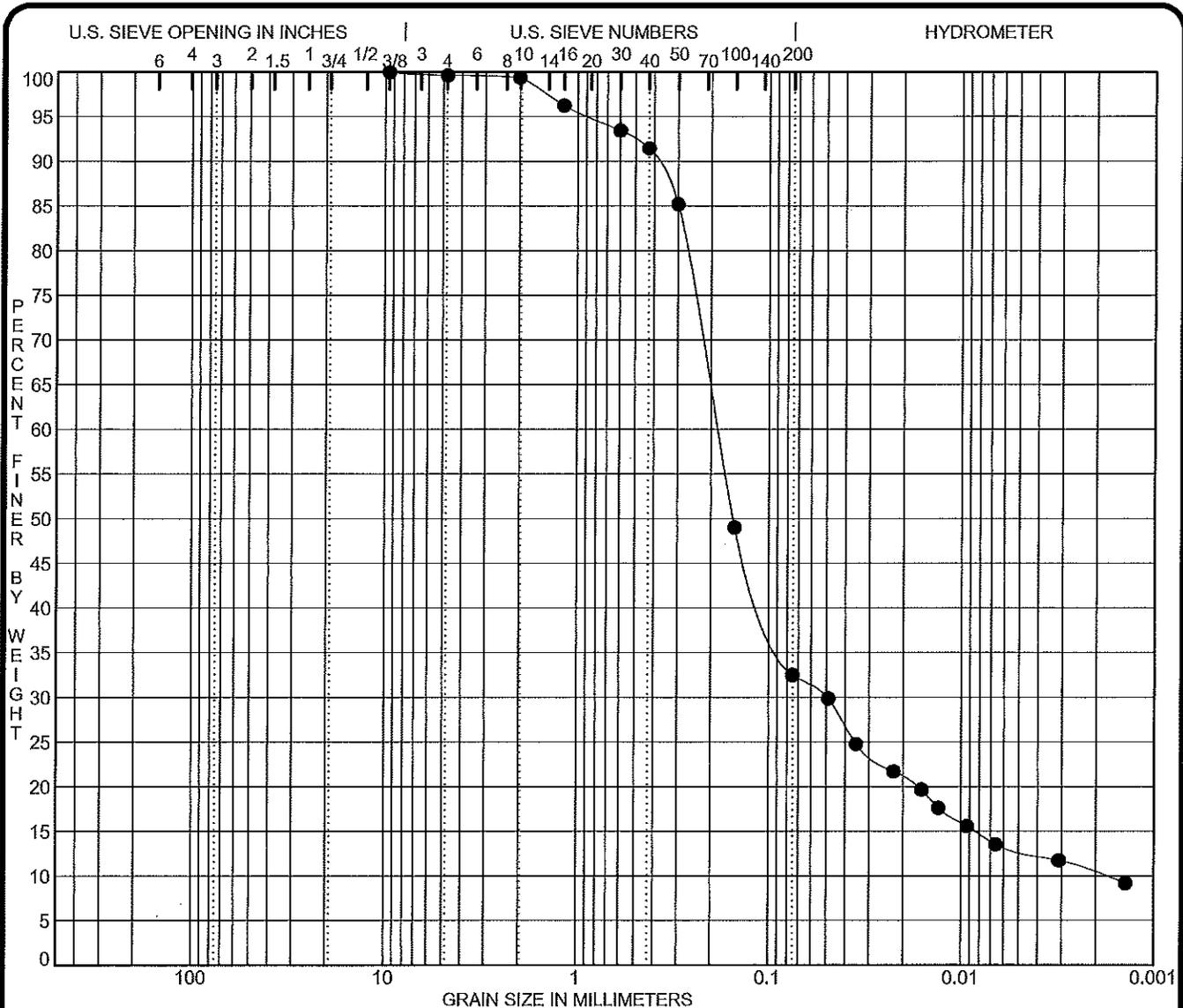
Remarks:



Project No. ---      Project Lake Manitou Dam & Spillway Improvements  
 Structure No. ---      Location Rochester, Indiana  
 EEI Proj. No. 1-15-324      Client Lawson-Fisher Associates P.C.

### GRAIN SIZE DISTRIBUTION CURVE

Earth Exploration, Inc.  
 7770 West New York Street Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)



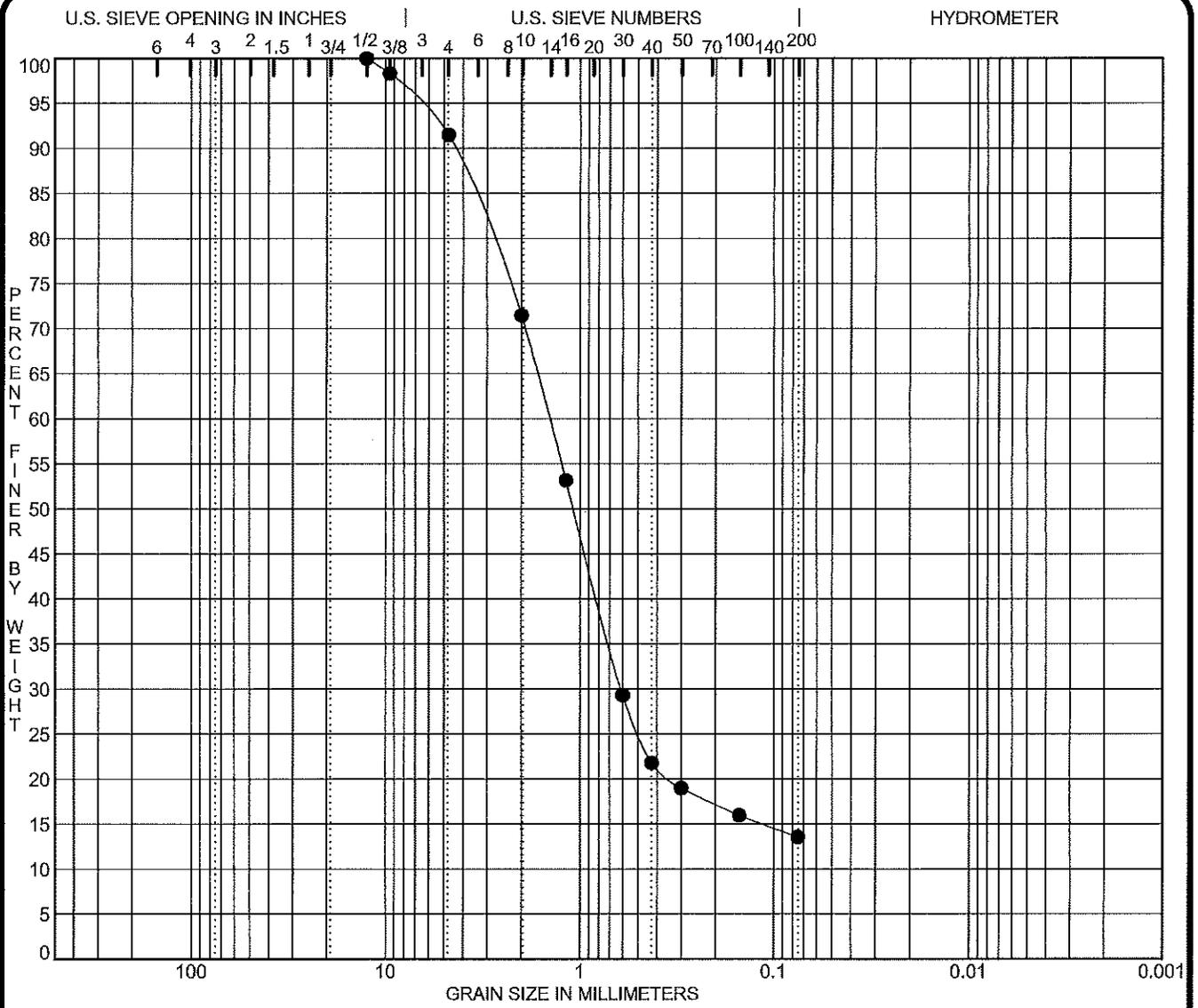
BOULDERS	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Sample Identification	Station / Offset / Line	Depth, ft.	Elevation, USCGS
B-2 SS-5	---	8.0 - 10.0	772.5 -

Lab No.	Classification	pH	%Gravel	%Sand	%Silt	%Clay	MC%	LL	PL	PI
	SM, Organic Silty Sand, trace gravel		0.6	66.9	22.2	10.3	109.9	NP	NP	NP

Remarks:

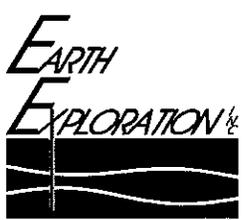
	Project No. ---	Project Lake Manitou Dam & Spillway Improvements
	Structure No. ---	Location Rochester, Indiana
	EEL Proj. No. 1-15-324	Client Lawson-Fisher Associates P.C.
<b>GRAIN SIZE DISTRIBUTION CURVE</b> Earth Exploration, Inc. 7770 West New York Street Indianapolis, Indiana 46214 317-273-1690 / 317-273-2250 (Fax)		



BOULDERS	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Sample Identification		Station / Offset / Line		Depth, ft.	Elevation, USCGS					
● B-3	SS-4	---		6.0 - 8.0	774.7 -					
Lab No.	Classification	pH	%Gravel	%Sand	%Silt	%Clay	MC%	LL	PL	PI
	SM, Silty Sand, trace gravel		28.5	57.9	13.6			NP	NP	NP

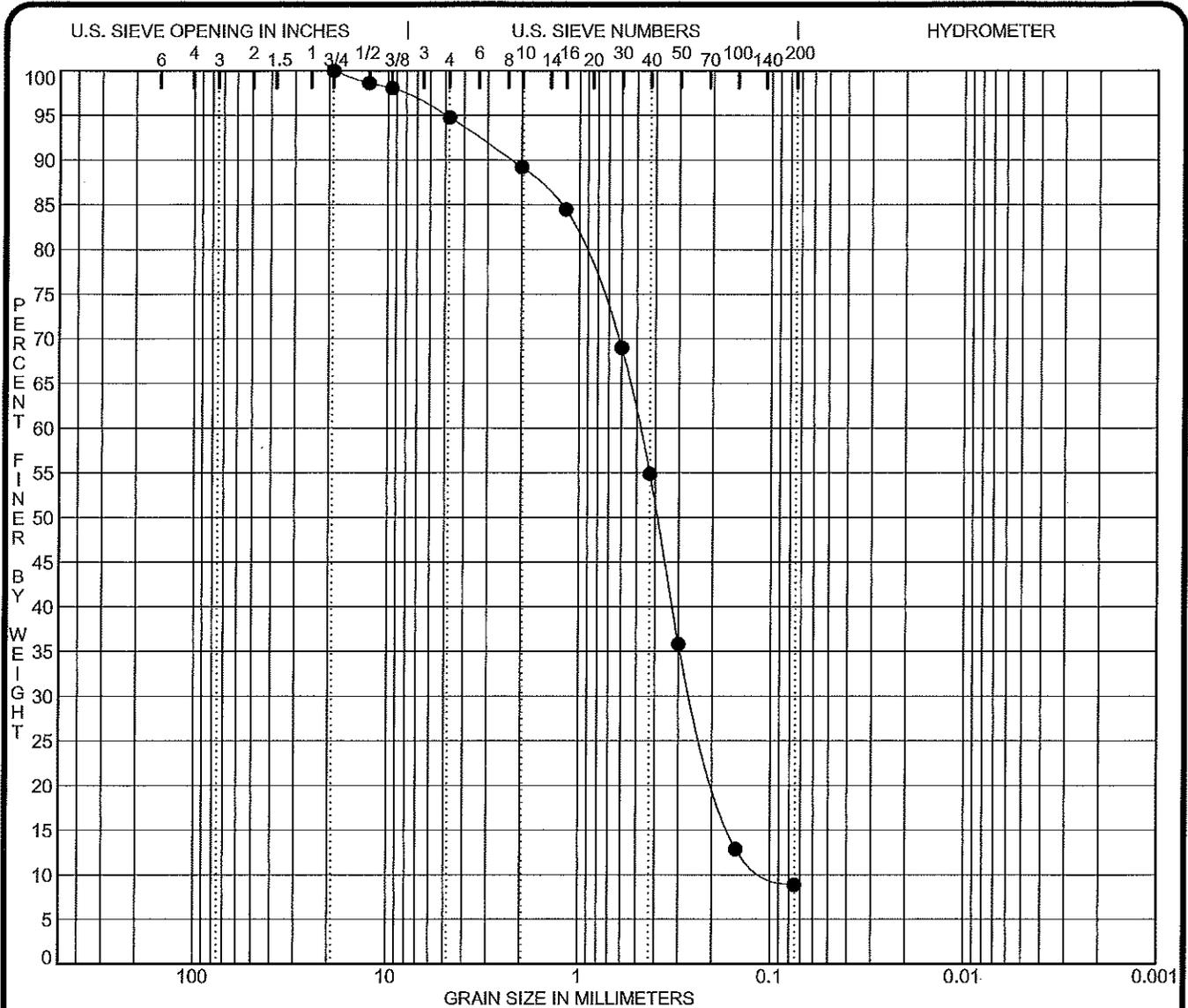
Remarks:



Project No. ---      Project Lake Manitou Dam & Spillway Improvements  
 Structure No. ---      Location Rochester, Indiana  
 EEI Proj. No. 1-15-324      Client Lawson-Fisher Associates P.C.

### GRAIN SIZE DISTRIBUTION CURVE

Earth Exploration, Inc.  
 7770 West New York Street Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)



BOULDERS	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Sample Identification	Station / Offset / Line	Depth, ft.	Elevation, USCGS
B-5 SS-2	---	2.0 - 4.0	772.6 -

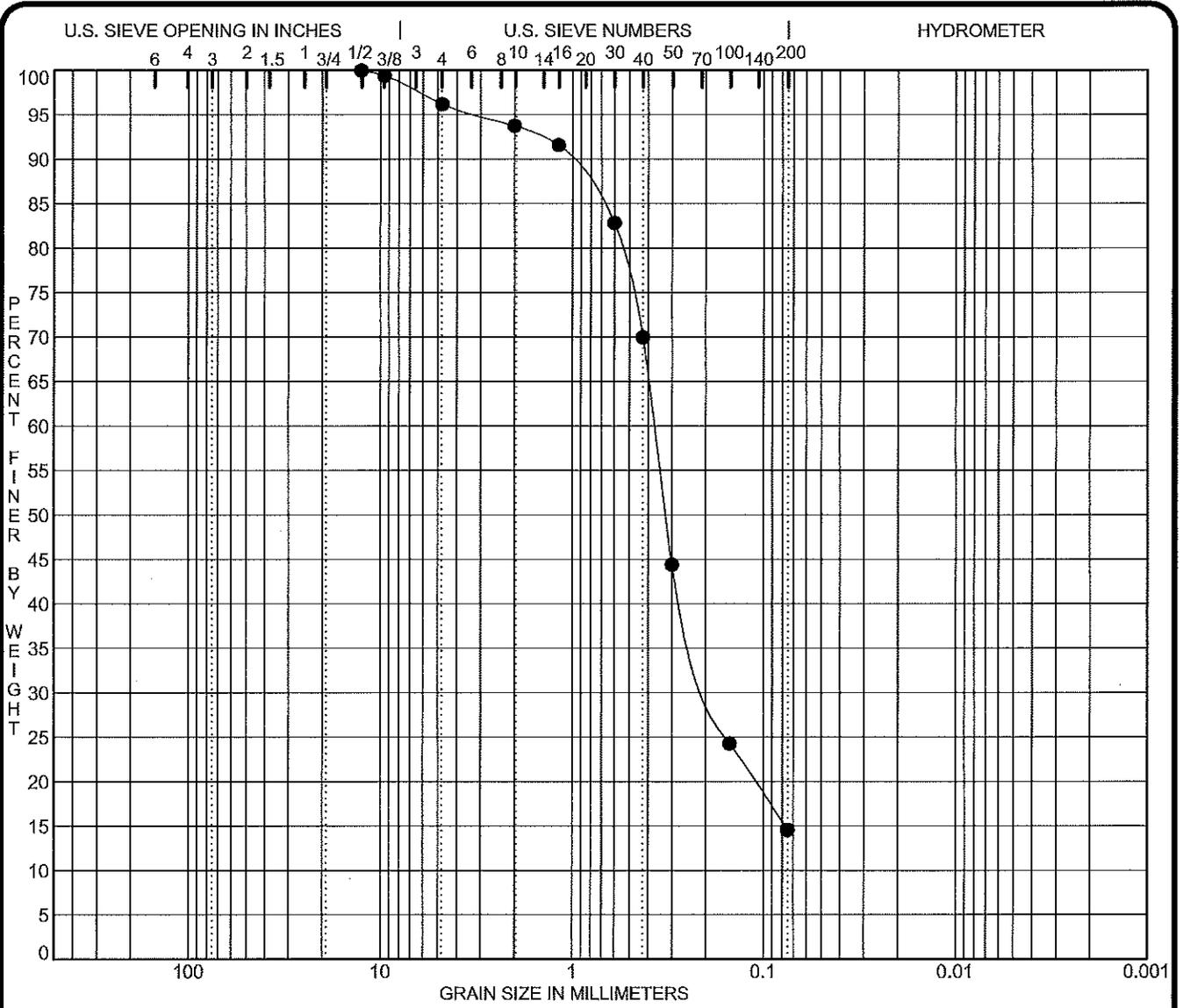
Lab No.	Classification	pH	%Gravel	%Sand	%Silt	%Clay	MC%	LL	PL	PI
	SP-SM, Fine-medium Sand, trace gravel		10.8	80.4	8.9			NP	NP	NP

Remarks:

	Project No. ---	Project Lake Manitou Dam & Spillway Improvements
	Structure No. ---	Location Rochester, Indiana
	EEl Proj. No. 1-15-324	Client Lawson-Fisher Associates P.C.

### GRAIN SIZE DISTRIBUTION CURVE

Earth Exploration, Inc.  
 7770 West New York Street Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)

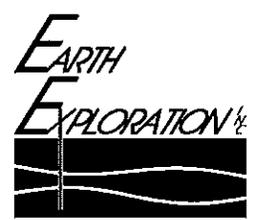


BOULDERS	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Sample Identification		Station / Offset / Line		Depth, ft.	Elevation, USCGS
B-6	SS-2	---		2.0 - 4.0	771.9 -

Lab No.	Classification	pH	%Gravel	%Sand	%Silt	%Clay	MC%	LL	PL	PI
	SM, Silty Sand, trace gravel		6.2	79.2	14.6		22.5	NP	NP	NP

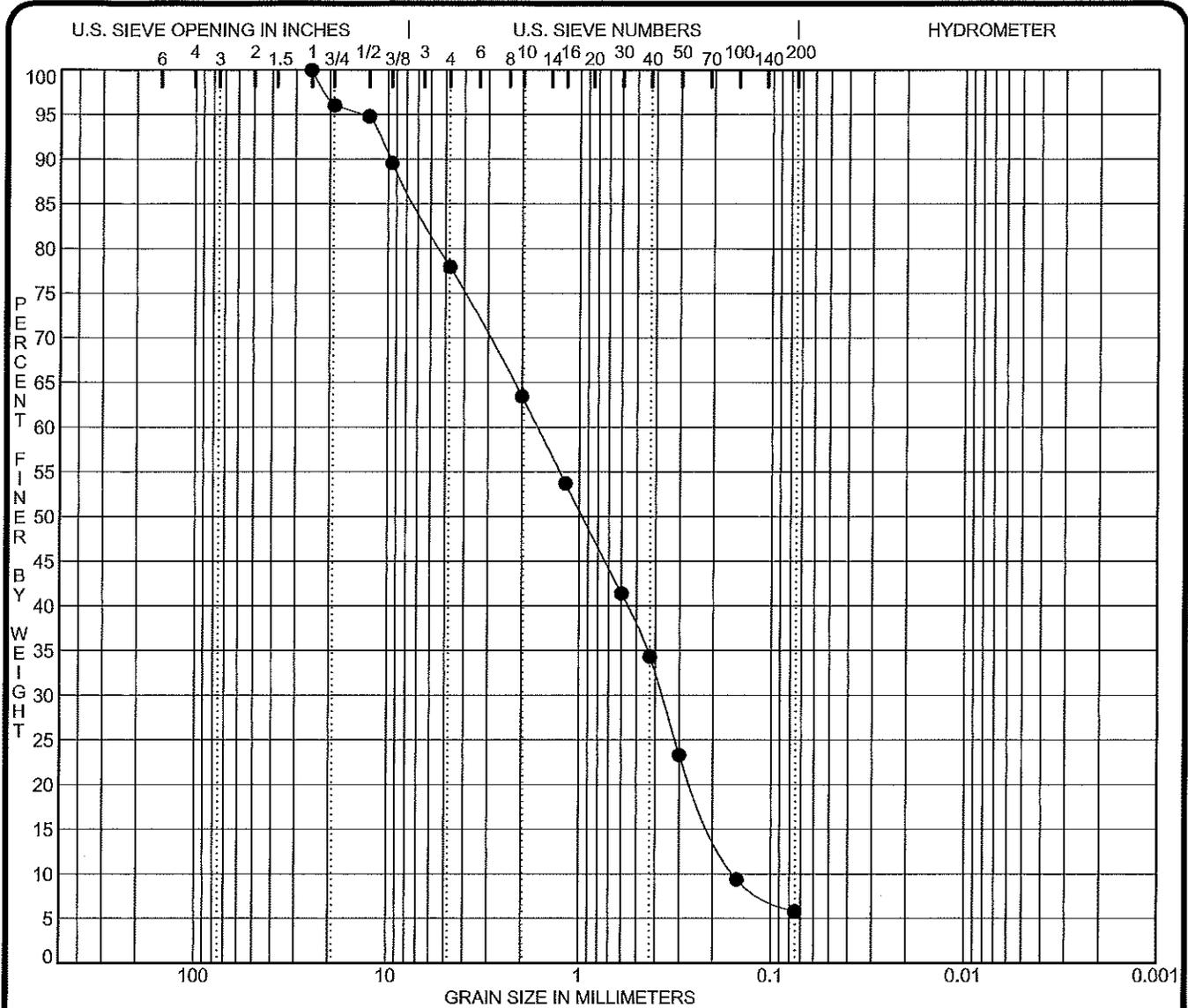
Remarks:



Project No. ---      Project Lake Manitou Dam & Spillway Improvements  
 Structure No. ---      Location Rochester, Indiana  
 EEI Proj. No. 1-15-324      Client Lawson-Fisher Associates P.C.

**GRAIN SIZE DISTRIBUTION CURVE**

Earth Exploration, Inc.  
 7770 West New York Street Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)



BOULDERS	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Sample Identification	Station / Offset / Line	Depth, ft.	Elevation, USCGS
B-7 SS-3	---	4.0 - 6.0	769.6 -

Lab No.	Classification	pH	%Gravel	%Sand	%Silt	%Clay	MC%	LL	PL	PI
	SP-SM, Fine - Medium Sand some gravel		36.5	57.7	5.8			NP	NP	NP

Remarks:

	Project No. ---	Project	Lake Manitou Dam & Spillway Improvements
	Structure No. ---	Location	Rochester, Indiana
	EEl Proj. No. 1-15-324	Client	Lawson-Fisher Associates P.C.

### GRAIN SIZE DISTRIBUTION CURVE

Earth Exploration, Inc.  
 7770 West New York Street Indianapolis, Indiana 46214  
 317-273-1690 / 317-273-2250 (Fax)

## **APPENDIX D**

Stability Analysis at Normal Pool  
(7 sheets; Figure 3)

Stability Analysis with Earthquake Loading  
(7 sheets; Figure 4)

Seepage Analysis at High Pool  
(6 sheets; Figure 5)

Stability Analysis at High Pool  
(7 sheets; Figure 6)

# Slope Stability at Normal Pool

---

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## File Information

File Version: 8.14  
Title: Lake Manitou Dam  
Created By: Kyle Zak  
Last Edited By: kyle zak  
Revision Number: 13  
Date: 10/30/2015  
Time: 12:44:33 PM  
Tool Version: 8.14.1.10087  
File Name: Seepage and Stability.gsz  
Directory: K:\Projects\Geotechnical Projects\1-15-324 Manitou Lake Dam and Spillway Improvements, Fulton County, IN, Lawson-Fisher Associates P.C\Analysis\  
Last Solved Date: 10/30/2015  
Last Solved Time: 12:44:38 PM

## Project Settings

Length(L) Units: Feet  
Time(t) Units: Seconds  
Force(F) Units: Pounds  
Pressure(p) Units: psf  
Strength Units: psf  
Unit Weight of Water: 62.4 pcf  
View: 2D  
Element Thickness: 1

## Analysis Settings

### Slope Stability at Normal Pool

Kind: SLOPE/W  
Parent: Seepage at Normal Pool  
Method: Spencer  
Settings  
    PWP Conditions Source: Parent Analysis  
Slip Surface  
    Direction of movement: Right to Left  
    Use Passive Mode: No  
    Slip Surface Option: Entry and Exit  
    Critical slip surfaces saved: 1  
    Resisting Side Maximum Convex Angle: 1 °

Driving Side Maximum Convex Angle: 5 °  
Optimize Critical Slip Surface Location: No  
Tension Crack  
    Tension Crack Option: (none)  
F of S Distribution  
    F of S Calculation Option: Constant  
Advanced  
    Number of Slices: 30  
    F of S Tolerance: 0.001  
    Minimum Slip Surface Depth: 0.1 ft  
    Search Method: Root Finder  
    Tolerable difference between starting and converged F of S: 3  
    Maximum iterations to calculate converged lambda: 20  
    Max Absolute Lambda: 2

## Materials

### Embankment fill

Model: Mohr-Coulomb  
Unit Weight: 120 pcf  
Cohesion': 0 psf  
Phi': 30 °  
Phi-B: 0 °

### Silty Sand

Model: Mohr-Coulomb  
Unit Weight: 110 pcf  
Cohesion': 0 psf  
Phi': 28 °  
Phi-B: 0 °

### Sand

Model: Mohr-Coulomb  
Unit Weight: 120 pcf  
Cohesion': 0 psf  
Phi': 30 °  
Phi-B: 0 °

### Dense Sand

Model: Mohr-Coulomb  
Unit Weight: 120 pcf  
Cohesion': 0 psf  
Phi': 32 °  
Phi-B: 0 °

## Slip Surface Entry and Exit

Left Projection: Range

Left-Zone Left Coordinate: (0, 774) ft

Left-Zone Right Coordinate: (87.56432, 776.11618) ft

Left-Zone Increment: 15

Right Projection: Range

Right-Zone Left Coordinate: (102.07055, 779.10276) ft

Right-Zone Right Coordinate: (147, 779.11111) ft

Right-Zone Increment: 10

Radius Increments: 6

## Slip Surface Limits

Left Coordinate: (0, 774) ft

Right Coordinate: (151, 778) ft

## Points

	X (ft)	Y (ft)
Point 1	0	774
Point 2	0	770
Point 3	0	766
Point 4	75	775
Point 5	75	769
Point 6	75	759
Point 7	80	775
Point 8	84	775.5
Point 9	87	776
Point 10	104	779.5
Point 11	135	780.5
Point 12	142	780.5
Point 13	151	778
Point 14	139	775
Point 15	139	769
Point 16	139	757
Point 17	0	750
Point 18	151	750
Point 19	151	775
Point 20	151	769

Point 21	151	757
Point 22	75	773

## Regions

	Material	Points	Area (ft <sup>2</sup> )
Region 1	Dense Sand	17,3,6,16,21,18	1,533.5
Region 2	Sand	3,2,5,15,20,21,16,6	1,373
Region 3	Silty Sand	2,1,22,14,19,20,15,5	692
Region 4	Embankment fill	1,4,7,8,9,10,11,12,13,19,14,22	420.75

## Current Slip Surface

Slip Surface: 1,011  
 F of S: 2.324  
 Volume: 89.204003 ft<sup>3</sup>  
 Weight: 10,599.605 lbs  
 Resisting Moment: 111,861.64 lbs-ft  
 Activating Moment: 48,123.771 lbs-ft  
 Resisting Force: 3,766.1964 lbs  
 Activating Force: 1,620.501 lbs  
 F of S Rank: 1  
 Exit: (75.961288, 775) ft  
 Entry: (106.54629, 779.58214) ft  
 Radius: 27.977102 ft  
 Center: (87.79931, 800.34915) ft

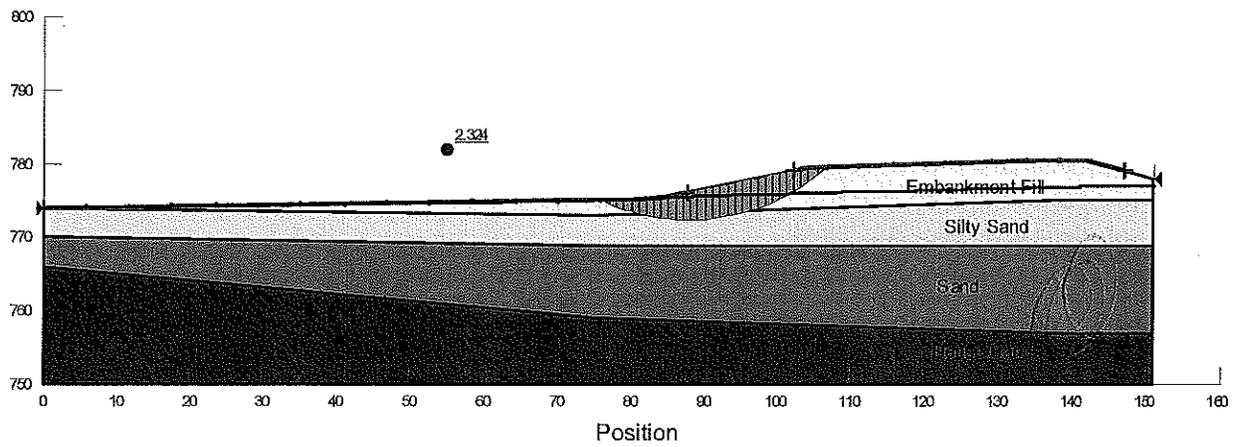
## Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	76.466127	774.77627	14.109203	31.396222	9.9806653	0
Slice 2	77.475805	774.35207	41.061506	89.429219	27.925112	0
Slice 3	78.485483	773.97332	65.398576	139.54155	42.806463	0
Slice 4	79.495161	773.63811	88.604497	182.27817	54.082522	0
Slice 5	80.541665	773.33563	111.15985	228.89449	67.974125	0

Slice 6	81.569442	773.07905	132.12872	274.02526	75.447728	0
Slice 7	82.541665	772.87497	149.80251	310.53991	85.465593	0
Slice 8	83.513888	772.70659	164.68565	342.23565	94.405012	0
Slice 9	84.5	772.57184	177.0859	372.35706	103.82752	0
Slice 10	85.5	772.47121	186.90474	400.8422	113.75256	0
Slice 11	86.5	772.40672	194.0484	424.65965	122.61818	0
Slice 12	87.510998	772.3782	198.65843	446.61294	131.83975	0
Slice 13	88.532995	772.38634	200.73579	466.61483	141.37039	0
Slice 14	89.554991	772.43189	200.26006	481.97897	149.7926	0
Slice 15	90.576988	772.51502	197.26163	492.78847	157.13441	0
Slice 16	91.598985	772.63607	191.76754	499.10404	163.41372	0
Slice 17	92.620981	772.79556	183.79322	500.96564	168.64357	0
Slice 18	93.642978	772.99414	173.29693	498.39257	172.85642	0
Slice 19	94.664974	773.23268	160.27452	491.38416	176.05412	0
Slice 20	95.686971	773.51225	144.63381	479.91768	178.2736	0
Slice 21	96.685596	773.82581	126.84425	461.9202	193.45619	0
Slice 22	97.66085	774.17289	106.86291	439.46691	192.02901	0
Slice 23	98.636104	774.56151	84.260063	412.50032	189.5096	0
Slice 24	99.611358	774.99359	58.872789	380.92139	185.93485	0

Slice 25	100.58661	775.4714	30.611475	344.6115	181.288	0
Slice 26	101.56187	775.99763	-0.7306622	303.48149	175.21512	0
Slice 27	102.53712	776.57551	-35.298518	260.60367	150.4596	0
Slice 28	103.51237	777.20892	-73.385207	213.51227	123.27137	0
Slice 29	104.63657	778.02004	-122.37391	142.81692	82.455385	0
Slice 30	105.90972	779.04109	-184.34296	48.101414	27.771364	0

### Lake Manitou Dam



Name: Embankment fill Unit Weight: 120 pcf Cohesion: 0 psf Phi: 30 °  
Name: Silty Sand Unit Weight: 110 pcf Cohesion: 0 psf Phi: 28 °  
Name: Sand Unit Weight: 120 pcf Cohesion: 0 psf Phi: 30 °  
Name: Dense Sand Unit Weight: 120 pcf Cohesion: 0 psf Phi: 32 °

Figure 3. Slope Stability at Normal Pool

# Slope Stability with EQ Loading

---

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## File Information

File Version: 8.14  
Title: Lake Manitou Dam  
Created By: Kyle Zak  
Last Edited By: kyle zak  
Revision Number: 13  
Date: 10/30/2015  
Time: 12:44:33 PM  
Tool Version: 8.14.1.10087  
File Name: Seepage and Stability.gsz  
Directory: K:\Projects\Geotechnical Projects\1-15-324 Manitou Lake Dam and Spillway Improvements, Fulton County, IN, Lawson-Fisher Associates P.C\Analysis\  
Last Solved Date: 10/30/2015  
Last Solved Time: 12:44:39 PM

## Project Settings

Length(L) Units: Feet  
Time(t) Units: Seconds  
Force(F) Units: Pounds  
Pressure(p) Units: psf  
Strength Units: psf  
Unit Weight of Water: 62.4 pcf  
View: 2D  
Element Thickness: 1

## Analysis Settings

### Slope Stability with EQ Loading

Kind: SLOPE/W  
Parent: Seepage at Normal Pool  
Method: Spencer  
Settings  
PWP Conditions Source: Parent Analysis  
Slip Surface  
Direction of movement: Right to Left  
Use Passive Mode: No  
Slip Surface Option: Entry and Exit  
Critical slip surfaces saved: 1  
Resisting Side Maximum Convex Angle: 1 °

Driving Side Maximum Convex Angle: 5 °  
Optimize Critical Slip Surface Location: No  
Tension Crack  
Tension Crack Option: (none)  
F of S Distribution  
F of S Calculation Option: Constant  
Advanced  
Number of Slices: 30  
F of S Tolerance: 0.001  
Minimum Slip Surface Depth: 0.1 ft  
Search Method: Root Finder  
Tolerable difference between starting and converged F of S: 3  
Maximum iterations to calculate converged lambda: 20  
Max Absolute Lambda: 2

## Materials

### Embankment fill

Model: Mohr-Coulomb  
Unit Weight: 120 pcf  
Cohesion': 0 psf  
Phi': 30 °  
Phi-B: 0 °

### Silty Sand

Model: Mohr-Coulomb  
Unit Weight: 110 pcf  
Cohesion': 0 psf  
Phi': 28 °  
Phi-B: 0 °

### Sand

Model: Mohr-Coulomb  
Unit Weight: 120 pcf  
Cohesion': 0 psf  
Phi': 30 °  
Phi-B: 0 °

### Dense Sand

Model: Mohr-Coulomb  
Unit Weight: 120 pcf  
Cohesion': 0 psf  
Phi': 32 °  
Phi-B: 0 °

## Slip Surface Entry and Exit

Left Projection: Range  
Left-Zone Left Coordinate: (0, 774) ft  
Left-Zone Right Coordinate: (87.56432, 776.11618) ft  
Left-Zone Increment: 15  
Right Projection: Range  
Right-Zone Left Coordinate: (102.07055, 779.10276) ft  
Right-Zone Right Coordinate: (147, 779.11111) ft  
Right-Zone Increment: 10  
Radius Increments: 6

## Slip Surface Limits

Left Coordinate: (0, 774) ft  
Right Coordinate: (151, 778) ft

## Seismic Coefficients

Horz Seismic Coef.: 0.06

## Points

	X (ft)	Y (ft)
Point 1	0	774
Point 2	0	770
Point 3	0	766
Point 4	75	775
Point 5	75	769
Point 6	75	759
Point 7	80	775
Point 8	84	775.5
Point 9	87	776
Point 10	104	779.5
Point 11	135	780.5
Point 12	142	780.5
Point 13	151	778
Point 14	139	775
Point 15	139	769
Point 16	139	757
Point 17	0	750

Point 18	151	750
Point 19	151	775
Point 20	151	769
Point 21	151	757
Point 22	75	773

## Regions

	Material	Points	Area (ft <sup>2</sup> )
Region 1	Dense Sand	17,3,6,16,21,18	1,533.5
Region 2	Sand	3,2,5,15,20,21,16,6	1,373
Region 3	Silty Sand	2,1,22,14,19,20,15,5	692
Region 4	Embankment fill	1,4,7,8,9,10,11,12,13,19,14,22	420.75

## Current Slip Surface

Slip Surface: 1,011  
 F of S: 1.720  
 Volume: 89.204003 ft<sup>3</sup>  
 Weight: 10,599.605 lbs  
 Resisting Moment: 110,056.42 lbs-ft  
 Activating Moment: 63,984.066 lbs-ft  
 Resisting Force: 3,711.4214 lbs  
 Activating Force: 2,158.5763 lbs  
 F of S Rank: 1  
 Exit: (75.961288, 775) ft  
 Entry: (106.54629, 779.58214) ft  
 Radius: 27.977102 ft  
 Center: (87.79931, 800.34915) ft

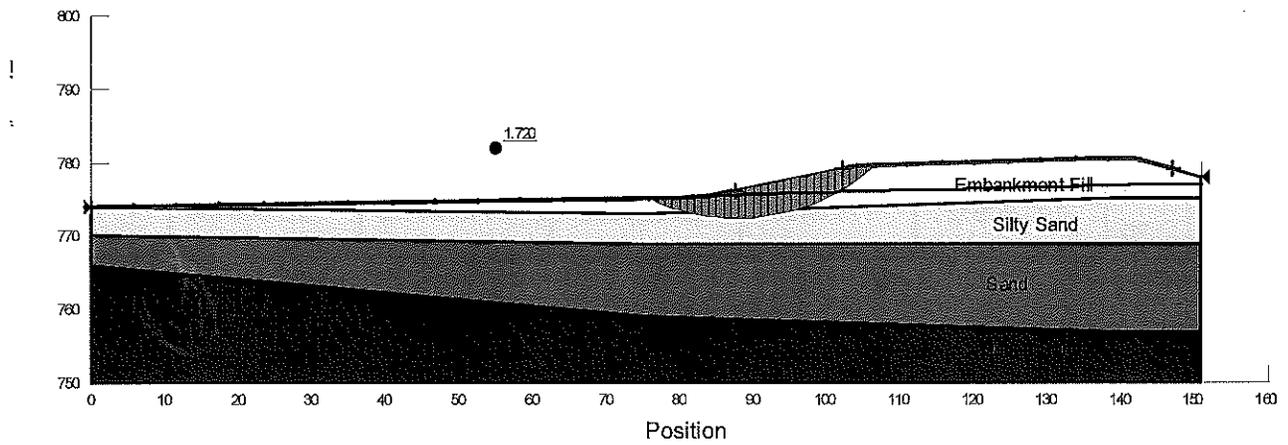
## Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	76.466127	774.77627	14.109203	33.792697	11.36427	0
Slice 2	77.475805	774.35207	41.061506	95.352514	31.344928	0
Slice 3	78.485483	773.97332	65.398576	147.52434	47.41533	0

Slice 4	79.495161	773.63811	88.604497	191.10626	59.179417	0
Slice 5	80.541665	773.33563	111.15985	238.40569	73.465419	0
Slice 6	81.569442	773.07905	132.12872	282.9056	80.169492	0
Slice 7	82.541665	772.87497	149.80251	318.9852	89.95603	0
Slice 8	83.513888	772.70659	164.68565	349.89058	98.475206	0
Slice 9	84.5	772.57184	177.0859	379.03552	107.37852	0
Slice 10	85.5	772.47121	186.90474	406.36821	116.6908	0
Slice 11	86.5	772.40672	194.0484	428.81144	124.82572	0
Slice 12	87.510998	772.3782	198.65843	449.26115	133.24783	0
Slice 13	88.532995	772.38634	200.73579	467.63427	141.91244	0
Slice 14	89.554991	772.43189	200.26006	481.2472	149.40351	0
Slice 15	90.576988	772.51502	197.26163	490.23161	155.7749	0
Slice 16	91.598985	772.63607	191.76754	494.69166	161.06761	0
Slice 17	92.620981	772.79556	183.79322	494.70712	165.31585	0
Slice 18	93.642978	772.99414	173.29693	490.33507	168.57217	0
Slice 19	94.664974	773.23268	160.27452	481.60989	170.85705	0
Slice 20	95.686971	773.51225	144.63381	468.54358	172.22588	0
Slice 21	96.685596	773.82581	126.84425	449.28605	186.16186	0
Slice 22	97.66085	774.17289	106.86291	425.65365	184.05392	0

Slice 23	98.636104	774.56151	84.260063	397.74818	180.99245	0
Slice 24	99.611358	774.99359	58.872789	365.507	177.03535	0
Slice 25	100.58661	775.4714	30.611475	328.85064	172.18847	0
Slice 26	101.56187	775.99763	-0.7306622	287.73977	166.12663	0
Slice 27	102.53712	776.57551	-35.298518	245.7258	141.86986	0
Slice 28	103.51237	777.20892	-73.385207	200.17959	115.57374	0
Slice 29	104.63657	778.02004	-122.37391	132.98427	76.778502	0
Slice 30	105.90972	779.04109	-184.34296	44.424425	25.648454	0

### Lake Manitou Dam



Name: Embankment fill Unit Weight: 120 pcf Cohesion: 0 psf Phi: 30 °  
Name: Silty Sand Unit Weight: 110 pcf Cohesion: 0 psf Phi: 28 °  
Name: Sand Unit Weight: 120 pcf Cohesion: 0 psf Phi: 30 °  
Name: Dense Sand Unit Weight: 120 pcf Cohesion: 0 psf Phi: 32 °

Figure 4. Slope Stability under Earthquake Loading

# Seepage at High Pool

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## File Information

File Version: 8.14  
Title: Lake Manitou Dam  
Created By: Kyle Zak  
Last Edited By: kyle zak.  
Revision Number: 13  
Date: 10/30/2015  
Time: 12:44:33 PM  
Tool Version: 8.14.1.10087  
File Name: Seepage and Stability.gsz  
Directory: K:\Projects\Geotechnical Projects\1-15-324 Manitou Lake Dam and Spillway Improvements, Fulton County, IN, Lawson-Fisher Associates P.C\Analysis\  
Last Solved Date: 10/30/2015  
Last Solved Time: 12:44:34 PM

## Project Settings

Length(L) Units: Feet  
Time(t) Units: Seconds  
Force(F) Units: Pounds  
Pressure(p) Units: psf  
Mass(M) Units: Pounds  
Mass Flux Units: lbs/sec  
Unit Weight of Water: 62.4 pcf  
View: 2D  
Element Thickness: 1

## Analysis Settings

### Seepage at High Pool

Kind: SEEP/W  
Method: Steady-State  
Settings  
    Include Air Flow: No  
Control  
    Apply Runoff: Yes  
Convergence  
    Maximum Number of Iterations: 500  
    Minimum Pressure Head Difference: 0.005  
    Significant Digits: 2

Max # of Reviews: 10  
Hydraulic Under-Relaxation Criteria  
    Under-Relaxation Initial Rate: 1  
    Under-Relaxation Min. Rate: 0.1  
    Under-Relaxation Reduction Rate: 0.65  
    Under-Relaxation Iterations: 10  
Equation Solver: Parallel Direct

Time

Starting Time: 0 sec  
Duration: 0 sec  
Ending Time: 0 sec

## Materials

### Embankment fill

Model: Saturated Only  
Hydraulic  
    Sat Kx: 0.001 ft/sec  
    Ky'/Kx' Ratio: 1  
    Rotation: 0 °  
    Volumetric Water Content: 0 ft<sup>3</sup>/ft<sup>3</sup>  
    Mv: 0 /psf

### Silty Sand

Model: Saturated Only  
Hydraulic  
    Sat Kx: 0.0001 ft/sec  
    Ky'/Kx' Ratio: 1  
    Rotation: 0 °  
    Volumetric Water Content: 0 ft<sup>3</sup>/ft<sup>3</sup>  
    Mv: 0 /psf

### Sand

Model: Saturated Only  
Hydraulic  
    Sat Kx: 0.01 ft/sec  
    Ky'/Kx' Ratio: 1  
    Rotation: 0 °  
    Volumetric Water Content: 0 ft<sup>3</sup>/ft<sup>3</sup>  
    Mv: 0 /psf

### Dense Sand

Model: Saturated Only  
Hydraulic  
    Sat Kx: 0.01 ft/sec  
    Ky'/Kx' Ratio: 1

Rotation: 0 °  
Volumetric Water Content: 0 ft<sup>3</sup>/ft<sup>3</sup>  
Mv: 0 /psf

## Boundary Conditions

### Seepage Face

Type: Total Flux (Q) 0  
Review: Yes

### High Pool

Type: Head (H) 780  
Review: No

### Water at Surface

Type: Head (H) 774  
Review: No

## Points

	X (ft)	Y (ft)
Point 1	0	774
Point 2	0	770
Point 3	0	766
Point 4	75	775
Point 5	75	769
Point 6	75	759
Point 7	80	775
Point 8	84	775.5
Point 9	87	776
Point 10	104	779.5
Point 11	135	780.5
Point 12	142	780.5
Point 13	151	778
Point 14	139	775
Point 15	139	769
Point 16	139	757
Point 17	0	750
Point 18	151	750

Point 19	151	775
Point 20	151	769
Point 21	151	757
Point 22	75	773

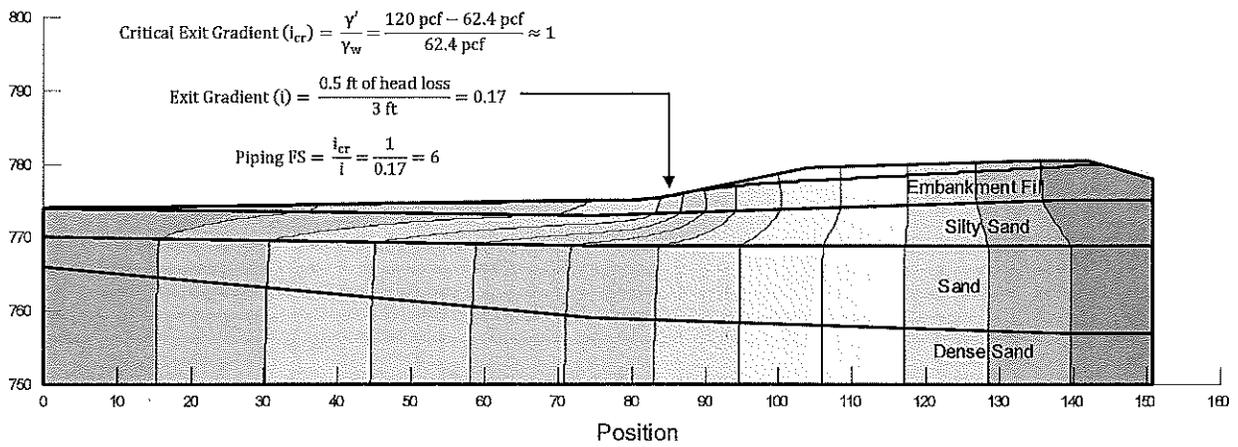
## Lines

	Start Point	End Point	Hydraulic Boundary
Line 1	17	3	Water at Surface
Line 2	3	6	
Line 3	6	16	
Line 4	16	21	
Line 5	21	18	High Pool
Line 6	18	17	
Line 7	3	2	Water at Surface
Line 8	2	5	
Line 9	5	15	
Line 10	15	20	
Line 11	20	21	High Pool
Line 12	2	1	Water at Surface
Line 13	1	22	
Line 14	22	14	
Line 15	14	19	
Line 16	19	20	High Pool
Line 17	1	4	Seepage Face
Line 18	4	7	Seepage Face
Line 19	7	8	Seepage Face
Line 20	8	9	Seepage Face
Line 21	9	10	Seepage Face
Line 22	10	11	Seepage Face
Line 23	12	13	High Pool
Line 24	13	19	High Pool
Line 25	11	12	

## Regions

	Material	Points	Area (ft <sup>2</sup> )
Region 1	Dense Sand	17,3,6,16,21,18	1,533.5
Region 2	Sand	3,2,5,15,20,21,16,6	1,373
Region 3	Silty Sand	2,1,22,14,19,20,15,5	692
Region 4	Embankment fill	1,4,7,8,9,10,11,12,13,19,14,22	420.75

### Lake Manitou Dam



Name: Embankment fill Sat Kx: 0.001 ft/sec Ky/Kx Ratio: 1  
 Name: Silty Sand Sat Kx: 0.0001 ft/sec Ky/Kx Ratio: 1  
 Name: Sand Sat Kx: 0.01 ft/sec Ky/Kx Ratio: 1  
 Name: Dense Sand Sat Kx: 0.01 ft/sec Ky/Kx Ratio: 1

Figure 5. Seepage Analysis at High Pool

# Slope Stability at High Pool

---

Report generated using GeoStudio 2012. Copyright © 1991-2014 GEO-SLOPE International Ltd.

## File Information

File Version: 8.14  
Title: Lake Manitou Dam  
Created By: Kyle Zak  
Last Edited By: kyle zak  
Revision Number: 13  
Date: 10/30/2015  
Time: 12:44:33 PM  
Tool Version: 8.14.1.10087  
File Name: Seepage and Stability.gsz  
Directory: K:\Projects\Geotechnical Projects\1-15-324 Manitou Lake Dam and Spillway Improvements, Fulton County, IN, Lawson-Fisher Associates P.C\Analysis\  
Last Solved Date: 10/30/2015  
Last Solved Time: 12:44:36 PM

## Project Settings

Length(L) Units: Feet  
Time(t) Units: Seconds  
Force(F) Units: Pounds  
Pressure(p) Units: psf  
Strength Units: psf  
Unit Weight of Water: 62.4 pcf  
View: 2D  
Element Thickness: 1

## Analysis Settings

### Slope Stability at High Pool

Kind: SLOPE/W  
Parent: Seepage at High Pool  
Method: Spencer  
Settings  
    PWP Conditions Source: Parent Analysis  
Slip Surface  
    Direction of movement: Right to Left  
    Use Passive Mode: No  
    Slip Surface Option: Entry and Exit  
    Critical slip surfaces saved: 1  
    Resisting Side Maximum Convex Angle: 1 °

Driving Side Maximum Convex Angle: 5 °  
Optimize Critical Slip Surface Location: No  
Tension Crack

Tension Crack Option: (none)

F of S Distribution

F of S Calculation Option: Constant

Advanced

Number of Slices: 30

F of S Tolerance: 0.001

Minimum Slip Surface Depth: 0.1 ft

Search Method: Root Finder

Tolerable difference between starting and converged F of S: 3

Maximum iterations to calculate converged lambda: 20

Max Absolute Lambda: 2

## Materials

### Embankment fill

Model: Mohr-Coulomb

Unit Weight: 120 pcf

Cohesion': 0 psf

Phi': 30 °

Phi-B: 0 °

### Silty Sand

Model: Mohr-Coulomb

Unit Weight: 110 pcf

Cohesion': 0 psf

Phi': 28 °

Phi-B: 0 °

### Sand

Model: Mohr-Coulomb

Unit Weight: 120 pcf

Cohesion': 0 psf

Phi': 30 °

Phi-B: 0 °

### Dense Sand

Model: Mohr-Coulomb

Unit Weight: 120 pcf

Cohesion': 0 psf

Phi': 32 °

Phi-B: 0 °

## Slip Surface Entry and Exit

Left Projection: Range  
Left-Zone Left Coordinate: (0, 774) ft  
Left-Zone Right Coordinate: (87.56432, 776.11618) ft  
Left-Zone Increment: 15  
Right Projection: Range  
Right-Zone Left Coordinate: (102.07055, 779.10276) ft  
Right-Zone Right Coordinate: (147, 779.11111) ft  
Right-Zone Increment: 10  
Radius Increments: 6

## Slip Surface Limits

Left Coordinate: (0, 774) ft  
Right Coordinate: (151, 778) ft

## Points

	X (ft)	Y (ft)
Point 1	0	774
Point 2	0	770
Point 3	0	766
Point 4	75	775
Point 5	75	769
Point 6	75	759
Point 7	80	775
Point 8	84	775.5
Point 9	87	776
Point 10	104	779.5
Point 11	135	780.5
Point 12	142	780.5
Point 13	151	778
Point 14	139	775
Point 15	139	769
Point 16	139	757
Point 17	0	750
Point 18	151	750
Point 19	151	775
Point 20	151	769

Point 21	151	757
Point 22	75	773

## Regions

	Material	Points	Area (ft <sup>2</sup> )
Region 1	Dense Sand	17,3,6,16,21,18	1,533.5
Region 2	Sand	3,2,5,15,20,21,16,6	1,373
Region 3	Silty Sand	2,1,22,14,19,20,15,5	692
Region 4	Embankment fill	1,4,7,8,9,10,11,12,13,19,14,22	420.75

## Current Slip Surface

Slip Surface: 1,005  
 F of S: 1.835  
 Volume: 91.098001 ft<sup>3</sup>  
 Weight: 10,685.193 lbs  
 Resisting Moment: 52,403.716 lbs-ft  
 Activating Moment: 28,551.444 lbs-ft  
 Resisting Force: 2,612.4729 lbs  
 Activating Force: 1,423.3375 lbs  
 F of S Rank: 1  
 Exit: (75.961288, 775) ft  
 Entry: (102.07055, 779.10276) ft  
 Radius: 18.278641 ft  
 Center: (87.055567, 789.52672) ft

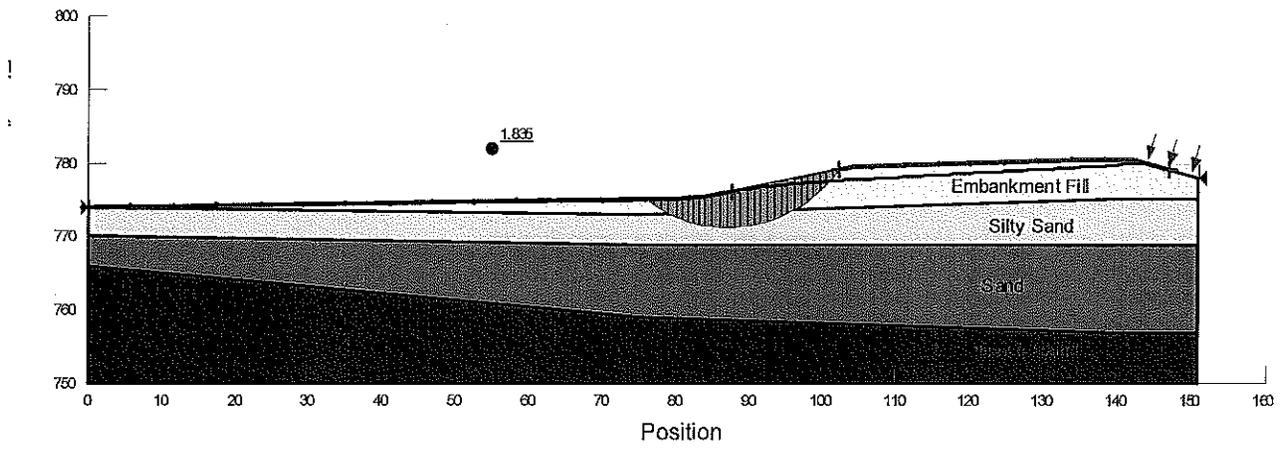
## Slip Slices

	X (ft)	Y (ft)	PWP (psf)	Base Normal Stress (psf)	Frictional Strength (psf)	Cohesive Strength (psf)
Slice 1	76.465796	774.64109	23.314647	57.036151	19.469119	0
Slice 2	77.474811	773.97144	67.189207	156.27845	51.435697	0
Slice 3	78.483827	773.39267	105.62387	235.37187	74.910045	0
Slice 4	79.494167	772.89467	146.50131	291.08177	76.874796	0
Slice 5	80.4	772.50827	184.96519	337.85967	81.29544	0

Slice 6	81.2	772.21653	214.56277	380.72576	88.350428	0
Slice 7	82	771.96607	241.28601	417.76917	93.837761	0
Slice 8	82.8	771.75513	264.10053	449.62006	98.642483	0
Slice 9	83.6	771.58231	283.8999	476.51833	102.41704	0
Slice 10	84.5	771.43466	302.00768	503.73358	107.25956	0
Slice 11	85.5	771.32131	317.64424	530.0346	112.92996	0
Slice 12	86.5	771.26338	328.69202	549.50451	117.40808	0
Slice 13	87.456559	771.25819	335.12939	564.30562	121.85517	0
Slice 14	88.369678	771.30113	337.5696	575.00676	126.24758	0
Slice 15	89.282797	771.39011	336.60793	580.27118	129.55805	0
Slice 16	90.195916	771.52583	332.20726	580.1521	131.83461	0
Slice 17	91.109035	771.70935	324.61205	574.66279	132.95434	0
Slice 18	92.022154	771.94217	313.41199	563.75928	133.11202	0
Slice 19	92.935273	772.22628	299.02091	547.37761	132.0536	0
Slice 20	93.848392	772.56428	280.79469	525.3583	130.03678	0
Slice 21	94.76151	772.95948	259.06289	497.5397	126.80037	0
Slice 22	95.674629	773.41609	233.21395	463.63158	122.51523	0
Slice 23	96.555429	773.91856	205.55067	420.96652	124.3704	0
Slice 24	97.403909	774.46832	175.68311	373.64885	114.29558	0

Slice 25	98.252389	775.08887	141.19853	319.7283	103.07421	0
Slice 26	99.100869	775.78987	101.57533	258.61668	90.667864	0
Slice 27	99.94935	776.58453	56.057092	189.53776	77.065103	0
Slice 28	100.79783	777.4916	3.6757564	111.47308	62.23681	0
Slice 29	101.64631	778.53939	-57.693685	36.979529	21.350141	0

### Lake Manitou Dam



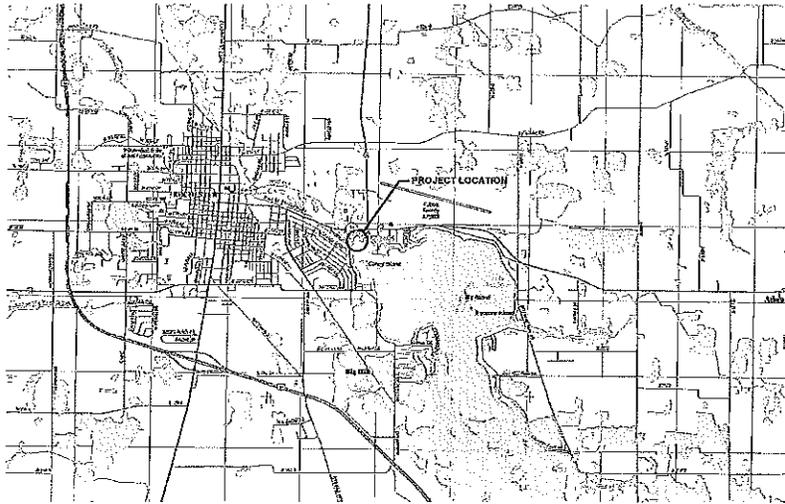
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Name: Silty Sand Unit Weight: 110 pcf Cohesion: 0 psf Phi: 28 °  
Name: Sand Unit Weight: 120 pcf Cohesion: 0 psf Phi: 30 °  
Name: Dense Sand Unit Weight: 120 pcf Cohesion: 0 psf Phi: 32 °

Figure 6. Slope Stability at High Pool

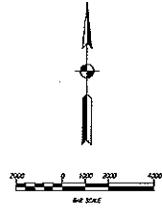
***APPENDIX B***  
***PROJECT PLANS***

INDIANA DEPARTMENT OF ADMINISTRATION (IDOA)  
 INDIANA DEPARTMENT OF NATURAL RESOURCES (IDNR)  
 DIVISION OF WATER

PROJECT No. E06-0059  
 LAKE MANITOU - OUTLET STRUCTURE AND DAM REPAIR  
 ROCHESTER TWP, FULTON COUNTY, INDIANA  
 SE 1/4, SECTION 9, T-30N, R-3E



LOCATION MAP  
 SCALE: 1" = 2000'



DRAWING INDEX

SHEET	DESCRIPTION
1	TITLE SHEET
2	EXISTING SITE PICTURES
3	EXISTING SITE PLAN AND GENERAL NOTES
4	PROPOSED SITE PLAN
5	OUTLET STRUCTURE PLAN
6-8	DETAILS
9	CROSS SECTIONS
10	TEMPORARY EROSION CONTROL PLAN

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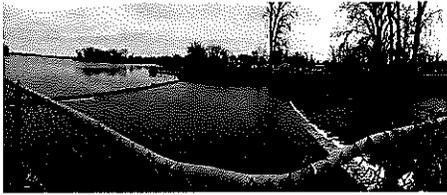
**LFA**  
 LAWSON-FISHER ASSOCIATES P.C.  
 825 W. WASHINGTON AVENUE  
 SOUTH BEND, INDIANA 46601  
 PH. (574) 234-3167



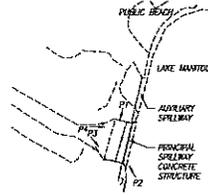
*John K. Moore* 08/22/18  
 SIGNATURE DATE

INDIANA DEPARTMENT OF NATURAL RESOURCES  
 LAKE MANITOU  
 OUTLET STRUCTURE AND DAM  
 TITLE SHEET

REVISIONS	HORIZONTAL SCALE NOTED	PROJECT NUMBER 201529.00
DATE	VERTICAL SCALE	
DRAWN BY	SURVEY BOOK	SHEETS
CHECKED BY	DATE	1 of 10
	AUGUST 2018	



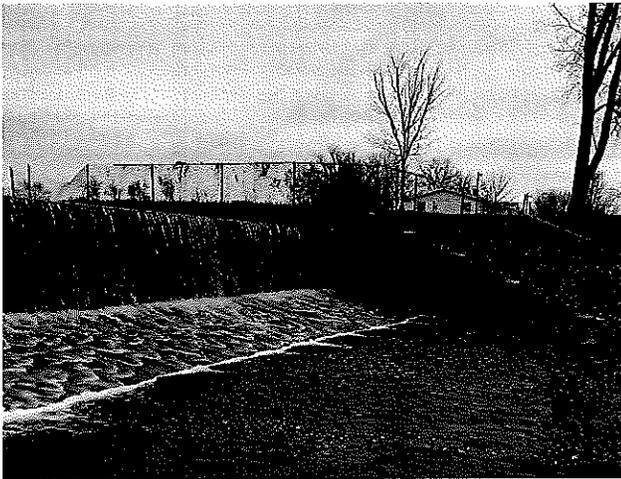
PICTURE P1  
OUTLET STRUCTURE  
LOOKING SOUTH



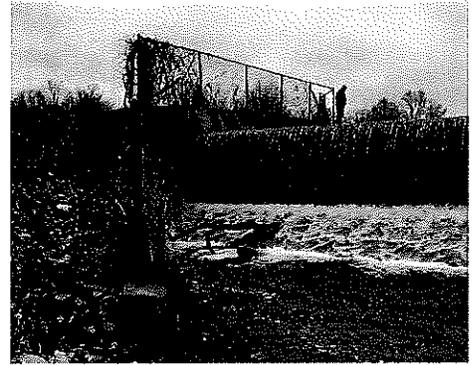
PHOTOGRAPH ORIENTATION  
DIAGRAM



PICTURE P2  
OUTLET STRUCTURE  
LOOKING NORTH



PICTURE P3  
SOUTH DOWNSTREAM  
RETAINING WALL



PICTURE P4  
NORTH DOWNSTREAM  
ABUTMENT AREA

NOTE:  
ALL PICTURES TAKEN IN DECEMBER 2015

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 525 W. WASHINGTON AVENUE  
 SOUTH BEND, INDIANA 46601  
 PH. 574.454-3167



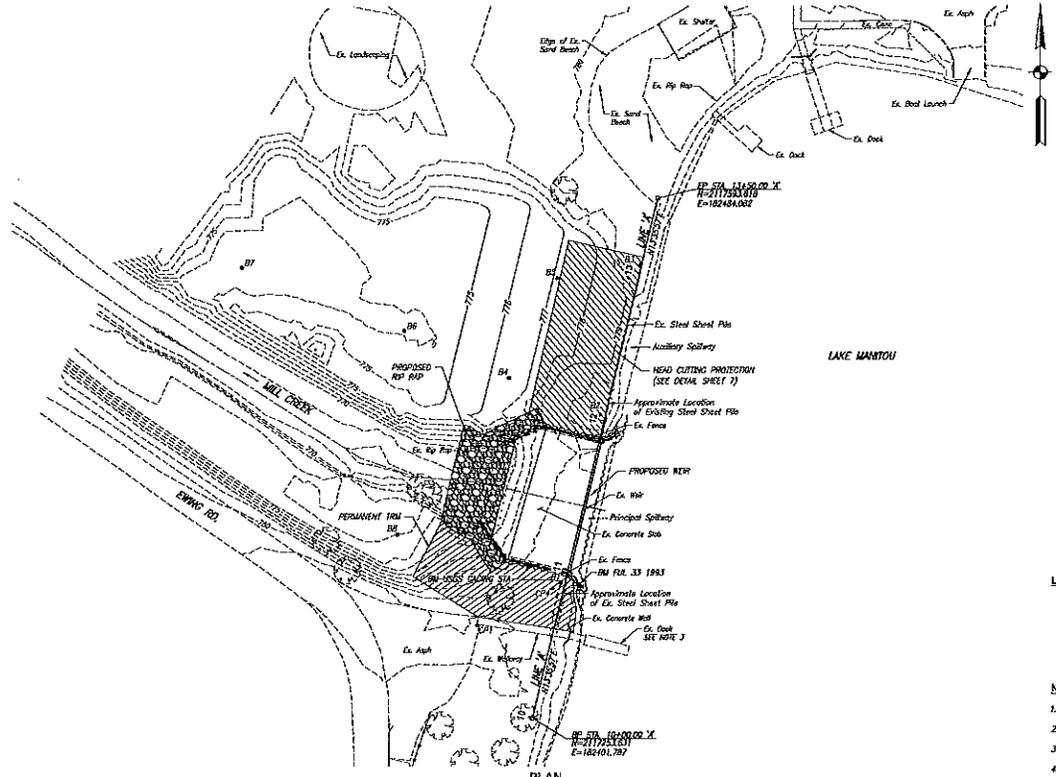
*Amy K. Madson* 08/22/16  
 ENGINEER

INDIANA DEPARTMENT OF NATURAL RESOURCES  
 LAKE MANITOU  
 OUTLET STRUCTURE AND DAM  
 EXISTING SITE  
 PICTURES

REVISIONS	HORIZONTAL SCALE N/A	PROJECT NUMBER 201529.00
	VERTICAL SCALE	
DRAWN BY	SURVEY BOOK	SHEETS
CHECKED BY	DATE AUGUST 2016	2 OF 10



VERTICAL DATUM=NAVD 88



- LEGEND:**
- HEAD CUTTING PROTECTION
  - RFP/RAP
  - PERMANENT TRIM

- NOTES:**
1. SEE SHEET 3 FOR GENERAL NOTES AND SURVEY INFORMATION.
  2. SEE SHEETS 5 AND 6 FOR ADDITIONAL DETAILS AND SECTIONS.
  3. EXISTING DOCK TO BE REMOVED AND REPLACED AS NECESSARY.
  4. CONTRACTOR SHALL COORDINATE ALL ACCESS LOCATIONS THROUGHOUT THE KING WEIR WITH THE VARIOUS OWNERS OF THE ACCESS LOCATIONS.
  5. EXISTING RFP/RAP DOWNSTREAM OF STEEL SHEETING IN AUXILIARY SPILLWAY TO BE REMOVED.



**LFA**  
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525 W. WASHINGTON AVENUE  
SOUTH BEND, INDIANA 46601  
PH. (874) 234-2167



J. K. Madson 08/22/16  
REGISTERED PROFESSIONAL ENGINEER  
DATE



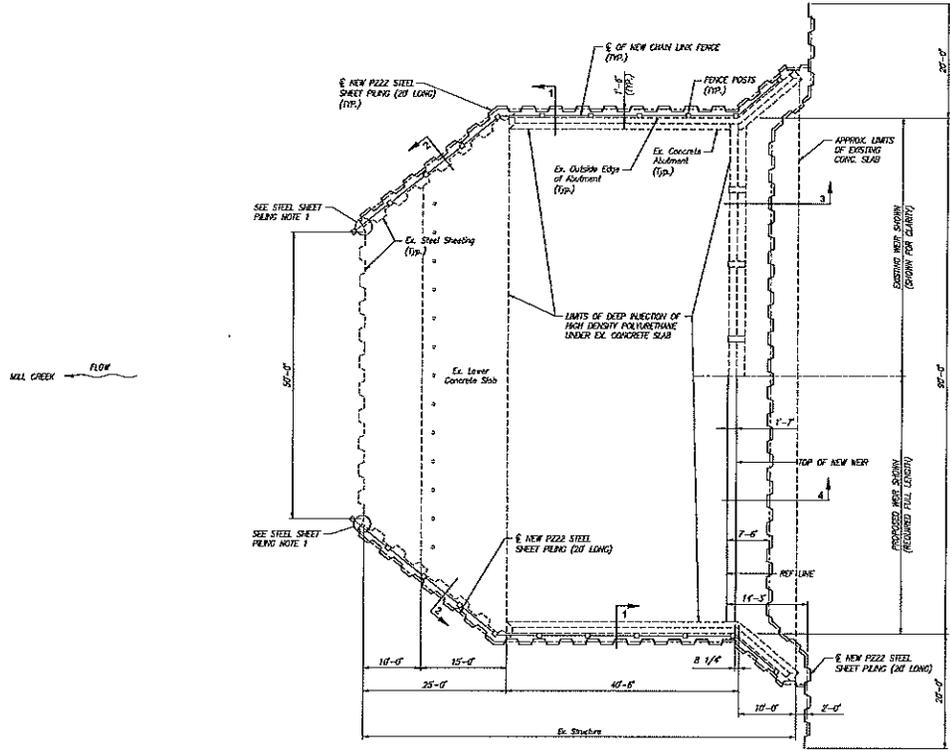
J. K. Madson 08/22/16  
REGISTERED PROFESSIONAL ENGINEER  
DATE

INDIANA DEPARTMENT OF NATURAL RESOURCES  
LAKE MANITOU  
OUTLET STRUCTURE AND DAM  
PROPOSED SITE  
PLAN

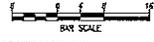
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	AUGUST 2016	

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VERTICAL DATUM=NAVD 88



**OUTLET STRUCTURE**  
SCALE 1/8"=1'-0"



**STEEL SHEET PILING NOTE:**  
WELD A NEW 3/8" THICK PLATE TO THE NEW STEEL SHEET PILING PERPENDICULAR TO THE STEEL SHEET PILING. ALTERNATE: DOSE THE NEW STEEL SHEETING WITH THE 3/8" THICK PLATE TIGHT AGAINST THE EXISTING SHEETING.

**HIGH DENSITY POLYURETHANE (HDP) NOTES:**

1. CONSTRUCTION SHALL CONFORM TO APPLICABLE PROVISIONS OF THE SPECIFICATIONS AND THE STANDARD PROCEDURES FOR DEEP INJECTION OF HDP.
2. THE HDP SHALL BE INSTALLED AS NOTED IN THE SPECIFICATIONS.
3. DEEP INJECTION OF HDP SHALL START NEAR THE WEIR AND CONTINUE DOWNSTREAM.
4. AN ESTIMATE VOLUME OF 25 YD<sup>3</sup> OF MATERIAL MIXED BASED UPON AN ASSUMED 3 IN. VOID GROUND BOX OF THE EXISTING SLAB WITHIN THE LIMITS SHOWN.

**CONCRETE NOTES:**

1. THE CONCRETE SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH (F<sub>c</sub>) OF 4,000 PSI. AIR CONTENT SHALL BE 6% (1.5%).
2. ALL REINFORCING STEEL SHALL BE GRADE 60 (F<sub>y</sub> = 60,000 PSI).
3. ALL EXPOSED CONCRETE EDGES SHALL HAVE A 1/4" CHAMFER.
4. ALL WELDING OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH AWS D1.4.
5. ALL CONCRETE COVER SHALL BE 2" UNLESS NOTED.

**NOTES:**

1. SEE SHEET 3 FOR GENERAL NOTES AND SURVEY INFORMATION.
2. ALL DIMENSIONS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
3. SEE SHEET 6 FOR DETAILS.
4. SEE SHEETS 4 & 8 FOR RSP R/W LIMITS.

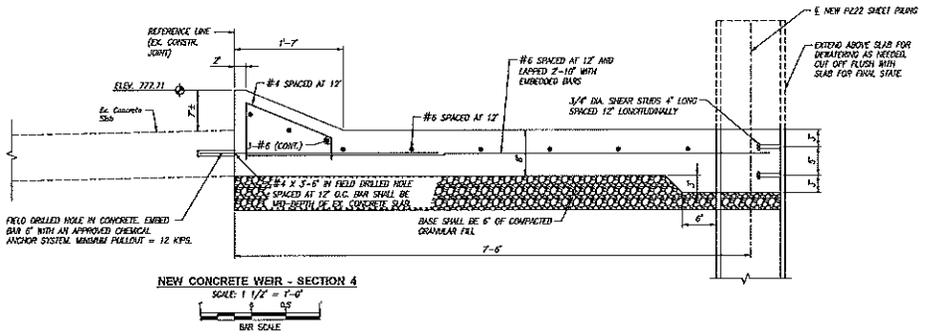
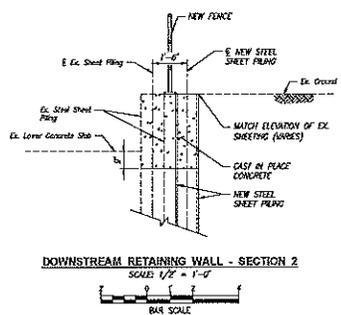
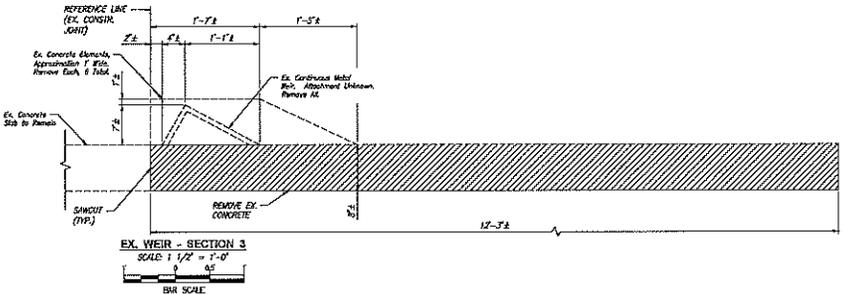
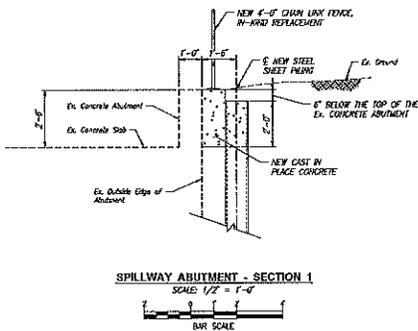
**LFA**  
LAWSON-FISHER ASSOCIATES P.C.  
525 W. WASHINGTON AVENUE  
SOUTH BEND, INDIANA 46601  
PH. (574) 234-2197

Professional Engineer Seal for **John R. Malone**, No. 10000, State of Indiana, dated 08/22/10.  
Professional Engineer Seal for **Thomas D. Bell**, No. 10000, State of Indiana, dated 08/22/10.

INDIANA DEPARTMENT OF NATURAL RESOURCES  
LAKE MANITOU  
OUTLET STRUCTURE AND DAM  
OUTLET STRUCTURE PLAN

REVISIONS	HORIZONTAL SCALE SOUTH	PROJECT NUMBER 201629.00
	VERTICAL SCALE	
DRAWN: BJT	SURVEY BOOK	SHEETS
CHECKED: SKM	DATE AUGUST 2015	5 OF 10

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LAP LENGTH  
#6 LSP = 2'-10"

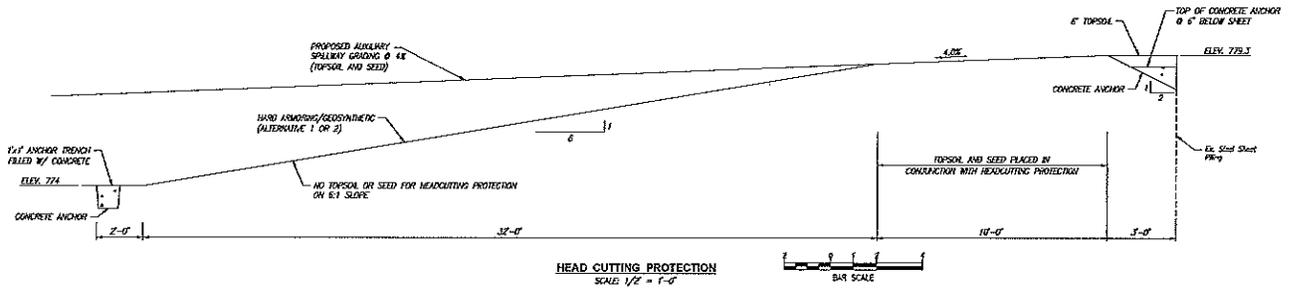
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PH. (574) 234-3167

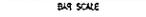
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Professional Engineer Seal for **John A. Fisher**, License No. 12000, State of Indiana, dated 08/22/16.

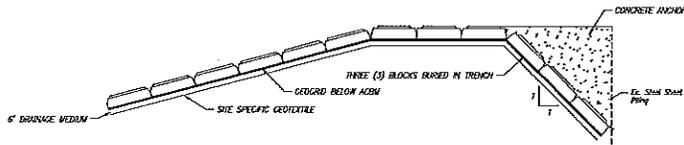
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DRAWN	VERTICAL SCALE	
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	AUGUST 2016	



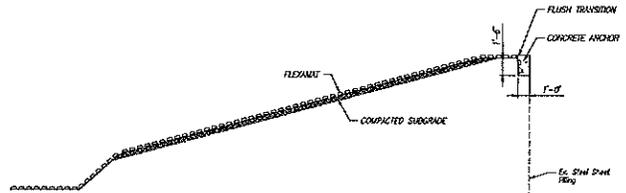
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SCALE 1/2" = 1'-0"



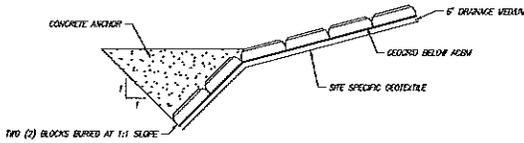
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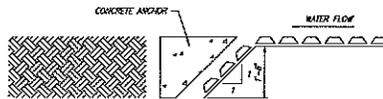
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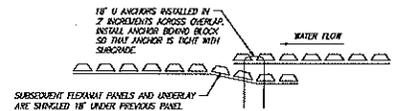
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DOWNSTREAM ANCHOR (ALTERNATE 1)  
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DOWNSTREAM ANCHOR (ALTERNATE 2)  
NOT TO SCALE

MAT OVERLAP (ALTERNATE 2)  
NOT TO SCALE

**LFA**  
LAWSON-FISHER ASSOCIATES P.C.  
825 W. WASHINGTON AVENUE  
SOUTH BEND, INDIANA 46601  
PH. (574) 234-3167



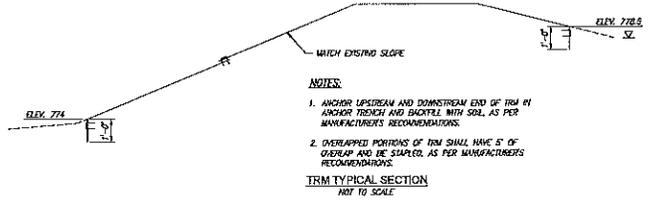
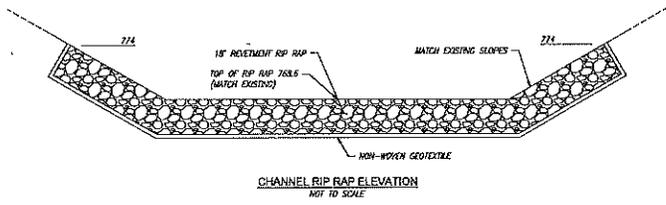
*John R. Madson* 08/22/16  
SEAL No. 000289  
DATE



INDIANA DEPARTMENT OF NATURAL RESOURCES  
LAKE MANITOU  
OUTLET STRUCTURE AND DAM  
DETAILS

DESIGNER	HORIZONTAL SCALE	PROJECT NUMBER
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	DATE	AUGUST 2016

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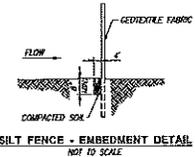
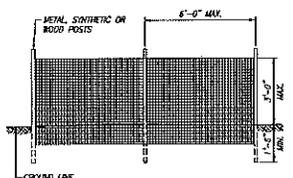
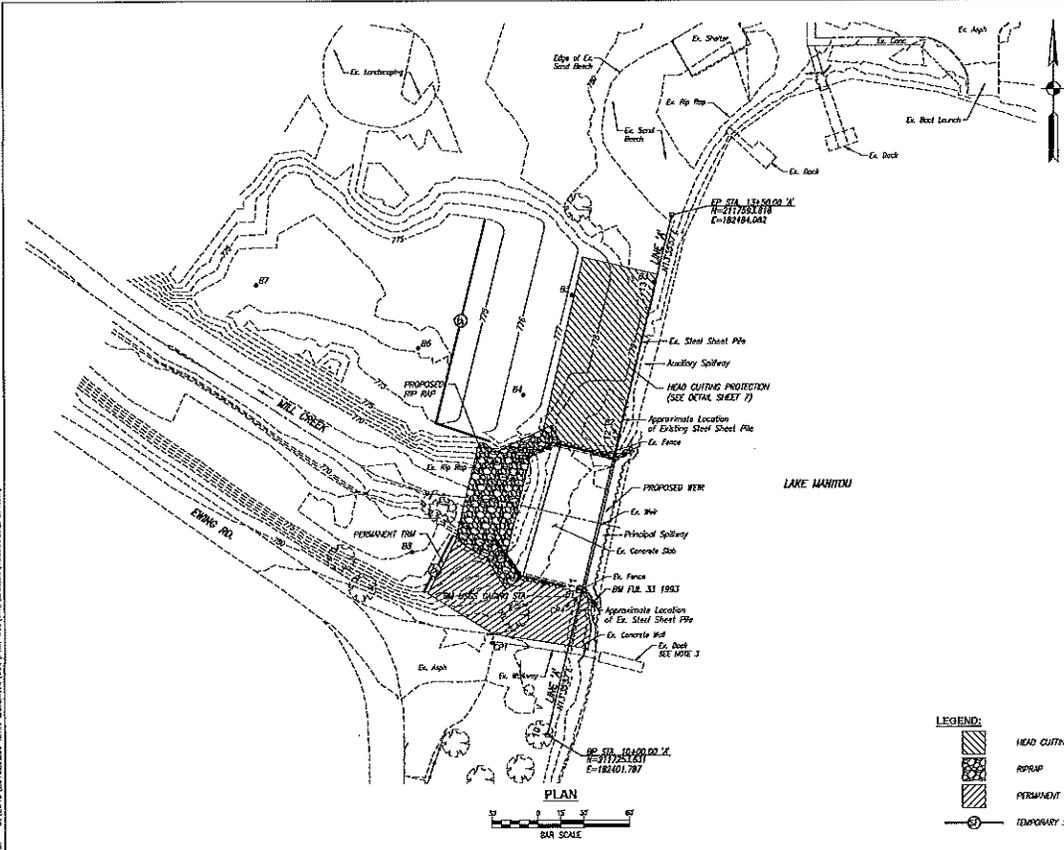


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 <b>LAWSON-FISHER ASSOCIATES P.C.</b> 525 W. WASHINGTON AVENUE SOUTH BEND, INDIANA 46601 PH. (574) 234-3167	 State of Indiana Professional Engineer No. 12345 Exp. 12/31/2018	Date: 11/22/16 Signature: <i>[Signature]</i> Title: <i>[Title]</i>	 State of Indiana Professional Engineer No. 12345 Exp. 12/31/2018	INDIANA DEPARTMENT OF NATURAL RESOURCES LAKE MANITOU OUTLET STRUCTURE AND DAM DETAILS	REVISIONS	HORIZONTAL SCALE NOTED	PROJECT NUMBER 201529.00
					DRAWN: BJT CHECKED: SKM	SURVEY BOOK DATE AUGUST 2016	SHEETS 8 OF 10



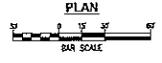
VERTICAL DATUM=NAVD 88'



**TEMPORARY EROSION CONTROL NOTES:**  
SILT FENCE LOCATION IS APPROXIMATE - INSTALL OUTSIDE LIMITS OF CLEARING. SOME SILT FENCE WILL NEED TO BE REMOVED AND RELOCATED DURING VARIOUS PHASES OF THE WEIR AND DURING FLUCTUATING WATER LEVELS. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED.

- LEGEND:**
- HEAD CUTTING PROTECTION
  - RRPAP
  - PERMANENT TRM
  - TEMPORARY SILT FENCE

- NOTES:**
1. SEE SHEET 3 FOR GENERAL NOTES AND SURVEY INFORMATION.
  2. SEE SHEETS 5 AND 6 FOR ADDITIONAL DETAILS AND SECTIONS.
  3. EXISTING DOCK TO BE REMOVED AND REPLACED AS NECESSARY.
  4. CONTRACTOR SHALL COORDINATE ALL ACCESS LOCATIONS THROUGH THE DAM AND WELL COORDINATE WITH THE VARIOUS OWNERS OF THE ACCESS LOCATIONS.
  5. EXISTING RRPAP DOWNSTREAM OF STEEL SHEETING IN AUXILIARY SPILLWAY TO BE REMOVED.



CON. - E:\22\2015\2015\_08\_14 - LAKE MANITOU\CONV\DWG\LAKE MANITOU\OUTLET\TEMPORARY EROSION CONTROL.PLOT

**LFA**  
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**Professional Engineer Seal:** E. J. ...  
**Professional Engineer Seal:** ...  
DATE: 08/22/16  
DATE: 08/22/16

INDIANA DEPARTMENT OF NATURAL RESOURCES  
LAKE MANITOU  
OUTLET STRUCTURE AND DAM  
TEMPORARY EROSION CONTROL  
PLAN

REVISIONS	HORIZONTAL SCALE NOTED	PROJECT NUMBER
	VERTICAL SCALE	201529.00
DESIGN: GDM	SURVEY BOOK	SHEETS
CHECKED: SKM	DATE: AUGUST 2015	10 OF 10