

**PUBLIC WORKS PROJECT NUMBER: 84003001-22-058-C1
CLEAR CREEK WELCOME CENTER
WEST TERRE HAUTE, INDIANA / INDOT**

Volume 1 of 6

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ERIC HOLCOMB
GOVERNOR

SUZANNE CROUCH
LIEUTENANT GOVERNOR

DR. REBECCA HOLWERDA
COMMISSIONER, DEPARTMENT OF ADMINISTRATION

MICHAEL SMITH
COMMISSIONER, DEPARTMENT OF TRANSPORTATION

BOB GROSSMAN
DIRECTOR, PUBLIC WORKS DIVISION



PROJECT MANUAL

For construction of:

**Clear Creek Welcome Center
West Terre Haute, Indiana**

**Public Works Project
84003001-22-058-C1**

For

Department of Transportation

Prepared by

**Janssen & Spaans Engineering
9120 Harrison Park Court
Indianapolis, IN 46216**

**Synthesis, Inc.
251 N. Illinois St., Suite 200
Indianapolis, IN 446204**

**Applied Engineering Services, Inc.
5975 Castle Creek Pkwy. N. Dr. Suite 300
Indianapolis, IN 446250**

**Ratio
101 S. Pennsylvania St.
Indianapolis, IN 46204**

**BLN
505 S. Woodcrest Drive
Bloomington, IN 47401**

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CERTIFICATION PAGE

OWNER: Indiana Department of Administration
Public Works Division
For
Department of Transportation

**CIVIL
ENGINEER:** Janssen & Spaans Engineering
9120 Harrison Park Court
Indianapolis, IN 46216
Phone: (317) 254-9686

ARCHITECT: Synthesis, Inc.
251 N. Illinois St., Suite 200
Indianapolis, IN 446204
Phone: (317) 951-9500
Fax: (317) 951-9501

ENGINEER: Applied Engineering Services
5975 Castle Creek Pkwy. N. Dr., Suite 300
Indianapolis, IN 46250
Phone: (317) 810-4141

LANDSCAPE: Ratio
101 S. Pennsylvania St.
Indianapolis, IN 46204
Phone: (317) 238-4688

SANITARY: BLN
505 S. Woodcrest Drive
Bloomington, IN 47401
812-803-6227

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C-700	SITE STORMWATER MANAGEMENT PLAN
C-701	SITE STORMWATER MANAGEMENT PLAN
C-702	TEMPORARY EROSION CONTROL PLAN
C-800	JOINT LAYOUT PLAN
C-801	JOINT LAYOUT PLAN
C-900	SITE WATER LINE LAYOUT
C-901	SITE WATER LINE LAYOUT
C-902	WATER MAIN DETAILS

CS-100	INDOT STANDARD DRAWING
CS-101	INDOT STANDARD DRAWING
CS-102	INDOT STANDARD DRAWING
CS-103	INDOT STANDARD DRAWING
CS-104	INDOT STANDARD DRAWING
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CS-165	INDOT STANDARD DRAWING
CS-166	INDOT STANDARD DRAWING
CS-167	INDOT STANDARD DRAWING
CS-168	INDOT STANDARD DRAWING

DRAWING SET #6 SANITARY

G100	TITLE SHEET
G101	INDEX
G102	PROJECT OVERVIEW
C101-C102	GRAVITY SANITARY SEWER PLAN & PROFILES
C103	LIFT STATION SITE PLAN
C104	LIFT STATION DETAILS
C201-C210	LINE "PR-FM » FORCE MAIN PLAN & PROFILES
C400-402	EROSION CONTROL
C500-502	CONSTRUCTION DETAILS



STATE OF INDIANA

ERIC J. HOLCOMB, Governor

DEPARTMENT OF ADMINISTRATION

Public Works Division
402 West Washington Street, Room W462
Indiana Government Center – South
Indianapolis, Indiana 46204-2746
PHONE: (317) 232-3001

NOTICE TO BIDDERS

BY STATE OF INDIANA DEPARTMENT OF ADMINISTRATION, PUBLIC WORKS DIVISION FOR A PUBLIC WORKS CONSTRUCTION PROJECT ESTIMATED AT ONE HUNDRED FIFTY THOUSAND DOLLARS OR ABOVE

SECURED ELECTRONIC BIDS FOR:

**Public Works Project No. 84003001-22-058-C1
I-70 EB Clear Creek Welcome Center**

will be received from Contractors, holding a current Certificate of Qualification, at Department of Administration, Public Works Division Email Bid Box-publicworks bids@idoa.in.gov
(note, do not cc: any other party)

Subject line MUST contain “Bid- 84003001-22-058-C1; - Clear Creek Welcome Center - (Your firm)”

Bid File (PDF) MUST be named-“(Bidding Firm name) Bid-84003001-22-058-C1; - Clear Creek Welcome Center and not exceed 9Mb

Until 1:31 P.M (Indianapolis Time), Wednesday March 29 2023, after which all bids will be publicly opened and read online in a Microsoft Teams Live Event- <https://on.in.gov/b8ltk>

Minority Contractors are encouraged to submit bids on this project as a prime contractor or through a prime contractor.

PDF Copies of the detailed Instructions to Bidders and Drawings and/or Specifications dated February, 2023 may be obtained from the office of: Janssen & Spaans Engineering, Inc.; 9120 Harrison Park Ct., Indianapolis, IN 46216; Phone: 317-254-9686, Ext. 277; Email: idalal@jsenqr.com

Bids shall be taken from Prime Contractors pre-qualified by the Public Works Certification Board in the following classification(s): 1542.00A-Institutional Buildings (hospitals, schools, prisons) in excess of \$10,000,000.

The Specified construction period is 730 calendar days. The State of Indiana reserves the right to reject any and all bids.

Project Goal of 7% MBE, 5% WBE and 3% IVOSB. Link: <https://www.in.gov/idoa/mwbe/2494.htm>

Project Manager: *Carol C. French*

Carol French, RA DAPW cfrench@idoa.in.gov (317) 232-3004

Director of Public Works:

Robert Grossman, Director

Pre-Bid Information: **A Pre-Bid Meeting shall be held in conference room of Janssen & Spaans Engineering, Inc.; 9120 Harrison Park Court; Indianapolis, IN 46216 on March 8, 2023 at 3:00 PM (EST), 2:00 PM (CST).**

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 4-13-1 through IC 4-13-7.

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.

14 BUILD AMERICA, BUY AMERICA ACT REQUIREMENTS

- A. *Contractor shall comply with the requirements of the Build America, Buy America Act. Two conditions must be present for the Build America, Buy America Act to apply: (1) the procurement must be intended for public use within the United States; and (2) the items to be procured or the materials from which they are manufactured must be present in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality. If the domestic equivalent exceeds 6% or causes a significant schedule impact, then a waiver could be approved.*

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>)

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/ 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:

<u>MBE/WBE</u>	<u>P PHONE</u>	<u>COMPANY NAME</u>	<u>SCOPE OF PRODUCTS/SERVICES</u>	<u>UTILIZATION DATE</u>	<u>AMOUNT</u>

*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**.

MBE and WBE Barrier Assistance	Describe
Advertisement	Describe
Agency Assistance	Describe
Other Criteria	Describe

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?
 2. Is Occurrence Basis Coverage provided under Property Damage Liability? _____
 3. Is Broad Form Property Damage Coverage provided for this Project?
 4. Is Personal Injury Coverage included?
 5. Is coverage provided for Contractual Liability (including indemnification provision) assumed by insured?
- UNDER AUTOMOBILE LIABILITY POLICY OR POLICIES
1. Does coverage shown above apply to non-owned and hired automobiles? ..
 2. Is Occurrence Basis Coverage provided under Property Damage Liability? _____

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
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
 2. Indiana Business Diversity Council, Inc.
2126 North Meridian Street
Indianapolis, IN 46202
(317) 921-2678
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 or 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>
----------------	--------------	---------------------	------------------------------------------	-------------------------	----------------

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.

XXXXXXXXXX
[Contractor]

**Department of Administration
Public Works Division**

By: _____
Printed Name: _____
Title: _____

Date: _____

By: _____
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 15, 2016.
FA 16-28*

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

Legal counsel: _____ (initials)



PSI Project Number: 00161475
INDOT DES No. 1092855
October 11, 2022

Professional Service Industries, Inc.
5362 West 78th Street, Indianapolis, Indiana 46268
Phone: (317) 876-7723
Fax: (317) 876-8155

Mr. David Hedlund, P.E.
Janssen and Spaans Engineering, Inc.
9120 Harrison Park Court
Indianapolis, Indiana 46216

Re: Geotechnical Engineering Exploration Report
INDOT Rest Areas Design Build
INDOT DES No. 1902855
Clear Creek Rest Areas
Terre Haute, Indiana

Dear Mr. Hedlund,

Thank you for choosing Professional Service Industries, Inc. (PSI), an Intertek Company, as your consultant for the rest area reconstruction project located along I-70 west of Terre Haute, Indiana. This exploration was completed in accordance with PSI Proposal 0016-372264 dated April 26, 2022.

The results of the exploration are discussed in the accompanying report. This includes field test data, an engineering evaluation of the data, and recommendations to aid in the design and construction of the proposed project elements.

If you have any questions pertaining to this report, please contact our office at (317) 876-7723. PSI would be pleased to continue providing geotechnical services throughout the implementation of the project, and we look forward to working with you and your organization on this and future projects.

Respectfully submitted,
PROFESSIONAL SERVICE INDUSTRIES, INC.

Johnathon F. Keith, P.E.
Project Engineer

Christopher Carson, P.E.
Geotechnical Department Manager
Principal Consultant
11/08/2022



1 copy – Client
Enclosures





GEOTECHNICAL EXPLORATION REPORT

For the:
INDOT Rest Area Design Build
INDOT DES No. 1902855
Clear Creek Rest Areas
Terre Haute, Indiana

Prepared for:
Janssen and Spaans Engineering, Inc.
9120 Harrison Park Court
Indianapolis, Indiana 46216

Prepared by:
PSI
5362 West 78th Street
Indianapolis, IN 46268
Telephone (317) 876-7723

PSI PROJECT NUMBER 0016-1475

October 11, 2022

Christopher L. Carson, P.E.
Geotechnical Department Manager
Principal Consultant

Johnathon F. Keith, P.E.
Project Engineer

Chiarra Cerola
Geologist

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SUMMARY OF GEOTECHNICAL EXPLORATION REPORT
Proposed Clear Creek Welcome Center Project
Terre Haute, Indiana
INDOT Des. No.: 1902855
PSI Project No.: 00161475

GENERAL INFORMATION:

The existing Clear Creek Rest Area is being updated to a Welcome Center. The improvements will include a new Welcome Center Building supported on shallow foundations with grade supported floor slabs. The ramp geometry will remain essentially the same as the existing rest area; however, the surface parking will be expanded to include approximately 75 truck parking spaces. Two trucker restroom buildings will also be constructed along with a maintenance shed and other associated structures. The extents of this project are shown on the Boring Location Plan in the Appendix of this report.

The in-situ subsurface conditions beneath the project site were explored with 14 soil test borings. The subsurface exploration was performed in September of 2022. The soil test borings extended to maximum depth of approximately 30 feet below the existing ground surface. The boring locations and depths were selected by PSI in consultation with the design team. Relatively undisturbed thin-wall tube samples were obtained in 6 of the test borings.

BUILDING DESIGN CONSIDERATIONS:

Based on the information provided, shallow foundations are considered a suitable foundation system for the new structures in the rest areas. At this time, the final design loads have not been supplied to PSI. Based on the results of the analysis, PSI recommends factored bearing resistances as shown in Table 4.3.1.

Table 0.1: Summary of Design Parameters for Foundations

RECOMMENDED SOIL PARAMETERS FOR FOUNDATION DESIGN		ESTIMATED VALUE
Bearing Resistance Factor (ϕ_b)		0.50
Nominal Bearing Resistance (Q_n) psf	Column Footing	6,850
	Continuous Footing	5,800
Factored Bearing Resistance (Q_r) psf	Column Footing	3,425
	Continuous Footing	2,900
Angle of Friction of Backfill Material (degrees)		34
Sliding Resistance Factor (ϕ_t)		0.85
Friction Factor ($\frac{2}{3} \tan \phi$) of the Foundation Soil		0.35
Soil Cohesion, psf		1,000
Ultimate Friction Between Foundation Soil and Poured Concrete Footing (C_a) °		21



PAVEMENT DESIGN CONSIDERATIONS:

Based upon the test borings and laboratory test data, the soils that will comprise the majority of the pavement subgrades for this project are anticipated to consist primarily fine-grained clay loam soils with some gravel. The soils generally appeared to be naturally deposited or properly constructed fill. The clayey soils were of moderate to low plasticity. PSI does not anticipate swelling will be a concern. Soil pH ranged from 6.9 to 7.4 and organic content based on Loss on Ignition Testing ranged from 0.6 to 2.5 percent. These soils are suitable for support of the pavements.

Based upon an evaluation of the laboratory test data, in conjunction with engineering judgment; a resilient modulus value of 10,000 psi is recommended for use in pavement design for the prepared or treated subgrade. A resilient modulus value of 6,000 psi is recommended for use in the pavement design for the natural or existing cohesive subgrade soils. Table 5.1.1 below and also provided under Section 5.1 of the main report summarizes the pavement design parameters that should be used for the design of the pavement:

Table 0.1: Pavement Design Parameters

Property	North Bound Rest Area
Resilient Modulus (Mr) - Prepared Subgrade	10,000 psi
Resilient Modulus (Mr) - Natural Subgrade	6,000 psi
Predominant Soil Type	Loam A-6
Percent Fines (passing No. 200 sieve)	54
Percent Silt	40
Liquid Limit	27
Plastic Limit	14
Design Depth to Water Table	15
Moisture Content Natural Subgrade (%)	14 to 23
Organic Content (%)	< 2
Filter Fabric for Underdrains	Yes: 918.02 (b) Type 1A
Subgrade Treatment	Type IBC or Type IV



1. PROJECT INFORMATION

1.1. PROJECT AUTHORIZATION

Table 1.1.1 summarizes (in chronological order) the Project Authorization history for the services performed and represented in this report by Professional Service Industries, Inc. (PSI):

Table 1.1.1: Project Authorization

DOCUMENT AND REFERENCE	DATE	REQUESTED/PROVIDED BY
PSI Proposal No. 0016-339596	06/29/2021	Mr. Christopher Carson of PSI
Project Authorization	06/21/2022	Mr. Robert Gray of Janssen and Spaans Engineering, Inc.

1.2. PROJECT DESCRIPTION

It is PSI's understanding that Janssen and Spaans Engineering is gathering information with regards to the proposed reconstruction of the Clear Creek rest areas along I-70. The I-70 East Bound Clear Creek Truck Parking is located approximately 5 to 6 miles west of Terre Haute, Indiana, respectively. The project includes demolition of the existing structures and removal of the parking lot and on-ramp/off-ramp pavements. Further, the project includes construction of new trucker restrooms and approximately 75 truck parking spaces at each site.

Table 1.2.1: Project Drawings

DESCRIPTION OF MATERIAL	PROVIDER/SOURCE	DATE
1364 Clear Creek Welcome Center	Janssen and Spaans Engineering, Inc.	7/21/2022

The geotechnical recommendations presented in this report are based on the available project information, the proposed location and orientation of the structures on the site, and the subsurface materials described in this report. If any of the information noted above is incorrect, please inform PSI in writing so that we may amend the recommendations presented in this report if appropriate and if desired by the client. PSI will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.

1.3. PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to explore the subsurface conditions within the existing rest areas and to prepare recommendations for foundations, floor slab systems, and pavement recommendations for the proposed reconstructions. PSI's scope of services included drilling 14 soil test borings, select laboratory



testing, and preparation of this geotechnical engineering report. The soil test borings extended to depths ranging between approximately 10 to 30 feet below the existing ground surface. The field activities, laboratory testing, and this geotechnical report were performed in general accordance with the INDOT Geotechnical Manual. This report briefly outlines the testing procedures, presents available project information, describes the site and subsurface conditions, and presents recommendations regarding the following:

- Review of geologic setting;
- Grading procedures for site development
- Groundwater observations during field activities
- Recommendations for design and construction of foundations
- Recommendations for foundation types and bearing resistance
- Pavement design recommendations

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, surface water, groundwater, or air on, below, or around this site. Any statements in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes. PSI's geotechnical scope also did not include any service to investigate or detect the presence of moisture, mold or other biological contaminants in or around any structure, or any service that was designed or intended to prevent or lower the risk of the occurrence or the amplification of the same. Client should be aware that mold is ubiquitous to the environment with mold amplification occurring when building materials are impacted by moisture. Client should also be aware that site conditions are outside of PSI's control, and that mold amplification will likely occur, or continue to occur, in the presence of moisture. As such, PSI cannot and shall not be held responsible for the occurrence or reoccurrence of mold amplification.

2. FIELD SAMPLING AND MEASUREMENTS

2.1. FIELD SAMPLING

The soil test borings were advanced utilizing 3¼ inch inside diameter, hollow stem auger drilling methods. During the test boring sampling procedure, standard penetration tests were performed at regular intervals to obtain the standard penetration value of the soil. The standard penetration value (N) is defined as the number of blows ("blow counts") of a 140-pound hammer free falling 30 inches, required to advance the split-spoon sampler a distance of 1 foot into the soil at each sampling increment. The sampler is lowered to the bottom of the drill hole and the number of blows recorded for each of 3 successive increments of 6-inch penetration. The "N" value is obtained by adding the second and third



incremental blow count results. The results of the standard penetration test indicate the relative density and comparative consistency of the soils, and thereby provide a basis for estimating the relative strength and compressibility of the soil profile constituents. Select soil samples were later tested in the laboratory to obtain soil material properties for the foundation recommendations. Drilling, sampling, and laboratory testing was accomplished in general accordance with ASTM procedures.

2.2. WATER LEVEL MEASUREMENTS

Water level observations were made during and at completion of drilling activities, prior to backfilling the boreholes, and are noted on the boring logs presented herewith. Please note that the groundwater levels in open boreholes are often not representative of the actual made during and at completion of drilling activities, prior to backfilling the boreholes, and are noted on the boring logs presented herewith groundwater level because the boreholes remain open for a relatively short time. To obtain longer-term measurements, one temporary piezometer was installed along the project site. Seasonal variations, temperature and recent rainfall conditions may influence the levels of the groundwater table and volumes of water will depend on the permeability of the soils.

2.3. GROUND SURFACE ELEVATIONS

The elevations at the ground surface of the cores were estimated based on the elevation contours shown on available topographic mapping provided from the design team, the US Geological Survey, and Google Earth Pro. These elevations are indicated on the boring logs located in the Appendix of this report and should be considered approximate.

2.4. LABORATORY TESTING

The disturbed soil samples were visually classified by an engineer in accordance with the INDOT Geotechnical Manual and the visual classifications were verified or modified based upon the results of laboratory tests. Final test boring logs were subsequently prepared and are included in the appendix. Soil index property tests including natural moisture content tests (AASHTO T265), grain size analyses (AASHTO T88), Atterberg limits test (AASHTO T89 and T90), unconfined compressive strength tests (AASHTO T208), pH test (ASTM D-2976), and organic content tests (AASHTO T267) were performed on representative samples. In addition to classification tests, hand penetrometer tests were performed on intact cohesive samples. The results of all laboratory tests are included on the boring logs and summary sheets in the appendix of this report.



3. SITE AND SUBSURFACE CONDITIONS

3.1. SITE GEOLOGY

Based on the on-line geologic map provided by the Indiana Geological Survey (available at <http://maps.indiana.edu>), the proposed site is located within the Wabash Lowland, which is part of the Southern Hills and Lowlands Natural Region of Indiana. The overburden geology in the project area consist of mostly shale and sandstone, with beds of limestone and coal deposits of the Patoka and Shelburn Formations of the Pennsylvanian age glaciation. The thickness of the unconsolidated deposits in the project area is reported to be between 50 and 75 feet. Based on the USDA Natural Resources Conservation Service (NRCS), the soils at the project site are reported to consist of silt loams and loam. The NRCS Map and soil classifications are included in the Appendix.

3.2. SUBSURFACE CONDITIONS

The in-situ pavement conditions were explored with 14 soil test borings. The boring locations and depths were selected by PSI and approved by the client. PSI personnel marked the core locations in the field by using a hand-held GPS instrument. The surface elevations at the test boring north bound test boring locations are estimated to be from 856 to 868 feet MSL based on available topographic mapping. Cores will be retained until the design plans have been approved and then will be discarded.

3.3. GROUNDWATER LEVEL MEASUREMENTS

Initial depth to groundwater measurements were taken in the test borings during drilling activities and at the completion of drilling activities. Free groundwater was not encountered during or after drilling. Based on the results of laboratory testing to determine soil saturation, PSI recommends a design groundwater elevation of approximately 500 feet MSL.

Although free groundwater was not observed at these levels at the time of drilling activities, there exists the potential for free groundwater to enter open excavations from discontinuous saturated granular zones within the glacial till deposits. The water level measurements presented in this report are the levels that were measured at the time of INDOT's and PSI's field activities. Temporary dewatering of excavations for underground utilities should be anticipated where those will occur below approximately elevation 500 feet MSL, especially if the construction activities take place during wet/rainy seasons. Groundwater pumped to the surface must be controlled and directed away from open excavations. The discharge should be outlet in accordance with the project permits and commitments.



4. GEOTECHNICAL RECOMMENDATIONS

4.1. EMBANKMENT CONSTRUCTION

In areas that will receive new fill, surficial organic soil, vegetation, soft, frozen or other unsuitable materials in the construction areas shall be stripped and removed from the proposed structure and pavement areas. After stripping operations, project areas should be proof rolled in accordance with INDOT standard Specification 203.26. Soils that are observed to rut or deflect excessively under the moving load should be undercut and replaced with properly compacted low plasticity fill material. The proof-rolling and undercutting activities should be witnessed by a representative of the geotechnical engineer and should be performed during a period of dry weather, if possible.

Organic soils may be stockpiled for later use in landscaping areas. There may be areas of the site that require more or less stripping due to variations in the thickness of the organic soil and the root systems from the trees and vegetation. The geotechnical consultant recommends a minimum of 12-inches of stripping to remove organic soil and loose soil that has been exposed to numerous freeze-thaw cycles. The engineer should determine and document the depth of removal at the time of construction.

4.2. FILL RECOMMENDATIONS

Where fill soils will be placed to establish grade or used as backfill, the first layer of fill material should be placed in a relatively uniform horizontal lift and properly keyed into the existing subgrade soils. In accordance with the INDOT Geotechnical Manual, Modified Proctor (T-180) maximum dry density greater than 100 lbs/ft³, be free of organic or other deleterious materials, have a maximum particle size of 3-inches, have a liquid limit less than 50 and a plasticity index less than 25. Soils classified as A-6 and A-4 will generally meet these requirements. Soils classified as A-7-6 will generally not meet these requirements. The on-site soils are generally suitable for use as embankment fill. Test strips should be performed for each set of equipment and fill source according to INDOT Standard Specification.

Embankment fill should be placed in maximum lifts of 8-inches of loose material. Each lift of compacted fill should be tested and documented by a representative of the geotechnical engineer prior to the placement of subsequent lifts. If fine-grained soil is used for fill, close moisture content control will be essential to achieve the recommended degree of compaction. If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying. Test strips should be performed for each set of equipment and fill source according to INDOT Standard Specifications.

Clean or screened rock can be used as select fill, but a fabric separator (i.e. filter fabric) conforming to Type 1A per ISS 918.02 (c) and approved by the geotechnical engineer of record should be placed between



the stone and fine-grained soils to prevent soil migration into the rock void space. This type of fill and backfill should be tracked or tamped to achieve densification.

4.2.1. Fill Placement Criteria

The fill placed shall be tested and documented according to the INDOT Standard Specifications, construction documents and/or local construction standards. It should be noted that the geotechnical engineer of record can only certify testing performed and work observed by engineers or staff in direct report to the geotechnical engineer of record. The following table summarizes the recommended compactive effort for various types of engineered fills.

Material Tested	Proctor Type	Min % of Max. Dry Density	Moisture Content Range	Frequency of Testing*
Embankment per INDOT Specification 203.23	Modified T-180	95%	-2 to +1 %	Three DCP or Density tests per 2,000 cyd for each lift.
Embankment for sands and gravels per INDOT Specification 203.23	Modified T-180	95%	Below optimum as directed (-3% to optimum)	Three DCP or Density tests per 2,000 cyd for each lift.
Structure Backfill	Modified T-99	Per Spec. 211	Per Spec. 211	1 per 500 cy of fill placed

* Frequency from INDOT Frequency Manual, Minimum of 3 test per lift

PSI does not recommend the use of silt as defined by the INDOT classification as embankment fill. If silt material is to be used as embankment fill, it should be mixed properly with clay material to meet the embankment specifications to be placed at -2% to +1% of optimum moisture content per the INDOT Standard Specifications.

The test frequency for the laboratory reference should be in accordance with the INDOT Frequency Manual and the project specifications. If the borrow or source of fill material changes, a new reference moisture/density test should be performed.

Tested fill materials that do not achieve either the required dry density or moisture content range shall be recorded, the location noted, and reported to the Contractor and Owner. A re-test of that area should be performed after the Contractor performs remedial measures. Retest shall be documented to failed tests.



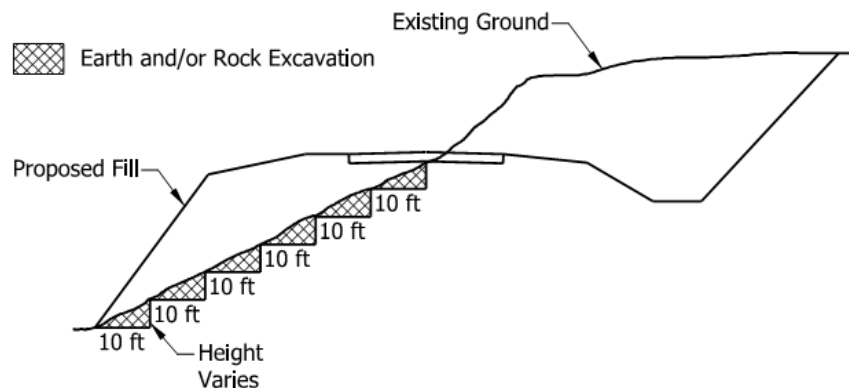
4.2.2. Pavement Fill Criteria

The pavement subgrade placement and compaction should follow the requirements in Section 207.03 of the ISS.

Soil Type	Moisture Compaction Range
Clay (< 105 lb/cu ft)	-2 to +2% of optimum moisture content
Clay (105 – 114 lb/cu ft)	-2 to +1% of optimum moisture content
Silty and Sandy (> 114 lb/cu ft)	-3% to optimum moisture content
Granular	5 to 8%

4.2.3. Fill Slope Construction

Fill slope construction is anticipated for the site based on the proposed embankment footprint and the existing site topography. Construction of the new fills on the existing slopes steeper than 4 Horizontal:1 Vertical must include benching into the existing slope to reduce the potential for creating a weak plane at the interface of the new fills and the existing soils. Benches should be constructed approximately every 5 vertical feet of fill material placed and should extend laterally into the existing slopes a minimum of 10 feet. The horizontal portion of each bench should be sloped slightly inward. The diagram below shows a typical arrangement of benches for a side hill fill. Benches and drainage structures should be installed according to 2013 Indiana Design Manual, Figure 107-6B.



PSI recommends that final slopes for the proposed fill be designed and constructed at a maximum slope of 3H:1V. It is the geotechnical consultant's experience that this is the maximum slope which can be properly maintained/mowed. Proper maintenance is extremely important to prevent erosion and maintain proper support for structural foundations and pavement sections. Maintenance on slopes steeper than 3H:1V will likely require specialized equipment to maintain the slope after construction. Improper maintenance of the slopes can lead to soil erosion and potential instability and possible distress



to the roadway or adjacent structures. The geotechnical consultant also recommends that the slopes be constructed a minimum of 2 feet, horizontally, beyond final alignment and then cut to final grade. This recommendation is based on experience that the soil next to a fill slope is generally not compacted to specifications.

4.3. FOUNDATION RECOMMENDATIONS

4.3.1. Shallow Foundations

Based on the information provided, shallow foundations are considered a suitable foundation system for the new structures in the rest areas. At this time, the final design loads have not been supplied to PSI. Based on the results of the analysis, PSI recommends factored bearing resistances as shown in Table 4.3.1.

Table 4.3.1: Summary of Design Parameters for Foundations

RECOMMENDED SOIL PARAMETERS FOR FOUNDATION DESIGN		ESTIMATED VALUE
Bearing Resistance Factor (ϕ_b)		0.50
Nominal Bearing Resistance (Q_n) psf	Column Footing	6,850
	Continuous Footing	5,800
Factored Bearing Resistance (Q_r) psf	Column Footing	3,425
	Continuous Footing	2,900
Angle of Friction of Backfill Material (degrees)		34
Sliding Resistance Factor (ϕ_t)		0.85
Friction Factor ($\frac{2}{3} \tan \phi$) of the Foundation Soil		0.35
Soil Cohesion, psf		1,000
Ultimate Friction Between Foundation Soil and Poured Concrete Footing (C_a) °		21

4.3.2. Foundation Settlement

Foundation settlements were evaluated based on the properties listed in Table 4.3.1. Anticipated settlement was based on strip foundations being loaded to the Factored Bearing Resistance provided in the above table. Anticipated building settlements of up to 1-inch total and ½-inch differential have been calculated based on the parameters described.

4.3.3. Seismic Design Data

PSI determined the seismic design information based on AASHTO LRFD 8th edition. The parameters are presented in Table 4.3.2. Seismic design parameters were determined using United States Geological



Survey design maps at <https://earthquake.usgs.gov/ws/designmaps/>.

Table 4.3.2: LRFD Seismic Design Data (Table continued on following page)

AASHTO LRFD 8 th Ed. - Seismic Design Parameters	
Seismic Site Class	C
PGA (g)	0.095
S _s (g)	0.209
S ₁ (g)	0.069
S _{D5} (g)	0.25
S _{D1} (g)	0.117
Seismic Design Category	A
Seismic Zone	2

Additionally, seismic design information according to Indiana Building Code was determined. The parameters are presented in Table 4.3.3. Seismic design parameters were determined using design maps at <https://www.seismicmaps.org/>.

Table 4.3.3: IBC 2012 Seismic Design Data

AASHTO LRFD 8 th Ed. - Seismic Design Parameters	
Seismic Site Class	C
PGA (g)	0.134
S _s (g)	0.271
S ₁ (g)	0.117
S _{D5} (g)	0.217
S _{D1} (g)	0.132
Seismic Design Category	B
Seismic Zone	2

4.4. GEOTHERMAL CONSIDERATIONS

PSI understands that geothermal heating is being considered for this site. It was originally discussed to have vertical wells for the geothermal field. However, after determining that rock was present in the upper 60 feet of the subsurface profile, a horizontal loop is the current proposal. Based on laboratory testing and the soils present, PSI recommends the following design values for soil thermal properties.



Soil Layer Depth (ft)	Classification	Thermal Resistivity (°C CM/Watt)	
		In-situ Moisture	Dry
0 - 8	Loam A-6	90	250
8 - 25	Sandy Loam A-2-4	60	160

4.5. LATERAL EARTH PRESSURE PROPERTIES FOR BELOW GRADE WALLS

Below-grade basement walls should be designed to resist lateral earth pressures. Lateral earth pressure is developed from the soils present within a wedge formed by the vertical below-grade wall and an imaginary line extending up and away from the bottom of the wall at an approximate 45° angle. The lateral earth pressures are determined by multiplying the vertical applied pressure by the appropriate lateral earth pressure coefficient K. If the walls are rigidly attached to the structure and not free to rotate or deflect at the top, PSI recommends designing the walls for the “at-rest” lateral earth pressure condition using K_o . Walls that are permitted to rotate and deflect at the top can be designed for the active lateral earth pressure condition using K_a . Passive pressure can be determined using K_p , with a factor of safety of 2.0. Recommended parameters for use in below grade walls are as follows:

Recommended Parameters for use in Below-Grade (Retaining, Basement) Wall Design				
Material Type	Drained Friction Angle (ϕ')			
1) Loam A-6 (in-situ)	26°			
2) Sand A-2-4 (in-situ)	31°			
3) Lean Clay (conditioned and compacted)	28°			
4) B-Borrow/Embankment	30°			
Total Soil Density (pcf)	125			
Cohesion for Clay Soils (psf) (undrained, $\phi = 0$)	1,000			
Groundwater Elevation	At bottom of the wall			
Parameters specific to soil type	1	2	3	4
Friction Factor for Base	0.32	0.40	0.35	0.38
Coefficient of Active Pressure (K_a) **	0.39	0.32	0.36	0.33
Coefficient of Passive Pressure (K_p) **	2.56	3.12	2.77	3.00
Coefficient of At-Rest Pressure (K_o) **	0.56	0.48	0.53	0.50

* These values may be used for design only if the crushed limestone backfill extends back from the wall certain distances. These are a horizontal distance approximately equal to or greater than the total height of the wall at the surface, and at least one-foot beyond the heel of the wall footing.

** Earth pressure coefficients valid for level backfill conditions with no surcharge



The calculation of values presented above was based on positive foundation drainage being provided to prevent the buildup of hydrostatic pressure. If surface loads are placed near the walls, such as traffic loads, they should be designed to resist an additional uniform lateral load of one-half of the vertical surface loads. An “equivalent fluid” pressure can be obtained from the above chart by multiplying the appropriate K-factor times the total unit weight of the soil. This applies to unsaturated conditions only. If a saturated “equivalent fluid” pressure is needed, the effective unit weight (total unit weight minus unit weight of water) should be multiplied times the appropriate K-factor and the unit weight of water added to that resultant. However, PSI does not recommend that earth retaining walls be designed with a hydrostatic load because positive drainage should be provided to relieve hydrostatic pressures.

5. PAVEMENT DESIGN RECOMMENDATIONS

The following geotechnical related recommendations have been developed on the basis of the subsurface conditions encountered and PSI’s understanding of the proposed pavement improvements. If changes in the project criteria occur, a review must be made by PSI to determine if modifications to the recommendations in this report may be required.

5.1. PAVEMENT FOUNDATION SOIL CONDITIONS

The foundation soils beneath the existing pavements consist primarily of fine-grained loam soils. Soil pH ranged from 6.9 to 7.3 and organic content based on Loss on Ignition Testing ranged from 0.6 to 2.5 percent. These soils are suitable for support of the pavements. Mr test samples were not collected; however, PSI used the correlation between the subgrade soil group index to resilient modulus as reported in FHWA Geotechnical Aspects of Pavements (NHI-05-037, May 2006). PSI also correlated the design Mr with the unconfined compressive strength as stated in the article “Resilient Modulus of Cohesive Soils”, (Journal of Geotechnical and Geo-environmental Engineering, February 1997, pp 131-136). The relevant equation is:

$$M_R = 695.4 \times (S_{u1.0}) - 5.93 \times (S_{u1.0})^2$$

Table 5.1.1 summarizes the values for pavement design for the project. PSI recommends Subgrade Treatment Type IBC for the reconstruction of the pavements and ramps on this project.



Table 5.1.1: Pavement Design Parameters

Resilient Modulus (Mr) - Prepared Subgrade	10,000 psi
Resilient Modulus (Mr) - Natural Subgrade	6,000 psi
Predominant Soil Type	Loam A-6
Percent Fines (passing No. 200 sieve)	54
Percent Silt	40
Liquid Limit	27
Plastic Limit	14
Design Depth to Water Table (ft)	15
Total Unit Weight of Natural Subgrade (psf)	127
Moisture Content Natural Subgrade (%)	14 to 23
Dry Unit Weight of Natural Subgrade (psf)	104
Organic Content (%)	< 2
Filter Fabric for Underdrains	Yes: 918.02 (b) Type 1A
Subgrade Treatment	Type IBC or Type IV

PSI recommends one of the following subgrade treatment types per ISS Section 207.04 in Table 5.1.2.

Table 5.1.2: Subgrade Treatment

RECOMMENDED SUBGRADE TREATMENT TYPES		
TYPE	THICKNESS, inches	Description
IBC	14	Chemical soil modification using cement
IV	12	Coarse Aggregate No. 53 with Type IB geogrid in accordance with 214

6. GEOTECHNICAL RISK

The concept of risk is an important aspect of the geotechnical exploration. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical exploration should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as planned. The engineering recommendations presented in the preceding section constitutes PSI's professional estimate of those measures that are necessary for the proposed structure to perform



according to the proposed design based on the information generated and referenced during this exploration, and PSI's experience in working with these conditions.

7. REPORT LIMITATIONS

The recommendations submitted are based on the available subsurface information obtained by PSI and design details furnished by Janssen and Spaans Engineering. If there are revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes to our recommendations are required. If PSI is not retained to perform these functions, PSI will not be responsible for the impact of those conditions on the project. The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

After the plans and specifications are more complete, the geotechnical engineer should be retained and provided the opportunity to review the final design plans and specifications to verify that PSI's engineering recommendations have been properly incorporated into the design documents. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of Janssen and Spaans Engineering, (and their designated consultants) for the specific application to the proposed Clear Creek Rest Area reconstruction project along Interstate 70 west of Terre Haute, Indiana.



Appendix

Boring Location Plan

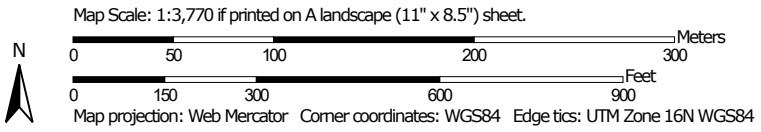
00161475 Clear Creek Welcome Center
Project Number: 84003001-22-058-C1

Legend

- Test Boring



Soil Map—Vigo County, Indiana
(00161475 - Clear Creek Rest Area)



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Vigo County, Indiana

Survey Area Data: Version 27, Sep 2, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 15, 2022—Jun 23, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AIC2	Alford silt loam, 5 to 10 percent slopes, eroded	5.7	16.4%
Bp	Borrow pits	0.0	0.0%
CaB	Camden silt loam, 2 to 6 percent slopes	3.8	11.1%
Ee	Eel silt loam, 0 to 2 percent slopes, frequently flooded	0.0	0.0%
HkF	Hickory loam, 25 to 40 percent slopes	4.6	13.2%
MuB2	Muren silt loam, 2 to 6 percent slopes, eroded	0.0	0.1%
PaD2	Parke silt loam, 12 to 18 percent slopes, eroded	0.2	0.5%
Wx	Whitaker loam	20.2	58.7%
Totals for Area of Interest		34.5	100.0%



INDOT BORING LOG

BORING NO.: **B-01**
 SHEET: 1 OF 1
 NORTHING: 1527680.1
 EASTING: 2834566
 DATUM: _____
 DATE STARTED: 09-21-22
 DATE COMPLETED: 09-21-22

GEOTECHNICAL CONSULTANT: Professional Service Industries
 DES NO.: 1902855 STRUCTURE #: _____

PROJECT TYPE: New Construction
 LOCATION: Clear Creek Rest Area
 COUNTY: Vigo PROJECT NO.: _____

ELEVATION: <u>512.0</u>	BORING METHOD: <u>Hollow Stem Auger</u>	HAMMER: <u>Auto</u>
STATION: _____	RIG TYPE: <u>CME-55LC</u>	DRILLER/INSP: <u>RJ/CC</u>
OFFSET: _____	CASING DIA.: _____	TEMPERATURE: <u>72 °F</u>
LINE: _____	CORE SIZE: _____	WEATHER: <u>Clear</u>
DEPTH: <u>30.0 ft</u>		

GROUNDWATER: Encountered at: _____ At completion: _____ After: _____

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		Topsoil Dark brown, (VISUAL) 0.3											
510.0	2.5	Loam A-6 , Brown, Medium Stiff To Stiff, (Lab No. 147503) 5.5	SPT 1	5-6-5	78	15.8		4.50					
	5.0		SPT 2	2-4-6	72	17.7		3.00					
505.0	7.5		SPT 3	3-4-5	83								
	10.0	Sand A-2-4 , Brown, Loose To Medium Dense, (Lab No. 147501) 23.0	SPT 4	4-6-7	78	0.5							
500.0	12.5		SPT 5	3-5-5	83								
495.0	15.0		SPT 6	8-9-6	83	19.9		0.25					18.0, Became Gray
490.0	20.0	Silty Loam A-6 , Gray, Soft To Medium Stiff, (Lab No. 147502) 30.0	SPT 7	1-3-2	100	3.1		0.25					
485.0	25.0		SPT 8	1-3-4	89			0.75					
480.0	30.0		Bottom of Boring at 30.0 ft										

INDOT BORING LOG 00161475 CLEAR CREEK.GPJ INDOT_169_11202009.GDT 11/8/22



INDOT BORING LOG

BORING NO.: **B-02**
 SHEET: 1 OF 1
 NORTHING: 1527825.3
 EASTING: 2834679.6
 DATUM: _____
 DATE STARTED: 09-21-22
 DATE COMPLETED: 09-21-22

GEOTECHNICAL CONSULTANT: Professional Service Industries
 DES NO.: 1902855 STRUCTURE #: _____

PROJECT TYPE: New Construction
 LOCATION: Clear Creek Rest Area
 COUNTY: Vigo PROJECT NO.: _____

ELEVATION: <u>509.0</u>	BORING METHOD: <u>Hollow Stem Auger</u>	HAMMER: <u>Auto</u>
STATION: _____	RIG TYPE: <u>CME-55LC</u>	DRILLER/INSP: <u>RJ/CC</u>
OFFSET: _____	CASING DIA.: _____	TEMPERATURE: <u>67 °F</u>
LINE: _____	CORE SIZE: _____	WEATHER: <u>Clear</u>
DEPTH: <u>30.0 ft</u>		

GROUNDWATER: Encountered at _____ At completion: _____ After _____ Caved in at 23.0 ft

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		Dark brown, (VISUAL) 0.3											
505.0	2.5	Loam A-6, Grayish brown, Stiff To Very Stiff, (Lab No. 147503)	SPT 1	6-9-7	78	13.0		1.50					
	5.0		SPT 2	3-8-7	67	12.9		2.50					
	7.5		SH 3			92	1.2						
500.0	10.0	Sandy Loam A-2-4, Brown, Loose To Medium Dense, (Lab No. 147501)	SPT 4	2-4-5	83								
495.0	15.0		SPT 5	2-3-3	94								
490.0	20.0		SPT 6	2-3-4	83								
485.0	25.0	Silty Loam A-6, Dark brown, Medium Stiff, (Lab No. 147502)	SPT 7	4-6-9	89								23.5, Became Medium Dense
480.0	30.0		SPT 8	2-3-5	100	20.1		0.50					30.0, Boring Terminated At 30 Feet Without Auger Refusal
		Bottom of Boring at 30.0 ft											

INDOT BORING LOG 00161475 CLEAR CREEK.GPJ INDOT_169_11202009.GDT 11/8/22



INDOT BORING LOG

BORING NO.: **B-03**
 SHEET: 1 OF 1
 NORTHING: 1527897.8
 EASTING: 2834767.7
 DATUM: _____
 DATE STARTED: 09-21-22
 DATE COMPLETED: 09-21-22

GEOTECHNICAL CONSULTANT: Professional Service Industries
 DES NO.: 1902855 STRUCTURE #: _____

PROJECT TYPE: New Construction
 LOCATION: Clear Creek Rest Area
 COUNTY: Vigo PROJECT NO.: _____

ELEVATION: <u>508.0</u>	BORING METHOD: <u>Hollow Stem Auger</u>	HAMMER: <u>Auto</u>
STATION: _____	RIG TYPE: <u>CME-55LC</u>	DRILLER/INSP: <u>RJ/CC</u>
OFFSET: _____	CASING DIA.: _____	TEMPERATURE: <u>64 °F</u>
LINE: _____	CORE SIZE: _____	WEATHER: <u>Clear</u>
DEPTH: <u>30.0 ft</u>		

GROUNDWATER: Encountered at At completion After

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		Topsoil Dark brown, (VISUAL) 0.3											
505.0	2.5	Loam A-6 , Brown, Stiff To Very Stiff, (Lab No. 147503) 5.5	SPT 1	6-9-8	89			4.50					
	5.0		SPT 2	4-3-8	94	10.8		4.50					
500.0	7.5		SPT 3	3-6-6	100			0.50					
	10.0	Sandy Loam A-2-4 , Gray, Loose To Medium Dense, (Lab No. 147501) 28.0	SPT 4	1-4-4	67								
495.0	15.0		SPT 5	4-4-4	78								
	20.0		SPT 6	5-7-10	78								
485.0	25.0		SPT 7	2-4-6	83								
480.0	30.0		Silty Loam A-6 , Brown, Medium Stiff, (Lab No. 147502) 30.0	SPT 8	2-2-4	100	20.8		0.50				
		Bottom of Boring at 30.0 ft											30.0, Boring Terminated At 30 Feet Without Auger Refusal

INDOT BORING LOG 00161475 CLEAR CREEK.GPJ INDOT_169_11202009.GDT 11/8/22



INDOT BORING LOG

BORING NO.: **B-04**
 SHEET: 1 OF 1
 NORTHING: 1527679
 EASTING: 2834820.2
 DATUM: _____
 DATE STARTED: 09-20-22
 DATE COMPLETED: 09-20-22

GEOTECHNICAL CONSULTANT: Professional Service Industries
 DES NO.: 1902855 STRUCTURE #: _____

PROJECT TYPE: New Construction
 LOCATION: Clear Creek Rest Area
 COUNTY: Vigo PROJECT NO.: _____

ELEVATION: <u>515.0</u>	BORING METHOD: <u>Hollow Stem Auger</u>	HAMMER: <u>Auto</u>
STATION: _____	RIG TYPE: <u>CME-55LC</u>	DRILLER/INSP: <u>RJ/CC</u>
OFFSET: _____	CASING DIA.: _____	TEMPERATURE: <u>57 °F</u>
LINE: _____	CORE SIZE: _____	WEATHER: <u>Clear</u>
DEPTH: <u>30.0 ft</u>		

GROUNDWATER: Encountered at _____ At completion: _____ After _____ Caved in at 23.0 ft

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		Topsoil Dark brown, (VISUAL) 0.3											
510.0	2.5		SPT 1	3-7-5	100			1.50					
	5.0	Loam A-6 , Gray, Soft To Stiff, (Lab No. 147503)	SPT 2	3-2-3	100	23.0		1.00					
	7.5		SPT 3	2-4-7	100	18.9		1.50					
505.0	10.0		SPT 4	4-7-9	100			0.50					
	12.5	Clay Loam A-6 , Brown, Medium Dense, (Lab No. 147504)	SH 5		100								
500.0	15.0												
	17.5												
495.0	20.0	Silty Loam A-2-4 , Brown, Loose, (Lab No. 147501)	SPT 6	2-3-3	100	18.8		1.50					
	22.5												
490.0	25.0	Silty Loam A-6 , Gray, Hard, (Lab No. 147502)	SPT 7	0/50	33	11.0		4.50					24.5, Boring Terminated At 24.5 Feet With Auger Refusal On Appearant Bedrock.
	27.5												
485.0	30.0	Bottom of Boring at 30.0 ft											

INDOT BORING LOG 00161475 CLEAR CREEK.GPJ INDOT_169_11202009.GDT 11/8/22



INDOT BORING LOG

BORING NO.: **P-01**
 SHEET: 1 OF 1
 NORTHING: 1527571.5
 EASTING: 2834424.3
 DATUM: _____
 DATE STARTED: 09-20-22
 DATE COMPLETED: 09-20-22

GEOTECHNICAL CONSULTANT: Professional Service Industries
 DES NO.: 1902855 STRUCTURE #: _____

PROJECT TYPE: New Construction
 LOCATION: Clear Creek Rest Area
 COUNTY: Vigo PROJECT NO.: _____

ELEVATION: <u>514.0</u>	BORING METHOD: <u>Hollow Stem Auger</u>	HAMMER: <u>Auto</u>
STATION: _____	RIG TYPE: <u>CME-55LC</u>	DRILLER/INSP: <u>RJ/CC</u>
OFFSET: _____	CASING DIA.: _____	TEMPERATURE: <u>60 °F</u>
LINE: _____	CORE SIZE: _____	WEATHER: <u>Clear</u>
DEPTH: <u>10.0 ft</u>		

GROUNDWATER: Encountered at At completion After

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		Topsoil Dark brown, (VISUAL) 0.3											
510.0	2.5		SH 1		42			4.50					
	5.0	Loam A-6 , Brown, Medium Stiff, (Lab No. 147505)	SPT 2	3-3-3	100	19.0		1.00					
	7.5		SPT 3	2-4-6	100	18.8		0.50					
505.0	8.0												
	10.0	Sandy Loam A-2-4 , Brown, Loose, (Lab No. 147501)	SPT 4	3-5-5	100								
	10.0	Bottom of Boring at 10.0 ft											10.0, Boring Terminated At 10 Feet Without Auger Refusal



INDOT BORING LOG

BORING NO.: **P-02**
 SHEET: 1 OF 1
 NORTHING: 1527570.7
 EASTING: 2834593.7
 DATUM: _____
 DATE STARTED: 09-20-22
 DATE COMPLETED: 09-20-22

GEOTECHNICAL CONSULTANT: Professional Service Industries
 DES NO.: 1902855 STRUCTURE #: _____

PROJECT TYPE: New Construction
 LOCATION: Clear Creek Rest Area
 COUNTY: Vigo PROJECT NO.: _____

ELEVATION: <u>513.0</u>	BORING METHOD: <u>Hollow Stem Auger</u>	HAMMER: <u>Auto</u>
STATION: _____	RIG TYPE: <u>CME-55LC</u>	DRILLER/INSP: <u>RJ/CC</u>
OFFSET: _____	CASING DIA.: _____	TEMPERATURE: <u>65 °F</u>
LINE: _____	CORE SIZE: _____	WEATHER: <u>Clear</u>
DEPTH: <u>10.0 ft</u>		

GROUNDWATER: Encountered at At completion After

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		Dark brown, (VISUAL) 0.3											
510.0	2.5	Loam A-6 , Brown, Medium Stiff, (Lab No. 147505)	SH 1		100								
	5.0	5.5	SPT 2	1-3-6	100	14.9		1.00					
505.0	7.5	Sandy Loam A-2-4 , Brown, Medium Dense, (Lab No. 147501)	SPT 3	4-7-8	100								
	10.0	10.0	SPT 4	3-5-6	100								
		Bottom of Boring at 10.0 ft											10.0, Boring Terminated At 10 Feet Without Auger Refusal
500.0	12.5												
	15.0												
495.0	17.5												
	20.0												
490.0	22.5												
	25.0												
485.0	27.5												
	30.0												



INDOT BORING LOG

BORING NO.: **P-03**
 SHEET: 1 OF 1
 NORTHING: 1527389.6
 EASTING: 2835016.5
 DATUM: _____
 DATE STARTED: 09-20-22
 DATE COMPLETED: 09-20-22

GEOTECHNICAL CONSULTANT: Professional Service Industries
 DES NO.: 1902855 STRUCTURE #: _____

PROJECT TYPE: New Construction
 LOCATION: Clear Creek Rest Area
 COUNTY: Vigo PROJECT NO.: _____

ELEVATION: <u>519.0</u>	BORING METHOD: <u>Hollow Stem Auger</u>	HAMMER: <u>Auto</u>
STATION: _____	RIG TYPE: <u>CME-55LC</u>	DRILLER/INSP: <u>RJ/CC</u>
OFFSET: _____	CASING DIA.: _____	TEMPERATURE: <u>67 °F</u>
LINE: _____	CORE SIZE: _____	WEATHER: <u>Clear</u>
DEPTH: <u>10.0 ft</u>		

GROUNDWATER: Encountered at _____ At completion _____ After _____

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		Topsoil Dark brown, (VISUAL) 0.3											
515.0	2.5		SH 1		100								
	5.0	Loam A-6 , Brown, Very Stiff To Hard, (Lab No. 147505)	SPT 2	4-7-11	100	11.2		4.50					
	7.5		SPT 3	6-12-17	100	9.5		4.50					
510.0	10.0		SPT 4	8-17-23	100	9.5		4.50					
		Bottom of Boring at 10.0 ft											10.0, Boring Terminated At 10 Feet Without Auger Refusal



INDOT BORING LOG

BORING NO.: **P-04**
 SHEET: 1 OF 1
 NORTHING: 1527567.1
 EASTING: 2835384.5
 DATUM: _____
 DATE STARTED: 09-20-22
 DATE COMPLETED: 09-20-22

GEOTECHNICAL CONSULTANT: Professional Service Industries
 DES NO.: 1902855 STRUCTURE #: _____

PROJECT TYPE: New Construction
 LOCATION: Clear Creek Rest Area
 COUNTY: Vigo PROJECT NO.: _____

ELEVATION: <u>513.0</u>	BORING METHOD: <u>Hollow Stem Auger</u>	HAMMER: <u>Auto</u>
STATION: _____	RIG TYPE: <u>CME-55LC</u>	DRILLER/INSP: <u>RJ/CC</u>
OFFSET: _____	CASING DIA.: _____	TEMPERATURE: <u>70 °F</u>
LINE: _____	CORE SIZE: _____	WEATHER: <u>Clear</u>
DEPTH: <u>10.0 ft</u>		

GROUNDWATER: Encountered at At completion After

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		Dark brown, (VISUAL) 0.3											
510.0	2.5		SH 1		63			4.50					
	5.0	Loam A-6, Brown, Medium Stiff, (Lab No. 147505)	SPT 2	4-6-4	100	16.4		4.50					
	7.5		SPT 3	2-4-4	100	21.2		2.00					
505.0	8.0												
	10.0	Sand A-2-6, Brown, Loose, (VISUAL) 10.0	SPT 4	3-4-3	100	20.5							
		Bottom of Boring at 10.0 ft											10.0, Boring Terminated At 10 Feet Without Auger Refusal
500.0	12.5												
	15.0												
495.0	17.5												
	20.0												
490.0	22.5												
	25.0												
485.0	27.5												
	30.0												



INDOT BORING LOG

BORING NO.: **P-05**
 SHEET: 1 OF 1
 NORTHING: 1527564.9
 EASTING: 2835864.6
 DATUM: _____
 DATE STARTED: 09-21-22
 DATE COMPLETED: 09-21-22

GEOTECHNICAL CONSULTANT: Professional Service Industries
 DES NO.: 1902855 STRUCTURE #: _____

PROJECT TYPE: New Construction
 LOCATION: Clear Creek Rest Area
 COUNTY: Vigo PROJECT NO.: _____

ELEVATION: <u>508.0</u>	BORING METHOD: <u>Hollow Stem Auger</u>	HAMMER: <u>Auto</u>
STATION: _____	RIG TYPE: <u>CME-55LC</u>	DRILLER/INSP: <u>RJ/CC</u>
OFFSET: _____	CASING DIA.: _____	TEMPERATURE: <u>62 °F</u>
LINE: _____	CORE SIZE: _____	WEATHER: <u>Clear</u>
DEPTH: <u>10.0 ft</u>		

GROUNDWATER: Encountered at At completion After

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		Dark brown, (VISUAL) 0.3											
505.0	2.5	Loam A-6, Brown, Medium Stiff To Stiff, (Lab No. 147505)	SPT 1	2-4-4	78			2.00					10.0, Boring Terminated At 10 Feet Without Auger Refusal
	5.0		SPT 2	3-6-6	72	20.6		2.50					
	7.5		SPT 3	4-6-6	83	19.0		4.00					
500.0	8.0												
	10.0	Sand A-2-6, Brown, Loose, (VISUAL) 10.0	SPT 4	4-6-4	83								
		Bottom of Boring at 10.0 ft											
495.0	12.5												
	15.0												
490.0	17.5												
	20.0												
485.0	22.5												
	25.0												
480.0	27.5												
	30.0												



INDOT BORING LOG

BORING NO.: **P-06**
 SHEET: 1 OF 1
 NORTHING: 1527858.9
 EASTING: 2835301.1
 DATUM: _____
 DATE STARTED: 09-20-22
 DATE COMPLETED: 09-20-22

GEOTECHNICAL CONSULTANT: Professional Service Industries
 DES NO.: 1902855 STRUCTURE #: _____

PROJECT TYPE: New Construction
 LOCATION: Clear Creek Rest Area
 COUNTY: Vigo PROJECT NO.: _____

ELEVATION: <u>514.0</u>	BORING METHOD: <u>Hollow Stem Auger</u>	HAMMER: <u>Auto</u>
STATION: _____	RIG TYPE: <u>CME-55LC</u>	DRILLER/INSP: <u>RJ/CC</u>
OFFSET: _____	CASING DIA.: _____	TEMPERATURE: <u>75 °F</u>
LINE: _____	CORE SIZE: _____	WEATHER: <u>Clear</u>
DEPTH: <u>10.0 ft</u>		

GROUNDWATER: Encountered at At completion After

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		Brown, (VISUAL) 0.3											
510.0	2.5	Loam A-6, Brown, Medium Stiff To Very Stiff, (Lab No. 147505)	SPT 1	2-4-4	100			2.00					
	5.0		SPT 2	2-4-5	100	24.6		2.50					
	7.5		SPT 3	3-6-14	100	10.2		4.00					
505.0	8.0	Sand A-2-4, Brown, Medium Dense, (Lab No. 147501)											
	10.0		SPT 4	6-9-9	100	11.5		0.50					
	10.0	Bottom of Boring at 10.0 ft											10.0, Boring Terminated At 10 Feet Without Auger Refusal



INDOT BORING LOG

BORING NO.: R-01
 SHEET 1 OF 1
 NORTHING : 1527463
 EASTING : 2834254.3
 DATUM :
 DATE STARTED : 09-20-22
 DATE COMPLETED : 09-20-22

GEOTECHNICAL CONSULTANT : Professional Service Industries
 DES NO. : 1902855 STRUCTURE # :

PROJECT TYPE : New Construction
 LOCATION : Clear Creek Rest Area
 COUNTY : Vigo PROJECT NO.:

ELEVATION : <u> 520.0 </u>	BORING METHOD : <u> Hollow Stem Auger </u>	HAMMER : <u> Auto </u>
STATION : <u> </u>	RIG TYPE : <u> CME-55LC </u>	DRILLER/INSP : <u> RJ/CC </u>
OFFSET : <u> </u>	CASING DIA. : <u> </u>	TEMPERATURE : <u> 77 °F </u>
LINE : <u> </u>	CORE SIZE : <u> </u>	WEATHER : <u> Clear </u>
DEPTH : <u> 15.0 ft </u>		

GROUNDWATER: Encountered at At completion - After

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		Topsoil Dark brown, (VISUAL) 0.3											
	2.5		SPT 1	2-4-6	100			1.00					
515.0	5.0	Loam A-6, Brown, Soft To Stiff, (Lab No. 147505)	SPT 2	1-2-3	100	18.5		1.00					
	7.5		SPT 3	3-6-9	100	11.5		4.00					
	10.0		SPT 4	5-12-13	100	9.6		4.50					
510.0	12.5	Loam A-6, Grayish brown, Very Stiff To Hard, (Lab No. 147504)	SPT 5	9-13-15	100	9.4		4.50					
	15.0		SPT 6	5-15-23	100	9.6		4.50					
	15.0	Bottom of Boring at 15.0 ft											15.0, Boring Terminated At 15 Feet Without Auger Refusal
	17.5												
500.0	20.0												
	22.5												
495.0	25.0												
	27.5												
490.0	30.0												

INDOT BORING LOG 00161475 CLEAR CREEK.GPJ INDOT_169_11202009.GDT 11/8/22



INDOT BORING LOG

BORING NO.: R-02
 SHEET 1 OF 1
 NORTHING : 1527460.7
 EASTING : 2834762.7
 DATUM :
 DATE STARTED : 09-20-22
 DATE COMPLETED : 09-20-22

GEOTECHNICAL CONSULTANT : Professional Service Industries
 DES NO. : 1902855 STRUCTURE # :

PROJECT TYPE : New Construction
 LOCATION : Clear Creek Rest Area
 COUNTY : Vigo PROJECT NO.:

ELEVATION : <u> 519.0 </u>	BORING METHOD : <u> Hollow Stem Auger </u>	HAMMER : <u> Auto </u>
STATION : <u> </u>	RIG TYPE : <u> CME-55LC </u>	DRILLER/INSP : <u> RJ/CC </u>
OFFSET : <u> </u>	CASING DIA. : <u> </u>	TEMPERATURE : <u> 82 °F </u>
LINE : <u> </u>	CORE SIZE : <u> </u>	WEATHER : <u> Clear </u>
DEPTH : <u> 15.0 ft </u>		

GROUNDWATER: Encountered at At completion - After

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		(VISUAL) 0.3											
515.0	2.5	Loam A-6, Brown, Medium Stiff, (Lab No. 147505)	SPT 1	3-5-5	100			3.50					
	5.0		SPT 2	2-4-6	100	22.4		2.50					
	7.5		SPT 3	3-3-6	100	19.5		1.00					
510.0	8.0	Loam A-6, Reddish brown, Medium Stiff, (Lab No. 147506)	SPT 4	3-4-3	100	13.8		2.00					
	10.0		SPT 5	1-3-4	100	21.2		0.50					
505.0	12.5		SPT 6	2-4-5	100	20.0		0.50					
	15.0												
		Bottom of Boring at 15.0 ft											15.0, Boring Terminated At 15 Feet Without Auger Refusal
	17.5												
500.0	20.0												
	22.5												
495.0	25.0												
	27.5												
490.0	30.0												



INDOT BORING LOG

BORING NO.: R-03
 SHEET 1 OF 1
 NORTHING : 1527572.2
 EASTING : 2834283.1
 DATUM :
 DATE STARTED : 09-20-22
 DATE COMPLETED : 09-20-22

GEOTECHNICAL CONSULTANT : Professional Service Industries
 DES NO. : 1902855 STRUCTURE # :

PROJECT TYPE : New Construction
 LOCATION : Clear Creek Rest Area
 COUNTY : Vigo PROJECT NO.:

ELEVATION : <u> 515.0 </u>	BORING METHOD : <u> Hollow Stem Auger </u>	HAMMER : <u> Auto </u>
STATION : <u> </u>	RIG TYPE : <u> CME-55LC </u>	DRILLER/INSP : <u> RJ/CC </u>
OFFSET : <u> </u>	CASING DIA. : <u> </u>	TEMPERATURE : <u> 84 °F </u>
LINE : <u> </u>	CORE SIZE : <u> </u>	WEATHER : <u> Clear </u>
DEPTH : <u> 15.0 ft </u>		

GROUNDWATER: Encountered at At completion - After

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		Topsoil Brown, (VISUAL) 0.3											
	2.5	Loam A-6, Brown, Very Stiff, (Lab No. 147505) 5.5	SPT 1	6-9-8	100			1.50					
510.0	5.0		SPT 2	4-7-10	100	7.6		3.50					
	7.5	Sand A-3, Brown, Medium Dense, (Lab No. 147507) 8.0	SPT 3	4-7-7	100			0.50					
505.0	10.0		SPT 4	2-3-4	100	24.3		2.00					
	12.5	Loam A-6, Reddish brown, Soft To Medium Stiff, (Lab No. 147506) 15.0	SPT 5	0-1-2	100	19.6		0.50					
500.0	15.0		SPT 6	2-4-5	100	20.6		1.50					
	17.5	Bottom of Boring at 15.0 ft											15.0, Boring Terminated At 15 Feet Without Auger Refusal
495.0	20.0												
	22.5												
490.0	25.0												
	27.5												
485.0	30.0												

INDOT BORING LOG 00161475 CLEAR CREEK.GPJ INDOT_169_11202009.GDT 11/8/22



INDOT BORING LOG

BORING NO.: **R-04**
 SHEET: 1 OF 1
 NORTHING: 1527827.1
 EASTING: 2834284.2
 DATUM: _____
 DATE STARTED: 09-20-22
 DATE COMPLETED: 09-20-22

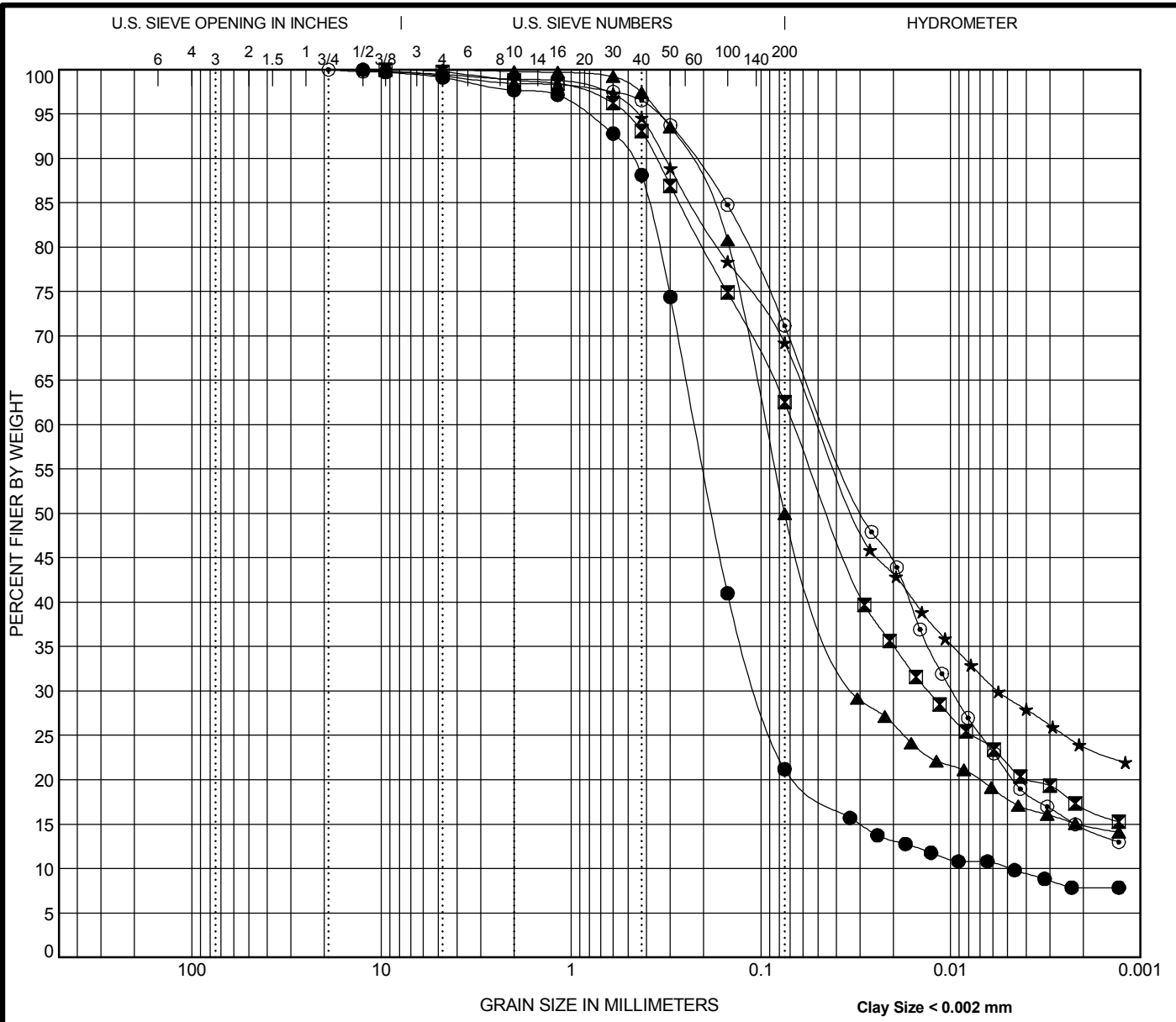
GEOTECHNICAL CONSULTANT: Professional Service Industries
 DES NO.: 1902855 STRUCTURE #: _____

PROJECT TYPE: New Construction
 LOCATION: Clear Creek Rest Area
 COUNTY: Vigo PROJECT NO.: _____

ELEVATION: <u>513.0</u>	BORING METHOD: <u>Hollow Stem Auger</u>	HAMMER: <u>Auto</u>
STATION: _____	RIG TYPE: <u>CME-55LC</u>	DRILLER/INSP: <u>RJ/CC</u>
OFFSET: _____	CASING DIA.: _____	TEMPERATURE: <u>82 °F</u>
LINE: _____	CORE SIZE: _____	WEATHER: <u>Clear</u>
DEPTH: <u>15.0 ft</u>		

GROUNDWATER: Encountered at At completion After

ELEVATION	SAMPLE DEPTH	SOIL/MATERIAL DESCRIPTION	SAMPLE NUMBER	SPT per 6"	% RECOVERY	MOISTURE CONTENT	DRY DENSITY, pcf	POCKET PEN., tsf	UNCONF. COMP., tsf	ATTERBERG LIMITS			REMARKS
										LL	PL	PI	
		Brown, (VISUAL) 0.3											
510.0	2.5	Loam A-6 , Dark brown, Medium Stiff, (Lab No. 147505) 3.0	SPT 1	2-4-5	100			3.00					
	5.0		SPT 2	2-4-4	100	20.0		3.00					
505.0	7.5	Loam A-6 , Reddish brown, Medium Stiff To Stiff, (Lab No. 147506) 10.5	SPT 3	3-5-7	100	15.5		4.00					
	10.0		SPT 4	2-3-3	100								
500.0	12.5	Sand A-3 , Brown, Loose, (Lab No. 147507) 15.0	SPT 5	2-2-4	100			1.00					
	15.0		SPT 6	1-3-4	100								
		Bottom of Boring at 15.0 ft											15.0, Boring Terminated At 15 Feet Without Auger Refusal
495.0	17.5												
	20.0												
490.0	22.5												
	25.0												
485.0	27.5												
	30.0												



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● B-01 9.3	Sandy Loam - A-2-4 (Lab No. 147501)	NP	NP	NP	9.55	45.38
⊠ B-01 24.3	Silty Loam - A-6 (Lab No. 147502)					
▲ B-02 6.8	Loam - A-6 (Lab No. 147503)	NP	NP	NP		
★ B-04 14.3	Clay Loam - A-6 (Lab No. 147504)	29	14	15		
⊙ P-01 1.8	Loam - A-6 (Lab No. 147505)	30	19	11		

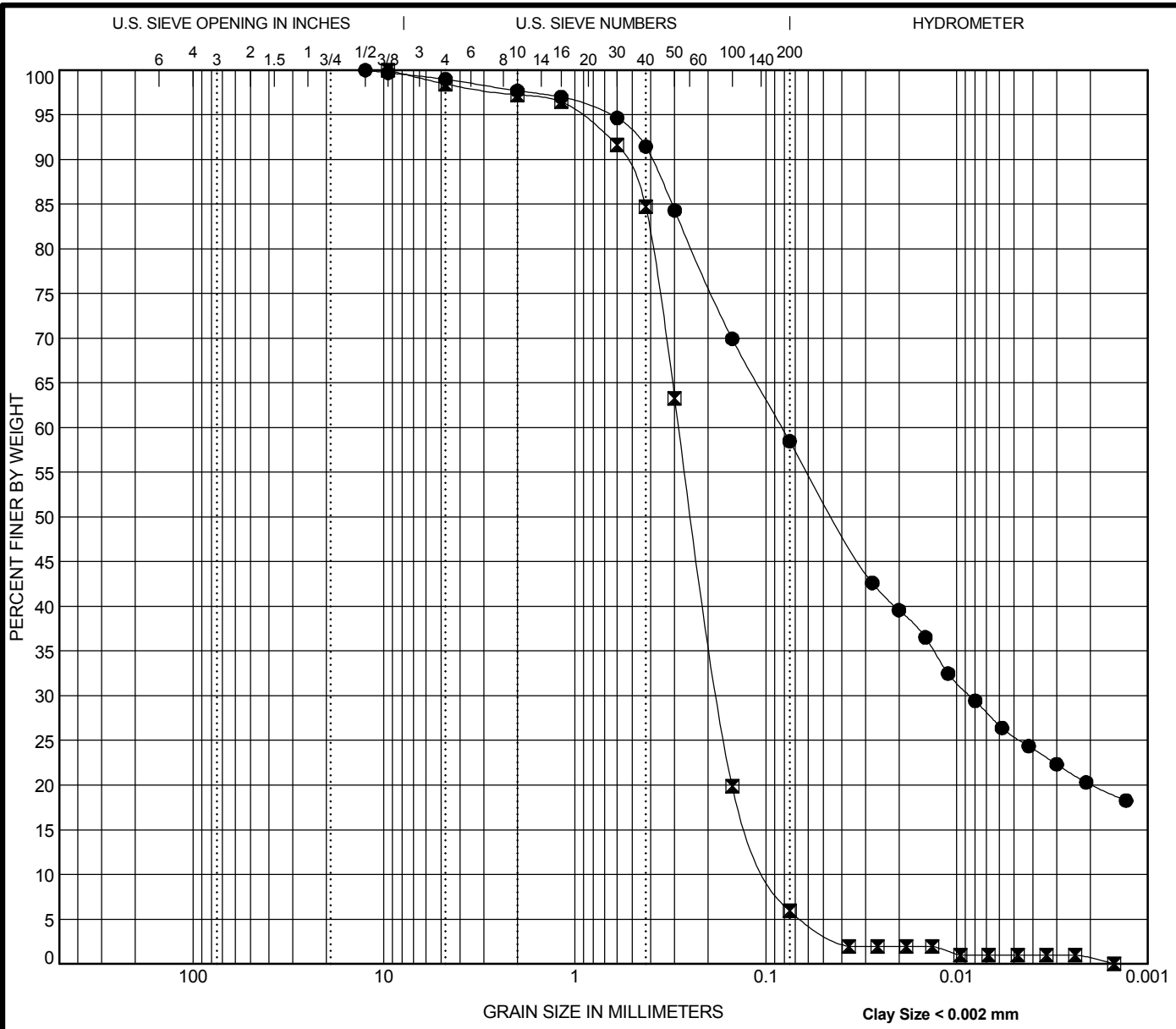
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-01 9.3	12.5	0.223	0.102	0.005	0.9	77.9	13.3	7.8
⊠ B-01 24.3	9.5	0.067	0.013		0.2	37.2	45.6	16.9
▲ B-02 6.8	9.5	0.094	0.032		0.0	50.0	35.1	14.9
★ B-04 14.3	12.5	0.05	0.006		0.5	30.2	45.5	23.8
⊙ P-01 1.8	19	0.045	0.01		0.7	28.1	56.6	14.6



Professional Service Industries, Inc.
 5362 West 78th Street
 Indianapolis, IN 46268
 Telephone: (317) 876-7723
 Fax: (317) 876-8155

GRAIN SIZE DISTRIBUTION

Project: Clear Creek Rest Area
 PSI Job No.: 00161475
 Location: I-70 West
 Terre Haute, Indiana



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	LL	PL	PI	Cc	Cu
● R-02 9.3		28	11	17		
☒ S-01 4.3		NP	NP	NP	1.19	3.10

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● R-02 9.3	12.5	0.082	0.009		1.0	40.5	38.4	20.1
☒ S-01 4.3	9.5	0.285	0.176	0.092	1.5	92.5	5.3	0.6



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GRAIN SIZE DISTRIBUTION

Project: Clear Creek Rest Area
 PSI Job No.: 00161475
 Location: I-70 West
 Terre Haute, Indiana

UNCONFINED COMPRESSION STRENGTH

Project Name: "Clear Creek Rest Area"
Client: JSE

Date Tested: 10/10/22
Project No.: "00161475"

Soil Description: LOAM

Boring #: B-04

Depth (ft): 13-15'

LAB NO.: 147504

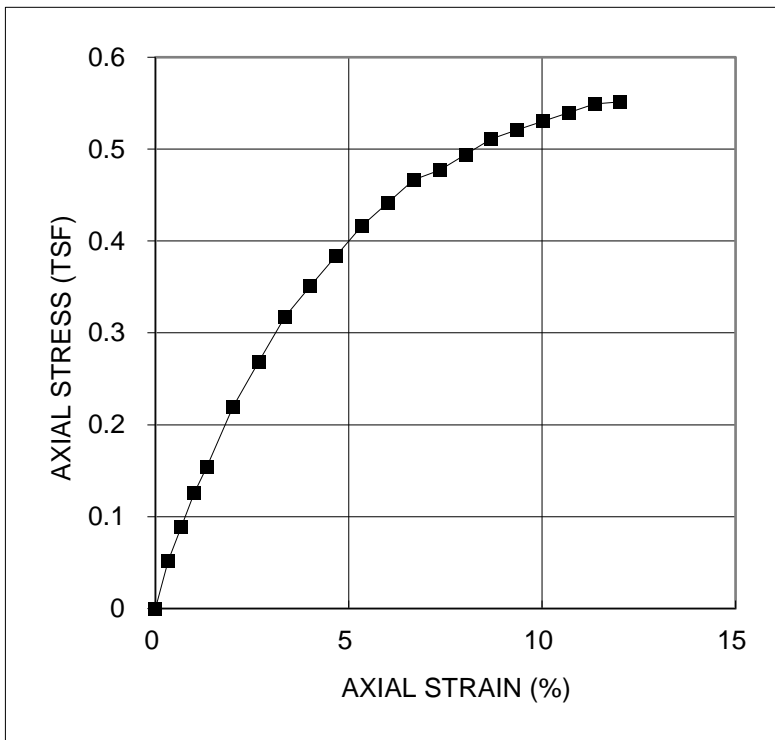
Qp(tsf): 0.5

Wet Weight(g): 1268.27

Sample No.: 5/SH
 (0.0) meters

Tested By: CL
Reviewed By: CC

Load Cell Calibration		Height: 5.99 inches		152.08 mm		
Pounds/mVolt 6.53685		Diameter: 2.83 inches		71.98 mm		
		Moisture Content: 23.0%		Saturation (%): 103.3		
		Ht.-Diameter Ratio - 2.11		Specific Gravity: 2.65		
		Dry Density: 104.0 pcf		1665.4 kg/m ³		
READING NUMBER	DEFOR-MATION (in.)	TRANS-DUCER READING	LOAD (lbs)	STRAIN (%)	CORRECTED AREA (in ²)	AXIAL STRESS (tsf)
0	0.000	0.0	0.0	0.00	6.306	0.00
1	0.020	0.7	4.6	0.33	6.328	0.05
2	0.040	1.2	7.8	0.67	6.349	0.09
3	0.060	1.7	11.1	1.00	6.370	0.13
4	0.080	2.1	13.7	1.34	6.392	0.15
5	0.120	3.0	19.6	2.00	6.435	0.22
6	0.160	3.7	24.2	2.67	6.480	0.27
7	0.200	4.4	28.8	3.34	6.524	0.32
8	0.240	4.9	32.0	4.01	6.570	0.35
9	0.280	5.4	35.3	4.68	6.616	0.38
10	0.320	5.9	38.6	5.34	6.663	0.42
11	0.360	6.3	41.2	6.01	6.710	0.44
12	0.400	6.7	43.8	6.68	6.758	0.47
13	0.440	6.9	45.1	7.35	6.807	0.48
14	0.480	7.2	47.1	8.02	6.856	0.49
15	0.520	7.5	49.0	8.68	6.906	0.51
16	0.560	7.7	50.3	9.35	6.957	0.52
17	0.600	7.9	51.6	10.02	7.009	0.53
18	0.640	8.1	52.9	10.69	7.061	0.54
19	0.680	8.3	54.3	11.36	7.114	0.55
20	0.720	8.4	54.9	12.03	7.169	0.55
Qu = 0.55 tsf		52.81 kPa		Strain 12.03%		



FAILURE SKETCH

UNCONFINED COMPRESSION STRENGTH

Project Name: "Clear Creek Rest Area"
Client: JSE

Date Tested: 10/10/22
Project No.: "00161475"

Soil Description: LOAM

Boring #: P-02

Depth (ft): 1-3'

LAB NO.: 147508

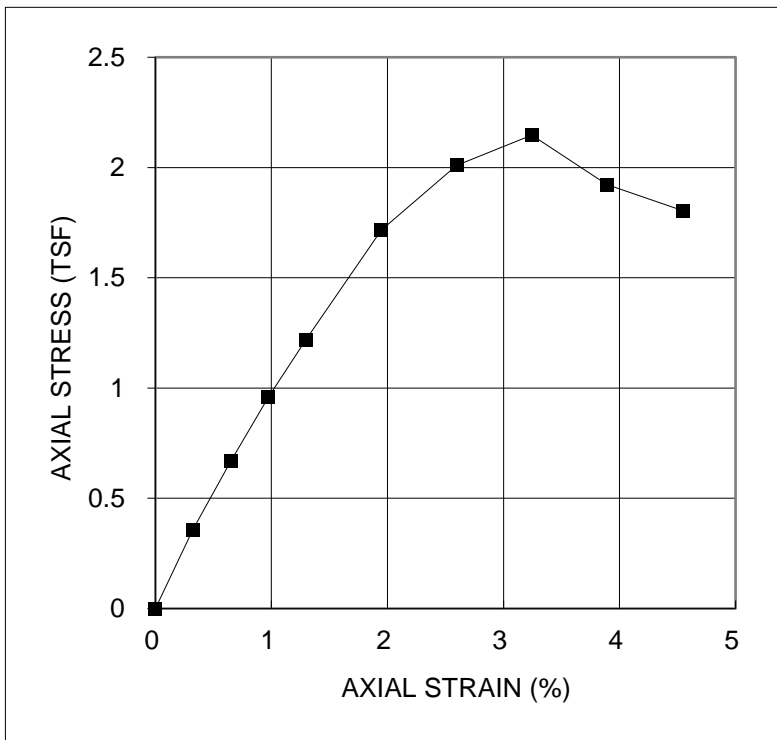
Qp(tsf): 3.5

Wet Weight(g): 1316.81

Sample No.: 1
 (0.0) meters

Tested By: CL
Reviewed By: CC

Load Cell Calibration		Height: 6.17 inches		156.60 mm		
Pounds/mVolt 13.8738		Diameter: 2.85 inches		72.47 mm		
		Moisture Content: 20.2%		Saturation (%): 95.4		
		Ht.-Diameter Ratio - 2.16		Specific Gravity: 2.65		
		Dry Density: 105.8 pcf		1694.3 kg/m ³		
READING NUMBER	DEFOR-MATION (in.)	TRANS-DUCER READING	LOAD (lbs)	STRAIN (%)	CORRECTED AREA (in ²)	AXIAL STRESS (tsf)
0	0.000	0.0	0.0	0.00	6.393	0.00
1	0.020	2.3	31.9	0.32	6.414	0.36
2	0.040	4.3	59.7	0.65	6.435	0.67
3	0.060	6.2	86.0	0.97	6.456	0.96
4	0.080	7.9	109.6	1.30	6.477	1.22
5	0.120	11.2	155.4	1.95	6.520	1.72
6	0.160	13.2	183.1	2.60	6.563	2.01
7	0.200	14.2	197.0	3.24	6.607	2.15
8	0.240	12.8	177.6	3.89	6.652	1.92
9	0.280	12.1	167.9	4.54	6.697	1.80
10	0.320	0.0				
11	0.360	0.0				
12	0.400	0.0				
13	0.440	0.0				
14	0.480	0.0				
15	0.520	0.0				
16	0.560	0.0				
17	0.600	0.0				
18	0.640	0.0				
19	0.680	0.0				
20	0.720	0.0				
Qu =		2.15 tsf		205.58 kPa		Strain 3.24%



FAILURE SKETCH

Project: Clear Creek Welcome Center
 Project No.: 00161475
 Prepared By: CC Date: 10/11/22
 Checked By: _____ Date: _____

Bearing Capacity of Shallow Soil-Supported Foundations

Reference: Bowles, J. E. *Foundation Analysis and Design*. Fourth Edition.

Case Description:	Building Spread Footing
-------------------	-------------------------

Foundation Dimensions

Width, B	6.0 feet
Length, L	6.0 feet

Soil Parameters for Overburden

Embedment Depth, D_f	3.0 feet
Effective Unit Weight, $\gamma_{e,OB}$	125.0 pcf

Shear Strength of Bearing Soils

Friction Angle, ϕ	0 deg
Cohesion, c	1,000 psf

Unit Weight of Bearing Soils

Wet Unit Weight, γ_{wet}	128.0 pcf
Saturated Unit Weight, γ_{sat}	131.5 pcf

Effect of Water Table on Bearing Capacity

Depth to water table below base of footing, d_w	12.0 feet
Effective shear depth of interest, $H = 0.5 \cdot B \cdot \tan(45 + \phi/2)$	3.0 feet
If $d_w > H$, $\gamma_e = \gamma_{wet}$, else $\gamma_e = (2 \cdot H - d_w) \cdot (d_w/H^2) \cdot \gamma_{wet} + (\gamma'/H^2) \cdot (H - d_w)^2$	128.0 pcf

Meyerhof Bearing Capacity Factors

$N_q = e^{\pi \cdot \tan \phi} \cdot \tan^2(45 + \phi/2)$	1.00
$N_c = (N_q - 1) \cdot \cot(\phi)$ (if $\phi=0$, $N_c=\pi+2$)	5.14
$N_\gamma = (N_q - 1) \cdot \tan(1.4 \cdot \phi)$	0.00

Rankine Passive Earth Pressure Coefficient

$K_p = \tan^2(45 + \phi/2)$	1.00
-----------------------------	------

Meyerhof Shape Factors

$s_c = 1 + (B/L)(N_q/N_c)$	1.19
$s_q = 1 + (B/L) \cdot \tan \phi$	1.51
$s_\gamma = 1 - (0.4(B/L))$	0.60

Meyerhof Depth Factors

$d_c = 1$	1.00
$d_q = \text{Table 10.6.3.1.2a-4}$	1.26
$d_\gamma = 1$	1.00

Bearing Capacity

(Table

$C_{wq} = 1$ 10.6.3.1.2a-2) $C_{w\gamma} = 1$ (Table 10.6.3.1.2a-2)

Gross ultimate bearing resistance, $q_n = c \cdot N_c \cdot s_c \cdot d_c + \gamma_{e,OB} \cdot D_f \cdot N_q \cdot s_q \cdot d_q \cdot C_{wq} + 0.5 \cdot \gamma_e \cdot B \cdot N_\gamma \cdot s_\gamma \cdot d_\gamma \cdot r_\gamma \cdot C_{w\gamma}$	6,855 psf	10.6.3.1.2a-1
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------	---------------

$c \cdot N_c \cdot s_c \cdot d_c$	6,142 psf
$\gamma_{e,OB} \cdot D_f \cdot N_q \cdot s_q \cdot d_q \cdot C_{wq}$	713 psf
$0.5 \cdot \gamma_e \cdot B \cdot N_\gamma \cdot s_\gamma \cdot d_\gamma \cdot r_\gamma \cdot C_{w\gamma}$	0 psf
Reduction Factor for Surcharge Term, r_γ	1.00

ϕb	0.50
$qr = q_n \cdot \phi b$	3,427 psf

Project: Clear Creek Welcome Center
 Project No.: 00161475
 Prepared By: CC Date: 10/11/22
 Checked By: _____ Date: _____

Bearing Capacity of Shallow Soil-Supported Foundations

Reference: Bowles, J. E. *Foundation Analysis and Design*. Fourth Edition.

Case Description:	Building Spread Footing
-------------------	-------------------------

Foundation Dimensions

Width, B	6.0 feet
Length, L	60.0 feet

Soil Parameters for Overburden

Embedment Depth, D_f	3.0 feet
Effective Unit Weight, $\gamma_{e,OB}$	125.0 pcf

Shear Strength of Bearing Soils

Friction Angle, ϕ	0 deg
Cohesion, c	1,000 psf

Unit Weight of Bearing Soils

Wet Unit Weight, γ_{wet}	128.0 pcf
Saturated Unit Weight, γ_{sat}	131.5 pcf

Effect of Water Table on Bearing Capacity

Depth to water table below base of footing, d_w	12.0 feet
Effective shear depth of interest, $H = 0.5 \cdot B \cdot \tan(45 + \phi/2)$	3.0 feet
If $d_w > H$, $\gamma_e = \gamma_{wet}$, else $\gamma_e = (2 \cdot H - d_w) \cdot (d_w/H^2) \cdot \gamma_{wet} + (\gamma'/H^2) \cdot (H - d_w)^2$	128.0 pcf

Meyerhof Bearing Capacity Factors

$N_q = e^{\pi \cdot \tan \phi} \cdot \tan^2(45 + \phi/2)$	1.00
$N_c = (N_q - 1) \cdot \cot(\phi)$ (if $\phi=0$, $N_c=\pi+2$)	5.14
$N_\gamma = (N_q - 1) \cdot \tan(1.4 \cdot \phi)$	0.00

Rankine Passive Earth Pressure Coefficient

$K_p = \tan^2(45 + \phi/2)$	1.00
-----------------------------	------

Meyerhof Shape Factors

$s_c = 1 + (B/L)(N_q/N_c)$	1.02
$s_q = 1 + (B/L) \cdot \tan \phi_f$	1.05
$s_\gamma = 1 - (0.4(B/L))$	0.96

Meyerhof Depth Factors

$d_c = 1$	1.00
$d_q = \text{Table 10.6.3.1.2a-4}$	1.26
$d_\gamma = 1$	1.00

Bearing Capacity

(Table

$C_{wq} = 1$ 10.6.3.1.2a-2) $C_{w\gamma} = 1$ (Table 10.6.3.1.2a-2)

Gross ultimate bearing resistance, $q_n = c \cdot N_c \cdot s_c \cdot d_c + \gamma_{e,OB} \cdot D_f \cdot N_q \cdot s_q \cdot d_q \cdot C_{wq} + 0.5 \cdot \gamma_e \cdot B \cdot N_\gamma \cdot s_\gamma \cdot d_\gamma \cdot r_\gamma \cdot C_{w\gamma}$	5,738 psf	10.6.3.1.2a-1
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------	---------------

$c \cdot N_c \cdot s_c \cdot d_c$	5,242 psf
$\gamma_{e,OB} \cdot D_f \cdot N_q \cdot s_q \cdot d_q \cdot C_{wq}$	497 psf
$0.5 \cdot \gamma_e \cdot B \cdot N_\gamma \cdot s_\gamma \cdot d_\gamma \cdot r_\gamma \cdot C_{w\gamma}$	0 psf
Reduction Factor for Surcharge Term, r_γ	1.00

ϕb	0.50
$qr = q_n \cdot \phi b$	2,869 psf

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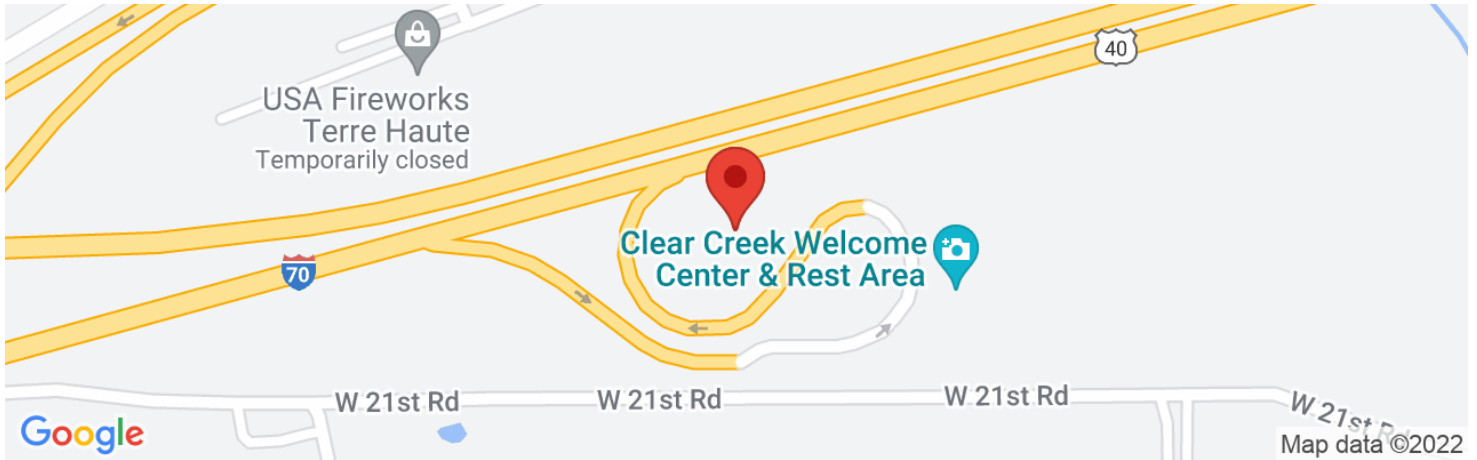
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Clear Creek Rest Area

Latitude, Longitude: 39.4421, -87.5021



Date	11/1/2022, 4:47:34 PM
Design Code Reference Document	IBC-2012
Risk Category	III
Site Class	C - Very Dense Soil and Soft Rock

Type	Value	Description
S _S	0.271	MCE _R ground motion. (for 0.2 second period)
S ₁	0.117	MCE _R ground motion. (for 1.0s period)
S _{MS}	0.326	Site-modified spectral acceleration value
S _{M1}	0.198	Site-modified spectral acceleration value
S _{DS}	0.217	Numeric seismic design value at 0.2 second SA
S _{D1}	0.132	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	B	Seismic design category
F _a	1.2	Site amplification factor at 0.2 second
F _v	1.683	Site amplification factor at 1.0 second
PGA	0.134	MCE _G peak ground acceleration
F _{PGA}	1.2	Site amplification factor at PGA
PGA _M	0.16	Site modified peak ground acceleration
T _L	12	Long-period transition period in seconds
SsRT	0.271	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.302	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.117	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.137	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGA _d	0.6	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA _{UH}	0.134	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C _{RS}	0.899	Mapped value of the risk coefficient at short periods
C _{R1}	0.855	Mapped value of the risk coefficient at a period of 1 s
C _V		Vertical coefficient

DISCLAIMER

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December 9, 2022

Mr. Bob Gray
Vice President
Janssen & Spaans Engineering, Inc.
9120 Harrison Park Court
Indianapolis, IN 46216

**RE: ASBESTOS INSPECTION
DES NO. 1902855
I-70 REST AREA MODERNIZATION – CLEAR CREEK WELCOME CENTER & REST AREA
TERRE HAUTE, VIGO COUNTY, INDIANA
METRIC PROJECT NO: 22-0049**

Dear Mr. Gray:


Metric Environmental, LLC. performed an asbestos inspection at the above referenced site. The enclosed report summarizes the activities and findings of this investigation.

Should you have any questions or comments regarding our findings, please do not hesitate to contact us.

Sincerely,

METRIC ENVIRONMENTAL, LLC


Kennita Jones
Project Geologist


Karla McDonald, CHMM
Director, Assessment-Remediation & EHS

Enclosures

ASBESTOS INSPECTION REPORT

INTERSTATE 70
CLEAR CREEK WELCOME CENTER & REST AREA

TERRE HAUTE, VIGO COUNTY, INDIANA

PREPARED FOR:

JANSSEN & SPAANS ENGINEERING, INC.

DECEMBER 9, 2022



Prepared by:

Metric Environmental, LLC

Complex Environment. Creative Solutions.

6958 Hillside Court
Indianapolis, IN 46256
Telephone: 317.400.1633
www.metricenv.com

SIGNATURES OF ENVIRONMENTAL PROFESSIONALS
ASBESTOS INSPECTION REPORT – CLEAR CREEK WELCOME CENTER & REST AREA
TERRE HAUTE, VIGO COUNTY, INDIANA

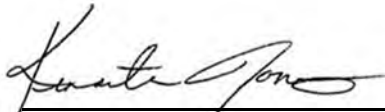
This Asbestos Inspection Report was prepared by Metric Environmental, LLC. (Metric) Janssen & Spaans Engineering, Inc.



Karla McDonald, CHMM
Metric Director, Assessment-Remediation & EHS

December 9, 2022

Date



Kennita Jones
Metric Project Geologist

December 9, 2022

Date

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Attachments

- Site Photographs
- Laboratory Accreditation and Chain of Custody

1.0 INTRODUCTION

Metric Environmental (Metric) performed an asbestos inspection and survey of the Clear Creek Welcome Center and Rest Area. Specifically, the welcome center and rest area is located at 5494 West 21st Road/W. Interstate 70, Terre Haute, Indiana. The site is identified as parcel number 84-05-34-277-002.000-021.

The purpose of the asbestos inspection was to investigate accessible areas which may contain suspected asbestos containing materials (SACMs) or materials which may become regulated if disturbed and to outline appropriate handling, removal, and disposal if such materials do exist. The purpose of this report is to convey the findings, conclusions and recommendations of this inspection.

2.0 ASBESTOS SAMPLING METHODOLOGY AND LIMITATIONS

On November 15, 2022, Elayna Stoner, Certified Licensed Asbestos Building Inspectors in the State of Indiana (Indiana Inspector License #:191808046, expiration date 6/15/2023), conducted the onsite inspection and bulk sampling of suspected asbestos containing materials (SACMs).

Metric conducted a visual inspection of the exterior and accessible areas within the buildings located at the rest area. The rest areas were active and in use at the time of the inspection.

A survey of the facility was conducted to identify the various SACM types. SACMs were then grouped based on material description, location, and usage. The SACMs were visually inspected for friability. All SACMs were then collected from random locations for sampling. Each sample was assigned a unique identification number and a brief description describing the location and material sampled.

All samples were collected according to 40 CFR 763 Subpart E. Specific care was taken not to disturb unnecessary areas of the SACM and to prevent the creation of airborne fibers. Visibly friable SACMs were gently sprayed with water prior to sample collection. Hand tools used for sample collection were decontaminated after the collection of each sample to minimize the potential for cross contamination. Each sample was placed into an airtight container, labeled, and then submitted to the laboratory for analysis. Each sample was identified with a unique identification number, to match the sample ID on the chain of custody. In addition to the sample ID, the specific location and description of the sample material was also included on the chain of custody. Sample locations were then labeled with a unique sample identification number and sorted according to homogenous area.

The collected samples were submitted to EMSL Laboratories in Indianapolis, Indiana, for analysis using polarized light microscopy (PLM). Once samples were released to the laboratory, the laboratory's quality control program was followed.

Please note, the pump house located beneath the steel grate in the maintenance area was not accessed during the inspection. The pump house is considered a confined space which would require special permitting prior to entry. Due to the quick turnaround for the inspection, the required permits were not obtained prior to the inspection and therefore, the pump house was not inspected. If the pump house is selected for demolition or renovation, Metric recommends the proper confined entry permits are obtained and the pump house inspected prior to the commencement of renovation/demolition activities.

3.0 ASBESTOS INSPECTION FINDINGS

Results of the sample analysis are listed below in **Table 3-1**. The laboratory analytical report is included in the attachments.

Table 3-1: Summary of Asbestos Sample Results – Lebanon Northbound Rest Area

HA#	Sample ID	Material Description	Location	Asbestos Content
1	01A	12" x 12" vinyl floor tile – tan	Visitor's Office	None Detected
1	01A	Floor tile mastic – yellow	Visitor's Office	None Detected
1	01B	12" x 12" vinyl floor tile – tan	Visitor's Office	None Detected
1	01B	Floor tile mastic – yellow	Visitor's Office	None Detected
1	01C	12" x 12" vinyl floor tile – tan	Visitor's Office	None Detected
1	01C	Floor tile mastic – yellow	Visitor's Office	None Detected
2	02A	Pipe wrap – yellow	Utility Room/ Women's Restroom	None Detected
2	02A	Pipe wrap sealant – white	Utility Room/ Women's Restroom	None Detected
2	02B	Pipe wrap – yellow	Utility Room/ Women's Restroom	None Detected
2	02B	Pipe wrap sealant – white	Utility Room/ Women's Restroom	None Detected
2	02C	Pipe wrap – yellow	Utility Room/ Women's Restroom	None Detected
2	02C	Pipe wrap sealant – white	Utility Room/ Women's Restroom	None Detected
3	03A	Drywall – brown & white	Visitor's Room	None Detected
3	03A	Drywall joint compound – white	Visitor's Room	None Detected
3	03B	Drywall – brown & white	Visitor's Room	None Detected
3	03B	Drywall joint compound – white	Visitor's Room	None Detected
3	03C	Drywall – brown & white	Visitor's Room	None Detected
3	03C	Drywall joint compound – white	Visitor's Room	None Detected
4	04A	Ceiling Tile	Women's Restroom	None Detected
4	04B	Ceiling Tile	Women's Restroom	None Detected
4	04C	Ceiling Tile	Women's Restroom	None Detected
5	05A	HVAC Duct Wrap	Janitor Area	None Detected

Table 3-1: Summary of Asbestos Sample Results – Lebanon Northbound Rest Area

HA#	Sample ID	Material Description	Location	Asbestos Content
5	05B	HVAC Duct Wrap	Janitor Area	None Detected
5	05C	HVAC Duct Wrap	Janitor Area	None Detected

Bold – Indicates asbestos content greater than 1%.

3.1 Assumed Asbestos Containing Materials

Metric observed asphalt roofing materials on two, wood-framed outbuildings located within the boundaries of the wastewater treatment facility. The larger, primary building located within the boundaries of the wastewater treatment facility area has a steel roof. All other buildings including the primary Welcome Center, associated vending building and connecting exterior porticos also had steel roofing. Soffits beneath the roofs and the exterior walls of these buildings consisted of painted wood.

The asphalt roofing materials on the two outbuildings were not sampled due to safety concerns. The assumed asphalt roofing materials are classified as Category 1 non-friable ACMs and appeared to be in good condition. Asbestos containing Category 1 non-friable asphalt roofing products that will not be made friable through normal demolition methods are not regulated under the National Emission Standards for Hazardous Air Pollutants (NESHAP) Standard or the Indiana Solid Waste Management Rule. Normal mechanical demolition activities are not anticipated to make the asphalt roofing materials a regulated ACM that would require removal prior to demolition.

Additional assumed ACMs consist of pipe connections observed in the water/wastewater utility closets located adjacent to the men’s and women’s restroom facilities. Metric was unable to collect samples from these pipe connections as the rest area facility was in operation and in use at the time of the inspection and sample collection would have resulted in damage and loss of function to the pipe connections.

A quantitative tabulation of assumed asbestos containing materials (ACMs) can be found in **Table 3-3** below.

Table 3-3: Assumed Asbestos Containing Materials

Material Description	Location	Approximately Quantity
Asphalt Roofing Material	Outbuilding 1 in wastewater treatment area	8 SF
Asphalt Roofing Material	Outbuilding 2 in wastewater treatment area	20 SF
Pipe Connections	Utility Closet Adjacent to Men’s Bathroom	~14 LF
Pipe Connections	Utility Closet Adjacent to Women’s Bathroom	~14 LF

SF: Square feet

*Quantity identified represents approximate amount which may be encountered and does not represent observed conditions as the roof was not accessed.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Metric Environmental (Metric) performed an asbestos inspection and survey of the Clear Creek Welcome Center and Rest Area located in Vigo County, Indiana. The purpose of this report is to convey the findings, conclusions and recommendations of the asbestos inspection.

Assumed Asbestos Containing Material Category I and Category II Non-friable Material:

- Asphalt Roofing materials* assumed (not sampled)
- Pipe Connectors *assumed (not sampled)

Asphalt roofing material is a Category I non-friable ACM and is unlikely to become friable when disturbed. If this material is anticipated to be disturbed by means and methods other than normal wrecking procedures such as sanding, grinding, or abrading, Metric recommends these materials be removed and disposed prior to such activities and assumed materials be sampled and analyzed to determine if the materials are asbestos containing.

The pipe connectors are considered a Category II non-friable material. The material could become regulated and friable during demolition and disposal activities. The materials were not sampled at the time of inspection as the facility was currently in operation. Metric recommends the material be sampled to determine if the material is asbestos containing after building operations cease and prior to the commencement of demolition activities.

EMSL Analytical defines samples containing less than 1% asbestos as "None Detected". Therefore, analytical results have demonstrated that the materials identified in **Table 3-1** and **Table 3-2** do not contain asbestos fibers at concentrations above 1%.

Potentially regulated asbestos containing materials (RACM) were identified but not sampled during this inspection. In the event of building demolition this material must be sampled to determine proper disposal options.

Metric made a good faith effort to identify asbestos containing materials throughout the building. The asbestos inspection did not include identification of materials which may be concealed, such as between walls or buried. If suspect RACM not identified in this report are encountered during renovation/demolition activities, Metric should be contacted for inspection and possible sampling for laboratory analysis.

According to the National Emission Standard for a Hazardous Air Pollutant (NESHAP) 40 CFR 61.145 (Standard for demolition and renovation) a written notification of intention to demolish (State Form 44593) must be provided to the Indiana Department of Environmental Management, Office of Air Management 10 working days prior to renovation/demolition activities. Such asbestos abatement projects implemented in the State of Indiana must be conducted by an asbestos contractor licensed and accredited by the Indiana Department of Environmental Management (IDEM) Office of Air Management (OAM).

GENERAL SITE PHOTGRAPHS



1) View of Clear Creek Welcome Center main building.



2) View Clear Creek Welcome Center main building interior.



3) View of Clear Creek Welcome Center vending building interior.



4) View of onsite picnic shelter.

SITE PHOTOGRAPHS

Clear Creek Welcome Center
Interstate 70 Eastbound
Vigo County, Indiana
Project #: 21-0049, Task 1C





5) View of assumed asbestos containing pipe connectors located in the utility closets.



6) View of inaccessible pump house located in the maintenance area.

SITE PHOTOGRAPHS

Clear Creek Welcome Center

Interstate 70 Eastbound

Vigo County, Indiana

Project #: 21-0049, Task 1C



LABORATORY ANALYTICAL AND CHAIN OF CUSTODY



EMSL Analytical, Inc.

6340 CastlePlace Dr. Indianapolis, IN 46250

Tel/Fax: (317) 803-2997 / (317) 803-3047

<http://www.EMSL.com> / indianapolislab@emsl.com

EMSL Order: 162226945

Customer ID: MTRC42

Customer PO:

Project ID:

Attention: Elayna Stoner
Metric Environmental
6958 Hillside Court
Indianapolis, IN 46250

Phone: (317) 315-3322

Fax:

Received Date: 11/17/2022 9:51 AM

Analysis Date: 11/17/2022 - 11/18/2022

Collected Date: 11/16/2022

Project: 21-0049 1C CLEAR CREEK REST AREA

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
01A-Floor Tile <small>162226945-0001</small>	12 X 12 VINYL FLOOR TILE, VISITORS OFFICE	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01A-Mastic <small>162226945-0001A</small>	12 X 12 VINYL FLOOR TILE, VISITORS OFFICE	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01B-Floor Tile <small>162226945-0002</small>	12 X 12 VINYL FLOOR TILE, VISITORS OFFICE	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01B-Mastic <small>162226945-0002A</small>	12 X 12 VINYL FLOOR TILE, VISITORS OFFICE	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01C-Floor Tile <small>162226945-0003</small>	12 X 12 VINYL FLOOR TILE, VISITORS OFFICE	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01C-Mastic <small>162226945-0003A</small>	12 X 12 VINYL FLOOR TILE, VISITORS OFFICE	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02A-Insulation <small>162226945-0004</small>	PIPE WRAP-UTILITY ROOM / WOMENS BATH	Yellow Fibrous Homogeneous	98% Min. Wool	2% Non-fibrous (Other)	None Detected
02A-Sealant <small>162226945-0004A</small>	PIPE WRAP-UTILITY ROOM / WOMENS BATH	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02B-Insulation <small>162226945-0005</small>	PIPE WRAP-UTILITY ROOM / WOMENS BATH	Yellow Fibrous Homogeneous	98% Min. Wool	2% Non-fibrous (Other)	None Detected
02B-Sealant <small>162226945-0005A</small>	PIPE WRAP-UTILITY ROOM / WOMENS BATH	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02B-Wrap <small>162226945-0005B</small>	PIPE WRAP-UTILITY ROOM / WOMENS BATH	Tan/Silver Fibrous Homogeneous	75% Cellulose 15% Glass	10% Non-fibrous (Other)	None Detected
02C-Insulation <small>162226945-0006</small>	PIPE WRAP-UTILITY ROOM / WOMENS BATH	Yellow Fibrous Homogeneous	98% Min. Wool	2% Non-fibrous (Other)	None Detected
02C-Sealant <small>162226945-0006A</small>	PIPE WRAP-UTILITY ROOM / WOMENS BATH	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
3A-Drywall <small>162226945-0007</small>	DRYWALL / VISITORS ROOM	Brown/White Fibrous Heterogeneous	40% Cellulose	50% Gypsum 10% Non-fibrous (Other)	None Detected
3A-Joint Compound <small>162226945-0007A</small>	DRYWALL / VISITORS ROOM	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
3B-Drywall <small>162226945-0008</small>	DRYWALL / VISITORS ROOM	Brown/White Fibrous Heterogeneous	40% Cellulose	50% Gypsum 10% Non-fibrous (Other)	None Detected

Report amended: 11/18/2022 14:31:08 Replaces initial report from: 11/18/2022 09:33:21 Reason Code: Data Entry-Change to Project



EMSL Analytical, Inc.

6340 CastlePlace Dr. Indianapolis, IN 46250

Tel/Fax: (317) 803-2997 / (317) 803-3047

<http://www.EMSL.com> / indianapolislab@emsl.com

EMSL Order: 162226945
Customer ID: MTRC42
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
3B-Joint Compound <i>162226945-0008A</i>	DRYWALL / VISITORS ROOM	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
3C-Drywall <i>162226945-0009</i>	DRYWALL / VISITORS ROOM	Brown/White Fibrous Heterogeneous	40% Cellulose 2% Glass	50% Gypsum 8% Non-fibrous (Other)	None Detected
3C-Joint Compound <i>162226945-0009A</i>	DRYWALL / VISITORS ROOM	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
4A <i>162226945-0010</i>	CEILING TILE / WOMENS BATHROOM	Brown/White Fibrous Heterogeneous	30% Cellulose 2% Glass	60% Gypsum 2% Mica 6% Non-fibrous (Other)	None Detected
4B <i>162226945-0011</i>	CEILING TILE / WOMENS BATHROOM	Brown/White Fibrous Heterogeneous	30% Cellulose 2% Glass	60% Gypsum 2% Mica 6% Non-fibrous (Other)	None Detected
4C <i>162226945-0012</i>	CEILING TILE / WOMENS BATHROOM	Brown/White Fibrous Heterogeneous	30% Cellulose 2% Glass	60% Gypsum 2% Mica 6% Non-fibrous (Other)	None Detected
5A-Insulation <i>162226945-0013</i>	HVAC DUCT WRAP / JANITORS AREA	Black/Yellow Fibrous Homogeneous	98% Min. Wool	2% Non-fibrous (Other)	None Detected
5A-Wrap <i>162226945-0013A</i>	HVAC DUCT WRAP / JANITORS AREA	White/Silver Fibrous Homogeneous	70% Cellulose 15% Glass	15% Non-fibrous (Other)	None Detected
5B-Insulation <i>162226945-0014</i>	HVAC DUCT WRAP / JANITORS AREA	Black/Yellow Fibrous Homogeneous	98% Min. Wool	2% Non-fibrous (Other)	None Detected
5B-Wrap <i>162226945-0014A</i>	HVAC DUCT WRAP / JANITORS AREA	White/Silver Fibrous Homogeneous	70% Cellulose 15% Glass	15% Non-fibrous (Other)	None Detected
5C-Insulation <i>162226945-0015</i>	HVAC DUCT WRAP / JANITORS AREA	Black/Yellow Fibrous Homogeneous	98% Min. Wool	2% Non-fibrous (Other)	None Detected
5C-Wrap <i>162226945-0015A</i>	HVAC DUCT WRAP / JANITORS AREA	White Fibrous Homogeneous	75% Cellulose 15% Glass	10% Non-fibrous (Other)	None Detected

Analyst(s)

Alison Pacey (19)

Hannah Morgan (9)

Asbestos Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Indianapolis, IN NVLAP Lab Code 200188-0, AZ0939, CA 2575, CO AL-15132, TX 300262

Report amended: 11/18/2022 14:31:08 Replaces initial report from: 11/18/2022 09:33:21 Reason Code: Data Entry-Change to Project



Asbestos Chain of Custody (Air, Bulk, Soil)

EMSL Order Number / Lab Use Only

EMSL Analytical, Inc.
6340 Castleplace Drive
Indianapolis, IN 46250

PHONE: (317) 803-2997
EMAIL: indianapolislab@EMSL.com

EMSL ANALYTICAL, INC.
TESTING LABS • PRODUCTS • TRAINING

162226945

If Bill-To is the same as Report-To leave this section blank. Third-party billing requires written authorization.

Customer Information	Customer ID:	Billing ID:
	Company Name: <u>Metric Environmental</u>	Company Name: <u>SAME</u>
	Contact Name: <u>Elayna Stoner</u>	Billing Contact:
	Street Address: <u>6958 Hillside Ct.</u>	Street Address: <u>←</u>
	City, State, Zip: <u>Indianapolis, IN 46280</u> Country:	City, State, Zip: Country:
	Phone: <u>317-315-3322</u>	Phone:
Email(s) for Report: <u>elaynas@metricenv.com</u>	Email(s) for Invoice:	

Project Information

Project Name/No: 21-0049 1C Clear Creek Rest Area Purchase Order:

EMSL LIMS Project ID: (If applicable, EMSL will provide) US State where samples collected: IN State of Connecticut (CT) must select project location: Commercial (Taxable) Residential (Non-Taxable)

Sampled By Name: Elayna Stoner Sampled By Signature: Elayna Stoner No. of Samples in Shipment:

Turn-Around-Time (TAT)

3 Hour 4.5 Hour 6 Hour 24 Hour 32 Hour 48 Hour 72 Hour 96 Hour 1 Week 2 Week

TEM Air 3-6 Hour, please call ahead to schedule. 32 Hour TAT available for select tests only; samples must be submitted by 11:30 am.

Test Selection

PCM Air

NIOSH 7400 AHERA 40 CFR, Part 763

NIOSH 7400 w/ 8hr. TWA NIOSH 7402

PLM - Bulk (reporting limit) EPA Level II

PLM EPA 600/R-93/116 (<1%) ISO 10312*

PLM EPA NOB (<1%) TEM - Bulk

POINT COUNT TEM EPA NOB

400 (<0.25%) 1,000 (<0.1%) NYS NOB 198.4 (Non-Friable-NY)

POINT COUNT w/ GRAVIMETRIC TEM EPA 600/R-93/116 w Milling Prep (0.1%)

400 (<0.25%) 1,000 (<0.1%) Soil - Rock - Vermiculite (reporting limit)*

NIOSH 9002 (<1%) TEM Qualitative via Filtration Prep

NYS 198.1 (Friable - NY) TEM Qualitative via Drop Mount Prep

NYS 198.6 NOB (Non-Friable - NY)

NYS 198.8 (Vermiculite SM-V)

**Please call with your project-specific requirements.*

Positive Stop - Clearly Identified Homogeneous Areas (HA) Filter Pore Size (Air Samples) 0.8um 0.45um

Sample Number	Sample Location / Description	Volume, Area or Homogeneous Area	Date / Time Sampled (Air Monitoring Only)
01A	12x12 Vinyl Floor Tile, Visitors Office	Visitors office Area	11/16/22
01B	↓	↓	
01C	↓	↓	
02A	Pipe Wrap - Utility Rm / Womens Bath	Utility Rm	11/16/22
02B	↓	↓	
02C	↓	↓	

Special Instructions and/or Regulatory Requirements (Sample Specifications, Processing Methods, Limits of Detection, etc.)

15 Total Samples

Method of Shipment:	Sample Condition Upon Receipt:
Relinquished by: <u>Elayna Stoner</u> Date/Time: <u>11/17/22</u>	Received by: <u>DBughan</u> <u>11/17/22</u> <u>9:51 AM</u>
Relinquished by: <u>Elayna Stoner</u> Date/Time: <u>9:42 am</u>	Received by: <u>WJ</u> Date/Time: <u>WJ</u>

Controlled Document - COC-05 Asbestos R15 4/23/2021 AGREE TO ELECTRONIC SIGNATURE (By checking, I consent to signing this Chain of Custody document by electronic signature.)

EMSL Analytical, Inc.'s Laboratory Terms and Conditions are incorporated into this Chain of Custody by reference in their entirety. Submission of samples to EMSL Analytical, Inc. constitutes acceptance and acknowledgment of all terms and conditions by Customer.

Indiana Department of Transportation

County Vigo

Route I-70

Des. No. 1902855

ENVIRONMENTAL COMMITMENTS

List all commitments and include the name of agency/organization requesting/requiring the commitment(s). Listed commitments should be numbered.

Firm:

- 1) If the scope of work or permanent or temporary right-of-way amounts change, the INDOT Environmental Services Division (ESD) and the INDOT District Environmental Section will be contacted immediately. (INDOT ESD and INDOT District)
- 2) It is the responsibility of the project sponsor to notify school corporations and emergency services at least two weeks prior to any construction that would block or limit access. (INDOT ESD)
- 3) UNT 2, UNT 3, UNT 4 and UNT 6 to Clear Creek will be labeled on the plans as "Do Not Disturb". (INDOT ESD)
- 4) Wetland A and B will be labeled on the plans as "Do Not Disturb". (INDOT ESD)
- 5) Any work in a wetland area within right-of-way or in borrow/waste areas is prohibited unless specifically allowed in the U.S. Army Corps of Engineers permit. (INDOT EWPO)
- 6) USFWS Bridge/Structure Assessments are only valid for two years. If construction will begin after October 26, 2024, of the building demolitions an inspection of the structures by a qualified individual, must be performed. Inspection of the structures should check for presence of bats/bat indicators and/or presence of birds. The results of the inspections must indicate no signs of bats or birds. If signs of bats or birds are documented during this inspection, the INDOT District Environmental Manager must be contacted immediately. (INDOT ESD)
- 7) General AMM 1: Ensure all operators, employees, and contractors working in areas of known or presumed bat habitat are aware of all FHWA/FRA/FTA (Transportation Agencies) environmental commitments, including all applicable AMMs. (USFWS)
- 8) Lighting AMM 1: Direct temporary lighting away from suitable habitat during the active season. (USFWS)
- 9) Lighting AMM 2: When installing new or replacing existing permanent lights, use downward-facing, full cut-off 2 lens lights (with same intensity or less for replacement lighting); or for those transportation the goal is to be as close to 0 for all three ratings with a priority of "uplight" of 0 and "backlight" as low as practicable. (USFWS)
- 10) Tree Removal AMM 1: Modify all phases/aspects of the project (e.g., temporary work areas, alignments) to the extent practicable to avoid tree removal in excess of what is required to implement the project safely. (USFWS)
- 11) Tree Removal AMM 2: Apply time of year (TOY) restrictions (April 1 - September 30) for tree removal when bats are not likely to be present, or limit tree removal to 10 or fewer trees per project at any time of year within 100 ft. of existing road/rail surface and outside of documented roosting/foraging habitat or travel corridors; visual emergence survey must be conducted with no bats observed. (USFWS)
- 12) Tree Removal AMM 3: Ensure tree removal is limited to that specified in project plans and ensure that contractors understand clearing limits and how they are marked in the field (e.g., install bright colored flagging/fencing prior to any tree clearing to ensure contractors stay within clearing limits). (USFWS)
- 13) Tree Removal AMM 4: Do not remove documented Indiana bat or NLEB roosts that are still suitable for roosting; or trees within 0.25 miles of roosts; or documented foraging habitat any time of year. (USFWS)

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- 14) The Project Sponsor will assure that \$78,302.00 of Preliminary Engineering funds will be allocated to the Range-wide In-Lieu Fee Program, administered by The Conservation Fund, to resolve formal consultation under the Range-wide Programmatic (4.25 acres X 1.75 mitigation ratio X \$10,528 = \$78,302.00). Payment shall be in process at the RFC date. (USFWS)
- 15) In March 2022, the Service proposed to reclassify the NLEB from its current status as federally threatened to federally endangered. The original NLEB listing and current reclassification proposal are due to dramatic population declines associated with white-nose syndrome (WNS), a deadly fungal disease affecting hibernating bats such as the NLEB. On November 30, 2022, the reclassification action was finalized, and the new listing will go into effect January 30, 2023. Once the new classification is effective, re-initiation on this project due to the change in listing status for the NLEB will be required. At that time, an updated 2023 Programmatic Consultation and determination key (via the Information for Planning and Consultation website; IPAC) will be available for use. (USFWS)
- 16) Contractors must take care when handling dead or injured bats (regardless of species), and any other federally listed species that are found at the Project site in order to preserve biological material in the best possible condition and protect the handler from exposure to diseases, such as rabies. Project personnel are responsible for ensuring that any evidence about determining the cause of death or injury is not unnecessarily disturbed. Reporting the discovery of dead or injured listed species is required in all cases to enable the Service to determine whether the level of incidental take exempted by the BO is exceeded, and to ensure that the terms and conditions are appropriate and effective. Parties finding a dead, injured, or sick specimen of any bat (regardless of species), or other endangered or threatened species, must promptly notify the USFWS Bloomington Field Office at (812) 334-4261. (USFWS)
- 17) A "Reinitiation Notice" is required if: more than 4.25 acres of trees are to be cleared between 100 and 300 ft. from the edge of pavement; the amount or extent of incidental take of Indiana bat is exceeded; new information about listed species is encountered; new species is listed or critical habitat designated that the project may affect; the project is modified in a manner that causes an effect to the listed species; or, new information reveals that the project may affect listed species or critical habitat in a manner not considered in the project information. (USFWS)
- 18) Metric will re-initiate coordination with USFWS, after January 30, 2023, when the new NLEB listing status takes effect, to determine if an updated determination key is required. (USFWS)
- 19) Avoid or replace survey markers and benchmarks that may be disturbed or damaged due to proposed construction. The Vigo County Surveyor's Office would like the benchmark preserved, if possible. If not preserved and instead destroyed, the information should be transferred to a New Benchmark and that information filed in the Vigo County Surveyor's office. Impacted Survey Markers should be reset with a Harrison Survey Marker, supplied by the Vigo County Surveyor's Office. (Vigo County Surveyor)
- 20) Sugar Creek Consolidated Elementary School is south-adjacent to the central portion of the project area and Big Sprouts Pre-School is north-adjacent to the central portion of the project area. Coordination with Sugar Creek Consolidated Elementary School and Big Sprouts Pre-School will occur. (INDOT SAM)
- 21) One (1) pipeline segment, Terre Haute Gas Corp., crosses and parallels the central and eastern portions of the project area. One (1) pipeline segment, Amoco Oil Company, is located approximately 0.04 mile from the west end of the exit to the rest area park. Coordination with INDOT Utilities and Railroads will occur. (INDOT SAM)
- 22) Four (4) underground mine polygons, all representing former coal mines that are no longer in operation, are within or adjacent to the project area. Coordination with IDNR Reclamation Division will occur. (INDOT SAM)

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- 23) West Side Salvage, 3151 Old US Hwy. 40, AI #57857, is adjacent south of the project area on the west side of Darwin Road between 9th Drive and Old US 40. The site, an apparent salvage yard, is not listed in the GIS layer and was visually identified from aerial photography. Although the site was assigned an AI number, no files are available in the VFC. If the Darwin Road alternative is selected, a Phase II Environmental Site Assessment is recommended to occur before RFC. Prior to any investigation activities, a scope of work plan will be prepared and submitted to INDOT SAM for review and approval. (INDOT SAM)
- 24) Powers Property, 603 S. Hovey Pl., AI #103663, is approximately 0.05 mile northeast of the east end of the project area. The IDEM Brownfields Program provided an eligibility letter to an economic development agency in December 2011. The eligibility letter noted that although the current use of the site was exclusively residential, a small auto repair business had been operated out of a detached garage from circa 1975 until 1994. No record of contamination, petroleum storage, or on-site disposal from this historic use was found in IDEM's review of information. IDEM determined that the economic development agency was eligible to use Brownfield funding to aid in the redevelopment of the property. No action was ever taken. If the Darwin Road alternative is selected, a Phase II Environmental Site Assessment is recommended to occur before RFC. Prior to any investigation activities, a scope of work plan will be prepared and submitted to INDOT SAM for review and approval. (INDOT SAM)
- 25) Clear Creek Welcome Center, I-70 MM 1, Permit #IN0056154, is located in the welcome center portion of the project area. The listing is for the package treatment plant at the welcome center, with an effective permit that expires July 31, 2027. Coordination with INDOT will occur. (INDOT SAM)
- 26) Clear Creek Welcome Center, NPDES #IN0056154, is an outfall pipe to Clear Creek from the package treatment plant at the welcome center. Coordination with INDOT will occur. (INDOT SAM)

For Further Consideration:

- 27) Do not cut any trees suitable for Indiana bat or Northern Long-eared bat roosting (greater than 5 inches dbh, living or dead, with loose hanging bark, or with cracks, crevices, or cavities) from April 1 through September 30. (IDNR-DFW)
- 28) All directional boring at creek or stream crossings should be done using a trenchless method. The length of the bore should include any forested riparian areas along the creek to minimize impacts to forested habitat. Install erosion control measures such as silt fencing or other appropriate devices around directional drilling pits in order to prevent drilling mud from leaving the immediate area of the pit or entering the stream. (IDNR-DFW)
- 29) Any open-trench stream crossing should be timed to coincide with the low-water time of year (typically mid- to late-summer). (IDNR-DFW)
- 30) Restore disturbed streambanks using bioengineering bank stabilization methods and revegetate disturbed banks with native trees, shrubs and herbaceous plants. Stream bank slopes after project completion should be restored to stable-slope steepness (not steeper than 2:1). (IDNR-DFW)
- 31) The cleared width through any forested area as a result of directional boring should be the minimum needed to install the line and no more than 20 ft. wide through the forested area to allow the canopy to close over the line. (IDNR-DFW)
- 32) Use graded stone or riprap to protect the section of trench below the normal water level from scour or erosion (any stone or riprap fill in the streambed must not be placed above the existing streambed elevation to avoid creating a fish passage obstruction). (IDNR-DFW)

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- 33) A minimum 35 ft. wide forested buffer should be maintained on the east side of the rest area between the cleared areas and the top of bank on both sides of the stream (IDNR-DFW).
- 34) Impacts to non-wetland forest of one (1) acre or more should be mitigated at a minimum 2:1 ratio. If less than one acre of non-wetland forest is removed in a rural setting, replacement should be at a 1:1 ratio based on area. Impacts to non-wetland forest under one (1) acre in an urban setting should be mitigated by planting five trees, 1 inch to 2 inches in diameter-at-breast height (dbh), for each tree which is removed that is 10 inches dbh or greater (5:1 mitigation based on the number of large trees) or by using the 1:1 replacement ratio based on area depending on the type of habitat impacted (individual canopy tree removal in an urban streetscape or park-like environment versus removal of habitat supporting a tree canopy, woody understory, and herbaceous layer). Impacts under 0.10 acre in an urban area may still involve the replacement of large diameter trees but typically do not require any additional mitigation or additional plantings beyond seeding and stabilizing disturbed areas. There are exceptions for high quality habitat sites however. The mitigation site should be located in the floodway, downstream of the one (1) square mile drainage area of that stream (or another stream within the 8-digit HUC, preferably as close to the impact site as possible) and adjacent to existing forested riparian habitat. (IDNR-DFW)
- 35) Culverts should span the active stream channel, should be either embedded or a 3-sided or open-arch culvert, and be installed where practicable on an essentially flat slope. When an open-bottom culvert or arch is used in a stream, which has a good natural bottom substrate, such as gravel, cobbles and boulders, the existing substrate should be left undisturbed beneath the culvert to provide natural habitat for the aquatic community. (USFWS)
- 36) Minimize the extent of hard armor (riprap) in bank stabilization by using bioengineering techniques whenever possible. If riprap is utilized for bank stabilization, extend it below low-water elevation to provide aquatic habitat. (USFWS)
- 37) Avoid all work within the inundated part of the stream channel (in perennial streams and larger intermittent streams) during the fish spawning season (April 1 through June 30), except for work within sealed structures such as caissons or cofferdams that were installed prior to the spawning season. No equipment shall be operated below Ordinary High-Water Mark during this time unless the machinery is within the caissons or on the cofferdams. (USFWS)
- 38) Evaluate wildlife crossings under bridge/culverts projects in appropriate situations. Suitable crossings include flat areas below bridge abutments with suitable ground cover, high water shelves in culverts, amphibian tunnels and diversion fencing. (USFWS)
- 39) Restrict below low-water work in streams to placement of culverts, piers, pilings and/or footings, shaping of the spill slopes around the bridge abutments, and placement of riprap. (USFWS)

BID FORM ATTACHMENT A - BID PRICES
OWNER: INDOT
PROJECT: Clear Creek Rest Stop - Wastewater

Bidder will complete the Work for the following Unit price(s):

Administrative

- 1 Mobilization/Demobilization *(not to exceed 5% of base bid)*
- 2 Maintenance of Traffic

Sitework

- 3 Erosion Control
- 4 Structure Backfill
 - 4.01 Over Gravity Sewers and Sewer Force Mains
- 5 Boring with Casing Pipe
 - 5.01 18-inch Casing

Meters

- 6 Sewer Force Main Meters
 - 6.01 2-inch Meter w/ Bypass

Gravity Sanitary Sewers

- 7 8-inch Gravity Sanitary Sewers
 - 7.01 8-inch Gravity Sanitary Sewers
- 8 4-foot Dia. Gravity Sanitary Sewer Manholes
 - 8.01 4-foot Dia. Gravity Sanitary Sewer Manholes

Lift Stations and Force Mains

- 9 Lift Stations
 - 9.01 Submersible Lift Station
- 10 Sewer Force Mains
 - 10.01 4" Force Main, HDD
- 11 Sewer Force Main Connections and Cleanouts
 - 11.01 Force Main Connection to Existing Structure
 - 11.02 Force Main Cleanouts
- 12 Force Main Air Release Valves
 - 12.01 1-inch Combination Force Main Air Valves

Lawns and Grasses

- 13 Lawns and Grasses
 - 13.01 Seeding

Estimated Quantity	Unit Type	Unit Price	Estimated Price
	1 LS		
	1 LS		
	1 LS		
	2,210 CY		
	550 LF		
	1 EA		
	1,062 LF		
	4 EA		
	1 LS		
	6,600 LF		
	1 EA		
	5 EA		
	2 EA		
	318 SY		

Total Unit Price Base Bid Amount, inclusive of all Pay Items:

_____ *(words)*

\$

_____ *(numerals)*

Bidder: _____

Date: _____

By: _____

(Signature of Bid Form Signatory)

Name (typed or printed): _____

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Project information.
- 2. Work covered by Contract Documents.
- 3. Contractor's use of site and premises.
- 4. Work restrictions.
- 5. Specification and Drawing conventions.

B. Related Requirements:

- 1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
- 2. Section 017300 "Execution" for coordination of Owner-installed products.

1.3 DEFINITIONS

- A. Work Package: A group of specifications, drawings, and schedules prepared by the design team to describe a portion of the Project Work for pricing, permitting, and construction.

1.4 PROJECT INFORMATION

A. Project Identification: PWP# 37005000-21-019-C1 ClearCreek Welcome Center

- 1. Project Location: EB I-70, West Terre Haute, Indiana.

B. Owner: The Department of Administration, Public Works Division, State of Indiana.

- 1. Owner's Representative: Carol French, Staff Architect

C. Using Agency: Indiana Department of Transportation, State of Indiana.

- 1. User's Representative: Steve McAvoy, Statewide Facilities Director
- 2. User's Representative: Lauren Wilburn, Statewide Facilities Manager

D. Owner Consultants: Owner has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. Drawing Sets # 1, # 2, # 3: Have been prepared by the following:
 - a. Architectural: Synthesis, Inc.
 - 1) 251 N Illinois Street, Suite 200, Indianapolis, IN 446204
 - 2) Phone: 317-424-3516
 - b. Plumbing, Mechanical and Electrical Engineering: Applied Engineering Services
 - 1) 5975 Castle Creek Pkwy. N. Dr., Suite 300, Indianapolis, IN 46250
 - 2) Phone: 317-810-4141
2. Drawing Set #4: Has been prepared by the following:
 - a. Architectural: RATIO, Landscape Architecture
 - 1) 101 S. Pennsylvania Street, Indianapolis, IN 46204
 - 2) Phone: 317-238-4688
3. Drawing Sets # 5: Has been prepared by the following:
 - a. Civil and Engineering: JSE, Janssen & Spaans Engineering.
 - 1) 9120 Harrison Park Court, Indianapolis, Indiana 46216
 - 2) Phone: 317-254-9686
4. Drawing Sets # 6: Has been prepared by the following:
 - a. Civil and Engineering: BLN
 - 1) 505 S. Woodcrest Drive, Bloomington, Indiana 47401
 - 2) Phone: 812-803-6227

1.5 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:

1. Drawing Set # 1: Welcome Center # 1 Building
 - 1) Work within the building perimeter and mechanical courtyard perimeter, and the associated exterior perimeter of the building required for footing installation. Reference Drawing sets #5 and #6 for additional information for courtyard concrete pavement type and elevations.
 - 2) Work defined in the structural and architectural drawings, including but not limited to cast-in-Place concrete, masonry, structural steel, decking, cold formed framing, metal fabrications, specialty metals, sheathing, waterproofing, roof systems, insulation systems, metal and composite material wall panels, curtain wall and storefront systems, specialty glazing systems, doors, door hardware, interior finishes, specialties and furnishings.
 - 3) Work defined in the mechanical, electrical and plumbing drawings within the building perimeter and extensions to connections to site utility services.
2. Drawing Set # 2: Trucker Restroom Buildings
 - 1) Work within the building perimeter and associated mechanical units, including the associated exterior perimeter of the building required for footing installation.
 - 2) Work defined in the structural and architectural drawings, including but not limited to cast-in-Place concrete, masonry, structural steel, decking, cold formed framing, metal fabrications, specialty metals, sheathing, roof systems, insulation systems, composite material wall panels, storefront systems, doors, door hardware, interior finishes.

- 3) Work defined in the mechanical, electrical and plumbing drawings within the building perimeter and extensions to connections to site utility services.
3. Drawing Set # 3: Maintenance Building and Dumpster Enclosures:
 - 1) Work within the Maintenance Building's perimeter and courtyard perimeter, and the associated exterior perimeter of the building required for footing installation. Reference Drawing Sets #5 and #6 for additional information for courtyard concrete pavement type and elevations.
 - 2) Work within the Dumpster Enclosure's perimeter and the associated exterior perimeter required for footing installation. Reference Drawings Sets #5 and #6 for additional information for courtyard concrete pavement type and elevations.
 - 3) Work defined in the structural and architectural drawings, including but not limited to cast-in-place concrete, masonry, structural steel, decking, cold formed framing, metal fabrications, specialty metals, sheathing, roof systems, insulation systems, composite material wall panels, storefront systems, coiling door, door, door hardware and interior finishes.
 - 4) Work defined in the mechanical, electrical and plumbing drawings within the building perimeter and extensions to connections to site utility services.
 4. Drawing Set # 4: Landscape:
 - 1) All work listed on the L series sheet and associated specifications and other Work indicated in the Contract Documents include the following site improvements for the eastbound welcome center site.
 - 3) Pedestrian pavement finishes: This work includes finishes to pedestrian pavement as noted on the drawings.
 - 4) Planting: Including but not limited to, all trees, shrubs, sod, seeded lawn, native seeding, and perennials. Includes installation, maintenance and warranties listed.
 - 5) Site amenities: Including but not limited to playground equipment, playground surfacing, workout equipment, benches, trash receptacles, fences, and signage.
 5. Drawing Set # 5: Site:
 - 1) Traffic Maintenance: Install closure signs on all Rest Area signs along I-70. Coordinate with INDOT TMC to show the truck spots as unavailable. Post advanced warning signs of the closure two weeks prior.
 - 2) Removals: Install appropriate erosion control before beginning work. All existing infrastructure is to be removed. Remove all buildings, ancillary structures, pavement, drainage structures, pipes and culverts. Remove existing light poles including foundations. Remove existing cameras and poles including foundations. Remove the existing traffic monitoring equipment. Store the cameras, poles and traffic monitoring equipment for reuse. Remove existing wastewater treatment plant in accordance with IDEM standards. Trees shall only be removed if not to be included in the final landscape.
 - 3) Grading: Strip topsoil from site and store for future use. Rough grade site to new grading plan. Excavate detention ponds and place liner
 - 4) Inground Work: Install all drainage features and utilities including power, telecommunications, sanitary sewer and water lines
 - 5) Paving: Install concrete paving in the truck parking lots and the car parking lot ramps. Construct sidewalks, paths and curbs
Lighting and ITS: Install new light poles and luminaires. Standard INDOT poles are to be used in the truck parking lot. Decorative poles and fixtures are to be

installed in the car parking lot and around the rest area building. Reinstall the cameras and traffic monitoring equipment on new foundations

- 6) Finish grading and seeding: Finish grade the site and place the topsoil in the planting areas. Seed all other bare areas not indicated in Drawing Set # 4.
- 7) Commissioning Check all mechanical and electrical features for proper operations.

7. Drawing Set # 6: Sanitary:

- 1) Sanitary: All work indicated for gravity lines, force main, Lift station and associated piping.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.6 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Unrestricted Use of Site: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Limits on Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1.7 WORK RESTRICTIONS

- A. Comply with restrictions on construction operations.
 1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work to between 6:00 a.m. to 6:00 p.m., Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by Owner and authorities having jurisdiction.
- C. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, and other controlled substances on Project site is not permitted.

1.8 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

- B. Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.
- C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings and published as part of the U.S. National CAD Standard.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:

- 1. Base Bid Lump Sum Allowances

- a. Remediation Unforeseen Constraints
 - b. Unsatisfactory Soil Excavation, Disposal and Replacement
 - c. Commissioning Agent
 - d. Storm Water Control Monitoring Agent
 - e. Art Exhibits- Hamilton Exhibits
 - f. CenterPoint Energy- Natural Gas Utility
 - g. Terrazzo Floor
 - h. State Seal
 - i. IMS Logo
 - j. Printed Acrylic Art Panels & Installation
 - k. Access Control System
 - l. Ribbon Wall (Linel)
 - m. Winner's Walk Signs (Bo-mar)
 - n. Borg-Warner Trophy (Bo-mar)
 - o. Pylon (Bo-mar)
 - p. Perforated Metal Story Wall (Bo-mar)
 - q. Furniture
 - r. Professional Photography
 - s. Utility Vehicle
 - t. Independent Quality Control Monitoring Agent

- ~~2. Alternate Bid Lump Sum Allowances~~

- ~~a. Horticulture Soil Testing and Recommendation Allowance~~
 - ~~b. Soil Amendments Allowance.~~
 - ~~e. Vertical Wind Turbine Allowance.~~
 - ~~d. Access Control System Allowance.~~
 - ~~e. Blade Mural Allowance.~~
 - ~~f. Interior Furniture Allowance.~~
 - ~~g. Utility Vehicle Allowance.~~

- C. Related Requirements:

- 1. Section 012200 "Unit Prices" for procedures for using unit prices.
 - 2. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS

- A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Engineer of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Engineer's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Engineer from the designated supplier.

1.5 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Proposal Requests.

1.6 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 LUMP-SUM ALLOWANCES

- A. Remediation Allowance:
 - 1. Contractor shall include an allowance of \$500,000.00 in the Base Bid for Owner-directed remediation of unforeseen constraints.
 - 2. Such constraints may include but are not necessarily limited to unforeseen subsurface conditions particular to this construction site; improperly recorded or unrecorded physical properties and conditions at the site; obstructions or delays to reasonable work sequences by the Institution, the using Agency, or the Owner; uncommon adverse weather or site conditions; and conflicts within or omissions from the Contract Documents.
 - 3. All remediation work shall be proposed to and authorized by Director of Public Works division prior to execution, and jointly documented by Contractor and Designer, and recorded in Contractor's as-built's and Designer's project record Documents.
 - 4. At Project closeout, credit unused amounts remaining in the remediation allowance to Owner by Change Order.
- B. Unsatisfactory Soil Excavation, Disposal and Replacement Allowance:

1. Contractor shall include an allowance of \$250,000.00 for unsatisfactory soil excavation and disposal off-site and replacement with satisfactory soil material from off-site, as specified in Section 312000 "Earth Moving."
- C. Commissioning Agent Allowance:
1. Contractor shall include an allowance of \$30,000.00 in Base Bid for Commissioning. Owner will determine Commissioning Agent and Agent will be compensated out of the allowance. The Agent will perform Commissioning services as indicated on the drawings and as directed by the Owner. If additional Commissioning services are required due to test failures the Contractor will compensate the Commissioning Agent for those additional services.
- D. Storm Water Control Monitoring Agent Allowance
1. Contractor shall include an allowance of \$40,000.00 in Base Bid for Storm Water Control Monitoring Agent. Owner will determine Storm Water Control Monitoring Agent and Agent will be compensated out of the allowance. The Agent will perform required weekly site inspections and prepare required reports and post "major rain event" reports for the project, and submit those reports to Owner, Contractor and IDEM on the General Contractor's behalf. The Contractor is responsible for notifying the Agent of any onsite rainfall that qualifies as a "major rain event". The Agent will notify the contractor of any required field changes "noted" but is not liable for the changes. The contractor remains responsible for all Storm Water Control Measures. The Agent shall not control or have charge of, and shall not be responsible for, construction means, methods, techniques, recommendations, sequences, procedures of construction, health or safety programs, or precautions connected with the work of the above referenced project or its beneficiaries or its other contractors, and shall not manage, supervise, control or have charge of construction.
- E. Arts Exhibits Allowance – Hamilton Exhibits.
1. Contractor shall include an allowance of \$800,000.00 in Base Bid for Hamilton Exhibits to furnish and install exhibits in the Welcome Center building. Hamilton Exhibits will be compensated out of the allowance.
- F. CenterPoint Energy – Natural Gas Utility Allowance.
1. Contractor shall include an allowance of \$220,000.00 in Base Bid for CenterPoint Energy to construct an offsite gas line to the welcome center site. CenterPoint Energy will be compensated out of the allowance.
 2. At Project closeout, credit unused amounts remaining in the CenterPoint Energy Natural Gas Utility allowance to Owner by Change Order.
- G. Terrazzo Flooring Allowance.
1. Contractor shall include an allowance of ~~\$360,000.00~~ **\$390,000.00** in Base Bid for furnishing and installing terrazzo flooring in Welcome Center building as indicated in the drawings. Owner will determine the provider, and provider will be compensated out of the allowance.
- H. State Seal Allowance.
1. Contractor shall include an allowance of \$27,000.00 in Base Bid for furnishing and installing the state seal in the Welcome Center Building as indicated in the drawings. Owner will determine the provider, and provider will be compensated out of the allowance.
- I. IMS Logo Allowance.
1. Co Contractor shall include an allowance of \$15,500.00 in Base Bid for furnishing and installing the IMS logo in the Welcome Center Building as indicated in the drawings. Owner will determine the provider, and provider will be compensated out of the allowance.
- J. Printed Acrylic Art Panels & Installation Allowance.
1. Contractor shall include an allowance of \$15,000.00 in Base Bid for furnishing and installing Printed Acrylic Art Panels at the welcome center site as indicated in the drawings. Owner will determine the provider, and provider will be compensated out of the allowance.
- K. Access Control System Allowance.

1. Contractor shall include an allowance of \$60,000.00 in Base Bid for furnishing and installing an Access Control System . Owner will determine the provider, and provider will be compensated out of the allowance.
 - L. Ribbon Wall Allowance:
 1. Contractor shall include an allowance of \$2,000,000.00 in Base Bid for furnishing and installing a ribbon wall at the Welcome Center Building as indicated in the drawings. Owner will determine the provider, and provider will be compensated out of the allowance.
 - M. Winner's Walk Signs Allowance – Bo-mar:
 1. Contractor shall include an allowance of \$88,000.00 in Base Bid for Bo-mar to furnish and install signs for the Winner's Walk as indicated in the drawings. Bo-mar will be compensated out of the allowance.
 - N. Borg-Warner Trophy Allowance – Bo-mar:
 1. Contractor shall include an allowance of \$665,000.00 in Base Bid for Bo-mar to furnish and install the Borg-Warner Trophy on a foundation to be constructed by Contractor as indicated in the drawings. Bo-mar will be compensated out of the allowance.
 - O. Pylon Allowance – Bo-mar:
 1. Contractor shall include an allowance of \$525,000.00 in Base Bid for Bo-mar to furnish and install the Pylon on a foundation to be constructed on a foundation constructed by Contractor as indicated in the drawings. Bo-mar will be compensated out of the allowance.
 - P. Perforated Metal Story Wall Allowance – Bo-mar.
 1. Contractor shall include an allowance of \$185,000.00 in Base Bid for Bo-mar to furnish and install the Perforated Metal Story Wall as indicated in the drawings. Bo-mar will be compensated out of the allowance.
 - Q. Furniture Allowance.
 1. Contractor shall include an allowance of \$30,000.00 in Base Bid for furnishing and installing furniture in the Welcome Center Building. Owner will determine vendors, and vendors will be compensated out of the allowance.
 - R. Professional Photography Allowance.
 1. Contractor shall include an allowance of \$10,000.00 in Base Bid for providing post construction photography of finished project. Owner will determine provider, and provider will be compensated out of the allowance.
 - S. Utility Vehicle Allowance.
 1. Contractor shall include an allowance of \$15,000.00 in Base Bid for utility vehicle. Owner will determine vendor, and vendor will be compensated out of the allowance.
 - T. Independent Quality Control Monitoring Agent Allowance
 1. Contractor shall include an allowance of \$62,000.00 in Base Bid for an Independent Quality Control Monitoring Agent. Owner will determine the provider, and provider will be compensated out of the allowance.
- 1.8 ADJUSTMENT OF ALLOWANCES
- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.
 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs

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- and other markups.
 - 3. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
 - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs due to a change in the scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
- 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.
 - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF LUMP SUM BASE BID ALLOWANCES

- A. Remediation Allowance: Include \$500,000.00 in the Base Bid for Owner directed remediation of unforeseen constraints.
- B. Unsatisfactory Soil Excavation and Disposal and Replacement Allowance: Include \$250,000.00 for unsatisfactory soil removal and replacement.
- C. Commissioning Agent Allowance: Include \$ 30,000.00 in the Base Bid for Commissioning Agent Services.
- D. Storm Water Control Monitoring Agent Allowance: Include \$40,000.00 in the Base Bid for Commissioning Storm Water Control Monitoring Agent.
- E. Arts Exhibits Allowance: Include \$800,000.00 in the Base Bid for Arts Exhibits to be Furnished and installed by Hamilton Exhibits.
- F. CenterPoint Energy Natural Gas Utility Allowance: Include \$220,000.00 in the Base Bid For CenterPoint Energy to construct an offsite natural gas line.
- G. Terrazzo Flooring Allowance: Include ~~\$360,000.00~~ \$390,000.00 in the Base Bid for furnishing and Installing Terrazzo flooring.
- H. State Seal Allowance: Include \$27,000.00 in the Base Bid for furnishing and

ALLOWANCES

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Installing the State Seal.

- I. IMS Logo Allowance: Include \$15,500.00 in the Base Bid for furnishing and installing the IMS Logo.
- J. Printed Acrylic Art Panels & Installation Allowance: Include \$15,000.00 in the Base Bid for furnishing and installing Printed Acrylic Panels.
- K. Access Control System Allowance: Include \$60,000.00 in the Base Bid for furnishing and Installing an Access Control System.
- L. Ribbon Wall Allowance: Include \$2,000,000.00 in the Base Bid for furnishing and Installing a Ribbon Wall.
- M. Winner's Walk Signs Allowance: Include \$88,000.00 in the Base Bid for Winner's Walk Signs to be furnished and installed by Bo-mar.
- N. Borg-Warner Trophy Allowance: Include \$665,000.00 in the Base Bid for the Borg-Warner Trophy to be furnished and installed by Bo-mar.
- O. Pylon Allowance: Include \$525,000.00 in the Base Bid for the Pylon to be furnished and Installed by Bo-mar.
- P. Perforated Metal Story Wall Allowance: Include \$185,000.00 in the Base Bid for Perforated Metal Story Wall to be furnished and installed by Bo-mar.
- Q. Furniture Allowance: Include \$30,000.00 in the Base Bid for furnishing and installing furniture.
- R. Professional Photography Allowance: Include \$10,000.00 in the Base Bid for providing post construction photography.
- S. Utility Vehicle Allowance: Include \$15,000.00 in the Base Bid for furnishing a utility vehicle.
- T. Independent Quality Control Monitoring Agent Allowance: Include \$62,000.00 in the Base Bid for an Independent Quality Control Monitoring Agent.

END OF SECTION 012100

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Section 012100 "Remediation Allowance" for procedures for using unit prices to adjust quantity allowances.
 - 2. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
 - 3. Section 014000 "Quality Requirements" for general testing and inspecting requirements
 - 4. Section 312000 "Earth Moving" for procedures for measurement and payment for rock excavation and excavation/fill of unsuitable soils.

1.3 DEFINITIONS

- A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

- A. Unit Price 1: Removal of unsatisfactory soil and replacement with engineered fill material.
 - 1. Description: Unsatisfactory soil excavation and disposal off site and replacement with engineered fill from off site, as required, according to Section 312000 "Earth Moving." Include testing of replaced material.
 - 2. Unit of Measurement: One (1) Cubic yards of soil excavated, based on survey of volume removed.
 - 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Remediation Allowance."

- B. Unit Price 5: Earth moving excavation for preparing for using Controlled Low Strength Material.
 - 1. Description: Earth moving excavation and preparing subgrade for Controlled Low Strength Material, as required, according to Section 312000 "Earth Moving."
 - 2. Unit of Measurement: One (1) Cubic yards of soil excavated, based on survey of volume removed.
 - 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Remediation Allowance."

- C. Unit Price 5: Controlled Low Strength Material.
 - 1. Description: Furnish and install Controlled Low Strength Material, as required, according to Section 312000 "Earth Moving."
 - 2. Unit of Measurement: One (1) Cubic yards of Controlled Low Strength Material, based on delivery ticket.
 - 3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Remediation Allowance."

END OF SECTION 012200

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 1.
 - 1. Horticulture Soil Testing and Recommendation Allowance:
 - a. Provide price to ADD Horticulture Soil Testing and Recommendation Allowance as specified in section 012100 "Allowances".

- B. Alternate No. 2.
 - 1. Soil Amendments Allowance:
 - a. Provide price to ADD Soil Amendments Allowance as specified in section 012100 "Allowances".

- C. Alternate No. 3.
 - 1. Vertical Wind Turbines Allowance:
 - a. Provide price to ADD Vertical Wind Turbines Allowance as specified in section 012100 "Allowances".

- D. Alternate No. 4.
 - 1. Access Control System Allowance:
 - a. Provide price to ADD Access Control System Allowance as specified in section 012100 "Allowances".

- E. Alternate No. 5.
 - 1. Blade Mural Allowance:
 - a. Provide price to ADD Blade Mural Allowance as specified in section 012100 "Allowances".

- F. Alternate No. 6.
 - 1. Interior Furniture Allowance:
 - a. Provide price to ADD Interior Furniture Allowance as specified in section 012100 "Allowances".

- G. Alternate No. 7.
 - 1. Utility Vehicle Allowance:
 - a. Provide price to ADD Utility Vehicle Allowance as specified in section 012100 "Allowances".

END OF SECTION 012300

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for administrative procedures for handling adjustments to remediation allowance for changes in contract work.

1.3 MINOR CHANGES IN THE WORK

- A. Engineer will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Engineer are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request or 10 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use forms acceptable to Engineer.

- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Engineer.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Include costs of labor and supervision directly attributable to the change.
 - 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - 6. Proposal Request Form: Use form acceptable to Engineer.

1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

1.6 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Change Proposal Request, Engineer will issue a letter authorizing the work may proceed and the remediation allowance adjusted accordingly. Owner will issue a Remediation Approval Letter authorizing that the contractor may bill for the additional work. If approved work exceeds remaining amount in remediation allowance a Change Order for signatures of Owner and Contractor will be issued to replenish the remediation allowance.

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Engineer may issue a Construction Change Directive. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Requests for Information (RFIs).
 - 3. Project meetings.
- B. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from Owner, Construction Manager, Engineer, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Engineer will return RFIs submitted to Engineer by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Engineer.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: AIA Document G716 or Software-generated form with substantially the same content as indicated above, acceptable to Engineer.
- D. Engineer's Action: Engineer will review each RFI, determine action required, and respond. Allow seven working days for Engineer's response for each RFI. RFIs received by Engineer after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Engineer's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Engineer's action may include a request for additional information, in which case Engineer's time for response will date from time of receipt of additional information.
 3. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within 10 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly. Use CSI Log Form 13.2B or Software log with not less than the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Engineer.
 4. RFI number including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.

7. Date Engineer's response was received.

F. On receipt of Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Engineer within seven days if Contractor disagrees with response.

1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.7 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within three days of the meeting.

B. Preconstruction Conference: Engineer will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Engineer, but no later than 15 days after execution of the Agreement.

1. Conduct the conference to review responsibilities and personnel assignments.
2. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Preparation of record documents.
 - m. Use of the premises.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Procedures for moisture and mold control.
 - s. Procedures for disruptions and shutdowns.
 - t. Parking availability.

- u. Office, work, and storage areas.
 - v. Equipment deliveries and priorities.
 - w. First aid.
 - x. Security.
 - y. Progress cleaning.
4. Minutes: Engineer will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Engineer of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
 6. Minutes: Contractor will record and distribute meeting minutes.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Engineer, but no later than 90 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for delivery of material samples, attic stock, and spare parts.
 - f. Requirements for demonstration and training.
 - g. Preparation of Contractor's punch list.
 - h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - i. Submittal procedures.
 - j. Coordination of separate contracts.
 - k. Owner's partial occupancy requirements.
 - l. Installation of Owner's furniture, fixtures, and equipment.
 - m. Responsibility for removing temporary facilities and controls.
 4. Minutes: Contractor will record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at monthly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.

- 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
4. Contractor shall provide Engineer a list of construction activities of progress to date and a list of construction activities expected in next period prior to start of meeting.
 5. Minutes: Contractor will conduct the meeting and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's Construction Schedule.
2. Construction schedule updating reports.
3. Daily construction reports.
4. Site condition reports.
5. Unusual event reports.

- B. Related Requirements:

1. Section 013300 "Submittal Procedures" for submitting schedules and reports.
2. Section 014000 "Quality Requirements" for schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

- B. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.

- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine the critical path of Project and when activities can be performed.

- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

- E. Event: The starting or ending point of an activity.

- F. Float: The measure of leeway in starting and completing an activity.

1. Float time belongs to Owner.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Resource Loading: The allocation of manpower and equipment necessary for completing an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. PDF electronic file or two paper copies.

B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

C. Construction Schedule Updating Reports: Submit with Applications for Payment.

D. Daily Construction Reports: Keep on file in job trailer.

E. Site Condition Reports: Submit at time of discovery of differing conditions.

F. Unusual Event Reports: Submit at time of unusual event.

1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Time Frame: Extend schedule from date established for Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than [20] <Insert number> days, unless specifically allowed by Engineer.
2. Procurement Activities: Include procurement process activities for the following long lead-time items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
4. Startup and Testing Time: Include no fewer than 15] days for startup and testing.
5. Commissioning Time: Include no fewer than 7 days for commissioning.
6. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Engineer's administrative procedures necessary for certification of Substantial Completion.
7. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and Final Completion.

- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Uninterruptible services.
 - b. Use-of-premises restrictions.
 - c. Seasonal variations.
 - d. Environmental control.
 2. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Building flush-out.
 - m. Startup and placement into final use and operation.
 - n. Commissioning.
 3. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
 - a. Structural completion.
 - b. Temporary enclosure and space conditioning.
 - c. Permanent space enclosure.
 - d. Completion of mechanical installation.
 - e. Completion of electrical installation.
 - f. Substantial Completion.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
 2. Unanswered Requests for Information.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
 5. Pending modifications affecting the Work and the Contract Time.
- F. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule at each regularly scheduled progress meeting.

- G. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.
- H. Distribution: Distribute copies of approved schedule to Engineer, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1.6 CPM SCHEDULE REQUIREMENTS

- A. CPM Schedule: Prepare Contractor's Construction Schedule using a time-scaled CPM network analysis diagram for the Work.
 - 1. Develop network diagram in sufficient time to submit CPM schedule, so it can be accepted for use no later than 60 days after date established for the Notice of Award.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Engineer's approval of the schedule.
 - 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 - 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule to coordinate with the Contract Time.
- B. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
 - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing and inspection.
 - j. Commissioning.
 - k. Punch list and Final Completion.
 - l. Activities occurring following Final Completion.
 - 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 - 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.

4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- C. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project schedule.
- D. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
 1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Main events of activity.
 4. Immediate preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
- E. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
 1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.

1.7 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Testing and inspection.
 8. Accidents.
 9. Meetings and significant decisions.
 10. Unusual events.
 11. Stoppages, delays, shortages, and losses.
 12. Meter readings and similar recordings.
 13. Emergency procedures.
 14. Orders and requests of authorities having jurisdiction.
 15. Change Orders received and implemented.
 16. Construction Change Directives received and implemented.

17. Services connected and disconnected.
 18. Equipment or system tests and startups.
 19. Partial completions and occupancies.
 20. Substantial Completions authorized.
- B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- C. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.
1. Submit unusual event reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule at each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Engineer Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 2. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 4. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's or Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Engineer or Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Engineer's final release or approval.
 - g. Activity or event number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Engineer's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Engineer for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.

4. Sequential Review: Where sequential review of submittals by Engineer's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Engineer and to Engineer's consultants, allow 15 days for review of each submittal. Submittal will be returned to Engineer before being returned to Contractor.

D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer.
 - d. Name of Contractor.
 - e. Name of subcontractor.
 - f. Name of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 - a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Engineer.
5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will discard submittals received from sources other than Contractor.
 - a. Transmittal Form for Paper Submittals: Use AIA Document G810 or form with the following information:
 - 1) Project name.
 - 2) Date.
 - 3) Destination (To:).
 - 4) Source (From:).
 - 5) Name and address of Engineer.
 - 6) Name of Contractor.
 - 7) Name of firm or entity that prepared submittal.
 - 8) Names of subcontractor, manufacturer, and supplier.
 - 9) Category and type of submittal.
 - 10) Submittal purpose and description.

- 11) Specification Section number and title.
 - 12) Specification paragraph number or drawing designation and generic name for each of multiple items.
 - 13) Drawing number and detail references, as appropriate.
 - 14) Indication of full or partial submittal.
 - 15) Transmittal number, numbered consecutively.
 - 16) Submittal and transmittal distribution record.
 - 17) Remarks.
- E. Options: Identify options requiring selection by Engineer.
- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Submit electronic submittals via email as PDF electronic files.
 - a. Engineer will return annotated file. Annotate and retain one copy of file as an electronic Project record document file and two additional copies if required by operation and maintenance manuals.
 2. Action Submittals: Submit three paper copies if format size is (8 1/2" x 11" to 11" x 17"), submit four paper copies if format size is greater than (11" x 17"). Submit two additional copies if copies are required for operation and maintenance manuals. Engineer will return two copies, four if required for operation and maintenance manuals. Mark up and retain one returned copy at job site as Project Record Documents to be turned over to owner upon project completion. Add one additional copy if concurrent consultant submittal. PDF electronic files may be submitted instead of three paper copies of the (8 1/2" x 11" to 11" x 17") format. Engineer will return via email as a PDF electronic file, contractor shall make copies for job site project record document and for operation manuals.
 3. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Engineer will not return copies.

4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
 - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. As indicated for action submittals.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.

3. Submit Shop Drawings in the following format:
 - a. As indicated for action submittals.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer will return submittal with options selected.
- E. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
- F. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- G. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."
- H. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
- I. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."
- J. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of Engineers and owners, and other information specified.
- K. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

- L. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- M. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- N. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- O. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- P. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- Q. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- R. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.
- S. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- T. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.

- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit as action submittal copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION

- A. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Engineer.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Engineer without action.

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Engineer, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Requirements:
 - 1. Section 012100 "Allowances" for testing and inspection allowances.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
 - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).
- D. Mockups: Full-size physical assemblies that are constructed either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under

Sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

- E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.
- F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- G. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" shall have the same meaning as the term "testing agency."
- I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Engineer[or Construction Manager].

1.4 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.
- B. Delegated-Design Services Statement: Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.5 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Engineer regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Engineer for clarification before proceeding.

- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- D. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 1. Specification Section number and title.
 2. Entity responsible for performing tests and inspections.
 3. Description of test and inspection.
 4. Identification of applicable standards.
 5. Identification of test and inspection methods.
 6. Number of tests and inspections required.
 7. Time schedule or time span for tests and inspections.
 8. Requirements for obtaining samples.
 9. Unique characteristics of each quality-control service.
- E. Reports: Prepare and submit certified written reports and documents as specified.
- F. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.7 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 1. Date of issue.
 2. Project title and number.
 3. Name, address, telephone number, and email address of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.

12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement of whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement of whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

1.8 QUALITY ASSURANCE

- A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.

- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged in the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups of size indicated.
 - 2. Build mockups in location indicated or, if not indicated, as directed by Engineer.
 - 3. Notify Engineer seven days in advance of dates and times when mockups will be constructed.
 - 4. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
 - 5. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 6. Obtain Engineer's approval of mockups before starting corresponding Work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 - 7. Promptly correct unsatisfactory conditions noted by Engineer's preliminary review, to the satisfaction of the Engineer, before completion of final mockup.
 - 8. Approval of mockups by the Engineer does not constitute approval of deviations from the Contract Documents contained in mockups unless Engineer specifically approves such deviations in writing.
 - 9. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 10. Demolish and remove mockups when directed unless otherwise indicated.

1.9 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Engage a qualified testing agency to perform quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least [24] <Insert number> hours in advance of time when Work that requires testing or inspection will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Engineer, Commissioning Authority, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Engineer, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform duties of Contractor.
- E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- G. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspection equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's Construction Schedule. Update and submit with each Application for Payment.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Engineer.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Engineer's, Commissioning Authority's, and authorities' having jurisdiction reference during normal working hours.
1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.

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- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Engineer's action on Contractor's submittals, applications, and requests, "approved" is limited to Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Engineer. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

1. For standards referenced by applicable building codes, comply with dates of standards as listed in building codes.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 USE CHARGES

- A. Installation, removal, and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Engineer, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Pay sewer-service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Pay water-service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Implementation and Termination Schedule: Within [15] <Insert number> days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.
- C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- D. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- E. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
 - 1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and requirements for replacing water-damaged Work.

2. Indicate sequencing of work that requires water, such as terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 3. Indicate methods to be used to avoid trapping water in finished work.
- F. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:
1. Locations of dust-control partitions at each phase of work.
 2. HVAC system isolation schematic drawing.
 3. Location of proposed air-filtration system discharge.
 4. Waste-handling procedures.
 5. Other dust-control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.
- B. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches.
- C. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

- A. Field Offices: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Engineer, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:

1. Furniture required for Project-site documents, including file cabinets, plan tables, plan racks, and bookcases.
 2. Conference room of sufficient size to accommodate meetings of 16 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- square tack and marker boards.
 3. Drinking water.
 4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
 5. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
1. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 2. Heating, Cooling, and Dehumidifying Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction. and clean HVAC system as required in Section 017700 "Closeout Procedures."

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
 - 1. Use of Permanent Toilets: Use of Owner's new toilet facilities is not permitted.
- E. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
 - 1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
- F. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Install electric power service overhead or underground.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- H. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install WiFi cell phone access equipment for each field office.
 - 1. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Contractor's emergency after-hours telephone number.
 - e. Engineer's office.
 - f. Engineers' offices.
 - g. Owner's office.
 - h. Principal subcontractors' field and home offices.
- I. Electronic Communication Service: Provide secure WiFi wireless connection to internet with provisions for access by Engineer and Owner.

3.4 SUPPORT FACILITIES INSTALLATION

- A. Comply with the following:
1. Provide construction for temporary field offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible in accordance with ASTM E136. Comply with NFPA 241.
 2. Maintain support facilities until Engineer schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations.
1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- C. Temporary Use of Planned Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
 2. Prepare subgrade and install subbase and base for temporary roads and paved areas in accordance with requirements for permanent roads.
 3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
- D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
1. Maintain access for fire-fighting equipment and access to fire hydrants.
- E. Parking: Parking areas for construction personnel.
- F. Storage and Staging: Provide area for storage and staging needs.
- G. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
 2. Remove snow and ice as required to minimize accumulations.
- H. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
1. Identification Signs: Provide Project identification signs using information on cover sheet of drawings.
 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
 3. Maintain and touch up signs, so they are legible at all times.

- I. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."
- J. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
 - 1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings.
 - 1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
 - 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 - 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 - 4. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- E. Tree and Plant Protection: Comply with requirements specified in Section 015639 "Temporary Tree and Plant Protection."
- F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals, so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.
- G. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

- H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- I. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- J. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.6 MOISTURE AND MOLD CONTROL

- A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.
- B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 - 1. Protect porous materials from water damage.
 - 2. Protect stored and installed material from flowing or standing water.
 - 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 - 4. Remove standing water from decks.
 - 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 - 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 - 2. Keep interior spaces reasonably clean and protected from water damage.
 - 3. Periodically collect and remove waste containing cellulose or other organic matter.
 - 4. Discard or replace water-damaged material.
 - 5. Do not install material that is wet.
 - 6. Discard and replace stored or installed material that begins to grow mold.
 - 7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.
- D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
 - 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.

2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for [48] <Insert time period> hours are considered defective and require replacing.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for [48] <Insert time period> hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Engineer.
 - c. Remove and replace materials that cannot be completely restored to their manufactured moisture level within [48] <Insert time period> hours.

3.7 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 015723 - TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Temporary stormwater pollution controls.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for Storm Water Control Monitoring Agent Allowance.

1.3 STORMWATER POLLUTION PREVENTION PLAN

- A. The Stormwater Pollution Prevention Plan (SWPPP) is part of the Contract Documents.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Engineer and earthwork subcontractor.
 - 2. Review requirements of the SWPPP, including permitting process, worker training, and inspection and maintenance requirements.

1.5 INFORMATIONAL SUBMITTALS

- A. Stormwater Pollution Prevention Plan (SWPP): Within 15 days of date established for commencement of the Work, submit completed SWPPP.
- B. EPA authorization under the EPA's "2017 Construction General Permit (CGP)."
- C. Stormwater Pollution Prevention (SWPP) Training Log: For each individual performing Work under the SWPPP.
- D. Inspection reports.

1.6 QUALITY ASSURANCE

- A. Stormwater Pollution Prevention Plan (SWPPP) Coordinator: Experienced individual or firm with a record of successful water pollution control management coordination of projects with similar requirements. (Storm Water Control Monitoring Agent will be paid out of the Allowance)
 - 1. SWPPP Coordinator shall complete and finalize the SWPPP form.
 - 2. SWPPP Coordinator shall be responsible for inspections and maintaining of all requirements of the SWPPP.
- B. Installers: Trained as indicated in the SWPPP.
- C. The Owner will engage a Storm Water Control Monitoring Agent paid out of the Storm Water Control Monitoring Agent Allowance to assist Contractor's (SWPPP) Coordinator.

PART 2 - PRODUCTS

2.1 TEMPORARY STORMWATER POLLUTION CONTROLS

- A. Provide temporary stormwater pollution controls as required by the SWPPP.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with all best management practices, general requirements, performance requirements, reporting requirements, and all other requirements included in the SWPPP.
- B. Locate stormwater pollution controls in accordance with the SWPPP.
- C. Conduct construction as required to comply with the SWPPP and that minimize possible contamination or pollution or other undesirable effects.
 - 1. Inspect, repair, and maintain SWPPP controls during construction.
 - a. Inspect all SWPPP controls not less than every seven days, and after each occurrence of a storm event, as outlined in the SWPPP.
- D. Remove SWPPP controls at completion of construction and restore and stabilize areas disturbed during construction.

END OF SECTION 015723

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for products selected under an allowance.
 - 2. Section 01770 "Closeout Procedures" for submitting warranties.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
 - 3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.
 - 1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.

- C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.
- D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:
 - 1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
 - 2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.
- E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 013300 "Submittal Procedures."

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 - 1. Resolution of Compatibility Disputes between Multiple Contractors:
 - a. Contractors are responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - b. If a dispute arises between the multiple contractors over concurrently selectable but incompatible products, Engineer will determine which products shall be used.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.
 - 1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
 - 2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.
 - 3. See individual identification Sections in Divisions 21, 22, 23, and 26 for additional equipment identification requirements.

1.5 COORDINATION

- A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

- B. Delivery and Handling:

- 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
- 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
- 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- 4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.

- C. Storage:

- 1. Provide a secure location and enclosure at Project site for storage of materials and equipment.
- 2. Store products to allow for inspection and measurement of quantity or counting of units.
- 3. Store materials in a manner that will not endanger Project structure.
- 4. Store products that are subject to damage by the elements under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection from wind.
- 5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
- 6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
- 7. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

- 1. **Manufacturer's Warranty:** Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
- 2. **Special Warranty:** Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.

- B. **Special Warranties:** Prepare a written document that contains appropriate terms and identification, ready for execution.

- 1. **Manufacturer's Standard Form:** Modified to include Project-specific information and properly executed.

2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Engineer will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. Or Equal: For products specified by name and accompanied by the term "or equal," "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
 - a. Submit additional documentation required by Engineer in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of "or equal" product status is by the Engineer, whose determination is final.
- B. Product Selection Procedures:
1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole product may be indicated by the phrase "Subject to compliance with requirements, provide the following."
 2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole manufacturer/source may be indicated by the phrase "Subject to compliance with requirements, provide products by the following."
 3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

- a. Limited list of products may be indicated by the phrase "Subject to compliance with requirements, provide one of the following."
- 4. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."
- 5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
 - a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 "Substitution Procedures" for substitutions for convenience.
- C. Visual Matching Specification: Where Specifications require the phrase "match Engineer's sample," provide a product that complies with requirements and matches Engineer's sample. Engineer's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Engineer from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Engineer will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Engineer may return requests without action, except to record noncompliance with the following requirements:
 - 1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects, with project names and addresses and names and addresses of Engineers and owners, if requested.
 - 5. Samples, if requested.
- B. Engineer's Action on Comparable Products Submittal: If necessary, Engineer will request additional information or documentation for evaluation, as specified in Section 013300 "Submittal Procedures."

1. Form of Approval of Submittal: As specified in Section 013300 "Submittal Procedures."
 2. Use product specified if Engineer does not issue a decision on use of a comparable product request within time allocated.
- C. Submittal Requirements, Two-Step Process: Approval by the Engineer of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.
- D. Submittal Requirements, Single-Step Process: When acceptable to Engineer, incorporate specified submittal requirements of individual Specification Section in combined submittal for comparable products. Approval by the Engineer of Contractor's request for use of comparable product and of individual submittal requirements will also satisfy other submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:

- 1. Construction layout.
- 2. Field engineering and surveying.
- 3. Installation of the Work.
- 4. Cutting and patching.
- 5. Progress cleaning.
- 6. Starting and adjusting.
- 7. Protection of installed construction.

- B. Related Requirements:

- 1. Section 011000 "Summary" for coordination of limits on use of Project site.
- 2. Section 017700 "Closeout Procedures" for Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

1.5 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Engineer of locations and details of cutting and await directions from Engineer before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
- C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities,[mechanical and electrical systems,] and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
 2. List of detrimental conditions, including substrates.
 3. List of unacceptable installation tolerances.
 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to [local utility] [Owner] that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Engineer [through Construction Manager] in accordance with requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Engineer and Construction Manager promptly.
- B. Engage a land surveyor experienced in laying out the Work, using the following accepted surveying practices:
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify Engineer when deviations from required lines and levels exceed allowable tolerances.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Engineer.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Engineer. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Engineer before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

- D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

3.5 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb, and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces, unless otherwise indicated on Drawings.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure satisfactory results as judged by Engineer. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Engineer. Fit exposed connections together to form hairline joints.
- J. Repair or remove and replace damaged, defective, or nonconforming Work.

1. Comply with Section 017700 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.6 CUTTING AND PATCHING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Temporary Support: Provide temporary support of Work to be cut.
- C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- D. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. [Concrete] [and] [Masonry]: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- E. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Engineer. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

- a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
- 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
- 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- F. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 - 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in [Section 015000 "Temporary Facilities and Controls."] [Section 017419 "Construction Waste Management and Disposal."]

- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with General Commissioning Requirements.
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.9 PROTECTION AND REPAIR OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:

- 1. Substantial Completion procedures.
- 2. Final completion procedures.
- 3. Warranties.
- 4. Final cleaning.

- B. Related Requirements:

- 1. Section 017823 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
- 2. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
- 3. Section 017900 "Demonstration and Training" for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.3 DEFINITIONS

- A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Engineer's use prior to Engineer's inspection, to determine if the Work is substantially complete.

1.4 ACTION SUBMITTALS

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Certified List of Incomplete Items: Final submittal at Final Completion.

1.5 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest-control inspection.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.7 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Engineer. Label with manufacturer's name and model number.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Engineer's signature for receipt of submittals.
 5. Submit testing, adjusting, and balancing records.
 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
 6. Advise Owner of changeover in utility services.
 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 9. Complete final cleaning requirements.
 10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.8 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:
1. Submit a final Application for Payment
 2. Certified List of Incomplete Items: Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.9 LIST OF INCOMPLETE ITEMS

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first, listed by room or space number.
 2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer.
 - d. Name of Contractor.
 - e. Page number.
 4. Submit list of incomplete items in the following format:

- a. PDF Electronic File: Engineer will return annotated file.

1.10 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Engineer for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- C. Warranties in Paper Form:
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface. d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.

- f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- g. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- h. Clean flooring, removing debris, dirt, and staining; clean according to manufacturer's recommendations.
- i. Vacuum and mop concrete.
- j. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
- k. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
- l. Remove labels that are not permanent.
- m. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- p. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
- q. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
- r. Clean strainers.
- s. Leave Project clean and ready for occupancy.

- C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste-disposal requirements in Section 015000 "Temporary Facilities and Controls."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations required by Section 017300 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

- 1. Operation and maintenance documentation directory manuals.
- 2. Emergency manuals.
- 3. Systems and equipment operation manuals.
- 4. Systems and equipment maintenance manuals.
- 5. Product maintenance manuals.

- B. Related Requirements:

- 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

- 1. Engineer will comment on whether content of operation and maintenance submittals is acceptable.
- 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

- B. Format: Submit operation and maintenance manuals in the following format:

- 1. Submit on digital media acceptable to Engineer. Enable reviewer comments on draft submittals.
- 2. Submit one paper copy: Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves.

- C. Initial Manual Submittal: Submit electronic file and draft paper copy of each manual at least 30 days before commencing demonstration and training. Engineer and Commissioning Authority will comment

on whether general scope and content of manual are acceptable. Paper copy will be returned to be included into final copy.

- D. Final Manual Submittal: Submit final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Engineer and Commissioning Authority will return copy with comments.
 - 1. Correct or revise each manual to comply with Engineer's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Engineer's and Commissioning Authority's comments and prior to commencing demonstration and training.
- E. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.
 - 1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
 - 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 - 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
 - 4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
 - 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

- a. If oversized drawings are necessary, fold drawings to same size as text pages and use as foldouts.
- b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.6 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
 1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Engineer.
 7. Name and contact information for Commissioning Authority.
 8. Names and contact information for major consultants to the Engineer that designed the systems contained in the manuals.
 9. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.7 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
 1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

1.8 EMERGENCY MANUALS

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Content: Organize manual into a separate section for each of the following:
 1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
- C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.
- D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- E. Emergency Procedures: Include the following, as applicable:
 1. Instructions on stopping.
 2. Shutdown instructions for each type of emergency.
 3. Operating instructions for conditions outside normal operating limits.
 4. Required sequences for electric or electronic systems.
 5. Special operating instructions and procedures.

1.9 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.10 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.
- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.

- C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

- J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

- 1. Do not use original project record documents as part of maintenance manuals.

1.11 PRODUCT MAINTENANCE MANUALS

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record specifications.
 - 3. Record Product Data.
- B. Related Requirements:
 - 1. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set(s) of marked-up record prints.
- B. Record Specifications: Submit one paper copy of Project's Specifications, including addenda and Contract modifications.
- C. Record Product Data: Submit one paper copy of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
2. Content: Types of items requiring marking include, but are not limited to, the following:
- a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Engineer's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file[
 3. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Engineer.
 - e. Name of Contractor.

1.5 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.

3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

B. Format: Submit record specifications as paper copy.

1.6 RECORD PRODUCT DATA

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.

B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

C. Format: Submit Record Product Data as paper copy.

1. Include Record Product Data directory organized by Specification Section number and title.

1.7 MAINTENANCE OF RECORD DOCUMENTS

A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Engineer's reference during normal working hours.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Instruction in operation and maintenance of systems, subsystems, and equipment.
 - 2. Demonstration and training video recordings.

1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
- B. Attendance Record: For each training module, submit list of participants and length of instruction time.

1.4 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name and address of videographer.
 - c. Name of Engineer.
 - d. Name of Contractor.
 - e. Date of video recording.
 - 2. At completion of training, submit complete training manual(s) for Owner's use prepared in same paper format required for operation and maintenance manuals specified in Section 017823 "Operation and Maintenance Data."

1.5 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
 - 1. Inspect and discuss locations and other facilities required for instruction.
 - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 - 3. Review required content of instruction.
 - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.6 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Engineer.

1.7 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Operating standards.
 - c. Equipment function.
 - d. Operating characteristics.
 - e. Limiting conditions.
 - 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Systems and equipment operation manuals.
 - c. Systems and equipment maintenance manuals.
 - d. Product maintenance manuals.

3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.

5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.

7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning.
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.

8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

1.8 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

1.9 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner with at least 14 days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

1.10 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Digital Video Recordings: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full HD mode with vibration reduction technology.
 - 1. Submit video recordings on CD-ROM and thumb drive.
 - 2. File Hierarchy: Organize folder structure and file locations according to Project Manual table of contents. Provide complete screen-based menu.
 - 3. File Names: Utilize file names based on name of equipment generally described in video segment, as identified in Project specifications.
 - 4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the equipment demonstration and training recording that describes the following for each Contractor involved on the Project, arranged according to Project Manual table of contents:

- a. Name of Contractor/Installer.
 - b. Business address.
 - c. Business phone number.
 - d. Point of contact.
 - e. Email address.
- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
- 1. Film training session(s) in segments not to exceed 15 minutes.
 - a. Produce segments to present a single significant piece of equipment per segment.
 - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
 - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.
- D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
- 1. Furnish additional portable lighting as required.
- E. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 017900

**PUBLIC WORKS PROJECT NUMBER: 84003001-22-058-C1
CLEAR CREEK WELCOME CENTER
WEST TERRE HAUTE, INDIANA / INDOT**

Volume 5 of 6

MARCH 2023

ERIC HOLCOMB
GOVERNOR

SUZANNE CROUCH
LIEUTENANT GOVERNOR

DR. REBECCA HOLWERDA
COMMISSIONER, DEPARTMENT OF ADMINISTRATION

MICHAEL SMITH
COMMISSIONER, DEPARTMENT OF TRANSPORTATION

BOB GROSSMAN
DIRECTOR, PUBLIC WORKS DIVISION



PROJECT MANUAL

For construction of:

**Clear Creek Welcome Center
West Terre Haute, Indiana**

**Public Works Project
84003001-22-058-C1**

For

Department of Transportation

Prepared by

**Janssen & Spaans Engineering
9120 Harrison Park Court
Indianapolis, IN 46216**

**Synthesis, Inc.
251 N. Illinois St., Suite 200
Indianapolis, IN 446204**

**Applied Engineering Services, Inc.
5975 Castle Creek Pkwy. N. Dr. Suite 300
Indianapolis, IN 446250**

**Ratio
101 S. Pennsylvania St.
Indianapolis, IN 46204**

**BLN
505 S. Woodcrest Drive
Bloomington, IN 47401**

Date of Issue

March 2023

CERTIFICATION PAGE

OWNER: Indiana Department of Administration
Public Works Division
For
Department of Transportation

**CIVIL
ENGINEER:** Janssen & Spaans Engineering
9120 Harrison Park Court
Indianapolis, IN 46216
Phone: (317) 254-9686

ARCHITECT: Synthesis, Inc.
251 N. Illinois St., Suite 200
Indianapolis, IN 446204
Phone: (317) 951-9500
Fax: (317) 951-9501

ENGINEER: Applied Engineering Services
5975 Castle Creek Pkwy. N. Dr., Suite 300
Indianapolis, IN 46250
Phone: (317) 810-4141

LANDSCAPE: Ratio
101 S. Pennsylvania St.
Indianapolis, IN 46204
Phone: (317) 238-4688

SANITARY: BLN
505 S. Woodcrest Drive
Bloomington, IN 47401
812-803-6227

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DRAWING SET #1 WELCOME CENTER

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PROJECT MANUAL

SPECIFICATIONS

02000 Supplemental Civil Specifications

UTILITY COORDINATION

The Contractor shall be responsible for coordination with all utilities during construction as well as construction of the utilities as shown on plans within the project limits in accordance with INDOT, all other regulating agencies and the individual utility company standards and specifications.

The Town of West Terre Haute will be constructing a new water main in W. 21st Street Road (Cook Road) and a new 6" waterline into the welcome Center site. The contractor shall coordinate with the Town's contractor during the construction of this new water line. If questions arise, Ed Stewart of the Town may be contacted at 812-533-1053 (office) or at 812-870-5950 (mobile).

The facilities of Duke Energy exist within the rest areas project limits and are expected to be affected by this project. New 3 Phase service will be installed to replace the existing 3 Phase service. If questions arise, *Tyler Angle* of the utility may be contacted at 812-231-8721 (office) or at 812-249-7163 (Mobile) or at tyler.angle@duke-energy.com. Also, work will be occurring within the two Duke Energy transmission easements within the project site and care must be taken to protect the existing transmission poles and facilities. If questions arise, Ryan Daugherty may be contacted at 812-375-2021 or at Ryan.Daugherty@duke-energy.com.

The gas line facilities of CenterPoint Energy do not exist within the rest area project limits at this time, but are planned to be constructed to the project site during the period of this contract. Contractor shall coordinate with the CenterPoint contractor during the construction of the gas line facilities. If questions arise, Jennifer Isbell-Scott may be contacted at 812-231-6303 or at Jennifer.IsbellScott@centerpointenergy.com.

Fiber Optic Cable will be constructed to the welcome center building either from the proposed cell tower along W. 21st Street Road or from offsite across I-70 by Joink, LLC. Contractor shall coordinate with Joink, LLC during the construction of the fiber optic cable. If questions arise, Ray Osland may be contacted at 812-315-6465 or at ray.osland@joinkllc.com or Karla Noorlag may be contacted at 812-234-5100 or at kkarla.noorlag@joinkllc.com

DEPARTMENT SALVAGEABLE ITEMS

Description

Following items will be salvaged by the Department before the Contractor begin any work on site. Contractor shall coordinate with Mr. Carl Rochelle, INDOT Crawfordsville District Facilities at CRochelle@indot.IN.gov.

Main Building and Lot

- 4 New indoor Furnaces
- 4 new AC condenser units and controls
- 8 Electrical panels
- 1 New electric hanging heater
- 1 Booster pump and controls
- 13 Benches

24 Tables
 32 Yard Lights
 2 Sump Pumps
 1 Meter base
 Fire Extinguishers

From the Pole Barn

1 Pallet Jack
 1 Metal work Table
 1 Flammable Cabinet
 1 Lighting Controls for lot lights

From the Well House

2 Electrical Panels
 1 Phase Inverter(inside and outside components)
 1 Meter Base
 1 Well Pump
 1 Pressure Tank
 1 Backflow Preventor

From Waste Water treatment Plant

1 Window Ac Unit

CCTV ASSEMBLY

Description

This work shall consist of furnishing and installing closed circuit television cameras and supporting equipment.

Materials

Camera shall, at a minimum, meet the following characteristics:

Camera Sensors:

- Sensor 1/2.8" CMOS
- Progressive Scanning
- Resolution 1,920 x 1080
 - 640 x 360 @ 3x digital zoom
- Digital formats:
 - 1080p
 - 1080i
 - 720p
- Frame rate 30 frames per second
- Day/Night format with IR cut filter
- Automatic Day/Night mode
- Color
 - 0.25 lux
- Black and white
 - 0.024 lux
- Signal/Noise ratio >50db
- Motion detection

Optics:

- Physical zoom 30x
 - 4.4 to 132 mm
 - Effective 264mm with 2x digital zoom
- Aperture f1.4 -> f4.6
- HAFOV 63.4° to 2.1° @ 1920x1080
 - 63.4° to 0.7° @ 640x360
- Focus auto/manual [Near, far]
- Focus searching:
 - Normal
 - Bright
 - Point Source
- Focus sensitivity:
 - Low
 - Normal
 - High
- Digital zoom 12x on/off
- Auto focus of iris on PTZ

System Processing:

- Defog mode
- Image stabilization
- Enhanced intensity
- Whiteout reduction
- Dynamic Range >90dB
- Black light composition
- Shutter auto/manual
- Slow shutter
- White balance adjustments
- Sharpness adjustments
- Noise reduction
- 3 video streams
- Codecs:
 - H.264
 - MJPEG
- Protocols:
 - RTP/RTSP
 - RTSP Interleave
 - HTTP tunneling
 - RTP Multicast
 - 802.3u 100Base-T
 - MIDI-X auto sensing
 - Full duplex
 - TCP
 - UDP
 - IPv4
 - ICMP
 - DNS
 - IGMPv2/3
 - DHCP
 - NTP
 - HTTP
 - SOAP
 - HTTPS
 - FTP
 - SMTP
 - SNMP/NTCIP

- ONVIF Profile S
- NTCIP 1205
- 802.3bt (PoE++)
- Video data rate control minimum of 256Kbs
- Video rate control variable or constant
- Video transmittal 99.99% error free
- Support for VLC media player or any media player compliant with the following RFCs:
 - 2236
 - 3984
 - 3550
 - 2435
 - ISO/IEC 13818-1
- Configurations shall be stored on non-volatile memory
- Upload file over web interface or shell
- Security profile support
- Output triggers supporting:
 - FTP
 - Email
 - Tour
 - On-screen display message
- On Screen Display:
 - 7 elements for display
 - Text Preset
 - Date/Time
 - Sector
 - Maintenance
 - Action Event
 - 40 characters per text element
 - Size variant of 20-90 points, incrementing by 10
 - Color of text:
 - Blue
 - Red
 - Green
 - Black
 - White
 - Positioning of:
 - Upper Right/left
 - Lower Right/left
 - Center
 - Custom
 - Banner Display on/off
 - Logo display supporting:
 - BMP
 - PNG
 - GIF
 - X,Y position
 - Transparency
 - Privacy masks:
 - Rectangular shape
 - Colored Red, Green, Blue, Purple, or Gray
 - Opacity 25, 50, or 75%
 - Four levels of brightness adjustment
- Inverted mounting
- 256 Preset locations

- 256 tours containing 10 preset locations each
- Auto Park timer to return to preset or tour after timer expires
 - Time of off, 1 minute, 999 hours

Mechanical:

- IP68 rating
- Powered by PoE++
- Voltage Range NEMA TS 2-2003 section 2.2.7 test C through H
- Transient/Surge Certified to CISPR 24 Levels
- Emissions Certified to CISPR 22 levels
- CE, FCC Part 15B RoHS
- Corrosion MIL-STD-810G, method 509.5 Paragraph 4.5.2, ANSI NCSL Z 540-1
- ISO 172025:2005
- Shock per NEMA TS2 paragraph 2.2.9 10g applied in each of 3 mutually perpendicular planes
- Humidity up to 100%
- Pan Range 360° of continuous rotation
- Tilt range 180°
- Preset Speed Peak of 120° / second
- 180° movement in < 3 seconds
- Manual speed of 0.1° to 45° /second
- Operational temperature -40°F to 167°F Per NEMA TS2 2.2.7
- RJ45 Connection for data and power support
- Inverted mounting
- Set north calibration

Camera shall include required hardware for mounting and connecting device to structure and associated equipment. Camera shall be configured for remote access. Minimum configuration settings shall include:

- IPv4/6 address
- Subnet Mask
- Default IPv4/6 gateway
- NTP server
- DNS server
- DHCP settings
- Hostname
- Domain/workgroup
- Username
- Password

Department ITS Engineer shall provide specific parameters per device for installation upon request.

Construction Requirements

All installation services shall comply with all manufacturer's instructions and warranty provisions and warranty contract maintenance services and Department electrical codes. All wiring entry to the camera dome shall use watertight fittings. All materials shall be installed in a neat and professional manner. All wiring entry and exits shall be made at the side or underneath components; no exposed top entry or exits are permitted. This requirement extends to all enclosures, junction boxes, support arms, or any other externally exposed devices.

~~Method of measurement~~

~~CCTV Assembly will be measured by the number of units installed.~~

Basis of payment

~~CCTV Assembly will be paid for at the contract unit price per EACH.~~

~~Payment will be made under:~~

Pay Item	Pay Unit	Symbol
CCTV Assembly	EACH	

~~The cost of all labor, materials, design, vendor support, and items necessary to provide a complete and functioning CCTV assembly shall be included in the cost of CCTV assembly.~~

CONDUIT

Description

Work under this item shall include furnishing and installing conduit as shown on the plans and described in these specifications to provide raceways for fiber-optic cable, copper communications cable, and power conductors.

Materials

HDPE conduits shall meet or exceed the requirements of section 922.19. Schedule 80, coilable, HDPE conduit shall be color coded orange, green, and blue for communication cable and black for power cable. The HDPE shall meet or exceed the properties listed in ASTM D-3350 for minimum cell classification of Class E Colored with UV Stabilizer. The properties and dimensions shall be in accordance with ASTM F 2160 standard specification for "Solid Wall High Density Polyethylene (HDPE) Conduit Based on Controlled Outside Diameter (OD)".

Fiberglass conduit shall be manufactured to NEMA TC-14 2002 standards and listed by Underwriters Laboratories (UL) standard 1684 "Above Ground and Below Ground". Carbon black shall be used as an ultraviolet inhibitor. All fiberglass conduit shall be Iron Pipe Size (IPS), "Standard Wall" with a minimum 0.07-inch wall thickness, and a minimum impact resistance per the following table and in accordance with ASTM D2444.

Table: Fiberglass Conduit Impact Resistance

CONDUIT SIZE	STANDARD WALL IMPACT RESISTANCE
2-inch	40 lbs ft
3-inch	60 lbs ft
4-inch	70 lbs ft
5-inch	100 lbs ft
6-inch	100 lbs ft

PVC and steel conduits shall meet the requirements of section 922.19. Liquid-tight Flexible Metal Conduit (LFMC) shall consist of a single strip of continuous, flexible, interlocked galvanized steel inside and out, forming a smooth internal wiring channel with a liquid tight covering of UV resistant flexible polyvinyl chloride (PVC). LFMC shall be manufactured in accordance with UL 360. All liquid-tight connectors shall be UL/CSA listed for wet locations.

Construction Requirements

General:

The Contractor shall comply with Section 807.06, except as noted in this special provision. The Contractor shall install conduits underground by means of trenching or directional drilling. Except as noted, the plans

depict conduit routing and schematic form only. The contractor shall determine final routing based on actual field conditions at each site, including utility locator service markings, to assure no conflicts with existing utilities. In addition to notifying the IUPPS "Call Before You Dig" service, the Contractor shall notify the INDOT ITS Division and the INDOT District to request the ITS locates and highway lighting locates 48 hours in advance of excavation work. The cost of notifying IUPPS, the INDOT ITS division, and the INDOT District office shall be considered incidental to the contract. All conduits shall be placed a minimum of 3 feet below existing grade, except for immediately adjacent to hand holes/vaults or as noted on plans. All conduits shall be stubbed out a minimum of 6 inches into each handhole or vault.

Construction limits shall be restored by grading soil smooth and seeding as necessary to prevent erosion on steep grades. Restoring construction limits will be considered incidental to the conduit installation.

Warning tape shall be furnished and installed in all the trenches containing conduit, as depicted in the plan details.

Trenching:

Conduit identified to be installed in a trench may be trenched or plowed at the Contractor's discretion and as permitted by the site conditions. Except as revised herein, conduit trenches shall be in accordance with the INDOT Standard Specifications Section 807.04. Common trenches shall be used for multiple conduits as shown on the plans.

Conduit may be installed by directional drilling at locations called out to be as trenched on the plans with no additional compensation.

Conduit pushes as shown on the plan shall be in accordance with standard specification section 805.11 and 807.06. The Contractor shall verify the existing pavement conditions prior to construction to avoid cracking the pavement.

All flexible roadside delineators disturbed during trenching operations shall be restored or replaced at no additional cost to the contract.

Hand Trenching:

Conduit identified as Hand Trench is located in areas where sensitive existing crossing utilities have been identified and will likely require positive identification of the existing utility prior to trenching above or below the existing utility line or where surface features such as riprap would inhibit trenching. The method of positive identification of the existing utility line is at the discretion of the Contractor and shall be accomplished with no additional compensation. Any material that is removed to accomplish Hand Trenching shall be restored or replaced in kind by the Contractor without additional compensation.

Conduit type, number, and size shall be as identified on the plans.

Conduit identified as Hand Trench may be trenched or plowed at the Contractor's discretion and as permitted by site conditions. Except as revised herein, conduit trenches shall be in accordance with 807.04. Common trenches shall be used for multiple conduits, as shown on the plans.

Conduit may be installed by directional drilling at locations called out to be as hand trenched on the plans with no additional compensation.

All flexible roadside delineators disturbed during hand trenching operation shall be restored or replaced at no additional cost to the contract.

Offset Trenching:

Conduit identified as Offset Trench is in areas where the trench is located behind obstructions. This type of trenching shall utilize a long reach hydraulic driven trenching machine to reach over and beyond the obstruction and complete trench as the same as TRENCH. This trenching machine is typically attached to and powered by an excavator.

Conduit may be installed by directional drilling at locations called out to be offset trench on the plans with no additional compensation.

Bridge Transition Conduit:

Conduit identified as transition is located in areas where the conduit quantity and type changes to accommodate a bridge crossing.

Unless otherwise specified, transition conduit shall be flexible conduit in accordance with 807.02.

Directional Drilling:

The Contractor shall determine all utility locations near the path of the proposed drill, including depth. The Contractor shall use this information to avoid damage to utilities and/or facilities within the work area. The Contractor shall provide this information, including the sources, to the Engineer a minimum of five working days prior to drilling. The Contractor shall not drill until the Engineer approves that submittal.

Prior to drilling, the Contractor shall expose all utilities for which it is customary and safe to do so.

The diameter of the drilled hole shall conform to the outside diameter of the conduit or conduits as closely as practical. The Contractor shall pressure grout as directed by the Engineer, to fill any voids, which develop during the installation operation. The Contractor shall remove and replace any conduit damaged in the directional drilling operations at no expense to the project.

The use of water and other fluids in connection with the drilling operation will be permitted only to the extent necessary to lubricate cuttings. Jetting shall not be permitted, and the use of water alone as a drilling fluid shall not be permitted. The Contractor shall use a drilling fluid/slurry consisting of at least 10% high grade, processed Bentonite to consolidate excavated material, seal the walls of the hole, and furnish lubrication for the subsequent removal of material and immediate installation of the conduit.

The Contractor shall provide a means of collecting and containing drilling fluid/slurry that returns to the surface, such as slurry pit, or a method approved by the Engineer. The Contractor shall include the following procedures: Provide measures to prevent drilling fluids from entering storm sewer systems. Prevent drilling fluid/slurry from accumulating on or flowing onto sidewalks, other pedestrian walkways, driveways, or streets. Immediately remove any slurry that is inadvertently deposited on pedestrian walkways. Transport waste drilling slurry from the site and dispose of it. Do not allow slurry to enter wetlands. Protect wetlands from slurry using appropriate soil erosion control measures approved by the Engineer.

The Contractor shall use a digital walkover locating system to track the drill head during the bore. At minimum, the locating system shall be capable of determining the pitch, roll, heading, depth, and horizontal position of the drill head at any point along the bore. During each drilling operation, the Contractor shall locate the drill head every 10 feet along the bore and prior to crossing any underground utility or structure. Upon

completion of the drilling operation and conduit installation, the Contractor shall furnish the Engineer with an as-built profile drawing and plan drawing for the drilled conduit showing the horizontal and vertical locations of the installed conduit.

Conduit identified to be installed between 1,000 feet and 1,500 feet indicates a long continuous bore. Equipment required to directional drill at this distance may be different from other types of directional drilling equipment needed on shorter distance directional drills. These areas of directional drilling are inaccessible to equipment that cannot drill between the handholes and vaults shown on the plans in a single set-up. Alternate means of accomplishing the directional drill may be proposed by the Contractor and shall require approval of the Engineer.

Conduit on Structure or Bridge Attached:

Fiberglass conduit shall be provided for all above ground locations where the conduit is to be attached to a bridge, as shown on the plans and in accordance with 807.02 except as revised herein. Fiberglass conduit runs shall be continuous between handholes or points of conduit transition with the exception that expansion joints shall be provided for every 200 feet of exposed conduit, or as recommended by the conduit manufacturer. Fiberglass fittings and expansion joints shall be of the same material from the same manufacturer as the fiberglass conduit. If rebar is struck while drilling lag screw holes into the bridge, drilling shall cease immediately and the hole shall be patched using an epoxy compound approved by the Engineer for patching concrete.

The bridge attachment details shown in the plans represent only one of the methods available for attaching fiberglass conduit to a bridge. The details shown in the plans were chosen because it is assumed to be the most cost-effective method to meet the following goals for this contract. It is not the designer's desire that the plan details should limit the contractor from exploring other options. Regardless of the method used to attach the conduit to the bridge, all materials and workmanship shall be of top quality.

The conduit shall be securely supported at a maximum spacing of 10 feet, or as recommended by the manufacturer, whichever is less.

The conduit shall be allowed to expand and contract without grinding against sharp edges or rough surfaces (such as concrete). Lateral movement shall not be restricted by the conduit attached hardware.

All metallic portions of conduit attachment hardware shall be constructed of non-corrosive aluminum, stainless steel, or galvanized steel.

Nothing may be attached to any bridge that reduces the under-bridge clearance. Drilling or welding of the steel bridge girders will not be permitted. Attaching conduit or hangers to the bridge barrier wall or bridge retaining wall will not be permitted due to the potential for damage from vehicle impacts.

Conduit Under Structure:

PVC conduit, Schedule 80 shall be provided for all locations where the conduit is to be attached under a bridge or structure. The under-structure conduit shall be as shown on the plans and according to 807.02 except as revised herein. Conduit runs shall be continuous between junction boxes, handholes, or points of conduit transition with the exception that expansion joints shall be provided for every 200 feet of exposed conduit, or as recommended by the conduit manufacturer. Fittings and expansions joints shall be of the same material and from the same manufacturer as the conduit. If rebar is struck while drilling lag screw or anchor bolt holes

into the bridge deck, drilling shall cease and the hole shall be patched using an epoxy compound approved by the Engineer for patching concrete.

The conduit shall be securely supported at a maximum spacing of 8 feet, or as recommended by the manufacturer, whichever is less.

The conduit shall be allowed to expand and contract without grinding against sharp edges or rough surfaces. Lateral movement shall not be restricted by the conduit attachment hardware except as provided as part of the expansion attachment system such as split stop rings.

All metallic portions of conduit attachment hardware shall be constructed of stainless steel or galvanized steel.

Nothing may be attached to any bridge or structure that reduces the under-bridge clearance for vehicles or vessels passing under the bridge or structure. Areas not permissible for vehicles or vessels passing under may be reduced in clearance for the purpose of extending the conduit from under the structure to the outside of the structure as shown on the plans. These locations are typically under the slope wall and at the beginning and end points of the structure where the conduit transitions from underground to under structure. Drilling or welding of the steel girders will not be permitted. Attaching conduit or hangers to the bridge barrier wall or bridge railing will not be permitted.

Install New Conduit Into Existing Handholes:

At locations shown on the plans, the Contractor shall install new conduit into existing handholes or vaults. The Contractor shall use the following procedure:

Remove concrete by cutting, chiseling, or core drilling as required to install new conduit without damaging the existing conduits. It shall be the Contractor's responsibility to protect the cables inside the handhole during this operation.

After removing the concrete, the area shall be washed with pressurized water and then dried with compressed air.

Position new conduits and apply an approved concrete bonding compound on the exposed concrete surfaces as recommended by the concrete manufacturer.

Place grout in all open spaces to prevent dirt and water entry into the handhole.

Perform necessary work to install the new conduit entrance, including but not limited to excavating around edges of the handhole, and replacing crushed stone base removed to install conduit. Take necessary precautions to prevent damage to the existing conduits and cables located in these existing handholes. The Contractor shall be solely responsible for any damage or displacement of the cable, conduit, or handhole arising out of or related to the Contractor's activities. With the exception of concrete pavement removal, breaking into existing handholes will be considered incidental to the installation of conduit and cable and will not be paid for separately.

Modifications to Existing Cabinet Conduits:

At locations indicated on the Plans, the Contractor shall furnish and install conduit, cables, and/or equipment into existing cabinets. The Contractor shall take necessary precautions to maintain uninterrupted operation of all existing equipment inside the cabinet throughout the entire installation. The Contractor shall perform all necessary work to install any new conduit. The Contractor shall be solely responsible for any damage or displacement of existing cables, conduit, or equipment in the cabinet

arising out of or related to the Contractor's activities. Installing new conduit, cable, and equipment into existing cabinets will be considered incidental to the cost of providing the conduit, cable, and equipment will not be paid for separately. If existing empty conduits can be located by the Contractor at the existing cabinet, the Contractor may utilize the spare conduit for entry to the cabinet. Utilizing an existing empty conduit is the preferred method for entry to an existing cabinet.

HDPE Conduit Splicing:

All HDPE conduit splices shall be fusion splices, unless mechanical splices are approved in writing by the INDOT ITS Technology Deployment Division Director.

Reattaching Existing Cabling:

Some locations within this contract require the Contractor to disconnect and pull existing cables free from an old conduit and then reconnect the cables to existing or new equipment. The cost of disconnecting, pulling back, re-pulling, and reconnecting existing cables shall be included in the bid price of the new conduit.

The conduit shall be cleaned by rodding and swabbing to remove all dirt and other foreign materials and capped until conductors are installed.

For all empty HDPE conduit installed under this contract and designated for future use or cable installation by others, the Contractor shall proof the conduit system with a mandrel, as per Table below, to remove any obstruction or debris. The Contractor shall perform the conduit proofing in the presence of the Engineer. The Contractor shall apply a pressure of 100-110 PSI to the conduit, close to the air output valve and stop compressor, and measure air pressure loss. The maximum allowable air pressure loss within 2 minutes of pressurization is 20 psi. The contractor shall record the Conduit Test form attached to this special provision.

Conduit Size (in)	Mandrel Diameter (in)	Minimum Mandrel Length (in)	Maximum Mandrel Length (in)	Proof (%)
1	0.60	1.0	4	80
1 ¼	0.86	1.5	4	80
1 ½	1.12	1.8	4	80
2	1.62	2.4	6	80
3	2.5	3.25	8	80
4	3.5	4.25	8	85
6	5.5	6.25	10	85
8	7.5	8.25	12	85

Conduit Testing Form

Date: _____ Route: _____ Direction: _____

Starting Station: _____ Ending Station: _____

Starting Mile Post: _____ Ending Mile Post: _____

Conduit #	Conduit Color Marking (Color/Stripe)	Conduit Size (inches)	Cleaned (Rodded and Swabbed) (Check Mark)	Pressure Test Starting Pressure (PSI)	Pressure Test End Pressure (PSI) (2 mins)	Capped (Check Mark)
1						
2						
3						

4						
5						
6						

Contractor: _____

Engineer: _____

Method of Measurement

~~Conduits of the type, size, and installation method specified shall be measured for payment per linear foot of conduit provided complete and in place.~~

Basis of Payment

~~Conduit will be paid for at the contract unit price per linear foot. Payment will be made under:~~

Pay Item	Pay	Unit
Conduit, 3 HDPE, 1 1/4 in., SCH 80, Trench	LFT	
Conduit, 3 HDPE, 1 1/4 IN., SCH 80, Hand Trench		L
FTT		
Conduit, 3 HDPE, 1 1/4 IN., SCH 80, Offset Trench		L
FTT		
Conduit, 3 HDPE, 1 1/4 IN., SCH 80, Bore		L
FTT		
Conduit, 3 HDPE, 1 1/4 IN., SCH 80, Bore, 1,000 FT. - 1,500 FT		L
FTT		
Conduit, 3 HDPE, 2 IN., SCH 80, Bore		L
FTT		
Conduit, 3 HDPE, 2 IN., SCH 80, Trench		L
FTT		
Conduit, 3 HDPE, 2 IN., SCH 80, Bore		L
FTT		
Conduit, 2 PVC, 2 IN., Trench		L
FTT		
Conduit, PVC, 3 IN., Bore		L
FTT		
Conduit, PVC, 4 IN., Trench		L
FTT		
Conduit, 1 Steel, Galvanized, 2 IN., Trench		L
FTT		
Conduit, Steel, Galvanized, 3 IN., Trench		L
FTT		
Conduit, Fiberglass, 3 IN., Bridge Attach		L
FTT		
Conduit, Transition, 3 IN.		L
FTT		

(PE-90) for a single sheathed, armored cable, and shall be new, unused, and of current design and manufacture. The number of fibers in each cable shall be as specified on the plans.

Minimum Bending Radius:

The cable shall be capable of withstanding a minimum-bending radius of fifteen (15) times its outer diameter during operation and ten (10) times its outer diameter during installation without changing the characteristics of the optical fibers.

Environmental Requirements:

The cable shall meet all of the specified requirements under the following conditions:

- Shipping/storage temperature: -40°F to +158°F (-50°C to +70°C)
- Installation temperature: -30°F to +158°F (-30°C to +70°C)
- Operating temperature: -40°F to +158°F (-40°C to +70°C)
- Relative humidity from 0% to 95%, non-condensing

All backbone cables shall be suitable for installation in outdoor handholes, manholes, or vaults subject to immersion in water and ice.

Construction Requirements

Experience Requirements:

Personnel involved in the installation, splicing, and testing of the fiber optic cables shall meet the following requirements:

- Shall have installed two systems where fiber optic cables are outdoors in conduit and where the systems have been in continuous satisfactory operation for at least two years. The Contractor shall submit as proof, photographs or other supporting documents, and the names, addresses, and telephone numbers of the operating personnel who can be contacted regarding the installed fiber optic systems.
- A minimum of three years of experience in the installation of fiber optic cables, including fusion splicing, terminating, and testing single mode fibers.
- Shall have installed one fiber optic cable system (which may be one of the two in the preceding paragraph), which the Contractor can arrange for demonstration to the Department representatives and the Engineer, if requested.
- Installers shall be familiar with the cable manufacturer's recommended procedures for installing the cable. This shall include knowledge of splicing procedures for the fusion splicer being used on this project and knowledge of all hardware such as breakout (furcation) kits and splice closures. The Contractor shall submit documented procedures to the Engineer for approval and to be used by Construction inspectors.
- Personnel involved in testing shall have been trained by the manufacturer of the fiber optic cable test equipment to be used in fiber optic cable testing procedures. Proof of this training shall be submitted to the Engineer for approval. In addition, the Contractor shall submit documentation of the testing procedures for approval by the Engineer.

Installation in Conduit:

The Contractor shall provide a cable-pulling plan, identifying where the cable will enter the underground system and the direction of pull. This plan shall address locations where the cable is pulled out of a handhole,

coiled in a figure eight, and pulled back into the handhole. The plan shall address the physical protection of the cable during installation and during periods of downtime. The cable-pulling plan shall be provided to the Engineer for approval a minimum of 10 working days prior to the start of installation. The Engineer's approval shall be for the installation operation on the freeway and does not include an endorsement of the proposed procedures. The Contractor is responsible for the technical adequacy of the proposed procedures.

During cable pulling operations, the Contractor shall ensure that the minimum bending of the cable is maintained during the unreeling and pulling operations. Entry guide chutes shall be used and the ends of the conduit shall be fitted with bells to protect and guide the cable into the handhole conduit ports. Bells shall be removed after installation of the cable. Lubricating compound shall be used to minimize friction. Corner rollers (wheels), if used, shall not have radii less than the minimum installation-bending radius of the cable. A series array of smaller wheels can be used for accomplishing the bend if the cable manufacturers specifically approve the array.

The pulling tension shall be continuously measured and shall not be allowed to exceed the maximum tension specified by the manufacturer of the cable. Fuse links and breaks can be used to ensure that the cable tensile strength is not exceeded. The pulling system shall have an audible alarm that sounds whenever a pre-selected tension level is reached. Tension levels shall be recorded continuously and shall be given to the Engineer upon request.

The number of handholes/manholes/vaults and their locations shall be as shown on the Plans, or as requested by the Engineer.

The cable shall be pulled into the conduit as a single component, absorbing the pulling force in all tension elements.

The steel strength member(s) and Aramid yarn shall be attached directly to the pulling eye during cable pulling. "Basket grip" or "Chinese-finger type" attachments, which only attach to the cable's outer jacket, shall not be permitted. A breakaway swivel, rated at 95% of the cable manufacturer's approved maximum tensile loading, shall be used on all pulls. When simultaneously pulling fiber optic cable with other cables, separate grooved rollers shall be used for each cable.

Three hundred (300) feet of slack fiber shall be installed at all location where splices are being made, one hundred and fifty (150) feet on each side of the splice enclosure and tie-wrapped and coiled as indicated on the plans. Five (5) feet of slack fiber shall be included at all other handholes or vaults not containing splices. Slack cable shall be pulled from the adjacent cabinet or shelter after installation and secured inside of the vault.

Construction Documentation Requirements:

Installation Practices for Outdoor Fiber Optic Cable Systems: The Contractor shall examine the proposed cable plant design. At least one month prior to starting installation of the fiber optic cable plant, the Contractor shall prepare and submit to the Engineer for review and approval, ten (10) copies of the Contractor's "Installation Practices for Outdoor Fiber Optic Cable Systems" manual, or as required by the Engineer. This manual shall address the Contractor's proposed practices covering all aspects of the fiber optic cable plant. This submittal shall include all proposed procedures, list of installation equipment, and splicing and test equipment. Test and quality control procedures shall be detailed as well as procedures for corrective action.

Operation and Maintenance Documentation:

After the fiber optic cable plant has been installed, ten (10) complete sets of Operation and Maintenance Documentation shall be provided, or as required by the Engineer. The documentation shall, as a minimum, include the following:

- Complete and accurate as-built diagrams showing the entire fiber optic cable plant including locations of all splices.
- Final copies of all approved test procedures.
- Complete performance data of the cable plant showing the losses at each splice location and each terminal connector.
- Complete parts list including names of vendors.

Testing Requirements: The Contractor shall submit detailed test procedures for approval by the Engineer. All fibers shall be tested bi-directionally at both 1310 nm and 1550 nm with both an Optical Time Domain Reflectometer (OTDR) and a power meter and optical source. Any discrepancies between the measured results and these specifications shall be resolved to the satisfaction of the Engineer.

A Certified Technician utilizing an Optical Time Domain Reflectometer (OTDR) and Optical Source/Power Meter shall conduct the installation test. The Technician is directed to conduct the test using the standard operating procedures defined by the manufacturer of the test equipment. All fibers installed shall be tested in both directions.

The Contractor shall provide the date, time, and location of any tests required by this specification to the Engineer at least 5 days before performing the test. Upon completion of the cable installation, splicing, and termination, the Contractor shall test all fibers for continuity, events above 0.1 dB, and total attenuation of the cable. The test procedure shall be as follows:

Optical Time Domain Reflectometer:

The method of connectivity between the OTDR and the cable shall be a factory patch cord or launch cable of a length equal to the "dead zone" of the OTDR. Optionally, the Technician can use a factory "fiber box" of 328 ft (100 m) minimum with no splices within the box. The tests shall be conducted at 1310 nm and 1550 nm for all fibers.

At the completion of the test, the Contractor shall provide two copies of documentation of the test results along with a Comma Separated File (CSV) to the Project Engineer. The test documentation shall be bound and shall include the following:

- Cable & Fiber Identification:
 - Cable ID
 - Cable Location beginning point
 - Cable Location end point
 - Fiber ID
 - Rube/Ribbon Color
 - Fiber color
- Operator Name
- Date & Time
- Setup Parameters
- Wavelength
- Pulse width (OTDR)
- Refractory index (OTDR)
- Range (OTDR)
- Scale (OTDR)

- Setup Option chosen to pass OTDR "dead zone"
- Test Results:
 - OTDR Test
 - Total Fiber Trace
 - Splice Loss/Gain
 - Events > 0.10 dB
- Physical Length (Cable Marking)
- Fiber Length (OTDR)
- Test results and traces shall also be provided on a CD or flash drive
- Optical Source/Power Meter
- Total Attenuation

These results shall be provided in tabular form. The following shall be the criteria for the acceptance of the cable:

- The test results shall show that the dB/km loss does not exceed +3% of the factory test or 1% of the cable's published production loss.
- However, no event shall exceed 0.10 dB. If any event is detected above 0.10 dB, the Contractor shall replace or repair the fiber including that event point.

The total dB loss of the cable, less events, shall not exceed the manufacturer's production specifications as follows:

- 0.5 dB/km at 1310 nm
- 0.4 dB/km at 1550 nm

If the total loss exceeds these specifications, the Contractor shall replace or repair that cable run at the Contractor's expense, both labor and materials. Elevated attenuation due to exceeding the pulling tension during installation shall require the replacement of the cable run at the Contractor's expense, including labor and materials.

The aforementioned tests shall be completed on the reel before installation and completed after the complete installation.

Splicing Requirements: Splices shall be made at locations shown on the Plans. Any other splices shall be permitted only with the written approval of the Engineer.

All optical fibers shall be spliced as indicated on the Plans. If no information is provided, mainline splices shall concatenate the fibers from the two cable segments, that is, the colors of the buffer tubes and fibers shall be the same across the splice. For splices that breakout the individual fibers, the fibers shall be spliced in accordance with the Plans.

Slack Storage of Fiber Optic Cables: As part of this item, slack fiber shall be supplied as necessary to allow splicing of the fiber optic cables to occur in a controlled environment, such as a splicing van or tent. After splicing has been completed, the slack fiber shall be stored underground in vaults.

Where identified on the plans or as directed by the Engineer, additional lengths of fiber shall be stored as maintenance coils. The aggregate lengths of the maintenance coils and the slack fiber shall be used to repair and maintain the fiber optic cable.

Label the destination of each cable in each handhole, vault. Label the destination of each cable at a fiber distribution panel (FDP) located in cabinets, DMSs, and shelters. As a minimum, FDP face plate shall indicate the destination (i.e., dms-465-022-0-nb).

Fiber optic cable shall be tagged inside handholes with a vinyl label

containing the text: "CAUTION - FIBER OPTIC CABLE."

Identification of installed Fiber Optic Cables: The backbone fiber optic cable shall be labeled as "Destination (i.e. CDP-S2)" - "Route (i.e. 465)" - "Destination (i.e. CDP-S3" and "Count" - "Fiber Type (SM or MM)" depending on the location of the fiber and type of fiber. Labels shall be permanent wrap-around type, machine printed and shall be installed within 2 feet from each installed splice enclosure, termination shelf, or conduit penetration into a handhole, cabinet or other structure.

Method of measurement

~~Fiber optic cable will be measured per foot of cable provided in conduit, handhole, vault, cabinet, or shelter.~~

Basis of payment

~~Fiber optic cable will be paid at the contract unit price per lineal foot. Payment will be made under:~~

Pay Item	Pay	Unit
Symbol		
Fiber Optic Cable, Armored, ##F Single Mode	LFT	
Fiber Optic Cable, Armored, ##F Single Mode	LFT	

~~The cost of materials, labor, equipment, transportation, placement, and all incidentals shall be included in the cost of the pay item.~~

~~The bid price shall include all necessary preparation work, pulling equipment and materials, testing, labor, and incidentals necessary to complete the work.~~

FIBER OPTIC CABLE SPLICE

Description

The Contractor shall splice optical fibers from different cable sheaths and protect them with a splice enclosure and splice trays at the locations shown on the Plans. Fiber splicing consists of in-line fusion splices for all fibers described in the cable plan at the particular location.

Materials

Splice Enclosures:

Splice Enclosures shall be designed for use under the most severe conditions such as moisture, vibration, impact, cable stress, and flex temperature extremes as demonstrated by successfully passing the factory test procedures and minimum specifications listed below:

Physical Requirements:

The enclosures shall provide ingress for up to four cables in a butt configuration. The closure shall prevent the intrusion of water without the use of encapsulates.

The enclosure shall be capable of accommodating splice organizer trays that accept mechanical or fusion splices. The splice enclosure shall have provisions for storing fiber splices in an orderly manner, mountings for splice organizer assemblies, and space for excess or un-spliced fiber. Splice organizers shall be re-enterable. The splice case shall be UL rated.

Enclosure re-entry and subsequent reassembly shall not require specialized tools or equipment. Further, these operations shall not require the use of additional parts.

The splice enclosure shall have provisions for controlling the bend

radius of individual fibers to a minimum of 1.5 in (38 mm).

For splices in armored cables, the splice closure shall provide a method of bonding the armor from all sheaths entering the closure. It shall also provide a means of grounding the armor and closure at the splice location.

Factory Testing:

Factory Testing shall conform to the following testing;

Compression Test:

The closure shall not deform more than 10% in its largest cross-sectional dimension when subjected to a uniformly distributed load of 1335 N at a temperature of 0° F and 100° F (-18° C and 38° C). The test shall be performed after stabilizing at the required temperature for a minimum of two hours. It shall consist of placing an assembled closure between two flat parallel surfaces, with the longest closure dimension parallel to the surfaces. The weight shall be placed on the upper surface for a minimum of 15 minutes. The measurement shall then be taken with weight in place.

Impact Test:

The assembled closure shall be capable of withstanding an impact of 28 N- M at temperatures of 0° F and 100° F (-18° C and 38° C). The test shall be performed after stabilizing the closure at the required temperature for a minimum of 2 hours. The test fixture shall consist of 20 lb (9 kg) cylindrical steel impacting head with a 2 in (5 cm) spherical radius at the point where it contacts the closure. It shall be dropped from a height of 12 in (30 cm). The closure shall not exhibit any cracks or fractures to the housing that would preclude it from passing the water immersion test. There shall be no permanent deformation to the original diameter or characteristic vertical dimension by more than 5%.

Cable Gripping and Sealing Testing:

The cable gripping and sealing hardware shall not cause an increase in fiber attenuation in excess of 0.05 dB/fiber @ 1550 nm when attached to the cables and the closure assembly. The test shall consist of measurements from six fibers, one from each buffer tube or channel, or randomly selected in the case of a single fiber bundle. The measurements shall be taken from the test fibers before and after assembly to determine the effects of the cable gripping and sealing hardware on the optical transmission of the fibers.

Vibration Test:

The splice organizers shall securely hold the fiber splices and store the excess fiber. The fiber splice organizers and splice retaining hardware shall be tested per EIA Standard FOTP-II, Test Condition I. The individual fibers shall not show an increase in attenuation in excess of 0.1 dB/fiber.

Water Immersion Test:

The closure shall be capable of preventing a 10 ft. water head from intruding into the splice compartment for a period of seven days. Testing of the splice closure will be accomplished by placing the closure into a pressure vessel and filling the vessel with tap water to cover the closure. Continuous pressure shall be applied to the vessel to maintain a hydrostatic head equivalent to 10 ft. on the closure and cable. This process shall be continued for 30 days. Remove the closure and open to check for the presence of water. Any intrusion of water in the compartment containing the splices constitutes a failure.

Certification:

It is the responsibility of the Contractor to ensure that either the

manufacturer, or an independent testing laboratory has performed all of the above tests, and the appropriate documentation has been submitted to the Department. Manufacturer certification is required for the model of closure supplied. It is not necessary to subject each supplied closure to the actual tests described herein.

Construction Requirements

Installation:

Underground splice enclosures shall be installed in ATMS Vaults at locations shown on the plans. After all necessary splices are made and the enclosure is sealed, the Contractor shall install the enclosure in the vault such that it is supported at least one ft. above the aggregate bottom of the vault. The Contractor shall use appropriate hardware for mounting. The Contractor shall seal the splice closure and pressure test it following the manufacturer's instructions. Dry water-blocking compound shall be placed in the closure during this process.

The Contractor shall secure the Splice Closure to the side of the splice facility using cable support brackets or similar methods. All cables shall be properly dressed and secured to rails or racks within the vault. No cables or enclosures will be allowed to lie on the floor of the splice facility. Cables that are spliced inside a building shall be secured to the equipment racks or walls as appropriate and indicated on the Plans.

The enclosure shall be installed according to the manufacturer's recommended guidelines.

The Contractor shall prepare the cables and fibers in accordance with the enclosure and cable manufacturers' installation practices. A copy of these practices shall be provided to the Engineer 21 days prior to splicing operations.

Using a fusion splicer, the Contractor shall optimize the alignment of the fibers and fuse them together. The Contractor shall recoat the fused fibers and install mechanical protection over them.

Upon completing all splicing operations for a cable run, the Contractor shall measure the mean bi-directional loss at each splice using an Optical Time Domain Reflectometer. This loss shall not exceed 0.1 dB.

The Contractor shall measure the end-to-end attenuation of each fiber, from connector to connector, using an optical power meter and source. This loss shall be measured from both directions and shall not exceed 0.5 dB per installed kilometer of single mode cable, measured at 1310 nm.

The test results shall be supplied to the Department in hard copy and electronic versions.

The cable installation shall satisfy the requirements of both the National Electric Code (NFPA-70-2008) and the National Electric Safety Code (IEEE C2- 2007). The standards require that the armor be bonded and grounded any time that the armor is interrupted or exposed by opening the sheath. These documents also provide minimum separations from foreign utilities.

For splices in armored cables, the Contractor shall ground the splice closure using a #6 AWG conductor or equivalent.

As directed by the Engineer, the Contractor at no additional cost to the Department shall replace any cable splice not satisfying the required objectives.

~~Method of measurement~~

~~Fiber optic fusion splices will be measured for payment per each spliced fiber strand, furnished, installed and tested.~~

~~Splice enclosures will be measured for payment per each enclosure furnished, installed and secured to the wall of the splice facility.~~

~~No additional payment will be made for pulling slack fiber optic cable from nearby vaults, as required to complete a fiber optic splice. The cost of pulling slack cable shall be included in the bid price of the fiber optic splice.~~

~~**Basis of payment**~~

~~Fiber optic fusion splices will be paid for at the contract unit price per each fiber optic strand spliced, complete and in place. Fiber optic splice enclosures will be paid for at the contract unit price per EACH.~~

~~Payment will be made under:~~

Pay Item	Pay	Unit
Symbol		
Fiber Optic, Fusion Splice	EACH	
Fiber Optic, Splice Enclosure	EACH	

~~The unit prices include, as a minimum, all testing and performance verification as described herein, and any incidentals necessary to complete the work.~~

FIBER OPTIC LOCATOR POST

Description

The Contractor shall furnish Fiber Optic Locator Post for identifying locations of fiber optic cable as shown on the plans or as directed by the Engineer.

Material

The Fiber Optic Locator Post shall be made of a non-conductive, high-density polymer, and shall be integrally white in color with an orange cap with black graphic and lettering on two sides. Decals shall be provided on both sides of the markers. Decal shall consist of a standard fiber optic warning message, visible from a distance, such as "Warning Fiber Optic Cable". In addition, the decal shall include the message "Call INDOT Technology Deployment Technicians Supervisor before digging 317-899-8606" along with the Department symbol (digital image is available on the Department's website)." All colors shall be stabilized against ultraviolet light such that they will not fade under continuous exposure to direct sunlight. The marker shall retain dimensional stability in temperatures ranging between -40° F and 175° F. Each post shall be able to withstand a single vehicle impact at 45 MPH and return to within 10 degrees of vertical within 60 seconds.

Installation

A Locator Post shall be installed at fiber optic splice locations. At splice points, posts shall be connected to the fiber splice cases and the armored cable with a #12 ITS, Tracer Wire in innerduct as indicated on the Plans.

Locator Posts shall be installed in accordance with the manufacturer specifications and details.

Locator Posts shall be installed at the same time or immediately after the installation of underground conduits and vaults for identification of underground infrastructure.

Method of Measurement

~~This work will be measured in units of each for the number of markers that are placed and accepted.~~

Basis of Payment

~~Payment will be made per each for Fiber Optic, Locator Post at locations as shown on the plans or as approved by the Engineer.~~

~~Payment will be considered full compensation for all work, materials and equipment required to place the markers at the locations shown on the plans, details, or as directed by the Engineer.~~

Pay Item	Pay	Unit
Symbol		
Fiber Optic, Locator Post	EACH	

~~The cost of materials, #12 tracer wire between the vault and post, labor, equipment, transportation, placement, and all incidentals shall be included in the cost of the pay item.~~

FIBER OPTIC PATCH CORD

Description

The Fiber Optic Patch Cord is used to make fiber optic network device connections between switches and patch panels/terminal blocks with SC and LC connectors as shown on the Plans.

Materials

The fiber optic patch cord shall be a Single Mode, 9-Micron, Duplex, Fiber Optic Cable. All conductors shall have the following specifications:

Single Mode Patch Cord 1 Bend Radius - Meets ANSI/TIA/EIA-568B.3 standard 2 Cladding - 125±1µm 3 Core - 9.2±0.4µm 4 Crush Resistance - 750 N/cm 5 Operating Temperature - -4° F to 158° F 6 Return Loss - ≥55 dB typical 7 Tensile Strength - 240 N (54 lb./24.5 kg) 8 Wavelength - 1310 nm, 1550 nm 9 Maximum attenuation - 0.4dB/km at 1310nm, 0.3db/km at 1550nm 10 Protective boot and boot clip to allow up to a 90° bend on the LC end 11 Protective boot shall accommodate a 90° bend within 2.165 inches from the face of the connector

Construction Requirements

The Fiber Optic Patch Cords shall be provided in accordance with the manufacturer's instructions and as shown on the plans. All materials shall be installed in a neat and professional manner. All installation services shall comply with all warranty provisions and warranty contract maintenance services in accordance with these specifications. Coordinate layout and installation of fiber patch cables with the Engineer.

All fiber optic ferrules shall be cleaned immediately prior to installation.

Method of measurement

~~All Fiber Patch Cables will be measured for payment per the number of units installed and after demonstration of performance.~~

Basis of payment

~~Fiber Patch Cables will be paid for at the contract unit price per EACH. Payment will be made under:~~

Pay Item	Pay	Unit
Symbol		
Fiber Optic, Patch Cord, SM, LC SC, 3 FT	EACH	

~~Fiber Optic, Patch Cord, SM, LC-SC, 10 FT EACH~~

~~This pay item includes patch panel connections, network card connections, and other equipment.~~

FIBER OPTIC PATCH PANEL ASSEMBLY

Description

This work shall consist of furnishing and installing patch panels for terminations inside of the communications shelter or ITS Cabinet.

Materials

The patch panel shall have brackets and all other hardware required for rack mounting in an EIA standard 19-in. equipment rack, or wall mounted if required as shown on the plans. The enclosure shall take up no more than four rack units for 96 fiber panels and no more than one rack unit for 12 fiber panels. The patch panel shall be made of powder-coated aluminum.

The enclosure shall include routing guides for jumpers, strain relief for pigtailed coming from a splice enclosure, and labels for every connector. The panel shall route fiber optic patch cables between any two connectors without reaching the patch cables' minimum bending radius.

Twelve Port Panels:

The enclosure shall include a 12 port patch panel cassette module with a male connection MPO, Type A, IP 69k and 68 for connection to the trunk cable and SC connectors on the front panel. The patch panel cassette shall be pre-terminated from the factory between the SC connectors and the MPO connector. Each MPO connector shall not cause in excess of 0.65dB optical signal loss when tested at 1310nm with a typical loss of 0.35dB. Each SC connector shall not cause in excess of 0.3dB optical signal loss when tested at 1310nm. The enclosure shall be designed to hold cassettes totaling at least 36 connectors or as shown on the plans. Provide enough cassettes for every fiber that terminates in the enclosure. Provide blank panels for panel positions that are not equipped with cassettes or patch panels.

Ninety-six Port Panels:

The enclosure shall include patch panel modules with SC connectors. Each SC connector on the panel shall not cause in excess of 0.3dB optical signal loss when tested at 1310nm. The enclosure shall be designed to hold modules totaling at least 96 connectors in a vertical array mountable in a 19 inch rack. Provide enough modules for every fiber that terminates in the enclosure. Provide blank panels for panel positions that are not equipped with patch panels.

Construction Requirements

Contractor shall provide all equipment for fusion splices, pig tails, trays for organizing equipment, break out kits, connectors, labels, and other accessories required to make a complete system. All fibers shall be terminated into the patch panel assembly in either a communications shelter or cabinet location. ~~The cost of terminations shall be included in the patch panel assembly price.~~

Method of Measurement

~~Fiber optic patch panels shall be measured per each unit furnished and installed, which shall include the patch panel, appropriate mounting hardware, labor, and any other incidental materials necessary to complete the work.~~

Basis of Payment

~~Fiber optic patch panels will be paid for at the contract unit price each.~~

~~Payment will be made under:~~

Pay Item	Pay	Unit
Symbol		
Fiber Optic, Patch Panel Assembly, 96 Port	EACH	
Fiber Optic, Patch Panel Assembly, 12 Port, 1U	EACH	

~~The cost of materials, labor, equipment, transportation, placement, and all incidentals shall be included in the cost of the pay item.~~

FIBER SMALL FORM-FACTOR PLUGGABLE TRANSCEIVERS

Description

The small form-factor pluggable (SFP) transceiver inserts into the ITS switches to interface with the fiber connection.

Materials

SFP transceivers shall be compatible with the ITS Field switches and comply with the Multiple Source Agreement (MSA) specifications. The SFP transceivers shall provide performance as follows:

- Operating temperature of -20° F to 130° F
- LC Connector
- Distance Range:
 - Short - 550m for 50 µm multimode fiber
 - Medium - 10km for 9 µm single-mode fiber
 - Long - 70km for 9 µm single-mode fiber
 - Extended - 80km for 9 µm single-mode fiber
- Optical Link Budget:
 - Short 7dB
 - Medium 10dB
 - Long 24dB
 - Extended 24dB
- Transmit/Receive wavelength:
 - Short 850 nm
 - Medium 1310 nm
 - Long 1550 nm
 - Extended 1550 nm
- Data Rate:
 - Short - 1000Mb/s
 - Medium - 1000Mb/s
 - Long - 1000Mb/s
 - Extended - 1000Mb/s
 - SFP+ - 10Gb/s

Construction Requirements

SFP transceivers shall be furnished and installed at each site that is to be connected to fiber as shown on the plans.

~~Method of measurement~~

~~The SFP transceivers will be measured for payment by the unit Each complete and in place. This work shall include test and performance verification, and incidentals necessary to complete the work.~~

~~Basis of payment~~

~~SFP Transceivers will be paid for at the contract unit price per Each.~~

~~Payment will be made under:~~

Pay Item	Pay	Unit
Symbol		
Fiber Optic, SFP Transceiver, SM, Medium Range	EACH	
Fiber Optic, SFP Transceiver, SM, Long Range	EACH	
Fiber Optic, SFP Transceiver, SM, SFP+	EACH	

~~The cost of materials, labor, equipment, transportation, placement and all incidentals shall be included in the cost of the pay item.~~

GROUNDING

Description

This work includes solid grounding of electrical systems and equipment. It includes basic requirements for grounding for protection of life, equipment, circuits, and systems. Grounding requirements specified herein may be supplemented in other sections of these specifications. All ground wires shall be tinned copper.

The Contractor shall design a ground system for each type of remote site and submit Plans in the form of a design drawing for approval by the Engineer. The design shall be certified by a Professional Engineer in the State of Indiana.

The work shall be completed in accordance with 807 and 922.07. This work shall also comply with Motorola R-56, Motorola Standards and Guidelines for Communications Sites 2000, Chapter 6, External Grounding. Where conflicts exist between Motorola R-56 and specifications, the more stringent requirement shall prevail.

Materials

Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, or manufacturers with equal products, the following:

- O-Z/Gedney Co.
- Alltec Corporation
- American Electric/Blackburn
- Thomas & Betts Corp.

Grounding and Bonding Products: Products of types indicated and of sizes and ratings to comply with the NEC. Where types, sizes, ratings, and quantities indicated in these Specifications, Plans, Motorola R-56, or 807 are in excess of the NEC requirements, the more stringent requirements and the greater size, rating, and quantity indications govern. Conductor materials shall be copper.

Wire and Cable Conductors:

- Aluminum wire and cable shall not be used.
- In general, conform to NEC Table 8, except as otherwise indicated, for conductor properties, including stranding.
- Equipment Grounding Conductor shall be green insulated.
- Grounding Electrode Conductor shall be solid copper wire.
- Bare Copper Conductors shall be solid copper wire: ASTM B-3.
- Assembly of Stranded Conductors in accordance with ASTM B-8.
- Tinned Conductors in accordance with ASTM B-33.

Miscellaneous Conductors:

200-R-401

- Ground Bus shall be bare annealed copper bars of rectangular cross section.

Connector Products:

- In general shall be listed and labeled as grounding connectors for the materials used.
- Pressure Connectors shall be high-conductivity-plated units.
- Bolted Clamps shall be heavy-duty units listed for the application.
- Exothermic Welded Connections shall be provided in kit form and selected for the specific types, sizes, and combinations of conductors and other items to be connected.

Grounding Electrodes: Ground Rods shall be copper-clad steel with high-strength steel core and electrolytic-grade copper outer sheath, molten welded to core. Electrolytic ground rods maybe used, if required by soil conditions, with the approval of the Engineer. Ground rods shall be 5/8 in. by 10 ft.

Construction Requirements: Electrical systems and equipment shall be grounded in accordance with Motorola R-56 and NEC requirements except where exceed by the plans or the specifications.

Listing and Labeling:

Products provided shall be listed and labeled. The terms "listed" and "labeled" shall be in accordance with NEC, Article 100.

Electrical Component Standard: Components and installation shall comply with NFPA 70 of the NEC.

UL Standard:

Grounding and bonding equipment shall comply with UL 467, Grounding and Bonding Equipment.

Equipment Grounding Conductor Application:

Equipment grounding conductors shall comply with NEC Article 250 for size and quantity, except where larger sizes or more conductors are indicated on the plans or by Motorola R-56.

Connections:

In general make connections in such a manner as to minimize galvanic action or electrolysis. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be compatible and prevent galvanic action. The following requirements shall also apply:

- Use electroplated or hot-tin-coated materials to ensure high conductivity and make contact points closer in order of galvanic series.
- Make connections with clean bare metal at points of contact.
- Aluminum to steel connections shall be with stainless steel separators and mechanical clamps.
- Aluminum to galvanized steel connections shall be with tin-plated copper jumpers and mechanical clamps.
- Coat and seal connections involving dissimilar metals with inert material such as red lead paint to prevent future penetration of moisture to the contact surfaces.

Exothermic Welded Connections:

Use for connections to structural steel, for all underground connections, and for all connections to ground rods and plate electrodes. Comply with manufacturer's written recommendations. Welds that are puffed

up or that show convex surfaces indicating improper cleaning are not acceptable.

Terminate insulated equipment grounding conductors for feeders and branch circuits with pressure-type grounding lugs. Where metallic conduits terminate at metallic housings without mechanical and electrical connection to the housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to the ground bus in the housing. Noncontinuous, metallic conduits shall be bonded, in an electrical manner, at one end with grounding bushings and bare grounding conductors.

Tighten grounding and bonding connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque-tightening values for connectors and bolts. Where manufacturer's torquing requirements are not indicated, tighten connections to comply with torque tightening values specified in UL 486A.

Ground Rod Installations:

Ground rods shall be driven into the earth. The top of the ground rod shall be a minimum of 12 inches below finished grade. Conductor terminations to the ground rod shall be made by exothermic welds, rated for underground installation.

Compression-Type Connections:

Use hydraulic compression tools to provide the correct circumferential pressure for compression connectors. Use tools and dies recommended by the manufacturer of the connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on the ground conductor.

Moisture Protection:

Where insulated ground conductors terminated underground insulate the entire area of the connection and seal against moisture penetration of the insulation and cable.

Field Quality Control:

The procedures for performing resistance testing of the site grounding electrode system shall comply with the following:

The resistance of a grounding electrode system shall be measured after its installation and before it is bonded to the power company neutral wire or any other utility, such as the telephone ground or metallic pipes.

Resistance testing shall be done using the Three-Point/Fall-of-Potential method. The Three-Point/Fall-of-Potential test is the most widely accepted and recommended test method. This procedure is documented in ANSI/IEEE STD 81 and shall be referred to for more details. The testing shall be done in accordance with Motorola R-56. An instrument designed specifically to measure the resistance of a point to each ground shall be used and the instructions provided with the instrument shall be followed for proper measurement method. All measurements shall be recorded along with the location of each ground rod and submitted to the Engineer.

Upon completion of all grounding requirements outlined in these Special Provisions and other applicable documents, the ground resistance for Configuration G sites shall be 4 Ohms or less, all Configuration J shall be 25 Ohms or less, and all other sites shall be 10 Ohms or less.

Deficiencies:

Where ground resistances exceed specified values, the Contractor shall modify the grounding system to reduce resistance values. Additional costs for materials and labor used in these modifications will be considered incidental to the cost of the grounding system.

Reporting:

Prepare test reports of the ground resistance at each test location. Include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

Cleaning and Adjusting:

Restore surface features at areas disturbed by excavation and reestablish original grades except as otherwise indicated.

Where sod has been removed, replace it as soon as possible after backfilling is completed. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work to their original condition. Include necessary topsoil, fertilizing, liming, seeding, sodding, sprigging, or mulching. Maintain disturbed surfaces, restore vegetation, and restore disturbed paving.

Inspection:

The grounding system will be inspected by the Engineer using the checklist from Motorola R-56 Appendix F pages 601 through 643, as applicable.

~~Method of Measurement~~

~~Grounding will not be measured for payment.~~

~~Basis of Payment~~

~~Grounding will not be paid for separately, and will be considered incidental to the cost of electrical equipment, cabinets, and ATMS equipment. No separate payment will be made for equipment grounding unless otherwise specifically stated herein.~~

HANDHOLES

SECTION 805.03, BEGIN LINE 30, INSERT AS FOLLOWS:

ATMS Handholes shall be as shown on the plans. The handhole covers shall be bolted into place with stainless steel bolts and washers. The cover frame shall be installed in the handhole with a butyl rubber sealant in tape/coil form for a proper seal between the handhole and frame and to prevent it from moving out of place. The sealant shall comply with ASTM C990 for butyl rubber sealants.

The cover for the ATMS handhole shall be marked with logo imprints of "Traffic Management System," "Traffic Management Fiber," or "Traffic Management Power" horizontally across the cover. Covers labeled "Traffic Management Power" shall be provided whenever the handhole is used for power distribution cables. Covers labeled "Traffic Management Fiber" shall be provided whenever the handhole is used for backbone fiber. Covers labeled "Traffic Management System" shall be provided in all other handholes.

~~SECTION 805.16, BEGIN LINE 664, INSERT AS FOLLOWS:~~

~~Pay Item:~~

~~Handhole, ATMS _____ EACH~~

ITS COMPONENT ACCEPTANCE

ITS Component Acceptance will occur after all components are installed and integrated with the existing traffic management system. The Contractor shall submit a written request stating that the project ITS components are ready for inspection and acceptance. INDOT ITS will inspect and verify all

ITS components installed on this project are acceptable. All deficiencies will be noted and a written inspection punch list form noting all deficiencies shall be presented to the Contractor. Participation of the Department in the testing does not constitute ITS Component Acceptance. Provision of a punch list after initial ITS inspection does not constitute ITS Component Acceptance. After all deficiencies are corrected, the Contractor shall provide a written request for reinspection; noting how all deficiencies were corrected. Upon reinspection and verification that all punch list items have been corrected, INDOT ITS will issue written verification showing the date of ITS Component Acceptance.

ITS DOCUMENTATION AND SUBMITTALS

Description

The Contractor shall provide four types of documentation and submittals for this contract: wiring diagrams and system schematics, submittal data, as-built documentation, and manuals and maintenance documentation. The Contractor shall submit working drawings in accordance with 105.02 and the following additional requirements.

All documentation shall be provided in electronic format and delivered to INDOT ITS via email as practical. If files exceed the size limits of the contractor's or the department's email service, the contractor shall contact INDOT ITS to discuss appropriate methods of electronic file transfer. All electronic files shall be readable using standard Microsoft Office products or Adobe Acrobat Reader.

All documentation shall also be provided in physical form. Such physical documentation shall be no smaller than 8½ in. by 11 in. or no larger than 24 in. by 36 in. except as approved by the engineer. Standard bound manuals shall be exempted from this requirement. The Department shall maintain the right to reproduce unlimited copies of any documentation for exclusive use on this contract.

All 8½ in. by 11 in. documentation, except standard bound manuals, shall be bound in logical groupings in three ring loose-leaf binders. Binders may also include 11 in. by 17 in. documentation if Z-folded. One copy of each bound grouping of documentation shall be provided labeled in a legible and permanent manner. One copy of all 24 in. by 36 in. documentation and a single reduced set no smaller than 11 in. by 17 in. shall be provided.

All documentation submitted shall be of reproducible quality as determined by the Engineer. All unsatisfactory items will be returned to the Contractor who shall make the submittal again in satisfactory reproducible form as determined by the Engineer.

All literature from manufacturers shall be original documents provided by the manufacturers. Black and white copies of color originals are not acceptable. No facsimile reproductions of any type shall be accepted.

Wiring Diagrams

Wiring diagrams and system schematics shall be prepared and meet the following requirements:

- Include wire designations by color or labels for every piece of field equipment in every cable segment between the equipment.
- Include appropriate designations for every cable and conduit segment. All conduits carrying electrical cables shall be marked or labeled at all maintenance points and points of access.

Designations shall include terminology such as, "Power Distribution - 480 VAC", "Video Coax", etc. All designations shall be submitted to the Engineer for approval prior to submittal.

- Show locations of all cable splices.
- Show connections to all communications equipment at the remote sites, CDP sites, and at the Traffic Management Center.
- All radio equipment documentation packages shall include system diagrams, interconnection drawings, parameter lists and optimization procedures.

Submittal Data

Submittal Data shall be prepared and meet the following requirements:

Prior to the purchase or fabrication of any equipment or material proposed for use on this project, the Contractor shall submit for review by the Engineer catalog cut sheets and specifications for all standard, off-the-shelf items; working drawings shall be submitted for all non-catalog or custom items. An electronic copy of all submittals and working drawings shall be provided in .pdf format. ~~In lieu of electronic copies the Contractor may choose to submit ten paper copies of submittals and working drawings.~~ Every submittal shall be accompanied by transmittal letter providing following information:

- Submittal number
- ~~Pay item number~~
- Manufacturer and model number
- Description

Submittals and working drawings will be approved or rejected in writing, and a memorandum stating the disposition will be returned to the Contractor. Certain items will require verification of performance, which shall be provided with the catalog cut sheets, working drawings, and specifications. See individual equipment specifications for requirements.

The purpose of the submittal and working drawing data is to show specifically and in detail how the Contractor intends to satisfy the requirements of these specification and the plans. If preprinted literature is utilized to satisfy some or all of these requirements, there shall be no statements on the literature which conflict with these specifications or plans. Any such statements will be crossed off and initialed by the Contractor and an appropriate statement be attached indicating how the requirements of these specification or the plans will be fulfilled.

The Contractor shall label each item of submittal and working drawing data with the bid item number or other description of the items to which it applies. Each submittal of catalog cut sheets, specifications, or working drawings, shall contain sufficient information and details to allow the Engineer to evaluate the particular component.

Copies of the catalog cut sheets, specifications, and working drawings shall be submitted by the Contractor to the Engineer and INDOT ITS. All catalog cut sheets and specification submittal data shall be submitted within 30 calendar days following issuance of the Notice to Proceed. All working drawings shall be submitted within 90 calendar days following issuance of the Notice to Proceed. ~~Failure to submit catalog cut sheets, specifications and working drawings within this time frame shall result in liquidated damages of \$1000 per day to be withheld from Contractor payment.~~

All submittals will be returned to the Contractor within 30 days of submission. All submittals returned to the Contractor as rejected shall be resubmitted for approval within 14 calendar days from the notice of rejection. ~~Failure to resubmit documentation within the 14 calendar days from notice of rejection will result in liquidated damages of \$1000 per day~~

~~to be withheld from Contractor payment.~~

The Contractor may submit alternatives to the Plans and Special Provisions to the Department for consideration. Any alternative submitted shall be identified with benefits stated and documented.

The Contractor shall submit the following items at a minimum. Any item included in this list that is not a deliverable of the contract may be removed from the requirements with approval by the Engineer. This list does not preclude the submittal of other items as required in the specifications. The submittal requirement items are as follows:

- Fiber optic cable
- Fiber optic drop cable assemblies
- Fiber optic patch panels
- Fiber optic patch cables
- Fiber optic break out kit and connectors
- Fusion splice protection kit
- Fusion splice enclosure
- Small Form-Factor Pluggable Transceivers (SFPs)
- Vaults
- Handholes
- Handhole and vault rings & lids
- Cable duct markers, concrete
- Cable duct markers, flexible (including decal design)
- All conduits
- All electrical and grounding cables
- Cell Modems
- Conduit splicing methods and materials
- Dynamic Message Sign Structure
- Dynamic Message Sign Structure Foundation
- DMS Panels and Signs
- ITS Cabinet
- Wireless Vehicle Detection System
- Monopole
- Monopole Foundation
- Camera Assemblies
- Computers

As-Built Documentation

Documentation of the work, as-built, shall be provided by the Contractor prior to acceptance of the work. The Contractor shall draw in the final as-built locations for the cabinets, poles, conduits including burial depth, and device locations. These drawings shall be returned in ~~both~~ electronic ~~and paper~~ format.

As part of the final as-built documentation the Contractor shall provide GPS coordinates accurate within 3 ft. of a CCTV, DMS, Cabinet, or Service point location. The coordinates shall be noted on the plans and in a single spreadsheet form provided to the Department.

As part of the final as-built documentation the Contractor shall provide GPS coordinates accurate within 3 ft. of all handhole and vault locations. The coordinates shall be noted on the plans and in a single comma separated value, CSV, file provided to the Department. The CSV file shall be supplied to the Department including the Latitude and Longitude of all handhole and vault locations in decimal degree format. Each record shall include the type of object, Latitude, Longitude, Road Name, direction of roadway travel, and Nearest Mile Marker to the nearest tenth of a mile. The

following is an example of the record format;

Example record: Vault, 39.40247778, -86.44611111, I-69, NB, 136.7

This would be the location record for a vault placed along I-69, on the NB side of the road, at the 136.7 mile marker near the interchange with SR 39.

Component and wiring diagrams shall be provided for all custom manufactured equipment as well as a complete parts listing indicating the manufacturer and model of all electronic components.

In addition to the documentation specified elsewhere, prints of schematic diagrams applicable to the equipment contained in cabinets or the communication shelters shall be provided by the Contractor. An 11 in. by 17 in. laminated wiring diagram, and an 11 in. by 17 in. laminated site drawing shall also be supplied in a weatherproof holder and mounted at each new cabinet and communication shelter.

Manuals and Maintenance Documentation

Two manuals shall be supplied for each individual component of the system. A reproducible form of the manual shall also be provided. The manuals supplied for the off-the-shelf items shall be those supplied by the equipment manufacturer.

Manuals shall include, at a minimum, the following material:

- Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
- Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions.
- Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
- Servicing instructions and schedules.

The Contractor shall provide a maintenance history for each piece of electronic equipment provided on this contract. This history shall include the equipment type, model and serial numbers, date of manufacture, date and location of installation, date of all associated tests required by these specifications and the performance of the equipment during these tests.

Any maintenance activity performed on the unit because of a failure shall be documented, and shall include: an explanation of all failures, date that the equipment was removed from a cabinet, the repairs that were made, the date and nature of any tests made to check the correct operation of the unit, and the date and the location where the unit was reinstalled in the field.

After each repair conducted, prior to acceptance, the warranty period shall be renewed. No more than one repair shall be allowed prior to acceptance. If a second repair is required, the equipment shall be replaced in kind with a new warranty period.

~~Method of Measurement~~

~~ATMS Documentation and Submittals will not be measured.~~

~~Basis of Payment~~

~~System documentation will be considered incidental to the cost of equipment being provided on this contract and will not be paid for separately.~~

ITS EQUIPMENT WARRANTY

Unless otherwise specified in the individual equipment special provisions, equipment warranties shall be provided for a period of time that is customary and normal for the manufacturer but shall not be less than one year from date of final acceptance of the contract. Final acceptance will not be provided without ITS Component Acceptance.

The warranty shall cover, at a minimum, all work and materials for all ITS equipment components and hardware including, but not limited to, all communication equipment including Switches, radios, antennas, SFP's, and all connecting cables; all end devices including microwave detectors, Travel Time Signs, camera assemblies, and camera interfaces; and all ancillary equipment including support structures, step-down transformers, power strips, remote power switches, and UPSs. Documentation shall be provided for all equipment to show compliance with warranty requirements.

ITS POWER SERVICE DROP

Description

Work under this item shall include furnishing and installing all equipment necessary to provide a complete service point power entry for ATMS equipment. Electrical service, where required, shall be provided by power utility which services the location of the service point. Provide a 100 Amp, 120/240 VAC, 1-phase, 3-wire service or a 100 Amp and 480 VAC 1-phase, 2-wire service or as indicated on the plans.

Materials

The service drops shall be sized and equipped as shown on the Plans. Meter sockets shall be installed in accordance with the requirements of the utility. Grounding shall be in accordance with Standard Specification 807.12 and shall be part of the service installation.

The service drop or metered panel shall be a Service Entrance rated, NEMA 3R Load Center with integral meter base rated 120/240VAC similar to the GE TSM1610CSCU, Square D RC1624M100S, or Siemens MC2040B1150, or with a separate meter base when rated at 480VAC as indicated in the plans. The panel shall be equipped with a Main Circuit Breaker sized as indicated on the plans or sized for the service provided. Provide a minimum of sixteen, 1 inch, 1-pole circuit breaker spaces in the panel for branch circuits. The enclosure shall be padlockable.

Circuit breakers shall be single or two-pole as required by the branch circuit. Circuit breakers shall have a minimum 10,000 AIC for 240V circuit breakers, and 65,000 AIC for 480V circuit breakers. Panels shall be fully rated; series rated shall not be allowed.

Construction Requirements

The service point shall be installed at locations as indicated in the Plans and shall also be closely coordinated with the utility's requirements. Work under this item includes overhead and underground service power drops. The Contractor shall pay for all costs required by the utility for service installation.

After coordination with the electric utility's representative, the Contractor shall contact the ITS Technology Support Director at jessicakruger@indot.in.gov to set up the Service Point Account with the Utility Company in the Department's name so that the Department will be

responsible for paying for energy consumption after service is connected for permanent service drops. The Contractor shall pay for any utility construction costs and any associated utility expenses. The Contractor shall pay all utility expenses including energy consumption for temporary service drops. The Service drops shall be in accordance with these Special Provisions and with 807.15.

All electrical work associated with the service power drop installations shall be in accordance with the Plans, Standard Specifications, and the manufacturer's written instructions and applicable requirements of NEC standards. As identified in the plans or per the Engineer request, where the proposed service point is more than 500 ft. from the ATMS remote site, a separate, lockable, subpanel shall be provided at the ATMS site.

All subpanels shall have their own ground rod which is also connected to the site's grounding system. The grounding conductors and ground rod shall be bonded to all non-current carrying metal on the subpanel.

Any location that incurs a new customer set-up charge from the power utility shall be considered as part of the installation. The installation is not complete until power is available at the service point site.

~~Method of Measurement~~

~~Service points will be measured for payment per unit each complete and in place. Circuit Breakers when identified as the method for power service connection to an existing ITS service point shall be measured for payment per unit each complete and in place.~~

~~Basis of Payment~~

~~Service Points shall be paid for at the contract unit price per each as follows:~~

~~Payment will be made under:~~

Pay Item	Pay	Unit
Symbol		
Service Point, ATMS, Circuit Breaker	EACH	
Service Point, ATMS, 120/240V, Overhead	EACH	
Service Point, ATMS, 120/240V, Underground	EACH	
Service Point, ATMS, Subpanel	EACH	
Service Point, ATMS, Metered Panel	EACH	

~~Terminations, connections, service conductors, circuit breakers when not identified as the power source to an existing ITS Service Point, ground rods, ground wires, fittings, switches, service cabinets, utility current transformer cabinets, PT cabinets, CT cabinets, weatherheads, meter sockets, cables, conduits down to first below grade bend, poles, aluminum channels, braces, and mounting surfaces, and other miscellaneous items shall be incidental to this work and no separate payment will be made. Utility charges that are a standard fee for new service installations are incidental to this work, except as provided below.~~

~~The cost of the ground rod for a subpanel location shall be considered incidental to the cost of the subpanel.~~

~~Padlocks are to be in accordance with the padlock specification and are paid for separately.~~

Description

Work under this item shall include furnishing and installing tracer wire in conduits as shown on the plans and as described in these specifications to assist with conduit locates.

Materials

Tracer wires shall be a single conductor, high strength copper clad steel, orange color jacket, high molecular weight and high density polyethylene (HMWPE) insulation, #12 AWG wire. The HMWPE jacket shall be a minimum of 30 millimeters in thickness. The wire shall have a minimum break load of 425 pounds and made of fully annealed, high carbon 1055 grade steel. Tracer wires shall be rated for use at 30 volts. Wire connectors shall be waterproof.

Construction Requirements

As determined by the Department, new continuous tracer wire shall be placed into each run of fiber optic cable, fiber optic trunk cable, fiber optic lateral cable and fiber optic extension cable from handhole to handhole or vault. A minimum of 3 ft. of tracer wire shall be securely tied off inside of a terminating handhole.

As determined by the Department, a new continuous tracer wire shall be provided in the same raceway with all fiber optic cables. Tracer wire is not required to be installed in above-ground conduits and empty conduits that are part of a duct bank that contains a non-dielectric (conductive) cable. When multiple cables are to be installed in a conduit, all cables shall be pulled simultaneously to prevent friction damage to the cable insulation. Spare and empty conduits shall not be utilized to install the tracer wire.

The tracer wire shall be securely fastened inside of the handhole or vault. A waterproof wire nut or direct burial connector shall be connected to each end of the tracer wire to prevent corrosion. At vaults with splice enclosures the tracer wire shall be connected to the enclosure and also connect to the wire lead for the Fiber Optic, Locator Post.

~~**Method of Measurement**~~

~~ITS, Tracer Wire will be measured for payment per linear ft. of materials provided complete and in place.~~

~~**Basis of Payment**~~

~~ITS, Tracer Wire will be paid at the contract unit price per linear ft., complete and in place.~~

~~Payment will be made under:~~

Pay Item	Pay	Unit
Symbol		
ITS, Tracer Wire		LFT

~~The cost of materials, labor, equipment, and necessary incidentals are included in the cost of this work. ITS, Tracer Wire shall include fasteners, waterproof wire nuts, waterproof direct burial rated connectors and all other incidentals necessary for installation.~~

~~Waterproof wire nuts or connectors shall be considered incidental to the cost of the tracer wire.~~

ITS, CELLULAR MODEM ASSEMBLY

Description

200-R-401

The modem shall provide communication between the ITS Controller and the TMC.

Materials

The ITS, Cellular Modem shall consist of the following components:

- One cellular modem gateway
 - o CRADLEPOINT COR SERIES ROUTER MODEL # IBR900-1200
 - o Direct wire GPIO cable
- One, Five-in-one antenna
 - o AG60 SERIES W/CABLE (2 X CELLULAR 3G/4G/LTE/GPS/ 2 X WiFi 2.4GHZ FOR CRADLEPOINT IBR900)

The ITS, Cellular Modem shall provide all the needed features and components to provide data communications between the ITS field cabinet and the Department Traffic Management Centers.

Construction Requirements

The ITS, Cellular Modem shall be installed in accordance with the manufacturer's instructions. All materials shall be installed in a neat and professional manner. All installation services will comply with all warranty provisions and warranty contract maintenance services in accordance with these specifications. All installation services shall comply with all local and state electrical codes, and Motorola R-56 requirements. All wiring entry and exits shall be made at the side or underneath components; no exposed top entry or exits are permitted. This requirement extends to all enclosures, junction boxes, support arms, or any other externally exposed devices. Cable termination shall be in accordance with the manufacturer's recommendations. Connectors outside of cabinets shall be sealed in accordance with the manufacturer's recommendations. The contractor shall de-burr all holes made in metal poles or cabinets and install grommets for cable protection.

~~Method of Measurement~~

~~The ITS, Cellular Modem will be measured for payment per the number of units furnished and installed complete and in place and after passing component and subsystem testing.~~

~~Basis of Payment~~

~~ITS, Cellular Modem will be paid for at the contract unit price per each.~~

~~Payment will be made under:~~

Pay Item	Pay	Unit
Symbol		
ITS, Cellular Modem Assembly		EACH

~~The unit price includes the cellular gateway modem, cellular gateway modem power supply, antenna, cables, environmental enclosure, housing, mount, all mounting hardware, support arms, connections, Ethernet cables, and incidentals necessary to complete the work.~~

PADLOCKS

Description

This work shall consist of furnishing and installing padlocks for all cabinets, fence gates, and enclosures specified in these Special Provisions.

Materials

The padlock shall be classified as a high security padlock with

hardened shackle, laminated body, 4 pin cylinder (minimum) and come complete with a weather cover to protect the lock body and cylinder from sand, dirt, water and ice. A wafer cylinder shall not be used.

NO keys shall be provided to the Department with each padlock supplied. All padlocks shall be keyed alike and be identical to the keys currently in use by the Department. The main body width of the padlock shall not exceed 3" and have a shackle length of 2.25" to 3.75" and a shackle diameter of 5/16".

For padlock information, contact, Brian Stoner, ITS Technology Deployment Division Maintenance Supervisor Indiana Department of Transportation (317) 690-5534 bstoner1@indot.in.gov

~~Method of measurement~~

~~The Padlocks will be measured per item provided by the unit of EACH.~~

~~Basis of payment~~

~~The Padlocks will be paid for at the contract unit price of EACH.
Payment will be made under:~~

Pay Item	Pay Unit Symbol
ITS, Padlock	EACH

VAULT, ATMS

Description

This work consists of furnishing and installing ATMS vaults for communications cable access as shown on the plans.

Materials

Materials for the ATMS vault shall be as shown in the plans and in accordance with 807.03. All vault covers are required to be bolted into place to prevent accidental removal by mowing crews or other unintentional means. The cover frame shall be installed in the vault with a butyl rubber sealant in tape/coil form for a proper seal and to prevent the frame from moving out of place. The sealant shall comply with ASTM C990 for butyl rubber sealants.

The vault rings and covers shall be as shown on the plans and in accordance with 807.09 except the message displayed on the lid shall read "TRAFFIC MANAGEMENT FIBER". Fabrication of these vault covers shall not commence until working drawings that the Contractor shall have submitted have been approved by the Engineer.

Construction Requirements ATMS vaults shall be installed at all planned and potential future fiber optic cable splicing locations and at additional locations as shown on the plans.

Material surrounding the buried conduit splices and ATMS vaults shall be tamped and added in such a manner so that there are no voids or depressions formed. Conduit entrance and exit points in the new ATMS vaults shall be sealed watertight.

ATMS vaults shall be precast. The top of the vault shall be flat and level with the surrounding ground. The vault shall be placed such that final grading will provide a minimum of 4 inches of soil over the concrete box. Clean applicable surfaces before installing butyl sealant on the cover frame prior to installation in the vault. Adhesive primer shall be used when moisture is present on surfaces. Follow manufacturer's instructions for proper installation. When the installation is completed, all disturbed portions of the construction area shall be cleaned and any excess excavation

or other materials shall be properly disposed of as soon as possible.

Method of Measurement

~~The completed work as described for ATMS vault will be measured by the unit of each and shall include furnishing and installation of a new vault, a bolt down cover, butyl sealant, excavation, and all other accessories, grading, and re-seeding necessary for a complete installation.~~

Basis of Payment

~~Payment for the work included in this special provision will be paid for at the Contract unit price per each.~~

~~Payment will be made under:~~

Pay Item	Pay Unit Symbol
Vault, ATMS	EACH

~~The cost of materials, labor, equipment, transportation, placement, and all incidentals shall be included in the cost of the pay item.~~

~~All earthwork preparation and grading necessary for installation of the vault shall be considered incidental to this work. All final clean-up and disposal of excess excavation shall be considered incidental to this work.~~

WIRELESS VEHICLE DETECTION SYSTEM

Description

This work shall consist of furnishing and installing wireless vehicle detection systems for vehicle detection.

Materials

The wireless vehicle detection system, WVDS, is comprised of wireless magnetometer detectors, contact closure cards, receiver processors, and wireless repeaters installed for a signalized intersection. The system shall be capable of monitoring vehicles on a roadway via detection of changes in inductance caused by the presence or passage of a vehicle and shall provide detector outputs to a traffic signal controller.

The WVDS shall include magnetometer detectors, a minimum of two receiver processors, the required mounting equipment, cables, rack mounted cards, set-up and operating software, all connectors, and miscellaneous equipment necessary for the installation and operation of the system. If required, the WVDS shall also include wireless repeaters.

Only models from the Department's approved materials list for traffic signal and ITS devices shall be used.

Ethernet cable for wireless vehicle detectors shall be outdoor rated and UV shielded.

Construction Requirements

Prior to the installation, the Contractor shall test all wireless magnetometer detectors and demonstrate proper operation and communication between the wireless magnetometer detectors and the receiver processor and wireless repeater, if required.

Prior to the installation, the Contractor shall demonstrate that each wireless magnetometer detector is within range of its corresponding receiver processor, using wireless repeaters as necessary. All wireless magnetometer detectors assigned to either a receiver processor or wireless repeater shall be located within a 120° arc measured from the receiver processor or wireless repeater.

The Contractor shall install each wireless magnetometer detector in the roadway according to the manufacturer's recommendations with one wireless magnetometer detector programmed to count vehicles for each through travel lane. Holes cored in the pavement shall be cleaned and dried before installing wireless magnetometer detectors. The cored pavement shall be backfilled according to the manufacturer's recommendations.

Receiver processors and wireless repeaters shall be mounted on traffic signal steel strain, pedestal, cantilever poles, or square steel sign posts. If a square steel sign post is used, it shall have a length of no more than 24 ft and a Type 3 object marker shall be installed on the post, with a mounting height of 4 ft, measured from the edge of the traveled way to the bottom of the object marker. The mounting height of receiver processors above the pavement surface shall be per the manufacturer's specifications. The mounting height of wireless repeaters above the pavement surface shall be per the manufacturer's specifications.

The minimum distance between a receiver processor and wireless repeater mounted on the same structure shall be 2 ft. This distance may be increased to enable better communication between the devices.

After installation, the Contractor shall demonstrate successful communication between each wireless magnetometer detector, receiver processor, and wireless repeater to the Engineer.

Method of Measurement

~~Wireless magnetometer detectors, contact closure cards, receiver processors and wireless repeaters will be measured by the number of units installed.~~

Basis of Payment

~~Wireless magnetometer detectors, contact closure cards, receiver processors and wireless repeaters will be paid for at the contract unit price per each.~~

Pay Item	Pay	Unit
Symbol		
Contact Closure Card	EACH	
Receiver Processor	EACH	
Wireless Magnetometer Detector	EACH	
Wireless Repeater	EACH	

~~The cost of coring the pavement, sealant, and all work necessary for proper installation and operation of the wireless magnetometer detectors shall be included in the cost of the wireless magnetometer detector.~~

~~The cost of cables, connectors, set-up and operating software, access boxes, rack mounted expansion cards, and all hardware necessary to complete the installation shall be included in the cost of the contact closure cards.~~

~~The cost of required mounting equipment, cables, connectors, and miscellaneous equipment necessary for proper installation and operation of the receiver processors shall be included in the cost of the receiver processors.~~

~~The cost of required mounting equipment, connectors, and miscellaneous equipment necessary for proper installation and operation of the wireless repeaters shall be included in the cost of the wireless~~

(Revised 04-25-21)

Description

Recycled foundry sand, RFS, consists of a mixture of residual materials used from ferrous or non-ferrous metal castings and natural sands. The Contractor shall have the option of incorporating RFS into applicable operations in accordance with 105.03.

Materials

RFS sources are to be selected from the qualified products list, QPL, of Recycled Foundry Sand. RFS may be substituted for B borrow or Borrow upon the approval by the Department's Geotechnical Services Division.

The Contractor shall provide a copy of the Indiana Department of Environmental Management's, IDEM, waste classification certification for Type III or IV residual sands prior to use. The IDEM certification shall clearly identify the stockpiles with regard to their extent and geographical location.

A type A certification in accordance with 916 shall be provided for recycled foundry sand. The results of the gradation test shall be shown on the certification for recycled foundry sand. Consultants on the Department's list of Qualified Geotechnical Consultants shall perform the testing of RFS materials.

RFS use is restricted to the following additional requirements:

1. RFS derived from Type III residual sand shall not be allowed within 100 ft, horizontally, of a stream, river, lake, reservoir, wetland, or any other protected environmental resource area.
2. RFS derived from Type III or Type IV residual sand shall not be placed within 150 ft, horizontally, of a well, spring, or other ground source of potable water.
3. RFS shall not be allowed adjacent to metallic pipes or other metallic structures.
4. RFS shall not be used as encasement material.
5. RFS shall not be used in MSE wall applications.
6. RFS placement shall be at least 2 ft above ground water elevation.

If RFS is used in embankment, excavation and replacement operations as a replacement for B borrow or borrow, the following additional restrictions will be required.

1. Borrow: RFS shall be in accordance with 203.
2. B borrow: RFS shall be in accordance with 211.

Construction Requirements

RFS shall be transported in a manner that prevents the release of fugitive dust and loss of material. Adequate measures shall be taken during construction operations to control fugitive dust from RFS. RFS shall not be applied when wind conditions result in problems in adjacent areas or result in a hazard to traffic on any adjacent roadway. The spreading of RFS shall be limited to an amount that shall be encased within the same workday. If weather causes stoppage of work or exposes the RFS to washing or blowing, additional RFS may be spread when the work resumes. Spraying with water, limewater, or other sealing type sprays will be considered to be acceptable methods for dust control.

When RFS is used as borrow or B borrow, the lift thickness and compaction of the materials shall be in accordance with 203.23. The dynamic cone penetrometer, DCP, criteria will be determined by a test section in accordance with ITM 514. The DCP testing will be performed in accordance with ITM 509. The moisture content shall be controlled in accordance with 203.23. The test section shall be constructed in the presence of a representative of the Department's Geotechnical Services Division. When RFS is used as B borrow, the DCP criteria for the granular soils shall be used in accordance with 203.23. Nuclear density testing of RFS will not be allowed.

When RFS is used in embankment construction, the sideslopes of the RFS shall be encased with 1 1/2 ft of non-RFS borrow materials. All RFS shall be encased with a minimum of 1 ft of non-RFS borrow materials prior to the completion of construction operations in a calendar year. The encasement materials shall be placed and compacted concurrently with the RFS lifts. Encasement materials not meeting the AASHTO M 145 Classifications of A-6 and A-7 shall be submitted to the Department's Geotechnical Services Division for approvals.

Method of Measurement

RFS applications will be measured in accordance with the respective uses for borrow or B borrow.

-

Basis of Payment

RFS will be paid for at the contract unit price in accordance with the respective uses for borrow or B borrow.

-

No payment will be made for the transportation, handling, or any special construction requirements such as alternative compaction means or encasement activities, when using RFS materials.

-

The cost of the use of water, limewater, sprays, or other activities necessary for dust control, shall be included in the cost of the respective pay item.

-

The cost of geotechnical testing for the use of RFS materials shall be included in the cost of the respective pay item.

RECYCLED FOUNDRY SAND SOURCE QUALIFICATION CRITERIA

The following procedures covers the requirements for Recycled Foundry Sand sources or otherwise prescribed subject matter to qualify, be added, maintained, and removed from a Department's QPL.

The procedures for qualification may involve hazardous materials, operations, and equipment. These procedures do not purport to address all

of the safety problems associated with the use of the product. The source's responsibility is to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

General Requirements

1. A source, requesting addition to the QPL, shall provide to the Division of Materials and Tests the following:
 - (a) Name and location of source or manufacturer
 - (b) List of material and specification reference for the material being requested for consideration,
 - (c) Average monthly production of the material by size, type or grade
 - (d) Name, address, and phone number of responsible contact person
 - (e) Facility layout or production process of the material
 - (f) Quality parameters of the material
 - (g) Raw material sampling and testing frequency
 - (h) Procedures for conforming materials which provides a positive linkage between the furnished materials and the quality control test data
 - (i) Procedures for non-conforming materials
 - (j) Procedures for marking and tracking materials
 - (k) Procedures for documentation maintenance
 - (l) Finished material sampling and testing frequency
 - (m) Procedures for reviewing and updating the source operations
 - (n) Testing laboratory quality system
 - (o) Names, titles and qualifications of sampling and testing personnel
 - (p) Location and phone number of the laboratory testing office
 - (q) Sample management describing procedures for samples identification, maintenance of the samples prior to testing, sample retention and disposal of samples
 - (r) Testing report procedures
 - (s) Methods used to identify improper test results and procedures followed when testing deficiencies occur

- (t) Statistical analysis of test results, and
- (u) Maintenance of test records.

The application shall be signed and dated by the source's or manufacturer's representative at the time the application is submitted for acceptance. The application shall be maintained to reflect the current status and revisions shall be provided to the Department in writing.

- 2. Testing may be required which will be performed outside the Department's laboratories. A recognized laboratory shall be the following:
 - (a) a State transportation agency testing laboratory,
 - (b) a testing laboratory regularly inspected by the AMRL,
or
 - (c) a testing facility approved by the Department.

Qualification Requirements

In addition to the general requirements, the source shall also submit the following to the Division of Materials and Tests.

- (a) Name of Testing Facility
- (b) Dates samples were obtained
- (c) Dates samples were tested
- (d) Test method used for IDEM classification
- (e) Letter from IDEM indicating the waste classification of the materials
- (f) Test results for TCLP and neutral leachate
- (g) Stockpile sampling locations, including depths and available historical testing results
- (h) Gradation test results
- (i) Recycled Foundry Sand (RFS) Source Certification.

The Recycled Foundry Sand (RFS) source certification is included as Attachment A. A new approval submission shall be required when re-sampling is required in accordance with 329 IAC 10-9-4(e)(2). (In accordance with 329 IAC 10-9-4 (e)(2) for foundry waste, re-sampling is conducted: at two-year intervals whenever the process changes or according to a schedule for re-sampling by the IDEM Commissioner based on variability noted in previous sampling and other factors affecting the predictability of waste characteristics.)

When metal concentration of the Type III residual sand exceeds 80% of the allowable limits within IDEM classification, an indemnification clause is required. The "Recycled Foundry Sand (RFS) Indemnification Clause" is included as Attachment B.

Maintaining Qualification

Test reports shall be generated in accordance with specification requirements for the material and submitted monthly to the Division of Materials and Tests. If the material is not produced by the source in a given month, the monthly submittal shall state:

"No _____ was manufactured during _____."

Material _____ month/year

Samples of material may be obtained randomly for verification at the source or at the point of incorporation into the work in accordance with 106.02.

The source shall provide written notification of any changes, revisions or updates of their operations, source name or address, contact person or product name to the Division of Materials and Tests.

To maintain approval, a summary of new stockpile test results for the acceptance analysis shall be submitted monthly indicating testing every 2,000 t. Tested and approved RFS stockpiles shall be properly signed for easy identification. If no new stockpiles are created in a given month, a letter indicating, "no new RFS stockpiles for month/year were created" shall be submitted to the Division of Materials and Tests.

Removal from QPL

A source will be removed from the QPL for the following, but not limited to, reasons:

- (a) test failures determined by Department verification sampling,
- (b) monthly test reports not provided for three consecutive months,
- (c) test reports generated by the source which indicate non-compliance with specification requirements, or
- (d) performance of the product no longer meets the intended purpose.

Attachment A

RECYCLED FOUNDRY SAND (RFS) SOURCE CERTIFICATION

This is to certify recycled foundry sand (RFS) stockpiles geographically located as follows:

RFS _____

RFS was produced by the _____
Company located in _____ (City), and _____

(State) and was shipped for use on Indiana Department of Transportation projects is Type _____ (III or IV) material according to the

IDEM's restricted waste criteria. If any metal concentration exceeds 80% of the allowable limits for a Type III material the foundry shall provide

at regular intervals by properly identified representatives of the Department or a duly assigned representative.

_____ (Date of Signing) _____ (RFS Producer)

_____ (Title)

_____ (Signature)

State of _____ SS: County of _____

Subscribed and sworn to before me by _____

of the firm of _____ this _____ day of _____ 20__

_____ Notary Public

My Commission Expires: _____

This certification has been reviewed and approved by:

_____ (INDOT Representative)

_____ Date

Attachment B

RECYCLED FOUNDRY SAND (RFS) INDEMNIFICATION CLAUSE

_____ RFS producer shall indemnify, defend, exculpate, and hold harmless the State of Indiana, its officials, and employees from any liability of the State of Indiana for loss, damage, injury, or other casualty of whatever kind or to whomever caused, arising out of or resulting from a violation of the federal or Indiana Occupational Safety and Health Acts (OSHA), the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or any other environmental law, regulation, ordinance, order or decree (collectively referred to hereinafter as "Environmental Laws"), as a result of the supply, testing, and application of residual sand or other materials supplied under this Contract by _____ source, whether due in whole or in part of the negligent acts or omissions of: (1) _____ Foundry, its agents, officers, or employees, or other persons engaged in the performance of the contract; or (2) the joint negligence of them and the State Of Indiana, its officials, agents, or employees.

This contract shall include, but not be limited to, indemnification from: (1) any environmental contamination liability due to the supply, testing, and application of residual sand in road base, embankments, or other projects designated by the Department as agreed to by the parties, and (2) any liability for the clean up or removal of residual sand, or materials incorporating such sand, pursuant to any Environmental Law.

The RFS producer also agrees to defend any such action on behalf of the State of Indiana, to pay all reasonable expenses and attorneys fees

for such defense, and shall have the right to settle all such claims. Provided, however, that no liability shall arise for any such fees or expenses incurred prior to the time that _____ Foundry shall

have first received actual and timely written notice of any claim against the State which is covered by this Indemnification Agreement. If timely written notice of any claim hereunder is not received by Foundry, and _____ Foundry is thereby prejudiced in its ability to defend or indemnify, then to the extent of such prejudice, this Indemnification Agreement shall be void.

This Indemnification Agreement does not create any rights in any third party, and is solely for the benefit of the State of Indiana and its agents, officials, and employees.

202-R-728 REMOVAL OF STRUCTURES AND OBSTRUCTIONS

(Adopted 05-20-21)

The Standard Specifications are revised as follows:

SECTION 202, BEGIN LINE 401, DELETE AND INSERT AS FOLLOWS:

(p) backfill excavations in an approved manner. Backfill shall be B borrow in accordance with ~~211~~904.06 with the exception that B borrow consisting of ACBF or GBF shall not be used within 2 ft of the free water level;

203-R-726 EXCAVATION AND EMBANKMENT

(Revised 10-21-21)

The Standard Specifications are revised as follows:

SECTION 203, BEGIN LINE 385, DELETE AND INSERT AS FOLLOWS:

When free water is encountered, backfilling shall be accomplished using B borrow, in accordance with ~~211.02,904.06~~ *with the exception that ACBF or GBF shall not be used. Backfilling using B borrow shall occur* to an elevation at least 2 ft above the free water level. Compaction of the B borrow placed above the free water level shall be accomplished using heavy vibratory equipment.

The use of hydraulic methods to construct embankments will be allowed only when authorized in writing. Only B borrow *without ACBF or GBF* shall be placed below the free water level. Backfill at structures shall be in accordance with 211.04.

SECTION 203, BEGIN LINE 479, DELETE AND INSERT AS FOLLOWS:

203.13 Slides

When slides are encountered during construction, or when water is observed seeping out of the slope or slope sloughing occurs the Engineer shall be notified. The Engineer will contact the Department's Geotechnical Engineering Division. The Department will provide the remedial measures to address the slope issues. Soil disturbed due to a slide shall be removed and treated as directed. and their removal Excavation of material resulting from a slide or sloughing event will be paid for as the class or classes of excavation encountered.

If the contract involves paving, the omission or delay of paving operations may be required at the location of a slide. If proper treatment of a slide has been ~~obtained~~ *completed* prior to ~~completion of~~ *constructing* the remaining pavement, the ~~gap~~ *slide section* may be required to be paved, and payment will be at the contract unit price for pavement.

If ~~proper~~ *the* treatment of a slide has not been ~~obtained~~ *addressed* prior to completion of the remaining pavement, the ~~gap left at the slide location~~ *slide section* shall become an exception to the contract item for pavement.

SECTION 203, BEGIN LINE 690, INSERT AS FOLLOWS:

If water is present, the backfill shall be with material in accordance with 211.02, *with the exception that ACBF or GBF shall not be used.* Placement of this material shall follow as closely behind the removal of the peat as possible. It shall be carried across the area from one end to the other by end-dumping and finally left at the established grade. This grade shall be such that keeps end-dumping to a minimum, which nominally shall be approximately 2 ft above free water level. That portion between free water level and this established grade shall be thoroughly water soaked to secure maximum compaction.

SECTION 203, BEGIN LINE 758, DELETE AND INSERT AS FOLLOWS:

203.18 Embankment Construction

Embankment construction shall consist of constructing roadway embankments, including preparation of the areas upon which they are to be placed; the construction of dikes within or outside the right-of-way; the placing and compacting of approved material

within roadway areas where unsuitable material has been removed; and the placing and compacting of embankment material in holes, pits, and other depressions within the roadway area. Only approved materials shall be used in the construction of embankment backfill. *Recycled concrete pavement shall be from past documented Department projects. RAP shall be the product resulting from the cold milling or crushing of an existing HMA pavement.* Rocks, broken concrete, RAP, or other solid materials shall not be placed in embankment areas where piling is to be placed or driven.

~~Recycled concrete pavement may be used in embankment construction. The recycled material shall meet the gradation requirements of B borrow in accordance with 211.02 or rock embankment in accordance with 203.20904.06. Construction requirements shall be in accordance with 203.20(a) or 211.03.~~

Only RAP particles measuring 2 in. or less in all directions shall be incorporated into the top 5 ft of the embankment. RAP particles incorporated anywhere in the embankment shall be 5 in. or less.

When two sizes are used for one embankment, materials shall be separated with a layer of geotextile in accordance with 918.02(c), Type 2A. Geotextile used between recycled material lifts shall be included in the cost of the embankment pay item.

Recycled concrete pavement and RAP shall not be mixed together or with other materials. When two or more approved materials are allowed for one embankment, materials shall be separated with a layer of geotextile in accordance with 918.02(c), Type 2A. Geotextile used between recycled material lifts shall be included in the cost of the embankment pay item.

~~The Recycled concrete pavement or RAP may shall only be placed used below the elevation of the pavement underdrains and shall be constructed in accordance with 203.23. Compacted lift thickness for RAP shall not be greater than 6 in. within the top 5 ft of the embankment. Where the depth of the embankment exceeds 5 ft, the compacted lift thickness for RAP shall not be greater than 12 in. The Recycled concrete pavement and RAP shall not be used within 2 ft of the water table. Proofrolling in accordance with 203.26 shall be performed to cover the whole grade for every 5 ft of fill. Any rut greater than 1/2 in. shall be corrected as directed.~~

Recycled concrete pavement shall be constructed in accordance with 203.20. RAP shall be constructed in accordance with 203.23 or 203.24. Proofrolling in accordance with 203.26 shall be performed to cover the entire grade for every 5 ft of fill.

A geotextile in accordance with 918.02(c), Type 1B shall be placed in accordance with 214 prior to the placement of other material when the material is finer than recycled material subgrade treatment Type IC, Type II, or Type IV in accordance with 207 when recycled concrete pavement or RAP is used for embankment construction. Recycled concrete pavement or RAP shall not be used for embankment construction when subgrade Type I, Type IBC, or Type IBL is specified. Geotextile shall be placed completely covering the top of the embankment. A minimum 24 in. soil encasement shall be constructed concurrently with the recycled concrete pavement or RAP lifts. A minimum 18 in.

encasement suitable for vegetation growth shall be constructed in accordance with 203.09.

205-R-740 PUMP AROUND

(Adopted 09-16-21)

Description

This work shall consist of furnishing, installing, and maintaining a pump around in accordance with 105.03.

The pump around shall be part of the temporary stormwater control plan and shall be constructed with the other temporary stormwater control measures in accordance with 205.

Materials

Materials shall be in accordance with 205.02.

The pump around dikes shall be constructed of non-erodible materials. Sandbag dikes shall be covered with impervious plastic sheeting, placed on the open channel side of the dikes. Sheet piling shall be watertight. Pump around and dewatering hoses shall be made of impervious material.

Construction Requirements

The Contractor may use an alternate method for the channel work as shown on the plans, pending the approval of the Engineer. If an alternate method is proposed, the Contractor shall make the appropriate permit application or amendment.

Traversing the channel reach with equipment within the work area where no work is proposed shall be avoided. If equipment is required to traverse such a reach for access to another area, timber mats or similar measures shall be used to minimize disturbance to the channel. A temporary channel crossing shall be used only when necessary and as approved.

The stormwater control measures adjacent to the channel area shall be installed before construction on the pump around can begin. All work shall stay within the construction limits. Disturbance within that area shall be minimized.

Work shall not be conducted during rain events.

Pump Around

The pump around shall be in accordance with the following:

Dewatering of the channel shall be performed by using a mechanical pump. The intake suction hose shall be floated as long as possible to prevent the pump from pulling sediment from the bottom of the pooled area.

Sandbag dikes shall be installed at the upstream and downstream ends of the work area as shown in the details, and the channel flow shall be pumped around the work area. The pump shall discharge onto a stable velocity dissipater consisting of riprap or sandbags or other approved medium.

Water trapped within the work area shall be pumped to a sediment filtering measure such as a dewatering basin, filter bag, or other approved device. The sediment filtering measure shall be located such that the water drains back into a stabilized area and into the channel below the downstream dike.

Dewatering Filter Bag

A dewatering filter bag shall be securely connected to the end of the discharge hose.

The dewatering filter bag shall be a single-use or reusable type of bag and shall be constructed of non-woven, polypropylene geotextile material. The bag shall have the following minimum specifications:

- Permittivity - 1.4 sec⁻¹
- Grab Tensile - 205 lbs
- Weight - 8 oz/sq yd
- Apparent Opening Size - 80 US Sieve.

The dewatering filter bag shall be placed on a flat surface and on riprap or sandbags to help increase the flow through the dewatering bag and help dissipate the velocity.

Water shall be pumped from the channeled area at a rate not to exceed the maximum manufacturer's recommended flow rate of the dewatering filter bag.

Dewatering filter bags shall be placed in a location in which runoff from the bag will pass through additional sediment control measures prior to leaving the site.

Following the completion of the dewatering, the sediment accumulated within the dewatering filter bag shall be removed from the bag and placed in an upland area.

Maintenance and Inspection

The diversion measures shall be inspected within 24 hours of each rainfall event and at least once every seven calendar days. The sediment and debris from the channel or upstream clean water dike shall be removed. The dikes shall be repaired as needed. All outlets shall be checked and repaired as needed to prevent washouts. The dewatering filter bag shall be checked and cleaned.

Removal

Pump around shall be removed after construction in the main channel is complete and permanent stormwater control features have been established. Any areas disturbed by the pump around measures shall be returned to their original condition and re-vegetated as needed.

~~**Method of Measurement**~~

~~Pump around will be measured by the number of units installed, complete in place.~~

~~**Basis of Payment**~~

~~The acceptable quantities of pump around will be paid for at the contract unit price per each.~~

~~Payment will be made under:~~

Pay Item	Pay Unit Symbol
Pump Around.....	EACH

~~The cost of furnishing all materials, equipment, labor, installation, maintenance, and removal required for dewatering and~~

operation of the temporary pump around shall be included in the cost at
pump around

The cost at temporary channel crossings if required shall be
included in the cost of the pump around

206-R-719 DEWATERING

(Revised 04-25-21)

Description

The Contractor shall design, furnish, install, test, operate, monitor, and maintain a dewatering system of sufficient scope, size, and capacity to prevent groundwater flow into excavations and allow water and construction operations to proceed on dry, stable subgrades.

Materials

Materials shall be in accordance with the following requirements.

Sediment filter bags shall consist of nonwoven, needle punched polypropylene geotextile consisting of strong, rot resistant, chemically stable long-chain synthetic polymer materials which are dimensionally stable relative to each other including the selvages. The plastic yarn or fibers used in the geotextile shall consist of at least 85% by weight of polyolefins, polyesters, or polyamides. The plastic yarn or fibers shall have stabilizers and inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and heat exposure.

The geotextile shall be in accordance with the physical requirements as follows:

PROPERTY	TEST METHOD	REQUIREMENTS*
Tensile Strength	Grab Tensile Strength, ASTM D4632	200 lb
Elongation	Grab Tensile Strength, ASTM D4632	15%
Bursting Strength	ASTM D3786	350 psi
Seam Strength	Grab Tensile Strength, ASTM D4632	180 lb
Puncture Resistance	ASTM D4833	110 lb
Trapezoid Tearing Strength	ASTM C4533	80 lb
Deterioration in Tensile Strength due to Ultraviolet Degradation at 150 h	ASTM D4355	70% strength retained
Apparent Opening Size, AOS	ASTM D4751	No. 80 standard sieve or filter
Flow Rate	ASTM D4491	80 gal./min/sq ft
* The value in the weaker principal direction shall be used. All numerical values represent minimum average roll value and test results from any sampled roll in a lot shall meet or exceed the minimum values in the table. Lots shall be sampled according to ASTM D4354.		

The size of the filter bag shall be appropriate for the site conditions.

Construction Requirements

Dewatering operations shall be maintained to ensure stability of excavations and constructed slopes and that the excavation does not flood. Surface water shall be prevented from entering excavations by grading, dikes, or other means. Water from work area dewatering pumps shall be discharged through a sediment filter bag, or other approved device. The filter bag shall be located such that discharge water flows back into a stabilized area downstream of the work area. Dewatering shall be accomplished without damaging existing buildings or structures adjacent

to excavation. The dewatering system shall be removed when no longer needed.

The Contractor shall comply with water disposal requirements of authorities having jurisdiction.

The operation of the dewatering pumps and the condition and efficiency of the sediment filter bags shall be closely monitored. Sediment filter bags which do not perform properly or reach their capacity shall be replaced immediately.

The Contractor shall dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Disposal of water shall not inconvenience others. Sumps, sedimentation tanks, flow-control devices, and temporary sediment and erosion control shall be provided in accordance with 205 and as required by authorities having jurisdiction. Sediment in filter bags shall be removed once it has accumulated to the design volume and be disposed of in accordance with 202.

~~**Method of Measurement**~~

- Dewatering will not be measured, regardless of how many times the system is moved, replaced or relocated. Sediment filter bags will not be measured regardless of the number of times a day a filter bag may become filled and replaced.

-

~~**Basis of Payment**~~

- Dewatering shall be considered incidental to the work being performed and shall be included in the cost of other items.

-

- The cost of the pump, materials, installation, inspection, maintenance, sediment filter bags, filter stone, secondary containment, removal and proper disposal, and all necessary incidentals shall be included in the cost of other items.

207-R-735 SUBGRADE

(Adopted 07-15-21)

The Standard Specifications are revised as follows:

SECTION 207, BEGIN LINE 9, DELETE AND INSERT AS FOLLOWS:

207.02 Materials

Materials shall be in accordance with the following:

~~Chemical Modifiers~~..... ~~215.02~~
 Coarse Aggregate, Class D or Higher,
 Size No. 5, 8, 43, 53, or 73..... 904.03
Fly Ash, Class C..... 901.02
 Geogrid, Type IB 918.05
 Geocell Confinement System ~~214~~918.04
Geotextile..... 918.02
 Geotextile *Properties* for Pavement
 and/or Subgrade Stabilizations..... 918.02(c)
Lime 913.04(b)
Portland Cement, Type 1..... 901.01(b)
 Water 913.01

Air-cooled blast furnace slag shall not be used for subgrade treatment Types ID, IV, and IVA.

Soil Property	Test Method	Requirements
Dry Weight Organic Material	AASHTO T 267	≤ 3%
Max Dry Density	AASHTO T 99	≥ 100 pcf
Liquid Limit	AASHTO T 89	≤ 50
Soluble Sulfate	ITM 510	≤ 1000 ppm
Note: Only soils meeting these requirements will be allowed within the specified thickness of the subgrade treatment in cut sections. Only soils meeting these requirements will be allowed within 24 in. of the finished subgrade elevation in fill sections.		

CONSTRUCTION REQUIREMENTS

207.03 Construction Requirements

(a) Subgrade Construction Methods

The subgrade shall be constructed uniformly transversely across the width of the pavement including shoulders or curbs unless shown otherwise on the plans, by one of the following methods:

1. chemical modification in accordance with 215;
2. aggregate No. 53 in accordance with 301;
3. ~~geogrid~~ *geosynthetic* in accordance with 214 placed under

~~coarse aggregate No. 53~~ in accordance with 301, or

- 4. soil compaction to 100% of maximum dry density;
- 5. ~~geotextile in accordance with 214 placed under aggregate No. 5, 8, and 53 in accordance with 301.~~

Longitudinally, the treatment may vary depending on the method of construction.

SECTION 207, BEGIN LINE 109, DELETE AND INSERT AS FOLLOWS: -

207.05 Method of Measurement

~~Subgrade treatment will be measured in both cut and fill areas by the square yard per type. Chemicals for soil modification using cement or lime, excavation, aggregates, geotextile, and geogrid materials will not be measured.~~

~~Geosynthetic specified for use in addition to that required for the specified subgrade treatment will be measured in accordance with 214.05.~~

~~The undercutting of rock, where encountered, will be measured in accordance with 203.27(b).~~

~~Testing, sampling, coarse aggregates, chemicals for modification, water, excavation, geogrid, geotextile, and geocell confining system for specified subgrade treatment types will not be measured.~~

207.06 Basis of Payment

~~The accepted quantities of subgrade treatment will be paid for at the contract unit price per square yard per type, complete in place. In areas where shallow utilities are encountered or the Contractor elects to use Type IC for Type IBC or Type IBL, payment will be made at the price of Type IBC or Type IBL.~~

~~The undercutting of rock, where encountered, will be paid for in accordance with 203.28.~~

Payment will be made under:

- Pay Item	- Pay Unit Symbol
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- Subgrade Treatment, Type _____	SYS
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~~The cost of subgrade treatments including testing, sampling, coarse aggregates, chemicals for soil modification with cement or lime, water, excavation, geogrid, geotextile and geocell confinement system, coarse aggregate for Type IC, Type ID, Type II, Type IV, Type IVA, Type V, water, and the excavation required, specified subgrade treatment types shall be included in the cost of the pay item.~~

~~The cost of excavation and grading of existing railroad ballast and railroad bed material shall be included in the cost of subgrade treatment, Type V.~~

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211-R-730 B BORROW AND STRUCTURE BACKFILL

(Adopted 05-20-21)

The Standard Specifications are revised as follows:

SECTION 211, BEGIN LINE 11, DELETE AND INSERT AS FOLLOWS:

211.02 Materials

Materials shall be in accordance with the following:

B Borrow	As Defined*904.06
Flowable Backfill	213
Geotextile.....	918.02
Structure Backfill	904.05

~~*The material used for special filling shall be of acceptable quality, free from large or frozen lumps, wood, or other extraneous matter and shall be known as B borrow. It shall consist of suitable sand, gravel, crushed stone, ACBF, GBF, or other approved material. The material shall contain no more than 10% passing the No. 200 (75 µm) sieve and shall be otherwise suitably graded. The use of an essentially one size material will not be allowed unless approved.~~

Aggregate for end bent backfill shall be No. 8 or No. 9 crushed stone or ACBF, class D or higher.

SECTION 211, BEGIN LINE 81, INSERT AS FOLLOWS:

Where B borrow or structure backfill is required as backfill at culverts, retaining walls, sewers, manholes, catch basins, and other miscellaneous structures, it shall be compacted in accordance with 211.04. *B borrow consisting of ACBF or GBF shall not be used within 2 ft of the free water level.*

214-R-733 GEOSYNTHETICS

(Revised 09-16-21)

The Standard Specifications are revised as follows:

SECTION 214, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 214 – GEOSYNTHETICS

214.01 Description

This work shall consist of furnishing and installing geosynthetics as shown on the plans or as directed by the Engineer and in accordance with 105.03.

MATERIALS

214.02 Materials

Materials shall be in accordance with the following:

Coarse Aggregate	904.03 *
Geocell Confinement System.....	918.04
Geogrid.....	918.05
Geotextile for Pavement and Subgrade.....	918.02
Notes: Coarse Aggregate *Only No. 2, 5, 43, 53, 73, shall be used only. ACBF Slag shall not be allowed used.	

CONSTRUCTION REQUIREMENTS

214.03 Foundation Preparation

The embankment foundation shall be cleared and grubbed in accordance with 201 and excavated using lightweight equipment to minimize disturbance of the embankment foundation surface soils. Construction activities using equipment which cause pumping and rutting of the embankment foundation soils shall be prevented where possible and shall otherwise be minimized. Fine grading may be waived where impractical. When very soft soil is encountered, the embankment foundation shall be cleared of all trash and rubbish materials without disturbing the vegetation cover or root mat. The embankment foundation shall be subject to approval prior to placement of geosynthetics. Proofrolling of the embankment foundation will not be required in accordance with 203.09 when geosynthetics are used in construction of embankment foundation treatment.

(a) Geotextile as a Drainage Blanket

Geotextile shall be stored in such a manner as to prevent exposure to direct sunlight and damage by other construction activities. Geotextile shall be placed taut and transversely after backfilling all wheel tracks. Geotextile shall be overlapped by 3 ft and sewn in accordance with the manufacturer’s guidelines.

Coarse aggregate No. 2 or No. 5 shall be placed as directed and encapsulated with geotextile. Coarse aggregate shall be placed by spreading dumped material over previously placed material with light equipment in such a manner as to prevent damage to the geotextile. Dumping of coarse aggregate will be allowed on *the* initial working platform. The overlap shall be staggered throughout the roadway profile. Coarse aggregate shall be

placed to the full required thickness and compacted before any loaded trucks are allowed on the blanket. The drainage blanket shall have positive drainage.

No vehicles or construction equipment ~~shall~~ *will* be allowed on the geotextile prior to placement of the coarse aggregate. Damaged geotextile shall be repaired or replaced as directed. Damaged geotextile may be patched by placing a piece of the same geotextile over the damaged area. The overlap shall be at least 3 ft wide. The remaining lifts of the embankment shall be in accordance with 203.23.

(b) Geotextile Placement for Pavement, Subgrade, or Embankment

The subgrade or embankment shall be proofrolled in accordance with 203.26 and any defect or rut shall be repaired as directed prior to the geotextile placement. Geotextile shall be placed taut, without wrinkles and stretched in tension. Coarse aggregate shall be placed with a minimum disturbance to grade. Any damage to geotextile shall be repaired in accordance with 214.03(a). The remaining grade shall be constructed in accordance with 207. *Geotextile for pavement, subgrade, or embankment shall be in accordance with 918.02(c).*

When geotextile for moisture management is specified, the grade shall be prepared in such a way as to provide positive drainage. The surface shall be prepared in accordance with 201.03 and compacted in accordance with 203.23. All rocks shall be broken and compacted in accordance with 203.24. Geotextiles shall be placed taut, without wrinkles, in accordance with the manufacturer's guidelines, as shown on the plans, or as specified. Damaged geotextile shall be replaced. Geotextile for moisture management shall be in accordance with 918.02(d).

Geotextile shall be covered within three calendar days of placement.

(c) Geogrid Placement in Embankment and Subgrade

The geogrid shall be installed in accordance with the Engineer's designs or the manufacturer's recommendations. The geogrid shall be kept taut during placement of the initial lift of backfill. Installation shall require the use of stakes, staples, sandbags, pile of granular fill, or other approved means to hold the geogrid in place during fill placement operations. ~~Type IA~~ *Geogrid shall be used for embankment foundation treatment. Type IB geogrid shall be used for subgrade treatment, type IV.* When placing ~~type IA~~ *geogrid in the embankment foundation, any* rutting in the granular material shall not exceed 3 in. ~~in the embankment foundation.~~ The Engineer may increase the lift thickness to obtain stability of the granular material.

~~If required by the Engineer, the geogrid material supplier shall provide a qualified manufacturer's representative on the contract site at the start of the work to assist the Contractor. The representative shall also be available during the construction when required by the Engineer or the Contractor.~~

~~When type IB geogrid is used~~ *specified for subgrade*, proofrolling shall be performed in accordance with 203.26 prior to placing the ~~type IB~~ geogrid. Deflection or rutting shall not exceed 1 in. Any defect shall be repaired as directed. The first 6 in. of coarse aggregate No. 53 shall be spread and compacted with a 10 t roller in static mode. ~~The s~~Spreading and compaction of the aggregate shall be performed so that ~~adequate~~

~~interlocking~~ of the aggregate and geogrid is obtained ~~interlock~~. The second 6 in. of coarse aggregate No. 53 shall be constructed in accordance with 301.

When geogrid is specified for subbase or base applications, geogrid shall be placed as shown on the plans and in accordance with the manufacturer's guidelines.

When specified, the geogrid material supplier shall provide a qualified manufacturer's representative on site at the start of the work to assist the Contractor. The representative shall also be available during the construction when requested by the Engineer or the Contractor.

The geogrid shall be overlapped a minimum of 2 ft side to side and end to end for ~~subgrade, subbase, and base applications—type IB. The type IA—g~~Geogrids shall be overlapped 3 ft in areas where foundation conditions cannot support foot traffic or where 2 ft is found to be inadequate during fill placement. Overlaps shall be oriented in the direction of fill placement, or shingled, to prevent advancing fill from lifting any geogrid roll edges. Overlaps shall be further secured to prevent separation during fill placement. Damaged geogrid shall be patched. Patching shall include placement of a minimum of 3 ft of overlapped geogrid beyond the damaged area. If the damaged portion extends for more than 50% of the roll in the width direction, the entire width shall be replaced.

Geogrid shall be covered with fill within three calendar days after placement. Only that amount of geogrid required for pending work shall be placed to minimize exposure of the geogrid.

(d) Geocell Confinement System

The Contractor shall construct the grade in accordance with 203. A layer of geotextile shall be placed in accordance with 214.03(b) and shall be anchored at the roadway edge when widening or when intersecting an existing roadway. The geocell confinement system, GCS, shall be placed and anchored as shown on the plans, or as directed. The Contractor shall ensure that the GCS is anchored vertically and the geocell shall be filled with a minimum of ~~34~~ in. of coarse aggregate No. 5, No. 8, or No. 43. If the Contractor chooses No. 5 or No. 8, geotextile in accordance with 918.02(a), Type 1B shall be placed on the GCS before placing No. 53 or No. 73. The GCS shall be oriented with the smaller cell dimension perpendicular to the roadway. The remaining GCS shall be filled with ~~No. 53 or No. 73 and~~ at least 98 in. of No. 53 or No. 73. ~~shall be placed on the GCS.~~ The aggregate shall be back dumped and compacted with a light roller in accordance with 301. No trucks or construction vehicles ~~shall~~ will be allowed on the GCS. A light tracked bulldozer or other equipment may be used as directed. ~~A~~The 6 in. lift above GCS shall be compacted with low frequency and amplitude, with a minimum of six passes. The remaining aggregate shall be placed and compacted lightly at first, then with high amplitude. Efforts shall be made to ensure that the geotextile and GCS are in tension. ~~The Contractor may propose an alternate means of providing a typical section for the GCS, and shall submit the proposal to the Engineer for review and approval. The proposal shall be certified by a professional engineer licensed in the State of Indiana.~~

The Contractor may propose an alternate means of providing a typical section for the GCS, and shall submit the proposal to the Engineer for review and approval. The proposal shall be certified by a professional engineer registered in the State of Indiana.

GCS shall be constructed in accordance with 207 and 214.

214.04 Fill Placement

Construction vehicles shall not be allowed on the geogrid geosynthetic. The placement of the fill shall proceed forward along the roadway centerline and outward to the embankment edges and compacted in accordance with 203.23. The Engineer may waive density requirements for the first lift of embankment foundation treatment if the fill is determined to be too weak to support compaction equipment.

214.05 Method of Measurement

~~Geotextile for pavement, and subgrade, embankment, and moisture management will be measured by the square yard, for the type specified. Geotextile for coarse aggregate and drainage blankets will be measured in accordance with 301 and 616, respectively. Geogrid will be measured by the square yard, for the type specified. The quantity will be computed based on the total area of geosynthetics shown on the plans. The aggregate used for the embankment foundation improvement will be measured in accordance with 301.09. The geogrid reinforced subgrade, GCS, and the excavation required to place the GCS will be measured in accordance with 207.05.~~

~~The GCS and the excavation required to place the GCS will not be measured.~~

214.06 Basis of Payment

~~The accepted quantity of geotextile will be paid for at the contract unit price per square yard per type of geotextile. Geotextile for subgrade and geotextile for embankment will be paid for as geotextile for pavement, for the type specified, at the contract unit price per square yard. The accepted quantities of geogrid will be paid for at the contract unit price per square yard per type of geogrid. The aggregates will be paid for in accordance with 301.10. The geogrid reinforced subgrade will be paid for in accordance with 207.06.~~

~~Payment will be made under:~~

Pay Item	Pay Unit Symbol
Geotextile for Moisture Management, _____ typeSYS
Geotextile for Pavement, _____ typeSYS
Geotextile for Subgrade, _____ typeSYS
Geogrid, _____ typeSYS

~~The cost of furnishing the materials, manufacturer's representative, all labor and equipment required for furnishing and placing the geotextile or geogrid, all work necessary to establish grades, geogrid splices, overlaps, stakes or pins, supplemental product test data, and patching or replacement of damaged geotextile or geogrid shall be included in the cost of this work.~~

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306-R-753 16 FT STRAIGHTEDGE

(Adopted 08-18-22)

The Standard Specifications are revised as follows:

SECTION 305, BEGIN LINE 19, DELETE AND INSERT AS FOLLOWS:

305.03 New PCC Base

Construction of new PCC bases shall be in accordance with 502, except for 502.14, and 502.20. The CMDS shall be in accordance with 502.03 except utilization of the Department provided spreadsheet is not required. The surface shall be finished with wet burlap or by wood floats. Smoothness of the base ~~will~~*shall* be controlled by the Contractor with a 16 ft long straightedge longitudinally and *will be controlled by the Department* with a 10 ft long straightedge transversely. *The 16 ft straightedge shall be in accordance with 306.03(d). The 10 ft straightedge will be in accordance with 306.03(d).*

~~SECTION 305, AFTER LINE 198, INSERT AS FOLLOWS:~~

~~- *Furnishing and operating the 16 ft straightedge shall be included in the cost of other pay items within this section.*~~

SECTION 306, BEGIN LINE 59, DELETE AND INSERT AS FOLLOWS:

(d) Straightedge

1. Straightedge – 16 ft

~~A 16 ft straightedge shall be a rigid beam mounted on two solid wheels on axles 16 ft apart. The straightedge has a mounted push bar to facilitate propelling the device along or across the pavement. Tolerance points are located at the 1/4, 1/2, and 3/4 points and may be composed of threaded bolts capable of being adjusted to the tolerance required~~*The straightedge shall be a walk behind, rigid beam device on two solid wheels on axles 16 ft apart with adjustable rods at the 1/4, 1/2, and 3/4 points. The adjustable rods shall be set to a 1/4 in clearance from the bottom of the rods to the bottom of the wheels when checked with a taut stringline running from wheel to wheel at each end of the straightedge. The straightedge shall be operated in the wheel path approximately 3 ft transversely from the edge line in the direction of traffic and parallel to the pavement centerline. The operator of the straightedge shall walk the equipment over the completed pavement surface while maintaining the alignment of the equipment in the presence of the Engineer.*

~~SECTION 306, AFTER LINE 267, INSERT AS FOLLOWS:~~

~~- *Furnishing and operating the 16 ft straightedge shall be included in the cost of other pay items within this section.*~~

SECTION 409, BEGIN LINE 142, DELETE AND INSERT AS FOLLOWS:

(f) Smoothness Equipment

1. Profilograph

The ~~profilograph~~*inertial profiler* shall be in accordance with ITM 912917.

2. Straightedge—16 ft

~~A 16 ft straightedge shall be a rigid beam mounted on two solid wheels on axles 16 ft apart. The straightedge has a mounted push bar to facilitate propelling the device along~~

or across the pavement. Tolerance points are located at the 1/4, 1/2, and 3/4 points and may be composed of threaded bolts capable of being adjusted to the tolerance required.

3. Straightedge—10 ft

The 10 ft straightedge is the same as a 16 ft straightedge except that the wheels are mounted 10 ft apart. A handheld rigid beam may be substituted.

~~SECTION 410, BEGIN LINE 499, DELETE AND INSERT AS FOLLOWS:~~

~~- Payment for furnishing, calibrating, and operating the profilograph *inertial profiler*, and furnishing IRI profile information will be made in accordance with 401.22401.18.~~

~~-~~

~~- *Furnishing and operating the 16 ft straightedge shall be included in the cost of other pay items within this section.*~~

~~-~~

~~SECTION 410, BEGIN LINE 538, DELETE AND INSERT AS FOLLOWS:~~

~~- The price for ~~profilograph *Inertial Profiler*, HMA~~ will be full compensation regardless of how often the profilograph *inertial profiler* is used or how many profilograms are produced ~~often the IRI is determined.~~~~

SECTION 414, BEGIN LINE 173, DELETE AND INSERT AS FOLLOWS

414.13 Smoothness

~~A straightedge in accordance with 409.03(f) will be used to determine smoothness. The 16 ft straightedge will be used to accept smoothness along the direction of mainline traffic and the 10 ft straightedge will be used to accept smoothness transverse to the direction of mainline traffic.~~ *Pavement smoothness shall be controlled by the Contractor with a 16 ft long straightedge longitudinally, and will be controlled by the Department with a 10 ft long straightedge transversely. The 16 ft straightedge shall be in accordance with 306.03(d). The 10 ft straightedge will be in accordance with 306.03(d). Smoothness correction shall be in accordance with 401.18(ee).*

SECTION 506, BEGIN LINE 463, DELETE AND INSERT AS FOLLOWS:

For patches which are not to be overlaid and have a length greater than 20 ft, pavement smoothness will be in accordance with 501.25 except ~~profilograph *inertial profiler*~~ requirements will not apply.

SECTION 508, BEGIN LINE 282, DELETE AND INSERT AS FOLLOWS:

(c) Profilograph *Inertial Profiler*

The ~~profilograph *inertial profiler*~~ shall be in accordance with ITM 912917.

(d) Straightedge—16 ft

~~A 16 ft straightedge shall be a rigid beam mounted on two solid wheels on axles 16 ft apart. The straightedge has a mounted push bar to facilitate propelling the device along or across the pavement. Tolerance points are located at the 1/4, 1/2, and 3/4 points and may be composed of threaded bolts capable of being adjusted to the tolerance required.~~

(e) Straightedge—10 ft

A 10 ft straightedge is the same as a 16 ft straightedge except that the wheels are mounted 10 ft apart. A handheld rigid beam may be substituted.

501-R-752 INERTIAL PROFILER WITH SMOOTHNESS PAY ADJUSTMENTS FOR PCCP,
FIXED INTERVAL

(Revised 10-20-22)

The Standard Specifications are revised as follows:

SECTION 501, BEGIN LINE 63, DELETE AND INSERT AS FOLLOWS:

The aggregate blend submitted on the CMDS shall produce an optimized aggregate gradation in accordance with ~~ITM 226 sections 6.2.1 and 6.3~~ *the Department provided spreadsheet*. The aggregate blend shall consist of, at a minimum, one concrete coarse aggregate and one fine aggregate, size No. 23. One additional class A intermediate-sized coarse aggregate may be included if approved by the Engineer.

SECTION 501, DELETE LINES 409 THROUGH 514.

SECTION 501, AFTER LINE 514, INSERT AS FOLLOWS:

501.25 Pavement Smoothness

Pavement smoothness will be accepted by means of an inertial profiler, a 16 ft long straightedge, or a 10 ft long straightedge as described below.

(a) Inertial Profiler with Smoothness Pay Adjustments

When a pay item for Inertial Profiler, PCCP is included in the contract, the Contractor shall furnish, calibrate, and operate an approved inertial profiler in accordance with ITM 917 for the acceptance of longitudinal smoothness on the mainline traveled way, including adjacent acceleration or deceleration lanes, where both of the following conditions are met:

1. *The posted speed is greater than 45 mph.*
2. *The traveled way width and slope are constant and is at least 0.5 mi in length.*

The profiles International Roughness Index, IRI, results including areas of localized roughness, and fixed interval IRI results shall become the property of the Department. The inertial profiler shall remain the property of the Contractor.

The paving exceptions and areas exempt from inertial profiler operation will be in accordance with ITM 917.

If the posted speed limit for an entire smoothness section is less than or equal to 45 mph, the section will be exempt from inertial profiler operation and the smoothness within the section will be accepted in accordance with 501.25(b).

If the posted speed limit is greater than 45 mph for a portion of a smoothness section and is less than or equal to 45 mph for the remainder, the section smoothness acceptance will be as follows:

1. *By inertial profiler for the portion of the section with a posted speed limit greater than 45 mph.*

2. *In accordance with 501.25(b) for the portion of the section with a posted speed limit less than or equal to 45 mph.*

(b) 16 ft Straightedge

The Contractor shall furnish and operate a 16 ft straightedge in accordance with 306.03(d) and as described below. The 16 ft straightedge shall be used to measure smoothness along the direction of mainline traffic.

Locations on the pavement surface scraped by the straightedge shall be marked. The pavement shall be corrected in accordance with 501.25(e) to meet the required tolerance. For existing utility and manhole castings that required no grade adjustment, the tolerance may be adjusted after being reviewed and approved by the Engineer.

For contracts which include the Inertial Profiler, PCCP pay item, the 16 ft long straightedge or the Inertial Profiler simulating the 16 ft long straightedge shall be used to measure longitudinal smoothness at the following locations:

1. *All mainline traveled way lanes shorter than 0.5 mi.*
2. *All mainline traveled way lanes at locations exempted from inertial profiler operation in accordance with ITM 917.*
3. *All mainline traveled way lanes within smoothness sections with posted speed limits less than or equal to 45 mph throughout the entire section length.*
4. *All tapers.*
5. *All ramps.*
6. *All turn lanes, including bi-directional left turn lanes shorter than 0.5 mi.*
7. *All acceleration and deceleration lanes associated with ramps with posted speeds of 45 mph or less.*
8. *All shoulders.*
9. *All intersections with significant change in cross slope.*

For contracts where the inertial profiler is not used for smoothness acceptance, the 16 ft straightedge shall be used to measure longitudinal smoothness at the above locations, on all mainline traveled way lanes and ramps with posted speeds greater than 45 mph, and on ramp acceleration or deceleration lanes.

(c) 10 ft Straightedge

The 10 ft straightedge will be in accordance with 306.03(d). The 10 ft straightedge will be used to check transverse slopes across travel lanes and shoulders, approaches, and

crossovers. When the 10 ft straightedge is used, the pavement variations shall be corrected to 1/8 in. or less.

(d) Areas of Localized Roughness, ALR

At locations where the inertial profiler is used, all areas having a localized roughness in excess of 160 in./mi utilizing continuous IRI with a 25 ft window shall be corrected subject to approval by the Engineer. After ALRs have been identified, a grinding simulation shall be performed to estimate whether the ALR can be corrected to an IRI value of less than 160 in./mi with no more than 1/4 in. grind depth at any spot. If such correction is not possible, then an ALR with an IRI value less than 190 in./mi can remain uncorrected if approved by the Engineer and ALR with an IRI value greater than 190 in./mi shall require full depth removal and replacement of sufficient area to meet specifications.

In addition, if there is only one ALR in any two-lane mile section, then no smoothness correction will be required if the ALR does not exceed 190 in./mi and the overall smoothness in accordance with 501.25(d) of the two-lane mile section does not require any corrective action. A two-lane mile section will start one mile before the ALR and end one mile after the ALR in order that all two-lane mile sections will have, at most, one ALR each.

(e) Smoothness Correction

Pavement smoothness variations outside specified tolerances shall be corrected by grinding with a groove type cutter or by replacement. Grinding will not be allowed until the PCCP is 10 days old and flexural strength testing yields a modulus of rupture of 550 psi or greater. The grinding of the pavement to correct the profile shall be accomplished in either the longitudinal or the transverse direction. The PCCP texture after grinding shall be uniform. If the grinding operation reduces the tining grooves to a depth of less than 1/16 in. and the longitudinal length of the removal area exceeds 15 ft, or two or more areas are within 30 ft of each other, the PCCP shall be re-textured in accordance with 504.03.

The width of the corrected area may be partial or full lane width, depending on the respective wheel path profiles. After the corrective action is complete, the inertial profiler shall be operated throughout the entire affected smoothness section to verify the adequacy of the corrective action.

At locations where the 16 ft straightedge is used, the pavement variations shall be corrected to 1/4 in. or less.

SECTION 501, DELETE LINES 632 THROUGH 657.

SECTION 501, AFTER LINE 657, INSERT AS FOLLOWS:

(d) Smoothness

Smoothness pay adjustments will only be applied when the smoothness is measured by an inertial profiler in accordance with 501.25(a).

When the pavement smoothness is tested with an inertial profiler, payment will be based on the Mean Roughness Index, MRI, for each lane for each 0.1-mile section of paving. The MRI for a 0.1-mile section is the average of the IRI of the two-wheel paths. A Quality Assurance Pay Factor, PF_s , for smoothness will apply to the planned thickness of

the PCCP. The quality assurance adjustment for each section will be calculated by the following formula:

$$q_s = (PF_s - 1.00) \times A \times U$$

where:

q_s = quality assurance adjustment for smoothness for one section

PF_s = pay factor for smoothness

A = area of the section, sq yd

U = unit price for the material, \$/sq yd.

The quality assurance adjustment for smoothness, Q_s , for the contract will be the total of the quality assurance adjustments for smoothness, q_s , on each section by the following formula:

$$Q_s = \sum q_s$$

When smoothness is measured by an inertial profiler, payment adjustments will be made for any 0.1-mile section based on the initial MRI generated and in accordance with the following table. The MRI pay factors for smoothness will be determined prior to any required smoothness correction in accordance with 510.25(d). Smoothness correction if required shall be in accordance with 501.25(d). For any 0.1-mile sections containing transverse construction joints that are required as per the planned maintenance of traffic, the pay factors for smoothness may be determined after corrective action at the discretion of the Contractor. Regardless of the tabulated value, the maximum pay factor for a smoothness section where corrective action has been performed will be 1.00.

<i>PAY FACTORS FOR SMOOTHNESS</i>	
<i>Posted Speed greater than 45 mph</i>	
<i>MRI, in./mi</i>	<i>Pay Factor, PF_s</i>
<i>over 0 to 35</i>	<i>1.08</i>
<i>over 35 to 40</i>	<i>1.07</i>
<i>over 40 to 45</i>	<i>1.05</i>
<i>over 45 to 50</i>	<i>1.03</i>
<i>over 50 to 55</i>	<i>1.02</i>
<i>over 55 to 60</i>	<i>1.01</i>
<i>over 60 to 70</i>	<i>1.00</i>
<i>over 70 to 75</i>	<i>0.99</i>
<i>over 75 to 80</i>	<i>0.98</i>
<i>over 80 to 85</i>	<i>0.96</i>
<i>over 85 to 90</i>	<i>0.95</i>
<i>over 90</i>	<i>PF_s will be 0.95 and the section shall be corrected to 90 or less.</i>

~~SECTION 501, BEGIN LINE 719, DELETE AND INSERT AS FOLLOWS:-~~

~~- **501.31 Basis of Payment**~~

~~- The accepted quantities of QC/QA PCCP will be paid for at the contract unit price per square yard for the thickness specified, complete in place.~~

~~Furnishing and operating the 16 ft straightedge shall be included in the cost of other pay items within this section.~~

~~-
- Payment for furnishing, calibrating, and operating the profilographinertial profiler, and furnishing IRI profile information will be made at the contract lump sum price for profilographInertial Profiler, PCCP.~~

~~-
SECTION 501, BEGIN LINE 746, DELETE AND INSERT AS FOLLOWS:~~

~~- - ~~ProfilographInertial Profiler, PCCP.....LS~~~~

~~-
SECTION 501, BEGIN LINE 752, DELETE AND INSERT AS FOLLOWS:~~

~~- The price of profilographInertial Profiler, PCCP will be full compensation regardless of how often the profilographinertial profiler is used or how many profilograms are producedoften the IRI is determined.~~

SECTION 502, BEGIN LINE 358, DELETE AND INSERT AS FOLLOWS:

502.20 Pavement Smoothness

Pavement smoothness will be in accordance with 501.25 except profilographinertial profiler requirements will not apply.

601-R-750 GUARDRAIL

(Adopted 03-17-22)

The Standard Specifications are revised as follows:

SECTION 601, BEGIN LINE 22, DELETE AND INSERT AS FOLLOWS:

All guardrail, ~~post, accessories, fittings,~~ and *connection* hardware shall be supplied from a manufacturer listed on the QPL of Guardrail Manufacturers in accordance with 910.09. Guardrail end treatments shall be selected from the QPL of Guardrail End Treatments in accordance with 601.07 and impact attenuators shall be selected from the QPL of Impact Attenuators in accordance with 601.08.

SECTION 910, BEGIN LINE 591, INSERT AS FOLLOWS:

910.10 Guardrail Posts

Guardrail posts shall be either steel or timber as specified and shall be in accordance with the following requirements. *A type C certification in accordance with 916 shall be provided for the guardrail posts.*

SECTION 910, BEGIN LINE 615, DELETE AND INSERT AS FOLLOWS:

910.11 Guardrail Accessories, Fittings, and Hardware

These items consist of brackets, splice plates and bars, post anchors, diaphragms, clamps and clamp bars, end caps, connections *hardware*, anchor rod assemblies, deadmen, ~~bolts, screws, nuts, washers~~ and blockouts of the type, dimensions, and design shown on the plans. They shall be in accordance with the requirements set out below. Items of the same type shall be interchangeable regardless of the source. *Connection hardware consisting of bolts, nuts, washers, and splice plates will only be accepted from qualified manufacturers on the QPL of Guardrail Manufacturers. A type C certification in accordance with 916 shall be provided for all other accessories and fittings.*

603-R-414 POLYVINYL CHLORIDE COATED CHAIN LINK FENCE

(Revised 05-23-13)

Description

This work shall consist of the furnishing and placement of polyvinyl chloride, PVC, coated chain link fence and gates in accordance with 105.03.

MATERIALS

Materials

Materials shall be in accordance with the following:

Chain Link Fabric, PVC, Class 2b.....	ASTM F668
Concrete, Class B.....	702
Concrete, Packaged Dry.....	901.08
Fence Posts.....	910.13
Gates.....	ASTM F1043
Tension Wire.....	ASTM F1664

The fence fabric shall be No. 9 gauge wire with 2 in. mesh. Tension wire shall be No. 9 gauge wire.

The color of all fence materials including the fabric, tension wire, posts, bars, gates, and miscellaneous hardware shall be in accordance with ASTM F668 and in accordance with the plans.

All caps, beveled tension and brace bands, and connectors used in construction of PVC coated chain link fence shall be pressed steel, malleable or cast steel, galvanized and PVC coated in accordance with ASTM F668.

All gate hardware shall meet the requirements for industrial fences. Hardware subject to movement and not vinyl-clad shall be field painted with touchup paint specifically formulated for this purpose.

CONSTRUCTION REQUIREMENTS

General

Construction operations shall be in accordance with 603.03, 603.04, 603.05, and 603.06.

~~Method of Measurement~~

PVC coated chain link fence, and resetting PVC coated chain link fence will be measured by the linear foot. Measurement will be made along the top of the fence from outside to outside of end posts for each continuous run of fence.

PVC coated gates will be measured as complete units of the size and type specified.

~~Basis of Payment~~

The accepted quantities of PVC coated chain link fence and resetting PVC coated chain link fence will be paid for at the contract unit price per linear foot, complete in place. PVC coated gates will be paid for at the contract unit price per each of the size specified, complete in place.

Payment will be made under:

Pay Item	Pay Unit	Symbol
Fence, Chain Link, PVC Coated, _____ in.....	height	LFT
Fence Gate, Chain Link, PVC Coated _____ in. x _____ in.....	height length	LFT
Fence, Chain Link, PVC Coated, Reset.....		LFT

The cost of adding grounding in accordance with the National Electric Safety Code including all materials, and labor shall be included in the cost of the fence.

The cost of PVC fence, corner, end, line, and pull posts shall be included in the cost of the fence.

The cost of PVC fence, posts and miscellaneous hardware shall be included in the cost of the gate.

The cost of all miscellaneous hardware related to the type of fence including brace connections, caps, clips, clamps, hinges, rivets, ties, truss rods, diagonal braces and stretcher bars shall be included in the cost of the fence.

The cost of concrete for posts, braces or anchors shall be included in the cost of the fence and gates.

The cost of removal, storage, re-installation, and the replacement of damaged or missing parts shall be included in the cost of the resetting fence.

621-R-398 CAPPING CUT AND FILL SLOPES STEEPER THAN 3:1

(Revised 05-23-13)

Description

This work shall consist of:

- (a) covering soil slopes with a cohesive soil to establish vegetation;
- (b) use of soil reinforcement materials and blankets for mulching seed as shown on the plans and in accordance with these requirements;
- (c) use of water absorption chemicals to hold water and keep moisture available for seed germination; and
- (d) soil testing for pH, nutrient supply, and organic matter percentage.

Materials

The materials shall be in accordance with the following:

(a) Mulch Blankets

The mulch blankets shall be excelsior blankets or straw mats in accordance with 621.05(d) or 621.05(f).

(b) Water Absorption Gels

Water absorption gels developed for horticultural use shall be incorporated into the top 1 1/2 in. of the capping soil according to the manufacturer's recommendations. The Contractor shall supply a copy of the manufacturer's recommendation to the Engineer prior to the placement of the capping soil.

(c) Capping Soil

The capping soil shall be a type A4, A5, A6, or A7 AASHTO classification, that has a pH range of 6 to 7 and an organic content of 5 to 10% by volume or 2 to 3% by dry weight. The soil shall be tested by an approved laboratory and the results shall be furnished to the Engineer prior to the placement of the soil.

Construction Requirements

All slopes steeper than 3:1 designated for seeding shall be ripped to a depth of 2 in. and then covered with a 6 in. layer of capping soil. The capping soil shall be evenly spread over all areas and shall have the water absorption gels incorporated. The capping soil shall be tracked into place such that the cap adheres to the existing soil and forms the desired contours for the slope. All debris in the capping soil shall be in accordance with 203.09. All areas shall be fine graded to produce a smooth surface which conforms to the contours and cross sections desired.

~~Method of Measurement~~

- Existing soils stripped and stockpiled for use as a capping soil will be measured as common excavation in accordance with 203.27. Capping soil obtained from off the right-of-way will be measured as borrow in accordance with 203.27. Erosion control blankets will be measured in accordance with 621.13. Water absorption gels will not be measured for payment.

Basis of Payment

- Existing soils stripped, stockpiled, and then redistributed as a capping soil will be paid for as common excavation in accordance with 203.28. Capping soil obtained from off the right-of-way will be paid for as borrow in accordance with 203.28. Erosion control blankets will be paid for in accordance with 621.14.

- The cost of the water absorption gel shall be included in the cost of the erosion control blanket.

715-R-732 PIPE CULVERTS, AND STORM AND SANITARY SEWERS

(Revised 07-15-21)

The Standard Specifications are revised as follows:

SECTION 715, BEGIN LINE 24, DELETE AND INSERT AS FOLLOWS:

Materials shall be in accordance with the following:

B Borrow	211904.06*
Concrete.....	702
Flowable Backfill.....	213
Geotextiles	918.02
Pipe Joint Sealant.....	907.11
Reinforcing Bars	910.01
Rubber Type Gaskets	907.13
Straps, Hook Bolts, and Nuts.....	908.12
Structure Backfill	904

** B borrow consisting of ACBF or GBF shall not be used within 2 ft of the free water level.*

The maximum particle size of backfill material for corrugated pipe shall be less than 1/2 the corrugation depth.

SECTION 715, BEGIN LINE 334, DELETE AND INSERT AS FOLLOWS:

715.09 Backfilling

All pipe trenches shall be backfilled with structure backfill ~~or flowable backfill~~. Structure backfill shall be placed in accordance with 211. ~~Flowable backfill shall be placed in accordance with 213.07 as shown on the plans or as directed.~~ Structure backfill nominal sizes 2 in. and 1 1/2 in. shall not be used as pipe backfill on any pipe with exterior ribs, corrugations, or other profile.

If a pipe is to be backfilled using one of the flowable backfill options, design calculations shall be submitted in accordance with 105.02, either proving the pipe will not float or detailing the methods to be taken to prevent the pipe from floating during installation of the flowable backfill. Prior to placing one of the flowable backfill options for structure backfill, all standing water shall be removed from the trench. If ~~the~~ water cannot be removed from the trench, one of the non-flowable structure backfill options shall be used ~~in lieu of flowable~~ to backfill to an elevation 2 ft above the ~~ground~~water. The remainder of the trench shall be backfilled as shown on the plans.

Where material other than structure backfill is allowed and used for backfilling, it shall be of such nature that compacts readily. The portion around and for 6 in. above the top of the pipe shall be free from large stones. The material shall be placed in layers not exceeding 6 in. loose measurement, and each layer shall be compacted thoroughly by means of mechanical tamps.

Whenever a fine aggregate or dense graded backfill is placed on top of a coarse graded backfill, geotextile, in accordance with 918.02(a), Type 2A shall be used between the different backfill materials.

Backfill for slotted drain pipe and slotted vane drain pipe shall consist of class A concrete on both sides of the pipe. During the backfilling and paving operations, the slot shall be covered to prevent infiltration of material into the pipe.

All pipes, except underdrains, will be visually inspected for acceptance a minimum of 30 days after the completion of backfill operations. Pipes that cannot be visually inspected shall be video inspected for acceptance using equipment in accordance with 718.07. The Engineer will determine the sections of pipe to be video inspected.

For pipes that were video inspected, a copy of the video inspection shall be provided in a format acceptable to the Engineer. The video inspection shall be provided prior to performing the mandrel testing or if mandrel testing is not required, prior to acceptance of the pipe.

Type 3 pipes in accordance with 715.02(c) are excluded from the mandrel testing and video inspection requirements.

For pipe not requiring mandrel testing that is determined to be unacceptable by the Engineer, the unacceptable pipe shall be replaced between the nearest pipe joints or to the nearest structure, or a remediation plan shall be prepared by a professional engineer and submitted to the Engineer for final determination.

After the visual or video inspection, the Contractor shall check pipe deflection by performing a mandrel test as directed on pipes manufactured from materials listed in the following table. The Engineer will determine the runs of pipe installations to be mandrel tested with a minimum of 10% of the total length of each material to be inspected.

Pipes Required to Be Mandrel Tested	
Pipe Material	Standard Specifications
Corrugated Polyethylene Pipe*	907.17(b)
Corrugated Polypropylene Pipe	907.19
Profile Wall Polyethylene Pipe	907.20
Smooth Wall Polyethylene Pipe	907.21
Profile Wall PVC Pipe*	907.22
Smooth Wall PVC Pipe	907.23
* When used as underdrain pipe, mandrel testing will not be required.	

The mandrel shall have a minimum of nine arms or prongs and a diameter that is 95% of the nominal pipe diameter. The Contractor shall provide a proving ring that is 95% of the nominal pipe diameter for each mandrel.

The Contractor shall pull the mandrel through the pipe by hand. If the mandrel does not pass through the pipe, the Contractor shall measure and report the minimum diameter of the deficient pipe to the Engineer.

If the minimum diameter of the deficient pipe is between 92.5% and 95.0% of the nominal pipe diameter, the Contractor shall provide an evaluation of the deficient pipe prepared by a professional engineer. The evaluation shall consider the severity of the deflection and its effects on structural integrity, environmental conditions, and the design service life of the pipe. A report summarizing the evaluation and including the professional engineer's recommendation for acceptance, remediation, or replacement of the pipe shall be submitted to the Engineer for final determination.

If the minimum diameter of the deficient pipe is equal to or less than 92.5% of the nominal pipe diameter, the deficient pipe shall either be replaced or a remediation plan shall be prepared by a professional engineer and submitted to the Engineer for final determination.

The deficient pipe shall be replaced if the professional engineer's remediation plan recommends replacement of the pipe or if the pipe has been damaged.

Deficient pipe shall at a minimum be replaced between the nearest pipe joints or to the nearest structure. Replaced or remediated pipe sections shall be mandrel tested a minimum of 30 days after the completion of backfill operations.

~~Commercial and private drive pipes are excluded from the mandrel testing and video inspection requirements.~~

~~Where material other than structure backfill or flowable backfill is allowed and used for backfilling, it shall be of such nature that compacts readily. That portion around and for 6 in. above the top of the pipe shall be free from large stones. This material shall be placed in layers not to exceed 6 in., loose measurement, and each layer compacted thoroughly by means of mechanical tamps. Where coarse aggregate is used for structure backfill, geotextile shall be installed.~~

~~An adequate earth cover, as shown on the plans, shall be placed over the structure before heavy equipment is operated over it.~~

~~Backfill for slotted drain pipe and slotted vane drain pipe shall consist of class A concrete on both sides of the pipe. During the backfilling and paving operations, the slot shall be covered to prevent infiltration of material into the pipe.~~

SECTION 715, BEGIN LINE 529, DELETE AND INSERT AS FOLLOWS:

~~- Video inspection for pipe will be measured by the linear foot as determined by the electronic equipment.~~

~~-~~

~~- Geotextile used to wrap for backfill material will not be measured for payment.~~

~~-~~

SECTION 715, BEGIN LINE 667, DELETE AND INSERT AS FOLLOWS:

~~- The cost of concrete, grating, pipe tubing, reinforcing bars, aggregate leveling bed, hardware cloth, and necessary incidentals, for construction of grated box end sections will be included in the cost of the grated box end section.~~

~~-~~

~~- Geotextile required for coarse aggregate to be placed on top of the structure backfill~~

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720-R-646 CURB INLET CASTING

(Revised 04-25-21)

The Standard Specifications are revised as follows:

SECTION 910, AFTER LINE 404, INSERT AS FOLLOWS:

Where a 6 in. curb height is specified, a monolithic frame and curb box may be used in place of one with modular components, provided the monolithic casting's dimensions match those shown on the plans.

801-C-157 CERTIFICATION OF TEMPORARY TRAFFIC CONTROL DEVICES

*(Revised 05-23-13)***Category I Devices**

The Contractor shall certify that the following temporary traffic control devices to be used do not exceed the maximum values shown in the table below, and are considered crashworthy at Test Level 3 in accordance with NCHRP 350.

Device	Composition	Max. Weight	Max. Height
Single Piece Traffic Cones	Rubber	20 lb	36 in.
	Plastic	20 lb	48 in.
Tubular Markers	Rubber	13 lb	36 in.
	Plastic	13 lb	36 in.
Single Piece Drums	High Density Plastic	77 lb	36 in.
	Low Density Plastic	77 lb	36 in.
Delineators	Plastic, Fiberglass	N/A	48 in.

No lights, signs, flags, or other auxiliary attachments are included in the weight of the devices listed above. Reflective sheeting or reflective buttons are included on delineators. Maximum weights, including ballast, do not exceed the values shown in the table. "Single piece" refers to the construction of the body of the drum exclusive of a separate base, if any.

Type A or type C warning lights in accordance with the following specifications will be allowed on drums if they are firmly attached with vandal resistant 1/2 in. diameter by 4 in. cadmium plated steel bolt with nut and a 1 1/2 in. high cup washer.

1. The weight shall be no more than 5 lb.
2. The lens diameter shall be 7 to 8 in.
3. The height of the light shall be 11 to 14 in.

Category II Devices

Category II temporary traffic control devices include type III barricades, vertical panels, portable sign standards, and other light-weight traffic control devices.

Category II temporary traffic control devices shall be in accordance with the NCHRP 350, Test Level 3.

A form will be provided at the preconstruction conference for the Contractor to complete and return to the Engineer prior to the placement of category I or II traffic control devices.

801-R-542 WORKSITE ADDED PENALTY SIGNS

(Revised 03-16-17)

Worksite Added Penalty signs shall be placed as shown on the plans or as directed by the Engineer. The signs shall typically be placed in advance of the first Road Construction Ahead signs at either end of the project. The actual location and quantity of the signs will be determined by the Engineer in coordination with the Worksite Traffic Control Supervisor.

The XW2-6-A Worksite Added Penalty sign, 78 in. by 42 in., shall be installed on all projects in all cases not otherwise described below.

The XW2-6 Worksite Added Penalty sign, 60 in. by 36 in., shall only be installed on projects in urban areas that have a posted speed limit of 35 MPH or less and also meet one of the following conditions:

1. The existing surfaces outside the edge of pavement make installation of driven posts impractical, or
2. The width of the Right-of-Way outside of the edge of pavement is not sufficient to accommodate the larger XW2-6-A, Worksite Added Penalty sign, 78 in. by 42 in.

The XW2-6a-B Speeding and XW2-6b-B Reckless Driving signs, 48 in. by 48 in., shall be used in series with each other and shall only be used on projects that meet one of the following conditions:

1. Rural projects where the width of the Right-of-Way outside of the edge of pavement is not sufficient to accommodate the larger XW2-6-A Worksite Added Penalty sign, 78 in. by 42 in., or
2. Contracts using only moving operations where construction signs are set and removed each day to accommodate the changing location of the work.

The XW2-6a-A Speeding and XW2-6b-A Reckless Driving signs, 36 in. by 36 in., shall be used in series with each other and shall only be used on projects in urban area where the width of the Right-of-Way outside of the edge of pavement is not sufficient to accommodate the larger XW2-6-A Worksite Added Penalty sign, 78 in. by 42 in.

Worksite Added Penalty, Speeding, Reckless Driving signs will be measured and paid for as Construction Sign, Type A in accordance with 801.17 and 801.18.

801-T-150d

801-T-207 TEMPORARY TRAFFIC BARRIERS

(Revised 09-15-22)

The Standard Specifications are revised as follows:

SECTION 801, BEGIN LINE 418, DELETE AND INSERT AS FOLLOWS:

(b) Connection

Type 1 and type 3 barrier sections shall be connected as follows:

1. Smooth Bar Hooks

- 1a. The adjacent barrier sections shall be placed end to end, with sufficient overlapping of the smooth bar hooks to allow placement of the connecting bolt or threaded rod and the top spacer.
- 2b. The adjacent barrier sections shall then be moved in opposite directions for a sufficient distance to develop the maximum contact between the smooth bar hooks and the connecting bolt or threaded rod.
- 3c. The bottom spacer and nut shall then be placed as shown on the plans. The nut shall be sufficiently tightened to eliminate all gaps between the adjacent bolt heads, spacers, nuts, and washers which form the connection.

2. J-J Hook

- a. *The adjacent barrier sections shall be placed in accordance with the manufacturer's recommendations such that the J-J hooks are engaged.*
- b. *The adjacent barrier sections shall then be moved in opposite directions for a sufficient distance to develop the maximum separation between the barrier sections.*

SECTION 801, BEGIN LINE 436, DELETE AND INSERT AS FOLLOWS:

~~Type 1 and type 3 precast units which have previously been cast meeting earlier Department standards may be used. The Contractor will be allowed to mix type 1 and type 3 units in a run as long as the units are in good condition and the connecting devices are compatible. If units meeting earlier Department standards are used, a 1 in. bolt will be allowed to link the units together. The spacer detail shall, however, be in accordance with the current standard. Units cast after March 1, 2003 shall be linked with the 1 1/4 in. bolt.~~

Type 2 temporary traffic barriers shall be connected as recommended by the barrier manufacturer.

(c) Anchorage

~~Type 1 and type 3 temporary traffic barriers shall be anchored in accordance with the methods shown on the plans, at the locations described herein. Type 2 barriers shall be~~

~~anchored as recommended by the barrier manufacturer and at locations described herein.~~ Temporary concrete traffic barriers shall be anchored ~~when located on or within 60 ft of a bridge, and along tapered alignments~~ *at the locations shown on the plans.* Anchoring at locations in addition to those ~~described herein will~~ *shown shall* be required when directed. *Anchoring shall be in accordance with the NCHRP 350 or MASH crash test. The FHWA eligibility letter shall be provided to the Engineer prior to placing the barrier.*

Chemical anchor systems with removable bolts, or mechanical anchors may be used to anchor ~~type 1~~ barriers to bridge decks, concrete pavement, and concrete shoulders. Mechanical anchors may be ferrous or non-ferrous material. ~~All anchors shall have a shear strength of 10,000 lb and an ultimate pullout strength of 6,500 lb.~~

801-T-232 TRAFFIC CONTROLS FOR CONSTRUCTION AND MAINTENANCE OPERATIONS

(Revised 03-17-22)

The Standard Specifications are revised as follows:

SECTION 107, BEGIN LINE 438, DELETE AND INSERT AS FOLLOWS:

Pavements and shoulders having an edge drop of more than 3 in. shall be delineated with drums in accordance with 801.09. Delineation shall be at a maximum spacing of 200 ft. The use of cones in accordance with 801.08 will be allowed as shown on the plans except cones shall not be used for ~~interstate lane restrictions~~ *shift or merge tapers on interstates and freeways and 42 in. cones may be used in tangent sections on interstates and freeways only when the use of drums would result in an effective lane width of less than 10 ft.*

SECTION 801, BEGIN LINE 294, DELETE AND INSERT AS FOLLOWS:

Cones shall be used only during temporary activities where portability is advantageous and they remain in place and do not create a hazard to traffic. The use of cones in lieu of drums will be allowed as shown on the plans except cones shall not be used for ~~interstate lane restrictions~~ *shift or merge tapers on freeways and 42 in. cones may be used in tangent sections on interstates and freeways only when the use of drums would result in an effective lane width of less than 10 ft.*

Tubular markers shall be used for separating two-lane two-way traffic *on non-freeways* as shown on the plans or as directed. *Tubular markers may be used to delineate a pavement drop-off on non-freeways when the use of drums would result in an effective lane width of less than 10 ft.*

SECTION 801, BEGIN LINE 932, DELETE AND INSERT AS FOLLOWS:

~~Temporary traffic barrier will be measured by the linear foot per the type specified. Anchored traffic barrier will be measured by the linear foot, separately from unanchored temporary concrete barrier per the type specified. End treatments, other than construction zone energy absorbing terminals, CZ, used on a type 1, type 2, or type 4 type 3 temporary traffic barrier will be measured by the linear foot as part of the barrier. All end treatments used on type 4 temporary traffic barrier will be measured by the linear foot as part of the barrier.~~

~~Construction zone energy absorbing terminals, CZ, used on type 1, or type 2, and or type 3 temporary traffic barriers will be measured by the number of terminals placed.~~

SECTION 801, BEGIN LINE 1000, DELETE AND INSERT AS FOLLOWS:

~~Temporary traffic barrier and anchored temporary traffic barrier will be paid for at the contract unit price per linear foot per the type specified. Payment will be made only once, regardless of the number of times the barrier is moved to accommodate different phases of traffic maintenance or construction operations as shown in the contract within each project. Payment will be made for Temporary Traffic Barrier placed in, or relocated to, a separate project.~~

~~End treatments, other than construction zone energy absorbing terminal, CZ, used on a type 1, type 2, type 4 temporary traffic barrier or type 3 will be paid for on a linear basis as part of the barrier. All end treatments used on type 4 temporary traffic barrier will be paid for on a linear basis as part of the barrier.~~

~~Construction zone energy absorbing terminal, CZ, when used with type 1, or type 2, or type 3 temporary traffic barriers will be paid for at the contract unit price per each for energy absorbing terminal, CZ, of the test level placed. Each unit will be paid for only once regardless of how many times it is moved within each project. Construction zone energy absorbing terminal, CZ, when used with type 2 or type 4 temporary traffic barriers will be paid for at the contract unit price per linear foot of type 2 or type 4 temporary traffic barrier. Payment will be made for construction zone energy absorbing terminal, CZ placed in, or relocated to, a separate project. Back up units will be paid for as energy absorbing terminal, CZ, of the test level placed, if they are placed in service due to non-repairable damage to the units already in service.~~

SECTION 801, BEGIN LINE 1039, DELETE AS FOLLOWS:

~~A temporary worksite speed limit sign assembly for continuous use includes two signs; each will be paid for at the contract unit price for construction sign.~~

SECTION 801, BEGIN LINE 1135, INSERT AS FOLLOWS:

- Temporary Worksite Speed Limit Sign Assembly _____ EACH
- type

SECTION 801, BEGIN LINE 1138, DELETE AND INSERT AS FOLLOWS:

- ~~Each construction sign, barricade, temporary worksite speed limit sign assembly, road closure sign assembly, or flashing arrow sign will be paid for only once regardless of how many times each is moved, replaced, or how many times each is altered to change the sign message within each project. Payment will be made for signs placed in, or relocated to, a separate project. A Project Work Zone is defined as a segment of highway from the "Road Construction Ahead" sign to the "End Construction" sign. Payment will not be made for signs or barricades used for the convenience of the Contractor.~~

805-T-078 ELECTRICAL INSULATION SEALANT

(Revised 05-18-17)

The electrical insulation sealant for cable or wire splices as described in 805.05 shall be chosen from the following list:

- (a) Star brite liquid electrical tape, manufactured by Star brite, Inc.
 - (b) 3M Scotchkote Electrical Coating, manufactured by 3M Company
 - (c) 10 Plyseal Insulating Mastic, manufactured by Plymouth Rubber Europa S.A.
 - (d) or approved equal.
-

805-T-191 MAGNETOMETERS AND MICROLOOP DETECTORS

(Revised 04-25-21)

Description

This work shall consist of furnishing and installing magnetometer or microloop vehicle detection, as specified in the plans.

Materials

Materials for microloop detectors shall be selected from the QPL of Traffic Signal and ITS Devices. The microloop detectors selected shall be capable of counting vehicles in addition to detecting vehicle presence.

Each microloop detector location shall include the following items:

1. Non-invasive probe, lead-in cable and carriers for microloop detector as shown on the plans;
2. 3-in. diameter schedule 80 HDPE conduit containing the probes, lead-in cable and carriers;
3. Buried service wire encapsulation kit compatible with microloop detector for all splicing between the lead-in cable and the home run cable;
4. Installation kit, one for each conduit containing probes;
5. All mounting hardware, conduit bushings, wiring, connectors, grounding wires, ground rods, and grounding cables necessary to complete the microloop detector location installation.

Testing

Before installation of magnetometer or microloop probes the Contractor shall confirm the adequacy of the magnetic field intensity, to be sure that the range is suitable for their operation.

The Contractor shall demonstrate that the microloop count data recorded in the controller's detector log is within 5% of count data obtained visually over a 15-minute period for every detector installation. The test shall be performed by the Contractor in the presence of the Engineer. If detector sensitivity or calibration settings are adjusted in order to meet this test, the new settings shall be recorded on the wiring diagram in the cabinet.

Installation

Arrangement of probes shall be located at maximum distance from metal objects as per manufacturer's recommendation. Probes shall be installed with their long dimension vertical, and with the cable end at the top. Probes shall be firmly supported, so the lateral and vertical motion is restricted. Probes shall be connected in series. The splice shall be soldered by means of hot iron, or pouring or dripping without flames, with rosin core solder and shall be insulated and waterproofed in accordance with the manufacturer's specifications.

Conduit for the microloop detector probes shall be directionally pushed beneath the pavement at the depth and slope determined by the manufacturer to ensure proper carrier and probe installation. The Contractor shall repair any damage to the pavement that occurs during the

installation. The microloop detector probe location in each lane shall be per the manufacturer's recommendation.

Method of Measurement

- Magnetometer detector and microloop detector probe will be measured by the number of units installed.

- Conduit and signal cable will be measured in accordance with 805.15.

Basis of Payment

- If specified as pay items, magnetometer detector and microloop detector probe will be paid for at the contract unit price per each.

- Conduit and signal cable will be paid for in accordance with 805.16.

- Payment will be made under:

Pay Item

Pay Unit Symbol

- <u>Magnetometer Detector</u>	<u>EACH</u>
- <u>Microloop Detector Probe</u>	<u>EACH</u>

- The cost of coring the pavement, sealant, and all work necessary for proper installation and operation of the in-pavement sensors shall be included in the cost of magnetometer detector.

- The cost of the detector unit, lead-in cable, and all work necessary for proper installation shall be included in the cost of magnetometer detector or microloop detector probe.

- The cost of all hardware and work required to provide and install signal cable from microloop detector probe, including extra-low voltage (home-run), from the handhole adjacent to the detector probe to the controller cabinet shall be included in the cost of signal cable.

901-M-061 PCC MATERIALS

(Adopted 07-15-21)

The Standard Specifications are revised as follows:

SECTION 901, BEGIN LINE 179, DELETE AND INSERT AS FOLLOWS:

1. Requirements

The fly ash shall be in accordance with AASHTO M 295 for class C or class F, with the following exceptions:

Loss on Ignition, LOI, max. %	34
Autoclave Expansion or Contraction, max. %	0.5
Fineness: Amount retained when wet-sieved on No. 325 (45 µm) sieve, max. %	30

901-M-064 PACKAGED PATCHING PRODUCTS

(Adopted 12-17-21)

The Standard Specifications are revised as follows:

SECTION 603, BEGIN LINE 12, DELETE AND INSERT AS FOLLOWS:

~~Concrete, Packaged Dry.....901.08~~
 Farm Field/Woven Wire910.18(a)
 Fence Posts.....910.13
 Gates.....910.18(d)
Packaged Patching Products901.08
 Tension Wire.....910.18(b)1

SECTION 710, BEGIN LINE 36, DELETE AS FOLLOWS:

~~A type B certification in accordance with 916 shall be provided for the packaged patching products. The certification shall be submitted to the Department’s Concrete Engineer at least 14 calendar days prior to application of the materials.~~

SECTION 802, BEGIN LINE 22, DELETE AND INSERT AS FOLLOWS:

802.02 Materials

Materials shall be in accordance with the following:

Concrete702 ~~or 901.08~~
 Fasteners.....919.01(d)
 Overhead Sign Structure910.19
Packaged Patching Products901.08
 Reinforcing Bars910.01
 Sign Posts.....910.14
 Traffic Signs.....919.01

SECTION 901, BEGIN LINE 548, DELETE AND INSERT AS FOLLOWS:

~~901.08 Packaged, Dry, Combined Materials for Mortar and Concrete~~*Patching Products*

Packaged patching products shall be selected from the Department’s QPL of Rapid Setting Patch Materials. A packaged patching product may be added to the QPL by completing the requirements in ITM 806, Procedure F.

~~These materials~~*Packaged patching products* shall be in accordance with ASTM C387. All packages shall be identified as conforming to ASTM C387. The markings shall also show the kind and type of material, the net weight in each bag, the yield in cubic feet or yield in square feet per inch of thickness, and the amount of water recommended for mixing to produce a 2 in. to 3 in. slump.

The following exceptions to ASTM C387 shall apply for packaged patching products used in accordance with 710. ~~The limits of the following shall be shown on the type B certification.~~

Physical Test	Specification	Requirements
---------------	---------------	--------------

Compressive Strength, min. 24 h 28 days	ASTM C109 on 2 in. cubes (neat)	2,000 psi 5,000 psi
Length Change, max. 28 days (air storage) 28 days (water storage)	ASTM C157, modified C928	-0.09% +0.03%
Slant/Shear Bond Strength, min. 28 days	ASTM C882 modified*	2,000 psi
Modulus of Elasticity Minimum @ 28 days Maximum @ 28 days	ASTM C469	3,000,000 psi 5,000,000 psi
* Product scrubbed into substrate or as recommended by the manufacturer.		

904-M-059 AGGREGATES

(Revised 09-15-22)

The Standard Specifications are revised as follows:

SECTION 904, BEGIN LINE 152, DELETE AND INSERT AS FOLLOWS:

(f) Mineral Filler for SMA

Mineral filler shall consist of dust produced by crushing stone, portland cement, or other inert mineral matter having similar characteristics. Mineral filler shall be in accordance with the gradation requirements of 904.02(h) for size No. 16 or as approved by the Engineer. Mineral filler shall be in accordance with ITM 203 or from an ACBF slag source. The sieve analysis of mineral filler shall be conducted in accordance with AASHTO T 37 except as noted in 904.067. Mineral filler shall be non-plastic in accordance with AASHTO T 90.

SECTION 904, BEGIN LINE 280, DELETE AND INSERT AS FOLLOWS:

(f) Sampling and Testing

Sampling and testing will be in accordance with the following AASHTO, ASTM, and ITMs.

Amount of Material finer	
than No. 200 (75 µm) Sieve*.....	AASHTO T 11
Brine Freeze and Thaw Soundness	ITM 209
Clay Lumps and Friable Particles	AASHTO T 112
Control Procedures for Classification of Aggregates.....	ITM 203
Crushed Particles.....	ASTM D5821
Dolomite Aggregates.....	ITM 205
Flat and Elongated Particles	ASTM D4791
Freeze and Thaw Beam Expansion	ITM 210
Lightweight Pieces in Aggregates*.....	AASHTO T 113
Los Angeles Abrasion	AASHTO T 96
Micro-Deval Abrasion.....	AASHTO T 327
Polished Resistant Aggregates.....	ITM 214
Sampling Aggregates*	AASHTO T 2
Sampling Stockpiled Aggregates	ITM 207
Scratch Hardness.....	ITM 206
Sieve Analysis*	AASHTO T 27
Soundness*	AASHTO T 103, AASHTO T 104
Specific Gravity and Absorption*.....	AASHTO T 85
Unit Weight and Voids in Aggregates	AASHTO T 19

*Except as noted in 904.06904.07

SECTION 904, BEGIN LINE 342, INSERT AS FOLLOWS:

(f) Sizes of Riprap

Gradation Requirements					
Percent Smaller					
Size, in.	Revetment	Class 1	Class 2	Uniform A	Uniform B

30			100		
24		100	85 - 100		
18	100	85 - 100	60 - 80		
12	90 - 100	35 - 50	20 - 40		
8				100	
6	20 - 40	10 - 30	0 - 20	35 - 80	95 - 100
3	0 - 10	0 - 10	0 - 10		35 - 80
1				0 - 20	0 - 20
Depth of Riprap, min.	18 in.	24 in.	30 in.		

The maximum dimension of individual pieces shall not be greater than three times the minimum dimension *and no dimension shall exceed the maximum size listed for the respective size of riprap*. The riprap will be visually inspected for size, shape, and consistency.

SECTION 904, AFTER LINE 358, DELETE AND INSERT AS FOLLOWS:

904.06 B Borrow

The material used for special filling shall be of acceptable quality, free from large or frozen lumps, wood, or other extraneous matter and shall be known as B borrow. It shall consist of suitable sand, gravel, or crushed stone ACBF, GBF, or other approved material. The material shall contain no more than 10% passing the No. 200 (75 μ m) sieve and shall be otherwise suitably graded. The ratio of the fraction passing the No. 200 (75 μ m) sieve to the fraction retained on the No. 30 (600 μ m) sieve shall not exceed one-fifth. The use of an essentially one-size material will not be allowed unless approved. B borrow containing greater than 3% by dry weight organic material will not allowed.

Sieve analysis and organic material will be performed in accordance with AASHTO T 11 and AASHTO T 267.

904.067 Exceptions to AASHTO Standard Methods

(a) Exceptions to AASHTO T 2

Stockpile sampling shall be in accordance with ITM 207, unless otherwise approved.

918-M-060 GEOSYNTHETIC MATERIALS

(Adopted 05-20-21)

The Standard Specifications are revised as follows:

SECTION 918, BEGIN LINE 35, DELETE AND INSERT AS FOLLOWS:

(b) Geotextile Properties for Underdrains, *Subsurface Drains*, and *Drainage Filtration Applications*

Test	Method, ASTM	Requirements ^{(1) (2)}				
		Type 1A	Type 1B	Type 2A	Type 2B	Type 3
Grab Tensile Strength, min.	D4632	80 lb	200 lb	160 lb	200 lb	200 lb
Grab Elongation	D4632	> 50%	< 50%	> 50%	< 50%	< 50%
CBR Puncture Strength, min.	D6241	175 lb	600 lb	410 lb	750 lb	1,100 lb
Deterioration in Tensile Strength due to UV Degradation 500 hrs, min.	D4355 D6637	70% strength retained	70% strength retained	70% strength retained	70% strength retained	90% strength retained
Apparent Opening Size, AOS	D4751	≤ No. 50 sieve, for soils ≥ 40% passing the No. 200 sieve	≤ No. 40 sieve, for soils < 40% passing the No. 200 sieve	≤ No. 70 sieve, for soils ≥ 40% passing the No. 200 sieve	≤ No. 30 sieve, for soils < 40% passing the No. 200 sieve	≤ No. 40 sieve
Permittivity	D4491	≥ 1.2 sec ⁻¹	≥ 2.1 sec ⁻¹	≥ 0.8 sec ⁻¹	≥ 0.9 sec ⁻¹	0.90 sec ⁻¹
Notes:						
(1) All values are minimum average roll values (MARV) as determined in accordance with ASTM D4354 in the weaker principal direction, except AOS size is based on maximum average roll value.						
(2) Type 3 value is a maximum average roll value (Max ARV) as determined in accordance with ASTM D4354.						

(c) Geotextile Properties for Pavement or Subgrade Stabilizations

Test	Method, ASTM	Requirements ⁽¹⁾			
		Type 1A	Type 1B	Type 2A	Type 2B
Grab Tensile Strength, min.	D4632	200 lb	300 lb	290 lb	400 lb
Wide Width Tensile, @ 5% Strain, min.	D4595	n/a	n/a	1,200 lb/ft	2,400 lb/ft
Grab Elongation	D4632	≤ 50%	< 50%	≤ 50%	< 50%
CBR Puncture Strength, min.	D6241	175 lb	600 lb	410 lb	750 lb
Trapezoid Tearing Strength, min.	D4533	75 lb	110 lb	n/a	n/a
Deterioration in Tensile Strength due to UV Degradation 500 hrs, min.	D4355 D6637	70% strength retained	70% strength retained	70% strength retained	70% strength retained
Apparent Opening Size, AOS, min.	D4751	No. 50 sieve	No. 40 sieve	No. 30 sieve	No. 30 sieve
Soil Retention, Pore Size, O ₅₀ /O ₉₅ , min.	D6767	n/a	n/a	290/380	100/350
Permittivity, min.	D4491	0.05 sec ⁻¹	0.050 sec ⁻¹	0.50 sec ⁻¹	0.40 sec ⁻¹
Note:					

⁽¹⁾ All values are minimum average roll values (MARV) as determined in accordance with ASTM D4354 in the weaker principal direction, except AOS size is based on maximum average roll value.

(d) Geotextile Properties for Moisture Management

Type, IMA geotextile shall consist of woven polypropylene filaments, wicking filaments and shall be in accordance with the following:

Test	Method, ASTM	Requirements
		Type IMA
Wide Width Tensile Strength, min. Machine direction Cross machine direction	D4595 ³	5,280 lbs/ft 5,280 lbs/ft
Wide Width Tensile Strength, @ 2% Strain, min. Machine direction Cross machine direction	D4595 ³	480 lbs/ft 1,080 lbs/ft
Apparent Opening Size, AOS, min.	D4751	No. 40 sieve
Flow Rate	D4491 ³	30 gal./min/ft ²
Wicking Requirement Wet Front Movement ¹ 24 minutes, min.	C1559 ²	6 in. Vertical Direction
Wicking Requirement Wet Front Movement ¹ 983 minutes. Zero Gradient, min.	C1559 ²	73 in. Horizontal Direction
Permittivity, min.	D4491 ³	0.4 sec ⁻¹
Notes: 1. 'STP': Standard Temperature and Pressure 2. Modified, time 3. Minimum average roll values shall be in accordance with ASTM D4759		

(de) Geotextile Properties for Silt Fence

Test	Method, ASTM	Requirements ⁽¹⁾	
		Wire Fence Supported	Self Supported
Grab Strength	D4632	90 lb	90 lb
Elongation @ 45 lb	D4632		50% max.
Apparent Opening Size ⁽²⁾	D4751	No. 20 sieve	No. 20 sieve
Permittivity ⁽²⁾	D4491	0.01 sec ⁻¹	0.01 sec ⁻¹
Ultraviolet Degradation at 500 hrs	D4355	70% strength retained	70% strength retained
⁽¹⁾ The value in the weaker principal direction shall be used. All numerical values will represent the minimum average roll value. Test results from a sampled roll in a lot shall be in accordance with or shall exceed the minimum values shown in the above table. The stated values are for non-critical, non-severe conditions. Lots shall be sampled in accordance with ASTM D4354. ⁽²⁾ The values reflect the minimum criteria currently used. Performance tests may be used to evaluate silt fence performance if deemed necessary by the Engineer. Note: All values are minimum average roll values (MARV) as determined in accordance with ASTM D4354.			

918.03 Geomembrane

This material shall consist of a geomembrane fabricated from high density polyethylene, HDPE, consisting of strong, rot resistant, chemically stable long-chain synthetic polymer materials, dimensionally stable with distinct and measurable openings. The manufacturer shall submit the tests for the intended use to the Department.

SECTION 918, BEGIN LINE 72, INSERT AS FOLLOWS:

918.05 Geogrid

Geogrid shall be a biaxial or multi axial of a regular network of connected polymer tensile elements with aperture geometry sufficient to enable significant mechanical interlock with the surrounding material. The material shall be polypropylene, ASTM D 4101 (97% minimum) and Carbon Black, ASTM D 1603 (0.5% minimum). The geogrid structure shall be dimensionally stable and shall be able to retain its geometry under construction stresses. The geogrid structure shall have a resistance to damage during construction, ultraviolet degradation, and all forms of chemical and biological degradation encountered in the soil being placed.

922-T-196 CONTROLLER CELLULAR MODEM

(Revised 04-25-21)

The Standard Specifications are revised as follows:

SECTION 922, AFTER LINE 519, INSERT AS FOLLOWS:

8. Cellular Modems**a. Service Provider**

All data, power and antenna cables, and all supplemental hardware shall be provided. The modem shall be compatible with the Department's current cellular carriers/providers, the traffic control device communications software, and the closed loop communications software that it is supplied for.

b. Modem Hardware

Cell modems shall be selected from the QPL of Traffic Signal and ITS Devices.

c. Modem Antenna

The modem antenna shall be selected from the QPL of Traffic Signal and ITS Devices. The antenna connectors for cellular service, GPS, and WiFi shall be configured to connect to the cellular modem.

d. Modem Software

The modem configuration shall be editable and viewable with MS-Windows provided software or with proprietary software that is included and designed to run on a MS-Windows operating system. The software shall auto-detect connection parameters and display settings when connected.

e. Installation and Support

~~*The Department will supply the SIM card for the cellular modem.*~~

The serial number shall be clearly labeled on the exterior of the modem. The cellular modem shall be installed, configured, and tested to allow data communication directly to a secondary controller. All data, power and antenna cables, and all supplemental mounting hardware shall be installed. The modem shall be powered by the cabinet power supply from a terminal location on the cabinet back panel or the power distribution panel. The antenna shall be mounted externally and the mounting location shall include a watertight seal.

The cellular modem shall include three years of product and licensing support, from the date of installation, to ensure all features are enabled. The cellular modem shall be preloaded onto the Department's Traffic Management Enterprise Cloud Manager, ECM, account.