

PROPOSAL CONTRACT

FOR THE CONSTRUCTION OF

Contract No. 2024-0246

PIN: 125418.00
County: Williamson
Federal Project No.: STP-M-9305(31)
State Project No.: 94LPLM-F3-096
Local Agency Reference No.: COF Project No. 2015-002 / Contract No. 2024-0246
Description Of Project: East McEwen Drive Phase 4 Improvements, from east of roundabout intersection with Oxford Glen Drive / Cool Springs Boulevard to Wilson Pike (SR-252)
Project Length: 1.372 miles
Completion Time: On or Before 1,080 calendar days following the "Notice to Proceed" (NTP) with Work
DBE Goal: 8.50%

By: _____

City, _____

St.: _____

Surety: _____

TDOT Version: 6/1/23

NOT AN OFFICIAL BID DOCUMENT!
FOR INFORMATION ONLY!

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The above Supplemental Specifications, revised as noted, are incorporated by reference for bidding purposes and will be printed with the Contract after awards. These Supplemental Specifications may be obtained from the Department at Suite 700, James K. Polk Bldg., Nashville, Tennessee or viewed on the Department’s website at <http://www.tn.gov/tdot/section/tdot-construction-division>.

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ATTENTION

It shall be the bidders' responsibility to confirm that the Proposal Contract contains all the documents indicated on the Table of Contents.

Should any omissions occur, the appropriate documents may be obtained from the Construction Division upon request.

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THE CITY OF FRANKLIN

INSTRUCTIONS TO BIDDERS

BIDS TO BE RECEIVED

Friday, November 08, 2024

Sealed bids for the construction of the following projects will be received by the CITY OF FRANKLIN, **109 3rd Avenue South, Suite 107, Franklin, TN 37064** until **2:00 PM** (Central Time), **Friday November 08, 2024** and opened publicly at **Franklin City Hall, 109 3rd Avenue South, Franklin, TN 37064, 2:10 PM** (Central Time), **Friday, November 08, 2024**. The reading of the bids will begin at **2:10 PM** (Central Time).

The proposed construction shall be performed in accordance with the most current version of the Standard Specifications for Road and Bridge Construction of the Tennessee Department of Transportation, and the Standard Roadway and Structures Drawings of the Tennessee Department of Transportation which are incorporated herein by reference and made a part hereof. In addition, only the Special Provisions contained within the applicable Proposal Contract will be considered binding. Any reference to any Special Provision not contained within the applicable Proposal Contract shall be disregarded. All questions related to the Proposal Contract, Plans, Specifications or Special Provisions shall be directed to the **City of Franklin's Purchasing Office (615-550-6692)**. Information received from other offices of the CITY OF FRANKLIN strictly advisory.

IMPORTANT NOTICE TO BIDDERS:

Prospective bidders should read the following instructions carefully before submitting their bids. Special attention is called to the regulations of the CITY OF FRANKLIN that total bids, rather than unit prices, will be read. Proposals shall be rejected as being irregular if they fail to contain a unit price for each item listed. Extensions of the various items must be sub-totaled, carried forward, and shown as a grand total following the last proposal item. All entries must be in ink.

After a bidder has deposited a proposal with the CITY OF FRANKLIN, he can withdraw it only on written request in accordance with Subsection 102.07 of the Tennessee Department of Transportation Standard Specifications.

Totals read at the opening of the bids are not guaranteed to be correct and no final award of the contract will be made until bids and extensions have been checked and re-checked.

On all projects which are financed in whole or in part by funds received through Federal agencies and/or the Tennessee Department of Transportation, the awarding of contracts by the CITY OF FRANKLIN will be subject to approval by the Tennessee Department of Transportation. The CITY OF FRANKLIN reserves the right to reject any bid proposal which is not acceptable to the parties as listed, although such bid proposal would otherwise qualify as the lowest and best bid under the Tennessee Department of Transportation Standard Specifications.

The CITY OF FRANKLIN reserves the right to reject any or all Proposals, to waive technicalities or to advertise for new Proposals, if in the judgment of the awarding authority and subject to TDOT concurrence, the best interest of the CITY OF FRANKLIN will be promoted thereby.

The CITY OF FRANKLIN reserves the right to cancel the award of any Contract, at any time prior to execution of said Contract by all parties without any liability against the CITY OF FRANKLIN.

The awarding of the contract or rejection of all proposals will be made within 60 days after the formal opening of the proposals. Upon award, a detailed letter of instructions will be forwarded along with appropriate documents to the low bidder.

The CITY OF FRANKLIN hereby notifies all bidders, that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the basis of age, race, color, religion, national origin, sex or disability in consideration for an award.

The CITY OF FRANKLIN is an equal opportunity affirmative action employer, drug-free, with policies of nondiscrimination on the basis of race, sex, religion, color, national or ethnic origin, age, disability, or military service.

PREQUALIFICATION OF BIDDERS:

Each prospective bidder and subcontractor will be required to file a document entitled "Prequalification Questionnaire." The foregoing shall be filed on a form provided by the Tennessee Department of Transportation. The form must be filled out completely, and the truth and accuracy of the information provided must be certified by a sworn affidavit signed by an officer, partner, owner or other authorized representative of the applicant who has authority to sign contracts or other legal documents on behalf of the applicant. A prospective bidder must be prequalified by and in good standing with the Tennessee Department of Transportation prior to the issuance of a proposal form. A prospective subcontractor must be prequalified by and in good standing with the Tennessee Department of Transportation prior to being approved as a subcontractor. Each prospective bidder or subcontractor shall notify the Tennessee Department of Transportation if there is any subsequent change in the name, organization or contact information provided.

Prospective bidders' "Prequalification Questionnaire" shall be filed with the Tennessee Department of Transportation at least fourteen (14) days prior to the date of opening bids on any letting in which the applicant intends to submit a bid to the CITY OF FRANKLIN, or at least fourteen (14) days prior to the date on which the applicant requests approval as a subcontractor under a contract awarded by the CITY OF FRANKLIN. Bidders intending to submit proposals consistently shall complete and submit the prequalification application annually; however, this document may be changed during such period upon submission of additional favorable reports or upon receipt by the Tennessee Department of Transportation of substantiated evidence of unsatisfactory performance. The Tennessee Department of Transportation reserves the right to request additional information and documentation to clarify and/or verify any information submitted in an applicant's prequalification application.

The prequalification form can be found at the web address:
<https://www.tn.gov/tdot/tdot-construction-division/construction-contractor-prequalification.html>

A proposal to be used for non-bidding purposes may be issued to any interested party regardless of prequalification. **This proposal Contract will be marked "Void for Bidding"**. A contractor that has purchased a proposal contract that was marked "void for bidding" can buy another book once they are fully prequalified before the bid date.

LICENSING REQUIREMENTS

According to the types of funds used, contractor bidding requirements differ. When using any Federal funds, proposals shall be completed as described below:

Proposals shall be submitted by a bidder licensed with the Tennessee Department of Commerce and Insurance (TDCI), Board for Licensing Contractors (BLC) within twenty-one (21) days of the bid opening, in accordance with Subsection 102.11 of the Tennessee Department of Transportation Standard Specifications.

Prior to recommending award of a contract, the Local Government will confirm that the lowest responsible bidder is licensed with the BLC. Because TDOT work classifications and the BLC licensing classifications slightly differ, the Local Government will verify only that the apparent low bidder is licensed in the general classification (e.g., Heavy Construction (HC), Highway, Railroad, Airport Construction (HRA), Specialty (S), Municipal and Utility Construction (MU), or Electrical Contracting (CE)) and not the specific subcategories of these classifications for the type of work involved in the project. This is in recognition that the prime contractor is required to complete 30% of the specific project work and may subcontract the remainder of the work.

Title 48 of Tennessee Code requires all contractors and subcontractors that are domestic or foreign Corporations, Limited Liability Companies, Limited Partnerships, or Limited Liability Partnerships to be in good standing with the Secretary of State (i.e., have a valid Certificate of Existence/Authorization). This includes being duly incorporated, authorized to transact business, and/or in compliance with other requirements as detailed by the Secretary of State.

Bidders that are domestic or foreign corporations, limited liability companies, limited partnerships, or limited liability partnerships, must be in good standing with the Secretary of State (i.e., have a valid Certificate of Existence/Authorization) on or before twenty-one (21) days after proposals are opened.

PROPOSAL BOND

Each proposal must be accompanied by a bidder's bond, or Cashier's Check, or Certified Check made payable to the CITY OF FRANKLIN in an amount equaling not less than five percent (5%) of the amount bid. In the case of optional items in the proposals, the amount of the bidder's bond or check must be in an amount equaling not less than five percent (5%) of the total amount of the bid based on the high option.

If the bidder's bond is offered as guaranty, the bond must be on the form furnished by the CITY OF FRANKLIN and made by a surety company, qualified and authorized to transact business in the State of Tennessee and must be acceptable to the CITY OF FRANKLIN.

If a check is offered as guaranty, the check of the successful bidder will be cashable at the discretion of the CITY OF FRANKLIN, pending the satisfactory execution and acceptance of the contract and the contract bond.

ISSUANCE OF BIDDING DOCUMENTS

This CITY OF FRANKLIN and the Tennessee Department of Transportation are on a cash basis for sales of Plans, Proposal Contracts, Standard Specifications, Standard Drawings, Standard Drawing Books and Tabulations of Bids. Requests for documents must be accompanied by cash, check, money order, or they may be mailed to the buyer C.O.D.

A charge of **\$136.67** plus **9.75%** sales tax, for in-state delivery, will be made for each Proposal Contract. This charge is applicable regardless of whether the Proposal is to be used for bidding or non-bidding purposes. Proposals will be obtainable until the time set for opening bids. The charge for Plans and/or Cross-sections will be as specified in the Notice to Contractors and this charge will be applicable before the letting and for three months after the letting. Plans ordered after the three month period will be furnished at **\$5.00** per sheet. Individual Plan sheets and individual Standard Drawings will be furnished at **\$5.00** per sheet. Tabulations of bids will be furnished at **\$2.50** per sheet. Tennessee Department of Transportation Standard Drawing Books will be furnished by the Tennessee Department of Transportation at **\$100.00** per book plus **9.25%** sales tax, for in-state delivery. The most recent version of the Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction will be furnished by the Tennessee Department of Transportation at **\$12.00** per book plus **9.25%** sales tax, for in-state delivery. There will be a minimum charge of \$2.00 on any purchase. All documents will be furnished without refund and transmitted at your risk.

When two or more contractors wish to bid together in a joint venture, each contractor will be required to make a written request for such a proposal to the CITY OF FRANKLIN. This request shall be signed by an authorized signatory of each firm.

Requests for joint venture proposals may be made in person or by telephone. However, the proposal for said joint venture will not be issued until the request in writing, as set forth above, is received by the CITY OF FRANKLIN.

REJECTION OF PROPOSALS

Proposals will be rejected as irregular if prior to the formal opening of the Proposal all of the following documents have not been signed: (1) the bidder shall sign by written signature the Proposal form, (2) the bidder shall sign by written signature the Proposal Certification form, (3) the bidder shall sign by written signature the Proposal Bond form or the Proposal Guarantee, whichever is applicable, (4) the Agent or Attorney-in-Fact representing a Surety Company shall sign by written signature the Proposal Bond, if applicable. In addition, Proposals will be rejected if any of the above signatures are a reproduced copy, such as, but not limited to a photostatic copy or a facsimile transmission. An original, dated and valid Power of Attorney for the Attorney-in-Fact must accompany the Proposal and the Contract. The accompanying Power of Attorney must be dated, and the date must be the exact same date as the date on the Proposal Bond. The Proposal and the Proposal Bond, including the attached Power of Attorney, shall be valid and binding for 60 days subsequent to the date of opening bids.

Proposals shall be completed on the forms as issued. Proposals will be rejected as being irregular if they are not prepared on the prescribed forms; if they show any omissions, alterations of form, additions, or conditions not called for, unauthorized alternate bids, or irregularities of any kind; or if they fail to contain a unit price for each item listed. Proposals may be rejected if any of the unit prices contained therein are mathematically unbalanced, either excessive or below the Engineer's Estimate.

Written alterations to unit prices and extensions of the various items in the bid item sheets of the Proposal or, for computer assisted bids (CAB), in the CAB program generated set of bid item sheets will not be cause for rejection of the Proposal, provided each alteration is made in ink and is initialed by a duly authorized official of the company. In case of conflict between altered unit prices or extensions thereof, the unit price in numerals will govern.

The Plans and Specifications are as much a part of the proposal form as if they were bound therein. All of the documents contained therein are part of the proposal. Proposals shall not be taken apart. Proposals taken apart may be subject to rejection. Photostatic or facsimile copies of Proposal sheets may not be attached to the Proposal. Proposals containing forms not issued by the CITY OF FRANKLIN may be subject to rejection.

Proposals will be rejected as irregular if the bidder fails to acknowledge all addenda.

Proposals will be rejected as irregular when submitted by a bidder who is not prequalified and in good standing on the date of letting in accordance with Subsection 102.01 of the Tennessee Department of Transportation Standard Specifications and Chapter 1680-5-3, Prequalification of Contractors, of the Rules of the Tennessee Department of Transportation.

Proposals will be rejected as irregular when submitted by a bidder who is not licensed according to the requirements as detailed above.

Reasonable grounds for believing that there has been collusion among the Bidders will cause a rejection of all Proposals in which the Bidders involved are interested.

ADDENDA

Addenda to the Proposal will be acknowledged by all bidders. Failure to acknowledge receipt of Addendum Letters is grounds for rejection.

RETAINAGE

Effective for all contracts, the CITY OF FRANKLIN will not hold retainage. In addition, the Contractor will not be able to hold retainage from the subcontractor.

SUBCONTRACTS

Your special attention is called to Section 105 - Control of Work, and Section 108 - Prosecution and Progress of the Tennessee Department of Transportation Standard Specifications, concerning duties of the contractor and subletting of contracts.

CHANGED CONDITIONS

Your special attention is called to Section 104.02 of the Tennessee Department of Transportation Standard Specifications, concerning changed conditions on this contract.

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The following information applies to Federal-Aid construction projects:

NOTICE TO ALL BIDDERS

To report bid rigging activities call:

1-800-424-9071

The U.S. Department of Transportation (DOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m. eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

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INSERT ALL APPLICABLE SPECIAL PROVISIONS

Include all special provisions required by the Local Government Guidelines and any other applicable special provisions.

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SPECIAL PROVISION

REGARDING

EMPLOYING AND CONTRACTING WITH ILLEGAL IMMIGRANTS

The State shall endeavor to do business only with those contractors and subcontractors that are in compliance with the Federal Immigration and Nationality Act. This policy shall apply to all State Contractors including subcontractors. This policy statement is issued to establish implementation guidance to procuring state agencies and contractors reflecting the requirements of *Tennessee Code Annotated* §12-3-309 regarding the employment of illegal immigrants in the performance of state contracts.

1. The Contractor hereby attests, certifies, warrants, and assures that the Contractor shall not knowingly utilize the services of an illegal immigrant in the performance of this Contract and shall not knowingly utilize the services of any subcontractor who will utilize the services of an illegal immigrant in the performance of this Contract. The Contractor shall reaffirm this attestation, in writing, by submitting to the State a completed and signed copy of the "Attestation form" provided by the Department, semi-annually during the period of this Contract.
2. Prior to the use of any subcontractor in the performance of this Contract, and semi-annually thereafter, during the period of this Contract, the Contractor shall obtain and retain a current, written attestation that the subcontractor shall not knowingly utilize the services of an illegal immigrant to perform work relative to this Contract and shall not knowingly utilize the services of any subcontractor who will utilize the services of an illegal immigrant to perform work relative to this Contract.
3. The Contractor shall maintain records for its employees used in the performance of this Contract. Said records shall include a completed federal Department of Homeland Security Form I-9, *Employment Eligibility Verification*, for each employee and shall be subject to review and random inspection at any reasonable time upon reasonable notice by the State.

The Contractor understands and agrees that failure to comply with this section will be subject to the sanctions of *Tennessee Code Annotated* § 12-3-309 for acts or omissions occurring after January 1, 2007. This law requires the Chief Procurement Officer, Department of General Services, to prohibit a contractor from contracting with, or submitting an offer, proposal, or bid to contract with the State of Tennessee to supply goods or services for a period of one year after a

contractor is discovered to have knowingly used the services of illegal immigrants during the performance of this contract.

For the Purposes of this policy, “illegal immigrant” shall be defined as a non-citizen who has entered the United State of America without federal government permission or stayed in this country beyond the period allowed by a federal government-issued visa authorizing the non-citizen to enter the country for specific purposes and a particular time period.

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STATE

OF

TENNESSEE

(Rev. 6-20-11)

January 1, 2021

SPECIAL PROVISION

REGARDING

BUY AMERICA REQUIREMENTS

All manufacturing processes for iron and steel products, and coatings applied thereon, used in this project shall occur in the United States except that if the proposal has bid items for furnishing domestic and foreign iron and steel, the bidder will have the option of (1) submitting a bid for furnishing domestic iron and steel, or (2) submitting a bid for furnishing domestic iron and steel and a bid for furnishing foreign iron and steel. If option (2) is chosen, the bid will be tabulated on the basis of (a) the total bid price using the bid price for furnishing domestic iron and steel and, (b) the total bid price using the bid price for furnishing foreign iron and steel.

For the total bid based on furnishing foreign iron and steel to be considered for award, the lowest total bid based on furnishing domestic iron and steel must exceed the lowest total bid based on furnishing foreign iron and steel by more than 25 percent. The 25 percent differential applies to the total bid for the entire project, not just the bid prices for the steel or iron products.

Iron and steel products are defined as products rolled, formed, shaped, drawn, extruded, forged, cast, fabricated or otherwise similarly processed from iron and steel made in the United States. Iron products are included, however, pig iron and processed, pelletized, and reduced iron ore may be purchased outside the United States.

Manufacturing begins with initial melting and continues through the coating stage. Any process which modifies chemical content, physical size or shape, or the final finish is considered a manufacturing process. Coatings include epoxy, galvanizing, painting or any other surface protection that enhances the value and/or durability of a material.

The contractor shall provide a certification to the Engineer with each shipment of iron and steel products to the project site that the manufacturing processes for the iron and steel products occurred in the United States. No steel shall be placed until the contractor ensures the requirements of this Special Provision are met.

The above requirements do not prevent a minimal use of foreign materials, if the cost of such materials used does not exceed 0.1 percent of the total contract cost or \$2,500.00, whichever is greater. If steel not meeting the requirements of this Special Provision is used, the contractor shall provide a written statement to the Department prior to its use indicating where the steel will be incorporated in the work,

the value of the steel, the percentage of the contract amount, and the appropriate invoices shall be submitted as documentation.

The contractor shall be responsible for all cost associated with any steel that is permanently incorporated into the project that does not meet the requirements of this Special Provision without prior written approval from the Department, up to and including removal and replacement.

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STATE

OF

TENNESSEE

(Rev. 2-8-21)

January 1, 2021

SPECIAL PROVISION

REGARDING

WATER QUALITY AND STORM WATER PERMITS

Description

This work consists of the conditions that apply to all construction activities on the project pursuant to the following:

1. Section 404 of the Federal Clean Water Act (33 U.S.C. §1344), and all implementing regulations, including without limitation regulations of the U.S. Army Corps of Engineers governing permits for discharges of dredged or fill material into waters of the United States in 33 CFR Part 323; and
2. The Tennessee Water Quality Control Act (T.C.A. §69-3-101, et seq.) and all implementing regulations, including without limitation the Rules of the Tennessee Department of Environment and Conservation governing NPDES permits in Chapter 400-40-10, and Aquatic Resource Alteration permits in Chapter 400-40-7; and
3. Section 26a of the TVA Act of 1933 as amended (49 Stat. 1079, 16 U. S. C. sec. 831y1.) and all implementing regulations, including without limitation the regulations of the Tennessee Valley Authority governing construction in the Tennessee River System in 18 C.F.R., Part 1304; and
4. The Tennessee Wildlife Resources Agency Reelfoot Lake Watershed Management permit program (T.C.A. section 70-5-1.), and all implementing regulations, including without limitation regulations authorizing any activity, practice, or project which has or is likely to have the effect of diverting surface or subsurface water from the Lake or have the effect of draining or otherwise removing water from Reelfoot Lake; and
5. Coast Guard Bridge Permit (USCG) (Section 9 of the Rivers and Harbors Appropriation Act of 1899) and all implementing regulations, including but not without limitation for projects which impact streams deemed navigable by the U.S. Coast Guard.

Responsibility

Assume all responsibilities of the permittee as indicated in the permit that relates to protection of the "waters of the United States" and/or "waters of the State of Tennessee."

Obtain any additional permits required by the Contractor for off-site waste and/or borrow areas and associated off project work areas.

Sign the Notice of Intent (NOI) form, provided by the Department, indicating acceptance of the stipulations contained in the permit. Submit the signed NOI to the TDOT HQ Construction Division by email within 10 calendar days after submittal of the contract proposal or the Department may at its discretion cancel the award with the Contractor forfeiting the bid bond.

Implement the provisions of the Water Quality (including, but not limited to, TDEC ARAP, USACE 404, TVA Section 26a, Coast Guard, TWRA) and Storm Water [including, but not limited to, National Pollution Discharge Elimination System (NPDES), Statewide Stormwater Management Plan (SSWMP)] Permits and requirements that pertain to construction activities.

Review of the permit provisions, including NPDES Permit provisions the site specific SWPPP, the contract plans, Standard Specifications and contract Special Provisions and find the permit requirements and erosion prevention and sediment control (EPSC) procedures to be reasonable, workable, and binding.

The Contractor shall not be released from the project site responsibilities under the NPDES permit provisions until the Notice of Termination (NOT) is submitted to TDEC by the TDOT Regional Operations Engineer. The NOT is a certification that the construction project is permanently stabilized, and all construction related discharges have ceased. This means that the use of EPSC measures to alleviate concerns of surface erosion and transport of sediment to surface water conveyances or to waters of the state is no longer necessary. Furthermore, it means that permanent controls, hard surfaces and/or vegetation, used on the project are deemed adequate to prevent erosion and sediment transport and no other potential sources of construction-related pollution are on the project.

The Contractor shall not be released from any warranty provided for EPSC plantings, including sod and trees. If the entire project is complete as outlined in **105.15** of the Standard Specifications, the tree plantings shall still be required to meet the requirements of **802** Standard Specifications.

NPDES Permit Required Action

Accompany the TDOT EPSC inspector or TDOT consultant on all EPSC inspections of the entire construction project including permitted locations and potentially impacted streams, and attend all QA/QC Project Assessments.

EPSC Inspections shall be conducted as required in the most current TN Construction General Permit.

EPSC inspections shall be performed on the schedule established in the TN Construction General Permit until the site is permanently stabilized to determine if the permit requirements are being met. Where sites or portion(s) of the construction project have been temporarily stabilized, the inspections only have to be conducted once per month until construction activity resumes. Written

notification of the intent to change the inspection frequency and the justification for such request must be submitted to the TDOT District Supervisor and the TDEC Central Office before proceeding.

A representative who holds a current TDEC “*Fundamentals of Erosion Prevention and Sediment Control Level I*” certification shall accompany the TDOT EPSC inspector on all required EPSC inspections. The project supervisor(s) shall also hold a current TDEC “*Fundamentals of Erosion Prevention and Sediment Control Level I*” certification. Proof of required personnel training for the individual(s) shall be provided to the TDOT District Supervisor prior to beginning of construction.

The TDOT EPSC inspector shall document all deficiencies on the required current TDOT EPSC Inspection Report form. Sign the TDOT EPSC Inspection Report form and any supporting documentation indicating that there is agreement with the report, recommendations and repair schedule as stated in the documentation.

Make necessary maintenance and repairs relative to deficiencies in these permit conditions or requirements within 24 hours after an inspection identifies the maintenance or repair need, and/or as directed by the TDOT District Supervisor, unless conditions make a particular activity impracticable. Any such conditions that make immediate repairs impracticable shall be documented on the inspection report and provided to the TDOT District Supervisor, and be accompanied by an expected repair schedule based on forecasted weather conditions.

Review the site specific SWPPP that will be made available prior to or at the pre-construction conference, for any additional EPSC requirements. Sign and submit two copies of the SWPPP signature page provided by the Department in the site specific SWPPP. Submit for review and approval any changes/revisions to the SWPPP to prevent erosion and sediment transport at any time after contract execution. Rejection of any submittals by the Department does not relieve the liability for appropriate Best Management Practices (BMPs).

If at any time during this contract, the requirements for the Water Quality Permits and/or the Storm Water Permits for Construction Related Activities are changed/revised/updated, the Contractor shall be notified in writing by the Department of such requirements. Comply with the new requirements within 30 days of the Department notification.

If at any time that sedimentation is occurring or has occurred in streams impacted by the project, immediately notify the TDOT District Supervisor to evaluate the EPSC measures employed. A determination of the cause for sedimentation will be made by the Department. Immediately repair or replace defective EPSC measures and install, as applicable, additional or other EPSC measures with the goal of eliminating future sedimentation. Once a remediation plan is provided by the Department, within 24 hours after notification, begin the remediation as required. Based on the cause of sedimentation, the Department will determine if the cost of remediation will be performed at the Contractor’s expense.

Failure to Comply

In the event a Notice of Noncompliance, Notice of Violation, Notice of Deficiency, or Order is issued by any State or Federal Agency on this project, any required corrective action and all fines

will be the sole responsibility of the Contractor as outlined in **107.01** of the Standard Specifications.

Failure to comply or take immediate corrective actions required within 24 hours, unless documented conditions make a particular maintenance or repair activity impracticable immediately, shall be reason for the TDOT District Supervisor to suspend all other work on the Project, except EPSC and traffic control. The Department will apply non-refundable deductions of monies from the Contract per calendar day from monies due to the Contractor for any EPSC work on the Project. This deduction can be made for each location, as determined by the TDOT District Supervisor, for each calendar day that the deficiency is allowed to remain and charged as item description "*Failure to Comply with Permit Deduction*". A deduction shall be made from monies due the Contractor, not as a penalty, but as liquidated damages, as indicated in **108.09** of the Standard Specifications.

If the necessary corrections/adjustments are not done in a timely manner as required, the Department will implement the provisions of **209.07** and **109.08** of the Standard Specifications that provides for the Department making repairs and recovering the costs thereof from the Contractor.

The Department will not participate in any payment or reimbursement for fines and will not authorize time extensions due to delays in project progress for work stoppage, to remedy the violations stated within the NOV, required by the TDOT District Supervisor as stated in **105.01** of the Standard Specifications.

Spill Prevention, Control, and Countermeasure

To help prevent the discharge of oil into navigable waters, the U.S. Environmental Protection Agency (EPA) developed the Spill Prevention, Control, and Countermeasure (SPCC) Program. The SPCC Program is under the authority of Section 311 (j)(1)(C) of the Federal Water Pollution Control Act (Clean Water Act) in 1974. The rule may be found at Title 40, Code of Federal Regulations (CFR), Part 112. Additional information regarding the preparation and requirements of a SPCC Plan can be found at: <http://www.epa.gov/oem/content/spcc/>.

If applicable based upon the total aggregate capacity of aboveground oil storage, develop a site specific SPCC Plan per EPA requirements. This plan shall be provided to the TDOT District Supervisor as part of the required submittals during the project Pre-Construction Meeting or at which time the conditions on the project site meet the applicable criteria. Shall be responsible for obtaining any other necessary local, state, and federal permits as applicable. The SPCC Plan and/or permits shall be kept on-site.

Comply with all aspects of the site specific SPCC Plan including but not limited to performing any required inspections as directed by the SPCC Plan as well as implementing material and spill management practices per the project's SWPPP. In the event, where a release containing a hazardous substance in an amount equal to, or in excess of a reportable quantity established under either 40 CFR 117 or 40 CFR 302 occurs during a 24 hour period, immediately notify the TDOT District Supervisor.



DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
REGULATORY DIVISION
3701 BELL ROAD
NASHVILLE, TENNESSEE 37214

May 31, 2024

SUBJECT: LRN-2023-00839, McEwen Drive Phase IV, NWP 14, South Prong of Spencer Creek, Franklin, Williamson County, Tennessee

Mr. Paul Holzen
City of Franklin
109 Third Avenue South
Franklin, Tennessee 37064
E-Copy: Paul.Holzen@franklin.tn.gov

Dear Mr. Holzen:

This correspondence is in regard to your pre-construction notification (PCN) for the widening and construction of McEwen Drive that includes discharge of fill into 0.03-acres of wetland and 420 linear feet of stream in Franklin, Williamson County, Tennessee (Latitude 35.933611°, Longitude -86.781954°). This project has been assigned number (LRN-2023-00839). Please refer to this number in all communication concerning this matter.

Based on the information you provided, Nationwide Permit (NWP) 14, Linear Transportation Projects, which became effective February 25, 2022 [86 FR 73522], authorizes your proposal as depicted in the plans provided in the PCN dated October 16, 2023. In order for this authorization to be valid, you must ensure the work is performed in accordance with the enclosed *NWP 14, Terms and Conditions*, and the *2021 Nationwide Permit General Conditions*.

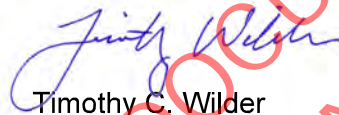
This verification is valid until March 14, 2026, unless the NWP authorization is modified, suspended, or revoked prior to that date. Furthermore, if you commence or are under contract to commence this activity before the date of NWP expiration, modification, or revocation, you will have 12 months from the date of expiration, modification or revocation to complete the activity under the present terms and conditions of the NWP. This will apply to all NWPs unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 CFR 330.4(e) and 33 CFR 330.5(c) or (d).

This NWP 14 verification does not obviate your responsibility to obtain and abide by all other federal, state and local permits or approvals required. This NWP verification should not be considered as an approval of the design features of any activity authorized or an implication that such construction is considered adequate for the purpose intended. In addition, it does not grant any property rights or exclusive privileges and does not authorize any injury to the property or rights of others. Failure to comply with all terms and conditions of this NWP

verification invalidates this authorization and could result in a violation of Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act.

Upon completing the authorized work, you must fill out and return the enclosed Certificate of Compliance with Department of the Army Permit form. Thank you for your cooperation during the permitting process. If you have any questions, please contact Ms. Jennifer Watson at 615-587-4716 or via e-mail Jennifer.a.watson2@usace.army.mil.

Sincerely,



Timothy C. Wilder
Chief, West Branch
Regulatory Division

Enclosures

- Enclosure 1 – NWP 14, Terms and Conditions
- Enclosure 2 – 2021 Nationwide Permit General Conditions
- Enclosure 3 – Compliance Certification
- Enclosure 4 – Water Quality Certification (NRS23.297)

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FOR INFORMATION ONLY!



US Army Corps
of Engineers®
Nashville District

2021 Nationwide Permit

Tennessee

86 FR 2744, 86 FR 27274, 86 FR 73522

14. Linear Transportation Projects. Activities required for crossings of waters of the United States associated with the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, driveways, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge of dredged or fill material cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge of dredged or fill material cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.

This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges of dredged or fill material, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10-acre; or (2) there is a discharge of dredged or fill material in a special aquatic site, including wetlands. (See general condition 32.) (Authorities: Sections 10 and 404)

Note 1: For linear transportation projects crossing a single waterbody more than one time at separate and distant locations, or multiple waterbodies at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. Linear transportation projects must comply with 33 CFR 330.6(d).

Note 2: Some discharges of dredged or fill material for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under Section 404(f) of the Clean Water Act (see 33 CFR 323.4).

Note 3: For NWP 14 activities that require pre-construction notification, the PCN must include any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings that require Department of the Army authorization but do not require pre-construction notification (see paragraph (b)(4) of general condition 32). The district engineer will evaluate the PCN in accordance with Section D, "District Engineer's Decision." The district engineer may require

mitigation to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see general condition 23).

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US Army Corps
of Engineers
Nashville District

2021 Nationwide Permit General Conditions

The following General Conditions must be followed in order for any authorization by NWP to be valid:

State of Tennessee Regional General Conditions (Applicable to ALL Nationwide Permits):

1. Except for NWP 3 Maintenance, a PCN is required for all proposed activities in *Exceptional Tennessee Waters* and/or *Outstanding National Resource Waters*. A list of known Exceptional Tennessee Waters and Outstanding National Resource Waters can be obtained from the Tennessee Department of Environment and Conservation's website: <https://tn.gov/environment/article/wr-water-resources-data-viewer>. A map of known Exceptional Tennessee Waters and Outstanding National Resource Waters can be obtained from the Tennessee Department of Environment and Conservation's website: <http://tdeconline.tn.gov/dwr/>.

National General Conditions:

1. **Navigation.**
 - (a) No activity may cause more than a minimal adverse effect on navigation.
 - (b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.
 - (c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
2. **Aquatic Life Movements.** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.
3. **Spawning Areas.** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.
4. **Migratory Bird Breeding Areas.** Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.
5. **Shellfish Beds.** No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. **Suitable Material.** No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).
7. **Water Supply Intakes.** No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. **Adverse Effects From Impoundments.** If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. **Management of Water Flows.** To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. **Fills Within 100-Year Floodplains.** The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. **Equipment.** Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. **Soil Erosion and Sediment Controls.** Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. **Removal of Temporary Structures and Fills.** Temporary structures and fills must be removed in their entirety, and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. **Proper Maintenance.** Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. **Single and Complete Project.** The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. **Wild and Scenic Rivers.**

- (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.
- (b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion

in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. Permittees shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: <http://www.rivers.gov/>.

17. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. Endangered Species.

(a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat of such species. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless ESA section 7 consultation addressing the consequences of the proposed activity on listed species or critical habitat has been completed. See 50 CFR 402.02 for the definition of "effects of the action" for the purposes of ESA section 7 consultation, as well as 50 CFR 402.17, which provides further explanation under ESA section 7 regarding "activities that are reasonably certain to occur" and "consequences caused by the proposed action."

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA (see 33 CFR 330.4(f)(1)). If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species or designated critical habitat, the pre-construction notification must include the name(s) of the endangered or threatened species that might be affected by the proposed activity or that utilize the designated critical habitat that might be affected by the proposed activity. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. For activities where the non-Federal applicant has identified listed species or critical habitat that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have "no effect" on listed species or critical habitat, or until ESA section 7 consultation has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWPs.

(e) Authorization of an activity by an NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide Web pages at <http://www.fws.gov/> or <http://www.fws.gov/ipac> and <http://www.nmfs.noaa.gov/pr/species/esa/> respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for ensuring that an action authorized by NWP complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting the appropriate local office of the U.S. Fish and Wildlife Service to determine what measures, if any, are necessary or appropriate to reduce adverse effects to migratory birds or eagles, including whether "incidental take" permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. Historic Properties.

(a) No activity is authorized under any NWP which may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)(1)). If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register

of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts commensurate with potential impacts, which may include background research, consultation, oral history interviews, sample field investigation, and/or field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect.

(d) Where the non-Federal applicant has identified historic properties on which the proposed NWP activity might have the potential to cause effects and has so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed. For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. Permittees that discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will

initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWP's 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, 52, 57 and 58 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWP's 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed by permittees in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWP's only after she or he determines that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) Compensatory mitigation at a minimum one-for-one ratio will be required for all losses of stream bed that exceed 3/100-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. This compensatory mitigation requirement may be satisfied through the restoration or enhancement of riparian areas next to streams in accordance with paragraph (e) of this general condition. For losses of stream bed of 3/100-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory

mitigation required. If restored riparian areas involves planting vegetation, only native species should be planted. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWP's, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f)).

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)).

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan needs to address only the baseline conditions at the impact site and the number of credits to be provided (see 33 CFR 332.4(c)(1)(ii)).

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to

ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality.

(a) Where the certifying authority (state, authorized tribe, or EPA, as appropriate) has not previously certified compliance of an NWP with CWA section 401, a CWA section 401 water quality certification for the proposed discharge must be obtained or waived (see 33 CFR 330.4(c)). If the permittee cannot comply with all of the conditions of a water quality certification previously issued by certifying authority for the issuance of the NWP, then the permittee must obtain a water quality certification or waiver for the proposed discharge in order for the activity to be authorized by an NWP.

(b) If the NWP activity requires pre-construction notification and the certifying authority has not previously certified compliance of an NWP with CWA section 401, the proposed discharge is not authorized by an NWP until water quality certification is obtained or waived. If the certifying authority issues a water quality certification for the proposed discharge, the permittee must submit a copy of the certification to the district engineer. The discharge is not authorized by an NWP until the district engineer has notified the permittee that the water quality certification requirement has been satisfied by the issuance of a water quality certification or a waiver.

(c) The district engineer or certifying authority may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). If the permittee cannot comply with all of the conditions of a coastal zone management consistency concurrence previously issued by the state, then the permittee must obtain an individual coastal zone management consistency concurrence or presumption of concurrence in order for the activity to be authorized by NWP. The district engineer or a state may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its CWA section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is authorized, subject to the following restrictions:

- (a) If only one of the NWPs used to authorize the single and complete project has a specified acreage limit, the acreage loss of waters of the United States cannot exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.
- (b) If one or more of the NWPs used to authorize the single and complete project has specified acreage limits, the acreage loss of waters of the United States authorized by those NWPs cannot exceed their respective specified acreage limits. For example, if a residential subdivision is constructed under NWP 29, and the single and complete project includes the filling of an upland ditch authorized by NWP 46, the maximum acreage loss of waters of the United States for the residential subdivision under NWP 29 cannot exceed 1/2-acre; and the total acreage loss of waters of United States due to the NWP 29 and 46 activities cannot exceed 1 acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

"When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

(Transferee) _____

(Date) _____

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

- (a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;
- (b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the

documentation required by 33 CFR 332.3(i)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

- (c) The signature of the permittee certifying the completion of the activity and mitigation. The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires review by, or permission from, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a "USACE project"), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission and/or is not authorized by NWP until the appropriate Corps office issues the section 408 permission or completes its review to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. Pre-Construction Notification.

(a) **Timing.** Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. Prospective permittee shall not begin the activity until either:

- (1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or
- (2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) **Contents of Pre-Construction Notification:** The PCN must be in writing and include the following information:

- (1) Name, address and telephone numbers of the prospective permittee;
- (2) Location of the proposed activity;

- (3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity.
 - (4) (i) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures.
 - (ii) For linear projects where one or more single and complete crossings require pre-construction notification, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters (including those single and complete crossings authorized by NWP but do not require PCNs). This information will be used by the district engineer to evaluate the cumulative adverse environmental effects of the proposed linear project, and does not change those non-PCN NWP activities into NWP PCNs.
 - (iii) Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans).
 - (5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial, intermittent, and ephemeral streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45 day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate.
 - (6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands or streams and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.
 - (7) For non-Federal permittees, if any listed species or designated critical habitat might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat, the PCN must include the name(s) of those endangered or threatened species that might be affected by the proposed activity or utilize the designated critical habitat that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act:
 - (8) For non-Federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;
 - (9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the "study river" (see general condition 16); and
 - (10) For an NWP activity that requires permission from, or review by, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from, or review by, the Corps office having jurisdiction over that USACE project.
- (c) *Form of Pre-Construction Notification:* The nationwide permit pre-construction notification form (Form ENG 6082) should be used for NWP PCNs. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submissions.
 - (d) *Agency Coordination:*
 - (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.
 - (2) Agency coordination is required for: (i) All NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iii) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.
 - (3) When agency coordination is required, the district engineer will immediately provide (e.g., via email, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFIS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or email that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure that the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an

unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

- (4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.
- (5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

Further Information

- 1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
- 2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.
- 3. NWPs do not grant any property rights or exclusive privileges.
- 4. NWPs do not authorize any injury to the property or rights of others.
- 5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

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US Army Corps
of Engineers ®
Nashville District

COMPLIANCE CERTIFICATION

YOU ARE REQUIRED TO SUBMIT THIS SIGNED CERTIFICATION REGARDING THE COMPLETED ACTIVITY AND ANY REQUIRED MITIGATION

I hereby certify that the work authorized by **Permit No. LRN-2023-00839**, and any required mitigation was done in accordance with the Corps authorization, including any general, regional, or special conditions.

Permittee Signature

Date

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative.

Submit this signed certification to the address below:

- U.S Army Corps of Engineers
Attn.: Jennifer Watson
Regulatory Division
3701 Bell Road
Nashville, TN 37214-2660
- East Regulatory Field Office
501 Adesa Parkway
Suite 250
Lenoir City, TN 37771
- West Regulatory Field Office
2424 Danville Road SW
Suite N
Decatur, AL 35603



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Water Resources
Davy Crockett Tower
500 James Robertson Parkway, 9th Floor
Nashville, Tennessee 37243

May 28, 2024

Paul Holzen
City of Franklin
109 Third Avenue South
Franklin, TN 37067

Subject: §401 Water Quality Certification - Aquatic Resource Alteration Permit (ARAP)
NRS23.297 McEwen Drive
Williamson County

Dear Mr. Holzen:

The Division has reviewed and approved your Aquatic Resource Alteration Permit application for the replacement of the existing 150 linear foot culvert with 140-foot culvert, removal of existing 140-foot culvert and encapsulation of 280 linear feet of stream, 100 feet of grading, and permanent fill of 0.03 acres of wetland for the widening of McEwen Drive. Impacts to streams for utility line relocations via HDD are temporary. Stream impacts resulting in loss of 173.6 functional feet of stream are to be offset through purchase of 115.8 functional foot credits from Harpeth River Mitigation Bank, and the remaining 57.8 debits (with the appropriate multiplier applied) will be offset by 129.5 functional foot credits purchased from the Cumberland River Compact In-Lieu Fee in the Upper Cumberland River Service Area. Wetland impacts totaling 0.03 acres shall be offset at a 2:1 ratio for purchase of 0.06 credits from Harpeth River Mitigation Bank.

The enclosed Aquatic Resource Alteration Permit authorizes the work you proposed in your application. The work must be performed in conformance with the accepted plans and information submitted in support of application NRS23.297 and the limitations and conditions set forth in the enclosed permit.

The activity was reviewed, and the Division has reasonable assurance that the activity as proposed and in accordance with all permit conditions herein will not violate applicable water quality standards. Subject to conformance with the accepted plans, specifications, and other information submitted in support of the referenced application, the state of Tennessee hereby issues certification for the proposed activity. The enclosed permit authorizes the activity pursuant to *The Tennessee Water Quality Control Act of 1977* (T.C.A. §69-3-101 et seq.) and may serve as a §401 water quality certification (pursuant to 40 C.F.R. §121.2).

For federal agency employees and permit holders, the 401 Water Quality Certification Justifications and Citations related to the procedural requirements of §121.7(d) can be found at <https://www.tn.gov/environment/permit-permits/water-permits1/aquatic-resource-alteration-permit--arap-.html>. A paper copy of the certifications and justifications can also be obtained by contacting water.permits@tn.gov or calling (615) 532-0359.

The state of Tennessee may modify, suspend or revoke this authorization or seek modification or revocation should the state determine that the activity results in more than an insignificant violation of applicable water
SPP-9.13

quality standards or violation of the TWQCA. Failure to comply with permit terms may result in penalty in accordance with T.C.A. §69-3-115.

It is the responsibility of the permittee to read and understand all permit conditions before the project begins. If you need any additional information or clarification, please contact me at 615-804-2409 or by e-mail at Alicia.Douglas@tn.gov.

Sincerely,



Alicia Douglas
Natural Resources Unit

Enclosure

cc: Tim Jennette, Nashville EFO Tim.Jennette@tn.gov
USACE – Nashville District jennifer.a.watson2@usace.army.mil
Jose Garcia, CEC, Inc. jcarcia@cecinc.com

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Aquatic Resource Alteration Permit NRS23.297

Pursuant to the *Tennessee Water Quality Control Act of 1977* (T.C.A. § 69-3-101 et seq.) and supporting regulations, a permit is required to alter the properties of waters of the state. Also, pursuant to §401 of the *Clean Water Act* (33 U.S.C. 1341), an applicant for a Federal license or permit which may result in a discharge into the waters of the U.S., shall provide the federal licensing or permitting agency a certification from the State in which the discharge will originate.

Accordingly, the Division of Water Resources requires reasonable assurance that the activity will not violate provisions of the *Tennessee Water Quality Control Act of 1977* (T.C.A. §69-3-101 et seq.) or provisions of §§301, 302, 303, 306 or 307 of the *Clean Water Act*.

Subject to conformance with accepted plans, specifications, and other information submitted in support of the application, the state of Tennessee hereby authorizes pursuant to 33 U.S.C. 1341 certifies and T.C.A. §69-3-101 et seq., the activity described below:

PERMITTEE: City of Franklin
109 Third Avenue South
Franklin, TN 37067

AUTHORIZED WORK: Replacement of existing 150 linear foot culvert with 140-foot culvert, removal of existing 140-foot culvert and encapsulation of 280 linear feet of stream, 100 feet of grading, and permanent fill of 0.03 acres of wetland for the widening of McEwen Drive. Impacts to streams for utility line relocations via HDD are temporary. Stream impacts resulting in loss of 173.6 functional feet of stream are to be offset through purchase of 115.8 functional foot credits from Harpeth River Mitigation Bank, and the remaining 57.8 debits (with the appropriate multiplier applied) will be offset by 129.5 functional foot credits purchased from the Cumberland River Compact In-Lieu Fee in the Upper Cumberland River Service Area. Wetland impacts totaling 0.03 acres shall be offset at a 2:1 ratio for purchase of 0.06 credits from Harpeth River Mitigation Bank.

LOCATION: McEwen Drive from east of roundabout at Cool Springs Boulevard/Oxford Glen to State Route 252 (Wilson Pike), Williamson County
South Prong Spencer Creek, Mayes Creek, and Unnamed Wetlands
Latitude 35.932882, Longitude - 86.783419

EFFECTIVE DATE: May 28, 2024
EXPIRATION DATE: May 27, 2029

A handwritten signature in cursive script, appearing to read "Claire W. Grippo".

for April Grippo
Acting Director, Division of Water Resources

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PART I

Authorized Alterations

The authorized work is removal of 290 linear feet of existing pipe, encapsulation of 420 linear feet of stream, 100 linear feet of grading, and permanent fill of 0.03 acres of wetland for the widening of McEwen Drive. Impacts to STR-1 and STR-3 for utility line relocations of an 8-inch gas line, 6-inch force main, fiber optics and street signal lines, and 8-inch gas line will be temporary due to horizontal directional drill (HDD) installation.

STR-1 (South Prong Spencer Creek) Crossing 1

Latitude: 35.933611 Longitude: -86.781954

- a. Existing 140-foot 36-inch corrugated metal pipe to be removed
- b. Install 280 feet of concrete pipes with wingwalls
 - i. 110-foot 18-inch culvert
 - ii. 170-foot 30-inch culvert
 - iii. Inlet control structure (4-foot by 4-foot concrete box with one 30-inch inlet and one 12-inch inlet)
- c. 100 linear feet of grading to direct flow toward culvert
- d. 8-inch water line, 6-inch force main, fiber optic, and street signal lines crossing via HDD
- e. Mitigation required for -173.6 functional feet

STR-1 (South Prong Spencer Creek) Crossing 2

Latitude: 35.93255 Longitude: -86.783455

- a. Removal of existing 150 feet of 30-inch pipe
- b. Install 140 feet of new culvert including wingwalls
 - i. 60 feet of 30-inch pipe
 - ii. 80 feet of 36-inch pipe
- c. No mitigation required

WTL-1

Latitude: 35.93269 Longitude: -86.788245

- a. Permanent fill of 0.01 acres
- b. Mitigation purchased for 0.02 credits at Harpeth River Mitigation Bank

WTL-3

Latitude: 35.93318 Longitude: -86.782216

- a. Permanent fill of 0.02 acres
- b. Mitigation purchased for 0.04 credits at Harpeth River Mitigation Bank

STR-3 (Mayes Creek)

Latitude: 35.936974 Longitude: -86.77254

- a. 8-inch gas line installation via HDD
- b. Impacts are temporary; no mitigation required

Special Conditions

1. The permittee shall submit a post construction inspection report that reflect the “as-constructed” condition of all features authorized or required by this permit:
 - a. The post construction inspection report shall include sufficient information, including photographic documentation, to demonstrate conformance with the approved plans, specifications, and special conditions of this permit.
 - b. The post construction inspection report shall be submitted **within 60 days** of completion of work.
 - c. The report may be submitted via email to water.permits@tn.gov or to the following address:

Division of Water Resources
Natural Resources Unit
Davy Crockett Tower
500 James Robertson Parkway, 9th Floor
Nashville, Tennessee 37243
2. The work shall be accomplished in conformance with the accepted plans, specifications, data, and other information submitted in support of application NRS23.297 and the limitations, requirements, and conditions set forth herein.
3. All debris and waste material will be cleaned up or removed from below the ordinary high-water level.
4. The bottom of culverts shall be constructed below the stream bed elevation, in a manner that allows natural substrate to reestablish.
5. Culverts shall not be constructed in a manner that would permanently disrupt the movement of fish and aquatic life.
6. All riprap areas shall be placed as to mimic the existing/proposed contours of the stream channel. Riprap shall be countersunk and placed at the grade with the existing stream substrate.
7. Voids within the riprap shall be filled with suitable substrate to prevent loss of stream within the riprap areas. Do not over-excavate for placement of riprap. Grouting of riprap is prohibited except where specifically authorized.
8. Construction and removal of bridges and culverts shall be in the dry to the maximum extent practicable, by diverting flow utilizing cofferdams, berms, and/or temporary channels or pipes. Temporary diversion channels shall be protected by non-erodible material and lines to the expected high-water level.
9. Any streams or wetlands outside of the permitted impact areas shall be clearly marked so that all work performed by the contractor is solely within the permitted impact area.
10. Only earthen materials consisting of soils, stones or rocks, or a mixture or combination of such materials, which are excavated or extracted from a borrow pit, earthen bank, gravel bank, mine or quarry shall be “Acceptable Fill.” Acceptable Fill shall not contain any sewage, industrial wastes, additives, or materials such as refuse, rubble, muck, metal, glass, concrete pieces, bricks, or asphalt paving materials, wood or other wastes as defined in the Tennessee Water Quality Control Act of 1977. “Other wastes” means any and all other substances or forms of energy, with the exception of sewage and industrial wastes, including, but not limited to, decayed wood, sand, garbage, silt,

municipal refuse, sawdust, shavings, bark, lime, ashes, offal, oil, hazardous materials, tar, sludge, or other petroleum byproducts, radioactive material, chemicals, heated substances, dredged spoil, solid waste, incinerator residue, sewage sludge, munitions, biological materials, wrecked and discarded equipment, rock, and cellar dirt. T.C.A. § 69-3-103(23).

11. Temporary impacts to wetlands shall be mitigated by the removal and stockpiling of the first 12 inches of topsoil, prior to construction. Temporary wetland crossings or haul roads shall utilize timber matting. Gravel, riprap, or other rock is not approved for construction of temporary crossings or haul roads across wetlands. Upon completion of construction activities, all temporary wetland impact areas are to be restored to pre-construction contours, and the stockpiled topsoil spread to restore these areas to pre-construction elevation. Other side-cast material shall not be placed within the temporary impact locations. Permanent vegetative stabilization using native species of all disturbed areas in or near the wetland must be initiated within 14 days of project completion (see also *Landscaping with Natives* at tneppc.org). Non-native, non-invasive annuals may be used as cover crops until native species can be established.
12. The use of monofilament-type erosion control netting or blanket is prohibited within 30 feet of streams and wetlands. To minimize wildlife entanglement and plastic debris pollution, temporary erosion and sediment control products that either do not contain netting, or that contain netting manufactured from 100 percent biodegradable non-plastic materials such as jute, sisal, or coir fiber shall be specified. Netting used in these products should have a loose-weave wildlife-safe design with movable joints between the horizontal and vertical twines, allowing the twines to move independently. Degradable, photodegradable, UVdegradable, oxo-degradable, or oxo-biodegradable plastic netting (including polypropylene, nylon, polyethylene, and polyester) are not acceptable alternatives.
13. Streambeds shall not be used as transportation routes for construction equipment. Temporary stream crossings shall be limited to one point in the construction area and EPSC measures shall be utilized where stream banks are disturbed.
14. Sediment shall be prevented from entering waters of the state. Erosion and sediment controls measures shall be designed according to the size and slope of disturbed or drainage areas to detain runoff and trap sediment and shall be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. Information on erosion and sediment control measures can be found in the department's Erosion and Sediment Control Handbook (<http://www.tnepsc.org/>).
15. If any state or federally listed aquatic species are discovered during construction, TDEC and TWRA shall be notified, and the permittee shall await and follow instructions on how to proceed.
16. All utility line relocations must adhere to the conditions set forth in the *General Permit for Utility Line Crossings*.

General Conditions

1. The amount of fill, stream channel and bank modifications, or other impacts associated with the activity shall be limited to the minimum necessary to accomplish the project purpose. The permittee shall utilize the least impactful practicable method of construction.
2. It is the responsibility of the permittee to convey all terms and conditions of this permit to all contractors. A copy of this permit, approved plans, and any other documentation pertinent to the

activities authorized by this permit shall be maintained on site at all times during periods of construction activity.

3. The work shall be accomplished in conformance with the accepted plans, specifications, data, and other information submitted in support of the application and the limitations, requirements and conditions set forth herein.
4. Clearing, grubbing, and other disturbance to riparian vegetation shall be kept at the minimum necessary for slope construction and equipment operations. Unnecessary native riparian vegetation removal, including tree removal, is prohibited. Native riparian vegetation must be reestablished in all areas of disturbance outside of any permanent authorized structures after work is completed. Coverage under this permit does not serve to waive any local riparian buffer protection requirement, and permittees are responsible for obtaining any necessary local approval.
5. Temporary or permanent soil stabilization shall be accomplished within 14 days after final grading or other earth work. Permanent stabilization with perennial vegetation or other permanently stable, non-eroding surface shall replace any temporary measures as soon as practicable. Vegetative species must be on approved native species planting list, (*Landscaping with Native Plants*; https://www.tnipc.org/wp-content/uploads/2017/10/landscaping_2016_forweb.pdf).
6. Work shall not commence until the permittee has received the federal §404 permit from the U. S. Army Corps of Engineers, a §26a permit from the Tennessee Valley Authority or authorization under a Tennessee NPDES Storm Water Construction Permit where necessary. The permittee is responsible for obtaining these permits.
7. Best Management Practices (BMPs) shall be stringently implemented throughout the construction period to prevent sediments, oils, or other project-related pollutants from being discharged.
8. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the state. Any equipment to be used in-stream shall be free of noticeable leaks of fluids; e.g., hydraulic, transmission, crankcase, and engine coolant fluids and oils. All spills must be reported to the appropriate emergency management agency, and measures shall be taken immediately to prevent the pollution of waters of the state, including groundwater, should a spill occur.
9. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in Rule 0400-4-3-.03 of the Rules of the Tennessee Department of Environment and Conservation. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impair the usefulness of waters of the state for any of the uses designated by Rule 0400-4-4. These uses include fish and aquatic life (including trout streams and naturally reproducing trout streams), livestock watering and wildlife, recreation, irrigation, industrial water supply, domestic water supply, and navigation.
10. Work shall not commence until the permittee has obtained all necessary authorizations pursuant to applicable provisions of section 10 of The Rivers and Harbors Act of 1899, section 404 of the Clean Water Act, section 26a of The Tennessee Valley Authority Act, section 402 of the Clean Water Act (including, but not limited to, an NPDES permit for construction stormwater), or any other federal, state, or local laws.
11. Backfill activities must be accomplished in the least impactful manner possible that stabilizes the streambed and banks to prevent erosion. The completed activities may not disrupt or impound stream flow.

12. Adverse impact to formally listed state or federal threatened or endangered species or their critical habitat is prohibited.
13. This permit does not authorize adverse impacts to cultural, historical, or archeological features or sites.

PART II

Monitoring Requirements and Procedures

No monitoring is required beyond As-Constructed Report (Special Condition 1).

Mitigation

1. Compensatory mitigation activities shall be carried out utilizing best professional efforts to comply with approved plans and the conditions of this permit. Mitigation activities shall be deemed complete when the Division determines that the permitted impact on aquatic resources has been adequately addressed through successful achievement of the compensatory mitigation activities, and a no further action letter has been provided to the permittee.
2. The goal of this permit and its mitigation success criteria is to ensure there is no net loss of resource value due to the impacts of the permitted activity. In accordance with adaptive management, the Division incorporates safety factors into compensatory mitigation requirements. Therefore, once successful mitigation has been achieved the Division reserves the right to revise performance standards and mitigation criteria to account for any changes documented in the compensatory mitigation project. While final mitigation activities may not result in a net loss of resource value, they may be revised to reflect approved changes from the original mitigation proposal and the success criteria in the permit. Upon acceptance of closure of the project, the Division shall record any such revisions of the mitigation plan or success criteria through formal modification of the permit conditions with public notice.
3. Wetland impacts totaling 0.03 acres shall be offset through purchase at a 2:1 ratio from Harpeth River Mitigation Bank for a total of 0.06 credits. Please be advised that the wetland impacts associated with this mitigation are not authorized to proceed until the specified mitigation credits have been purchased. Payment must be made within 60 days of invoice. **Proof of credit purchase shall be submitted to this office within 30 days of payment.** With the purchase of the wetland mitigation credits, legal responsibility for completion of this wetland mitigation is legally transferred to the Harpeth River Mitigation Bank.
4. Stream impact debits totaling 173.6 functional feet shall be offset through purchase of 115.8 ff credits from Harpeth River Mitigation Bank. The remaining 57.8 ff credits shall be purchased through Cumberland River Compact's In-Lieu Fee Program in the Upper Cumberland Service Area at a 2:1 ratio for proximity factor and 12% temporal loss multiplier for a total of 129.5 ff credits. Please be advised that the stream impacts associated with this mitigation are not authorized to proceed until the specified mitigation credits have been purchased. Payment must be made within 60 days of invoice. **Proof of credit purchase shall be submitted to this office within 30 days of payment.** With the purchase of the stream mitigation credits, legal responsibility for completion of this wetland mitigation is legally transferred to the Harpeth River Mitigation Bank and Cumberland River Compact.

PART III

Duty to Reapply

Permittee is not authorized to discharge or conduct an activity that alters the properties of waters of the state after the expiration date of this permit. In order to receive authorization to discharge or to conduct an activity that alters the properties of waters of the state beyond the expiration date, the permittee shall submit such information and forms as are required to the director of the Division of Water Resources. Such applications must be properly signed and certified.

If any portion of the permitted activities, including the authorized impacts to water resources, compensatory mitigation requirements, or post-project monitoring is not completed before the expiration date of this permit **the permittee must apply for permit extension or re-issuance**. The permittee shall submit such information and forms as are required to the director of the Division of Water Resources at least ninety (90) days prior to its expiration date. Such applications must be properly signed and certified.

Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

Water Rights

The waters of Tennessee are the property of the state and are held in public trust for the use of the people of the state. This permit does not grant or convey any prescriptive rights, appropriation, or allocation of water, nor does it authorize any injury to the riparian rights of others.

Other Permits

This permit does not preclude requirements of other federal, state, or local laws. This permit also serves as a state of Tennessee aquatic resource alteration permit (ARAP) pursuant to the *Tennessee Water Quality Control Act of 1977* (T.C.A. §69-3-101 et seq.).

Other Information

If the permittee becomes aware that he/she failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the director, then he/she shall promptly submit such facts or information.

Changes Affecting the Permit

Transfer/Change of Ownership

1. This permit may be transferred to another party, provided there are no activity or project modifications, no pending enforcement actions, or any other changes which might affect the permit conditions contained in the permit, by the permittee if:
 - a. The permittee notifies the Director of the proposed transfer at least 30 days in advance of the proposed transfer date;

- b. The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage, and contractual liability between them; and
 - c. The Director does not notify the current permittee and the new permittee, within 30 days, of his or her intent to modify, revoke, reissue, or terminate the permit, or require that a new application be filed rather than agreeing to the transfer of the permit.
2. The permittee must provide the following information to the division in their formal notice of intent to transfer ownership:
- a. the permit number of the subject permit;
 - b. the effective date of the proposed transfer;
 - c. the name and address of the transferor;
 - d. the name and address of the transferee;
 - e. the names of the responsible parties for both the transferor and transferee;
 - f. a statement that the transferee assumes responsibility for the subject permit;
 - g. a statement that the transferor relinquishes responsibility for the subject permit;
 - h. the signatures of the responsible parties for both the transferor and transferee, and;
 - i. a statement regarding any proposed modifications to the permitted activities or project, its operations, or any other changes which might affect the permit conditions contained in the permit.

Change of Mailing Address

The permittee shall promptly provide to the director written notice of any change of mailing address. In the absence of such notice the original address of the permittee will be assumed to be correct.

Noncompliance

Effect of Noncompliance

All discharges shall be consistent with the terms and conditions of this permit. Any permit noncompliance constitutes a violation of applicable state and federal laws and is grounds for enforcement action, permit termination, permit modification, or denial of permit reissuance.

Reporting of Noncompliance

24-Hour Reporting

1. In the case of any noncompliance which could cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the required notice of non-compliance shall be provided to the Division of Water Resources in the appropriate Environmental Field Office within 24-hours from the time the permittee becomes aware of the circumstances. (The Environmental Field Office should be contacted for names and phone numbers of environmental response personnel).

2. A written submission must be provided within five (5) days of the time the permittee becomes aware of the circumstances unless this requirement is waived by the director on a case-by-case basis. The permittee shall provide the director with the following information:
 - a. A description of the discharge and cause of noncompliance;
 - b. The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and
 - c. The steps being taken to reduce, eliminate, and prevent recurrence of the non-complying discharge.

Scheduled Reporting

For instances of noncompliance which are not reported under subparagraph a. above, the permittee shall report the noncompliance by contacting the permit coordinator and provide all information concerning the steps taken or planned to reduce, eliminate, and prevent recurrence of the violation and the anticipated time the violation is expected to continue.

Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the waters of Tennessee resulting from noncompliance with this permit, including but not limited to, accelerated or additional monitoring as necessary to determine the nature and impact of the noncompliance. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

Liabilities

Civil and Criminal Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Notwithstanding this permit, the permittee shall remain liable for any damages sustained by the state of Tennessee, including but not limited to fish kills and losses of aquatic life and/or wildlife, as a result of the discharge of pollutants to any surface or subsurface waters. Additionally, notwithstanding this Permit, it shall be the responsibility of the permittee to conduct its discharge activities in a manner such that public or private nuisances or health hazards will not be created.

Liability under State Law

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or the *Federal Water Pollution Control Act*, as amended.

Reopener:

This permit may be modified, suspended, or revoked for cause, including:

McEwen Drive Phase IV; NRS23.297
§401 Water Quality Certification

1. Violation of any of the terms or conditions of this permit or of T.C.A § 69-3-101 et. seq.;
2. Obtaining the permit by misrepresentation or failing to disclose fully all relevant facts;
3. A change in any condition that requires either a temporary or permanent change in the conditions of this permit.

Appeal:

An appeal of this action may be made as provided in T.C.A. §69-3-105(i) and Rule 0400-40-07-.04(9) by submitting a petition for appeal:

1. The petition must be filed within THIRTY (30) DAYS after public notice of the issuance of the permit.
2. The petition must specify the provisions subject to appeal and the basis for the appeal.
3. The petition should be addressed to the technical secretary of the Tennessee Board of Water Quality, Oil and Gas at the following address: Ms. April Grippo, Acting Director, Division of Water Resources, Davy Crockett Tower, 500 James Robertson Parkway, 9th Floor, Nashville, Tennessee 37243, or you may submit such petition electronically to TDEC.Appeals@tn.gov. Any hearing would be in accordance with T.C.A. §§69-3-110 and 4-5-301 et seq.

NOT AN OFFICIAL BID DOCUMENT!
FOR INFORMATION ONLY!

Permit Rationale

City of Franklin
McEwen Drive
Franklin, Williamson County, Tennessee

May 2024

Permit Writer: Alicia Douglas

Summary

**City of Franklin
109 Third Avenue South
Franklin, TN 37067
Contact: Paul Holzen 615-290-2717**

**Location: McEwen Drive from East of roundabout at Cool Springs Boulevard/Oxford Glen to State Route 252 (Wilson Pike), Williamson County
UT South Prong Spencer Creek, UT to Mayes Creek, and Unnamed Wetlands**

Latitude 35.932882, Longitude - 86.783419

Authorized Activity: Replacement of existing 150 linear foot culvert with 140-foot culvert, removal of existing 140-foot culvert and encapsulation of 280 linear feet of stream, 100 feet of grading, and permanent fill of 0.03 acres of wetland for the widening of McEwen Drive. Impacts to streams for utility line relocations via HDD are temporary. Stream impacts resulting in loss of 173.6 functional feet of stream are to be offset through purchase of 115.8 ff credits from Harpeth River Mitigation Bank and 129.5 ff credits from Cumberland River Compact In-Lieu Fee in the Upper Cumberland River Service Area.

Permit Status

| | |
|-------------------------|---------------------|
| Permit Type: | ARAP |
| Classification: | Major |
| Issuance Date: | May 28, 2024 |
| Expiration Date: | May 27, 2029 |
| Effective Date: | May 28, 2024 |

Status of Affected Waters

Streams

STR-1: Waterbody Segment ID : TN05130204016 0210 Name : South Prong Spencer Creek

| Designated Use | Use Support | Causes | Sources |
|-------------------------------|------------------|--------|---------|
| livestock watering & wildlife | fully supporting | | |
| irrigation | fully supporting | | |
| recreation | not assessed | | |

McEwen Drive Phase IV; NRS23.297
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| | | | |
|--------------------------------|-----------------------|--|---|
| fish and aquatic life | not supporting | alteration in streamside or littoral vegetative covers; sedimentation/siltation | Site clearance (land development or redevelopment) |
| domestic water supply | not assessed | | |
| industrial water supply | not assessed | | |

Assessment Date: June 3, 2019

The affected waters have Unavailable Parameters for habitat alteration.
The affected waters are not known Exceptional Tennessee Waters.

STR-3: Waterbody Segment ID : TN05130204016 0600 Name : Mayes Creek

| Designated Use | Use Support | Causes | Sources |
|--|-------------------------|---------------|----------------|
| livestock watering & wildlife | fully supporting | | |
| irrigation | fully supporting | | |
| recreation | fully supporting | | |
| fish and aquatic life | fully supporting | | |
| domestic water supply | not assessed | | |
| industrial water supply | not assessed | | |

Assessment Date: June 5, 2019

The affected waters have Available Parameters for habitat alteration.
The affected waters are not known Exceptional Tennessee Waters.

Wetlands

WTL-1 and WTL-3

The two wetlands to be impacted were assessed using the TRAM and scores were indicative of low resource value.

The affected waters have Available Parameters for habitat alteration.
The affected waters are not known Exceptional Tennessee Waters.

Authorized Alterations

The authorized work is encapsulation of 420 linear feet of stream and permanent fill of 0.03 acres of wetland for the widening of McEwen Drive. Impacts for utility line relocation for an 8-inch gas line, 6-inch force main, and fiber optics and street signal lines to STR-1 and 8-inch gas line impacts to STR-3 will be temporary due to HDD installation.

Alternatives Analysis and Selection of Least Impactful Practicable Alternative

The applicant has submitted an analysis of potentially practicable alternatives to the authorized activity. The overall stated purpose and need for the proposed project is to increase the capacity of McEwen Drive to handle the increase in traffic in this area and provide for a safer route for the community. The applicant has provided the following discussion analyzing alternatives:

- *“Northern alignment, alternative #1): The No Permit Action alternative proposes a new alignment roughly parallel to McEwen Drive to the north and consist no impact to aquatic resources. This alternative would require the purchase of ROW for the entire project length as well as impact residential homes. The alignment would improve roadway operation and safety and improve congestion. This alternative would require large ROW acquisitions, have an inefficient construction timeline due to the construction on steeper slopes, and result in a significant increase in the overall cost of the project.*
- *On-site alternative: The on-site alternative considered included adding additional lanes north of the existing two lane roadway and straightening the alignment. (City of Franklin’s preferred alternative) This alternative would allow for the widening of McEwen drive to the immediate north where a majority of the land is existing right-of-way. This alternative would improve roadway operation, safety, and ease congestion.*
- *Southern Alignment alternative #2: This alternative proposes a new alignment roughly parallel to McEwen Drive to the south. The new alignment will consist of four 12-foot travel lanes with a median and shoulders and roadside ditches. This alternative would impact more hydrologic features and require large quantities of fill. This alternative would require the purchase of ROW for the entire project length along the southern boundary as well as impact residential homes and require large quantities of fill due to the steep slope on sections of the southern boundary. It would improve roadway operation, safety, and ease congestion, but would require impact to approximately 2,000 linear feet of stream, and approximately 0.85 acres of pond and wetlands. This alternative would require large ROW acquisitions, greater impacts to hydrologic features and result in a significant increase in the overall cost of the project.*

The on-site alternative represents the least environmentally damaging practicable alternative for the reasons identified above and is the preferred alternative because of roadway operation and safety, ease of congestion, cost, construction timeline, and constructability issues.”

Based on its review of available information, the Division has made the determination that the least environmentally damaging practicable alternative is the preferred alternative.

Existing Conditions/Loss of Resource Values

The applicant has provided the following description of existing conditions and loss of resource values:

“STR-1 (Crossing 1) is an intermittent headwater stream with no fish present. STR-1 originates on the north side of McEwen Drive and flows south, southwest. As flow from the stream moves west, it enters a second culvert under Players Mill Road and then discharges into a detention pond. At high flow events, flow from the pond will enter a large dry detention pond located along the southern boundary of McEwen

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Drive and outside of Right-of-Way. The stream averages three to four feet wide within Right-of-Way and is about an inch deep and originates at a culver on the adjacent property to the north. The feature has historically experienced degradation by residential development to the north and south. There is currently an angled, 140-linear foot, 36-inch corrugated metal pipe under McEwen Drive that conveys flow to a detention pond to the southwest. The proposed impacts will consist of replacing the existing culvert with a linear, 280-foot concrete pipe, which includes wing walls. The new culvert will be constructed in two segments, a 110-foot, 18-inch culvert and 170-foot of 30-inch culvert. The difference in sizes is to manage peak storm events. The culvert, on the inlet side, will have an inlet control structure that would allow base flow conditions to continue unimpeded to the downstream reach portions of the stream. The structure would create temporary in-line detention on the upstream side during high flow events. The inlet structure is a 4-foot by 4-foot concrete box with two inlet structures, a 30-inch and 12-inch inlets. Approximately 100-linear feet of the upper reach of the channel will be graded to direct flow toward the proposed culvert. The need for the proposed impact is to provide safe ingress and egress, via a west bound slip lane for the residential development to the north.

WTL-1 is a low resource value (TRAM score 32.69) emergent wetland located within a constructed stormwater channel for McEwen Drive. The wetland is approximately 0.01 acres in size and likely developed due to inadequate grading.

WTL-3 is a low resource value (TRAM score 27.30) emergent wetland approximately 0.03 acres in size and is located in-line with STR-1. The feature is present due to a rock check dam that was likely installed by the development to the north and never removed.”

| Project ID/ Permit Number: | | 0 | | Users Input Values | | | | |
|--|-----------------------|--------|------------------------------|---|--------------------|-------------------------|--------------------------------|---------------------------------|
| | | | | Users select values from a pull-down menu | | | | |
| DEBIT TOOL TABLE | | | | | | | | |
| Stream ID by Reach | Impact Description | Option | Existing Stream Length | Existing Condition Score | Proposed Length | Impact Severity Tier | Proposed Condition Score | Change in Functional Feet |
| STR-1 | Encapsulate | | 280 | 0.59 | 280 | Tier 5 | 0.07 | -145.6 |
| STR-1 | Grading | | 100 | 0.59 | 100 | Tier 3 | 0.31 | -28.0 |
| 0 | 0 | | | | | Tier 0 | 0.00 | 0.0 |
| 0 | 0 | | | | | | | |
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| 0 | 0 | | | | | | | |
| 0 | 0 | | | | | | | |
| 0 | 0 | | | | | | | |
| Total Functional Loss (Debits in FF): | | | | | | | | -173.6 |

Mitigation Required

Stream impact debits totaling 173.6 functional feet shall be offset through purchase of 115.8 ff credits from Harpeth River Mitigation Bank, which is considered in-system mitigation. The remaining 57.8 ff credits shall be purchased through Cumberland River Compact's In-Lieu Fee Program in the Upper Cumberland Service Area at a 2:1 ratio for proximity factor and 12% temporal loss multiplier for a total of 129.5 ff credits.

Wetland impacts totaling 0.03 acres shall be offset through purchase at a 2:1 ratio from Harpeth River Mitigation Bank for a total of 0.06 credits.

The Division has made the determination that the mitigation will produce sufficient resource value offsets to compensate for the resource value loss associated with the project impacts.

Social and Economic Justification

The applicant has provided the following social and economic justification for the proposed impacts to jurisdictional streams and wetlands:

Traffic has increased significantly and is anticipated to continue along this section of McEwen drive. Alternative 1 and 2 would meet the overall goal of meeting the operation and safety criteria of the City, however, both alternatives would require the purchase of ROW for a majority of the project length. In addition, relocation to the north would require a large quantity of cut and relocation to the south would require a large quantity of fill and significant impact to hydrologic features. Both alternatives would increase cost and extend the timeline. On-Site Alternative: Under this alternative, the City would be able to widen and realign McEwen drive to sustain the rapid growth and keep up with the traffic demand in an efficient and cost-effective timeline. The expansion will lead to improved traffic flow and reduced congestions and traffic accidents, ultimately enhancing the daily commute for residents in east Franklin.

Antidegradation

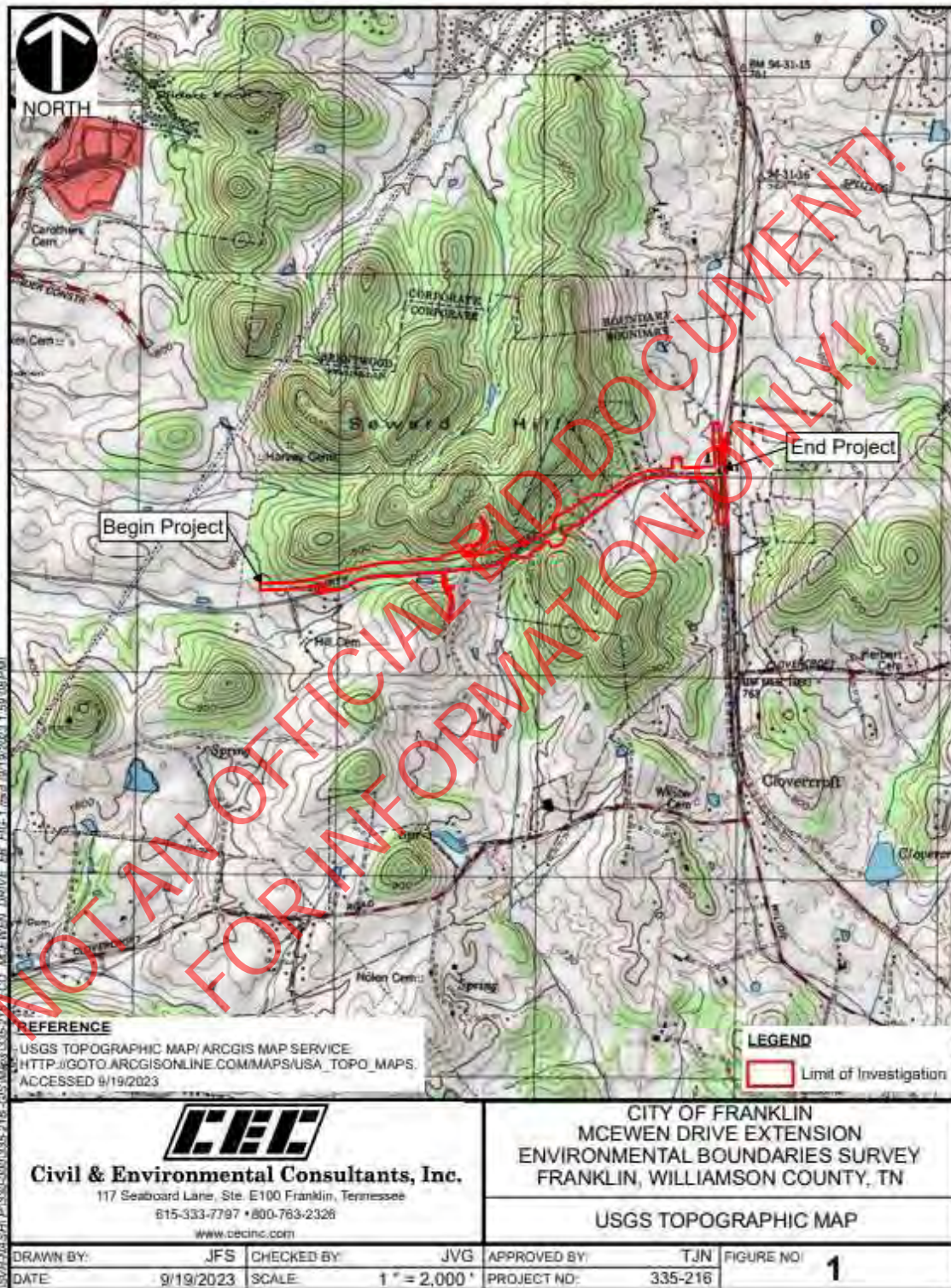
For impacts to jurisdictional streams, in accordance with the Tennessee Antidegradation Statement (Rule 0400-40-03-.06), the Division has made the determination that the activities will result in no significant degradation in a waterbody with unavailable parameters for habitat because the applicant proposes mitigation to offset any appreciable permanent loss of resource values.

For impacts to jurisdictional wetlands, in accordance with the Tennessee Antidegradation Statement (Rule 0400-40-03-.06), the Division has made the determination that the activities will result in *de minimis* degradation of waters with available parameters because the applicant proposes to provide in-system mitigation to offset any appreciable permanent loss of resource values.

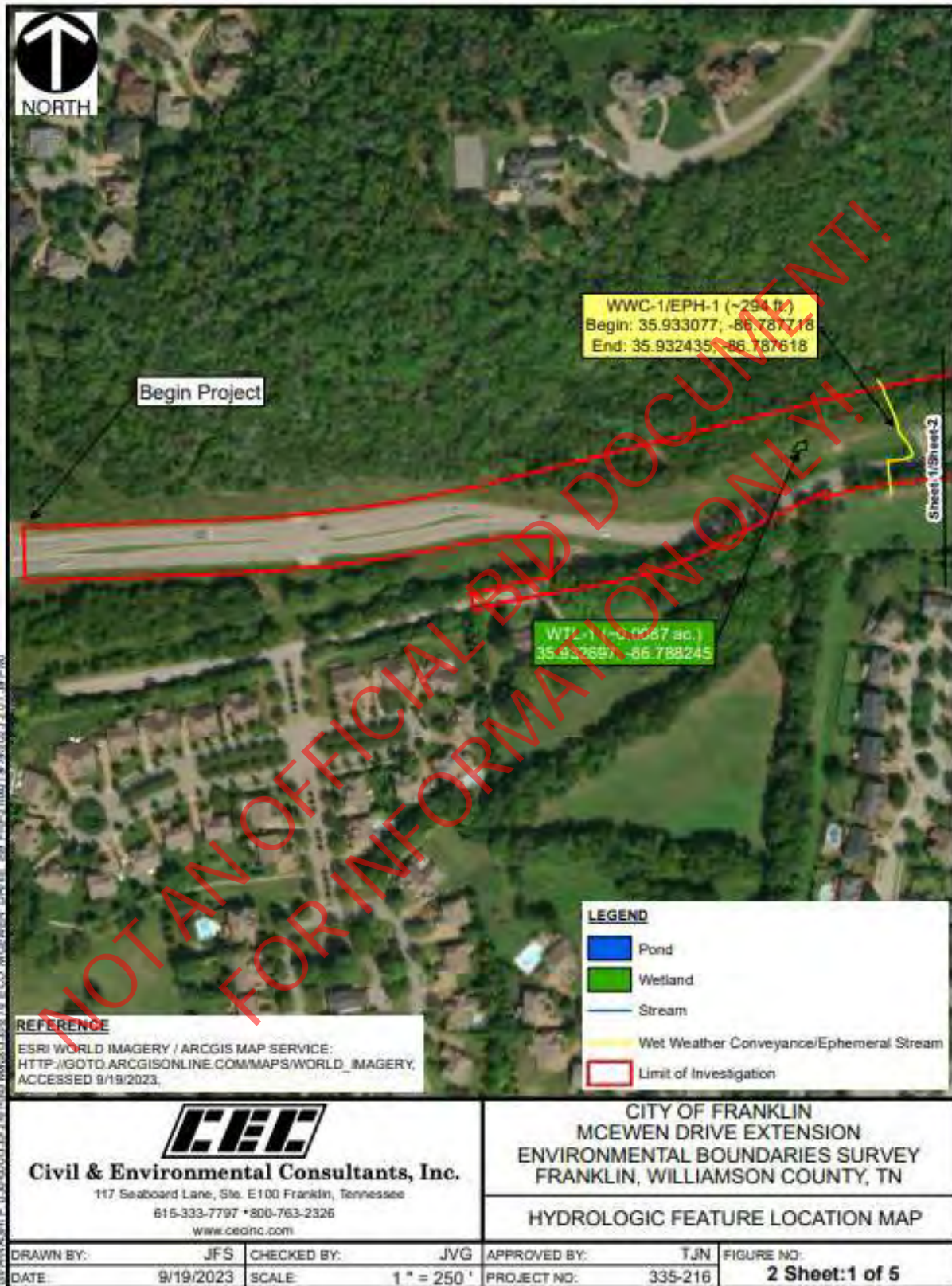
For more information, please reference Tennessee's Antidegradation Statement which is found in Chapter 0400-40-03 of the Rules of the Tennessee Department of Environment and Conservation.

PART IV

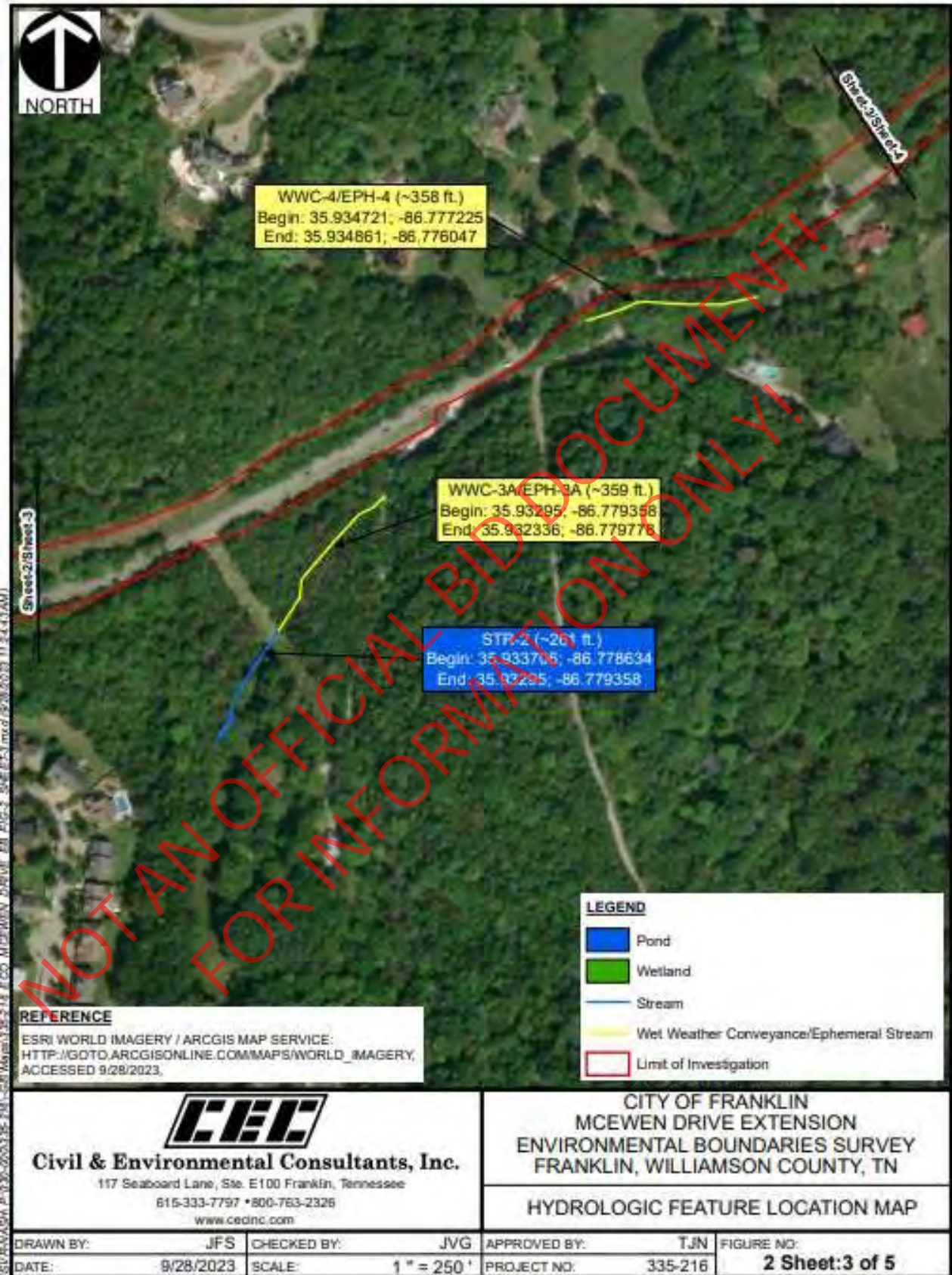
Maps



Aerial Photo









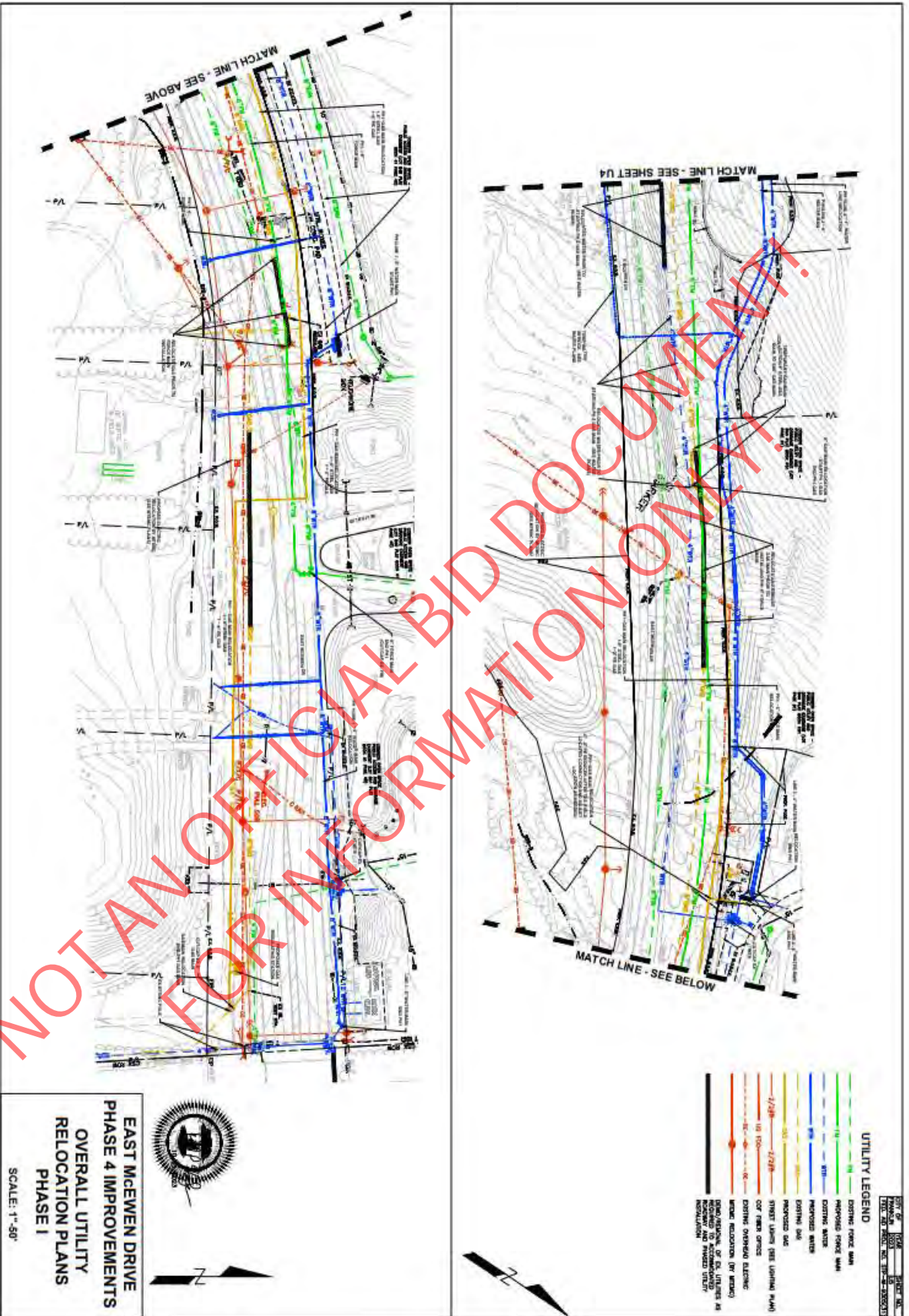
SQT

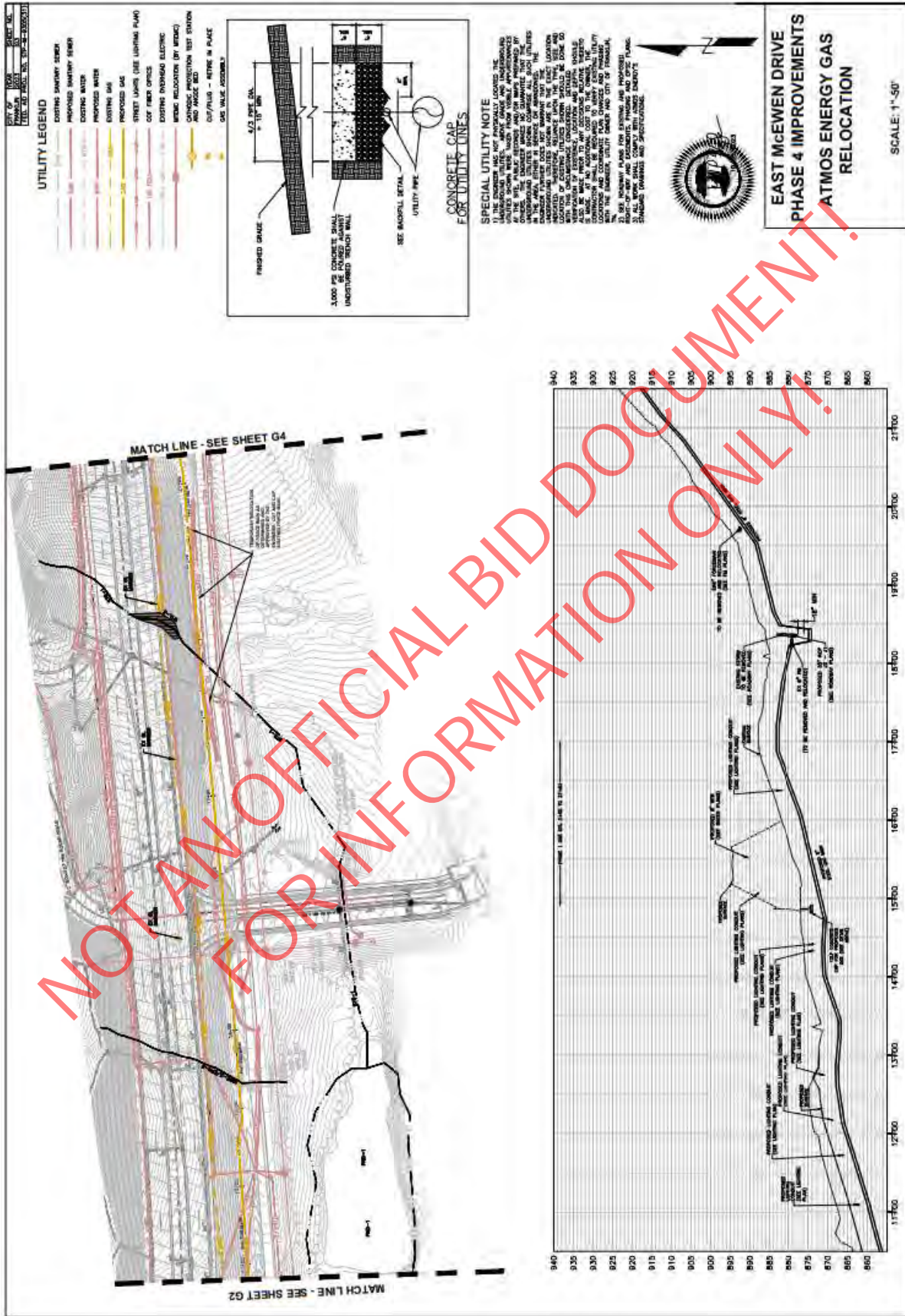
| Reach Information and Reference Standard Stratification | | | | | | | | | |
|---|--|--|----------------------------|--------------------------|-----------|---------------------|-----------------|-----------------------|------------|
| Reach ID: | STR-1 | Drainage Area (sqmi): | 0.04 | ETW/ONRW: | | No. | | Upstream Latitude: | 35.933587 |
| Existing Stream Type: | B | Existing Bed Material: | Silt/Clay | Data Collection Season: | | July - December | | Upstream Longitude: | -86.78187 |
| Reference Stream Type: | C | Existing Stream Slope (%): | 3 | Macro Collection Method: | | Unconfined Alluvial | | Downstream Latitude: | 35.933165 |
| Ecoregion: | 71h | Flow Type: | Perennial/Intermittent | Valley Type: | | Unconfined Alluvial | | Downstream Longitude: | -86.782181 |
| EXISTING CONDITION ASSESSMENT | | | | | | | | | |
| Functional Category | Function-Based Parameters | Measurement Method | Field Value | Index Value | Parameter | Category | Category | ECS | |
| Hydrology | Catchment Hydrology | Watershed Land Use Runoff Score | 0.76 | 0.80 | 0.80 | 0.78 | Functioning | | |
| | Reach Runoff | Stormwater Infiltration | 0.76 | 0.76 | 0.76 | | | | |
| Hydraulics | Floodplain Connectivity | Bank Height Ratio | 1.4 | 0.43 | 0.22 | 0.22 | Not Functioning | | |
| | Large Woody Debris | Entrenchment Ratio | 1.7 | 0.00 | | | | | |
| | | Large Woody Debris Index | # pieces | 2 | 0.16 | 0.16 | | | |
| | Lateral Migration | Erosion Rate (ft/yr) | Dominant BEH/NBS | 0.4 | 0.30 | 0.49 | | | |
| | | Percent Streambank Erosion (%) | H/L | | | | | | |
| | | Percent Armoring (%) | 18 | | 0.37 | | | | |
| | | Percent Average Diameter at Breast Height (DBH) (in) | 1.96 | | 0.21 | | | | |
| | Geomorphology | Riparian Vegetation | Right - Average DBH (in) | 3.75 | 0.40 | | | | |
| | | | Left - Buffer Width (feet) | 100 | 0.80 | | | | |
| | | Right - Buffer Width (feet) | 50 | 0.70 | | | | | |
| Left - Tree Density (#/acre) | | 320 | 0.72 | | | | | | |
| Right - Tree Density (#/acre) | | 480 | 0.50 | 0.38 | 0.37 | Functioning At Risk | | | |
| Left - Native Herbaceous Cover (%) | | 20 | 0.27 | | | | | | |
| Physicochemical | Bed Material Characterization | Right - Native Herbaceous Cover (%) | 10 | 0.13 | | | | | |
| | | Left - Native Shrub Cover (%) | 2 | 0.02 | | | | | |
| | Right - Native Shrub Cover (%) | 2 | 0.02 | | | | | | |
| | Size Class Pebble Count Analyzer (p-value) | | | | | | | | |
| | Bed Form Diversity | Pool Spacing Ratio | | 0.80 | | | | | |
| | | Pool Depth Ratio | | 0.80 | | | | | |
| | Plan Form | Percent Riffle (%) | | 0.80 | | 0.80 | 0.80 | Functioning | |
| | | Aggradation Ratio | | | | | | | |
| Sinuosity | | 1.03 | 0.00 | 0.00 | | | | | |
| E. Coli (Cfu/100 mL) | | | 0.80 | 0.80 | | | | | |
| Biology | Organic Enrichment | Percent Nutrient Tolerant Macroinvertebrates (%) | | 0.80 | | 0.80 | Functioning | | |
| | | Nitrate-Nitrite (mg/L) | | 0.80 | | | | | |
| | Phosphorus | Total Phosphorus (mg/L) | | 0.80 | 0.80 | | | | |
| Biology | Macroinvertebrates | Tennessee Macroinvertebrate Index | | 0.80 | 0.80 | 0.80 | Functioning | | |
| | | Percent Clingers (%) | | | | | | | |
| | Fish | Percent EPT - Cheumatopsyche (%) | | | | | | | |
| | | Percent Oligochaeta and Chironomidae (%) | | | | | | | |
| Fish | Catch per Unit Effort Score | Native Fish Score Index | | | 0.80 | 0.80 | Functioning | | |
| | | | | | | | | | |

Plans



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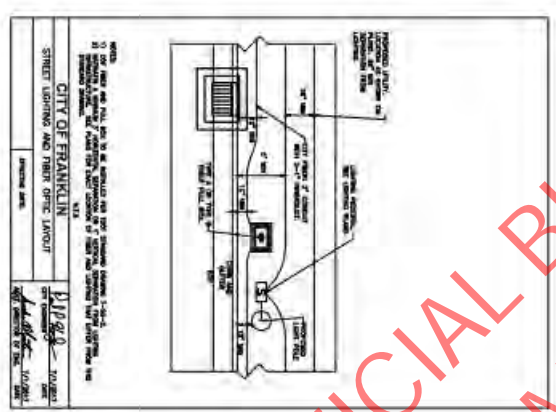
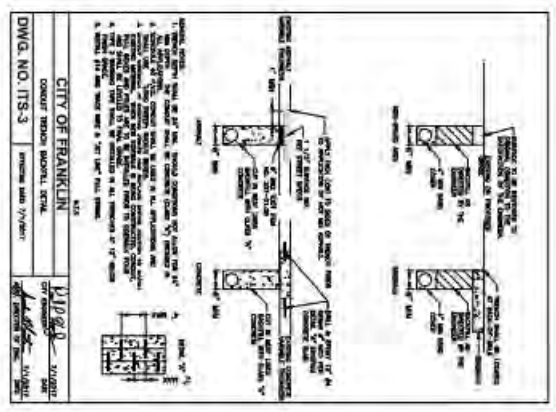


UTILITY LEGEND

| | |
|-----|-----------------------------------|
| --- | EXISTING SANITARY SEWER |
| --- | PROPOSED SANITARY SEWER |
| --- | EXISTING WATER |
| --- | PROPOSED WATER |
| --- | EXISTING GAS |
| --- | PROPOSED GAS |
| --- | STREET LIGHTS (SEE LIGHTING PLAN) |
| --- | COF FIBER OPTICS |
| --- | EXISTING OVERHEAD ELECTRIC |
| --- | UTILITY RELOCATION (BY OTHER) |

SPECIAL UTILITY NOTE

THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE CITY OF FRANKLIN AND THE UTILITY COMPANIES. THE CONTRACTOR SHALL MAINTAIN ALL UTILITIES AND SHALL BE RESPONSIBLE FOR REPAIRING ANY UTILITIES DAMAGED DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL UTILITIES AND SHALL BE RESPONSIBLE FOR REPAIRING ANY UTILITIES DAMAGED DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL UTILITIES AND SHALL BE RESPONSIBLE FOR REPAIRING ANY UTILITIES DAMAGED DURING CONSTRUCTION.



UTILITY LEGEND

| | |
|-----|-----------------------------------|
| --- | EXISTING SANITARY SEWER |
| --- | PROPOSED SANITARY SEWER |
| --- | EXISTING WATER |
| --- | PROPOSED WATER |
| --- | EXISTING GAS |
| --- | PROPOSED GAS |
| --- | STREET LIGHTS (SEE LIGHTING PLAN) |
| --- | COF FIBER OPTICS |
| --- | EXISTING OVERHEAD ELECTRIC |
| --- | UTILITY RELOCATION (BY OTHER) |

**EAST MCEWEN DRIVE
 PHASE 4 IMPROVEMENTS
 FIBER OPTIC PLAN
 CITY OF FRANKLIN**

SCALE: 1"=50'

CITY OF FRANKLIN
 DWG. NO. ITS-3

CITY OF FRANKLIN
 STREET LIGHTING AND TRAFFIC SIGNALS



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Division of Water Resources
Davy Crockett Tower
500 James Robertson Parkway, 9th Floor
Nashville, Tennessee 37243

May 28, 2024

Paul Holzen
City of Franklin
109 Third Avenue South
Franklin, TN 37067

Subject: §401 Water Quality Certification - Aquatic Resource Alteration Permit (ARAP)
NRS23.297 McEwen Drive
Williamson County

Dear Mr. Holzen:

The Division has reviewed and approved your Aquatic Resource Alteration Permit application for the replacement of the existing 150 linear foot culvert with 140-foot culvert, removal of existing 140-foot culvert and encapsulation of 280 linear feet of stream, 100 feet of grading, and permanent fill of 0.03 acres of wetland for the widening of McEwen Drive. Impacts to streams for utility line relocations via HDD are temporary. Stream impacts resulting in loss of 173.6 functional feet of stream are to be offset through purchase of 115.8 functional foot credits from Harpeth River Mitigation Bank, and the remaining 57.8 debits (with the appropriate multiplier applied) will be offset by 129.5 functional foot credits purchased from the Cumberland River Compact In-Lieu Fee in the Upper Cumberland River Service Area. Wetland impacts totaling 0.03 acres shall be offset at a 2:1 ratio for purchase of 0.06 credits from Harpeth River Mitigation Bank.

The enclosed Aquatic Resource Alteration Permit authorizes the work you proposed in your application. The work must be performed in conformance with the accepted plans and information submitted in support of application NRS23.297 and the limitations and conditions set forth in the enclosed permit.

The activity was reviewed, and the Division has reasonable assurance that the activity as proposed and in accordance with all permit conditions herein will not violate applicable water quality standards. Subject to conformance with the accepted plans, specifications, and other information submitted in support of the referenced application, the state of Tennessee hereby issues certification for the proposed activity. The enclosed permit authorizes the activity pursuant to *The Tennessee Water Quality Control Act of 1977* (T.C.A. §69-3-101 et seq.) and may serve as a §401 water quality certification (pursuant to 40 C.F.R. §121.2).

For federal agency employees and permit holders, the 401 Water Quality Certification Justifications and Citations related to the procedural requirements of §121.7(d) can be found at <https://www.tn.gov/environment/permit-permits/water-permits1/aquatic-resource-alteration-permit--arap-.html>. A paper copy of the certifications and justifications can also be obtained by contacting water.permits@tn.gov or calling (615) 532-0359.

The state of Tennessee may modify, suspend or revoke this authorization or seek modification or revocation should the state determine that the activity results in more than an insignificant violation of applicable water

SPP-9.45

quality standards or violation of the TWQCA. Failure to comply with permit terms may result in penalty in accordance with T.C.A. §69-3-115.

It is the responsibility of the permittee to read and understand all permit conditions before the project begins. If you need any additional information or clarification, please contact me at 615-804-2409 or by e-mail at Alicia.Douglas@tn.gov.

Sincerely,



Alicia Douglas
Natural Resources Unit

Enclosure

cc: Tim Jennette, Nashville EFO Tim.Jennette@tn.gov
USACE – Nashville District jennifer.a.watson2@usace.army.mil
Jose Garcia, CEC, Inc. jcarcia@cecinc.com

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Aquatic Resource Alteration Permit NRS23.297

Pursuant to the *Tennessee Water Quality Control Act of 1977* (T.C.A. § 69-3-101 et seq.) and supporting regulations, a permit is required to alter the properties of waters of the state. Also, pursuant to §401 of the *Clean Water Act* (33 U.S.C. 1341), an applicant for a Federal license or permit which may result in a discharge into the waters of the U.S., shall provide the federal licensing or permitting agency a certification from the State in which the discharge will originate.

Accordingly, the Division of Water Resources requires reasonable assurance that the activity will not violate provisions of the *Tennessee Water Quality Control Act of 1977* (T.C.A. §69-3-101 et seq.) or provisions of §§301, 302, 303, 306 or 307 of the *Clean Water Act*.

Subject to conformance with accepted plans, specifications, and other information submitted in support of the application, the state of Tennessee hereby authorizes pursuant to 33 U.S.C. 1341 certifies and T.C.A. §69-3-101 et seq., the activity described below:

PERMITTEE: City of Franklin
109 Third Avenue South
Franklin, TN 37067

AUTHORIZED WORK: Replacement of existing 150 linear foot culvert with 140-foot culvert, removal of existing 140-foot culvert and encapsulation of 280 linear feet of stream, 100 feet of grading, and permanent fill of 0.03 acres of wetland for the widening of McEwen Drive. Impacts to streams for utility line relocations via HDD are temporary. Stream impacts resulting in loss of 173.6 functional feet of stream are to be offset through purchase of 115.8 functional foot credits from Harpeth River Mitigation Bank, and the remaining 57.8 debits (with the appropriate multiplier applied) will be offset by 129.5 functional foot credits purchased from the Cumberland River Compact In-Lieu Fee in the Upper Cumberland River Service Area. Wetland impacts totaling 0.03 acres shall be offset at a 2:1 ratio for purchase of 0.06 credits from Harpeth River Mitigation Bank.

LOCATION: McEwen Drive from east of roundabout at Cool Springs Boulevard/Oxford Glen to State Route 252 (Wilson Pike), Williamson County
South Prong Spencer Creek, Mayes Creek, and Unnamed Wetlands
Latitude 35.932882, Longitude - 86.783419

EFFECTIVE DATE: May 28, 2024
EXPIRATION DATE: May 27, 2029

for April Grippo
Acting Director, Division of Water Resources

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PART I

Authorized Alterations

The authorized work is removal of 290 linear feet of existing pipe, encapsulation of 420 linear feet of stream, 100 linear feet of grading, and permanent fill of 0.03 acres of wetland for the widening of McEwen Drive. Impacts to STR-1 and STR-3 for utility line relocations of an 8-inch gas line, 6-inch force main, fiber optics and street signal lines, and 8-inch gas line will be temporary due to horizontal directional drill (HDD) installation.

STR-1 (South Prong Spencer Creek) Crossing 1

Latitude: 35.933611 Longitude: -86.781954

- a. Existing 140-foot 36-inch corrugated metal pipe to be removed
- b. Install 280 feet of concrete pipes with wingwalls
 - i. 110-foot 18-inch culvert
 - ii. 170-foot 30-inch culvert
 - iii. Inlet control structure (4-foot by 4-foot concrete box with one 30-inch inlet and one 12-inch inlet)
- c. 100 linear feet of grading to direct flow toward culvert
- d. 8-inch water line, 6-inch force main, fiber optic, and street signal lines crossing via HDD
- e. Mitigation required for -173.6 functional feet

STR-1 (South Prong Spencer Creek) Crossing 2

Latitude: 35.93255 Longitude: -86.783455

- a. Removal of existing 150 feet of 30-inch pipe
- b. Install 140 feet of new culvert including wingwalls
 - i. 60 feet of 30-inch pipe
 - ii. 80 feet of 36-inch pipe
- c. No mitigation required

WTL-1

Latitude: 35.93269 Longitude: -86.788245

- a. Permanent fill of 0.01 acres
- b. Mitigation purchased for 0.02 credits at Harpeth River Mitigation Bank

WTL-3

Latitude: 35.93318 Longitude: -86.782216

- a. Permanent fill of 0.02 acres
- b. Mitigation purchased for 0.04 credits at Harpeth River Mitigation Bank

STR-3 (Mayes Creek)

Latitude: 35.936974 Longitude: -86.77254

- a. 8-inch gas line installation via HDD
- b. Impacts are temporary; no mitigation required

Special Conditions

1. The permittee shall submit a post construction inspection report that reflect the “as-constructed” condition of all features authorized or required by this permit:
 - a. The post construction inspection report shall include sufficient information, including photographic documentation, to demonstrate conformance with the approved plans, specifications, and special conditions of this permit.
 - b. The post construction inspection report shall be submitted **within 60 days** of completion of work.
 - c. The report may be submitted via email to water.permits@tn.gov or to the following address:

Division of Water Resources
Natural Resources Unit
Davy Crockett Tower
500 James Robertson Parkway, 9th Floor
Nashville, Tennessee 37243
2. The work shall be accomplished in conformance with the accepted plans, specifications, data, and other information submitted in support of application NRS23.297 and the limitations, requirements, and conditions set forth herein.
3. All debris and waste material will be cleaned up or removed from below the ordinary high-water level.
4. The bottom of culverts shall be constructed below the stream bed elevation, in a manner that allows natural substrate to reestablish.
5. Culverts shall not be constructed in a manner that would permanently disrupt the movement of fish and aquatic life.
6. All riprap areas shall be placed as to mimic the existing/proposed contours of the stream channel. Riprap shall be countersunk and placed at the grade with the existing stream substrate.
7. Voids within the riprap shall be filled with suitable substrate to prevent loss of stream within the riprap areas. Do not over-excavate for placement of riprap. Grouting of riprap is prohibited except where specifically authorized.
8. Construction and removal of bridges and culverts shall be in the dry to the maximum extent practicable, by diverting flow utilizing cofferdams, berms, and/or temporary channels or pipes. Temporary diversion channels shall be protected by non-erodible material and lines to the expected high-water level.
9. Any streams or wetlands outside of the permitted impact areas shall be clearly marked so that all work performed by the contractor is solely within the permitted impact area.
10. Only earthen materials consisting of soils, stones or rocks, or a mixture or combination of such materials, which are excavated or extracted from a borrow pit, earthen bank, gravel bank, mine or quarry shall be “Acceptable Fill.” Acceptable Fill shall not contain any sewage, industrial wastes, additives, or materials such as refuse, rubble, muck, metal, glass, concrete pieces, bricks, or asphalt paving materials, wood or other wastes as defined in the Tennessee Water Quality Control Act of 1977. “Other wastes” means any and all other substances or forms of energy, with the exception of sewage and industrial wastes, including, but not limited to, decayed wood, sand, garbage, silt,

municipal refuse, sawdust, shavings, bark, lime, ashes, offal, oil, hazardous materials, tar, sludge, or other petroleum byproducts, radioactive material, chemicals, heated substances, dredged spoil, solid waste, incinerator residue, sewage sludge, munitions, biological materials, wrecked and discarded equipment, rock, and cellar dirt. T.C.A. § 69-3-103(23).

11. Temporary impacts to wetlands shall be mitigated by the removal and stockpiling of the first 12 inches of topsoil, prior to construction. Temporary wetland crossings or haul roads shall utilize timber matting. Gravel, riprap, or other rock is not approved for construction of temporary crossings or haul roads across wetlands. Upon completion of construction activities, all temporary wetland impact areas are to be restored to pre-construction contours, and the stockpiled topsoil spread to restore these areas to pre-construction elevation. Other side-cast material shall not be placed within the temporary impact locations. Permanent vegetative stabilization using native species of all disturbed areas in or near the wetland must be initiated within 14 days of project completion (see also *Landscaping with Natives* at tneppc.org). Non-native, non-invasive annuals may be used as cover crops until native species can be established.
12. The use of monofilament-type erosion control netting or blanket is prohibited within 30 feet of streams and wetlands. To minimize wildlife entanglement and plastic debris pollution, temporary erosion and sediment control products that either do not contain netting, or that contain netting manufactured from 100 percent biodegradable non-plastic materials such as jute, sisal, or coir fiber shall be specified. Netting used in these products should have a loose-weave wildlife-safe design with movable joints between the horizontal and vertical twines, allowing the twines to move independently. Degradable, photodegradable, UVdegradable, oxo-degradable, or oxo-biodegradable plastic netting (including polypropylene, nylon, polyethylene, and polyester) are not acceptable alternatives.
13. Streambeds shall not be used as transportation routes for construction equipment. Temporary stream crossings shall be limited to one point in the construction area and EPSC measures shall be utilized where stream banks are disturbed.
14. Sediment shall be prevented from entering waters of the state. Erosion and sediment controls measures shall be designed according to the size and slope of disturbed or drainage areas to detain runoff and trap sediment and shall be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. Information on erosion and sediment control measures can be found in the department's Erosion and Sediment Control Handbook (<http://www.tnepsc.org/>).
15. If any state or federally listed aquatic species are discovered during construction, TDEC and TWRA shall be notified, and the permittee shall await and follow instructions on how to proceed.
16. All utility line relocations must adhere to the conditions set forth in the *General Permit for Utility Line Crossings*.

General Conditions

1. The amount of fill, stream channel and bank modifications, or other impacts associated with the activity shall be limited to the minimum necessary to accomplish the project purpose. The permittee shall utilize the least impactful practicable method of construction.
2. It is the responsibility of the permittee to convey all terms and conditions of this permit to all contractors. A copy of this permit, approved plans, and any other documentation pertinent to the

activities authorized by this permit shall be maintained on site at all times during periods of construction activity.

3. The work shall be accomplished in conformance with the accepted plans, specifications, data, and other information submitted in support of the application and the limitations, requirements and conditions set forth herein.
4. Clearing, grubbing, and other disturbance to riparian vegetation shall be kept at the minimum necessary for slope construction and equipment operations. Unnecessary native riparian vegetation removal, including tree removal, is prohibited. Native riparian vegetation must be reestablished in all areas of disturbance outside of any permanent authorized structures after work is completed. Coverage under this permit does not serve to waive any local riparian buffer protection requirement, and permittees are responsible for obtaining any necessary local approval.
5. Temporary or permanent soil stabilization shall be accomplished within 14 days after final grading or other earth work. Permanent stabilization with perennial vegetation or other permanently stable, non-eroding surface shall replace any temporary measures as soon as practicable. Vegetative species must be on approved native species planting list, (*Landscaping with Native Plants*; https://www.tnipc.org/wp-content/uploads/2017/10/landscaping_2016_forweb.pdf).
6. Work shall not commence until the permittee has received the federal §404 permit from the U. S. Army Corps of Engineers, a §26a permit from the Tennessee Valley Authority or authorization under a Tennessee NPDES Storm Water Construction Permit where necessary. The permittee is responsible for obtaining these permits.
7. Best Management Practices (BMPs) shall be stringently implemented throughout the construction period to prevent sediments, oils, or other project-related pollutants from being discharged.
8. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the state. Any equipment to be used in-stream shall be free of noticeable leaks of fluids; e.g., hydraulic, transmission, crankcase, and engine coolant fluids and oils. All spills must be reported to the appropriate emergency management agency, and measures shall be taken immediately to prevent the pollution of waters of the state, including groundwater, should a spill occur.
9. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in Rule 0400-4-3-.03 of the Rules of the Tennessee Department of Environment and Conservation. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impair the usefulness of waters of the state for any of the uses designated by Rule 0400-4-4. These uses include fish and aquatic life (including trout streams and naturally reproducing trout streams), livestock watering and wildlife, recreation, irrigation, industrial water supply, domestic water supply, and navigation.
10. Work shall not commence until the permittee has obtained all necessary authorizations pursuant to applicable provisions of section 10 of The Rivers and Harbors Act of 1899, section 404 of the Clean Water Act, section 26a of The Tennessee Valley Authority Act, section 402 of the Clean Water Act (including, but not limited to, an NPDES permit for construction stormwater), or any other federal, state, or local laws.
11. Backfill activities must be accomplished in the least impactful manner possible that stabilizes the streambed and banks to prevent erosion. The completed activities may not disrupt or impound stream flow.

12. Adverse impact to formally listed state or federal threatened or endangered species or their critical habitat is prohibited.
13. This permit does not authorize adverse impacts to cultural, historical, or archeological features or sites.

PART II

Monitoring Requirements and Procedures

No monitoring is required beyond As-Constructed Report (Special Condition 1).

Mitigation

1. Compensatory mitigation activities shall be carried out utilizing best professional efforts to comply with approved plans and the conditions of this permit. Mitigation activities shall be deemed complete when the Division determines that the permitted impact on aquatic resources has been adequately addressed through successful achievement of the compensatory mitigation activities, and a no further action letter has been provided to the permittee.
2. The goal of this permit and its mitigation success criteria is to ensure there is no net loss of resource value due to the impacts of the permitted activity. In accordance with adaptive management, the Division incorporates safety factors into compensatory mitigation requirements. Therefore, once successful mitigation has been achieved the Division reserves the right to revise performance standards and mitigation criteria to account for any changes documented in the compensatory mitigation project. While final mitigation activities may not result in a net loss of resource value, they may be revised to reflect approved changes from the original mitigation proposal and the success criteria in the permit. Upon acceptance of closure of the project, the Division shall record any such revisions of the mitigation plan or success criteria through formal modification of the permit conditions with public notice.
3. Wetland impacts totaling 0.03 acres shall be offset through purchase at a 2:1 ratio from Harpeth River Mitigation Bank for a total of 0.06 credits. Please be advised that the wetland impacts associated with this mitigation are not authorized to proceed until the specified mitigation credits have been purchased. Payment must be made within 60 days of invoice. **Proof of credit purchase shall be submitted to this office within 30 days of payment.** With the purchase of the wetland mitigation credits, legal responsibility for completion of this wetland mitigation is legally transferred to the Harpeth River Mitigation Bank.
4. Stream impact debits totaling 173.6 functional feet shall be offset through purchase of 115.8 ff credits from Harpeth River Mitigation Bank. The remaining 57.8 ff credits shall be purchased through Cumberland River Compact's In-Lieu Fee Program in the Upper Cumberland Service Area at a 2:1 ratio for proximity factor and 12% temporal loss multiplier for a total of 129.5 ff credits. Please be advised that the stream impacts associated with this mitigation are not authorized to proceed until the specified mitigation credits have been purchased. Payment must be made within 60 days of invoice. **Proof of credit purchase shall be submitted to this office within 30 days of payment.** With the purchase of the stream mitigation credits, legal responsibility for completion of this wetland mitigation is legally transferred to the Harpeth River Mitigation Bank and Cumberland River Compact.

PART III

Duty to Reapply

Permittee is not authorized to discharge or conduct an activity that alters the properties of waters of the state after the expiration date of this permit. In order to receive authorization to discharge or to conduct an activity that alters the properties of waters of the state beyond the expiration date, the permittee shall submit such information and forms as are required to the director of the Division of Water Resources. Such applications must be properly signed and certified.

If any portion of the permitted activities, including the authorized impacts to water resources, compensatory mitigation requirements, or post-project monitoring is not completed before the expiration date of this permit **the permittee must apply for permit extension or re-issuance**. The permittee shall submit such information and forms as are required to the director of the Division of Water Resources at least ninety (90) days prior to its expiration date. Such applications must be properly signed and certified.

Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

Water Rights

The waters of Tennessee are the property of the state and are held in public trust for the use of the people of the state. This permit does not grant or convey any prescriptive rights, appropriation, or allocation of water, nor does it authorize any injury to the riparian rights of others.

Other Permits

This permit does not preclude requirements of other federal, state, or local laws. This permit also serves as a state of Tennessee aquatic resource alteration permit (ARAP) pursuant to the *Tennessee Water Quality Control Act of 1977* (T.C.A. §69-3-101 et seq.).

Other Information

If the permittee becomes aware that he/she failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the director, then he/she shall promptly submit such facts or information.

Changes Affecting the Permit

Transfer/Change of Ownership

1. This permit may be transferred to another party, provided there are no activity or project modifications, no pending enforcement actions, or any other changes which might affect the permit conditions contained in the permit, by the permittee if:
 - a. The permittee notifies the Director of the proposed transfer at least 30 days in advance of the proposed transfer date;

- b. The notice includes a written agreement between the existing and new permittees containing a specified date for transfer of permit responsibility, coverage, and contractual liability between them; and
 - c. The Director does not notify the current permittee and the new permittee, within 30 days, of his or her intent to modify, revoke, reissue, or terminate the permit, or require that a new application be filed rather than agreeing to the transfer of the permit.
2. The permittee must provide the following information to the division in their formal notice of intent to transfer ownership:
- a. the permit number of the subject permit;
 - b. the effective date of the proposed transfer;
 - c. the name and address of the transferor;
 - d. the name and address of the transferee;
 - e. the names of the responsible parties for both the transferor and transferee;
 - f. a statement that the transferee assumes responsibility for the subject permit;
 - g. a statement that the transferor relinquishes responsibility for the subject permit;
 - h. the signatures of the responsible parties for both the transferor and transferee, and;
 - i. a statement regarding any proposed modifications to the permitted activities or project, its operations, or any other changes which might affect the permit conditions contained in the permit.

Change of Mailing Address

The permittee shall promptly provide to the director written notice of any change of mailing address. In the absence of such notice the original address of the permittee will be assumed to be correct.

Noncompliance

Effect of Noncompliance

All discharges shall be consistent with the terms and conditions of this permit. Any permit noncompliance constitutes a violation of applicable state and federal laws and is grounds for enforcement action, permit termination, permit modification, or denial of permit reissuance.

Reporting of Noncompliance

24-Hour Reporting

1. In the case of any noncompliance which could cause a threat to public drinking supplies, or any other discharge which could constitute a threat to human health or the environment, the required notice of non-compliance shall be provided to the Division of Water Resources in the appropriate Environmental Field Office within 24-hours from the time the permittee becomes aware of the circumstances. (The Environmental Field Office should be contacted for names and phone numbers of environmental response personnel).

2. A written submission must be provided within five (5) days of the time the permittee becomes aware of the circumstances unless this requirement is waived by the director on a case-by-case basis. The permittee shall provide the director with the following information:
 - a. A description of the discharge and cause of noncompliance;
 - b. The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and
 - c. The steps being taken to reduce, eliminate, and prevent recurrence of the non-complying discharge.

Scheduled Reporting

For instances of noncompliance which are not reported under subparagraph a. above, the permittee shall report the noncompliance by contacting the permit coordinator and provide all information concerning the steps taken or planned to reduce, eliminate, and prevent recurrence of the violation and the anticipated time the violation is expected to continue.

Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the waters of Tennessee resulting from noncompliance with this permit, including but not limited to, accelerated or additional monitoring as necessary to determine the nature and impact of the noncompliance. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

Liabilities

Civil and Criminal Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Notwithstanding this permit, the permittee shall remain liable for any damages sustained by the state of Tennessee, including but not limited to fish kills and losses of aquatic life and/or wildlife, as a result of the discharge of pollutants to any surface or subsurface waters. Additionally, notwithstanding this Permit, it shall be the responsibility of the permittee to conduct its discharge activities in a manner such that public or private nuisances or health hazards will not be created.

Liability under State Law

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or the *Federal Water Pollution Control Act*, as amended.

Reopener:

This permit may be modified, suspended, or revoked for cause, including:

1. Violation of any of the terms or conditions of this permit or of T.C.A § 69-3-101 et. seq.;
2. Obtaining the permit by misrepresentation or failing to disclose fully all relevant facts;
3. A change in any condition that requires either a temporary or permanent change in the conditions of this permit.

Appeal:

An appeal of this action may be made as provided in T.C.A. §69-3-105(i) and Rule 0400-40-07-.04(9) by submitting a petition for appeal:

1. The petition must be filed within THIRTY (30) DAYS after public notice of the issuance of the permit.
2. The petition must specify the provisions subject to appeal and the basis for the appeal.
3. The petition should be addressed to the technical secretary of the Tennessee Board of Water Quality, Oil and Gas at the following address: Ms. April Grippo, Acting Director, Division of Water Resources, Davy Crockett Tower, 500 James Robertson Parkway, 9th Floor, Nashville, Tennessee 37243, or you may submit such petition electronically to TDEC.Appeals@tn.gov. Any hearing would be in accordance with T.C.A. §§69-3-110 and 4-5-301 et seq.

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FOR INFORMATION ONLY!

Permit Rationale

City of Franklin
 McEwen Drive
 Franklin, Williamson County, Tennessee

May 2024

Permit Writer: Alicia Douglas

Summary

**City of Franklin
 109 Third Avenue South
 Franklin, TN 37067
 Contact: Paul Holzen 615-290-2717**

**Location: McEwen Drive from East of roundabout at Cool Springs Boulevard/Oxford Glen to
 State Route 252 (Wilson Pike), Williamson County
 UT South Prong Spencer Creek, UT to Mayes Creek, and Unnamed Wetlands**

Latitude 35.932882, Longitude - 86.783419

Authorized Activity: Replacement of existing 150 linear foot culvert with 140-foot culvert, removal of existing 140-foot culvert and encapsulation of 280 linear feet of stream, 100 feet of grading, and permanent fill of 0.03 acres of wetland for the widening of McEwen Drive. Impacts to streams for utility line relocations via HDD are temporary. Stream impacts resulting in loss of 173.6 functional feet of stream are to be offset through purchase of 115.8 ff credits from Harpeth River Mitigation Bank and 129.5 ff credits from Cumberland River Compact In-Lieu Fee in the Upper Cumberland River Service Area.

Permit Status

| | |
|-------------------------|---------------------|
| Permit Type: | ARAP |
| Classification: | Major |
| Issuance Date: | May 28, 2024 |
| Expiration Date: | May 27, 2029 |
| Effective Date: | May 28, 2024 |

Status of Affected Waters

Streams

STR-1: Waterbody Segment ID : TN05130204016 0210 Name : South Prong Spencer Creek

| Designated Use | Use Support | Causes | Sources |
|-------------------------------|------------------|--------|---------|
| livestock watering & wildlife | fully supporting | | |
| irrigation | fully supporting | | |
| recreation | not assessed | | |

| | | | |
|--------------------------------|-----------------------|--|---|
| fish and aquatic life | not supporting | alteration in streamside or littoral vegetative covers; sedimentation/siltation | Site clearance (land development or redevelopment) |
| domestic water supply | not assessed | | |
| industrial water supply | not assessed | | |

Assessment Date: June 3, 2019

The affected waters have Unavailable Parameters for habitat alteration.
 The affected waters are not known Exceptional Tennessee Waters.

STR-3: Waterbody Segment ID : TN05130204016 0600 Name : Mayes Creek

| Designated Use | Use Support | Causes | Sources |
|--|-------------------------|---------------|----------------|
| livestock watering & wildlife | fully supporting | | |
| irrigation | fully supporting | | |
| recreation | fully supporting | | |
| fish and aquatic life | fully supporting | | |
| domestic water supply | not assessed | | |
| industrial water supply | not assessed | | |

Assessment Date: June 5, 2019

The affected waters have Available Parameters for habitat alteration.
 The affected waters are not known Exceptional Tennessee Waters.

Wetlands

WTL-1 and WTL-3

The two wetlands to be impacted were assessed using the TRAM and scores were indicative of low resource value.

The affected waters have Available Parameters for habitat alteration.
 The affected waters are not known Exceptional Tennessee Waters.

Authorized Alterations

The authorized work is encapsulation of 420 linear feet of stream and permanent fill of 0.03 acres of wetland for the widening of McEwen Drive. Impacts for utility line relocation for an 8-inch gas line, 6-inch force main, and fiber optics and street signal lines to STR-1 and 8-inch gas line impacts to STR-3 will be temporary due to HDD installation.

Alternatives Analysis and Selection of Least Impactful Practicable Alternative

The applicant has submitted an analysis of potentially practicable alternatives to the authorized activity. The overall stated purpose and need for the proposed project is to increase the capacity of McEwen Drive to handle the increase in traffic in this area and provide for a safer route for the community. The applicant has provided the following discussion analyzing alternatives:

- *“Northern alignment, alternative #1): The No Permit Action alternative proposes a new alignment roughly parallel to McEwen Drive to the north and consist no impact to aquatic resources. This alternative would require the purchase of ROW for the entire project length as well as impact residential homes. The alignment would improve roadway operation and safety and improve congestion. This alternative would require large ROW acquisitions, have an inefficient construction timeline due to the construction on steeper slopes, and result in a significant increase in the overall cost of the project.*
- *On-site alternative: The on-site alternative considered included adding additional lanes north of the existing two lane roadway and straightening the alignment. (City of Franklin’s preferred alternative) This alternative would allow for the widening of McEwen drive to the immediate north where a majority of the land is existing right-of-way. This alternative would improve roadway operation, safety, and ease congestion.*
- *Southern Alignment alternative #2: This alternative proposes a new alignment roughly parallel to McEwen Drive to the south. The new alignment will consist of four 12-foot travel lanes with a median and shoulders and roadside ditches. This alternative would impact more hydrologic features and require large quantities of fill. This alternative would require the purchase of ROW for the entire project length along the southern boundary as well as impact residential homes and require large quantities of fill due to the steep slope on sections of the southern boundary. It would improve roadway operation, safety, and ease congestion, but would require impact to approximately 2,000 linear feet of stream, and approximately 0.85 acres of pond and wetlands. This alternative would require large ROW acquisitions, greater impacts to hydrologic features and result in a significant increase in the overall cost of the project.*

The on-site alternative represents the least environmentally damaging practicable alternative for the reasons identified above and is the preferred alternative because of roadway operation and safety, ease of congestion, cost, construction timeline, and constructability issues.”

Based on its review of available information, the Division has made the determination that the least environmentally damaging practicable alternative is the preferred alternative.

Existing Conditions/Loss of Resource Values

The applicant has provided the following description of existing conditions and loss of resource values:

“STR-1 (Crossing 1) is an intermittent headwater stream with no fish present. STR-1 originates on the north side of McEwen Drive and flows south, southwest. As flow from the stream moves west, it enters a second culvert under Players Mill Road and then discharges into a detention pond. At high flow events, flow from the pond will enter a large dry detention pond located along the southern boundary of McEwen

Drive and outside of Right-of-Way. The stream averages three to four feet wide within Right-of-Way and is about an inch deep and originates at a culver on the adjacent property to the north. The feature has historically experienced degradation by residential development to the north and south. There is currently an angled, 140-linear foot, 36-inch corrugated metal pipe under McEwen Drive that conveys flow to a detention pond to the southwest. The proposed impacts will consist of replacing the existing culvert with a linear, 280-foot concrete pipe, which includes wing walls. The new culvert will be constructed in two segments, a 110-foot, 18-inch culvert and 170-foot of 30- inch culvert. The difference in sizes is to manage peak storm events. The culvert, on the inlet side, will have an inlet control structure that would allow base flow conditions to continue unimpeded to the downstream reach portions of the stream. The structure would create temporary in-line detention on the upstream side during high flow events. The inlet structure is a 4-foot by 4- foot concrete box with two inlet structures, a 30-inch and 12-inch inlets. Approximately 100- linear feet of the upper reach of the channel will be graded to direct flow toward the proposed culvert. The need for the proposed impact is to provide safe ingress and egress, via a west bound slip lane for the residential development to the north.

WTL-1 is a low resource value (TRAM score 32.69) emergent wetland located within a constructed stormwater channel for McEwen Drive. The wetland is approximately 0.01 acres in size and likely developed due to inadequate grading.

WTL-3 is a low resource value (TRAM score 27.30) emergent wetland approximately 0.03 acres in size and is located in-line with STR-1. The feature is present due to a rock check dam that was likely installed by the development to the north and never removed.”

| Project ID/ Permit Number: 0 | | Users Input Values | | Users select values from a pull-down menu | | | | |
|--|-----------------------|--------------------|------------------------------|---|--------------------|-------------------------|--------------------------------|---------------------------------|
| DEBIT TOOL TABLE | | | | | | | | |
| Stream ID by Reach | Impact Description | Option | Existing Stream Length | Existing Condition Score | Proposed Length | Impact Severity Tier | Proposed Condition Score | Change in Functional Feet |
| STR-1 | Encapsulate | | 280 | 0.59 | 280 | Tier 5 | 0.07 | -145.6 |
| STR-1 | Grading | | 100 | 0.59 | 100 | Tier 3 | 0.31 | -28.0 |
| 0 | 0 | | | | | Tier 0 | 0.00 | 0.0 |
| 0 | 0 | | | | | | | |
| 0 | 0 | | | | | | | |
| 0 | 0 | | | | | | | |
| 0 | 0 | | | | | | | |
| 0 | 0 | | | | | | | |
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| 0 | 0 | | | | | | | |
| 0 | 0 | | | | | | | |
| 0 | 0 | | | | | | | |
| 0 | 0 | | | | | | | |
| 0 | 0 | | | | | | | |
| Total Functional Loss (Debits in FF): | | | | | | | | -173.6 |

Mitigation Required

Stream impact debits totaling 173.6 functional feet shall be offset through purchase of 115.8 ff credits from Harpeth River Mitigation Bank, which is considered in-system mitigation. The remaining 57.8 ff credits shall be purchased through Cumberland River Compact's In-Lieu Fee Program in the Upper Cumberland Service Area at a 2:1 ratio for proximity factor and 12% temporal loss multiplier for a total of 129.5 ff credits.

Wetland impacts totaling 0.03 acres shall be offset through purchase at a 2:1 ratio from Harpeth River Mitigation Bank for a total of 0.06 credits.

The Division has made the determination that the mitigation will produce sufficient resource value offsets to compensate for the resource value loss associated with the project impacts.

Social and Economic Justification

The applicant has provided the following social and economic justification for the proposed impacts to jurisdictional streams and wetlands:

Traffic has increased significantly and is anticipated to continue along this section of McEwen drive. Alternative 1 and 2 would meet the overall goal of meeting the operation and safety criteria of the City, however, both alternatives would require the purchase of ROW for a majority of the project length. In addition, relocation to the north would require a large quantity of cut and relocation to the south would require a large quantity of fill and significant impact to hydrologic features. Both alternatives would increase cost and extend the timeline. On-Site Alternative: Under this alternative, the City would be able to widen and realign McEwen drive to sustain the rapid growth and keep up with the traffic demand in an efficient and cost-effective timeline. The expansion will lead to improved traffic flow and reduced congestions and traffic accidents, ultimately enhancing the daily commute for residents in east Franklin.

Antidegradation

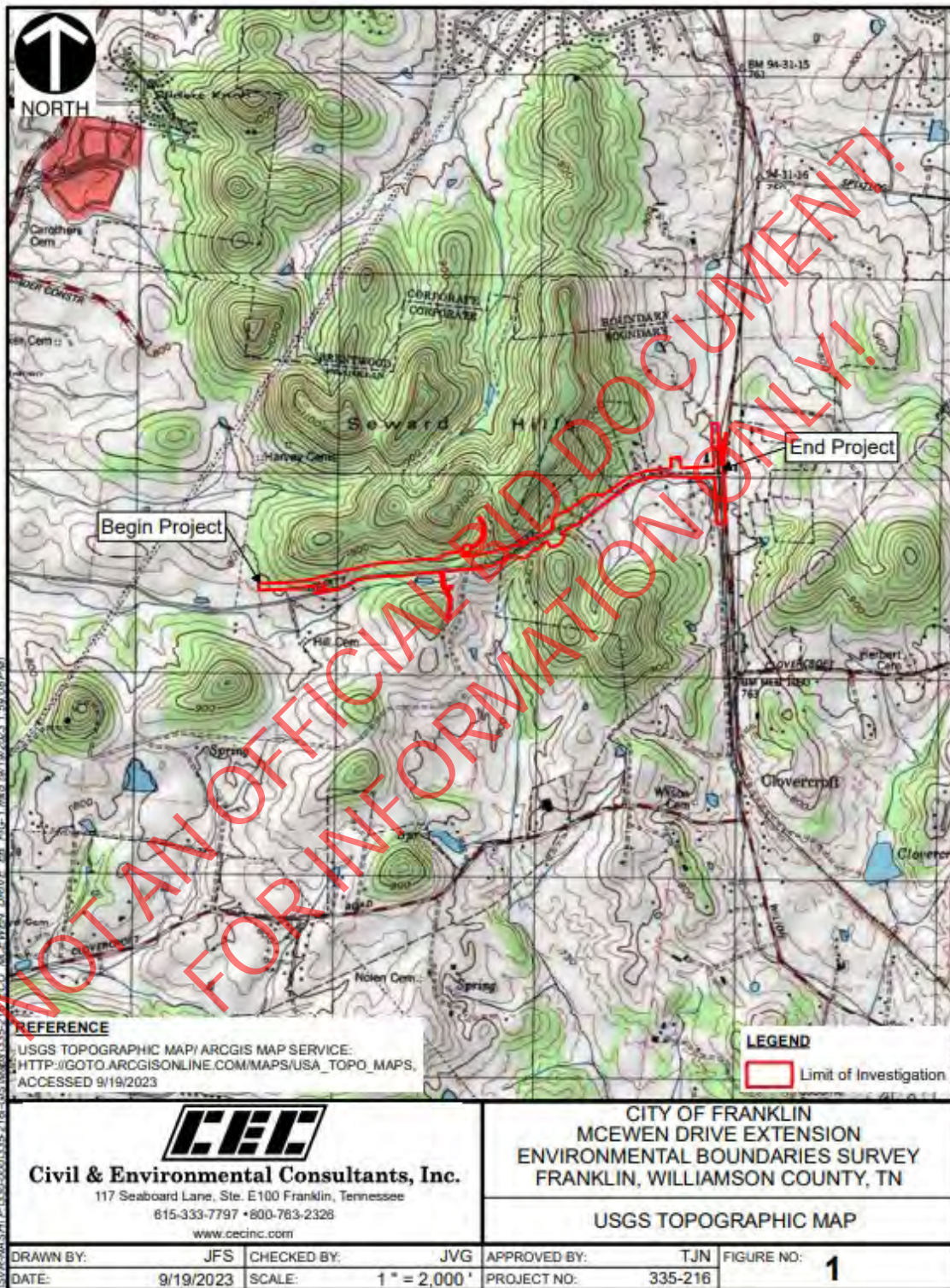
For impacts to jurisdictional streams, in accordance with the Tennessee Antidegradation Statement (Rule 0400-40-03-.06), the Division has made the determination that the activities will result in no significant degradation in a waterbody with unavailable parameters for habitat because the applicant proposes mitigation to offset any appreciable permanent loss of resource values.

For impacts to jurisdictional wetlands, in accordance with the Tennessee Antidegradation Statement (Rule 0400-40-03-.06), the Division has made the determination that the activities will result in *de minimis* degradation of waters with available parameters because the applicant proposes to provide in-system mitigation to offset any appreciable permanent loss of resource values.

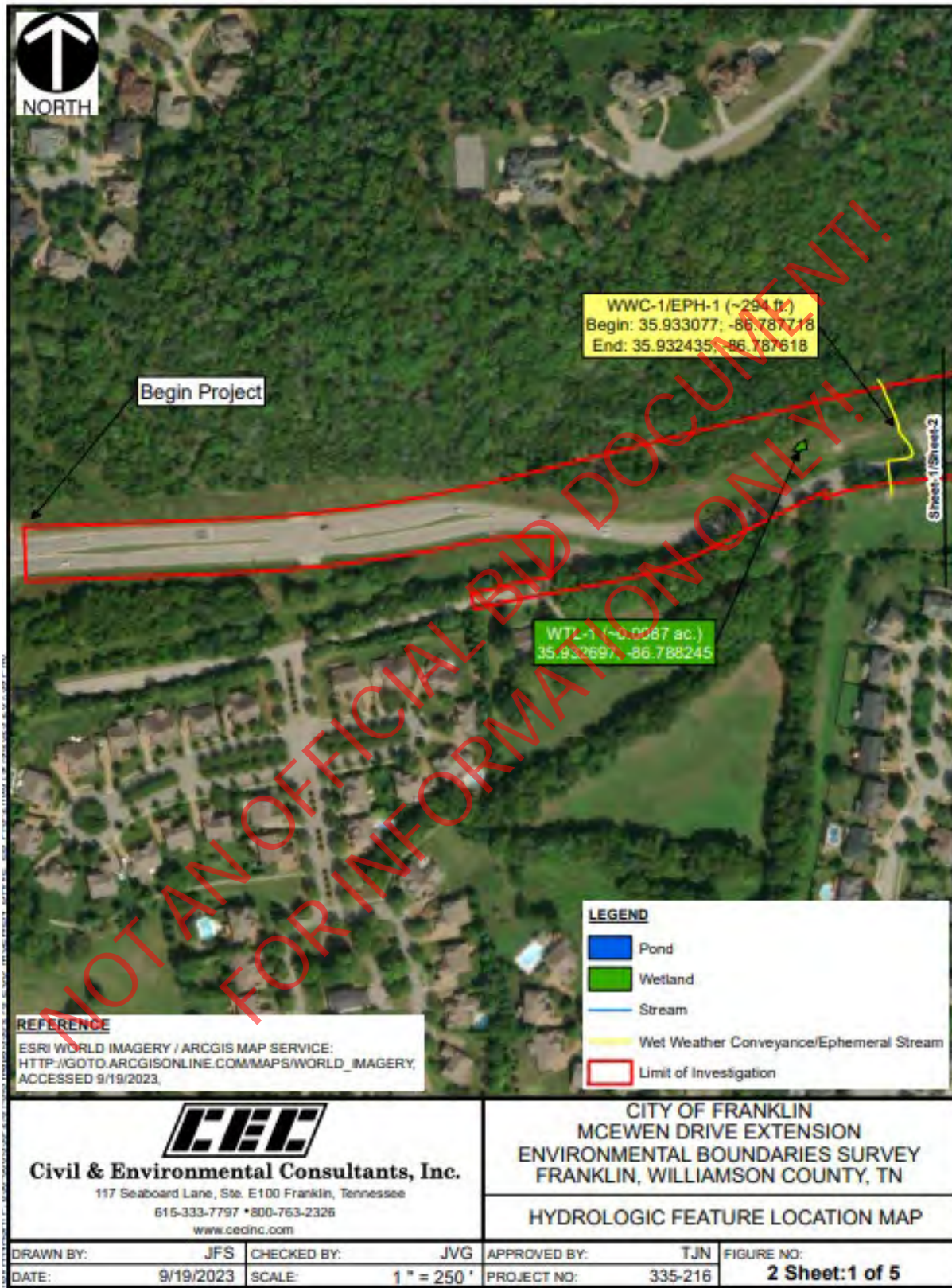
For more information, please reference Tennessee's Antidegradation Statement which is found in Chapter 0400-40-03 of the Rules of the Tennessee Department of Environment and Conservation.

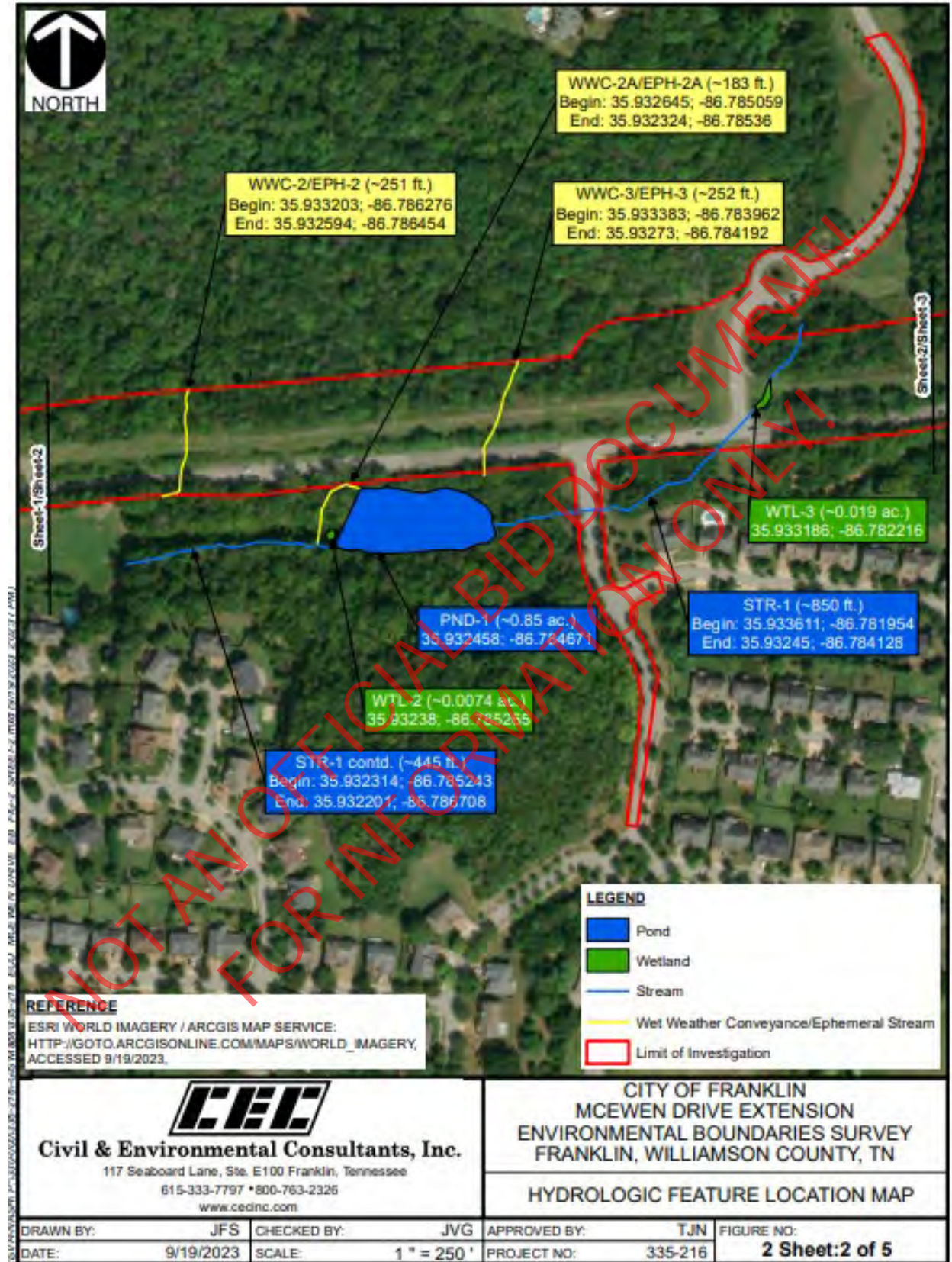
PART IV

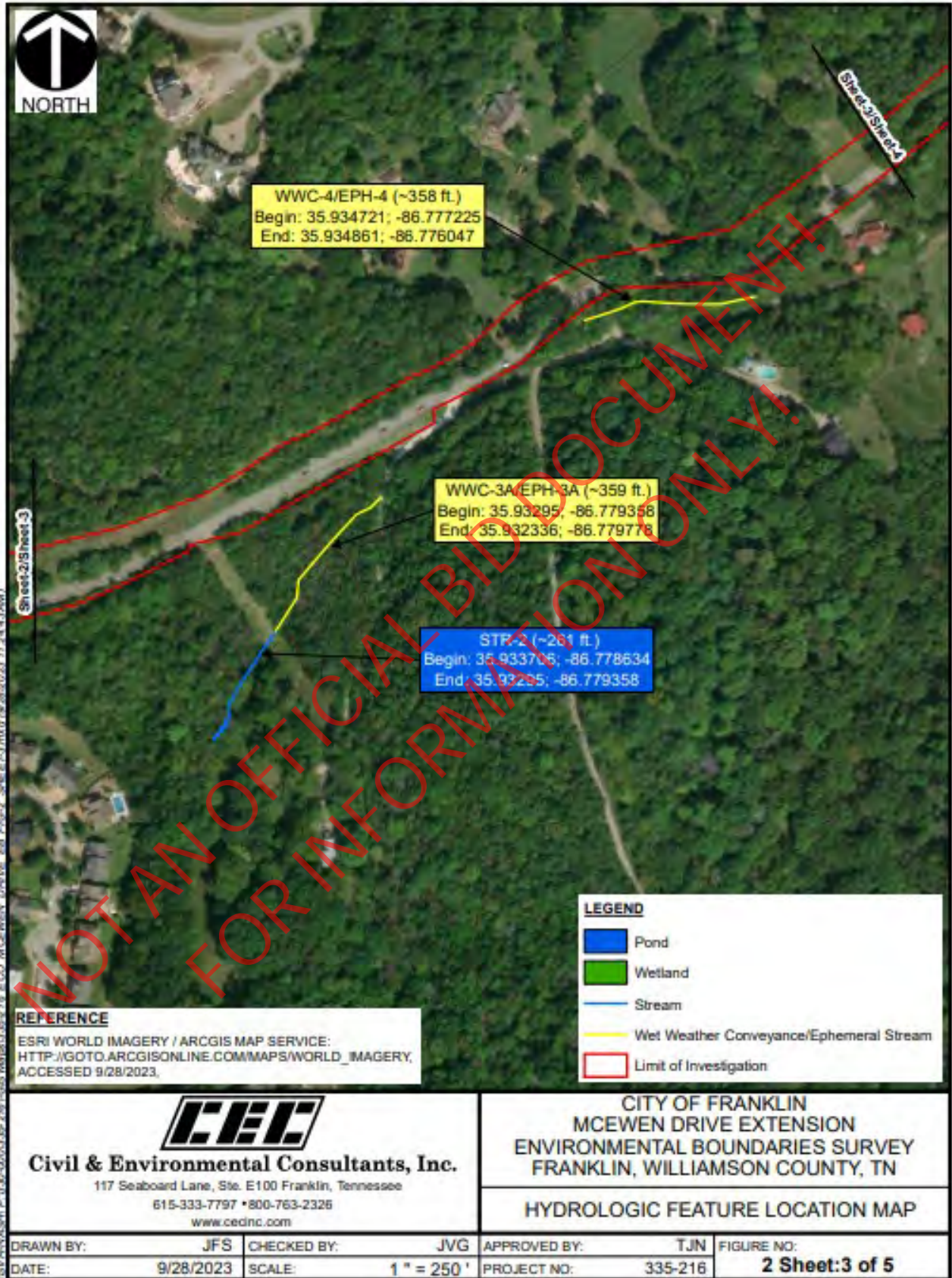
Maps



Aerial Photo



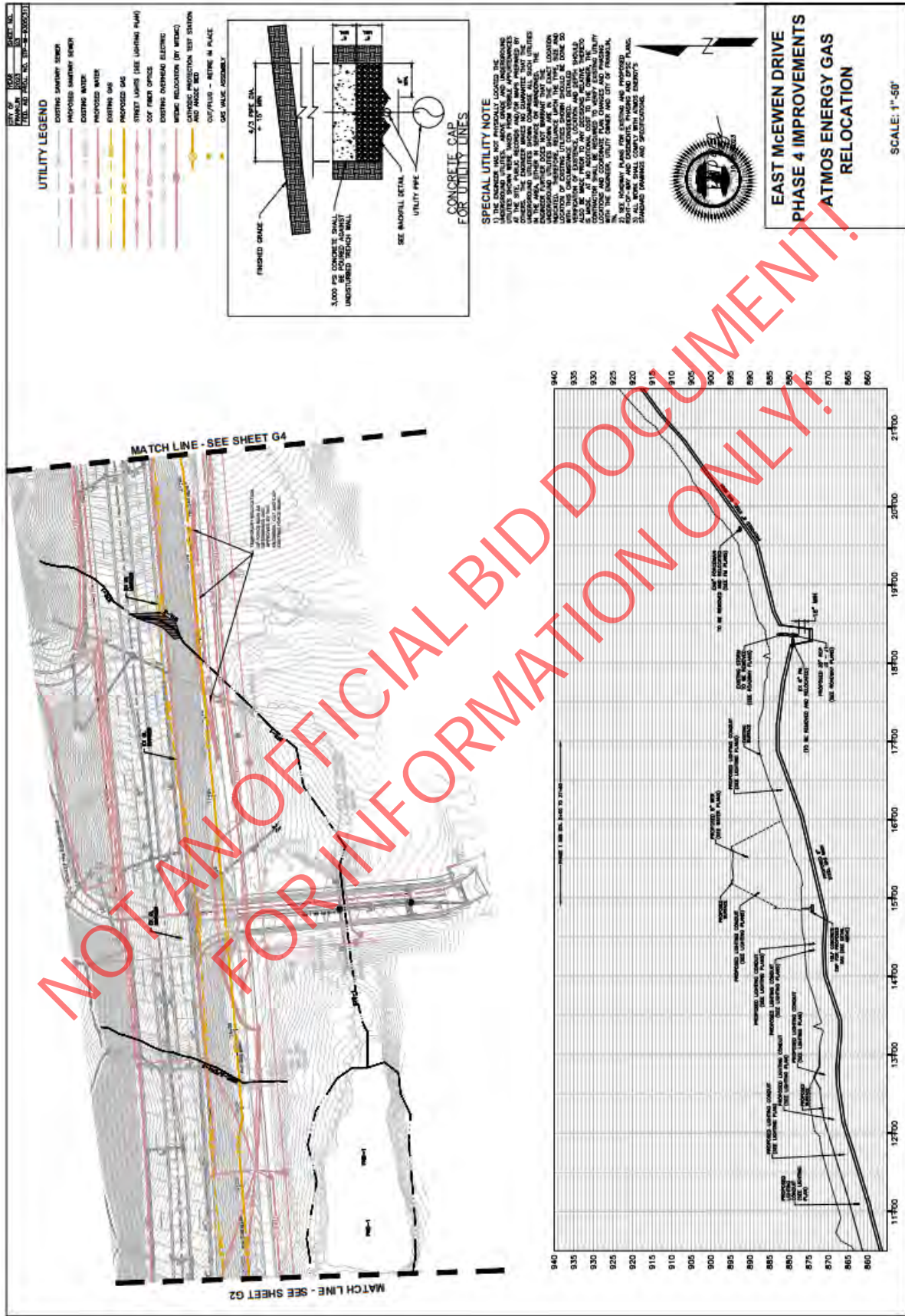


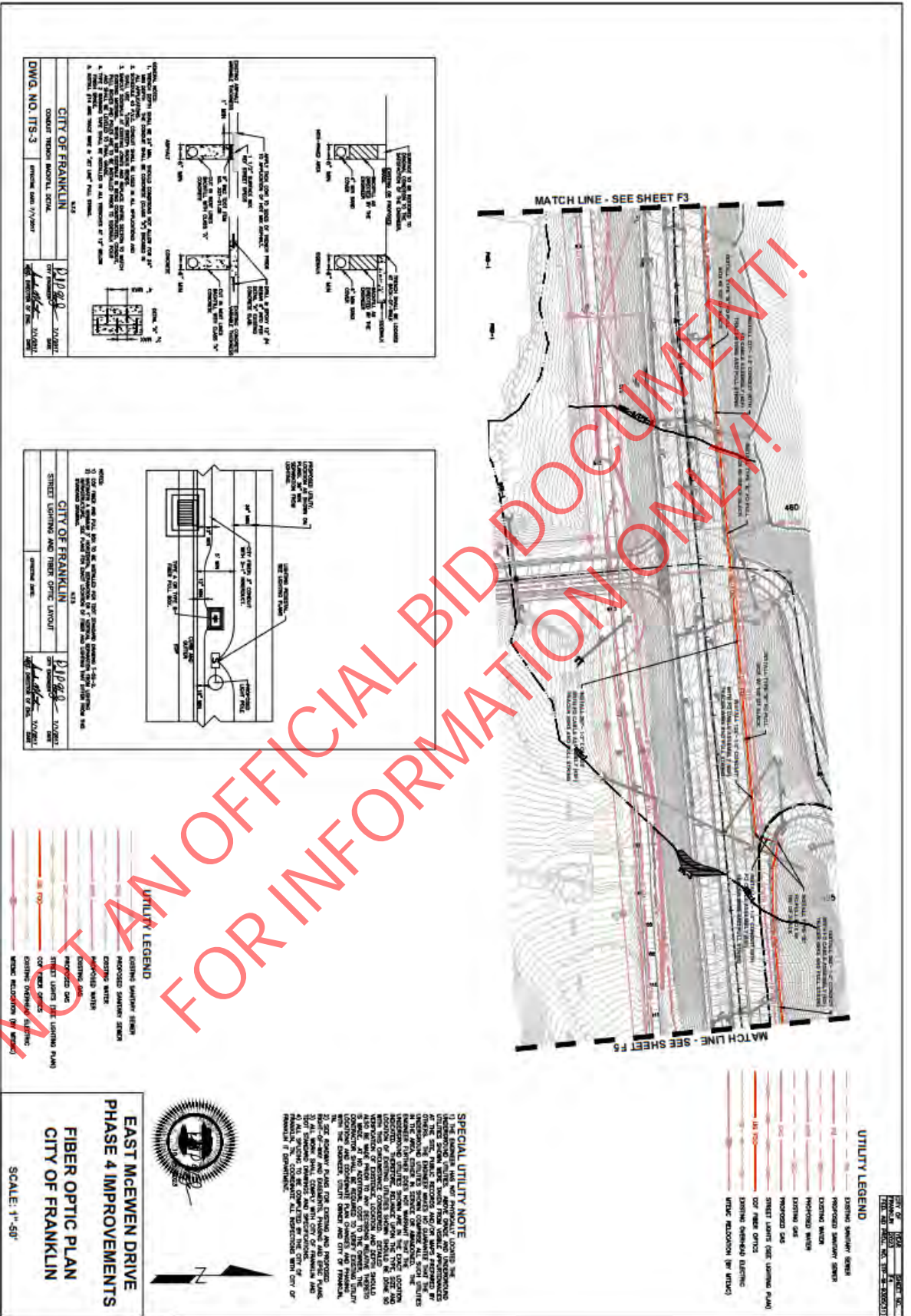




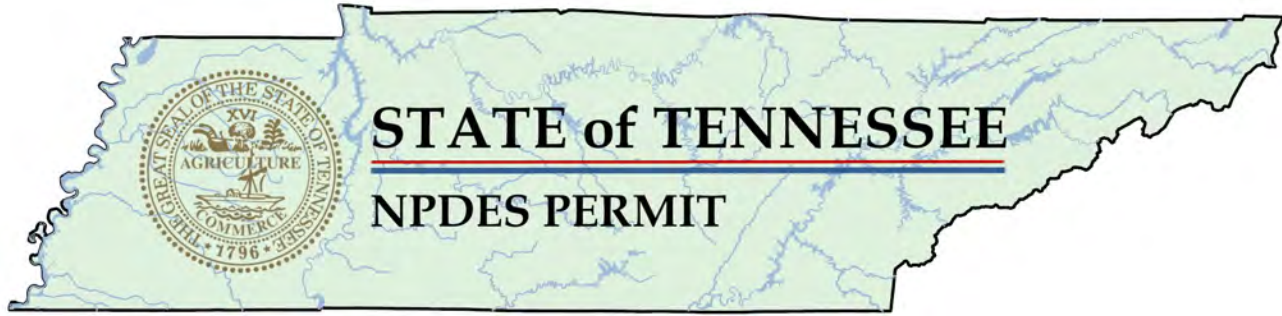
SQT

| Reach Information and Reference Standard Stratification | | | | | | | | | |
|---|--|--|---|--------------------------|---|-----------------------|-----------------|------|--|
| Reach ID: | STR-1 | Drainage Area (sqmi): | 0.04 <th>ETW/ONRW:</th> <td>No <th>Upstream Latitude:</th> <td>35,933587</td> </td> | ETW/ONRW: | No <th>Upstream Latitude:</th> <td>35,933587</td> | Upstream Latitude: | 35,933587 | | |
| Existing Stream Type: | B | Existing Bed Material: | Silt/Clay | Data Collection Season: | July - December | Upstream Longitude: | -86.78187 | | |
| Reference Stream Type: | C | Existing Stream Slope (%): | 3 | Macro Collection Method: | Unconfined Alluvial | Downstream Latitude: | 35,933165 | | |
| Ecoregion: | 71h | Flow Type: | Perennial/Intermittent | Valley Type: | | Downstream Longitude: | -86.782181 | | |
| EXISTING CONDITION ASSESSMENT | | | | | | | | | |
| Functional Category | Function-Based Parameters | Measurement Method | Field Value | Index Value | Parameter | Category | Category | ECS | |
| Hydrology | Catchment Hydrology | Watershed Land Use Runoff Score | 0.76 | 0.80 | 0.80 | 0.78 | Functioning | | |
| | Reach Runoff | Stormwater Infiltration | 0.76 | 0.76 | 0.76 | | | | |
| Hydraulics | Floodplain Connectivity | Bank Height Ratio | 1.4 | 0.43 | 0.22 | 0.22 | Not Functioning | | |
| | Large Woody Debris | Entrenchment Ratio | 1.7 | 0.00 | | | | | |
| | | Large Woody Debris Index | # Pieces | 2 | 0.16 | 0.16 | | | |
| | Lateral Migration | Erosion Rate (ft/yr) | | 0.4 | 0.30 | | | | |
| | | Dominant BEH/NBS | | H/L | | 0.49 | | | |
| | | Percent Streambank Erosion (%) | | 18 | 0.37 | | | | |
| | | Percent Armoring (%) | | | 0.80 | | | | |
| | Geomorphology | Left - Average Diameter at Breast Height (DBH, in) | Right - Average DBH (in) | 1.96 | 0.21 | | | | |
| | | | Left - Buffer Width (feet) | 3.75 | 0.40 | | | | |
| | | Right - Buffer Width (feet) | Right - Buffer Width (feet) | 100 | 0.80 | | | | |
| Left - Tree Density (#/acre) | | | 50 | 0.70 | | | | | |
| Right - Tree Density (#/acre) | | Right - Tree Density (#/acre) | 320 | 0.72 | | | | | |
| | | Left - Native Herbaceous Cover (%) | 480 | 0.50 | | | | | |
| Bed Material Characterization | Right - Native Herbaceous Cover (%) | | 20 | 0.27 | | | | | |
| | Left - Native Shrub Cover (%) | | 10 | 0.13 | | | | | |
| | Right - Native Shrub Cover (%) | | 2 | 0.02 | | | | | |
| | Size Class Pebble Count Analyzer (p-value) | | 2 | 0.02 | | | | 0.59 | |
| Bed Form Diversity | Pool Spacing Ratio | | | 0.80 | | | | | |
| | Pool Depth Ratio | | | 0.80 | | | | | |
| | Percent Riffle (%) | | | 0.80 | | | | | |
| | Aggradation Ratio | | | 0.80 | | | | | |
| Physicochemical | Plan Form | Sinuosity | 1.03 | 0.00 | 0.00 | | | | |
| | Bacteria | E. Coli (Cfu/100 mL) | | 0.80 | 0.80 | | | | |
| | Organic Enrichment | Percent Nutrient Tolerant Macroinvertebrates (%) | | 0.80 | | | | | |
| | Nitrogen | Nitrate-Nitrite (mg/L) | | 0.80 | 0.80 | | | | |
| | Phosphorus | Total Phosphorus (mg/L) | | 0.80 | 0.80 | | | | |
| Biology | Macroinvertebrates | Tennessee Macroinvertebrate Index | | 0.80 | 0.80 | | | | |
| | | Percent Clingers (%) | | 0.80 | | | | | |
| | Fish | Percent EPT - Cheumatopsyche (%) | | | 0.80 | | | | |
| | | Percent Oligochaeta and Chironomidae (%) | | | 0.80 | | | | |
| | Catch per Unit Effort Score | | | 0.80 | 0.80 | | | | |





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**TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES**

William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

Tracking No. TNR247325

Notice of Coverage (NOC) under the General NPDES Permit for
STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES (CGP)

Under authority of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.) and the delegation of authority from the United States Environmental Protection Agency under the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251, et seq.) in accordance with effluent limitations, monitoring requirements and other conditions set forth herein. CGP requirements and permit overview are located [here](#). Your coverage under the CGP shall be terminated upon receipt of [Notice of Termination \(NOT\)](#).

Construction Project: **McEwen Dr Phase IV**
 Area of Disturbance: **37.95 acres**
 Master Tracking Number: **TNR247325**
 Permittee Name: **City of Franklin**
 Project Name: **East McEwen Drive Phase 4 Improvements**
 is authorized to discharge: stormwater associated with construction activities
 from facility location: **McEwen Drive From 1750 E. of Cool Springs Blvd./Oxford Glen Dr. to SR-252 (Wilson Pk), Franklin, TN 37067, Williamson County**
 to receiving waters named: **Mayes Creek**
 Effective date: **06/24/2024**
 Expiration date: **06/30/2025**
 Contractors: **no contractor identified**

No Exceptional Tennessee Waters were identified by TDEC.

Print

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SWPPP INDEX OF SHEETS

| DESCRIPTION | SHT. |
|---|------------------------------|
| 1. SWPPP REQUIREMENTS (5.0.) | 1 |
| 2. SITE DESCRIPTION (5.5.1.) | 1 |
| 3. ORDER OF CONSTRUCTION ACTIVITIES (5.5.1.a) | 1 |
| 4. STREAM, OUTFALL, WETLAND, TMDL AND ECOLOGY INFORMATION | 1 |
| 5. EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES (5.5.3.) | 2 |
| 6. MAINTENANCE AND INSPECTION | 3 |
| 7. SITE ASSESSMENTS (5.5.3.8.) | 4 |
| 8. STORMWATER MANAGEMENT (5.5.3.11.h) | 4 |
| 9. NON-STORMWATER DISCHARGES (5.5.3.12.) | 4 |
| 10. SPILL PREVENTION, MANAGEMENT AND NOTIFICATION (5.5.3.7.c, 6.1) | 4 |
| 11. RECORD-KEEPING | 5 |
| 12. SITE WIDE/PRIMARY PERMITTEE CERTIFICATION (8.7.5.) | Error! Bookmark not defined. |
| 13. SECONDARY PERMITTEE (OPERATOR) CERTIFICATION (8.7.6.) | Error! Bookmark not defined. |

NOTE: CITATIONS IN PARENTHESIS INDICATE SECTIONS OF THE CURRENT CGP.

1. **SWPPP REQUIREMENTS** (5.0.)
 - 1.1. HAS THE SWPPP TEMPLATE BEEN PREPARED BY AN INDIVIDUAL THAT HAS THE FOLLOWING LICENSING AND/OR CERTIFICATIONS (5.2)?
 - YES (CHECK ALL THAT APPLY BELOW) OR NO
 - CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC)
 - A TN LICENSED PROFESSIONAL ENGINEER OR LANDSCAPE ARCHITECT
 - HAS SUCCESSFULLY COMPLETED TDEC LEVEL II COURSE
 - 1.2. DO THE EPSC PLANS INVOLVE STRUCTURAL DESIGN, HYDRAULIC, HYDROLOGIC OR OTHER ENGINEERING CALCULATIONS FOR EPSC STRUCTURAL MEASURES (E.G. SEDIMENT BASINS) (5.2)? YES NO
 - IF YES, HAVE THE EPSC PLANS BEEN PREPARED, STAMPED AND CERTIFIED BY A TN LICENSED PROFESSIONAL ENGINEER OR LANDSCAPE ARCHITECT? YES NO
 - 1.3. DO THE PROJECT STORMWATER OUTFALLS DISCHARGE INTO THE FOLLOWING (6.4.1.)? YES (CHECK ALL THAT APPLY BELOW) NO
 - WATERS WITH UNAVAILABLE PARAMETERS (303d FOR SILTATION)
 - EXCEPTIONAL TENNESSEE WATERS (ETW)
2. **SITE DESCRIPTION** (5.5.1.)
 - 2.1. PROJECT LIMITS (5.5.1.f): REFER TO TITLE SHEET
 - 2.2. TOTAL PROJECT AREA (5.5.1.b): 43.04 ACRES
 - 2.3. TOTAL AREA TO BE DISTURBED (5.5.1.b): 37.95 ACRES
 - 2.4. PROJECT DESCRIPTION (5.5.1.a):

TITLE: EAST MCEWEN DRIVE PHASE 4 IMPROVEMENTS
COUNTY: WILLIAMSON
 - 2.5. SITE MAP(S) (3.2.2.): REFER TO TITLE SHEET & FIG. 1 SITE LOCATION MAP
 - 2.6. DESCRIPTION OF EXISTING SITE TOPOGRAPHY (5.5.1.c): REFER TO EXISTING CONTOURS SHEET(S) 15C-15J, FIG. 1 SITE LOCATION MAP, AND THE OUTFALL TABLE IN SECTION 4.2.
 - 2.7. IF THE PROJECT WILL EXCEED 50 ACRES OF DISTURBANCE AT ANY POINT DURING THE LIFESPAN OF THE PROJECT THE FOLLOWING CONDITIONS MUST BE MET (5.5.3.3)
 - 2.7.1. TDEC SHALL BE NOTIFIED. (5.5.3.3.a)
 - 2.7.2. A GEOSPATIAL FILE IDENTIFYING THE PROJECT AREAS BOUNDARIES SHALL BE SUBMITTED TO TDEC. (5.5.3.3.e)
 - 2.7.3. A MONITORING PLAN SHALL BE PREPARED FOR OUTFALLS DRAINING 10 OR MORE ACRES, OR 5 ACRES IF DRAINING TO WATERS WITH UNAVAILABLE PARAMETERS (303d SILTATION) OR AN ETW. (5.5.3.3.f)
 - 2.7.4. SITE ASSESSMENTS SHALL BE CONDUCTED ON A QUARTERLY BASIS (5.5.3.3.b AND 5.5.3.8).
 - 2.7.5. INSPECTIONS SHALL BE CONDUCTED TWICE PER WEEK AND FOLLOWING ANY RAINFALL EVENT OF MORE THAN 0.5 INCHES IN 24 HOURS (5.5.3.3.c AND 5.5.3.9).

2.8. MAJOR SOIL DISTURBING ACTIVITIES (5.5.1.a) (CHECK ALL THAT APPLY):

- CLEARING AND GRUBBING
- EXCAVATION
- CUTTING AND FILLING
- FINAL GRADING AND SHAPING
- UTILITIES
- OTHER (DESCRIBE): _____

2.9. ARE THERE ANY SEASONAL LIMITATIONS ON WORK? YES NO
IF YES, LIST THE CORRESPONDING PLAN SHEET: N/A

2.10. SOIL PROPERTIES (5.5.1.d, 5.5.3.3.d, 5.5.3.6.b).
SOIL PROPERTIES FOR THE PRIMARY SOILS ARE LISTED IN THE TABLE BELOW.

| SOIL PROPERTIES | | | |
|--|-----|-----------|-----------------------|
| PRIMARY SOIL NAME | HSG | % OF SITE | ERODIBILITY (k value) |
| ARMOUR SILT LOAM, 2-5% SLOPES | B | 1.9 | 0.43 |
| ARMOUR SILT LOAM, 5-12% SLOPES | B | 0.1 | 0.43 |
| ARMOUR SILT LOAM, 5-12% SLOPES, ERODED | B | 8.9 | 0.43 |
| BRAXTON CHERTY SILT LOAM, 5-12% SLOPES, ERODED | C | 2.1 | 0.17 |
| DELLROSE GRAVELLY SILT LOAM, 12-20% SLOPES, ERODED | B | 10.3 | 0.24 |
| DELLROSE GRAVELLY SILT LOAM, 20-30% SLOPES, ERODED | B | 2.3 | 0.24 |
| EGAM SILT LOAM, PHOSPHATIC | C | 7.5 | 0.32 |
| GULLIED LAND | D | 1.0 | - |
| HAMPSHIRE SILT LOAM, 5-12% SLOPES, ERODED | C | 2.7 | 0.37 |
| HAMPSHIRE SILT LOAM, 12-20% SLOPES, ERODED | C | 10.7 | 0.37 |
| HUNTINGTON SILT LOAM, PHOSPHATIC | B | 15.3 | 0.37 |
| MAURY SILT LOAM, 5-12% SLOPES, ERODED | A | 0.8 | 0.32 |
| MIMOSA-ROCK OUTCROP COMPLEX 12-20% SLOPES | C | 0.7 | 0.15 |
| MIMOSA-ROCK OUTCROP COMPLEX 20-40% SLOPES | C | 2.3 | 0.37 |
| ASHWOOD-MIMOSA-ROCK OUTCROP COMPLEX, 5-15% SLOPES | D | 12.6 | 0.32 |
| ROCKLAND | D | 20.1 | - |
| STIVERSVILLE SILT LOAM, 5-12% SLOPES, ERODED | A | 0.7 | 0.32 |

2.11. PROJECT RUNOFF COEFFICIENTS AND AREA PERCENTAGES (5.5.3.6.a).

| RUNOFF COEFFICIENTS FOR EXISTING CONDITIONS | | | | |
|---|-----------|------------------------------|-----------|----------|
| AREA TYPE | AREA (AC) | PERCENTAGE OF TOTAL AREA (%) | RUNOFF CN | C FACTOR |
| IMPERVIOUS | 6.17 | 14.34 | 98 | - |
| PERVIOUS (WEIGHTED) | 36.87 | 85.66 | 73 | - |
| WEIGHTED CURVE NUMBER OR C-FACTOR = | | | 77 | - |

| RUNOFF COEFFICIENTS FOR POST-CONSTRUCTION CONDITIONS | | | | |
|--|-----------|------------------------------|-----------|----------|
| AREA TYPE | AREA (AC) | PERCENTAGE OF TOTAL AREA (%) | RUNOFF CN | C FACTOR |
| IMPERVIOUS | 15.87 | 36.87 | 98 | - |
| PERVIOUS | 27.17 | 63.13 | 71 | - |
| WEIGHTED CURVE NUMBER OR C-FACTOR = | | | 81 | - |

3. **ORDER OF CONSTRUCTION ACTIVITIES** (5.5.1.a)
CONSTRUCTION SHALL BE SEQUENCED AND STAGED TO: MINIMIZE THE EXPOSURE TIME OF GRADED OR DENUDED SOIL AREAS, PRESERVE TOPSOIL, AND MINIMIZE SOIL COMPACTION. NO WORK SHALL BE STARTED UNTIL THE CONTRACTOR'S PLAN FOR THE STAGING OF THEIR OPERATIONS, INCLUDING THE PLAN FOR STAGING OF TEMPORARY AND PERMANENT EPSC MEASURES, HAS BEEN ACCEPTED BY THE ENGINEER. THE CONTRACTOR'S EPSC PLAN SHALL INCORPORATE AND SUPPLEMENT, AS ACCEPTABLE, THE ORDER OF CONSTRUCTION ACTIVITIES AND THE BASIC EPSC DEVICES DEPICTED ON THE EPSC PLAN CONTAINED WITHIN THE APPROVED SWPPP.


- 3.1. SPECIAL SEQUENCING REQUIREMENTS (SEE SHEETS 15D, 15E, 15F, 15H, 15L, 15M, & 15Q)
- 3.2. INSTALL STABILIZED CONSTRUCTION EXITS.
- 3.3. INSTALL PERIMETER PROTECTION WHERE RUNOFF SHEET FLOWS FROM THE SITE.
- 3.4. INSTALL INITIAL EPSC MEASURES BEFORE CLEARING, GRUBBING, EXCAVATION, GRADING, CULVERT OR BRIDGE CONSTRUCTION, CUTTING, FILLING, OR ANY OTHER EARTHWORK OCCURS, EXCEPT AS SUCH WORK MAY BE NECESSARY TO INSTALL EPSC MEASURES.
- 3.5. PERFORM CLEARING AND GRUBBING (NOT MORE THAN TWO WEEKS PRIOR TO GRADING OR EARTH-MOVING. REFER TO THE STABILIZATION PRACTICES BELOW.).
- 3.6. REMOVE AND STORE TOPSOIL WITHIN LIMITS OF DISTURBANCE.
- 3.7. STABILIZE DISTURBED AREAS WITHIN 2 WEEKS OF COMPLETING ANY STAGE AND/OR PHASE OF ACTIVITY (STEEP SLOPES SHALL BE STABILIZED WITHIN 1 WEEK AFTER CONSTRUCTION ACTIVITY HAS TEMPORARY OR PERMANENTLY CEASED).
- 3.8. INSTALL UTILITIES, STORM SEWERS, CULVERTS AND BRIDGE STRUCTURES.
- 3.9. INSTALL INLET AND CULVERT PROTECTION ONCE STRUCTURES ARE IN PLACE AND CAPABLE OF INTERCEPTING FLOW.
- 3.10. PERFORM FINAL GRADING AND INSTALL BASE STONE.
- 3.11. COMPLETE FINAL PAVING AND SEALING OF CONCRETE.
- 3.12. INSTALL TRAFFIC CONTROL AND PROTECTION DEVICES.
- 3.13. COMPLETE FINAL STABILIZATION (TOPSOIL, SEEDING, MULCH, EROSION CONTROL BLANKET, SOD, ETC.)
- 3.14. REMOVE TEMPORARY EROSION CONTROLS AND ACCUMULATED SEDIMENT FROM AREAS THAT HAVE ESTABLISHED AT LEAST 70 PERCENT UNIFORM PERMANENT VEGETATIVE COVER.
- 3.15. RE-STABILIZE AREAS DISTURBED BY REMOVAL ACTIVITIES.

4. **STREAM, OUTFALL, WETLAND, TMDL AND ECOLOGY INFORMATION**

- 4.1. STREAM INFORMATION (5.5.1.h, 5.5.1.i)
 - 4.1.1. WILL CONSTRUCTION AND/OR EROSION PREVENTION AND SEDIMENT CONTROLS IMPACT ANY STREAMS WITHIN THE PROJECT LIMITS? YES NO

IF YES, THE IMPACT(S) HAVE BEEN INCLUDED IN THE TOTAL PROJECT IMPACTS AND HAVE BEEN INCLUDED IN THE WATER QUALITY PERMITS.
 - 4.1.2. HAVE ANY OF THE RECEIVING STATE WATERS LESS THAN OR EQUAL TO 1 FLOW MILE DOWN GRADIENT OF THE PROJECT LIMITS BEEN CLASSIFIED BY TDEC AS FOLLOWS (CHECK ALL THAT APPLY):
 - 303d WITH UNAVAILABLE PARAMETERS FOR SILTATION
 - EXCEPTIONAL TENNESSEE WATERS (ETW)

SPP-9.78

| | | |
|---|---|----------------------|
|  Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, TN 37067 | EAST MCEWEN DRIVE PHASE 4 IMPROVEMENTS WILLIAMSON COUNTY, TENNESSEE | |
| | STORM WATER POLLUTION PREVENTION PLAN | |
| DRAWN BY: JTM | CHECKED BY: JLW | PROJECT NO.: 335-216 |
| DATE: 12/27/2023 | DATE: 1/14/2024 | SHEET NO.: 1 |

4.1.3. RECEIVING WATERS OF THE STATE (5.5.1.h, 5.5.1.j, 5.5.1.k).

| RECEIVING WATERS OF THE STATE INFORMATION | | | | | |
|---|--|--|-----------------|---|---|
| STATE WATER LABEL | NAME OF RECEIVING STATE WATER | 303d WITH UNAVAILABLE PARAMETERS FOR SILTATION (YES OR NO) | ETW (YES OR NO) | LOCATED WITHIN PROJECT LIMITS (YES OR NO) | LOCATED WITHIN ≤ 1 FLOW MILE DOWN GRADIENT OF PROJECT LIMITS (YES OR NO) |
| STR-1 | SOUTH PRONG SPENCER CREEK (TN05130204016_0210) | YES | NO | YES | YES |
| STR-2 | MAYES CREEK (TN05130204016_0600) | NO | NO | NO | YES |
| STR-3 | MAYES CREEK (TN05130204016_0600) | NO | NO | YES | YES |

4.1.4. RECEIVING WATERS OF THE US (NON STATE WATERS) (4.1.2). LIST ANY FEATURE THAT IS IDENTIFIED AS A WET WEATHER CONVEYANCE (TDEC) AND IDENTIFIED AS WATERS OF THE US BY THE ARMY CORPS OF ENGINEERS.

| WET WEATHER CONVEYANCES THAT ARE WATERS OF THE US | | | |
|---|-------------------------------|---|--|
| WOTUS LABEL | NAME OF RECEIVING STATE WATER | LOCATED WITHIN PROJECT LIMITS (YES OR NO) | LOCATED WITHIN 15-FT OF THE PROJECT LIMITS (YES OR NO) |
| WWC-1/EPH-1 | N/A | YES | YES |
| WWC-2/EPH-2 | N/A | YES | YES |
| WWC-2A/EPH-2A | N/A | YES | YES |
| WWC-3/EPH-3 | N/A | YES | YES |
| WWC-3A/EPH-3A | N/A | YES | YES |
| WWC-4/EPH-4 | N/A | YES | YES |
| WWC-5/EPH-5 | N/A | YES | YES |

4.1.5. ARE THERE ANY WATER QUALITY RIPARIAN BUFFER ZONES REQUIRED FOR WATERS OF THE STATE? (5.5.1.i, 6.4.2.)

YES NO

IF YES, THEY HAVE BEEN INCLUDED ON PLAN SHEET(S) 15H, 15J, 15Q, 15R, 15X & 15Y.

IF YES, CHECK THE APPROPRIATE BOX BELOW FOR SIZE OF BUFFER.

60-FEET FOR WATERS WITH UNAVAILABLE PARAMETERS AND EXCEPTIONAL TENNESSEE WATERS (ETW) (AVERAGE WIDTH PER SIDE WITH A MINIMUM OF 30-FEET).

A 60 FOOT NATURAL WATER QUALITY RIPARIAN BUFFER ZONE ADJACENT TO AND ON BOTH SIDES OF THE RECEIVING STATE STREAM WITH THIS DESIGNATION SHALL BE PRESERVED TO THE MAXIMUM EXTENT PRACTICABLE DURING CONSTRUCTION ACTIVITIES AT THE SITE. THE 60 FOOT CRITERION FOR THE WIDTH OF THE BUFFER ZONE CAN BE ESTABLISHED ON AN AVERAGE WIDTH BASIS AT A PROJECT, AS LONG AS THE MINIMUM WIDTH OF THE BUFFER ZONE IS MORE THAN 30 FEET AT ANY MEASURED LOCATION. IF THE CONSTRUCTION SITE ENCOMPASSES BOTH SIDES OF A STREAM, BUFFER AVERAGING CAN BE APPLIED TO BOTH SIDES, BUT MUST BE APPLIED INDEPENDENTLY.

ARAP NRS23.297 FOR STR-1

30-FEET FOR ALL OTHER STREAMS (AVERAGE WIDTH PER SIDE WITH A MINIMUM OF 15-FEET).

A 30 FOOT NATURAL WATER QUALITY RIPARIAN BUFFER ZONE ADJACENT TO AND ON BOTH SIDES OF THE RECEIVING STATE STREAM SHALL BE PRESERVED TO THE MAXIMUM EXTENT PRACTICABLE DURING CONSTRUCTION ACTIVITIES AT THE

SITE. THE 30 FOOT CRITERION FOR THE WIDTH OF THE BUFFER ZONE CAN BE ESTABLISHED ON AN AVERAGE WIDTH BASIS AT A PROJECT, AS LONG AS THE MINIMUM WIDTH OF THE BUFFER ZONE IS MORE THAN 15 FEET AT ANY MEASURED LOCATION. IF THE CONSTRUCTION SITE ENCOMPASSES BOTH SIDES OF A STREAM, BUFFER AVERAGING CAN BE APPLIED TO BOTH SIDES, BUT MUST BE APPLIED INDEPENDENTLY.

4.1.6. ARE THERE ANY WATER QUALITY RIPARIAN BUFFER ZONES NOT REQUIRED FOR STATE WATERS DUE TO A TDEC ARAP? (1.5.2.)
 YES NO

4.1.7. ARE THERE WATER QUALITY RIPARIAN BUFFER ZONE EXEMPTIONS? (4.1.2.1.) YES NO

IF YES, EXISTING CONDITIONS DESCRIPTION: STR-3: EXISTING MCEWEN DRIVE ALIGNMENT

4.1.8. EVERY ATTEMPT SHOULD BE MADE FOR CONSTRUCTION ACTIVITIES TO NOT TAKE PLACE WITHIN THE WATER QUALITY RIPARIAN BUFFER ZONE AND FOR EXISTING FORESTED AREAS TO BE PRESERVED. (4.1.2., 6.4.2.)

4.1.9. BECAUSE OF HEAVY SEDIMENT LOAD ASSOCIATED WITH CONSTRUCTION SITE RUNOFF, WATER QUALITY RIPARIAN BUFFER ZONES ARE NOT SEDIMENT CONTROL MEASURES AND SHOULD NOT BE RELIED UPON AS PRIMARY SEDIMENT CONTROL MEASURES. THE WATER QUALITY RIPARIAN BUFFER ZONE SHALL BE ESTABLISHED BETWEEN THE TOP OF THE STREAM BANK AND THE DISTURBED CONSTRUCTION AREA.

4.1.10. WHERE IT IS NOT PRACTICABLE TO MAINTAIN A FULL WATER QUALITY RIPARIAN BUFFER, BEST MANAGEMENT PRACTICES (BMPs) PROVIDING EQUIVALENT PROTECTION AS THE NATURAL RIPARIAN ZONE MUST BE USED. A JUSTIFICATION FOR USE AND DESIGN EQUIVALENCY SHALL BE DOCUMENTED WITHIN THE SWPPP. THE ENVIRONMENTAL AND ROADWAY DESIGN DIVISIONS SHALL REVIEW AND APPROVE THIS REVISION OF THE SWPPP BEFORE DISTURBANCE OF THE SITE PROCEEDS, UNLESS PREVIOUSLY EXEMPT IN THE NPDES COP, WHERE ISSUED, ARAP/401 REQUIREMENTS WILL PREVAIL IF IN CONFLICT WITH THESE BUFFER ZONE REQUIREMENTS.

4.2. OUTFALL INFORMATION

4.2.1. OUTFALL TABLE (5.5.1.c). SEE SWPPP SHEET S-7 & S-8 FOR OUTFALL INFORMATION.

4.2.2. HAVE ALL OUTFALLS BEEN LABELED ON THE EPSC PLAN SHEETS (5.5.1.f)? YES NO

4.2.3. HAVE ALL OUTFALLS BEEN LABELED ON A USGS TOPOGRAPHIC MAP INCLUDED IN THE "DOCUMENTATION AND PERMITS" BINDER (3.2.2.)? YES NO

4.2.4. WHERE POSSIBLE, HAS NON-PROJECT RUN-ON BEEN DIVERTED AROUND OR THROUGH THE PROJECT TO ELIMINATE CONTACT WITH DISTURBED AREAS OF THE PROJECT AND SEPARATE IT FROM PROJECT RUN-OFF THEREBY REDUCING THE DRAINAGE AREA OF TO THE OUTFALLS IN THIS AREA?
 YES NO N/A

4.2.5. ARE EQUIVALENT MEASURES BEING SUBSTITUTED FOR A SEDIMENT BASIN(S) OR SEDIMENT TRAP(S)? (5.5.3.5.)
 YES NO N/A

4.2.6. A SEDIMENT BASIN, OR EQUIVALENT MEASURE(S) WILL BE PROVIDED FOR ANY OUTFALL IN A DRAINAGE AREA:

OF TEN ACRES OR MORE FOR AN OUTFALL(S) THAT DOES NOT DISCHARGE TO A STATE STREAM WITH UNAVAILABLE PARAMETERS OR EXCEPTIONAL TENNESSEE WATERS. A TEMPORARY (OR PERMANENT) SEDIMENT BASIN OR EQUIVALENT CONTROL MEASURES THAT PROVIDES STORAGE FOR A CALCULATED VOLUME OF RUNOFF FROM A MINIMUM 2-YEAR/ 24-HOUR STORM EVENT, SHALL BE PROVIDED UNTIL FINAL STABILIZATION OF THE SITE. (5.5.3.5)

OR

OF FIVE ACRES OR MORE FOR AN OUTFALL(S) THAT DISCHARGES TO A STATE STREAM WITH UNAVAILABLE PARAMETERS DUE TO SILTATION OR EXCEPTIONAL TENNESSEE WATERS (ETW). A TEMPORARY (OR PERMANENT) SEDIMENT BASIN THAT PROVIDES STORAGE FOR A CALCULATED VOLUME OF RUNOFF FROM A 5-YEAR/ 24-HOUR STORM EVENT AND RUNOFF FROM EACH ACRE DRAINED, OR

EQUIVALENT CONTROL MEASURES, SHALL BE PROVIDED UNTIL FINAL STABILIZATION OF THE SITE. (6.4.1.e).

4.2.7. A SEDIMENT TRAP, OR EQUIVALENT MEASURE(S) WILL BE PROVIDED FOR ANY OUTFALL IN A DRAINAGE AREA:

OF 3.5 - 4.9 ACRES FOR AN OUTFALL(S) THAT DISCHARGES TO A STATE STREAM WITH UNAVAILABLE PARAMETERS (303d SILTATION) OR EXCEPTIONAL TENNESSEE WATERS (ETW). A SEDIMENT TRAP THAT PROVIDES STORAGE FOR A CALCULATED VOLUME OF RUNOFF FROM A 5-YEAR/24-HOUR STORM EVENT AND RUNOFF FROM EACH ACRE DRAINED, OR EQUIVALENT CONTROL MEASURES, SHALL BE PROVIDED UNTIL FINAL STABILIZATION OF THE SITE. (6.4.1.f).

IN BOTH INSTANCES, THE ENVIRONMENTAL AND ROADWAY DESIGN DIVISIONS MAY BE CONTACTED TO REVIEW AND CONCUR WITH ANY REVISION OF THE SWPPP BEFORE DISTURBANCE OF THE OUTFALL PROCEEDS.

4.2.8. SEDIMENT STRUCTURES TREATING DRAINAGE AREAS IN EXCESS OF 25 ACRES REQUIRE A SITE-SPECIFIC DESIGN THAT ACCURATELY DEFINES THE SITE HYDROLOGY, SITE-SPECIFIC SEDIMENT LOADING, HYDRAULICS OF THE SITE, AND ADHERES TO ALL TENNESSEE EROSION AND SEDIMENT CONTROL HANDBOOK DESIGN RECOMMENDATIONS FOR SEDIMENT BASINS. (5.5.3.5.)

4.3. WETLAND INFORMATION

WILL CONSTRUCTION AND/OR EROSION AND SEDIMENT CONTROLS IMPACT ANY WETLANDS? YES NO

IF YES, THE STRUCTURAL EPSC MEASURES HAVE BEEN INCLUDED IN THE TOTAL PROJECT IMPACTS AND IN THE WATER QUALITY PERMITS.

| WETLAND INFORMATION | | |
|---------------------|------------------------|------------------------|
| WETLAND LABEL | TEMPORARY IMPACTS (AC) | PERMANENT IMPACTS (AC) |
| WTL-1 | 0.00 | 0.01 |
| WTL-2 | 0.00 | 0.00 |
| WTL-3 | 0.00 | 0.02 |

4.4. TOTAL MAXIMUM DAILY LOADS (TMDL) INFORMATION (1.3.j)

4.4.1. IS THIS PROJECT LOCATED IN A HUC-8 WATERSHED THAT MAINTAINS AN EPA APPROVED TMDL FOR SILTATION AND HABITAT ALTERATION?
 YES NO

4.4.2. IF YES, IS THIS PROJECT LOCATED WITHIN A HUC-12 SUBWATERSHED WITH A WASTE LOAD ALLOCATION (WLA)?
 YES NO

4.4.3. IF YES, DOES THE PROJECT HAVE A DIRECT DISCHARGE TO A 303(d) LISTED STREAM FOR SILTATION?
 YES NO

IF YES, SWPPP INCORPORATES MEASURES OR CONTROLS CONSISTENT WITH THE ASSUMPTIONS AND REQUIREMENTS OF THE TMDL.


5. EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES (5.5.3.)

5.1. EPSC MEASURES MUST BE DESIGNED, INSTALLED AND MAINTAINED TO CONTROL STORMWATER VOLUME AND VELOCITY WITHIN THE SITE TO MINIMIZE EROSION (4.1.1).

5.2. EPSC MEASURES MUST CONTROL STORMWATER DISCHARGES, INCLUDING BOTH PEAK FLOWS AND TOTAL STORMWATER VOLUME, TO MINIMIZE EROSION AT OUTLETS, STREAM CHANNELS, AND STREAM BANKS. (4.1.1)

5.3. HAVE THE CONTROL MEASURES BEEN DESIGNED PER THE SIZE AND SLOPE OF THE DISTURBED DRAINAGE AREA (5.5.3.5.)?
 YES NO

SPP-9.79

| | | | |
|---|-----------------|---|--------------|
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| | | STORM WATER POLLUTION PREVENTION PLAN | |
| DRAWN BY: JTM | CHECKED BY: JLW | PROJECT NO.: 335-216 | SHEET NO.: 2 |
| DATE: 12/27/2023 | DATE: 1/14/2024 | | |

- 5.4. THE CONTROL MEASURES HAVE, AT A MINIMUM, BEEN DESIGNED FOR THE 5-YEAR, 24 HOUR STORM EVENT (5.5.3.5., 6.4.1.b).
- 5.5. ARE THE LIMITS OF DISTURBANCE CLEARLY MARKED ON THE EPSC PLANS (5.5.1.f)? YES NO
- 5.6. AREAS TO BE UNDISTURBED SHALL BE CLEARLY MARKED IN THE FIELD BEFORE CONSTRUCTION ACTIVITIES BEGIN.
- 5.7. CLEARING, GRUBBING, AND OTHER DISTURBANCE TO RIPARIAN VEGETATION SHALL BE LIMITED TO THE MINIMUM NECESSARY FOR SLOPE CONSTRUCTION AND EQUIPMENT OPERATIONS. EXISTING VEGETATION, INCLUDING STREAM AND WETLAND BUFFERS (UNLESS PERMITTED), SHOULD BE PRESERVED TO THE MAXIMUM EXTENT POSSIBLE. UNNECESSARY VEGETATION REMOVAL IS PROHIBITED.
- 5.8. HAS A THREE STAGED EPSC PLAN BEEN PREPARED FOR THE PROJECT (5.5.2.)?
YES A THREE STAGED EPSC PLAN HAS BEEN PREPARED.
NO A SINGLE STAGED EPSC PLAN HAS BEEN PREPARED SINCE THE PROJECT DISTURBANCE IS LESS THAN 5 ACRES AND THE PROJECT CONSISTS OF A SINGLE-LOT HOME, COMMERCIAL LOT OR LINEAR INFRASTRUCTURE PROJECT.
- 5.9. STEEP SLOPES ARE DEFINED AS A NATURAL OR CREATED SLOPE OF 35% GRADE OR GREATER REGARDLESS OF HEIGHT. HAVE STEEP SLOPES BEEN MINIMALLY DISTURBED AND/OR PROTECTED BY CONVEYING RUNOFF NON-EROSIVELY AROUND OR OVER THE SLOPE (5.5.3.4.) (10. "STEEP SLOPE")? YES NO N/A
- 5.10. THE STRUCTURAL EPSC MEASURES HAVE BEEN INCLUDED IN THE TOTAL PROJECT IMPACTS AND HAVE BEEN INCLUDED IN THE AQUATIC RESOURCE ALTERATION (ARAP) PERMIT OR SECTION 401 CERTIFICATION (5.5.1.h). ALL PERMITS WILL BE MAINTAINED ON SITE WITHIN THE "DOCUMENTATION AND PERMITS" BINDER.
- 5.11. TEMPORARY EPSC MEASURES MAY BE REMOVED AT THE BEGINNING OF THE WORKDAY, BUT MUST BE REINSTALLED AT THE END OF THE WORKDAY OR BEFORE A PRECIPITATION EVENT.
- 5.12. EPSC MEASURES LOCATED IN WOTUS (EPHEMERAL STREAMS) MUST BE CONSIDERED TEMPORARY AND SHALL BE REMOVED AT THE END OF CONSTRUCTION.
- 5.13. THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN A PROACTIVE METHOD TO PREVENT THE OFF-SITE MIGRATION OR DEPOSIT OF SEDIMENT OFF THE PROJECT LIMITS (E.G. R.O.W., EASEMENTS, ETC.), INTO WATERS OF THE STATE/U.S., OR ONTO ROADWAYS USED BY THE PUBLIC. IF SEDIMENT ESCAPES THE CONSTRUCTION SITE, OFF-SITE ACCUMULATIONS OF SEDIMENT THAT HAVE NOT REACHED A STREAM MUST BE REMOVED TO A LEVEL SUFFICIENT TO MINIMIZE OFF-SITE IMPACTS (E.G., FUGITIVE SEDIMENT THAT HAS ESCAPED THE CONSTRUCTION SITE AND HAS COLLECTED IN A STREET MUST BE REMOVED SO THAT IT IS NOT SUBSEQUENTLY WASHED INTO STORM SEWERS AND STREAMS BY THE NEXT RAIN AND/OR SO THAT IT DOES NOT POSE A SAFETY HAZARD TO USERS OF PUBLIC STREETS). ARRANGEMENTS CONCERNING REMOVAL OF SEDIMENT ON ADJOINING PROPERTY MUST BE SETTLED WITH THE ADJOINING PROPERTY OWNER BEFORE REMOVAL OF SEDIMENT. SEDIMENT THAT MIGRATES INTO WATERS OF THE STATE/US SHALL NOT BE REMOVED WITHOUT GUIDANCE AND APPROVAL FROM TDEC.
- 5.14. OFFSITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST SHALL BE MINIMIZED. A STABILIZED CONSTRUCTION EXIT (A POINT OF ENTRANCE/EXIT TO THE CONSTRUCTION PROJECT) SHALL BE PROVIDED TO REDUCE THE TRACKING OF MUD AND DIRT ONTO PUBLIC ROADS BY CONSTRUCTION VEHICLES.
- 5.15. DISCHARGES FROM DEWATERING ACTIVITIES ARE PROHIBITED UNLESS MANAGED BY APPROPRIATE CONTROLS THAT PROVIDE THE LEVEL OF TREATMENT (FILTRATION) NECESSARY TO COMPLY WITH PERMIT REQUIREMENTS. (4.1.3.).
- 5.16. SETTLING BASINS AND SEDIMENT TRAPS SHALL BE PROPERLY DESIGNED PER THE SIZE OF THE DRAINAGE AREAS OR VOLUME OF WATER TO BE TREATED. TREATED WATER MUST BE DISCHARGED THROUGH A PIPE OR WELL VEGETATED OR LINED CHANNEL, SO THAT THE DISCHARGE DOES NOT CAUSE EROSION OR SEDIMENT TRANSPORT.
- 5.17. DISCHARGES FROM SEDIMENT BASINS AND IMPOUNDMENTS SHALL UTILIZE OUTLET STRUCTURES THAT ONLY WITHDRAW WATER FROM NEAR THE SURFACE OF THE BASIN OR IMPOUNDMENT. TREATED WATER MUST BE DISCHARGED THROUGH A PIPE, WELL- VEGETATED AND/OR LINED CHANNEL, SO THAT THE DISCHARGE DOES NOT CAUSE EROSION OR SEDIMENT TRANSPORT. (5.5.3.5.).

- 5.18. THE DEWATERING OF WORK AREAS, TRENCHES, FOUNDATIONS, EXCAVATIONS, ETC. THAT HAVE COLLECTED STORMWATER, WATER FROM VEHICLE WASH AREAS, OR GROUNDWATER SHALL BE EITHER HELD IN SETTLING BASINS OR TREATED BY FILTRATION AND/OR CHEMICAL TREATMENT PRIOR TO ITS DISCHARGE. ALL CHEMICAL TREATMENTS MUST BE APPLIED PER SECTION 6 FLOCCULANTS.
- 5.19. WATER DISCHARGED FROM DEWATERING ACTIVITIES SHALL NOT CAUSE AN OBJECTIONABLE COLOR CONTRAST WITHIN THE RECEIVING NATURAL RESOURCE. WATER MUST BE HELD WITHIN SETTLING BASINS UNTIL IT IS AT LEAST AS CLEAR AS THE RECEIVING WATERS.
- 5.20. DEWATERING STRUCTURES, SEDIMENT FILTER BAGS, SEDIMENT BASINS AND TRAPS SHALL NOT BE LOCATED CLOSER THAN 30 FEET (60 FEET DESIRABLE VEGETATIVE BUFFER) FOR WATERS WITH UNAVAILABLE PARAMETERS DUE TO SILTATION AND EXCEPTIONAL TENNESSEE WATERS (ETW) AND 15 FEET (30 FEET DESIRABLE VEGETATIVE BUFFER) FOR ALL OTHER FEATURES FROM THE TOP BANK OF A STREAM, WOTUS (EPHEMERAL), WETLAND OR OTHER NATURAL RESOURCE AND SHALL BE PROPERLY DESIGNED PER THE SIZE OF THE DRAINAGE AREAS OR VOLUME OF WATER TO BE TREATED.
- 5.21. STABILIZATION PRACTICES: PRE-CONSTRUCTION VEGETATIVE COVER WILL NOT BE DESTROYED, REMOVED OR DISTURBED MORE THAN 2 WEEKS PRIOR TO GRADING OR EARTH MOVING UNLESS THE AREA WILL BE SEEDED AND/OR MULCHED OR OTHER TEMPORARY COVER IS INSTALLED (5.5.3.5.f).
- 5.22. STABILIZATION MEASURES WILL BE INITIATED AS SOON AS POSSIBLE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. TEMPORARY OR PERMANENT STABILIZATION WILL BE COMPLETED WITHIN 2 WEEKS AFTER ACTIVITY HAS TEMPORARILY OR PERMANENTLY CEASED IN THAT AREA. PERMANENT STABILIZATION WILL REPLACE TEMPORARY MEASURES AS SOON AS PRACTICABLE (5.5.3.4.).
- 5.23. PRIORITY SHALL BE GIVEN TO FINISHING OPERATIONS AND PERMANENT EPSC MEASURES OVER TEMPORARY EPSC MEASURES ON ALL PROJECTS. UNPACKED GRAVEL CONTAINING FINES (SILT AND CLAY SIZED PARTICLES) OR CRUSHER-RUN WILL NOT BE CONSIDERED A NON-ERODIBLE SURFACE
- 5.24. DELAYING THE PLANTING OF COVER VEGETATION UNTIL WINTER MONTHS OR DRY MONTHS SHOULD BE AVOIDED, IF POSSIBLE.
- 5.25. STEEP SLOPES SHALL BE TEMPORARILY STABILIZED NOT LATER THAN 1 WEEK AFTER CONSTRUCTION ACTIVITY ON THE SLOPE HAS TEMPORARILY OR PERMANENTLY CEASED. (5.5.3.4.).


6. MAINTENANCE AND INSPECTION

- 6.1. INSPECTION PRACTICES (5.5.3.9.)
- 6.1.1. PROJECT EPSC INSPECTORS RESPONSIBLE FOR THE INSPECTION, IMPLEMENTATION, MAINTENANCE, AND/OR REPAIR OF EPSC MEASURES SHALL MEET ONE OF THE FOLLOWING REQUIREMENTS (5.5.3.10.):
- 6.1.1.1. SUCCESSFULLY COMPLETED THE TDEC "LEVEL I - FUNDAMENTALS OF EROSION PREVENTION AND SEDIMENT CONTROL" COURSE AND ANY RECERTIFICATION COURSES AS REQUIRED
- 6.1.1.2. BE A CURRENT TN LICENSED PROFESSIONAL ENGINEER OR LANDSCAPE ARCHITECT.
- 6.1.1.3. BE A CURRENT CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC).
- 6.1.1.4. SUCCESSFULLY COMPLETED TDEC "LEVEL II - DESIGN PRINCIPLES FOR EROSION PREVENTION AND SEDIMENT CONTROL FOR CONSTRUCTION SITES" COURSE AND ANY RECERTIFICATION COURSE AS REQUIRED.
- 6.1.2. EPSC CONTROLS SHALL BE INSPECTED TO VERIFY MEASURES HAVE BEEN INSTALLED AND MAINTAINED IN ACCORDANCE WITH CONSTRUCTION DRAWINGS, SPECIFICATIONS, AND GOOD ENGINEERING PRACTICES. EPSC INSPECTIONS SHALL BE DOCUMENTED ON THE TDEC CONSTRUCTION STORMWATER INSPECTION CERTIFICATION (TWICE-WEEKLY INSPECTIONS) FORM.
- 6.1.3. OUTFALL POINTS SHALL BE INSPECTED TO ASCERTAIN WHETHER EPSC MEASURES ARE EFFECTIVE IN PREVENTING EROSION AND CONTROLLING SEDIMENT INCLUDING SIGNIFICANT IMPACTS TO SURROUNDING STATE WATERS, WOTUS (EPHEMERAL), WETLANDS, OTHER NATURAL RESOURCES AND ADJACENT PROPERTY OWNERS. WHERE DISCHARGE LOCATIONS ARE INACCESSIBLE, NEARBY DOWN GRADIENT LOCATIONS SHALL BE

INSPECTED. LOCATIONS WHERE VEHICLES ENTER AND EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE ROADWAY SEDIMENT TRACKING.

- 6.1.4. INSPECTIONS WILL BE CONDUCTED AT LEAST TWICE EVERY CALENDAR WEEK AND AT LEAST 72 HOURS APART (5.5.3.11.a).
- 6.1.5. ON PROJECTS WHERE THE PERMITTEE CHOOSES TO DISTURB MORE THAN 50 ACRES AT ONE TIME, INSPECTIONS WILL BE CONDUCTED TWICE PER WEEK AND FOLLOWING ANY RAINFALL EVENT OF MORE THAN 0.5 INCHES IN 24 HOURS. (5.5.3.3.c)
- 6.1.6. THE FREQUENCY OF EPSC INSPECTIONS MAY BE REDUCED TO ONCE A MONTH WHERE SITES OR PORTIONS OF SITES HAVE BEEN TEMPORARILY STABILIZED UNTIL CONSTRUCTION ACTIVITIES RESUME WITH WRITTEN NOTIFICATION TDEC ENVIRONMENTAL FIELD OFFICE AND SUBSEQUENT TDEC APPROVAL. WRITTEN NOTIFICATION MUST INCLUDE THE INTENT TO CHANGE FREQUENCY AND JUSTIFICATION (5.5.3.11.a).
- 6.1.7. ALL DISTURBED AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AREAS USED FOR MATERIAL STORAGE THAT ARE EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE, AND EACH OUTFALL WILL BE INSPECTED (5.5.3.11.b).
- 6.1.8. THE INSPECTOR WILL OVERSEE THE REQUIREMENTS OF OTHER CONSTRUCTION-RELATED WATER QUALITY PERMITS (I.E. TDEC ARAP, USACE SECTION 404, AND TVA SECTION 26a PERMITS) FOR CONSTRUCTION ACTIVITIES AROUND WATERS OF THE STATE (10 "INSPECTOR").
- 6.1.9. THE SWPPP WILL BE REVISED AS NECESSARY BASED ON THE RESULTS OF THE INSPECTION. REVISION(S) WILL BE RECORDED WITHIN 1 WEEK OF THE INSPECTION. REVISION(S) WILL BE IMPLEMENTED WITHIN 2 WEEKS OF THE INSPECTION (5.5.3.11.e AND 5.5.3.11.f).
- 6.1.10. DOCUMENTATION OF INSPECTIONS WILL BE MAINTAINED ON SITE IN THE "DOCUMENTATION AND PERMITS" BINDER.
- 6.1.11. THESE INSPECTION REQUIREMENTS DO NOT APPLY TO DEFINABLE AREAS OF THE SITE THAT HAVE MET FINAL STABILIZATION REQUIREMENTS AND HAVE BEEN NOTED IN THE SWPPP.
- 6.1.12. TRAINED CERTIFIED INSPECTORS SHALL COMPLETE INSPECTION TO THE BEST OF THEIR ABILITY. FALSIFYING INSPECTION RECORDS OR OTHER DOCUMENTATION OR FAILURE TO COMPLETE INSPECTION DOCUMENTATION SHALL RESULT IN A VIOLATION OF THIS PERMIT AND ANY OTHER APPLICABLE ACTS OR RULES (5.5.3.11.h).
- 6.2. MAINTENANCE PRACTICES (5.1 AND 8.13.)
- 6.2.1. ALL CONTROLS WILL BE MAINTAINED IN GOOD AND EFFECTIVE OPERATING ORDER AND IN ACCORDANCE WITH CONSTRUCTION DRAWINGS AND GOOD ENGINEERING PRACTICES. (5.1. AND 5.5.3.1.b)
- 6.2.2. MAINTENANCE AND REPAIR ACTIVITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.
- 6.2.3. UPON CONCLUSION OF THE INSPECTIONS, EPSC MEASURES FOUND TO BE INEFFECTIVE SHALL BE REPAIRED, REPLACED, OR MODIFIED BEFORE THE NEXT RAIN EVENT OR WITHIN 7 DAYS (WHICHEVER IS SOONER) AFTER THE INSPECTION OR WHEN THE CONDITION IS IDENTIFIED. (5.5.3.11.e).
- 6.2.4. SEDIMENT SHALL BE REMOVED FROM SEDIMENT CONTROL STRUCTURES (SEDIMENT TRAPS, SILT FENCE, SEDIMENT BASINS, OTHER CONTROLS, ETC.) WHEN THE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT (50%). (5.5.3.1.d).
- 6.2.5. DURING SEDIMENT REMOVAL, THE CONTRACTOR SHALL TAKE STEPS TO ENSURE THAT STRUCTURAL COMPONENTS OF EPSC MEASURES ARE NOT DAMAGED AND THUS MADE INEFFECTIVE. IF DAMAGE DOES OCCUR, THE CONTRACTOR SHALL REPAIR THE EPSC MEASURES AT THE CONTRACTOR'S OWN EXPENSE.
- 6.2.6. CHECK DAMS WILL BE INSPECTED FOR STABILITY. SEDIMENT WILL BE REMOVED WHEN DEPTH REACHES ONE-HALF (½) THE HEIGHT OF THE DAM.

SPP-9.80

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|  Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, TN 37067 | | EAST MCEWEN DRIVE PHASE 4 IMPROVEMENTS WILLIAMSON COUNTY, TENNESSEE STORM WATER POLLUTION PREVENTION PLAN | |
| DRAWN BY: | JTM | CHECKED BY: | JLW |
| DATE: | 12/27/2023 | DATE: | 1/14/2024 |
| PROJECT NO.: 335-216 | | SHEET NO.: 3 | |

- 6.2.7. SEDIMENT REMOVED FROM SEDIMENT CONTROL STRUCTURES SHALL BE PLACED AND TREATED IN A MANNER SO THAT THE SEDIMENT IS CONTAINED WITHIN THE PROJECT LIMITS, DOES NOT MIGRATE INTO FEATURES REMOVED FROM, AND DOES NOT MIGRATE ONTO ADJACENT PROPERTIES AND/OR INTO WATERS OF THE STATE/U.S.
- 6.2.8. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER WILL BE PICKED UP AND REMOVED FROM STORMWATER EXPOSURE PRIOR TO ANTICIPATED STORM EVENTS OR BEFORE BEING CARRIED OFF THE SITE BY WIND, OR OTHERWISE PREVENTED FROM BECOMING A POLLUTANT SOURCE FOR STORMWATER DISCHARGES. AFTER USE, MATERIALS USED FOR EROSION CONTROL WILL BE REMOVED (5.5.3.7.a).
- 6.2.9. ALL SEEDED AREAS WILL BE CHECKED FOR BARE SPOTS, EROSION WASHOUTS, AND VIGOROUS GROWTH FREE OF SIGNIFICANT WEED INFESTATIONS.

7. SITE ASSESSMENTS (5.5.3.8.)

ARE SITE ASSESSMENTS REQUIRED? YES NO

8. STORMWATER MANAGEMENT (5.5.3.11.h)

- 8.1. STORMWATER MANAGEMENT WILL BE HANDLED BY TEMPORARY CONTROLS OUTLINED IN THIS SWPPP AND ANY PERMANENT CONTROLS NEEDED TO MEET PERMANENT STORMWATER MANAGEMENT NEEDS IN THE POST CONSTRUCTION PERIOD. PERMANENT CONTROLS WILL BE DEPICTED ON THE PLANS AND NOTED AS PERMANENT.
- 8.2. DESCRIBE ANY SPECIFIC POST-CONSTRUCTION MEASURES THAT WILL CONTROL VELOCITY, POLLUTANTS, AND/OR EROSION (5.5.3.6.c):
DETENTION POND(S): FLEXAMAT; RIPRAP APRONS.
- 8.3. OTHER ITEMS NEEDING CONTROL (5.5.3.7.)
CONSTRUCTION MATERIALS: THE FOLLOWING MATERIALS OR SUBSTANCES ARE EXPECTED TO BE PRESENT ON THE SITE DURING THE CONSTRUCTION PERIOD. (CHECK ALL THAT APPLY).
 LUMBER, GUARDRAIL, TRAFFIC CONTROL DEVICES
 CONCRETE WASHOUT
 PIPE CULVERTS (I.E. CONCRETE, CORRUGATED METAL, HDPE, ETC.)
 MINERAL AGGREGATES, ASPHALT
 EARTH
 LIQUID TRAFFIC STRIPING MATERIALS, PAINT
 ROCK
 CURING COMPOUND
 EXPLOSIVES
 OTHER _____

THESE MATERIALS WILL BE HANDLED AS NOTED IN THIS SWPPP.

8.4. WASTE MATERIALS (5.5.3.7.c)

WASTE MATERIAL (EARTH, ROCK, ASPHALT, CONCRETE, ETC.) NOT REQUIRED FOR THE CONSTRUCTION OF THE PROJECT WILL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH FEDERAL AND STATE REGULATIONS. IMPACTS TO WATERS OF THE STATE/U.S. SHALL BE AVOIDED IF POSSIBLE. IF UNAVOIDABLE, THE CONTRACTOR WILL OBTAIN ALL NECESSARY PERMITS INCLUDING, BUT NOT LIMITED TO NPDES, AQUATIC RESOURCES ALTERATION PERMIT(S) CORPS OF ENGINEERS SECTION 404 PERMITS, AND TVA SECTION 26A PERMITS TO DISPOSE OF WASTE MATERIALS.

8.5. HAZARDOUS WASTE (5.5.3.7.c) (8.8)

ALL HAZARDOUS WASTE MATERIALS WILL BE DISPOSED OF IN A MANNER WHICH IS COMPLIANT WITH LOCAL OR STATE REGULATIONS. SITE PERSONNEL WILL BE INSTRUCTED IN THESE PRACTICES, AND THE INDIVIDUAL DESIGNATED AS THE CONTRACTOR'S ON-SITE REPRESENTATIVE WILL BE RESPONSIBLE FOR SEEING THAT THESE PRACTICES ARE FOLLOWED. THE CONTRACTOR WILL OBTAIN ALL NECESSARY PERMITS TO DISPOSE OF HAZARDOUS MATERIAL.

8.6. SANITARY WASTE (5.5.3.7.b)

PORTABLE SANITARY FACILITIES WILL BE PROVIDED ON ALL CONSTRUCTION SITES. SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS IN A TIMELY MANNER BY A LICENSED WASTE MANAGEMENT CONTRACTOR OR AS REQUIRED BY ANY LOCAL

REGULATIONS. THE CONTRACTOR WILL OBTAIN ALL NECESSARY PERMITS TO DISPOSE OF SANITARY WASTE.

8.7. OTHER MATERIALS

THE FOLLOWING MATERIALS OR SUBSTANCES ARE EXPECTED TO BE PRESENT ON THE SITE DURING THE CONSTRUCTION PERIOD. (CHECK ALL THAT APPLY).

- FERTILIZERS AND LIME
- PESTICIDES AND/OR HERBICIDES
- DIESEL AND GASOLINE
- MACHINERY LUBRICANTS (OIL AND GREASE)

THESE MATERIALS WILL BE HANDLED AS NOTED IN THIS SWPPP.

9. NON-STORMWATER DISCHARGES (5.5.3.12.)

9.1. THE FOLLOWING NON-STORMWATER DISCHARGES ARE ANTICIPATED DURING THE CONSTRUCTION OF THIS PROJECT (CHECK ALL THAT APPLY).

- DEWATERING OF WORK AREAS OF COLLECTED STORMWATER AND GROUND WATER.
- WATERS USED TO WASH VEHICLES (OF DUST AND SOIL) WHERE DETERGENTS ARE NOT USED AND DETENTION AND/OR FILTERING IS PROVIDED BEFORE THE WATER LEAVES THE SITE.
- WATER USED TO CONTROL DUST. (3.5.3.1.n)
- POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHING FROM WHICH CHLORINE HAS BEEN REMOVED TO THE MAXIMUM EXTENT PRACTICABLE.
- UNCONTAMINATED GROUNDWATER OR SPRING WATER.
- FOUNDATION OR FOOTING DRAINS WHERE FLOWS ARE NOT CONTAMINATED WITH POLLUTANTS.
- OTHER: _____

9.2. ALL ALLOWABLE NON-STORMWATER DISCHARGES WILL BE DIRECTED TO STABLE DISCHARGE STRUCTURES PRIOR TO LEAVING THE SITE.

9.3. THE DESIGN OF ALL IMPACTED EPSC MEASURES RECEIVING FLOW FROM ALLOWABLE NON-STORMWATER DISCHARGES MUST BE DESIGNED TO HANDLE THE VOLUME OF THE NON-STORMWATER COMPONENT.

9.4. WASH DOWN OR WASTE DISCHARGE OF CONCRETE TRUCKS WILL NOT BE PERMITTED ON-SITE UNLESS PROPER SETTLEMENT AREAS HAVE BEEN PROVIDED IN ACCORDANCE WITH BOTH STATE AND FEDERAL REGULATIONS.

9.5. ARE ANY DISCHARGES ASSOCIATED WITH INDUSTRIAL (NON-CONSTRUCTION STORMWATER) ACTIVITY EXPECTED (5.5.1.g)?

YES NO

IF YES, SPECIFY THE LOCATION OF THE ACTIVITY AND ITS PERMIT NUMBER: N/A

10. SPILL PREVENTION, MANAGEMENT AND NOTIFICATION (5.5.3.7.c, 6.1)

10.1. SPILL PREVENTION (5.5.3.7.c)

10.1.1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING A SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN WHEN REQUIRED BY FEDERAL CODE.

10.2. MATERIAL MANAGEMENT

10.2.1. HOUSEKEEPING

ONLY CONSTRUCTION PRODUCTS NEEDED SHALL BE STORED ON-SITE BY THE CONTRACTOR. EXCEPT FOR BULK MATERIALS THE CONTRACTOR WILL STORE ALL MATERIALS UNDER COVER AND IN APPROPRIATE CONTAINERS. PRODUCTS MUST BE STORED IN ORIGINAL CONTAINERS AND LABELED. MATERIAL MIXING WILL BE CONDUCTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHEN POSSIBLE, ALL PRODUCTS WILL BE USED COMPLETELY BEFORE PROPERLY DISPOSING OF THE CONTAINER OFF SITE. THE MANUFACTURER'S DIRECTIONS FOR DISPOSAL OF MATERIALS AND CONTAINERS WILL BE FOLLOWED. (9-410.06) THE CONTRACTOR'S SITE SUPERINTENDENT WILL INSPECT MATERIALS STORAGE AREAS REGULARLY TO ENSURE PROPER USE AND DISPOSAL. DUST GENERATED WILL BE CONTROLLED IN AN ENVIRONMENTALLY SAFE MANNER. VEGETATION AREAS NOT ESSENTIAL TO THE CONSTRUCTION PROJECT WILL BE PRESERVED AND MAINTAINED AS NOTED ON THE PLANS.

10.2.2. HAZARDOUS MATERIALS

PRODUCTS MUST BE STORED IN ORIGINAL CONTAINERS UNLESS THE CONTAINER IS NOT RE-SEALABLE. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHEETS WILL BE RETAINED IN A SAFE PLACE TO RELAY IMPORTANT PRODUCT INFORMATION. IF SURPLUS PRODUCT MUST BE DISPOSED OF, MANUFACTURER'S LABEL DIRECTIONS FOR DISPOSAL WILL BE FOLLOWED. MAINTENANCE AND REPAIR OF ALL EQUIPMENT AND VEHICLES INVOLVING OIL CHANGES, HYDRAULIC SYSTEM DRAIN DOWN, DE-GREASING OPERATIONS, FUEL TANK DRAIN DOWN AND REMOVAL, AND OTHER ACTIVITIES WHICH MAY RESULT IN THE ACCIDENTAL RELEASE OF CONTAMINANTS WILL BE CONDUCTED ON AN IMPERVIOUS SURFACE AND UNDER COVER DURING WET WEATHER TO PREVENT THE RELEASE OF CONTAMINANTS ONTO THE GROUND. WHEEL WASH WATER WILL BE COLLECTED AND ALLOWED TO SETTLE OUT SUSPENDED SOLIDS PRIOR TO DISCHARGE. WHEEL WASH WATER WILL NOT BE DISCHARGED DIRECTLY INTO ANY STORMWATER SYSTEM OR STORMWATER TREATMENT SYSTEM. POTENTIAL pH-MODIFYING MATERIALS SUCH AS: BULK CEMENT, CEMENT KILN DUST, FLY ASH, NEW CONCRETE WASHINGS AND CURING WATERS, CONCRETE PUMPING, AND MIXER WASHOUT WATERS WILL BE COLLECTED ON SITE AND MANAGED TO PREVENT CONTAMINATION OF STORMWATER RUNOFF.

10.3. PRODUCT SPECIFIC PRACTICES

10.3.1. PETROLEUM PRODUCTS: ALL ON-SITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED.

10.3.2. FERTILIZERS: FERTILIZERS WILL BE APPLIED ONLY IN THE AMOUNTS SPECIFIED BY THE SOIL ANALYSIS. ONCE APPLIED, FERTILIZERS WILL BE WORKED INTO THE SOIL TO LIMIT THE EXPOSURE TO STORMWATER. FERTILIZERS WILL BE STORED IN AN ENCLOSED AREA UNDER COVER. THE CONTENTS OF PARTIALLY USED FERTILIZER BAGS WILL BE TRANSFERRED TO SEALABLE CONTAINERS TO AVOID SPILLS.

10.3.3. PAINTS: ALL CONTAINERS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. THE EXCESS WILL BE DISPOSED OF PER THE MANUFACTURER'S INSTRUCTIONS AND APPLICABLE STATE AND LOCAL REGULATIONS.

10.3.4. CONCRETE TRUCKS: CONTRACTORS WILL PROVIDE DESIGNATED TRUCK WASHOUT AREAS ON THE SITE. THESE AREAS MUST BE SELF CONTAINED AND NOT CONNECTED TO ANY STORMWATER OUTLET OF THE SITE, AND PROPERLY SIGNED. UPON COMPLETION OF CONSTRUCTION WASHOUT AREAS WILL BE PROPERLY STABILIZED.

10.4. SPILL MANAGEMENT

IN ADDITION TO THE PREVIOUS HOUSEKEEPING AND MANAGEMENT PRACTICES, THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP IF NECESSARY:

10.4.1. ALL ONSITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTATIVE MAINTENANCE TO REDUCE THE CHANGE OF LEAKAGE AND SPILLS.

10.4.2. FOR ALL HAZARDOUS MATERIALS STORED ON SITE, THE MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEAN UP WILL BE CLEARLY POSTED. SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATIONS OF THE INFORMATION AND CLEANUP SUPPLIES.

10.4.3. APPROPRIATE CLEANUP MATERIALS AND EQUIPMENT WILL BE MAINTAINED BY THE CONTRACTOR IN THE MATERIALS STORAGE AREA ON-SITE AND UNDER COVER. SPILL RESPONSE EQUIPMENT SHALL BE INSPECTED AND MAINTAINED BY THE CONTRACTOR AS NECESSARY TO REPLACE ANY MATERIALS USED IN SPILL RESPONSE ACTIVITIES.

10.4.4. ALL SPILLS SHALL BE CLEANED IMMEDIATELY AFTER DISCOVERY AND THE MATERIALS DISPOSED OF PROPERLY. THE SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.

SPP-9.81

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|  Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, TN 37067 | | EAST MCEWEN DRIVE PHASE 4 IMPROVEMENTS WILLIAMSON COUNTY, TENNESSEE | |
| | | STORM WATER POLLUTION PREVENTION PLAN | |
| DRAWN BY: JTM | CHECKED BY: JLW | PROJECT NO.: 335-216 | SHEET NO.: 4 |
| DATE: 12/27/2023 | DATE: 1/14/2024 | | |

- 10.4.5. THE CONTRACTOR'S RESPONSIBLE PARTY WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THE SITE SUPERINTENDENT HAS HAD APPROPRIATE TRAINING FOR HAZARDOUS MATERIALS HANDLING, SPILL MANAGEMENT, AND CLEANUP.
- 10.4.6. IF SPILLS REPRESENT AN IMMINENT THREAT OF ESCAPING THE SITE AND ENTERING RECEIVING WATERS, PERSONNEL WILL RESPOND IMMEDIATELY TO CONTAIN THE RELEASE AND NOTIFY THE PRIMARY PERMITTEE AFTER THE SITUATION HAS BEEN STABILIZED.
- 10.4.7. IF AN OIL SHEEN IS OBSERVED ON SURFACE WATER (E.G. SETTLING PONDS, DETENTION PONDS, SWALES), ACTION WILL BE TAKEN IMMEDIATELY TO REMOVE THE MATERIAL CAUSING THE SHEEN. THE CONTRACTOR WILL USE APPROPRIATE MATERIALS TO CONTAIN AND ABSORB THE SPILL. THE SOURCE OF THE OIL SHEEN WILL ALSO BE IDENTIFIED AND REMOVED OR REPAIRED AS NECESSARY TO PREVENT FURTHER RELEASES.
- 10.4.8. IF A SPILL OCCURS THE CONTRACTOR'S RESPONSIBLE PARTY SHALL BE RESPONSIBLE FOR COMPLETING THE SPILL REPORTING FORM. ALL SPILLS MUST BE REPORTED TO THE APPROPRIATE AGENCY, AND MEASURES SHALL BE TAKEN IMMEDIATELY TO PREVENT THE POLLUTION OF WATERS OF THE STATE/U.S., INCLUDING GROUNDWATER, SHOULD A SPILL OCCUR.
- 10.5. SPILL NOTIFICATION (6.1)
WHERE A RELEASE CONTAINING A HAZARDOUS SUBSTANCE IN AN AMOUNT EQUAL TO, OR MORE THAN A REPORTABLE QUANTITY ESTABLISHED UNDER EITHER 40 CFR 117 OR 40 CFR 302 OCCURS DURING A 24 HOUR PERIOD:
- 10.5.1. THE PRIMARY PERMITTEE OFFICE WILL NOTIFY THE LOCAL TDEC ENVIRONMENTAL FIELD OFFICE AND ANY OTHER APPLICABLE REGULATORY AGENCIES WITHIN 24 HOURS OF THE SPILL.
- 10.5.2. IN ADDITION TO ANY FOLLOW UP NOTIFICATIONS REQUIRED BY FEDERAL LAW, A WRITTEN DESCRIPTION OF THE RELEASE, DATE OF RELEASE AND CIRCUMSTANCES LEADING TO THE RELEASE, WHAT ACTIONS WERE TAKEN TO MITIGATE EFFECTS OF THE RELEASE, AND STEPS TAKEN TO MINIMIZE THE CHANCE OF FUTURE OCCURRENCES WILL BE SUBMITTED TO THE APPROPRIATE TDEC ENVIRONMENTAL FIELD OFFICE WITHIN 2 WEEKS OF KNOWLEDGE OF THE RELEASE.
- 10.5.3. THE SWPPP MUST BE MODIFIED WITHIN 2 WEEKS OF KNOWLEDGE OF THE RELEASE PROVIDING A DESCRIPTION OF THE RELEASE, CIRCUMSTANCES LEADING TO THE RELEASE, AND THE DATE OF RELEASE. THE SWPPP WILL BE REVIEWED AND MODIFIED AS NECESSARY TO IDENTIFY MEASURES TO PREVENT THE REOCCURRENCE OF SUCH RELEASES AND TO RESPOND TO SUCH RELEASES.

11. RECORD-KEEPING


- 11.1. REQUIRED RECORDS
THE PRIMARY PERMITTEE OR THEIR DULY AUTHORIZED REPRESENTATIVE WILL MAINTAIN AT THE SITE THE FOLLOWING RECORDS OF CONSTRUCTION ACTIVITIES (7.2.1.):
- 11.1.1. THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR.
- 11.1.2. THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE.
- 11.1.3. THE DATES WHEN STABILIZATION MEASURES ARE INITIATED.
- 11.1.4. RECORDS EPSC INSPECTION REPORTS AND CORRECTIVE MEASURES.
- 11.1.5. RECORDS OF QUALITY ASSURANCE SITE ASSESSMENTS, IF APPLICABLE.
- 11.1.6. COPY OF SITE EPSC INSPECTOR'S CERTIFICATION AND/OR LICENSING
- 11.1.7. A COPY OF ANY REGULATORY CORRESPONDENCE REGARDING THE EFFECTIVENESS OF THE SWPPP OR EPSC CONTROLS.
- 11.2. RAINFALL MONITORING PLAN (7.2.1.):
- 11.2.1. EQUIPMENT
AT A MINIMUM, THE CONTRACTOR WILL INSTALL A FENCE POST TYPE RAIN GAUGE TO MEASURE RAINFALL. THE STANDARD FENCE POST RAIN GAUGE WILL BE A WEDGE-SHAPED GAUGE THAT

MEASURES UP TO 6 INCHES OF RAINFALL. AN ENGLISH SCALE WILL BE PROVIDED ON ONE FACE, WITH A METRIC SCALE ON THE OTHER FACE. GRADUATION WILL BE PERMANENTLY MOLDED IN DURABLE WEATHER-RESISTANT PLASTIC. THE MINIMUM GRADUATION WILL BE 0.01 INCH (OR 0.1MM). AN ALUMINUM BRACKET WITH SCREWS MAY BE USED TO MOUNT THE GAUGE ON A WOODEN SUPPORT. IF A RAIN GAUGE CANNOT BE MAINTAINED ON-SITE A REFERENCE SITE MAY BE USED FOR A RECORD OF DAILY RAINFALL.

- 11.2.2. LOCATION
THE RAIN GAUGE WILL BE LOCATED AT OR ALONG THE PROJECT SITE, AS DEFINED IN THE NOI OF THE NPDES PERMIT, IN AN OPEN AREA SUCH THAT THE MEASUREMENT WILL NOT BE INFLUENCED BY OUTSIDE FACTORS (I.E. OVERHANGS, GUTTER, TREES, ETC.). AT LEAST ONE RAIN GAUGE PER LINEAR MILE IS REQUIRED ALONG (AS MEASURED ALONG THE CENTERLINE OF THE PRIMARY ALIGNMENT) THE PROJECT WHERE CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING OR FILLING IS ACTIVELY PERFORMED, OR EXPOSED SOIL HAS NOT YET BEEN PERMANENTLY STABILIZED.
- 11.2.3. METHODS
RAINFALL MONITORING WILL BE INITIATED PRIOR TO CLEARING, GRUBBING, EXCAVATION, GRADING, CUTTING, OR FILLING, EXCEPT AS SUCH MINIMAL CLEARING MAY BE NECESSARY TO INSTALL A RAIN GAUGE IN AN OPEN AREA. THE RAIN GAUGE WILL BE CHECKED FOR OPERATIONAL SOUNDNESS DAILY (DURING NORMAL BUSINESS HOURS) IN WET TIMES AND WEEKLY IN DRY TIMES. GAUGES WILL BE REPAIRED OR REPLACED ON THE SAME DAY IF FOUND TO BE NON-OPERATIONAL OR MISSING.
- 11.2.4. EACH RAIN GAUGE WILL BE READ (FOR DETAILED RECORDS OF RAINFALL) AND EMPTIED AFTER EVERY RAINFALL EVENT OCCURRING ON THE PROJECT SITE AT APPROXIMATELY THE SAME TIME OF THE DAY (DURING NORMAL BUSINESS HOURS). DURING PERIODS OF DRY CONDITIONS IT WILL NOT BE NECESSARY TO READ THE RAIN GAUGE EVERY DAY. IN LIEU OF THIS REQUIREMENT ON WEEKENDS AND ON STATE HOLIDAYS, THE RAIN GAUGES CAN BE EMPTIED THE NEXT BUSINESS DAY AND A REFERENCE SITE USED FOR A RECORD OF DAILY AMOUNT OF PRECIPITATION FOR THOSE DAYS. A REFERENCE SITE IS THE DOCUMENTATION FROM THE CLOSEST GAUGE WITHIN PROXIMITY OF THE PROJECT FROM A RECOGNIZED SOURCE SUCH AS THE NOAA NATIONAL WEATHER SERVICE.
- 11.2.5. DETAILED RECORDS WILL BE RECORDED OF RAINFALL EVENTS INCLUDE DATES, AMOUNTS OF RAINFALL, AND THE APPROXIMATE DURATION (OR THE STARTING AND ENDING TIMES). THE RAINFALL RECORDS SHALL BE RECORDED ON THE RAINFALL RECORD SHEET AND SHALL BE MAINTAINED IN THE "DOCUMENTATION AND PERMITS" BINDER.
- 11.2.6. IF THE RAINFALL EVENT IS STILL IN PROGRESS AT THE DAILY RECORDING TIME, THE GAUGE WILL BE EMPTIED AND THE RECORD WILL INDICATE THAT THE STORM EVENT WAS STILL IN PROGRESS.
- 11.2.7. RAIN GAUGE INFORMATION (DETAILED RECORDS), INCLUDING THE LOCATION OF THE NEAREST OUTFALL, WILL BE RECORDED ON THE EPSC INSPECTION REPORT FORMS AT THE TIME OF MEASUREMENT.
- 11.3. KEEPING PLANS CURRENT (5.4.)
- 11.3.1. THE EPSC PLAN IS TO SERVE AS AN INITIAL GUIDE FOR SITE PERSONNEL AS THE CONSTRUCTION PROCESS DEVELOPS. IT MUST BE AMENDED, MODIFIED, AND UPDATED WHENEVER EPSC INSPECTIONS INDICATE, OR WHERE STATE OR FEDERAL REGULATORY OFFICIALS DETERMINE EPSC MEASURES ARE PROVING INEFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING POLLUTANT SOURCES OR ARE OTHERWISE NOT ACHIEVING THE GENERAL OBJECTIVES OF CONTROLLING POLLUTANTS IN STORMWATER DISCHARGES ASSOCIATED WITH THE CONSTRUCTION ACTIVITY.
- 11.3.2. THE STAGES DEPICTED WITHIN THE EPSC PLANS MAY NOT COINCIDE WITH THE ACTUAL STAGES OF CONSTRUCTION ESTABLISHED BY THE CONTRACTOR DURING CONSTRUCTION, THUS MODIFICATIONS WILL BE REQUIRED TO ENSURE THE EPSC PLAN IS MAINTAINED TO DEPICT CURRENT SITE CONDITIONS. IT SHOULD BE MAINTAINED SUCH THAT IT WILL ALWAYS REFLECT THE MEASURES THAT ARE INSTALLED DURING THE VARIOUS STAGES OF CONSTRUCTION. IT IS IMPRACTICAL TO DETERMINE ALL THE INTERMEDIATE STAGES OF CONSTRUCTION THAT WILL

- OCCUR, THUS THESE DOCUMENTS MUST BE UPDATED THROUGHOUT THE LIFE OF THE CONSTRUCTION PROJECT.
- 11.3.3. THE PRIMARY PERMITTEE'S EPSC INSPECTOR OR THEIR DULY AUTHORIZED REPRESENTATIVE WILL MODIFY AND UPDATE THE SWPPP WHEN ANY OF THE FOLLOWING CONDITIONS APPLY:
- 11.3.3.1. WHENEVER THERE IS A CHANGE IN THE SCOPE OF THE PROJECT THAT WOULD BE EXPECTED TO HAVE A SIGNIFICANT EFFECT ON THE DISCHARGE OF POLLUTANTS TO THE WATERS OF THE STATE AND WHICH HAS NOT OTHERWISE BEEN ADDRESSED IN THE SWPPP;
- 11.3.3.2. WHENEVER INSPECTIONS OR INVESTIGATIONS BY SITE OPERATORS, LOCAL, STATE, OR FEDERAL OFFICIALS INDICATE THE SWPPP IS PROVING INEFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING POLLUTANTS FROM CONSTRUCTION ACTIVITY SOURCES, OR IS OTHERWISE NOT ACHIEVING THE GENERAL OBJECTIVES OF CONTROLLING POLLUTANTS IN STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY; WHERE LOCAL, STATE, OR FEDERAL OFFICIALS DETERMINE THAT THE SWPPP IS INEFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING POLLUTANT SOURCES, A COPY OF ANY CORRESPONDENCE TO THAT EFFECT MUST BE RETAINED IN THE SWPPP;
- 11.3.3.3. WHEN ANY NEW OPERATOR AND/OR SUB-OPERATOR IS ASSIGNED OR RELIEVED OF THEIR RESPONSIBILITY TO IMPLEMENT A PORTION OF THE SWPPP;
- 11.3.3.4. TO PREVENT A NEGATIVE IMPACT TO LEGALLY PROTECTED STATE OR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED AQUATIC FAUNA;
- 11.3.3.5. WHEN THERE IS A CHANGE IN CHEMICAL TREATMENT METHODS INCLUDING: USE OF DIFFERENT TREATMENT CHEMICALS, DIFFERENT DOSAGE OR APPLICATION RATES OR A DIFFERENT AREA OF APPLICATION NOT SPECIFIED ON THE EPSC PLANS.
- 11.3.3.6. ALL SWPPP REVISION(S) SHALL BE RECORDED WITHIN 1 WEEK BY THE PROJECT EPSC INSPECTOR.
- 11.3.3.7. WHEN A TMDL IS DEVELOPED FOR THE RECEIVING WATERS FOR A POLLUTANT OF CONCERN (SILTATION AND/OR HABITAT ALTERATION), CONSTRUCTION SHALL NOTIFY THE PERMITS SECTION FOR PROPER COORDINATION.
- 11.4. MAKING PLANS ACCESSIBLE
- 11.4.1. THE PRIMARY PERMITTEE WILL RETAIN A COPY OF THIS SWPPP (INCLUDING A COPY OF THE "DOCUMENTATION AND PERMITS" BINDER AT THE CONSTRUCTION SITE (OR OTHER LOCATION ACCESSIBLE TO TDEC AND THE PUBLIC) FROM THE DATE CONSTRUCTION COMMENCES TO THE DATE OF FINAL STABILIZATION. THE PRIMARY PERMITTEE WILL HAVE A COPY OF THE SWPPP AVAILABLE AT THE LOCATION WHERE WORK IS OCCURRING ON-SITE FOR THE USE OF OPERATORS AND THOSE IDENTIFIED AS HAVING RESPONSIBILITIES UNDER THE SWPPP WHENEVER THEY ARE ON THE CONSTRUCTION SITE (7.2.).
- 11.4.2. PRIOR TO THE INITIATION OF LAND DISTURBING ACTIVITIES AND UNTIL THE SITE HAS MET THE FINAL STABILIZATION CRITERIA, THE PRIMARY PERMITTEE OR THEIR DULY AUTHORIZED REPRESENTATIVE WILL POST A NOTICE NEAR THE MAIN ENTRANCE OF THE CONSTRUCTION SITE WITH THE FOLLOWING INFORMATION (5.3.4.) (7.2.1.):
- 11.4.2.1. A COPY OF THE NOTICE OF COVERAGE (NOC) WITH THE NPDES PERMIT NUMBER FOR THE PROJECT;
- 11.4.2.2. THE INDIVIDUAL NAME, COMPANY NAME, E-MAIL ADDRESS (IF APPLICABLE) AND TELEPHONE NUMBER OF THE LOCAL PROJECT SITE OWNER AND OPERATOR CONTACT;
- 11.4.2.3. A BRIEF DESCRIPTION OF THE PROJECT; AND
- 11.4.2.4. THE LOCATION OF THE SWPPP.

SPP-9.82

| | | | |
|--|-----------------|---|--------------|
|  Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, TN 37067 | | EAST MCEWEN DRIVE PHASE 4 IMPROVEMENTS WILLIAMSON COUNTY, TENNESSEE | |
| | | STORM WATER POLLUTION PREVENTION PLAN | |
| DRAWN BY: JTM | CHECKED BY: JLW | PROJECT NO.: 335-216 | SHEET NO.: 5 |
| DATE: 12/27/2023 | DATE: 1/14/2024 | | |

11.4.3. ALL INFORMATION DESCRIBED IN SECTION 13.4.2 MUST BE MAINTAINED IN LEGIBLE CONDITION. IF POSTING THIS INFORMATION NEAR A MAIN ENTRANCE IS INFEASIBLE DUE TO SAFETY CONCERNS, THE NOTICE SHALL BE POSTED IN A LOCAL BUILDING. THE NOTICE MUST BE PLACED IN A PUBLICLY ACCESSIBLE LOCATION WHERE CONSTRUCTION IS ACTIVELY UNDERWAY AND MOVED AS NECESSARY.

11.5. NOTICE OF TERMINATION (9.0.)

11.5.1. WHEN ALL STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES THAT ARE AUTHORIZED BY THE PERMIT ARE ELIMINATED BY FINAL STABILIZATION, THE PRIMARY PERMITTEE WILL SUBMIT A NOTICE OF TERMINATION (NOT) THAT IS SIGNED IN ACCORDANCE WITH THE PERMIT TO THE TDEC CENTRAL OFFICE IN NASHVILLE, TN.

11.5.2. FOR THE PURPOSES OF THE CERTIFICATION REQUIRED BY THE NOT, THE ELIMINATION OF STORMWATER DISCHARGES ASSOCIATED WITH THE CONSTRUCTION ACTIVITY MEANS THE

11.5.2.1. ALL EARTH-DISTURBING ACTIVITIES ON THE SITE ARE COMPLETED AND ALL DISTURBED SOILS AT THE PORTION OF THE CONSTRUCTION SITE WHERE THE OPERATOR HAD CONTROL HAVE BEEN FINALLY STABILIZED; AND

11.5.2.2. ALL CONSTRUCTION MATERIALS, WASTE AND WASTE HANDLING DEVICES, AND ALL EQUIPMENT, AND VEHICLES THAT WERE USED DURING CONSTRUCTION HAVE BEEN REMOVED AND PROPERLY DISPOSED; AND

11.5.2.3. ALL STORMWATER CONTROLS THAT WERE INSTALLED AND MAINTAINED DURING CONSTRUCTION, EXCEPT THOSE THAT ARE INTENDED FOR LONG-TERM USE FOLLOWING TERMINATION OF PERMIT COVERAGE, HAVE BEEN REMOVED; AND

11.5.2.4. ALL POTENTIAL POLLUTANTS AND POLLUTANT GENERATING ACTIVITIES ASSOCIATED WITH CONSTRUCTION HAVE BEEN REMOVED; AND

11.5.2.5. THE PERMITTEE HAS IDENTIFIED WHO IS RESPONSIBLE FOR ONGOING MAINTENANCE OF ANY STORMWATER CONTROLS LEFT ON THE SITE FOR LONG-TERM USE FOLLOWING TERMINATION OF PERMIT COVERAGE; AND

11.5.2.6. TEMPORARY EPSC MEASURES HAVE BEEN OR WILL BE REMOVED AT AN APPROPRIATE TIME TO ENSURE FINAL STABILIZATION IS MAINTAINED; AND

11.5.2.7. ALL STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES FROM THE IDENTIFIED SITE THAT ARE AUTHORIZED BY A NPDES GENERAL PERMIT HAVE OTHERWISE BEEN ELIMINATED FROM THE PORTION OF THE CONSTRUCTION SITE WHERE THE OPERATOR HAD CONTROL.

11.6. RETENTION OF RECORDS (7.1.)

THE PRIMARY PERMITTEE WILL RETAIN COPIES OF THE SWPPP, ALL REPORTS REQUIRED BY THE PERMIT, AND RECORDS OF ALL DATA USED TO COMPLETE THE NOTICE OF INTENT FOR THE PROJECT FOR A PERIOD OF AT LEAST THREE (3) YEARS FROM THE DATE THE NOT WAS FILED.

NOT AN OFFICIAL BID DOCUMENT!
FOR INFORMATION ONLY!

SPP-9.83

| | | | |
|---|---|----------------------|--------------|
|  Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, TN 37067 | EAST MCEWEN DRIVE PHASE 4 IMPROVEMENTS WILLIAMSON COUNTY, TENNESSEE | | |
| | STORM WATER POLLUTION PREVENTION PLAN | | |
| DRAWN BY: JTM | CHECKED BY: JLW | PROJECT NO.: 335-216 | SHEET NO.: 6 |
| DATE: 12/27/2023 | DATE: 1/14/2024 | | |

12. OUTFALL TABLE (5.5.1.c, 6.4.1.e, 6.4.1.f)

| OUTFALL LABEL | SUB OUT-FALL | STATION CL, LT OR RT | SLOPE WITHIN ROW (%) | STAGE 1 DRAINAGE AREA (AC) | STAGE 2 DRAINAGE AREA (AC) | STAGE 3 DRAINAGE AREA (AC) | SEDIMENT BASIN OR EQUIVALENT MEASURE(S) (YES, NO OR N/A) | SEDIMENT TRAP OR EQUIVALENT MEASURE(S) (YES, NO OR N/A) | RECEIVING RESOURCE OR OTHER | COMMENTS |
|---------------|--------------|------------------------------|----------------------|----------------------------|----------------------------|----------------------------|--|---|-------------------------------|---|
| OUT EX-1 | | 447+90 RT | 2.88 | 2.12 | | | N/A | N/A | WWC-1/EPH-1 TO STR-1 | (35.932621, -86.787666) |
| OUT EX-2 | | 447+95 RT | 3.00 | 18.06 | | | YES | N/A | WWC-1/EPH-1 TO STR-1 | (35.932536, -86.787636) SEE SEQUENCING NOTES ON SHEETS 15D AND 15L |
| OUT EX-3 | | 451+05 RT | 2.25 | 13.29 | | | YES | N/A | WWC-2/EPH-2 TO STR-1 | (35.932637, -86.786429) SEE SEQUENCING NOTES ON SHEETS 15D AND 15L |
| | OUT EX-3A | 451+25 RT | 4.25 | 5.30 | | | NO | N/A | WWC-2/EPH-2 TO STR-1 | (35.932745, -86.786300) SEE SEQUENCING NOTES ON SHEETS 15D AND 15L |
| OUT EX-4 | | 458+50 RT | 3.50 | 1.95 | 1.95 | 1.95 | N/A | N/A | WWC-3/EPH-3 TO STR-1 | (35.932794, -86.784219) |
| OUT EX-5A | | 463+50 RT | 10.50 | 3.27 | | | N/A | N/A | STR-1 | (35.933123, -86.782508) |
| OUT EX-5B | | 463+45 RT | 13.00 | 0.10 | | | N/A | N/A | STR-1 | (35.933045, -86.782506) |
| OUT EX-5C | | 2+15 LT (PLAYERS MILL RD) | 2.50 | 0.17 | | | N/A | N/A | STR-1 | (35.932598, -86.783408) |
| OUT EX-5D | | 2+15 RT (PLAYERS MILL RD) | 2.50 | 0.20 | | | N/A | N/A | STR-1 | (35.932590, -86.783534) |
| OUT EX-6 | | 472+20 RT | 5.30 | 4.82 | | | N/A | N/A | WWC-3A/EPH-3A TO STR-2 | (35.933027, -86.779308) |
| OUT EX-7 | | 483+33 RT | 6.10 | 2.21 | | | N/A | N/A | WWC-4/EPH-4 TO STR-3 | (35.934857, -86.776030) |
| OUT EX-8 | | 496+50 RT | 6.80 | 0.74 | | | N/A | N/A | STR-3 | (35.937006, -86.772565) |
| OUT EX-9 | | 506+67 RT | 0.90 | 0.60 | | | N/A | N/A | STR-3 | (35.937286, -86.769227) |
| OUT EX-10 | | 460+20 RT | 3.97 | 1.38 | | | N/A | N/A | STR-1 | (35.932753, -86.783636) |
| OUT-1 | | 437+50 LT | 6.07 | | 0.83 | 0.83 | N/A | N/A | LEAVES ROW VIA ROADSIDE DITCH | (35.932303, -86.791217) |
| OUT-3 | | 448+10 RT | 3.00 | | 18.06 | 18.06 | YES | N/A | WWC-1/EPH-1 TO STR-1 | (35.932656, -86.787655) SEE SEQUENCING NOTES ON SHEETS 15D AND 15L. SEE SUBOUTFALLS. |
| | OUT SUB-3A | 448+05 RT | 4.25 | | 0.21 | 0.21 | N/A | N/A | WWC-1/EPH-1 TO STR-1 | (35.932620, -86.787681) |
| | OUT SUB-3B | 448+15 RT | 5.40 | | 0.62 | 0.62 | N/A | N/A | WWC-1/EPH-1 TO STR-1 | (35.932624, -86.787618) |
| | OUT SUB-3C | 448+12 RT | 3.00 | | 0.32 | 0.32 | N/A | N/A | WWC-1/EPH-1 TO STR-1 | (35.932780, -86.787689) |
| | OUT SUB-3D | 448+45 RT | 2.28 | | 0.06 | 0.06 | N/A | N/A | WWC-1/EPH-1 TO STR-1 | (35.932799, -86.787583) |
| | OUT SUB-3E | 448+45 LT | 3.43 | | 0.05 | 0.05 | N/A | N/A | WWC-1/EPH-1 TO STR-1 | (35.932928, -86.787618) |
| | OUT SUB-3F | 448+50 LT | 1.68 | | 16.80 | 16.80 | YES | N/A | WWC-1/EPH-1 TO STR-1 | (35.933125, -86.787671) SEE SEQUENCING NOTES ON SHEET 15D AND 15L. |
| OUT-4 | | 452+20 RT | 2.25 | | 13.29 | 18.59 | YES | N/A | WWC-2/EPH-2 TO STR-1 | (35.932716, -86.786351) SEE SEQUENCING NOTES ON SHEET 15D AND 15L. SEE SUBOUTFALLS. |
| | OUT SUB-4A | 452+25 RT | 4.25 | | 5.30 | 5.30 | NO | N/A | WWC-2/EPH-2 TO STR-1 | OUT EX-3A IN STAGE 1 (35.932745, -86.786300) |
| | OUT SUB-4B | 452+33 RT | 2.54 | | 1.00 (EST) | 1.00 (EST) | N/A | N/A | WWC-2/EPH-2 TO STR-1 | (35.932950, -86.786271) |
| | OUT SUB-4C | 452+50 RT | 3.00 | | 1.00 (EST) | 1.00 (EST) | N/A | N/A | WWC-2/EPH-2 TO STR-1 | (35.933019, -86.786243) |
| | OUT SUB-4D | 452+55 LT | 4.25 | | 0.21 | 0.21 | N/A | N/A | WWC-2/EPH-2 TO STR-1 | (35.933088, -86.786218) |
| | OUT SUB-4E | 452+67 LT | 3.96 | | 0.62 | 0.62 | N/A | N/A | WWC-2/EPH-2 TO STR-1 | (35.933156, -86.786188) |
| | OUT SUB-4F | 452+75 LT | 2.19 | | 13.29 | 13.29 | YES | N/A | WWC-2/EPH-2 TO STR-1 | (35.933292, -86.786143) SEE SEQUENCING NOTES ON SHEET 15D AND 15L. |

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SPP-9.84

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|--|--|---|--|
|  Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, TN 37067 | | EAST MCEWEN DRIVE PHASE 4 IMPROVEMENTS WILLIAMSON COUNTY, TENNESSEE | |
| DRAWN BY: JTM CHECKED BY: JLW DATE: 12/27/2023 DATE: 1/14/2024 | | PROJECT NO.: 333-216 SHEET NO.: 7 | |
| PREVENTION PLAN | | | |

| OUTFALL LABEL | SUB OUT-FALL | STATION CL, LT OR RT | SLOPE WITHIN ROW (%) | STAGE 1 DRAINAGE AREA (AC) | STAGE 2 DRAINAGE AREA (AC) | STAGE 3 DRAINAGE AREA (AC) | SEDIMENT BASIN OR EQUIVALENT MEASURE(S) (YES, NO OR N/A) | SEDIMENT TRAP OR EQUIVALENT MEASURE(S) (YES, NO OR N/A) | RECEIVING RESOURCE OR OTHER | COMMENTS |
|---------------|--------------|-----------------------------------|----------------------|----------------------------|----------------------------|----------------------------|--|---|--|---|
| OUT-5 | | 2+33 CL (PLAYERS MILL RD) | 0.50 | | 0.36 | 0.36 | N/A | N/A | STR-1 | (35.932548, -86.783456) |
| OUT-6 | | 1+50 LT (PLAYERS MILL RD) | 2.44 | | 0.21 | 0.21 | N/A | N/A | STR-1 | (35.932764, -86.783103) |
| OUT-7 | | 464+00 CL | 8.81 | | 2.10 | 2.10 | N/A | N/A | STR-1 | (35.933280, -86.782370) |
| OUT-7A | | 463+50 RT | 2.44 | | 1.09 | 1.09 | N/A | N/A | STR-1 | (35.933045, -86.782506) |
| OUT-7B | | 4+50 RT (ROAD OF THE ROUND TABLE) | 2.20 | | 1.75 | 1.75 | N/A | N/A | STR-1 | (35.933584, -86.782311) |
| OUT-8 | | 472+20 RT | 3.64 | | 7.50 | 7.50 | YES | N/A | WWC-3A/EPH-3A TO STR-2 | (35.933027, -86.779308) |
| OUT-9 | | 474+15 RT | 15.12 | | 0.98 | 0.98 | N/A | N/A | LEAVES ROW VIA OVERLAND FLOW & SHEETS TO STR-2 | (35.933224, -86.778724) |
| OUT-10 | | 483+05 RT | 1.56 | | 0.93 | 0.93 | N/A | N/A | LEAVES ROW VIA ARTICULATED CONC. MAT LINED CHANNEL | (35.934762, -86.776100) |
| OUT-11 | | 495+50 RT | 3.00 | | 36.33 | 36.33 | YES | N/A | STR-3 | 10.49 AC CLEAN PASS-THROUGH; REMAINING AREA ROUTED THROUGH SEDIMENT BASIN (35.936673, -86.772784) |
| OUT-12 | | 506+67 RT | 0.35 | | 1.60 | 1.60 | N/A | N/A | STR-3 | (35.937091, -86.769233) |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

"EX" DENOTES OUTFALL IN EXISTING CONDITIONS.

ALL UNUSED FIELDS WITHIN THE OUTFALL TABLE ARE TO BE SHADED, HATCHED, OR REMOVED TO INDICATE THEIR NON-USAGE.

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FOR INFORMATION ONLY!

SPP-9.85

| | | |
|--|---|----------------------|
|  Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, TN 37067 | EAST MCEWEN DRIVE PHASE 4 IMPROVEMENTS WILLIAMSON COUNTY, TENNESSEE | |
| | STORM WATER POLLUTION PREVENTION PLAN | |
| DRAWN BY: JTM DATE: 12/27/2023 | CHECKED BY: JLW DATE: 1/14/2024 | PROJECT NO.: 333-216 |
| | | SHEET NO.: 8 |



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

December 13, 2023

Mr. Paul Holzen, P.E.
Director of Engineering
e-copy: paul.holzen@Franklin.tn.gov
City of Franklin
109 3rd Ave South
Franklin, TN 37064

Subject: **Franklin**
County: Williamson
Wastewater Project Number: 23.0524
Project: East McEwen Drive Force Main Relocation Plans

Dear Mr. Holzen:

The Tennessee Department of Environment and Conservation, Division of Water Resources, acknowledges the receipt of your construction documents on September 15, 2023 and additional information through December 11, 2023.

The project consists of installation of 4,918 linear feet of 6-inch DIP Class 350 forcemain for a proposed roadway project.

Approval is granted in accordance with certain requirements of the Water Quality Control (WQC) Act of 1977 and Regulations of the Water Quality Control Board. **On the coversheet(s) of the site's set of plans and specifications, an approval date and its expiration date will be stamped by the division. Any indication of tampering with the bound set of documents will be subject to investigation and prosecution.** One complete set of construction documents, bearing the official stamp, must be kept at the construction site.

Approval expires one year from the stamped approval date (December 12, 2023) unless construction is either underway or complete. Any request for extension must be made prior to this expiration date. Significant deviations from the approved plan documents must be submitted

and approved in writing before such changes are made. Minor changes made during construction need not have prior written approval. Modifications, however, may be required by this Department should the changes be deemed inappropriate. It is advisable, therefore to obtain prior approval in cases where the significance of the change is uncertain.

The Division of Water Resources is authorized to inspect the construction work to verify compliance with the approved plans and specifications, which are on the site. Therefore, the engineer shall notify our staff at the Nashville Environmental Field Office by calling (615) 687-7000 before the start of construction.

Approval of these construction documents should not be construed as a permit for any activities related to this project. Activities which may require a permit under the WQC Act and Regulations include, but are not limited to, the following: streambank vegetation removal; creek crossing(s) for equipment or utility lines; construction within twenty (20) feet of a stream bank; construction in or near a marshy area or wetland, and/or land disturbance equal to or greater than one acre. Additionally, this approval does not authorize connection and use of sewer that will cause or contribute to collection system overflow or overload of receiving wastewater treatment facility.

The Nashville Environmental Field Office should also be contacted for determinations regarding whether modification of the existing NPDES or SOP permit, an Aquatic Resource Alteration Permit (ARAP) and/or a National Pollutant Discharge Elimination System (NPDES) construction stormwater permit will need to be obtained prior to the beginning of construction of this project.

The division's most recent TDEC Technical/Engineering Documents, including "*Design Criteria for Review of Sewage Works Construction Plans and Documents*", Chapters 1-17, of November 1, 2017, is available on our website: <https://www.tn.gov/environment/program-areas/wr-water-resources/water-quality/water-quality-reports---publications.html>.

To expedite matters, please reference the assigned wastewater project number 23.0524 on any future correspondence. If you have any questions, please feel free to contact Mr. Michael Bascom at (423) 585-7879 or by E-mail at Michael.Bascom@tn.gov.

Sincerely,



Angela Jones, P.E.
Manager, Engineering Services Unit

cc: Water-Based Systems File
Mr. Tim Jennette, Program Manager, TDEC Division of Water Resources, tim.jennette@tn.gov
Ms. Michelle Hatcher, Water Management Director, City of Franklin, Michelle.hatcher@franklintn.gov



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

September 14, 2023

Mr. Paul Holzen
Director of Engineering
e-copy: paul.holzen@franklin.tn.gov
City of Franklin
109 3rd Ave S
Franklin, TN 37064

RE: **MILCROFTON UTILITY DISTRICT (PWSID TN0000247)**
Williamson County
Project Number: DW20230795
East McEwen Drive Water Main Relocation

Dear Mr. Holzen:

The Tennessee Department of Environment and Conservation, Division of Water Resources, acknowledges receipt of construction documents for the referenced project on August 8, 2023.

This project generally consists of approximately 4,920 linear feet of 8-inch PVC water line and related appurtenances. As indicated by our stamp, this project has been approved for construction.

This letter, with the enclosed engineering documents bearing our official stamp, constitutes approval by the Commissioner of the Tennessee Department of Environment and Conservation for construction of the referenced facility. Approval is granted in accordance with the Tennessee Safe Drinking Water Act of 1983 and Regulations of the Tennessee Board of Water Quality, Oil and Gas. One complete set of plans and specifications, bearing the official stamp, must be kept at the construction site. Projects utilizing previously approved standard specifications are not required to maintain a stamped copy of the specifications at the construction site. All construction must conform with these approved documents. It is the responsibility of the water utility and/or their engineer to ensure that construction conforms to the plans and specifications.

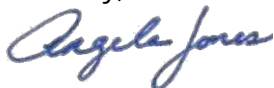
Approval expires one year from the stamped approval date (September 13, 2023) unless construction is either underway or complete. Deviations from the approved plan documents which may affect the quality or quantity of potable water must be submitted and approved in writing before such changes are made.

The Nashville Environmental Field Office should also be contacted for determinations regarding whether an Aquatic Resource Alteration Permit (ARAP) and/or a National Pollutant Discharge Elimination System (NPDES) construction stormwater permit will need to be obtained prior to the beginning of construction of this project.

The Division's appropriate Field Office may desire to schedule an inspection of the construction work to verify compliance with the approved plans and specifications. Therefore the engineer or the water utility shall notify the Nashville Field Office of the start of construction. This notification may be made by completing and sending the attached "Construction Start Notification" form to the field office.

To expedite matters, please reference the assigned drinking water project number DW20230795 on any future correspondence. If you have any questions, please feel free to contact Ms. Rylee Horne by E-mail at Rylee.Horne@tn.gov.

Sincerely,



Angela Jones, P.E.
Manager, Engineering Services Unit

Enclosures: Approved Construction Documents
Construction Start Notification Form

cc: Mr. Mike Jones, General Manager, Milcrofton Utility District, mike@milcrofton.com
Mrs. Lindsey Spears, Inflo Design Group, lindsey.spears@inflodesign.com
Mr. Mehdi Sadri, EPS 3, TDEC Division of Water Resources, dwr.nefo@tn.gov

NOT AN OFFICIAL BID DOCUMENT!
FOR INFORMATION ONLY!

STATE

OF

TENNESSEE

(Rev. 6-20-22)
(Rev. 9-7-22)

January 1, 2021

SPECIAL PROVISION

REGARDING

EQUAL EMPLOYMENT OPPORTUNITY

Electronic Code of Federal Regulations (e-CFR):
23 CFR 230 Chapter 1 Subchapter C Appendix A to Subpart A

Specific Equal Employment Opportunity Responsibilities

General

- a) Equal employment opportunity requirements not to discriminate and to take affirmative action to assure equal employment opportunity as required by Executive Order 11246 and Executive Order 11375 are set forth in Required Contract Provisions (Form PR-1273 or 1316, as appropriate) and these Special Provisions which are imposed pursuant to Section 140 of Title 23, U.S.C., as established by Section 22 of the Federal-Aid Highway Act of 1968. The requirements set forth in these Special Provisions shall constitute the specific affirmative action requirements for project activities under this contract and supplement the equal employment opportunity requirements set forth in the Required Contract Provisions.
- b) The contractor will work with the Tennessee Department of Transportation and the Federal Government in carrying out equal employment opportunity obligations and in their review of his/her activities under the contract.
- c) The contractor and all his/her subcontractors holding subcontracts not including material suppliers, of \$10,000 or more, will comply with the following minimum specific requirement activities of equal employment opportunity: (The equal employment opportunity requirements of Executive Order 11246, as set forth in Volume 6, Chapter 4, Section 1, Subsection 1 of the Federal-Aid Highway Program Manual, are applicable to material suppliers as well as contractors and subcontractors). The contractor will include these requirements in every subcontract of \$10,000 or more with such modification of language as is necessary to make them binding on the subcontractor.

Equal Employment Opportunity Policy

The contractor will accept as his operating policy the following statement which is designed to further the provision of equal employment opportunity to all persons without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability and to promote the full realization of equal employment opportunity through a positive continuing program:

It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability. Such action shall include employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training.

Equal Employment Opportunity Officer

The contractor will designate and make known to the Tennessee Department of Transportation contracting officers an equal employment opportunity officer (hereinafter referred to as the EEO Officer) who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of equal employment opportunity and who must be assigned adequate authority and responsibility to do so.

Dissemination of Policy

- a) All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's equal employment opportunity policy and contractual responsibilities to provide equal employment opportunity in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:
 - 1) Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's equal employment opportunity policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.
 - 2) All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer or other knowledgeable company official covering all major aspects of the contractor's equal employment opportunity obligations within thirty days following their reporting for duty with the contractor.
 - 3) All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer or appropriate company official in the contractor's procedures for locating and hiring minority group employees.

- b) In order to make the contractor's equal employment opportunity policy known to all employees, prospective employees, and potential sources of employees, i.e., schools, employment agencies, labor unions (where appropriate), college placement officers, etc., the contractor will take the following actions:
- 1) Notices and posters setting forth the contractor's equal employment opportunity policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
 - 2) The contractor's equal employment opportunity policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

Recruitment

- a) When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be published in newspapers or other publications having a large circulation among minority groups in the area from which the project work force would normally be derived.
- b) The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants, including, but not limited to, State employment agencies, schools, colleges and minority group organizations. To meet this requirement, the contractor will, through his EEO Officer, identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.

In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with equal employment opportunity contract provisions. (The U.S. Department of Labor has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended).

- c) The contractor will encourage his present employees to refer minority group applicants for employment by posting appropriate notices or bulletins in areas accessible to all such employees. In addition, information and procedures with regard to referring minority group applicants will be discussed with employees.

Personnel Actions

Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability. The following procedures shall be followed:

- a) The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.
- b) The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
- c) The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
- d) The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

Training and Promotion

- a) The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.
- b) Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event the Special Provision Regarding Training Program Requirements is provided under this contract, this subparagraph will be superseded as indicated therein.
- c) The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.
- d) The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

Unions

If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

- a) The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
- b) The contractor will use best efforts to incorporate an equal employment opportunity clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability.
- c) The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the Tennessee Department of Transportation and shall set forth what efforts have been made to obtain such information.
- d) In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age or disability, making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The U.S. Department of Labor has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees). In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the Tennessee Department of Transportation.

Subcontracting

- a) The contractor will use his best efforts to solicit bids from and to utilize minority group subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of minority-owned construction firms from the Tennessee Department of Transportation.
- b) The contractor will use his best efforts to ensure subcontractor compliance with their equal employment opportunity obligations.

Records and Reports

- a) The contractor will keep such records as are necessary to determine compliance with the contractor's equal employment opportunity obligations. The records kept by the contractor will be designed to indicate:
- 1) The number of minority and non-minority group members and women employed in each work classification on the project.
 - 2) The progress and efforts being made in cooperation with unions to increase employment opportunities for minorities and women. (Applicable only to contractors who rely in whole or in part on unions as a source for their work force),
 - 3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees, and
 - 4) The progress and efforts being made in securing the services of minority group subcontractors or subcontractors with meaningful minority and female representation among their employees.
- b) All such records must be retained for a period of 3 years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the of the Tennessee Department of Transportation and the Federal Highway Administration.
- c) The contractors will submit an annual report to the Tennessee Department of Transportation each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form PR 1391. If on-the-job training is being required by "Training Special Provision," the contractor will be required to furnish Form FHWA 1409.
- d) The contractor and subcontractors will be required to complete other reports as instructed by the Engineer.
- e) Current estimates may be withheld by the Engineer when reports are not received within the above specified time limits.

STATE

OF

TENNESSEE

(Rev. 6-20-22)

January 1, 2021

(Rev. 9-7-22)

SPECIAL PROVISION

REGARDING

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY

CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)

Electronic Code of Federal Regulations (e-CFR):

41 CFR 60-4.3 Equal Opportunity Clauses

1) As used in these specifications:

- a) "Covered area" means the geographical area described in the solicitation from which this contract resulted;
- b) "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
- c) "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
- d) "Minority" includes:
 - I. Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
 - II. Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish or Portuguese Culture or origin, regardless of race);
 - III. Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
 - IV. American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2) Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation, and which is set forth in the solicitations from which this contract resulted.

- 3) If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
- 4) The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.
- 5) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specification, Executive Order 11246, or the regulations promulgated pursuant thereto.
- 6) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.
- 7) The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
 - a) Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction

project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

- b) Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available and maintain a record of the organization's responses.
- c) Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.
- d) Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- e) Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The contractor shall provide notice of these programs to the sources compiled under 7.b) above.
- f) Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g) Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

- h) Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
 - i) Direct its recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screenings procedures, and tests to be used in the selection process.
 - j) Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.
 - k) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
 - l) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriation training, etc., such opportunities.
 - m) Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
 - n) Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
 - o) Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
 - p) Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
- 8) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of

the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

- 9) A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women, generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
- 10) The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability.
- 11) The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
- 12) The Contractor shall carry out such sanctions and penalties for violations of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
- 13) The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
- 14) The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

- 15) Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

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STATE

OF

TENNESSEE

(Rev. 6-20-22)

January 1, 2021

SPECIAL PROVISION

REGARDING

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION

TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)

Electronic Code of Federal Regulations (e-CFR):
41 CFR 60-4.2 -- Solicitations

- 1) The Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.
- 2) The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

| <u>County</u> | <u>Goals for Female Participation in each Trade</u> |
|---------------|---|
| All Counties | 6.9 |

| <u>County</u> | <u>Goals for Minority Participation for each Trade</u> |
|---|--|
| Lincoln | 11.2 |
| Hamilton, Marion, Sequatchie | 12.5 |
| Bledsoe, Bradley, Grundy, McMinn, Meigs, Monroe, Polk, Rhea | 8.6 |
| Carter, Hawkins, Sullivan, Unicoi, Washington | 2.6 |
| Greene, Hancock, Johnson | 3.2 |
| Anderson, Blount, Knox, Union | 6.6 |
| Campbell, Claiborne, Cocke, Cumberland, Fentress, Grainger, Hamblen, Jefferson, Loudon, Morgan, Roane, Scott, Sevier | 4.5 |

| <u>County</u> | <u>Goals for Minority Participation for each Trade</u> |
|---|--|
| Montgomery | 18.2 |
| Davidson, Cheatham, Dickson, Robertson, Sumner, Williamson, Wilson, Rutherford | 15.8 |
| Bedford, Cannon, Clay, Coffee, Dekalb, Franklin, Giles, Hickman, Houston, Humphreys, Jackson, Lawrence, Lewis, Macon, Marshall, Maury, Moore, Overton, Perry, Pickett, Putnam, Smith, Stewart, Trousdale, Van Buren, Warren, Wayne, White | 12.0 |
| Shelby, Tipton | 32.3 |
| Benton, Carroll, Chester, Crockett, Decatur, Dyer, Fayette, Gibson, Hardeman, Hardin, Haywood, Henderson, Henry, Lake, Lauderdale, McNairy, Madison, Obion, Weakley | 26.5 |

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted). If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in CFR Part 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from Project to Project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

- 3) The Contractor shall provide written notification to the Director of Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation.

U.S. Department of Labor – Regional Office
Office of Federal Contract Compliance Program
61 Forsyth Street, Room 7B75
Atlanta, GA 30303

The notification shall list the name, address, and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the contract is to be performed.

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STATE

OF

TENNESSEE

(Rev. 8-20-18)

January 1, 2021

(Rev. 9-7-22)

SPECIAL PROVISION

REGARDING

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION - LOCAL PROGRAMS

The disadvantaged business enterprise (DBE) requirements of 49 CFR Part 26 apply to this contract. Accordingly, Disadvantaged Business Enterprises (DBEs) as defined in 49 CFR Part 26 shall have the maximum appropriate opportunity to participate in the performance of this contract or in the performance of subcontracts to this contract. In this latter regard, the Contractor shall take all necessary and reasonable steps in accordance with 49 CFR Part 26 to ensure that DBEs have the opportunity to compete for and perform subcontracts. The Contractor shall not discriminate on the basis of race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability in the award of subcontracts.

The Contractor shall submit to the Civil Rights Division Small Business Development Program (CRD-SBDP) copies of any subcontract agreements with DBEs upon execution. The Contractor shall identify all DBE subcontractors at the Preconstruction Conference and indicate the approximate date for each DBE subcontractor's appearance on the project. Before terminating and/or substituting a DBE subcontractor, the Contractor must give notice in writing to the DBE subcontractor, with a copy to TDOT's CRD-SBDP, of its intent to terminate and/or substitute including the reason for the request.

The Contractor shall provide notification to the Project Supervisor at least 24 hours prior to each DBE beginning work. The project supervisor or Inspector must complete a "Commercially Useful Function Checklist" to document the first date of work, work items, equipment, and forces of each DBE. The Contractor shall take full responsibility for the performance of a commercially useful function (CUF) by all DBE subcontractors, manufacturers, and materials suppliers who work on or provide materials for the project.

The Contractor shall provide a monthly payment certification to the Department entitled "Prompt Payment Certification Form." The Department shall provide the Contractor with the Prompt Payment Certification Form. An officer of the Contractor shall provide an electronic signature to the Prompt Payment Certification Form and return in Excel format via email to DBE.Runningtally@tn.gov and to the Project Supervisor concurrently. The Prompt Payment Certification Form shall be submitted monthly beginning no later than sixty (60) days after payment of the first estimate. Payments must abide by the conditions set in T.C.A. § 12-4-707.

Prior to receiving final payment, the Contractor shall provide to the project supervisor and CRD-SBDP certification of the dollars paid to each DBE firm, using Form CC3, "Certification of DBE Accomplishment." The certification shall be dated and signed by a responsible officer of the Contractor and by a responsible officer of the DBE. Falsification of this certification may

result in formal enforcement actions, including civil actions for false claims, suspension and debarment proceedings, or other administrative actions affecting bidder qualifications.

The Contractor and all subcontractors shall retain, for a period of not less than three (3) years after final acceptance of a project, copies of canceled checks or other documentation that substantiates payments to DBE firms. These records shall be available at reasonable times and places for inspection by authorized representatives of the Department and various Federal Agencies.

The Contractor is advised that failure to carry out the requirements as set forth above shall constitute a breach of contract, and after notification by the Department, may result in termination of the contract or other remedy as the Department deems appropriate, which may include, but is not limited to:

- 1) Withholding monthly progress payments;
- 2) Assessing sanctions;
- 3) Liquidated damages; and/or
- 4) Disqualifying the contractor from future bidding as non-responsible.

The Title VI and nondiscrimination provisions of USDOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

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STATE

OF

TENNESSEE

(Rev. 6-20-22)

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(Rev.3-1-23)

January 1, 2021

SPECIAL PROVISION

REGARDING

DBE CONTRACT GOAL

Electronic Code of Federal Regulations (e-CFR):
49 CFR 26

All contractors shall pursue affirmative action requirements to encourage and increase participation of firms certified as a Disadvantaged Business Enterprise (DBE) as set forth in this special provision and in accordance with 49 CFR Part 26. The bidder shall arrange for the percentage of the work specified on the cover of the Proposal Contract to be performed by Tennessee Uniform Certification Program (TNUCP) Disadvantaged Business Enterprises (DBEs) or otherwise clearly demonstrate adequate good faith efforts as described herein. All payments must follow the conditions set by the most current T.C.A. § 12-4-707.

The Contractor shall take full responsibility for ensuring the performance of a “commercially useful function” (CUF), as defined in 49 CFR Part 26, by all DBE subcontractors, manufacturers, and materials suppliers who work on the project or provide materials for the project.

A. Disadvantaged Business Enterprise Policy

The Contractor shall abide by the following provision and include in all subcontract agreements the following provision, which is designed to promote full participation of DBEs as suppliers and subcontractors through a continuous, positive result-oriented program on contracts let by the Department:

The Contractor, sub-recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of U.S. Department of Transportation- assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Department deems appropriate, which may include, but is not limited to:

- 1) *Withholding monthly progress payments;*
- 2) *Assessing sanctions;*
- 3) *Liquidated damages; and/or*
- 4) *Disqualifying the contractor from future bidding as non-responsible.*

The Title VI and nondiscrimination provisions of USDOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

B. Counting DBE Participation toward Meeting Goals

The Contractor shall count DBE participation toward goals in accordance with 49 CFR Part-26. If the DBE performs a CUF on the contract including those functions as a subcontractor, expenditures to a DBE contractor count toward DBE goals. A DBE performs a CUF when it is responsible for execution of the specified work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a CUF, the DBE must also be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material, installing (where applicable), and paying for the material itself. The work performed by the DBE firm shall be necessary and useful to the completion of the contract, and consistent with normal highway construction industry practices in Tennessee. Work performed by a DBE firm in a particular transaction may be counted toward the goal only if the Department determines that it involves a CUF. The determination is verified by the “Commercially Useful Function Checklist” and the requirements of 49 CFR Part 26.

Note: In accordance with 49 CFR 26.55(c), to determine whether a DBE is performing a CUF, the Department must evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the contract is commensurate with the work it is actually performing, and the DBE credit claimed for its performance of the work, and other relevant factors. A DBE 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 DBE participation. In determining whether a DBE is such an extra participant, the Department must examine similar transactions, particularly those in which DBEs do not participate.

When a DBE is presumed not to be performing a commercially useful function, the DBE may present evidence to rebut this presumption. The Department may determine that the firm is performing a commercially useful function given the type of work involved and normal industry practices.

The bidder may count the following DBE expenditures involving a CUF towards the DBE goal:

1. Projects where the DBE is the Prime Contractor

The entire portion(s) of the contract to be completed by certified DBE firm’s own forces will be counted toward meeting the goal. This will also include the cost of supplies and materials obtained by the DBE for the work of the contract, including supplies purchased or equipment leased by the DBE. Items of the contract subcontracted to non-DBE firms will not be counted toward the goal.

Note: If a DBE does not perform or exercise responsibility for at least 30 percent of the total cost of its contract with its own work force, or the DBE 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, the Department must presume that it is not performing a commercially useful function.

2. Portions of a Bid from a Joint Venture

When a DBE performs as a participant in a joint venture, only the total dollar value of the contract equal to the distinct, clearly defined portion of the work of the contract that the DBE performs with its own forces will count toward DBE goals. A bid from a joint venture between a DBE and a non-DBE Contractor shall include an explanation of DBE commitments on [Form 8-5](#), which must be approved by the Civil Rights Division - Small Business Development Program (CRD-SBDP) and Local Programs Division prior to the letting. Only the DBE's portion will be counted toward the goal. Joint venture agreements have to be approved separately from the bid documents, prior to the awarding of the contract.

3. DBE Subcontractors

The DBE subcontractor shall assume actual and contractual responsibility for provision of materials and supplies, subcontracted work, or other commercially useful functions of the items of work subcontracted to them. When a DBE subcontracts part of the work of its contract to another firm, the value of the subcontracted work may be counted toward the DBE goal only if the DBE's subcontractor is also a DBE. Work that a DBE subcontracts to a non-DBE firm does not count toward the DBE goal. Cost of materials purchased from, or the cost of equipment leased from the non-DBE Contractor will not count toward the project DBE commitment. Prior written approval must be obtained from the CRD- SBDP for any DBE use of the Contractor's personnel or equipment.

4. DBE Manufacturers

The Contractor may count toward the DBE goal 100% of its expenditures for materials and supplies required under a contract and obtained from a DBE manufacturer only if the DBE operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.

5. DBE Regular Dealers (Material Suppliers)

The Contractor may count toward the DBE goal 60% of its expenditures for materials and supplies required under a contract and obtained from a DBE regular dealer. For purposes of this section, a regular dealer is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles, or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. To be a regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. A firm may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business where such products are bought, kept in stock, and regularly sold to the public if the firm owns and operates the distribution equipment for the products. Any supplementing of the regular dealer's own distribution equipment shall be by a long-term lease and not on an ad hoc or contract-by-contract basis. Any lease containing the terms of the agreement shall be made available to and must be approved in writing by CRD-SBDP.

6. Other DBE Suppliers

With respect to materials or supplies purchased from a DBE which is neither a manufacturer nor a regular dealer, count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site, toward DBE goals; provided, the Department finds the fees to be reasonable and not excessive as compared with fees customarily allowed for similar services. The cost of the materials and supplies themselves shall not count toward DBE goals.

7. Transportation or Hauling of Materials

The Contractor may count towards the DBE goal hauling in either DBE-owned trucks or in trucks leased to or by DBE firms. The verification of truck drivers employed by DBE firms will continue to be by submission of payrolls independent from any Davis-Bacon regulations. Use the following factors in determining whether a DBE trucking company is performing a CUF:

- a. The DBE must be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there cannot be a contrived arrangement for the purpose of meeting DBE goals.
- b. The DBE must itself own and operate at least one fully licensed, insured, and operational truck used on the contract.
- c. The DBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.
- d. The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services that the lessee DBE provides on the contract.
- e. The DBE may also lease trucks from a non-DBE firm, including an owner-operator. The DBE that leases trucks equipped with drivers from a non-DBE is entitled to credit for the total value of transportation services provided by non-DBE leased trucks equipped with drivers not to exceed the value of transportation services provided by DBE-owned trucks or leased trucks with DBE employee drivers. Additional participation by non-DBE owned trucks equipped with drivers receives credit only for the fee or commission it receives as a result of the lease arrangement. If the DBE chooses this approach, it must obtain written consent from the Department [CRD- SBDP].
- f. The DBE may lease trucks without drivers from a non-DBE truck leasing company. If the DBE leases trucks from a non-DBE truck leasing company and uses its own employees as drivers, it is entitled to credit for the value of these hauling services.
- g. For purposes of this paragraph, a lease must indicate that the DBE has exclusive use of and control over the truck. Leases cannot be Department contract-specific, must be long term, and must be approved by CRD-SBDP. This does not preclude the leased truck from working for others during the term of the lease with the consent of the DBE, so long as the lease gives the DBE absolute priority for use of the leased truck. Leased trucks must display the name and identification number of the DBE.

- h. Prior to hauling, the Contractor and DBE shall provide the District Supervisor a complete list of trucks that will be used on the project for DBE goal participation. The Department will provide a form that shall be used by the Contractor and the DBE to identify the trucks. A revised list will be required any time the trucks used changes. The Contractor and DBE must be able to adequately document the actual amount of hauling eligible for DBE goal participation.

8. Contracted Labor / Temporary Employment Agencies

The Department will count the entire amount of fees or commissions charged by a DBE firm for providing a bona fide service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of the contract; provided, however, the Department must find the fee to be reasonable and not excessive as compared to the fees customarily allowed for similar services.

C. Contract Award Procedures

The established DBE goal will be shown on the proposal as a percent of the total amount bid. If the total proposed DBE work submitted with the bid is less than the percentage participation goal set by the Department, the bidder shall, within three (3) business days from the bid openings, either propose sufficient additional DBE participation to meet the goal or clearly demonstrate by documentation that good faith efforts were made to meet the goal.

1. Bidder's Responsibility

It is the bidder's responsibility to determine the level of professional competence and financial responsibility of any proposed DBE subcontractor. The bidder shall ascertain that the proposed DBE subcontractor has suitable experience and equipment to perform a commercially useful function for work that is common industry practice in the Tennessee highway construction industry.

The Contractor shall develop and maintain records of negotiations with DBEs to reach agreeable prices, quotations, and work schedules, including but not limited to a record of dates when the Contractor first contacted each DBE.

2. DBE's Responsibility

Before bidding and subsequently entering into a contract (as a contractor or subcontractor), the DBE should consider the scope and size of the project, as well as whether it is certified to receive credit for the type of work performed. As with any contract, this is a legally binding document and should be performed to the best of one's ability. However, should a DBE ever have to withdraw from a contract, it shall provide the CRD-SBDP and Contractor with written documentation. A DBE should only withdraw when there is no other option, as non-completion of its duties may result in temporary disqualification of a prequalified bidder or subcontractor by suspending the privilege of bidding on Department contracts or becoming an approved subcontractor, as outlined in Chapter 1680-05-03 of the Rules of the Department.

3. Proposals with Established Project DBE Goals

For proposals with established project goals, the bidder will be required to complete [Form 8-5: DBE Award Information](#). The bidder shall list the following information on each Form 8-5 that is submitted:

- a. The names and addresses of all DBE firms being used or being considered for use under the contract as part of the bidder's DBE commitment.
- b. The work classification(s) for each DBE on the contract.
- c. The "Amount to DBE" which has been committed to each DBE firm for use on the contract.
- d. Written documentation of the bidder's commitment to use a DBE subcontractor whose participation it submits to meet a contract goal; and
- e. Written confirmation from each listed DBE firm that it is participating in the contract in the kind and amount of work provided in the Contractor's commitment.
- f. All other requested information that is on Form 8-5.

Submit the quote from the DBE and the completed DBE Form 8-5 within three (3) business days after the Letting. Failure to provide the quote and the completed form or documentation clearly evidencing a good faith effort, as detailed in Section 4 below, within three (3) business days after the Letting may cause the bid to be rejected as irregular. Only certified DBE firms may be used. Contractor may access certification information by viewing the [TNUCP DBE Directory website](#).

When DBE goal projects are involved and the Contractor subcontracts to a non-DBE, and the non-DBE subcontractor in turn subcontracts to a DBE as a second-tier subcontractor, the Contractor must affirm in writing his/her knowledge and approval of such an arrangement. Recognition of a second-tier arrangement with a DBE subcontractor for goal work must be forwarded to the CRD-SBDP Director for verification, in writing, prior to any work being performed by the DBE which is intended to be counted toward the goal.

4. Bidder Selection and Good Faith Efforts

- a. Bidders shall submit proposals that meet the DBE goal or shall submit documentation clearly evidencing that they made a good faith effort to meet the DBE goal. Contractors who meet or exceed the contract goal will be assumed to have made good faith efforts to utilize DBE firms. DBE firms who bid as Prime Contractors will be considered to have met the goal.
- b. In making a fair and reasonable judgment as to whether the bidder has made adequate good faith efforts, the Department shall consider quality, quantity, and intensity of the different kinds of efforts that the bidder has made. The following list of factors is not intended to be a mandatory checklist, nor is it intended to be exclusive or exhaustive. Other factors or types of efforts may be relevant in appropriate cases. In any event, the Department may consider whether the bidder:
 - 1) Selected portions of the work likely to attract DBE participation. The total dollar value of the portions selected should meet or exceed the contract DBE goal. If it is necessary, the bidder should break down subcontracts into economically feasible units in order to facilitate participation.

- 2) Provided notice to a reasonable number of specific DBEs, including those not regularly used by the bidder, that their participation in the contract is being solicited in sufficient time to allow them to participate effectively.
 - 3) Provided interested DBEs with adequate information about the plans, specifications, and requirements of the contract.
 - 4) Advertised in trade association publications or minority-focused media concerning participation opportunities.
 - 5) Effectively used the services of available minority community organizations, minority contractors' groups, local, state, or federal minority business assistance offices, or other organizations that provide assistance in the recruitment and placement of DBEs.
 - 6) Negotiated in good faith with interested DBEs, including not rejecting DBEs as unqualified lacking sound reasons based on a thorough investigation of their capabilities.
 - 7) Made efforts to assist interested DBEs in obtaining bonding or insurance required by the bidder.
 - 8) Submitted all quotations received from DBEs, and for those quotations not accepted, an explanation of why the DBE was not accepted including price comparisons. Receipt of a lower quotation from a non-DBE will not in itself excuse a bidder's failure to meet the contract goal.
 - 9) Has adequate records of its contacts and negotiations with DBEs.
- c. If the Contractor has not met the DBE goal or submitted documentation clearly evidencing good faith efforts within three (3) business days after the bid opening, the Contractor's bid will be considered non-responsive and may be cause for the forfeiture of the Proposal Guaranty which shall become the property of the Department, not as penalty, but as liquidated damages. The Department then may consider the next lowest responsive bid for award.

As soon as practical after contract award, the Contractor shall submit copies of all binding subcontracts and purchase orders with DBEs to the respective District Supervisor and to CRD-SBDP.

No progress estimate shall be processed until copies of all binding subcontracts and purchase orders with DBEs have been received.

5. Joint Checking Allowance for DBE

A DBE must receive pre-approval by the Department before using a joint check. Joint check requests shall be submitted by the DBE to CRD-SBDP prior to the subcontract agreement.

The following are some general conditions that must be met regarding joint check use:

- a. The second party (typically the Contractor) acts solely as a guarantor.
- b. The DBE must release the check to the supplier.
- c. The use of joint checks must be a commonly recognized business practice in the industry.
- d. The DBE remains responsible for all other elements of 49 CFR Part 26.55(c)(1).
- e. The DBE is not required to use a specific supplier nor the Contractor's negotiated unit price.
- f. The DBE shall submit receipt/copy of cancelled checks to CRD- SBDP.

D. Construction Requirements

1. Preconstruction Conference

The Contractor shall identify all DBE subcontractors and indicate the approximate dates for their appearance on the project. The Department will review the contract information to verify the actual work to be performed by the DBE subcontractors and will review any lease agreements allowed as part of the DBE commitment. Information submitted shall match Form 8-5.

2. Process for Removal of a DBE

At no time shall a DBE be terminated or substituted without prior written consent from CRD-SBDP. This includes, but is not limited to, instances in which the Contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm. The Contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the Contractor obtains the CRD-SBDP's written consent as provided herein. Absent such written consent, the Contractor shall not be entitled to any payment for work or material unless it is by the listed DBE. The CRD-SBDP may provide such written consent only if it agrees that the Contractor has good cause to terminate the DBE firm, as further described below.

Before terminating and/or substituting a DBE subcontractor on a project that includes SP1247 in the Contract Proposal, the Contractor must give notice in writing to the DBE subcontractor, with a copy to the CRD-SBDP, of its intent to request to terminate and/or substitute including the reason for the request.

The Contractor must then give the DBE five (5) days to respond to the Contractor's notice. The DBE shall then advise the CRD-SBDP and the Contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why the CRD-SBDP should not approve the Contractor's action. If required in a particular case as a matter of public necessity (e.g., safety), the CRO-SBDP may provide a response period shorter than five (5) days.

If approval is granted for removal, CRD-SBDP will submit a letter to the Contractor and the DBE. Good faith efforts shall then be directed at finding another DBE subcontractor to perform at least the same amount of work under the contract as the DBE that was terminated, to the extent needed to meet the contract goal established.

The good faith efforts shall be documented by the Contractor. If requested by the CRD-SBDP, the Contractor shall submit the documentation within seven (7) days, which may be extended for an additional seven (7) days, if necessary, at the request of the Contractor, and the CRD-SBDP shall provide a written determination to the Contractor stating whether or not good faith efforts have been demonstrated.

The Contractor has the responsibility to comply with 49 CFR Part 26.53(f) and all applicable policies and regulations.

Reasons for termination and/or substitution of a DBE subcontractor must meet the reasons for good cause as outlined in the current 49 CFR Part 26.53(f), which include, but are not limited to, circumstances in which the listed DBE subcontractor:

- a. Fails or refuses to execute a written contract.
 - b. Fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the Contractor.
 - c. Fails or refuses to meet the Contractor's reasonable, nondiscriminatory bond requirements.
 - d. Becomes bankrupt, insolvent, or exhibits credit unworthiness.
 - e. Becomes ineligible to work on public works projects because of suspension and debarment proceedings pursuant with 2 CFR Parts 180 and 1200 or applicable state law.
 - f. Is not a responsible subcontractor, as determined by the Department.
 - g. Voluntarily withdraws from the project and provides written notice to the Contractor of its withdrawal.
 - h. Is ineligible to receive DBE credit for the type of work required.
 - i. Is unable to complete its work on the contract as a result of death or disability of an owner; and/or
 - j. For other documented good cause, the Department may elect to compel the termination of the DBE subcontractor; provided that good cause does not exist if the Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the Contractor can self-perform the work for which the DBE was engaged, or so that the Contractor can substitute another DBE or non-DBE subcontractor after contract award.
3. Brokering of work by DBEs is not allowed and is a material breach of contract. A DBE firm involved in brokering of work may result in removal or suspension of DBE certification and/or formal enforcement actions, including civil actions for false claims, suspension and debarment proceedings, or other administrative actions affecting bidder qualifications. Any firm involved in brokering of work that engages in willful falsification distortion, or misrepresentation with respect to any facts related to the project shall be referred to the U. S. Department of Transportation's Office of the Inspector General for prosecution under Title 18, U.S. Code, Section 641. Contractor shall place this provision in all subcontracts with DBEs.

4. The Contractor shall provide notification to the Project Supervisor at least 24 hours prior to each DBE beginning work. A Department Project Supervisor/Inspector must complete a Commercially Useful Function (CUF) Checklist to document the first date of work, work items, equipment, and forces of each DBE.
5. The Contractor shall provide a monthly payment certification to the Department entitled "Prompt Payment Certification Form." The Department shall provide the Contractor with a computer generated [Prompt Payment Certification Form: LP Form 8-29](#). An officer of the Contractor shall provide electronic signature to the Prompt Payment Certification Form and return via email to DBE.Runningtally@tn.gov.

Prompt Payment data shall be submitted monthly beginning no later than sixty (60) days after payment of the first estimate.

6. The Department will hold estimate payment if previously listed information is not submitted. Reasons for non-payment to a DBE could include the following:
 - a. Whether the DBE is performing satisfactorily.
 - b. Whether the Contractor has reason to believe the DBE is not performing a commercially useful function, and if so, why, and what steps the Contractor is taking to rectify the situation.

In the event the Contractor reports questions in relation to prompt payment regarding whether a DBE is independent and performing a commercially useful function and takes appropriate steps promptly to address the issue, then the Department will take this effort into account when considering Contractor compliance measures as described below. Payments must abide by the conditions set in TCA 12-4-707.

E. Post Construction Requirements

Prior to receiving final payment, the Contractor shall provide to the Project Engineer and CRD-SBDP certification of the dollars paid to each DBE firm, using [Form 8-35; CC3](#). The certification shall be dated and signed by a responsible officer of the contractor and by a responsible officer of the DBE. Falsification of this certification may result in removal or suspension of DBE certification and/or formal enforcement actions, including civil actions for false claims, suspension and debarment proceedings, or other administrative actions affecting bidder qualifications. The final estimate will not be paid to the Contractor until proper certifications including CC-3 have been made.

F. Required Records

The Contractor and all subcontractors shall retain, for a period of not less than three (3) years after final acceptance of a project, copies of canceled checks or other documentation that substantiates payments to DBE firms. These records shall be available at reasonable times and places for inspection by authorized representatives of the Department and various Federal Agencies. Copies shall be provided to the Department if requested.

G. Contractor Compliance

If the Contractor fails to comply with Special Provision 1247 and/or 49 CFR Part 26, including failure to obtain goal where a good faith effort was not accepted, the Department shall take one or a combination of the following steps:

1. Withhold from the Contractor the monetary value of the unattained goal percentage plus an additional 10% for engineering costs, not as penalty but as liquidated damages.
2. Suspend the Contractor from participation in Department bid lettings pursuant to rules promulgated by the Department.
3. For repeated failures to comply, debar the Contractor pursuant to rules promulgated by the Department.
4. Invoke other remedies available by law and/or in the contract.
5. Invoke any other lawful remedy agreed upon by the Commissioner and the Contractor in writing.

NOT AN OFFICIAL BID DOCUMENT!
FOR INFORMATION ONLY!

NOT AN OFFICIAL BID DOCUMENT!
FOR INFORMATION ONLY!

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**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Non-segregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
- XI. Certification Regarding Use of Contract Funds for Lobbying
- XII. Use of United States-Flag Vessels:

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under title 23, United States Code, as required in 23 CFR 633.102(b) (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services). 23 CFR 633.102(e).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider. 23 CFR 633.102(e).

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services) in accordance with 23 CFR 633.102. The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in solicitation-for-bids or request-for-proposals documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract). 23 CFR 633.102(b).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work

performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract. 23 CFR 633.102(d).

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR Part 230, Subpart A, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal Employment Opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (see 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140, shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR Part 35 and 29 CFR Part 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract. 23 CFR 230.409 (g)(4) & (5).

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, sexual orientation, gender identity, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action or are substantially involved in such action, will be made fully cognizant of and will implement the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer or other knowledgeable company official.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action

within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs (i.e., apprenticeship and on-the-job training programs for the geographical area of contract performance). In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. 23 CFR 230.409. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide

sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established thereunder. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, sexual orientation, gender identity, national origin, age, or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors, suppliers, and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurances Required:

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

- (1) Withholding monthly progress payments;
- (2) Assessing sanctions;
- (3) Liquidated damages; and/or
- (4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women.

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of more than \$10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, the contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location under the contractor's control where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway

Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages (29 CFR 5.5)

a. *Wage rates and fringe benefits.* All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act ([29 CFR part 3](#))), the full amount of basic hourly wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. As provided in paragraphs (d) and (e) of 29 CFR 5.5, the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act ([40 U.S.C. 3141\(2\)\(B\)](#)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.e. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph 4. of this section. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided*, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph 1.c. of this section) and the Davis-Bacon poster (WH-1321) must be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. *Frequently recurring classifications.* (1) In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in [29 CFR part 1](#), a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph 1.c. of this section, provided that:

(i) The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;

(ii) The classification is used in the area by the construction industry; and

(iii) The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

(2) The Administrator will establish wage rates for such classifications in accordance with paragraph 1.c.(1)(iii) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. *Conformance.* (1) The contracting officer must require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is used in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

(3) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken will be sent by the contracting officer by email to DBAconformance@dol.gov. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer will, by email to DBAconformance@dol.gov, refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(5) The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division

under paragraphs 1.c.(3) and (4) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 1.c.(3) or (4) of this section must be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

d. *Fringe benefits not expressed as an hourly rate.* Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. *Unfunded plans.* If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided*, That the Secretary of Labor has found, upon the written request of the contractor, in accordance with the criteria set forth in § 5.28, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

f. *Interest.* In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

2. Withholding (29 CFR 5.5)

a. *Withholding requirements.* The contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph 3.d. of this section, the contracting agency may on its own initiative and after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with paragraph

2.a. of this section or Section V, paragraph 3.a., or both, over claims to those funds by:

- (1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- (2) A contracting agency for its procurement costs;
- (3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- (4) A contractor's assignee(s);
- (5) A contractor's successor(s); or
- (6) A claim asserted under the Prompt Payment Act, [31 U.S.C. 3901–3907](#).

3. Records and certified payrolls (29 CFR 5.5)

a. *Basic record requirements* (1) *Length of record retention.* All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

(2) *Information required.* Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in [40 U.S.C. 3141\(2\)\(B\)](#) of the Davis-Bacon Act); daily and weekly number of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

(3) *Additional records relating to fringe benefits.* Whenever the Secretary of Labor has found under paragraph 1.e. of this section that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in [40 U.S.C. 3141\(2\)\(B\)](#) of the Davis-Bacon Act, the contractor must maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits.

(4) *Additional records relating to apprenticeship.* Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

b. *Certified payroll requirements* (1) *Frequency and method of submission.* The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to the contracting

agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

(2) *Information required.* The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under paragraph 3.a.(2) of this section, except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker (e.g., the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH-347 or in any other format desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division website at <https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/wh347.pdf> or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the contracting agency.

(3) *Statement of Compliance.* Each certified payroll submitted must be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

(i) That the certified payroll for the payroll period contains the information required to be provided under paragraph 3.b. of this section, the appropriate information and basic records are being maintained under paragraph 3.a. of this section, and such information and records are correct and complete;

(ii) That each laborer or mechanic (including each helper and apprentice) working on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in [29 CFR part 3](#); and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

(4) *Use of Optional Form WH-347.* The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 will satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(3) of this section.

(5) *Signature.* The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

(6) *Falsification.* The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under [18 U.S.C. 1001](#) and [31 U.S.C. 3729](#).

(7) *Length of certified payroll retention.* The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. *Contracts, subcontracts, and related documents.* The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

d. *Required disclosures and access* (1) *Required record disclosures and access to workers.* The contractor or subcontractor must make the records required under paragraphs 3.a. through 3.c. of this section, and any other documents that the contracting agency, the State DOT, the FHWA, or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

(2) *Sanctions for non-compliance with records and worker access requirements.* If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under [29 CFR part 6](#) any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

(3) *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address

of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

4. Apprentices and equal employment opportunity (29 CFR 5.5)

a. *Apprentices* (1) *Rate of pay.* Apprentices will be permitted to work at less than the predetermined rate for the work they perform when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) *Fringe benefits.* Apprentices must be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringe benefits must be paid in accordance with that determination.

(3) *Apprenticeship ratio.* The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph 4.a.(4) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph 4.a.(1) of this section, must be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) *Reciprocity of ratios and wage rates.* Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. *Equal employment opportunity.* The use of apprentices and journeyworkers under this part must be in conformity with

the equal employment opportunity requirements of Executive Order 11246, as amended, and [29 CFR part 30](#).

c. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. 23 CFR 230.111(e)(2). The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeyworkers shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract as provided in 29 CFR 5.5.

6. Subcontracts. The contractor or subcontractor must insert FHWA-1273 in any subcontracts, along with the applicable wage determination(s) and such other clauses or contract modifications as the contracting agency may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate. 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract as provided in 29 CFR 5.5.

9. Disputes concerning labor standards. As provided in 29 CFR 5.5, disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility. a. By entering into this contract, the contractor certifies that neither it nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of [40 U.S.C. 3144\(b\)](#) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of [40 U.S.C. 3144\(b\)](#) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, [18 U.S.C. 1001](#).

11. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#);

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#);

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#); or

d. Informing any other person about their rights under the DBA, Related Acts, this part, or [29 CFR part 1](#) or [3](#).

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), the following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchpersons and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek. 29 CFR 5.5.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph 1. of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages and interest from the date of the underpayment. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or

mechanic, including watchpersons and guards, employed in violation of the clause set forth in paragraph 1. of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1. of this section.

* \$31 as of January 15, 2023 (See 88 FR 88 FR 2210) as may be adjusted annually by the Department of Labor, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990.

3. Withholding for unpaid wages and liquidated damages

a. *Withholding process.* The FHWA or the contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this section on this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with Section IV paragraph 2.a. or paragraph 3.a. of this section, or both, over claims to those funds by:

- (1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;
- (2) A contracting agency for its procurement costs;
- (3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;
- (4) A contractor's assignee(s);
- (5) A contractor's successor(s); or
- (6) A claim asserted under the Prompt Payment Act, [31 U.S.C. 3901](#)–3907.

4. Subcontracts. The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the

event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

5. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

- a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;
- b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;
- c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or
- d. Informing any other person about their rights under CWHSSA or this part.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" in paragraph 1 of Section VI refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions: (based on longstanding interpretation)

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;

- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), the contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. Pursuant to 23 CFR 635.116(c), the contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR Part 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract. 23 CFR 635.108.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and

health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR Part 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 11, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of \$150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.327.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.327.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200. 2 CFR 180.220 and 1200.220.

1. Instructions for Certification – First Tier Participants:

- a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction. 2 CFR 180.320.
- c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default. 2 CFR 180.325.
- d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances. 2 CFR 180.345 and 180.350.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900-180.1020, and 1200. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction. 2 CFR 180.330.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold. 2 CFR 180.220 and 180.300.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>). 2 CFR 180.300, 180.320, and 180.325.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default. 2 CFR 180.325.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.335;.

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property, 2 CFR 180.800;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification, 2 CFR 180.700 and 180.800; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

3. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which

this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances. 2 CFR 180.365.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900 – 180.1020, and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated. 2 CFR 1200.220 and 1200.332.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold. 2 CFR 180.220 and 1200.220.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily

excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment. 2 CFR 180.325.

4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

a. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(1) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(2) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(3) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

b. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000. 49 CFR Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or

cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

XII. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

**ATTACHMENT A - EMPLOYMENT AND MATERIALS
PREFERENCE FOR APPALACHIAN DEVELOPMENT
HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS
ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B)**

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

TENNESSEE DEPARTMENT OF TRANSPORTATION

MINIMUM WAGE SCALES FOR FEDERAL AID HIGHWAY CONSTRUCTION

"General Decision Number: TN20240147 01/05/2024

Superseded General Decision Number: TN20230147

State: Tennessee

Construction Type: Highway

Counties: Tennessee Statewide.

HIGHWAY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

| | |
|---|--|
| If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022: | <ul style="list-style-type: none">. Executive Order 14026 generally applies to the contract.. The contractor must pay all covered workers at least \$17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024. |
| If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022: | <ul style="list-style-type: none">. Executive Order 13658 generally applies to the contract.. The contractor must pay all covered workers at least \$12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024. |

POWER EQUIPMENT OPERATOR:

GROUP 1

Backhoe/Hydraulic
Excavator (3/4 yd &
over), Crane (less than
20 Tons), End Loader (3
yd & over), Motor Patrol
(finish), Piledriver,
Dragline.....\$ 19.14

GROUP 1A

Drill Operator (Caisson)...\$ 25.26
Farm Tractor Operator
(Power Broom).....\$ 13.50 **

GROUP 2

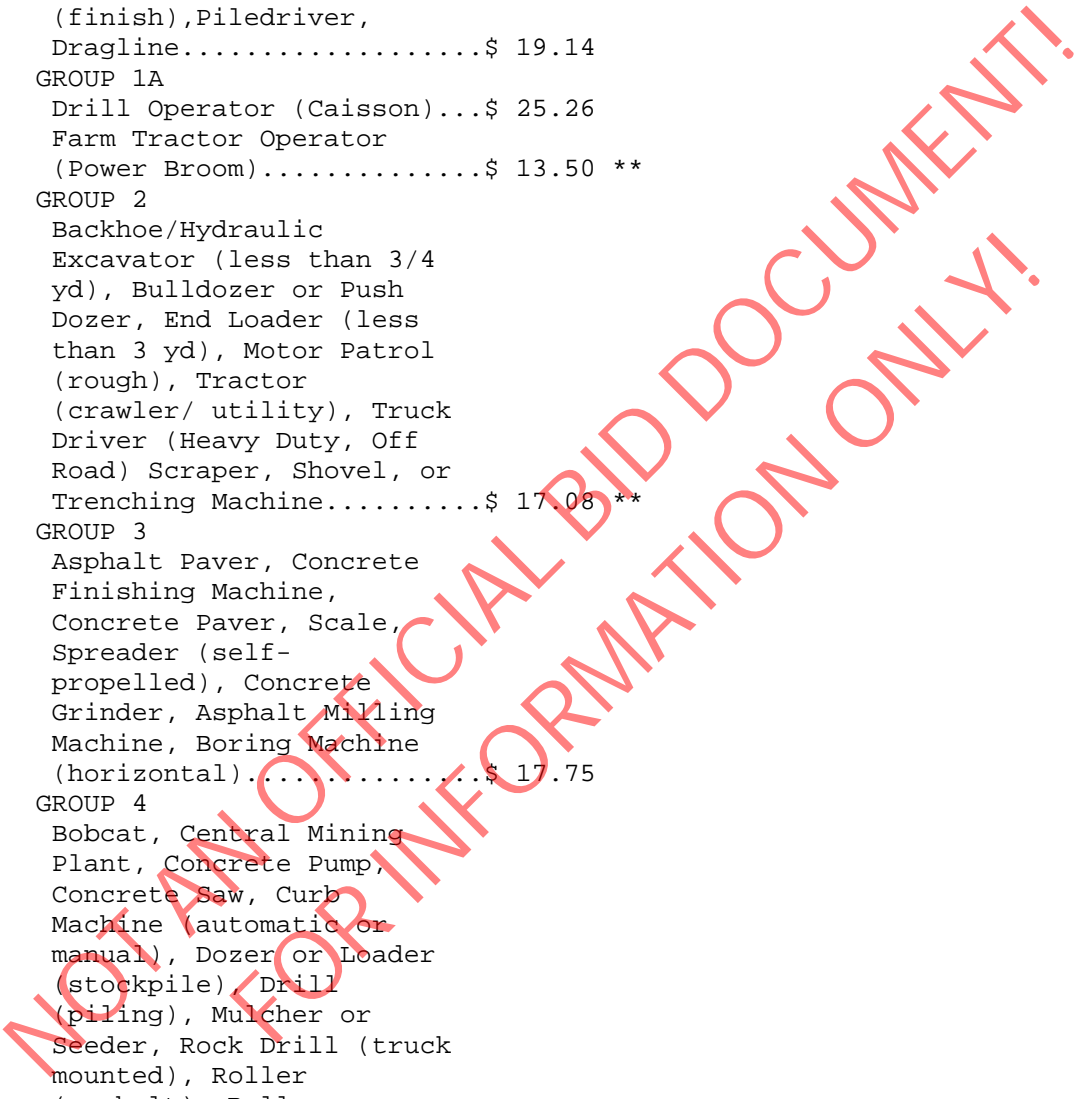
Backhoe/Hydraulic
Excavator (less than 3/4
yd), Bulldozer or Push
Dozer, End Loader (less
than 3 yd), Motor Patrol
(rough), Tractor
(crawler/ utility), Truck
Driver (Heavy Duty, Off
Road) Scraper, Shovel, or
Trenching Machine.....\$ 17.08 **

GROUP 3

Asphalt Paver, Concrete
Finishing Machine,
Concrete Paver, Scale,
Spreader (self-
propelled), Concrete
Grinder, Asphalt Milling
Machine, Boring Machine
(horizontal).....\$ 17.75

GROUP 4

Bobcat, Central Mining
Plant, Concrete Pump,
Concrete Saw, Curb
Machine (automatic or
manual), Dozer or Loader
(stockpile), Drill
(piling), Mulcher or
Seeder, Rock Drill (truck
mounted), Roller
(asphalt), Roller
(compaction self-
propelled), Soil
Stabilization Machine,
Tractor (boom and hoist),
Bituminous Distributor
Machine, pump, Track
Drill, Striping Machine....\$ 16.48 **
Heavy Duty Mechanic.....\$ 20.33
Light Duty Mechanic.....\$ 19.53



Sweeping Machine (Vacuum)
 Operator.....\$ 15.56 **
 GROUP 5
 Crane (over 20 Tons).....\$ 20.44

TRUCK DRIVER
 2 axles.....\$ 15.36 **
 3-4 axles.....\$ 14.86 **
 5 or more axles.....\$ 16.27 **

 WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$17.20) or 13658 (\$12.90). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the

classifications was union data. EXAMPLE: UAVG-OH-0010
08/29/2014. UAVG indicates that the rate is a weighted union
average rate. OH indicates the state. The next number, 0010 in
the example, is an internal number used in producing the wage
determination. 08/29/2014 indicates the survey completion date
for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of
each year, to reflect a weighted average of the current
negotiated/CBA rate of the union locals from which the rate is
based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can
be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on
a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests
for summaries of surveys, should be with the Wage and Hour
National Office because National Office has responsibility for
the Davis-Bacon survey program. If the response from this
initial contact is not satisfactory, then the process described
in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal
process described here, initial contact should be with the
Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an
interested party (those affected by the action) can request
review and reconsideration from the Wage and Hour Administrator
(See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION"

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STATE

OF

TENNESSEE

SPECIAL PROVISIONS RELATIVE TO PROTECTION OF RAILROAD PROPERTY, RAILROAD FLAGGING, AND INSURANCE REQUIREMENTS

Project Information: PIN 125418.00; [East] McEwen Drive, From East of Cool Springs Boulevard/Oxford Glen Drive to SR-252 (Wilson Pike); RR Under; CSXT Railroad Crossing (DOT#: 350354J, MP#: OBA-202.73); Fed. Proj. No.: STP-M-9305(31); in Region 3; CSXT OP#: (TN0631).

| | | |
|-------------------------------------|---------------|---------------|
| Tennessee Project Number(s): | PE-N | 94LPLM-L0-093 |
| | PE-D | 94LPLM-L1-094 |
| | R.O.W. | 94LPLM-L2-095 |
| | Const. | 94LPLM-L3-096 |

County: Williamson

Railroad Company: CSX Transportation, Inc. (CSXT)
P.O. Box 45052
Jacksonville, FL 32232-5052

AUTHORITY OF CSXT ENGINEER:

The authorized representative of the railroad, hereinafter referred to as CSXT Engineer, shall have final authority in all questions affecting his railroad operations, and the contractor must be governed accordingly.

All engineering correspondence, scheduling of work, and request for pre-construction representation shall be addressed to the CSX Transportation, Inc. **Project Manager contact (See sheet number 7 for name and address).**

PRECONSTRUCTION MEETING:

A preconstruction meeting will be scheduled by Department personnel prior to the Department's contractor starting work. The Department shall notify CSXT when the preconstruction meeting is scheduled so that a CSXT representative may attend. The Department will document the notification requesting CSXT attendance in the project file.

CSXT SCHEDULE I

The Department's contractor shall execute a CSXT Schedule I agreement prior to starting work.

INTERFERENCE WITH RAILROAD OPERATIONS:

The Department or its contractor shall so arrange and conduct their work that there will be no interference with railroad operations, including train, signal, telephone and telegraphic services, or damage to the property of the railroad, or to wires or other facilities of the tenants on the rights-of-way of the railroad.

The use of any scaffolding or other temporary framework that effects horizontal or vertical clearance must first be approved by the railroad CSXT Engineer and in no case exceed the approved clearances.

If conditions arising from or in connection with the Project require that immediate and unusual provisions be made to protect train operation or CSXT's property, the Department or its Contractor shall make such provision. If the CSXT Representative determines that such provision is insufficient, CSXT may, at the expense of the Department or its Contractor, require or provide such provision as may be deemed necessary, or cause the Work to cease immediately.

DAMAGE TO RAILROAD PROPERTY:

Should any damage occur to railroad property as a result of the contractor's unauthorized or negligent operations, and the railroad superintendent deems it necessary to repair such damage or perform any work for the protection of its property, the required materials, labor and equipment shall be furnished by the railroad and the contractor shall reimburse it for the costs incurred.

TEMPORARY GRADE CROSSINGS:

If the contractor desires access across railroad's right-of-way and tracks at other than an existing and open public road crossing in or incident to construction of the project, the railroad may permit such contractor access across said right-of-way and tracks at such location as shall be mutually agreed upon by CSXT and contractor, provided contractor first executes a license agreement satisfactory to the railroad and agrees to bear all costs and liabilities related to such access, including reimburse the railroad for the flagmen expenses, cost of providing and removing any temporary grade crossing, and other costs which CSXT deems necessary for protection of its property and operations. Contractor shall at no time cross the railroad's right-of-way or tracks with vehicles or equipment of any kind or character, except at such crossing or crossings as may be established pursuant to this subsection.

WATCHMEN:

The railroad shall have the right to assign a watchman to the site of the project to perform inspection services for protection of its railroad operations, whenever, in the opinion of CSXT, such inspection may be necessary to prevent interference with railroad operations, such as but not necessarily limited to obstruction of track clearances and roadbed drainage, foreign substances on or adjacent to the rails and disturbance of surface and alignment of track, but such inspection shall not relieve the contractor from liability. The cost incurred by the railroad for furnishing a watchman to perform such inspection services will be reimbursed by TDOT.

FLAGGING SERVICES:

Any flagging service required, when in the opinion of CSXT that such service is necessary for the safety of its operations because of work being performed by the contractor or in connection therewith, will be provided by the railroad. The requirements of the railroad are as follows:

The services of two flagmen whenever the contractor's men or equipment are, or are liable to be, working within the specified track clearances, or over the tracks, or when work has disturbed the surface and alignment of any operated track to such extent that movement of trains should be controlled by flagging.

The Department or contractor shall give a minimum of thirty (30) days advance notice to CSXT for anticipated need for flagging service. No work shall be undertaken until the flag person(s) is/are at the job site. If it is necessary for CSXT to advertise a flagging job for bid, it may take up to 90 days to obtain this flagging service, and CSXT shall not be liable for the cost of delays attributable to obtaining this flagging service.

The Department will reimburse the Railroad directly for all costs incurred for flagging services by railroad personnel. The Railroad has officially allotted 60 flagging days to the Contractor for the above described project. In the event that flagging services are required in excess of the officially allotted days, the Department will reimburse the Railroad for the additional cost of flagging services and such costs deducted from monies due the Contractor. No adjustments will be made to costs of flagging services that are required in excess of the allotted days. These additional flagging costs assessed against the Contractor will be made under the following item:

| | | |
|---------------|-----------------------------------|---------------|
| 105-03 | Railroad Flagging (Deduct) | Dollar |
|---------------|-----------------------------------|---------------|

The payment of flagging services will be based on invoices received from the Railroad. The Engineer shall sign the invoice in order to verify the flagging service performed by the Railroad.

Estimated flagging rate for this contract is \$504.00 per day per flagman based on a twelve (12) hour work day.

Overtime rate over 16 hours = 2.0 x regular hourly rate over 16 hours.

Holiday rate = 1.5 x regular hourly rate up to 16 hours and = 2.0 x regular hourly rate over 16 hours.

In addition to the above rate there will be an additive of 233.0% of direct labor for vacation, holiday, sickness, pension, administration, etc.

Minimum + hours per call out is eight (8) hours and notification to start or to terminate flagman must be given at least five (5) days in advance or else contractor might be billed for flagman whether he is working or not working.

The Contractor and Department will review and sign the Railroad flagman's time sheet attesting that the flagman was present during the time recorded. Flagmen may be removed by Railroad if form is not signed. If flagman is removed, the Contractor will not be allowed to re-enter the Railroad right-of-way until the issue is resolved. Any complaints concerning flagman or flagmen must be resolved in a timely manner. If need for flagman or flagmen is questioned, please contact CSX Transportation, Inc. **Flag Request Contact. (See sheet number 7 for name and address)**. All verbal complaints must be confirmed in writing by the Contractor within 5 working days with copy to the Highway Engineer. All written correspondence should be addressed to CSX Transportation, Inc. **Project Manager contact (See sheet number 7 for name and address)**.

The Railroad flagman assigned to the project will be responsible for notifying the State Project Supervisor upon arrival at the job site on the first day (or as soon thereafter as possible) that flagging services begin and on the last day that he performs such services for each separate period that services are provided. The State Project Supervisor will document such notification in the project records. When requested, the State Project Supervisor will also sign the flagman's diary showing daily time spent and activity at the project site.

Upon completion of all work within the Railroad right-of-way, the State Project Supervisor shall notify the Railroad for final inspection of this work. The Department shall give the Railroad 120 calendar days from the date of the on-site final inspection, in which the work is accepted by the Department and the Railroad, to submit all invoices for which flagging services are to be reimbursed. Department will not be liable for any payment of flagging charges received after 120 calendar days.

USE OF EXPLOSIVES:

Explosives shall not be used on or adjacent to any track or other railroad property without the prior written approval of CSXT, but such approval will not relieve the contractor from any liability. If the use of the explosives are permitted, the blasting shall be done with light charges under supervision of a responsible employee of the Department or contractor. **No blasting shall be done without the presence of an authorized representative of CSXT. At least thirty (30) business days advance notice to either the CSXT Construction Manager contact or the CSXT Roadmaster is required to arrange for the presence of an authorized CSXT representative and any flagging that CSXT may require.** Every precaution shall be taken to avoid damage to property, injury to persons and interruption of railroad operations. **Electronic detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way train radios.** Blasting shall be discontinued immediately on notice from CSXT that it is too hazardous.

The Department or contractor must have at the Project Site adequate equipment, labor and materials, and allow sufficient time to (i) clean up (at the Department's expense) debris resulting from the blasting without any delay to trains; and (ii) correct (at the Department's expense) any track misalignment or other damage to CSXT's property resulting from blasting, as directed by CSXT Representative, without delay to trains. If Department's or Contractor's actions result in delay of any trains, including Amtrak passenger trains, Department shall bear the entire cost thereof. In the event that the Contractor does not restore the Railroad's track and/or

related train traffic facilities to their pre-blasting condition, and/or the Contractor's actions result in any delay of train traffic CSXT's costs to mitigate such damages and/or train traffic delays that are charged to the Department by CSXT shall be reimbursed to the Department from monies due the Contractor.

The Department or Contractor shall not store explosives on CSXT property.

STORAGE OF MATERIALS:

The contractor shall not store or pile materials or equipment on the right-of-way of the railroad without having first obtained permission from CSXT, and in no case shall they be stored closer than 13' 0" from the centerline on any railroad track measured at right angles thereto. Such permission will be with the understanding that the railroad will not be liable for any damage to such materials or equipment from any cause and that CSXT may move, or require the contractor to move, at the contractor's expense, such materials and equipment. **The contractor shall store materials so as to prevent trespassers from causing damage to trains or CSXT property.**

CLEANING UP:

The contractor will be required upon completion of the work, to remove from within the limits of the railroad's right-of-way, all machinery equipment, surplus materials, falsework, rubbish, debris, or temporary buildings of said contractor, and to leave the right-of-way in a neat condition, satisfactory to CSXT. The contractor will be required to provide the project engineer with a letter of release from CSXT before final acceptance of the project by the State.

NOTICE OF STARTING WORK:

The contractor shall notify the CSXT Engineer of the railroad in writing at least ten (10) business days in advance, when he expects to start work on railroad's right-of-way and **thirty (30) days** in advance of flagging services.

COOPERATION AND DELAYS:

The contractor shall cooperate with others participating in the construction project, to the end that all work may be carried on to the best advantage. No charge or claim of the contractor against either the State or the railroad will be allowed for hindrance or delay on account of railroad traffic or any work done by the railroad or others, incident to or necessary for safe operation or maintenance of railroad traffic, facilities, and property, or completion of the project, but due consideration of any such delay will be taken into account in counting the working days to be charged against the project.

During construction of the footings of piers or other supports or structures adjacent to any track of the railroad, the contractor shall make adequate provisions against sliding, shifting, sinking, or in any way disturbing the railroad embankment and track operations, by driving temporary sheeting, and/or providing temporary shoring in a manner satisfactory to the State Project Supervisor, the railroad Project Manager (**See sheet number 7 for name and address**) and the railroad Staff Engineer.

Before commencing work on any pier or structure adjacent to any track, the contractor shall submit prints of the proposed shoring and bracing details for the protection of the railroad company's track to the State Project Supervisor for his approval. This submittal shall include the proposed method of installation and be accompanied by supporting data, including design computations, soil descriptions, and other pertinent information.

After approval by the State Project Supervisor, four prints of the proposed shoring and bracing details bearing the seal of a registered structural or professional engineer, together with supporting documents, shall be forwarded to the railroad Project Manager (**See sheet number 7 for name and address**) or his engineering designate for review and approval.

The contractor shall notify the railroad Engineering Consultant Designee and Project Manager (in writing) not less than one (1) week in advance of the proposed time of the beginning of the construction of the piers, supports or structures adjacent to the track.

INSURANCE:

In addition to any other forms of insurance or bonds required under the terms of the contract and specifications, the contractor will be required to carry insurance of the following kinds and minimum amounts:

- (1.) Commercial General Liability insurance coverage with limits of not less than **\$5,000,000.00** in combined single limits for bodily injury and or property damage per occurrence. Said policy shall include "explosion, collapse, and underground hazard" ("XCU") coverage, shall be indorsed to name Railroad specified in item 2.C. below as an additional insured, and shall include a severability of interest provision, and shall be addressed directly to **CSXT Risk Management contact (See sheet number 7 for name and address)**.
- (2.) Statutory Worker's Compensation and Employers Liability Insurance with limits of not less than **\$1,000,000.00**, which insurance must contain a waiver of subrogation against CSX Transportation, Inc. and its affiliates.
- (3.) Commercial automobile liability insurance with limits of not less than **\$1,000,000.00** combined single limit for bodily injury and/or property damage per occurrence, and such policies shall name CSX Transportation, Inc. as an additional named insured.

Railroad's Protective Public Liability and Property Damage Liability Insurance:

- (4.) The contractor will be required to furnish Railroad Protective Insurance to protect CSX Transportation, Inc. in connection with operations to be performed on or adjacent to CSX Transportation's right-of-way. Questions concerning CSX Transportation Insurance requirements shall be addressed directly to **CSXT Risk Management contact (See sheet number 7 for name and address)**. These are CSXT specifications for proper evidence of insurance:
 - A. The insurer must be financially stable and rated B+ or better in Best's Insurance Reports.
 - B. The policy must be written using the ISO/RIMA Form of Railroad Protective Insurance - Insurance Services Office (ISO) Form CG 00 35.
 - C. Named Insured Railroad and Address:

CSX Transportation, Inc.
Risk Management (C-907)
500 Water Street
Jacksonville, FL 32202

Electronic mail should be sent to:
mdonnelly@crouchengineering.com
 - D. Limits of Liability:

\$5,000,000.00 per occurrence combined single limit for bodily injury and property damage, subject to a \$10,000,000.00 annual aggregate limit is required because a significant number of hazardous materials trains (a total of 30 Train Movements at 60 MPH along this track per day) are in the area of construction.
 - E. **CSX Transportation must be named as the named insured on the Railroad Protective Policy.**
 - F. Name and address of the contractor and TDOT must be shown on the Declarations page.

- G. Name and address of the Project Sponsor, being the State of Tennessee, Department of Transportation must be shown on the Declarations page.
- H. Description of operations must appear on the Declarations page and must match the project description, including project or contract identification numbers.
- I. Authorized Endorsements:
1. Must Include:
 - a) Pollution Exclusion Amendment – CG 28 31
(Not necessary with Form CG 00 35 version 96 and later)
 - b) Delete Common Policy Conditions – CL/CG 99 01
If policy jacket does not include Common Policy Conditions this endorsement is not necessary.
 2. Acceptable:
 - a) Broad Form Nuclear Exclusion – IL 00 21
 - b) 30-Day Advance Notice of Non-renewal or cancellation
 - c) Required State Cancellation Endorsement
 - d) Quick Reference or Index – CL/IL 240
 3. Unacceptable:
 - a) Any Pollution Exclusion Endorsement except CG 28 31
 - b) An Endorsement that excludes TRIA coverage
 - c) An Endorsement that limits or excludes Professional Liability coverage
 - d) A Non-Cumulation of Liability or Pyramiding of Limits Endorsement
 - e) A Known Injury Endorsement
 - f) A Sole Agent Endorsement
 - g) Any Punitive or Exemplary Damages Exclusion
 - h) Any “Common Policy Conditions” Endorsement
 - i) Any endorsement that is not named in I (1) or I (2) above.
 - j) Policies that contain any type of deductible.
- J. Additional Terms:
1. The Contractor must submit its original insurance policies and two copies and all notices and correspondence regarding insurance policies directly to the **CSX Risk Management Contact (See sheet Number 7 for electronic/e-mail address)**.
 2. Neither TDOT nor the Contractor may begin work on the Project until it has received CSXT’s written approval of the required insurance policies.

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All insurance herein-before specified shall be carried until all work required to be performed under the terms of the contract has been satisfactorily completed within the limits of the right-of-way of the railroad, as evidenced by the formal acceptance by the State.

Insuring companies may not cancel insurance except by permission of the State and railroad insured, or on thirty (30) days written notice to the State and the railroad.

RAILROAD CONTACTS NAME AND ADDRESS

| | | | |
|---|---|---|---|
| <p>Mr. Todd Allton Principal Engineer- Public Projects</p> <p>CSX Transportation, Inc.</p> <p>1590 Marietta Blvd. NW</p> <p>Atlanta, GA 30318</p> <p>O. 404.350.5134</p> <p>E. Todd_Allton@csx.com</p> | <p>Mr. Will Roseborough Director Project Development</p> <p>CSX Transportation, Inc.</p> <p>500 Water Street HQ Bldg., 13th Floor Jacksonville, FL 32202</p> <p>O. 904.359.1048</p> <p>C. 904.738.9667</p> <p>E. Will_Roseborough@csx.com</p> | <p>Insurance Risk Management</p> <p>E. cmatheny@crouchengineering.com</p> | <p>FLAGGING REQUEST</p> <p>Mr. Scott Vick Public Projects Administrator Crouch Engineering, Inc.</p> <p>5115 Maryland Way., Suite 225</p> <p>Brentwood, TN 37027</p> <p>svick@crouchengineering.com</p> <p>O:615.791.0630</p> <p>C: 615.430.2511</p> <p>Charge Flagging to: CSXT OP#: TN0631</p> |
|---|---|---|---|

***Railroad Contacts For Pre-Con Meeting Notification And For Coordination of Construction Work:**

TDOT Construction Contact:
Kristin Qualls– Region 1 Operations Engineer
7345 Region Lane
Knoxville, TN 37914
Phone: 865-594-2350
Email: Kristin.Qualls@tn.gov

Railroad’s Construction Division Contact:
Amanda DeCesare, Director Construction Engineering
CSX Transportation, Inc.
500 Water Street
HQ Bldg.’ 4th Floor
Jacksonville, FL 32202
Office 904-359-1756
Email: Amanda_DeCresare@csx.com

Railroad’s Engineering Consultant Designate:
Jay Harris - Senior Railroad Engineer
5115 Maryland Way, Suite 225
Brentwood, TN 37027
O. 615.791.0630
M. 615.289.6121
Jharris@crouchengineering.com

Matt Donnelly - Project Manager
5115 Maryland Way., Suite 225
Brentwood, TN 37027
O: 615-932-8144
mddonnelly@crouchengineering.com

DOT Crossing Number(s): 350354J Information:

| | |
|-------------------------|-----------------|
| Date: | 01.20.15 |
| Average Trains/Day: | 15, 12 & 3 |
| Maximum Train Speed: | 60, 55 & 60 MPH |

SPECIAL NOTES

The contractor shall provide the Railroad Protective Insurance Policy and Certificates of Insurance by e-mail within (20) calendar days of Notification of Award.

Failure to provide the above within the specified time may subject the award to annulment and forfeiture of the bid guarantee, not as a penalty, but as liquidated damages.

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SCHEDULE I

TDOT PROJECT NO.: 94LPLM-F3-096
CSXT OP NO.: TN0631

CONTRACTOR'S AGREEMENT

This CONTRACTOR'S AGREEMENT is made as of _____, _____, by _____ ("Contractor"), to and for the benefit of CSX Transportation, Inc. ("CSXT") and to induce CSXT to permit Contractor on or about CSXT's property, for the purposes of performing work in connection with the above-referenced project for Tennessee Department of Transportation.

In consideration of CSXT's consent to permit Contractor on or about CSXT's property for such purposes, and other good and valuable consideration, the receipt and sufficiency of which are acknowledged by Contractor, Contractor hereby agrees as follows:

1. CSXT Special Provisions. Contractor agrees to abide by and observe the terms and conditions of the CSXT Special Provisions (which is incorporated by referenced into this Agreement).
2. Insurance Requirements. Contractor shall acquire and maintain the insurance described by the Special Provisions, and shall submit proof of insurance to CSXT in accordance with the Special Provisions, satisfactory to CSXT, prior to commencement of work on or about CSXT's property.
3. Indemnification.

Contractor further specifically agrees as follows:

- (a) Contractor shall indemnify, defend and save harmless CSXT and its affiliates from all suits or claims of any character brought because of any injuries or damage received or sustained by any person, persons, or property, in whole or in part, on account of the operations of Contractor or any subcontractor or sub-subcontractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials or workmanship in constructing the work; or because of any act or omission, neglect, or misconduct of Contractor or any subcontractor or sub-subcontractor; or because of any claims or amounts recovered from any infringements of patent, trademark or copyright; or for failing to pay, when and as due, all bills and other legitimate charges, including lawful claims for labor performed or materials, equipment and supplies furnished for use in and about the construction of the work under contract; or from any claims or amounts arising or recovered under the Worker's Compensation Act, or any other law, ordinance or decree. The foregoing indemnification obligation shall not be limited to the insurance coverage required by this Agreement.
- (b) Contractor shall comply with any federal, state or local laws, statutes, codes ordinances, rules, and regulations applicable to its construction and maintenance of

the project. Contractor shall indemnify, defend, and CSXT and its affiliates harmless with respect to any fines, penalties, liabilities, or other consequences arising from breaches of this Agreement.

- (c) For the purpose of this Agreement, CSXT’s affiliates include CSX Corporation and all entities, directly or indirectly, owned or controlled by or under common control of CSXT or CSX Corporation and their respective officers, directors, employees and agents.
- (d) Contractor shall notify CSXT promptly of any loss, damage, injury or death arising out of or in connection with the Project work.
- (e) The provisions of this agreement shall survive the termination or expiration of the Agreement.

IN WITNESS WHEREOF, Contractor has executed and delivered this Agreement as of the date set forth below.

CONTRACTOR

BY: _____

Print: _____

Date: _____

Title: _____

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STATE

OF

TENNESSEE

September 10, 2020

January 1, 2021

SPECIAL PROVISION

REGARDING

PROHIBITION ON CERTAIN TELECOMMUNICATION AND VIDEO

SURVEILLANCE SERVICES OR EQUIPMENT

Installation of telecommunication and video surveillance equipment, services or systems shall contain no components from providers as listed in Title 2 Code of Federal Regulations (CFR) Part 200.216.

The prohibition on certain telecommunication and video surveillance services or equipment regulation in Title 2 CFR 200.216 shall apply to this contract. Take all necessary and reasonable steps in accordance with Title 2 CFR 200.216 to ensure that no prohibited telecommunication and video surveillance services or equipment are included in any of the work in this contract. As defined in Title 2 CFR 200.471, the regulation provides clarity that the telecommunications and video surveillance costs associated with Title 2 CFR 200.216 are unallowable for services and equipment from the providers.

It is prohibited from installing equipment, services, or systems that use covered telecommunications equipment or services from providers described in section 889 of the National Defense Authorization Act for Fiscal Year 2019 (NDAA 2019).

As described in section 889 of the NDAA 2019, "covered telecommunications equipment or services" means:

- Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities);
- Video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities);
- Telecommunications or video surveillance services provided by such entities or using such equipment; or
- Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country. The term "covered foreign country" means the People's Republic of China.

Any prohibited equipment installed must be removed and replaced at the contactor's expense with acceptable equipment.

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STATE

OF

TENNESSEE

December 12, 2022
(Rev. 9-12-23)
(Rev. 11-21-23)

January 1, 2021

SPECIAL PROVISION

REGARDING

BUILD AMERICA, BUY AMERICA ACT

REQUIREMENTS

The Build America, Buy America Act (BABA) Public Law No. 117-58 SEC. 70914 that all of the iron, steel, manufactured products, and construction materials used are subject to Build America, Buy America requirements and are produced in the United States.

Effective 10/23/2023, the Office of Management and Budget (OMB) revised guidance in the Code of Federal Regulations (CFR) title 2 and add a new part 184 – Buy America Preferences For Infrastructure Projects and revised 200.322.

- A. Iron and steel: FHWA existing requirements SP106A Regarding Buy America.
- B. Manufactured products: FHWA Buy America Final Rule 11/25/1983, 48 FR 53099; Waiver for Manufactured Products.
- C. Construction materials includes an article, material, or supply that is or consists of only one of the materials listed except as provided in 2).
 - 1) Construction materials:
 - non-ferrous metals;
 - plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
 - Glass (including optic glass);
 - Fiber optic cable (including drop cable);
 - Optical fiber;
 - Lumber;
 - Engineered wood; and
 - Drywall.
 - 2) Minor additions of articles, materials, supplies, or binding agents to a construction material do not change the categorization of the construction material.

Construction materials incorporated into the project must meet one of the following construction material standards to be considered “**produced in the United States**”.

- 1) Non-ferrous metals. All manufacturing processes, from initial smelting or melting through final shaping, coating, and assembly, occurred in the United States.
- 2) Plastic and polymer-based products. All manufacturing processes, from initial combination of constituent plastic or polymer-based inputs, or, where applicable, constituent composite materials, until the item is in its final form, occurred in the United States.
- 3) Glass. All manufacturing processes, from initial batching and melting of raw materials through annealing, cooling, and cutting, occurred in the United States.
- 4) Fiber optic cable (including drop cable). All manufacturing processes, from the initial ribboning (if applicable), through buffering, fiber stranding and jacketing, occurred in the United States. All manufacturing processes also include the standards for glass and optical fiber, but not for non-ferrous metals, plastic and polymer-based products, or any others.
- 5) Optical fiber. All manufacturing processes, from the initial preform fabrication stage through the completion of the draw, occurred in the United States.
- 6) Lumber. All manufacturing processes, from initial debarking through treatment and planing, occurred in the United States.
- 7) Drywall. All manufacturing processes, from initial blending of mined or synthetic gypsum plaster and additives through cutting and drying of sandwiched panels, occurred in the United States.
- 8) Engineered wood. All manufacturing processes from the initial combination of constituent materials until the wood product is in its final form, occurred in the United States.

Provide certifications to the Engineer for the construction materials that they meet the Build America Buy America Act requirements. Assure all submittals required for Buy America are submitted to the Engineer prior to the products and or materials being incorporated in the project.

Effective August 16, 2023, with the US Department of Transportation (DOT) Office of the Secretary Docket No.: DOT-OST-2022-0124:

Waiver of Buy America Requirements for De Minimis Costs and Small Grants, decision, certain waivers to the requirements stated herein are allowed.

The BABA's domestic preferences for iron and steel, manufactured products, and construction materials used in projects funded under DOT administered financial assistance programs will not apply under a single financial assistance award for the following situations:

- 1) The total value of the noncompliant products is no more than the lesser of \$1,000,000 or 5% of total applicable costs for the project; where the "total value of the non-compliant products" does not include the value of those products subject to a separate Buy America waiver. "Total applicable project costs" are defined as the cost of materials (including the cost of any manufactured products) used in the project that are subject to a domestic preference requirement, including materials that are within the scope of an existing waiver and the de minimis cost portion of the waiver does not apply to iron and steel subject to the requirements of 23 U.S.C. 313/ 23 CFR 635.410 (b)(4), or
- 2) The total amount of Federal financial assistance applied to the project, through awards or subawards, is below \$500,000 but this does not apply to iron, steel, and manufactured goods subject to the requirements of 49 U.S.C. 22905(a).

The waiver does not apply to products that are the subject of two separate product-specific Buy America waivers from the Department:

- 1) For awards administered by FHWA that are subject to 23 U.S.C. 313, the waiver does not apply to electric vehicle chargers, as defined in the notice at 88 FR 10619.
- 2) For awards that are subject to 49 U.S.C. 5323(j), the waiver does not apply to mass-produced, unmodified non-ADA accessible vans and minivans with seating capacity for at least six adults not including the driver, as those terms are used in the notice at 87 FR 64534.

DOT Waiver of Buy America Requirements for De Minimis Costs requirements:

Provide certifications, documents, and calculations to the Engineer for all of the noncompliant products anticipated to be used in the project before being incorporated.

The contractor shall be responsible for all cost associated with products that are permanently incorporated into the project that does not meet the requirements of this Special Provision without prior written approval from the Department, up to and including removal and replacement.

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STATE

OF

TENNESSEE

January 17, 2023

January 1, 2021

SPECIAL PROVISION

REGARDING

CERTIFIED PAYROLLS – LOCAL PROGRAMS

As specified by Minimum Wage Scales for Federal-Aid and State Funded Construction contract provisions and Special Provision 1273, submit certified payrolls for Contractor and subcontractor workforce to the Engineer weekly for each week in which any work is performed. Once Work begins, if in any week the Contractor or subcontractor does not perform Work, submit the following statement to the Engineer: “No work performed by (contractor name) for the week ending _____.”

Assume all responsibility for ensuring all payrolls and all subcontractor payrolls are submitted and certified electronically for each week in which any contract work is performed. If all payrolls are not received in this timeframe, the progress payment shall be withheld until all necessary payrolls have been received.

There will be no direct payment for recording and reporting of this information. All cost associated with this provision shall be considered incidental.

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STATE

OF

TENNESSEE

(Rev. 05-16-16)
(Rev. 04-01-19)
(Rev. 11-08-19)
(Rev. 3-2-23)

January 1, 2021

SPECIAL PROVISION

REGARDING

PAYMENT ADJUSTMENT FOR BITUMINOUS MATERIAL

This Special Provision covers the method of payment adjustment for bituminous materials.

100% Virgin Bituminous Material

A payment adjustment will be made to compensate for increases and decreases of 5% or more in the contractor's bituminous material cost. The normal bid items in the contract covering the bituminous material shall not be changed. Payment adjustments (+/-) shall be paid under "Payment Adjustment for Bituminous Material" and calculated as described herein:

A "Basic Bituminous Material Index" will be established by the Tennessee Department of Transportation prior to the time the bids are opened. This "Basic Bituminous Material Index" is the average of the current quotations on P.G. 64-22 from suppliers furnishing asphalt cement to contractors in the State of Tennessee. These quotations are the cost per ton f.o.b. supplier's terminal.

The "Basic Bituminous Material Index" for this project is \$ **609.23** per ton.
(October 2024)

The "Monthly Bituminous Material Index" is also established on the first day of each month by the same method. A payment adjustment shall be made provided the "Monthly Bituminous Material Index" varies 5% or more (+/-) from the "Basic Bituminous Material Index".

Where the price index varies 5% or more (+/-), the payment adjustment will be made as follows:

$$PA = [Ic - Ib] \times T$$

Where:

- PA = Price Adjustment for Adjustment Month
- Ib = Basic Bituminous Material Index
- Ic = Monthly Bituminous Material Index
- T = Tons bituminous material for Adjustment Month

Payment adjustment will be applied to all asphalt cement, asphalt emulsion, or bituminous material used for paving on this project.

Upon the expiration of the allocated working time, as set forth in the original contract or as extended by Change Order, payment adjustments for bituminous material will continue to be made when the "Monthly Bituminous Material Index" varies 5% or more (+/-) from the "Basic Bituminous Material Index".

The calculation of the bituminous payment adjustment shall be made using the "Monthly Bituminous Material Index" or the "Bituminous Material Index for Contract Completion Date" in accordance with the following formulas:

The "Bituminous Material Index for Contract Completion Date" is the Monthly Bituminous Material Index in effect on the allocated Contract Completion Date or on the completion date as extended by Change Order.

The "Monthly Bituminous Material Index" is **less** than the "Bituminous Material Index for Contract Completion Date".

$$PA = [Ic - Ib] \times T$$

The "Monthly Bituminous Material Index" is **greater** than the "Bituminous Material Index for Contract Completion Date".

$$PA = [Icd - Ib] \times T$$

Where:

- PA = Price Adjustment for Adjustment Month
- Ib = Basic Bituminous Material Index
- Ic = Monthly Bituminous Material Index
- Icd = Bituminous Material Index for Contract Completion Date (or as extended by Change Order)
- T = Tons

FOR REFERENCE ONLY

SiteManager or spreadsheet calculates the price adjustment based on the actual amount of asphalt cement (residue) in the emulsion using the following percentages:

- tack coats and shoulder sealants (e.g., SS-1, SS-1h, CSS-1, Css-1h) 63% residue
- prime coats (e.g., AE-P) 54% residue
- scrub seals and microsurfacing (e.g., CQS-1HP) 65% residue
- chip seals (e.g., CRS-2, CRS-2P) 69% residue
- hot in-place recycle (ARA-3P) 63% residue

Mixes Containing Recycled Bituminous Material

The quantity of virgin asphalt cement in tons subject to payment adjustment in recycled mixes shall be the product of the total tons of each mix multiplied by the difference between (1) the percent of asphalt cement specified for bidding purposes and (2) the percent of asphalt cement obtained from the recycled asphaltic material (RAP) used in each mix. No payment adjustment under this special provision for increases and decreases in the contractor's cost for virgin asphalt cement in recycled mixes will be allowed for asphalt cement content in excess of the percent specified for bidding purposes, as all payment adjustments for asphalt cement in the mix design of recycled mixes in excess of the percent of asphalt cement specified for bidding purposes will be made in accordance with the Standard Specifications.

No payment adjustment for bituminous material containing RAP shall be made unless the "Monthly Bituminous Material Index" varies 5% or more (+/-) from the "Basic Bituminous Material Index" indicated in this Special Provision.

Where the price index varies 5% or more (+/-), the payment adjustment will be made as follows:

$$PA = \frac{[Ic - Ib] \times [BA - RA] \times Tm}{100}$$

- PA = Price Adjustment for Adjustment Month
- Ib = Basic Bituminous Material Index
- Ic = Monthly Bituminous Material Index
- BA = Percent asphalt specified for bidding purposes
- RA = Percent asphalt obtained from recycled asphaltic material used in each mix
- Tm = Tons asphalt mix for adjustment month

Upon the expiration of the allocated working time, as set forth in the original contract or as extended by Change Order, payment adjustments for bituminous material containing RAP will continue to be made when the "Monthly Bituminous Material Index" varies 5% or more (+/-) from the "Basic Bituminous Material Index".

The calculation of the bituminous payment adjustment shall be made using the "Monthly Bituminous Material Index" or the "Bituminous Material Index for Contract Completion Date" in accordance with the following formulas:

The "Bituminous Material Index for Contract Completion Date" is the Monthly Bituminous Material Index in effect on the allocated Contract Completion Date or on the completion date as extended by Change Order.

The “Monthly Bituminous Material Index” is **less** than the “Bituminous Material Index for Contract Completion Date”.

$$PA = [Ic - Ib] \times \frac{[BA - RA]}{100} \times Tm$$

The “Monthly Bituminous Material Index” is **greater** than the “Bituminous Material Index for Contract Completion Date”.

$$PA = [Icd - Ib] \times \frac{[BA - RA]}{100} \times Tm$$

Where:

- PA = Price Adjustment for Adjustment Month
- Ib = Basic Bituminous Material Index
- Ic = Monthly Bituminous Material Index
- Icd = Bituminous Material Index for Contract Completion Date (or as extended by Change Order)
- BA = Percent asphalt specified for bidding purposes
- RA = Percent asphalt obtained from recycled asphaltic material used in each mix
- Tm = Tons asphalt mix for adjustment month

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Bituminous Index (\$, ton)

(This Index to be used with Special Provision 109B)

MONTH

| YEAR | January | February | March | April | May | June | July | August | September | October | November | December |
|------|---------|----------|--------|--------|--------|--------|--------|--------|-----------|---------|----------|----------|
| 2010 | 445.45 | 490.91 | 499.55 | 500.45 | 501.36 | 489.55 | 474.09 | 450.00 | 447.27 | 442.73 | 441.36 | 453.18 |
| 2011 | 460.45 | 472.27 | 490.45 | 514.09 | 565.45 | 596.36 | 586.82 | 572.73 | 556.82 | 555.45 | 554.55 | 567.27 |
| 2012 | 571.36 | 596.82 | 610.91 | 615.45 | 623.18 | 625.91 | 605.91 | 587.27 | 570.91 | 570.50 | 569.50 | 568.50 |
| 2013 | 565.5 | 561.50 | 561.50 | 561.50 | 562.50 | 560.00 | 560.00 | 566.00 | 560.00 | 559.50 | 556.50 | 552.00 |
| 2014 | 552.00 | 552.00 | 556.00 | 556.00 | 566.00 | 574.50 | 588.00 | 608.00 | 613.00 | 609.00 | 602.00 | 585.50 |
| 2015 | 566.00 | 535.50 | 507.00 | 479.50 | 461.36 | 456.82 | 454.55 | 451.82 | 442.27 | 425.45 | 414.55 | 404.55 |
| 2016 | 388.64 | 366.82 | 349.09 | 339.00 | 328.64 | 333.64 | 344.55 | 340.91 | 334.09 | 331.82 | 329.55 | 329.55 |
| 2017 | 335.91 | 351.82 | 364.55 | 371.36 | 373.18 | 372.73 | 367.73 | 365.91 | 365.91 | 364.58 | 366.25 | 368.75 |
| 2018 | 380.42 | 390.42 | 400.00 | 418.33 | 435.42 | 462.92 | 494.58 | 533.75 | 543.75 | 545.83 | 544.58 | 541.67 |
| 2019 | 536.67 | 521.25 | 513.75 | 523.75 | 539.17 | 547.92 | 546.67 | 539.58 | 530.00 | 525.83 | 518.33 | 516.25 |
| 2020 | 513.75 | 511.25 | 512.08 | 492.08 | 466.67 | 445.42 | 432.08 | 430.83 | 427.50 | 425.00 | 421.67 | 416.67 |
| 2021 | 420.42 | 438.33 | 459.58 | 477.08 | 485.83 | 491.67 | 507.50 | 510.42 | 509.58 | 509.58 | 522.08 | 532.50 |
| 2022 | 532.92 | 547.08 | 586.25 | 659.17 | 705.42 | 745.42 | 772.92 | 773.75 | 764.17 | 735.00 | 709.17 | 689.17 |
| 2023 | 671.36 | 663.18 | 663.18 | 655.45 | 651.82 | 644.55 | 642.73 | 634.55 | 632.73 | 632.73 | 632.73 | 632.73 |
| 2024 | 629.09 | 629.09 | 625.45 | 623.64 | 628.64 | 628.64 | 629.55 | 632.69 | 630.00 | 609.23 | | |

Bituminous Index (\$, tonne)

(This Index to be used with Special Provision 109BM (METRIC))

MONTH

| YEAR | January | February | March | April | May | June | July | August | September | October | November | December |
|------|---------|----------|--------|--------|--------|--------|--------|--------|-----------|---------|----------|----------|
| 2010 | 491.03 | 541.13 | 550.65 | 551.66 | 552.66 | 539.63 | 522.60 | 496.04 | 493.03 | 488.02 | 486.52 | 499.55 |
| 2011 | 507.56 | 520.59 | 540.63 | 566.69 | 623.31 | 657.38 | 646.86 | 631.32 | 613.79 | 612.28 | 611.28 | 625.31 |
| 2012 | 629.82 | 657.88 | 673.41 | 678.42 | 686.94 | 689.95 | 667.9 | 647.36 | 629.32 | 628.87 | 627.77 | 626.66 |
| 2013 | 623.36 | 618.95 | 618.95 | 618.95 | 620.05 | 617.29 | 617.29 | 623.91 | 617.29 | 616.74 | 613.44 | 608.48 |
| 2014 | 608.48 | 608.48 | 612.89 | 612.89 | 623.91 | 633.28 | 648.16 | 670.21 | 675.72 | 671.31 | 663.59 | 645.40 |
| 2015 | 623.91 | 590.29 | 558.87 | 528.56 | 508.57 | 503.56 | 501.05 | 498.04 | 487.52 | 468.98 | 456.96 | 445.94 |
| 2016 | 428.40 | 404.35 | 384.81 | 369.27 | 362.26 | 367.77 | 379.80 | 375.79 | 368.27 | 365.77 | 363.26 | 363.26 |
| 2017 | 370.28 | 387.81 | 401.84 | 409.36 | 411.36 | 410.86 | 405.35 | 403.35 | 403.35 | 401.88 | 403.72 | 406.48 |
| 2018 | 419.34 | 430.36 | 440.92 | 461.13 | 479.96 | 510.28 | 545.18 | 588.36 | 599.38 | 601.68 | 600.30 | 597.09 |
| 2019 | 591.57 | 574.58 | 566.31 | 577.34 | 594.33 | 603.97 | 602.60 | 594.79 | 584.22 | 579.63 | 571.36 | 569.07 |
| 2020 | 566.31 | 563.56 | 564.48 | 542.43 | 514.41 | 490.99 | 476.29 | 474.91 | 471.24 | 468.48 | 464.81 | 459.30 |
| 2021 | 463.43 | 483.18 | 506.60 | 525.89 | 535.54 | 541.97 | 559.42 | 562.64 | 561.72 | 561.72 | 575.50 | 586.98 |
| 2022 | 587.44 | 603.06 | 646.23 | 726.61 | 777.59 | 821.68 | 851.99 | 852.91 | 842.35 | 810.20 | 781.72 | 759.68 |
| 2023 | 740.05 | 731.03 | 731.03 | 722.51 | 718.51 | 710.49 | 708.49 | 699.47 | 697.46 | 697.46 | 697.46 | 697.46 |
| 2024 | 693.45 | 693.45 | 689.45 | 687.44 | 692.95 | 692.95 | 693.96 | 697.42 | 694.46 | 671.56 | | |

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STATEOFTENNESSEE

(Rev. 5-15-17)

(Rev. 4-15-19)

(Rev. 11-9-20)

January 1, 2021

SPECIAL PROVISIONREGARDINGBITUMINOUS PLANT MIX PAVEMENTS (HOT MIX)ROADWAY DENSITYDescription

This work consists of the requirements for acceptance of asphalt roadway density by use of core samples, and for testing and acceptance of asphalt longitudinal joint density.

Meet all requirements of 407 of the Standard Specifications except as modified.

407.03.D.2.h - Contractor Quality Control System. Add the following between the second and third paragraphs:

Conduct quality control testing of surface and binder mixes for roadway density throughout placement to verify that the mixture being placed meets specified density requirements. A Quality Control Plan (QCP) for this density testing is required. Acceptable methods of quality control testing include coring, nuclear gauge testing, and non-nuclear gauge testing. Document all tests and records from the control strip (if any). Make quality control records available upon request to the Department.

407.07 - Rollers. Replace the entire subsection with the following:

Provide a sufficient number and type of self-propelled rollers to achieve proper compaction and obtain the specified densities.

407.15 - Compaction. Replace the entire subsection with the following:

A. General

After the bituminous mixture has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly compacted. Use a method that shall be capable of compacting the mixture to the specified density while it is in a workable condition. Rollers shall not park or be refueled on the bituminous pavements.

B. Density Requirements

Meet the applicable density requirements for travel lanes and joints as specified in Table 407DEN-1 and Table 407DEN-2.

1. Mix Types: All Travel Lanes for A, B, BM, BM-2, C, CW, D, E
2. All levels of ADT
3. %Gmm values specified are for lot averages.

Table 407DEN-1

| Travel Lane Density | | |
|----------------------------|-----|-------|
| % Gmm | | % Pay |
| Min | Max | |
| 99.0 | 100 | 90 |
| 98.0 | <99 | 94 |
| 97.0 | <98 | 98 |
| 96.0 | <97 | 100 |
| 95.0 | <96 | 101 |
| 94.0 | <95 | 102 |
| 93.0 | <94 | 101 |
| 92.0 | <93 | 100 |
| 91.0 | <92 | 98 |
| 90.0 | <91 | 94 |
| 89.0 | <90 | 90 |
| 88.0 | <89 | 86 |
| | <88 | * |

Table 407DEN-2

| Joint Density Incentive/Disincentive | | |
|---|-----|-------------|
| %Gmm | | \$/L.F./Lot |
| Min | Max | |
| 98.0 | 100 | * |
| 97.0 | <98 | -0.70 |
| 96.0 | <97 | -0.42 |
| 95.0 | <96 | 0.00 |
| 94.0 | <95 | 0.00 |
| 93.0 | <94 | 0.07 |
| 92.0 | <93 | 0.14 |
| 91.0 | <92 | 0.07 |
| 90.0 | <91 | 0.00 |
| 89.0 | <90 | -0.14 |
| 88.0 | <89 | -0.42 |
| 87.0 | <88 | -0.70 |
| 86.0 | <87 | -0.98 |
| | <86 | * |

*Shall be removed and replaced at no cost to the Department or as directed by the engineer.

% Pay for travel lanes shall be applied to the theoretical quantity of the mix on the travel lanes only, even when the shoulder and travel lane are placed concurrently. No incentive shall be paid for the second travel lane unless the joint for that lot is a minimum of 90.0%.

Any lot of joint density tests averaging below 87% shall be sealed at no cost to the Department. Approved sealers are listed on the Department’s Qualified Products List (QPL), Listing #40 for Pavement Sealers. Sealing of deficient longitudinal joint lots will only be required for surface mixes. No incentive/disincentive shall be applied to a longitudinal joint between a travel lane and a shoulder.

Meet the applicable density requirements for shoulders as specified in Table 407DEN-3.

1. Mix Types: All shoulder mixes
2. All levels of ADT
3. %Gmm values specified are for lot averages.

Table 407DEN-3

| Shoulder Density | | |
|------------------|-----|-------|
| % Gmm | | % Pay |
| Min | Max | |
| 98.0 | 100 | * |
| 97.0 | <98 | 96 |
| 96.0 | <97 | 98 |
| 95.0 | <96 | 100 |
| 94.0 | <95 | 100 |
| 93.0 | <94 | 100 |
| 92.0 | <93 | 100 |
| 91.0 | <92 | 100 |
| 90.0 | <91 | 100 |
| 89.0 | <90 | 100 |
| 88.0 | <89 | 100 |
| 87.0 | <88 | 98 |
| 86.0 | <87 | 94 |
| 85.0 | <86 | 90 |
| | <85 | * |

* Shall be removed and replaced at no cost to the Department or as directed by the engineer.

% Pay for shoulders shall be applied to the theoretical quantity of mix on the shoulder even when the travel lane and shoulder are placed concurrently.

407.20.B.5 - Acceptance of the Mixture. Replace the entire subsection with the following:

5. Acceptance for Mix Density on the Roadway

- a. **General.** The Department will apply a deduction in payment, not as a penalty but as liquidated damages, for failure to meet the density requirements as specified in **407.15.B**. As soon as practical after the final rolling is completed on each lot, 5 density tests (1 per subplot) shall be performed by the Department at random locations determined by the Engineer, and an average of all such tests shall be computed. Any deduction for failure to meet density requirements or incentive for exceeding density requirements shall be

computed to the nearest 0.1% as a percentage of the total payment otherwise due for each lot.

Consecutive lots with density deductions is cause to stop production as directed by the Engineer. Adjust the rolling operation and Quality Control Plan to achieve the required density. Construct a test strip of not more than 250 tons to demonstrate to the Engineer that the changes made produce densities meeting the requirement without deductions. Only resume full production after the Engineer has accepted the test strip.

- b. Travel Lane, Turning Lane, Ramp or Shoulder Density.** For density acceptance purposes, the pavement shall be divided into lots of 1,000 tons for surface mixes (D, E, C, and CW), 2,000 tons for intermediate mixes (B, BM, and BM2), and 3,000 tons for base mixes (A). Lots shall be divided into 5 even sublots. One core will be tested in each subplot and the average for the entire lot shall be compared with the requirements in Table 407DEN-1 for travel lanes or Table 407DEN-3 for shoulders. When possible, attention should be provided to avoid cutting cores in areas where signal/loop wire may be affected. If test location selections indicate testing locations in these areas, a new random number should be selected. At the beginning of a project or at any time advisable, the Department may consider smaller lots to evaluate compaction methods or for other reasons as approved or directed by the Engineer.
- c. Joint Density.** For density acceptance purposes, joints shall use the same length lot and longitudinal coring location as the last adjoining lane to be paved. The average of the 5 cores for the entire lot shall be compared with the requirements in Table 407DEN-2. At the beginning of a project or at any time advisable, the Department may consider smaller lots to evaluate compaction methods or for other reasons as approved or directed by the Engineer.
- d. Test Method.** Five randomly selected cores (4" min./ 6" max. diameter), from each lot, will be tested to determine density compliance and acceptance. The density (bulk specific gravity) determination for a compacted asphalt mixture shall be performed in accordance with AASHTO T-166, Method A only.

All core samples shall be COMPLETELY DRY before testing. Air drying is permitted provided core samples are weighed at 2-hour intervals until dry in accordance with AASHTO T166, Section 6.1. Cores may also be dried in accordance with ASTM D 7227.

The Bulk Specific Gravity (G_{mb}) of the cores shall be averaged for each lot.

For **lanes and shoulders** the maximum theoretical gravity (G_{mm}) from acceptance testing for that shift's production will be averaged and the percent density will be determined for compliance by dividing the G_{mb} average for each lot by the G_{mm} daily average.

For **joints** the maximum theoretical gravity (G_{mm}) from acceptance testing for both adjoining lanes shall be averaged, and the percent density will be determined for compliance by dividing the G_{mb} average for each lot by the G_{mm} daily average.

Obtain the cores at the locations randomly selected by the Engineer. The Department will test the cores by a certified plant technician.

If a lot is split between two days, determine the percent density of each individual core using the daily G_{mm} average from the day the subplot (represented by the core being tested) was paved.

After obtaining the cores, all core holes shall be properly filled and compacted in kind with hot mix asphalt at no additional cost to the Department.

Cores shall be clearly labeled in a discrete, sequential manner (i.e. – M1, M2, ..., M30; J1, J2, ..., J15) throughout the course of the project. After testing, cores shall be retained along with copies of test results and will be periodically obtained by regional materials and tests for spot-check verification testing. The cores may be discarded, if regional materials and tests determines that they are no longer needed for payment or dispute resolution.

- e. **Incentive/Disincentive Payment.** The Department shall apply the incentive disincentive payment in accordance with the tables in **407.15.B**.

Any deduction in monies due the Contractor for failure to meet the density requirements shall be made under the item for Density Deduction.

Any incentive payment due the Contractor shall be under the item for Density Incentive.

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STATE

OF

TENNESSEE

(Rev. 2-8-21)

January 1, 2021

SPECIAL PROVISION

REGARDING

REPAIR OF BRIDGE DECK CRACKS

Description

This work consists of the cleaning and repairing of visible bridge deck cracks in accordance with the contract plans or as directed by the Engineer. Cracks shall be repaired using a High Molecular Weight Methacrylate (HMWM).

Materials

The material used for treating cracks shall be a low viscosity, non-fuming, high molecular weight methacrylate resin conforming to the following:

| <u>Physical Property</u> | <u>Requirement</u> |
|--------------------------|---|
| Viscosity | 25 cps, maximum (Brookfield RVT with UL adaptor, 50 RPM at 25°C (77°F)) |
| Density | 0.9 kg/L (7.5 lbs/gal), minimum, at 25°C (77°F) |
| Flash Point | 82°C (180°F), minimum |
| Vapor Pressure | 1.0 mm Hg, maximum at 25°C (77°F) |
| Gel Time | 20 minutes minimum at application temperature |
| Tack Free Time | 6 hours maximum |
| Bond Strength | 10.3 MPa (1500 psi) minimum (ASTM C 882) |

A qualified representative shall be on site to provide expert assistance on storage, mixing, application, clean-up and disposal of materials.

The promoter and initiator, if supplied separately, shall not contact each other directly. Containers of promoters and initiators shall not be stored together in a manner that will allow leakage or spillage from one to contact the containers or material of the other.

The quantity of resin mixed with promoter and initiator shall be limited to 5 gallons at a time for manual application. A significant increase in viscosity shall be cause for rejection. The mixed resin shall be applied within 10 minutes after complete mixing.

A Material Safety Data Sheet (MSDS) shall be furnished for the HMWM resin promoter and initiator to be used. A certification showing conformance to these specifications shall be provided with each batch of resin.

Aggregate materials shall consist of clean, dry, fine grained sand as per resin manufacturer specifications.

Surface Preparation

Preparation of the concrete bridge deck surface shall consist of air blasting all visible cracks with oil free compressed air using sufficient air pressure to remove all loose or objectionable material from the cracks and bridge deck surface as approved by the Engineer. The surface cracks shall be visually dry before treatment with HMWM is allowed to begin.

Application of HMWM

Plan and prosecute the operations in such a manner as to protect persons and vehicles from injury or damage. If required, perform the Work prior to any mechanical grooving.

The concrete surface temperature shall not be less than 50° F and not more than 100° F at the time of resin application.

In applying to individual cracks on a linear foot basis the resin shall be applied at an average rate of 1 gallon per 200 linear feet or as directed by the Engineer. Large cracks (wider than 0.03 inches) should be pre-filled with sand before applying resin. Each crack shall be treated with resin by ponding the resin over the crack and allowing gravity to feed the material into the crack. The resin shall be ponded over each crack for 5-10 minutes. The ponding procedure shall be repeated until each crack is sealed. Excess resin shall be cleaned up.

Traffic shall not be permitted on the treated bridge deck until the treated cracks are tack free (non-oily).

Method of Measurement

The Department will measure, complete in place, Bridge Deck Crack Sealing by the linear foot

The Department will measure Sealant by the gallon of sealant material used for bridge deck crack sealing.

Basis of Payment

The Department will pay for accepted quantities, complete in place, at the contract prices as follows:

| Item No. | Description | Unit |
|-----------------|---------------------------|-------------|
| 617-02 | BRIDGE DECK CRACK SEALING | LINEAR FEET |
| 617-05 | SEALANT (DESCRIPTION) | GALLON |

Such payment will be full compensation for all work specified including labor, materials, equipment, tools, surface preparation and incidentals to complete the work.

NOT AN OFFICIAL BID DOCUMENT!
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STATE

OF

TENNESSEE

(Rev. 5-15-23)

January 1, 2021

SPECIAL PROVISION

REGARDING

RETAINING WALLS

General Description

This Special Provision covers the design requirements, submittal of wall design drawings and supporting calculations, materials, construction, measurement, and payment for earth retaining walls. The scope of work for retaining wall construction includes, but is not limited to, the following as required:

1. All grading necessary for wall construction,
2. Undercutting and back filling of weak surficial zones, and or ground improvement as required by plans,
3. Temporary Shoring/Wall,
4. Compaction of wall foundations,
5. General and local dewatering as required for proper execution of the work,
6. Construction of leveling pads,
7. Formwork, placement of reinforcing steel, placement and curing of concrete,
8. Texture coating or architectural treatment,
9. Placement of drainage materials,
10. Installation of piling,
11. Placement of soil reinforcing devices,
12. Placement and compaction of backfill,
13. Preparation and erection of wall units,
14. Construction of any required caps, copings, or end sections.

All items included in the construction of the retaining wall shall conform to this Special Provision, the *Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction*, henceforth referred to as the Standard Specifications, American Society for Testing Materials Standards (ASTM), Federal Highway Administration (FHWA) Technical Publications, the current edition of the *AASHTO LRFD Bridge Construction Specifications*, and the current *AASHTO LRFD Bridge Design Specifications* with interims, henceforth referred to as the AASHTO LRFD. The architectural treatment and/or texture finish of the walls shall be in accordance with the contract plans.

Design Criteria

The design of all types of earth retaining walls shall be in accordance with this Special Provision and the following Specifications as required:

1. *AASHTO LRFD Bridge Design Specifications* with interims
2. Publication No. FHWA-NHI-10-024, *Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes*
3. FHWA Report No. FHWA-IF-99-015, 1999 *Geotechnical Engineering Circular No. 4, Ground Anchors and Anchored Systems*

The soil and/or rock properties and specific design values required for wall design are provided in the contract plans.

Submittal Requirements for Contractor/Supplier Prepared Design Plans

The Contractor shall utilize the information contained on the Retaining Wall Conceptual drawing as well as information shown elsewhere in the plans (i.e., utility sheets or traffic control/phasing sheets) to prepare his bid for the wall during the project bidding process and to prepare wall design plans during the construction of the project. The final design shall be submitted subsequent to contract award and a minimum of 60 days prior to start of wall construction and shall include detailed design computations and all details, dimensions, quantities, and cross sections necessary to construct the wall. Acceptable wall types will be identified on the concept drawing. Specific wall systems for the Acceptable Wall Types shall be selected from the Department's Qualified Products List (QPL) in effect at time of bid letting. In certain circumstances for a particular project, the Department may elect to provide a complete, detailed wall design in the contract plans. The Contractor shall not bid for, nor shall the Contractor submit plans for wall types and/or specific wall systems not listed as an Acceptable Wall Type on the Retaining Wall Conceptual Drawing and related drawings. If a specific wall design is provided for in the contract plans, the Contractor shall not bid for or submit plans for other wall types or design. (See Section 8 for the limited conditions under which other wall types or designs may be considered). The Contractor shall not start work on any wall until the working drawings have been approved by the Engineer.

The plans shall be prepared to include but not be limited to the following items:

1. A plan and elevation sheet or sheets for each wall containing the following:
 - a. An elevation view of the wall showing grades at the top of the wall, every 50 feet along the wall and at all horizontal and vertical break points. Elevations at the top of leveling pads and footings, the distance along the face of the wall to all steps in the footings, and leveling pads, the designation as to the type of panel or module, the length, size and number of tiebacks, nails, mesh or strips and all the distances along the face of the wall to where changes in length of the reinforcing elements occur and the location of the original and final ground line should be shown. The Contractor shall be responsible for field verifying original ground elevations.
 - b. A plan view of the wall shall indicate the offset from the construction centerline to the face of the wall at all changes in horizontal alignment, the limit of the widest module, tiebacks, nails, mesh or strip and the centerline of any drainage pipe which is behind, under, in front of or passes through the wall.
 - c. Any general or special notes, standard or special drawings, or other unique provisions required for construction of the wall.
 - d. All horizontal and vertical curve data affecting wall construction.
 - e. Cross sections showing limits of construction and in fill sections, limits, and extent of select backfill material placed above original ground.
 - f. Limits and extent of reinforced soil volume.
 - g. Limits and extent of any ground improvements as required by the contract plans.
 - h. Limits and extent of temporary shoring/retaining walls.

2. Details
 - a. All structural details including reinforcing bar bending details. Bar bending details shall be in accordance with Concrete Reinforcing Steel Institute (CRSI) standards.
 - b. All details for foundations and leveling pads, including details for steps in the footings or leveling pads.
 - c. Wall Elevation drawings shall delineate the changes in wall design height with corresponding changes in reinforcement type and/or lengths for the design section.
 - d. For each delineated wall design segment, the Applied Factored Bearing Load at both the Service and Strength Limit States shall be shown.
 - e. All modules and facing elements shall be detailed. The details shall show all dimensions necessary to construct the elements, all reinforcing steel in the element, and the location of reinforcement element attachment devices embedded in the facing.
 - f. All details for construction of the wall around drainage facilities, overhead sign footings, abutment piles or other obstructions shall be clearly shown.
 - g. All details for connections to traffic barriers, coping, parapets, noise walls and attached lighting shall be shown.
 - h. All details for drainage behind wall or reinforced soil volume.
 - i. If vehicular impact protection is required due to the wall system not satisfying the minimal design requirements of Section 5.0, details of the barrier wall and end terminals shall be shown on the Contractor/Supplier Design plans for the proposed wall.
3. Detailed design computations which clearly demonstrate compliance with design requirements provided in this specification.
4. Limits of design responsibility, if any.
5. Each design submittal shall include a detailed list of quantities for each wall unit. The quantities shall include but not be limited to concrete cast in-place, pre-cast concrete, select backfill material, backfill material, reinforcing steel, geomembrane/geogrid reinforcement, modular blocks, structural steel, pre-stressing steel, etc. If known, all materials sources shall be identified so acceptance and verification sampling and testing can be conducted. All quantities listed are for informational purposes only and do not necessarily constitute a pay item or quantity. All retaining walls shall only be paid for under the respective retaining wall bid item measured and described herein.
6. The Contractor's wall plans shall be signed, stamped, and dated by a qualified registered Professional Engineer licensed in the State of Tennessee.
7. Submittals and Approval

Submit design drawings and detail design computations as specified meeting **105.02**. The computations shall include a detailed explanation of any symbols and computer programs used in the design of walls. Structures Division will submit to the Division of Materials and Tests.

All designs and construction details will be checked by the Structures Division and the Materials and Tests Division against the pre-approved design drawings and procedures for that particular system. Review of the wall submittal will occur within 30 days of receipt. If there are design or plans issues requiring revisions, then the Structures Division will inform the appropriated Department Construction Office and provide a listing of the required revisions. Depending on the required revisions the 30 day review timeframe may be extended. Approval of the detailed design and plans shall be made

by the Structures Division and Materials and Tests Division. Notification to proceed shall be made by the Structures Division.

Submit an electronic copy of the design drawings and detail design computations to the Structures Division and the Materials and Tests Division upon completion of the project.

8. Other Submission Requirements

As discussed in the previous sections, the Contractor shall bid for and, subsequently, (for the Contractor for which the project was awarded) prepare plans for and be prepared to construct the wall type(s) given on the Retaining Wall Conceptual Drawing or, under special circumstances, the specific wall type and design as provided by in the Contract Plans. The Contractor awarded the project may only under the circumstances discussed below request that a wall type, wall system, or associated construction for a wall (i.e., foundation improvement requirements, construction sequence requirements, etc.) be changed, altered, or eliminated from those requirements set forth in the plans.

The Contractor may request the Department consider a change in the wall type, specific system, and associated construction through the submission of a Value Engineering Change Proposal (VECP) unless the contract prohibits submission of a VECP. Furthermore, any conditions of a VECP, such as a minimum cost savings required by the contract must be followed. The Department's agreement to review a VECP for a retaining wall shall in no way imply subsequent acceptance of the VECP or any part thereof. Any costs associated with preparation and submittal of a VECP shall be borne by the Contractor and no construction scheduling changes or time delays shall be caused by the Contractor's submission of the VECP and the Department's review of the VECP. If the proposed change involves a wall system not on the Approved Wall System list, then the Contractor must coordinate with the system supplier to gain approval of the system and shall be aware of the approval requirements and time considerations for this approval process.

The Contractor may request the Department consider a change in the wall type, specific system, and/or associated construction if the Contractor determines that project conditions exist that substantially differ from those conditions upon which the decision to specify in the plans a particular wall type(s), wall system, or associated construction was made. An example of this would be where a soldier pile-lagging wall is specified as the only wall type due to right-of-way constraints not allowing for a typical wall type to be built, then subsequently it is determined the Department can acquire or has sufficient right-of-way available to make another wall type feasible.

The request for consideration of changing of a wall type, system, or associated construction shall be made in writing and be submitted to the Construction Engineer. The Construction Engineer will distribute the request to the Regional Construction Engineer, Structures Division, Geotechnical Engineering Section, Design Division, and Right-of-Way Division, if applicable. The parties will review the request and provide recommended action (approval, rejection, alterations) to the Construction Engineer. If necessary, a plans revision will be made. Note that the Contractor's submission of a request does not imply acceptance by the Department and that the request process shall not be justification for a project schedule change or time extension. The Department reserves the right to require the Contractor to construct the wall as shown in the plans if there are no conditions that exist which render the contract plan wall requirement not constructible.

The Contractor must provide documentation in the request to demonstrate that the proposed change does not in any way cause additional cost to the wall and associated construction or to other aspects of the project. If the Contractor judges that a change involving wall construction must be made due to differing site conditions, the Contractor must follow procedures given in **104.02** and **104.03** of the Standard Specifications.

Requirements for Retaining Wall Protection Provided by the Retaining Wall System

When noted on the plans that a retaining wall is located in a hazard zone subject to vehicular impact, the Contractor shall be aware that retaining wall protection against vehicular collision for the wall may be required. If the retaining wall facing meets any one of the following criteria, an independent barrier wall shall be provided in front of the wall and included in the square foot cost of the wall:

1. Any retaining wall facing that is constructed of non-reinforced concrete (cast-in-place concrete gravity walls are exempt from this requirement and do not require protection).
2. Any dimension of a retaining wall facial panel that is less than 5.0 feet x 5.0 feet x 6 inches thick reinforced panel.
3. A cast in place reinforced facing that has a thickness less than 6 inches.

Materials Approval

The materials used in the construction of the earth retaining walls shall conform to this Special Provision, the Standard Specifications, and/or Departmental procedures. Prior to delivery of any material used in the retaining wall construction, the materials must be accepted in conformance with the specifications associated with the wall type being constructed.

Materials

Unless otherwise stated in specific retaining wall specifications, the materials used in the construction of earth retaining walls shall conform to the following specifications:

1. All materials shall come from an approved facility listed on the Departments Producer List.
2. Class X - 3,000 pounds per square inch (psi) concrete shall be in accordance with Section **604** of the Standard Specifications.
3. Class X - 4,000 psi concrete shall be in accordance with Section **604** of the Standard Specifications.
4. Reinforcing steel shall conform to ASTM A615, Grade 60.
5. The sources for all backfill material shall be approved in conformance with the Standard Specifications before the material is delivered to the job site. Any select backfill material must be approved or tested for compliance prior to construction.
6. Lifting hooks and threaded inserts shall be of the size indicated on the working drawings.
7. When required, imbedded items must be galvanized in accordance with AASHTO M 232 or ASTM A153.
8. Acceptance of materials furnished for work will be in accordance with "SOP 1-1: Quality Assurance for the Sampling, Testing of Materials and Products" and certified test reports as specified in **106** supplemented by routine tests run by the Department as defined in the various applicable sections of the Standard Specifications.
9. Clearing and grubbing, removal of structures and obstructions, and excavation and undercutting shall be performed in accordance with the provisions of **201**, **202**, and **203**

of the Standard Specifications. Cost of these items, however, shall be included in the square foot price bid for retaining walls as shown in contract plans.

- 10. Reinforced Concrete Facing Panels - The panels shall be fabricated in accordance with the Department’s contract plans or drawings.
- 11. Stone masonry shall be in accordance with 612 of the Standard Specifications.
- 12. All fabricated or precast retaining wall assemblies shall be selected from the Department’s Qualified Products List

Select Backfill Material - All backfill material used in the Mechanically Stabilized Earth structure volume, as shown on the plans, shall be reasonably free (maximum of 0.1 percent) from organic and otherwise deleterious materials, and it shall be approved by the Engineer prior to use. The material shall conform to the following gradation limits and be tested at the established frequencies in SOP 1-1: “Quality Assurance for the Sampling, Testing of Materials and Products.” The Contractor shall also provide test data from an approved laboratory certifying that the material meets the following:

- i. Gradation as determined by AASHTO T 27.

| Sieve Size | Percent Passing |
|------------|-----------------|
| 4 inches | 100 |
| 3/8 inch | 0-75 |
| No. 4 | 0-25 |
| No. 8 | 0-10 |
| No. 16 | 0-5 |

Note: Size Nos. 1 through 78 as listed in order of Table 1 Standard Sizes of Processed Aggregate in 903.22 of Standard Specifications meeting the above gradation requirements.

- ii. In addition, the backfill must conform to all of the following requirements:

- Soundness - The material shall be substantially free from shale or other soft, poor durability particles. The material shall have a sodium sulfate loss of less than 12 percent after 5 cycles determined in accordance with AASHTO T 104.
- The material shall exhibit an angle of internal friction of not less than 34 degrees as determined by the standard direct shear test AASHTO T 236 on the portion finer than the No. 4 sieve, using a sample of the material compacted to 95 percent of AASHTO T 99. No testing is required for backfills where 80 percent of sizes are greater than 3/8 inch.
- Electrochemical requirements - The backfill shall meet the following criteria:

| REQUIREMENTS | TEST METHOD |
|--|--------------|
| pH = 5-10 | AASHTO T 289 |
| Resistivity > 3,000-ohm centimeters ¹ | AASHTO T 288 |
| Chlorides < 100 parts per million | AASHTO T 291 |
| Sulfates < 200 parts per million | AASHTO T 290 |
| Organic Content < 1 percent | AASHTO T 267 |

1. If the resistivity is greater or equal to 5,000-ohm centimeters the chloride and sulfates requirements may be waived.

- Unit weight- The unit weight of the backfill material (at optimum condition) shall meet the requirements of the approved shop drawings or plans.

All concrete, reinforcing steel, and backfill materials shall be tested at the specified frequencies in accordance with SOP 1-1: "Quality Assurance for the Sampling, Testing of Materials and Products."

Method of Measurement

The Department will measure by the square foot area of the wall face, measured from the top of footing (or bottom of wall for walls without footings) to the top of the wall excluding any appurtenances in accordance with drawing number W-MSE-1 Appurtenances are defined herein as barriers, fences, sign supports, noise wall support posts, and other fixtures. Coping, caps, end sections and moment slabs will not be considered appurtenances and are to be considered as part of the wall face.

Basis of Payment

The earth retaining wall, complete in place and accepted, shall be paid for at the contract square foot bid price. The bid price for walls shall include as required: grading and compaction of the wall foundation, undercutting and backfilling of weak surficial zones, installation of ground improvement, footing excavation, presplitting, sheeting, shoring, drilling, piles, lagging, grouting, concrete, reinforcing steel, reinforcement strips or mesh, tie strips or rods, fasteners, connectors, wire mesh baskets, prefabricated modular components, post tensioning, performance testing and evaluation, architectural treatment and/or texture finish, drainage system, water-stops and joint sealing material, coping, caps, end sections, moment slabs, and all miscellaneous material and labor for the complete installation of the wall. If the Contractor's design requires the use of select backfill, the unit price bid for the wall shall be full compensation for any additional backfill costs due to the use of select backfill material.

If required for retaining wall protection against vehicle impact, the cost of the barrier wall and end terminals shall be included in the square foot cost of the wall.

Additional area of wall required due to unforeseen foundation conditions or other reasons and approved by the Engineer will be paid for on the basis of the unit price bid except as noted below.

The mechanically stabilized earth wall, complete in place and accepted as noted above, shall be paid for at the contract square foot bid price. No increase in unit price will be paid for increases in wall height less than or equal to 10 feet as compared to the contract plans and wall heights. Wall height increases greater than 10 feet will be paid for by supplemental agreement.

The cast-in-place concrete cantilever or counterfort retaining wall, complete in place and accepted shall be paid for at the contract square foot bid price except as noted below.

If the actual quantity of concrete piles driven varies more than 10 percent from the estimated quantity, in the absence of a bid item, a unit price of 40 dollars, per linear foot for the adjusted piling quantity will be paid or deducted. If the Engineer orders additional test piles, they will be paid for at the contract bid price, or in the absence of a bid item, a unit price of forty (40) dollars per linear foot for the piling quantity will be paid. If the Contractor changes friction pile types or sizes, additional load test(s) may be required at the Engineer's discretion and at the Contractor's expense.

If the Contractor uses a different type of pile than those that have estimated lengths shown on the contract plans, the price of the wall shall include all costs associated with piles and pile installation

with no additional payment for any variation in pile lengths. All pile types and pile driving procedures, lengths, and bearings shall be in accordance with the Standard Specifications and shall be approved by the Engineer

The retaining wall design drawings submitted for approval shall show the estimated quantity of steel piles on the design. If the actual quantity of steel piles driven varies more than 10 percent from this approved estimated quantity due to variations in the rock line, in the absence of a bid item, a unit price of 40 dollars per linear foot, for the adjusted piling quantity will be paid or deducted.

If the Engineer orders changes in the work which alters the surface area of the wall without increasing the height of the wall, payment will be increased or decreased accordingly based on the square foot bid price. If the Engineer orders changes in the work which increases the height of the wall, the unit price bid for the wall sections that were increased up to a maximum of 10 feet will be adjusted according to the following tables. Adjustments exceeding 10 feet will be made by supplemental agreement.

| RETAINING WALL COST ADJUSTMENT FACTORS | | | | | | | | | | | |
|---|--------|------|------|------|------|------|------|------|------|------|------|
| Level Backfill with Slope <= 3 : 1 (Run : Rise) | | | | | | | | | | | |
| Height Increase (ft.) | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Original Height (ft.) | 1 - 10 | 1.01 | 1.02 | 1.04 | 1.06 | 1.08 | 1.10 | 1.13 | 1.16 | 1.20 | 1.24 |
| | 11 | 1.01 | 1.03 | 1.05 | 1.07 | 1.09 | 1.12 | 1.15 | 1.19 | 1.22 | 1.26 |
| | 12 | 1.02 | 1.03 | 1.06 | 1.08 | 1.11 | 1.14 | 1.17 | 1.21 | 1.25 | 1.29 |
| | 13 | 1.02 | 1.04 | 1.06 | 1.09 | 1.12 | 1.15 | 1.19 | 1.23 | 1.27 | 1.31 |
| | 14 | 1.02 | 1.04 | 1.07 | 1.10 | 1.13 | 1.17 | 1.21 | 1.25 | 1.29 | 1.34 |
| | 15 | 1.02 | 1.05 | 1.08 | 1.11 | 1.14 | 1.18 | 1.22 | 1.26 | 1.31 | 1.36 |
| | 16 | 1.03 | 1.05 | 1.08 | 1.12 | 1.15 | 1.19 | 1.24 | 1.28 | 1.33 | 1.38 |
| | 17 | 1.03 | 1.06 | 1.09 | 1.13 | 1.16 | 1.21 | 1.25 | 1.29 | 1.34 | 1.40 |
| | 18 | 1.03 | 1.06 | 1.10 | 1.13 | 1.17 | 1.22 | 1.26 | 1.31 | 1.36 | 1.41 |
| | 19 | 1.03 | 1.06 | 1.10 | 1.14 | 1.18 | 1.22 | 1.27 | 1.32 | 1.37 | 1.42 |
| | 20 | 1.03 | 1.07 | 1.11 | 1.15 | 1.19 | 1.23 | 1.28 | 1.33 | 1.38 | 1.44 |
| | 21 | 1.03 | 1.07 | 1.11 | 1.15 | 1.19 | 1.24 | 1.29 | 1.34 | 1.39 | 1.45 |
| | 22 | 1.04 | 1.07 | 1.11 | 1.15 | 1.20 | 1.25 | 1.29 | 1.35 | 1.40 | 1.45 |
| | 23 | 1.04 | 1.07 | 1.12 | 1.16 | 1.20 | 1.25 | 1.30 | 1.35 | 1.41 | 1.46 |
| | 24 | 1.04 | 1.08 | 1.12 | 1.16 | 1.21 | 1.25 | 1.30 | 1.36 | 1.41 | 1.47 |
| | 25 | 1.04 | 1.08 | 1.12 | 1.16 | 1.21 | 1.26 | 1.31 | 1.36 | 1.41 | 1.47 |
| | 26 | 1.04 | 1.08 | 1.12 | 1.17 | 1.21 | 1.26 | 1.31 | 1.36 | 1.42 | 1.47 |
| | 27 | 1.04 | 1.08 | 1.12 | 1.17 | 1.21 | 1.26 | 1.31 | 1.37 | 1.42 | 1.48 |
| | 28 | 1.04 | 1.08 | 1.12 | 1.17 | 1.22 | 1.26 | 1.31 | 1.37 | 1.42 | 1.48 |
| | 29 | 1.04 | 1.08 | 1.12 | 1.17 | 1.22 | 1.26 | 1.31 | 1.37 | 1.42 | 1.48 |
| 30 | 1.04 | 1.08 | 1.12 | 1.17 | 1.22 | 1.26 | 1.31 | 1.37 | 1.42 | 1.48 | |
| 31 | 1.04 | 1.08 | 1.12 | 1.17 | 1.22 | 1.26 | 1.31 | 1.37 | 1.42 | | |
| 32 | 1.04 | 1.08 | 1.12 | 1.17 | 1.22 | 1.26 | 1.31 | 1.36 | | | |
| 33 | 1.04 | 1.08 | 1.12 | 1.17 | 1.22 | 1.26 | 1.31 | | | | |
| 34 | 1.04 | 1.08 | 1.12 | 1.17 | 1.21 | 1.26 | | | | | |
| 35 | 1.04 | 1.08 | 1.12 | 1.17 | 1.21 | | | | | | |
| 36 | 1.04 | 1.08 | 1.12 | 1.17 | | | | | | | |
| 37 | 1.04 | 1.08 | 1.12 | | | | | | | | |
| 38 | 1.04 | 1.08 | | | | | | | | | |
| 39 | 1.04 | | | | | | | | | | |

| | | RETAINING WALL COST ADJUSTMENT FACTORS | | | | | | | | | |
|-----------------------|--------|--|------|------|------|------|------|------|------|------|------|
| | | Level Backfill with Slope > 3 : 1 (Run : Rise) | | | | | | | | | |
| | | Height Increase (ft.) | | | | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Original Height (ft.) | 1 - 10 | 1.03 | 1.07 | 1.11 | 1.16 | 1.22 | 1.28 | 1.35 | 1.43 | 1.51 | 1.60 |
| | 11 | 1.04 | 1.08 | 1.13 | 1.18 | 1.25 | 1.31 | 1.39 | 1.47 | 1.56 | 1.65 |
| | 12 | 1.04 | 1.09 | 1.14 | 1.20 | 1.27 | 1.34 | 1.42 | 1.50 | 1.59 | 1.69 |
| | 13 | 1.05 | 1.10 | 1.15 | 1.22 | 1.29 | 1.36 | 1.44 | 1.53 | 1.62 | 1.72 |
| | 14 | 1.05 | 1.10 | 1.16 | 1.23 | 1.30 | 1.38 | 1.46 | 1.55 | 1.65 | 1.75 |
| | 15 | 1.05 | 1.11 | 1.17 | 1.24 | 1.32 | 1.40 | 1.48 | 1.57 | 1.67 | 1.77 |
| | 16 | 1.05 | 1.12 | 1.18 | 1.25 | 1.33 | 1.41 | 1.49 | 1.59 | 1.68 | 1.78 |
| | 17 | 1.06 | 1.12 | 1.19 | 1.26 | 1.33 | 1.42 | 1.50 | 1.59 | 1.69 | 1.79 |
| | 18 | 1.06 | 1.12 | 1.19 | 1.26 | 1.34 | 1.42 | 1.51 | 1.60 | 1.70 | 1.80 |
| | 19 | 1.06 | 1.12 | 1.19 | 1.27 | 1.34 | 1.42 | 1.51 | 1.60 | 1.70 | 1.80 |
| | 20 | 1.06 | 1.13 | 1.19 | 1.27 | 1.34 | 1.43 | 1.51 | 1.60 | 1.69 | 1.79 |
| | 21 | 1.06 | 1.13 | 1.19 | 1.27 | 1.34 | 1.42 | 1.51 | 1.60 | 1.69 | 1.79 |
| | 22 | 1.06 | 1.13 | 1.19 | 1.27 | 1.34 | 1.42 | 1.51 | 1.59 | 1.68 | 1.78 |
| | 23 | 1.06 | 1.13 | 1.19 | 1.27 | 1.34 | 1.42 | 1.50 | 1.59 | 1.68 | 1.77 |
| | 24 | 1.06 | 1.13 | 1.19 | 1.26 | 1.34 | 1.41 | 1.50 | 1.58 | 1.67 | 1.76 |
| | 25 | 1.06 | 1.12 | 1.19 | 1.26 | 1.33 | 1.41 | 1.49 | 1.57 | 1.66 | 1.74 |
| | 26 | 1.06 | 1.12 | 1.19 | 1.26 | 1.33 | 1.40 | 1.48 | 1.56 | 1.64 | 1.73 |
| | 27 | 1.06 | 1.12 | 1.19 | 1.25 | 1.32 | 1.40 | 1.47 | 1.55 | 1.63 | 1.72 |
| | 28 | 1.06 | 1.12 | 1.18 | 1.25 | 1.32 | 1.39 | 1.46 | 1.54 | 1.62 | 1.70 |
| | 29 | 1.06 | 1.12 | 1.18 | 1.25 | 1.31 | 1.38 | 1.46 | 1.53 | 1.61 | 1.69 |
| | 30 | 1.06 | 1.12 | 1.18 | 1.24 | 1.31 | 1.38 | 1.45 | 1.52 | 1.60 | 1.67 |
| | 31 | 1.06 | 1.11 | 1.17 | 1.24 | 1.30 | 1.37 | 1.44 | 1.51 | 1.58 | |
| | 32 | 1.06 | 1.11 | 1.17 | 1.23 | 1.30 | 1.36 | 1.43 | 1.50 | | |
| | 33 | 1.05 | 1.11 | 1.17 | 1.23 | 1.29 | 1.36 | 1.42 | | | |
| | 34 | 1.05 | 1.11 | 1.17 | 1.22 | 1.29 | 1.35 | | | | |
| | 35 | 1.05 | 1.11 | 1.16 | 1.22 | 1.28 | | | | | |
| | 36 | 1.05 | 1.10 | 1.16 | 1.22 | | | | | | |
| | 37 | 1.05 | 1.10 | 1.16 | | | | | | | |
| | 38 | 1.05 | 1.10 | | | | | | | | |
| | 39 | 1.05 | | | | | | | | | |

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FOR INFORMATION ONLY

Specific Wall Construction and Materials Requirements

Cast in Place walls are covered through the Contractor's design. All other walls are approved through approved systems listed on the Qualified Products List.

A. Cast-in-Place (CIP) Concrete Gravity Retaining Walls

Construction

The construction of the wall shall be in accordance with this Special Provision and the Standard Specifications.

B. Cast-In-Place (CIP) Concrete Cantilever and Counterfort Retaining Walls

Construction

The construction of the wall shall be in accordance with this Special Provision and the Standard Specifications. If the use of piles is anticipated, the foundation information shown on the contract plans shall include the skin friction (F_s) and end bearing (Q_b) values, or the location of the rock line. Based on this information, estimated pile lengths shall be shown on the contract plans for 50- and 100-tons ultimate bearing capacity for Size 1 concrete friction piles. The Contractor shall estimate point bearing steel pile refusal lengths based on the given rock line information.

Concrete friction piles shall be installed to provide a minimum factor of safety of 2.0 if a load test is used and a minimum factor of safety of 3.0 if a load test is not used. Pile types, load test procedures, and driving equipment shall be in accordance with the Standard Specifications and shall be approved by the Engineer. The number and location of test piles and load tests shall be approved by the Engineer. Test pile lengths shall be 10 feet longer than the estimated pile lengths. Test piles shall be driven in accordance with the Standard Specifications and shall be required at least every 50 feet along the wall, unless otherwise approved by the Engineer. No pile shall be any farther than 500 feet from a load test, if a load test is used, unless otherwise approved by the Engineer. The length of production piles to be driven and the required bearing based on the driving equation shall be determined by the Engineer based on the required design bearing, the results of the test piles and load tests (if used), and applicable safety factors. Driven pile lengths and final bearings shall be approved by the Engineer.

Point Bearing Steel Piles shall be driven to refusal. Pile tips shall be used when indicated on the contract plans.

All reinforcing steel projecting from footing into the wall in the back face (fill side) shall be epoxy coated.

C. Gravity Wall Systems

1. Materials

The following items are the construction materials requirements necessary for gravity wall system design fabrication. All materials shall be approved prior to use.

- Pre-Cast Concrete Gravity Wall Systems

The pre-cast gravity wall systems are to be made of Class X concrete with a compressive strength of 4,000 psi conforming to 604 of the Standard Specifications.

2. Fabrication of Precast Concrete Gravity Wall Systems

- Out-of-state producers shall provide documentation of material quality before the manufacture of any pre-cast products (i.e., aggregate quality reports, cement/steel mill test reports, etc.)

The fabricator shall provide two precast modular units to the Engineer for approval.

- i. These approved precast modular units will serve as standard models. The finished exposed faces of the production precast modular units should be similar to the exposed faces of the model precast modular units.
 - ii. One of the model precast modular units should be kept at the production plant for relative comparison to future modular units. The other model should be kept on the construction site for comparison to the other delivered units.
- To assure uniform unit production steel forms must be used.
 - The placement of reinforcing steel within the precast units should conform to the design placement shown in the shop drawings.
 - Final acceptability of the precast units shall be determined on the basis of certification and shall be verified by compression tests production defects and tolerances, and visual inspection. The manufacturer shall furnish all sampling and testing facilities.
 - Section 604 of the Standard Specifications states the units shall be steam or moist cured until developing the specified compressive strength set forth in the shop drawings. Any unit not developing the specified compressive strength shall be rejected.
 - The precast units should not be delivered before samples have been verified by Regional Materials and Tests and attained the required compressive strength of 4,000 psi (f'_c).
 - Prior to shipment, the finished units are subject to visual inspection by the Engineer. Individual gravity wall system may be rejected for any of the reasons listed below.
 - i. Variations in the exposed face texture relative to the approved model face texture.
 - ii. The length or height of the unit not satisfying the unit allowable tolerance limit of 3/16 inch.
 - iii. Honeycombed or open texture units which are not properly repaired.
 - iv. Individual defects which could affect the structural integrity of the unit Variations in the exposed face texture relative to the approved model face texture.
 - The Department will verify products before shipment. If products are manufactured out of state, the Department may verify at the project site PRIOR to the placement of the units. The Contractor, or producer, shall notify the Regional Materials and Tests that products need to be verified.
 - Upon delivery, the exposed surface of the precast units shall be examined. If the exposed faces of any of the units are below the standards of the approved model on site, the units shall be replaced or properly repaired until conforming to the appearance, strength, and durability of the approved model.
 - The date of manufacture shall be clearly and permanently marked on one of the

inside surfaces of each unit. Each shipment must be accompanied with a certification letter.

3. Construction

- The Contractor should perform any soil improvement, such as undercutting and backfilling before foundation preparation.
- Compact the top 12 inches of soil on which the structure will rest to at least 95 percent of the maximum laboratory dry density as specified in AASHTO T-99.
- No Gravity Wall System should be built upon frozen ground.
- Following excavation for the gravity wall system, the Contractor shall notify the Engineer for approval of the footing depth and character of the foundation material. No gravity wall work shall proceed until approval has been granted.
- The correct batter of the wall shall not exceed $\frac{1}{2}$ inch per 10 feet. of wall height.
- The gravity wall system backfill should be placed and compacted to at least 95 percent of the maximum laboratory dry density (AASHTO T-99) in layers no thicker than 12 inches.
- Backfilling behind the gravity wall system shall follow erection as closely as possible. The wall height should never be greater than three feet above the backfill.
- Any underdrain shall be placed in accordance with the details of the working plans.
- The Contractor shall furnish, install, operate, and maintain satisfactory dewatering systems as required to maintain the site in a dry and workable condition. These systems shall be continued as long as necessary. No separate measurement or payment will be made for dewatering.

D. Gabion Wall (See Qualified Products List (QPL) for Approved Manufacturer/Supplier)

1. General

This section covers the furnishing, assembling, filling with stone, and tying open wire mesh rectangular compartmented gabions placed on filter cloth or filter stone as specified herein, and in reasonably close conformity with the lines, grades, dimensions, and cross-sections shown on the plans or as directed by the Engineer, and the design, working drawings, materials, construction, measurement, and payment for gabions.

Included in the scope of this section are: grading and compaction of the wall foundation, general and local dewatering as required for proper execution of the work, installation of wall drainage systems as specified on the plans, erection of units, the placement of stone within the units and compaction of the soils behind the units as well as the construction of any required reinforced concrete appurtenances such as caps, copings, or end sections as specified on the plans. For the purposes of this section, the gabions foundation shall include all areas underlying the gabion wall. All other items included in the construction of the retaining wall not specifically mentioned herein this special provision shall conform to the applicable sections of the Standard Specifications and the *AASHTO LRFD Bridge Design Specifications* with interims.

2. Design Criteria

The current AASHTO LRFD Bridge Design Specifications with interims shall be used as the basis for design for the Gabion Wall utilized as a gravity type retaining wall.

3. Materials

- Gabion Wire Mesh

Gabion basket units shall be fabricated from either a double twisted hexagonal wire mesh (metallic or PVC coated as required in contract plans) or welded wire mesh (metallic or PVC coated as required in contract plans) that meets property requirements described in:

ASTM Designation: A974 Standard Specification for Welded Wire Fabric Gabions and Gabion Mattresses (Metallic-Coated or Polyvinyl Chloride (PVC) Coated).

ASTM Designation: A975 Standard Specification for Double-Twisted Hexagonal Mesh Gabions and Revet Mattresses (Metallic-Coated Steel Wire or Metallic-Coated Steel Wire with Poly (Vinyl Chloride) (PVC) Coating

All other components of the gabion construction such as selvedge wire, lacing wire, spiral connectors, clips, galvanization, PVC coating shall be in accordance with the above specifications.

- Stone Fill

All stone fills shall be listed on the Department's Producer List and shall be of suitable quality to ensure durability. The inclusion of objectionable quantities of shale, dirt, sand, clay, rock fines, and other deleterious material will not be permitted. Stone fill shall be of well-graded mixture with sizes ranging between 4 inches and 10 inches in diameter, based on U.S. Standard square mesh sieves. No stone shall have minimum dimension less than 4 inches. Stone fill material selected for use in the gabions shall meet the minimum in-place density specified on the plans.

- Filter Cloth

All filter cloth shall meet the applicable requirements specified in **921.12**.

- Filter Stone

All filter stone shall meet the applicable aggregate quality requirements of **903.25** and aggregate grading requirements specified in **903.22** for Size 68 or 57.

4. Construction

- Clearing and Grubbing

Clearing and grubbing, removal of structures and obstructions, and excavation and undercutting shall be performed in accordance with the provisions of **201**, **202**, and **203**, respectively, of the Standard Specifications. Cost of these items, however, shall be included in the square foot price bid retaining walls as shown in contract plans.

- Foundation Preparation

Foundation preparation for the gabions shall be made to the required depth below the finished surface and to such a width as to permit the proper installation of the gabions. Prior to wall construction, the top 12 inches of the foundation shall be compacted to at least 95 percent of maximum laboratory dry density as specified in AASHTO T 99. All soft and unsuitable material shall be removed and replaced with suitable material, which shall then be compacted. The finished subgrade shall be smooth and uniform, with no protruding debris or rock formations. A Size 57 stone may be required to obtain the smooth uniform surface and shall be in reasonably

close conformity with the dimensions and designs shown on the plans or established by the Engineer. No gabions shall be constructed upon frozen foundation material.

- Filter Cloth or Filter Stone

Upon final foundation preparation and acceptance by the Engineer, the filter cloth or filter stone shall be placed directly on the foundation at those locations shown on the plans or as directed by the Engineer. All end and side laps shall be a minimum of 18 inches for the filter cloth.

- Assembly (Fabrication)

Gabions shall be fabricated in such a manner that the sides, ends, lid, and diaphragms can be assembled at the construction site into rectangular baskets. Gabions shall be of single unit construction, i.e., the base, lid, ends, and sides shall be either woven into a single unit or one edge of these members connected to the base section of the gabion in such a manner that strength and flexibility at the point of connection is at least equal to that of the mesh. Gabion units shall be equally divided, by diaphragms of the same mesh and gauge as the body of the gabions, into cells whose length does not exceed the horizontal width. The gabion shall be furnished with the necessary diaphragms secured in proper position on the base in such a manner that no additional tying at this juncture will be necessary. All perimeter edges of the mesh forming the gabion shall be securely joined so that the joints formed by tying the selvages or installation of spiral ties have at least the same strength as the body of the mesh. Lacing wire or connecting wire shall be supplied in sufficient quantity for securely fastening all diaphragms and edges of the gabion.

- Assembly (Field)

- i. Empty gabion units shall be placed on the filter blanket when required on contract drawings and shall be assembled individually to the lines and grades indicated on the Plans or as directed by the Engineer, with the sides, ends, and diaphragms erected in such a manner to ensure the correct position. All adjoining empty gabion units must be connected by tie wire lacing along the perimeter of their contact surfaces in order to obtain a monolithic structure. Lacing of adjoining basket units shall be accomplished by continuous stitching with alternating single and double loops at intervals of not more than 5 inches. All lacing wire terminals shall be securely fastened. The use of expedient clip connections for this purpose or as final lid closing will not be permitted. After adjoining empty basket units are set to line and grade and common sides with adjacent units thoroughly laced, they shall be placed in tension and stretched to remove any kinks from the mesh and to a uniform alignment. The stretching of empty basket units shall be accomplished in such a manner as to prevent any possible unraveling and distortion.
- ii. Stone filling operations shall carefully proceed with placement by hand or machine so as not to damage galvanized wire coating, to assure a minimum of voids between the stones, to prevent damage to the underlying filter blanket, and to ensure the maintenance of alignment throughout the filling process. The maximum height from which the stone may be dropped into the basket units shall be 36 inches. Along all exposed faces, the outer layer of stone shall be carefully placed and arranged by hand to ensure a neat and compact

appearance. The last layer of stone shall be leveled with the top of the gabions to allow for the proper closing of the lid and to provide an even surface that is uniform in appearance.

- iii. Lids shall be stretched tight over the stone fill using crowbars or lid closing tools until the lid meets the perimeter edges of the front and end panels. The lid shall then be tightly laced with tie wire along all edges, ends and internal cell diaphragms by continuous stitching with alternating single and double loops at intervals of not more than 5 inches. Special attention shall be given to see that all projections or wire ends are turned into the baskets. Where shown on the drawings or as directed by the Engineer, or where a complete gabion unit cannot be installed because of space limitations, the basket unit shall be cut, folded, and wired together to suit existing site conditions. The mesh must be cleanly cut and the surplus mesh cut out completely or folded back and neatly wired to an adjacent gabion face. The assembling, installation, filling, lid closing, and lacing of the reshaped gabion units shall be carried out as specified above.

- Backfill

Backfilling of the gabion wall shall follow erection as closely as possible and in no case should the height of the wall be greater than seven feet above the backfill. Underdrains, if required, shall be placed in accordance with the details shown on plans. Gabion walls backfill shall have a density of 100 pounds per cubic foot or as specified on contract plans and shall be compacted to at least 95 percent of the maximum laboratory dry density as defined in AASHTO T 99 to within one foot of the top of the wall. The top 12 inches shall be compacted to at least 100 percent of the maximum laboratory dry density. The backfill material shall consist of broken or crushed stone, gravel, sand, slag, or other suitable coarse granular material to insure proper drainage. Shale, clay, or cinders shall not be permitted as backfill material. Prior to placement, the backfill material must be approved by the Engineer. The Contractor shall furnish, install, operate, and maintain satisfactory dewatering system as required to maintain the site in a dry and workable condition so as to permit grading and compaction of the wall foundation and proper erection and backfill of the wall. These systems shall include all equipment and materials and shall be continued as long as necessary. No separate measurement or payment will be made for dewatering or dewatering systems.

All backfill material shall be tested prior to use and at the established frequencies in SOP 1-1: "Quality Assurance for the Sampling, Testing of Materials and Products."

- Vertical Wall Tolerance

The overall vertical tolerance of the wall (plumbness from top to bottom) shall not deviate more than ½ inch per 10 feet of wall height from the contract drawings batter of the wall.

- On Site Inspection

The quality of materials, the process of manufacture, and the finished members shall be subject to inspection and approval by the Engineer. Any gabions damaged prior to acceptance shall be repaired or reconstructed as directed by the Engineer. All costs of repairs or reconstruction shall be at the Contractor's expense.

E. Segmental, Precast Facing Mechanically Stabilized Earth (MSE) Wall (See QPL for Approved Manufacturer/Supplier)

1. Materials

General - The Contractor shall make arrangements to purchase or manufacture the facing elements, reinforcing mesh or strips, attachment devices, joint filler, and all other necessary components. Materials not conforming to this section or the Standard Specifications or from sources not listed in the contract document shall not be used without written consent from the Engineer.

Out-of-state producers shall provide documentation of material quality before the manufacture of any pre-cast products (i.e., aggregate quality reports, cement/steel mill test reports, etc.)

- Reinforced Concrete Facing Panels - The panels shall be fabricated in accordance with contract drawings.
 - i. Verification of the precast units will be determined on the basis of compressive strength tests, production tolerances, and visual inspection. The Contractor, or the supplier, shall furnish facilities and perform all necessary sampling and testing in an expeditious and satisfactory manner as directed by the Engineer.
 - ii. The hydraulic cement shall be as specified in **901.01** and shall conform to the requirements of AASHTO M 85 (ASTM C150). Concrete for precast panels shall be Class X concrete with a compressive strength of 4,000 psi as specified in **604** of the Standard Specifications. Admixtures containing chlorides shall not be used.
 - iii. The panels shall be cast using steel forms. The front face of the panel (face exposed to view when installed in the wall) shall be cast against a steel form or architectural form liner. The back face is to be float finished. The concrete in each panel shall be placed without interruption and shall be consolidated by the use of an approved vibrator, supplemented by such hand tamping as may be necessary to force the concrete into the corners of the forms and prevent the formation of stone pocket or cleavage planes. Clear form oil of the same type shall be used throughout the casting operation.
 - iv. Unless otherwise indicated on the plans or elsewhere in the Standard Specifications, the concrete surface for the front and rear face shall have a Class 1 finish as defined by Section 8.12.2 of AASHTO, Division II, and for the rear face a uniform surface finish. The rear face of the panel shall be float finished sufficiently to eliminate open aggregate pockets and surface distortions in excess of 1/4 inch. The panels shall be cast on a flat area. The strips or other galvanized attachment devices shall not contact or be attached to the face panel reinforcement steel.
 - v. Curing and forms removal shall be in accordance with the requirements of **604.20** and **604.24** of the Standard Specifications, unless otherwise approved by the Engineer. The forms shall remain in place until they can be removed without damage to the panel.
 - vi. The units shall be fully supported until the concrete reaches a minimum compressive strength of 1000 psi. The units may be shipped after reaching

- a minimum specified compressive strength of 4,000 psi. the Department will verify products before shipment. If products are manufactured out of state, the Department may verify at the project site PRIOR to the placement of the units. The Contractor, or producer, shall notify the Regional Materials and Tests Division that products need to be verified.
- vii. Marking - The date of manufacture, the production lot number, and the piece mark shall be clearly scribed on an unexposed face of each panel.
- viii. Handling, Storage, and Shipping - All units shall be handled, stored, and shipped in such a manner as to eliminate the dangers of chipping, discoloration, cracks, fractures, and excessive bending stresses. Panels damaged during handling or storage at the casting plant shall be repaired at the plant as directed by the Engineer. Any panels damaged during handling, storing, or shipping may be rejected upon delivery at the option of the Engineer. Panels in storage shall be supported in firm blocking located immediately adjacent to embedded connection devices to avoid bending the connection devices.
- ix. Tolerances - All units shall be manufactured within the following tolerances:
- Panel Dimensions - Position panel connection devices within 1 inch, except for all other dimensions within 3/16 inch.
 - Panel Squareness - Squareness as determined by the difference between the two diagonals shall not exceed 1/2 inch.
 - Angular distortion with regard to the height of the panel shall not exceed 3/16 inch in 5 feet.
 - Panel Surface Finish - Surface defects on smooth formed surfaces measured over a length of 5 feet shall not exceed 1/8 inch. Surface defects on the textured-finish surfaces measured over a length of 5 feet shall not exceed 5/16 inch.
- x. Steel - In accordance with the Standard Specifications
- xi. Compressive Strength - Verification of the concrete panels, with respect to compressive strength, will be determined on the basis of production lots. A production lot is defined as a group of panels that will be represented by a single compressive strength sample and will consist of a single day's production.
- xii. During the production of the concrete panels, Materials and Test will sample the concrete in accordance with AASHTO T 141 (ASTM C 172). A single compressive strength sample, consisting of a minimum of 6 cylinders, will be randomly selected for every production lot.
- xiii. Cylinders for compressive strength tests shall be prepared in accordance with AASHTO T 23 (ASTM C31) on 6 x 12 inch or 4 x 8 inch specimens. For every compressive strength sample, a minimum of 2 cylinders will be cured in the same manner as the panels and tested for acceptance no later than 28 days. The average compressive strength of these two cylinders, when tested according with AASHTO T 22 (ASTM C39), will determine the compressive strength of the production lot.
- xiv. If the Contractor wishes to remove forms or ship the panels prior to 28 days, a set of 2 backup cylinders will be cured in the same manner as the panels.

The average compressive strength of these cylinders when tested in accordance with AASHTO T 22, will determine whether the forms can be removed, and the panels are acceptable for shipment.

- xv. Acceptance of a production lot will be made if the compressive strength test result is greater than or equal to 4,000 psi when tested for acceptance no later than 28 days.
- xvi. In the event that a production lot fails to meet the specified compressive strength requirements, the production lot shall be rejected. Such rejection shall prevail unless the manufacturer, at their own expense, obtains and submits cores for testing and the results show that the strength and quality of the concrete placed within the panels of the production lot is acceptable. The cores shall be taken from the panels within the production lot and tested in accordance with the specifications of AASHTO T 24 (ASTM C 42). Two cores per each cylinder that failed will be required. In addition, any or all of the following defects shall be sufficient cause for rejection:
 - Defects that indicate imperfect molding.
 - Defects indicating honeycombing or open texture concrete.
 - Defects in the physical characteristics of the concrete such as cracked or severely chipped panels.
 - Color variation on front face of panel due to excess form oil or other reasons.
 - Damage due to handling, storing, or shipping.
- xvii. The Engineer shall determine whether spalled, honeycombed, chipped or otherwise defective concrete shall be repaired or rejected. Repair of concrete, if allowed, shall be done with a Department approved cementitious polymer patching mortar in a manner satisfactory to the Engineer. Repair to concrete surface which will be exposed to view after completion of construction must be approved by the Engineer.
- Soil Reinforcing and Attachment Devices - All reinforcing and attachment devices shall be shop fabricated and carefully inspected to ensure they are true to size and free from defects that may impair their strength and durability.
 - i. Reinforcing Strips - Reinforcing strips shall be hot rolled from bars to the required shape and dimensions. Their physical and mechanical properties shall conform to either AASHTO M 183 (ASTM A36) or AASHTO M 223 (ASTM A572) grade 65 or equal. Galvanization shall conform to the minimum requirements or AASHTO M 111 (ASTM A123).
 - ii. Tie Strips - The tie strips shall be shop- fabricated of hot rolled steel conforming to the minimum requirements of ASTM 570, Grade 50 or equivalent. Galvanization shall conform to AASHTO M 111 (ASTM A123). Tie straps may be partially bent before shipment to the precast yard. Minimum bending radius shall be one inch. Final bending may be accomplished at the precast yard.
 - iii. Reinforcing Mesh - Reinforcing mesh shall be shop fabricated of cold drawn steel wire conforming to the minimum requirements of AASHTO M 32 (ASTM A 82) and shall be welded into the finished mesh fabric in accordance with AASHTO M 55 (ASTM A185). Galvanization shall be

applied after the mesh is fabricated and conform to the minimum requirements of AASHTO M 111 (ASTM A123).

- iv. Fasteners - Fasteners shall be high strength hexagonal cap screw bolts and nuts conforming to AASHTO M 164 (ASTM A325). Galvanizing fastener elements, including washers, shall be in accordance with AASHTO M 232 (ASTM A153). Bolts and nuts nominal diameter will be shown in the plans and supplied in accordance with the fasteners as specified previously.
 - v. Steel Strap Connections - The steel strap connection bar and plate shall meet the same requirements as the reinforcing and tie strips specified above. Bolts, nuts, and washers shall conform to the requirements for the fasteners specified above. Coatings for connecting devices shall be as specified below.
 - vi. Clevis Loop and Mesh Loop - Clevis loops and mesh loops shall be fabricated of cold drawn steel wire conforming to the requirements of AASHTO M 32 (ASTM A82) and welded in accordance with AASHTO M 55 (ASTM A185) and shall develop a minimum stress of $0.9 F_y$.
 - vii. Connector Bar - Connector bar shall be fabricated of cold drawn steel wire conforming to the requirements of AASHTO M 32 (ASTM A82).
 - viii. Holes for bolts shall be punched in the location shown. Surfaces resulting from punching holes for bolts shall be galvanized in accordance with AASHTO M 111 (ASTM A123). Those parts of the connecting devices which are threaded shall be galvanized in accordance with AASHTO M 232 (ASTM A153). Alignment pins are to be hot dip galvanized.
 - ix. All connecting devices shall be to the dimensions shown on the plans. Connecting members and soil reinforcement devices shall be assembled prior to galvanization. All connecting devices shall be true to size and free from defects that may impair their strength or durability.
 - x. Any damage sustained to any part of the connecting devices, bolts or reinforcing devices during any phase of fabrication, storage or erection shall be repaired to the satisfaction of the Engineer at no increase in contract cost.
- Geosynthetic Reinforcement Material - Where geosynthetic reinforcements are used for the construction of MSE walls the following requirements shall apply:
 - i. Geotextiles and Thread for Sewing - Woven or nonwoven geotextiles shall consist only of long chain polymeric filaments or yarns formed into a stable network such that the filaments or yarns retain their position relative to each other during handling, placement, and design service life. At least 95 percent by weight of the long chain polymer shall be polyolefin or polyester. The material shall be free of defects and tears. The geotextile shall conform as a minimum to the properties indicated for Separation, Medium Survivability indicated under AASHTO T 288. The geotextile shall be free from any treatment or coating that might adversely alter its physical properties after installation.
 - ii. Geogrids - The geogrid shall be a regular network of integrally connected polymer tensile elements with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil or rock. The geogrid structure shall be dimensionally stable and able to retain its geometry

under manufacture, transport, and installation.

- iii. Required Properties - The specific geosynthetic material(s) shall be preapproved by the Department and shall have certified long-term strength (T_{al}) as determined by:

- Long-Term strength (T_{al}) based on the Equation where RF_{CR} is from creep tests performed in accordance with ASTM D5262, RF_{ID} obtained from site installation damage testing and RF_{ID} from hydrolysis or oxidative degradation testing extrapolated to 75- or 100-year design life.

$$T_{al} = \frac{T_{ult}}{RF_D \times RF_{ID} \times RF_{CR}}$$

- Ultimate Strength (T_{ULT}) based upon minimum average roll values (MARV, lb/ft), ASTM D4595.
- Pullout Resistance Factor developed in accordance with Chapter 3 of NHI-10-024.

- iv. Certification - The Contractor shall submit a manufacturer’s certification that the geosynthetics supplied meet the respective index criteria set when the geosynthetic was approved by the Department, measured in full accordance with all test methods and standards specified and as set forth in this document.

The manufacturer’s certificate shall state that the furnished geosynthetic meets the requirements of this document as evaluated by the manufacturer’s quality control program. The certificates shall be attested to by a person having legal authority to bond the manufacturer. In case of dispute over validity of value, the Engineer can require the Contractor to supply test data from a Department approved laboratory to support the certified values submitted.

- v. Manufacturing Quality Control: The geosynthetic reinforcement shall be manufactured with a high degree of quality control. The manufacturer is responsible for establishing and maintaining a quality control program to ensure compliance with the requirements of this document. The purpose of the QC testing program is to verify that the reinforcement geosynthetic being supplied to the project is representative of the material used for performance testing and approval by the Department.

Conformance testing shall be performed as part of the manufacturing process and may vary for each type of product. As a minimum, the following index tests shall be considered as applicable for an acceptable QA/QC program:

| <u>Property</u> | <u>Test Procedure</u> |
|--------------------------------|-----------------------|
| Specific Gravity (HDPE only) | ASTM D1505 Wide |
| Width Tensile | ASTM D4595; GRI:GG1 |
| Melt Flow (HDPE and PP only) | ASTM D1238 |
| Intrinsic Viscosity (PET only) | ASTM D4603 |
| Carboxyl End Group (PET only) | ASTM D2455 |

- vi. Sampling, Testing, and Acceptance - Sampling and conformance testing shall be in accordance with ASTM D4354. Conformance testing procedures shall be as established under section v. Manufacturing Quality Control.

Geosynthetic product acceptance shall be based on ASTM D 4759.

The quality control certificate shall include:

- Roll numbers and identification.
 - Sampling procedures.
 - Result of quality control tests, including a description of test methods used.
- vii. Select backfill Material for use with Geosynthetic Reinforcement – The backfill material shall conform to the requirements as stated above in Select Backfill Material of the Materials section; however, the maximum size of the backfill material shall be 3/4 inch, unless full scale installation damage tests are conducted in accordance with ASTM D5818.
- Joint Materials - Installed to the dimensions and thicknesses in accordance with the plans or approved shop drawings.
 - i. If required, provide flexible foam strips for filler for vertical joints between panels, and in horizontal joints where pads are used, where indicated on the plans.
 - ii. Provide in horizontal joints between panels preformed EPDM rubber pads conforming to ASTM D2000 for 4AA, 812 rubbers, neoprene elastomeric pads having a Durometer Hardness of 55 ± 5 , or high-density polyethylene pads with a minimum density of 59 lb/ft^3 in accordance with ASTM D1505.
 - iii. Cover all joints between panels on the back side of the wall with a geotextile meeting the minimum requirements for filtration applications as specified by AASHTO M 288. The minimum width and lap shall be 12 inches. Adhesive used to attach the filter fabric to the back of the panels shall be approved by the wall supplier.
 - Concrete Leveling Pad, Traffic Barrier, and Coping - The concrete shall conform to the requirements of the Standard Specifications for 3,000 psi concrete.
 - Acceptance of Material - The Contractor shall furnish the Engineer a Certificate of Compliance certifying the above materials comply with the applicable contract specifications. A copy of all test results performed by the Contractor necessary to assure contract compliance shall be furnished to the Engineer.

Acceptance will be based certification.

2. Construction

- a. Foundation Preparation - The foundation for the MSE wall shall be graded level for a minimum width equal to the width of the reinforced volume and leveling pad plus 1 foot, or as shown on the plans, using the top of the leveling pad as the grade elevation. Prior to wall construction, the foundation shall be compacted to 95 percent of optimum density, as directed by the Engineer. Any foundation soils found to be unsuitable shall be removed as directed by the Engineer and replaced with select backfill material compacted to 95 percent of the maximum density as determined by AASHTO T 99. The Contractor shall conduct any ground improvements required by the contract plans as part of foundation preparation.

At each panel foundation level, a precast reinforced or a cast-in-place unreinforced

concrete leveling pad of the type shown on the plans shall be provided. The concrete shall be concrete with compressive strength of 3000 psi (28-day strength). The leveling pad shall be cured a minimum of 12 hours before placement of wall panels.

- b. Wall Erection - Where a proprietary wall system is used, a field representative shall be available during the erection of the wall to assist the fabricator, Contractor, and Engineer. If there is more than one wall of the same type on the project, this requirement will apply to construction of the initial wall only. After construction of the initial wall, the representative will be available on an as-needed basis, as requested by the Engineer, during construction of the remainder of the walls. Wall erection shall be in conformance with the latest edition of the MSE wall construction manual as published by the wall supplier. For erection, panels are handled by means of a lifting device set into the upper edge of the panel. Precast concrete panels shall be placed such that a final vertical face will be obtained.

It shall be the responsibility of the Contractor to consult with the designer/supplier and to utilize the proper methods necessary to achieve a vertical face for the final wall. Panels should be placed in successive horizontal lifts as backfill placement proceeds. As backfill material is placed behind the panels, the panels shall be maintained in position by means of temporary wedges or bracing according to the wall supplier's recommendations. External bracing shall also be required for this initial lift. The wedges shall remain in place until the fourth layer of panels is placed, at which time the bottom layer of wedges shall be removed. Each succeeding layer of wedges shall be removed as the succeeding panel layers are placed. When the wall is completed, all wedges shall be removed. No wedges shall be used as a means of leveling panels on leveling pads. Wedges placed below the ground line on the front face of the wall shall be removed before this area is backfilled.

Tolerances and alignment shall be as follows:

- i. Horizontal and vertical joint openings between panels shall be uniform. The maximum allowable offset in any panel joint shall be 3/4 inch.
- ii. Vertical tolerance (plumbness) and horizontal alignment tolerances as the wall is constructed shall not exceed 3/4 inch when measured along a 10-foot straightedge.

The overall vertical tolerance of the wall (plumbness from top to bottom) in its final position shall not exceed 3/4 inch per 10 feet of wall height.

Cast-in-place concrete shall be placed on top of wall panels to allow precast coping elements on top of the wall to be brought to proper grade.

Prior to placing any select backfill material on any soil reinforcement device, all connections to the panels shall be completed.

- c. Backfill Placement - Backfill placement shall closely follow the erection of each lift of panels. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials including panels, soil reinforcements, and connections, or misalignment of the facing panels or reinforcing elements. Any wall materials which may become damaged or disturbed during backfill placement, or due to wall settlement prior to completion of the project shall be either removed and replaced at the Contractor's expense or corrected, as directed by the Engineer. Any misalignment or distortion of the wall facing panels due to placement of backfill

outside the limits of this section shall be corrected, as directed by the Engineer at the Contractor's expense. Backfill placement methods near the facing shall assure that no voids exist directly beneath the reinforcing elements.

Backfill shall be compacted to 95 percent of the maximum density as determined by AASHTO T 99. When the backfill supports a spread footing of a bridge or other structural load, the top 5 feet shall be compacted to 100 percent of the maximum density. For backfills containing more than 30 percent retained on the $\frac{3}{4}$ inch sieve, a method compaction consisting of a minimum of 2 passes of a steel drum roller or truck equipment equivalent or larger than a Caterpillar D6 Bulldozer shall be used.

The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Backfill materials shall be placed at a moisture content not more than 2 percentage points less than or equal to the optimum moisture content. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniformly acceptable throughout the entire lift. The optimum moisture content shall be determined in accordance with AASHTO T 99.

At each soil reinforcement device level, backfill shall be compacted to the full length of reinforcement devices and be sloped to drain away from the wall before placing and attaching the next layer of reinforcement devices. The compacted backfill shall be level with the connecting device before the reinforcement device can be connected. Compaction within three feet of the back face of the wall facing panel shall be achieved with at least 3 passes of a lightweight mechanical tamper, roller, or vibratory system.

Unless otherwise indicated on the plans or directed by the Engineer, soil reinforcement devices shall be placed at 90 degrees to the face of the wall. The maximum lift thickness before compaction shall be 10 inches and shall closely follow panel erection. The Contractor shall decrease this lift thickness, if required, to obtain the specified density.

At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing to rapidly direct runoff or rainwater away from the wall face. In addition, the Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

F. Prefabricated Modular Block Facing Mechanically Stabilized Earth (MSE) Wall (See QPL for Approved Manufacturer/Supplier)

1. Materials

General - The Contractor shall make arrangements to purchase or manufacture the facing elements, reinforcing mesh or strips, attachment devices, joint filler, and all other necessary components. Materials not conforming to this section or from sources not listed in the contract document shall not be used without written consent from the Engineer.

- Concrete Modular Block Facing - The concrete modular blocks shall be either hollow or solid concrete structural retaining wall units, machine made from Hydraulic cement, water, and mineral aggregates with or without the inclusion of other materials. The units are intended for use in the construction of mortarless, modular block retaining walls (MBW).

- i. Cementitious Materials - Materials shall conform to the following:
 - Hydraulic Cement – Shall be as specified in **901.01** and conform to AASHTO M 85 (ASTM C150).
 - Pozzolans – Class C or Class F fly ash -AASHTO M 295 Blast Furnace Slag Cement – grade 100 or 120- AASHTO M 302 (ASTM C989).
- ii. Aggregates - Aggregates shall conform to the following specifications, except that grading requirements shall not necessarily apply:
 - Normal Weight Aggregates – Standard Specification **903.01** and **903.03**.
 - Lightweight Aggregates - Standard Specification **903.19**.
- iii. Other Constituents Air-entraining agents, coloring pigments, integral water repellants, finely ground silica, and other constituents shall be previously established as suitable for use in concrete MBW units and shall conform to applicable AASHTO Standards or, shall be shown by test or experience to be not detrimental to the durability of MBW units or any material customarily used in masonry construction.
- iv. Physical Requirements. Prior to delivery to the work site, the units shall conform to the following physical requirements:
 1. Minimum required compressive strength = 4,000 psi (Average 3 coupons)
 2. Minimum required compressive strength = 3,500 psi (Individual coupon)
 3. Maximum water absorption = 5 percent
 4. Maximum number of blocks per lot = 2,000

Prior to delivery, the Department will conduct verification testing on the modular blocks in accordance with SOP 1-1: “Quality Assurance for the Sampling, Testing of Materials and Products.”

If products are manufactured out of state, TDOT may verify at the project site PRIOR to the placement of the units. The Contractor, or producer, shall notify the Regional Materials and Tests that products need to be verified.

- v. Tolerances. Blocks shall be manufactured within the following tolerances:
 - The length and width of each individual block shall be within 1/8 inch of the specified dimension. Hollow units shall have a minimum wall thickness of 1-1/4 inch.
 - The height of each individual block shall be within 1/16 inch of the specified dimension.
 - When a broken face finish is required, the dimension of the front face shall be within 1 inch of the theoretical dimension of the unit.
 - Finish and Appearance. All units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or significantly impair the strength or permanence of the construction. Minor cracks (e.g., no greater than 1/32 inch in width and no longer than 25 percent of the unit height) incidental to the usual method of manufacture or minor chipping resulting from shipment and delivery, are not grounds for rejection.
The face or faces of units that are to be exposed shall be free of chips,

cracks or other imperfections when viewed from 30 feet under diffused lighting. Up to 5 percent of a shipment may contain slight cracks or small chips not larger than 1 inch.

Color and finish shall be as shown on the plans and shall be erected with a running bond configuration.

- If pins are required to align MBW units, they shall consist of a non-degrading, polymer or galvanized steel and be made for the express use with the MBW units supplied.
 - Cap units shall be cast to or attached to the top MBW units in strict accordance with the manufacturer’s requirements and the adhesive manufacturer’s recommended procedures. The Contractor shall provide a written 10-year warranty acceptable to the Department that the integrity of the materials used to attach the cap blocks will preclude separation and displacement of the cap blocks for the warranty period.
- vi. Sampling and Testing. Verification of the concrete block with respect to compressive strength and absorption will be determined on a lot of basis. The lot will be randomly sampled in accordance with ASTM C140. Compressive strength and absorption tests shall be performed by the manufacturer and submitted to the Department. Compressive strength test specimens shall be cored or shall conform to the saw-cut coupon provisions of section 6.2.4 of ASTM C140. Blocks represented by test coupons that do not reach an average compressive strength of 4,000 psi or an individual strength of 3,500 psi or have less than 5 percent absorption will be rejected.
- vii. Rejection. Blocks shall be rejected because of failure to meet any of the requirements specified above. In addition, any or all of the following defects shall be sufficient cause for rejection.
- Defects that indicate imperfect molding.
 - Defects indicating honeycomb or open texture concrete.
 - Cracked or severely chipped blocks.
 - Color variation on front face of block due to excess form oil or other reasons.

Blocks may also be rejected if Departmental verification test results do not comply with the requirements specified above.

- Unit Fill - The unit fill and drainage aggregate shall be a well-graded crushed stone or granular fill meeting the following gradation:

| U.S. Sieve Size | Percent Passing |
|-----------------|-----------------|
| 1 inch | 100-75 |
| 3/4 inch | 50-75 |
| No. 4 | 0-60 |
| No. 40 | 0-50 |
| No. 200 | 0-5 |

- Geosynthetic Reinforcement Material - The following requirements shall apply for geosynthetic reinforcement material:
 - i. Geotextiles and Thread for Sewing - Woven or nonwoven geotextiles shall consist only of long chain polymeric filaments or yarns formed into a stable network such that the filaments or yarns retain their position relative to each other during handling, placement, and design service life. At least 95 percent by weight of the long chain polymer shall be polyolefin or polyester. The material shall be free of defects and tears. The geotextile shall conform as a minimum to the properties indicated for Separation, Medium Survivability indicated under AASHTO M 288. The geotextile shall be free from any treatment or coating that might adversely alter its physical properties after installation.
 - ii. Geogrids - The geogrid shall be a regular network of integrally connected polymer tensile elements with aperture geometry sufficient to permit significant mechanical interlock with the surrounding soil or rock. The geogrid structure shall be dimensionally stable and able to retain its geometry under manufacture, transport, and installation.
 - iii. Required Properties - The specific geosynthetic material(s) shall be pre-approved by the Department and shall have certified long-term strength (T_{al}) as determined by:
 - Long-Term strength (T_{al}) based on the Equation where RF_{CR} is from creep tests performed in accordance with ASTM D5262, RF_{ID} obtained from site installation damage testing and RF_{ID} from hydrolysis or oxidative degradation testing extrapolated to 75 or 100 year design life.

$$T_{al} = \frac{T_{ult}}{RF_D \times RF_{ID} \times RF_{CR}}$$
 - Ultimate Strength (T_{ULT}) based upon minimum average roll values (MARV) (lb/ft), ASTM D4595.
 - Pullout Resistance Factor developed in accordance with Chapter 3 of NHI-10-024.
 - iv. Certification - The Contractor shall submit a manufacturer's certification that the geosynthetics supplied meet the respective index criteria set when the geosynthetic was approved by the Department, measured in full accordance with all test methods and standards specified and as set forth in this section of this special provision. The manufacturer's certificate shall state that the furnished geosynthetic meets the requirements of this document as evaluated by the manufacturer's quality control program. The certificates shall be attested to by a person having legal authority to bond the manufacturer. In case of dispute over validity of values, the Engineer can require the Contractor to supply test data from a Department approved laboratory to support the certified values submitted.
 - v. Manufacturing Quality Control: The geosynthetic reinforcement shall be manufactured with a high degree of quality control. The manufacturer is responsible for establishing and maintaining a quality control program to ensure compliance with the requirements of this special provision. The purpose

of the QC testing program is to verify that the geosynthetic being supplied to the project is representative of the material used for performance testing and approval by the Department.

Conformance testing shall be performed as part of the manufacturing process and may vary for each type of product. As a minimum the following index tests shall be considered as applicable for an acceptable QA/QC program:

| <u>Property</u> | <u>Test Procedure</u> |
|--------------------------------|------------------------------|
| Specific Gravity (HDPE only) | ASTM D1505 |
| Wide Width Tensile | ASTM D4595; GRI:GG1 |
| Melt Flow (HDPE and PP only) | ASTM D1238 |
| Intrinsic Viscosity (PET only) | ASTM D4603 |
| Carboxyl End Group (PET only) | ASTM D2455 |

- vi. Sampling, Testing, and Acceptance - Sampling and conformance testing shall be in accordance with ASTM D4354. Conformance testing procedures shall be as established under section v. Manufacturing Quality Control. Geosynthetic product acceptance shall be based on ASTM D4759.

The quality control certificate shall include:

- Roll numbers and identification
- Sampling procedures
- Result of quality control tests, including a description of test methods used.

- vii. Select backfill Material for use with Geosynthetic Reinforcement The backfill material shall conform to the requirements as stated below in Select Backfill Material except that the maximum size of the backfill shall be 3/4 inch unless full scale installation damage tests are conducted in accordance with ASTM D5818.

All backfill material shall be tested prior to use and at the established frequencies in SOP 1-1: "Quality Assurance for the Sampling, Testing of Materials and Products."

- Soil Reinforcing and Attachment Devices - Where steel reinforcing and attachment devices are used in the construction of the MSE wall the following requirements shall apply.
 - i. Reinforcing Strips - Reinforcing strips shall be hot rolled from bars to the required shape and dimensions. Their physical and mechanical properties shall conform to either AASHTO M 183 (ASTM A36) or AASHTO M 223 (ASTM A572) grade 65 or equal. Galvanization shall conform to the minimum requirements or AASHTO M 111 (ASTM A123).
 - ii. Tie Strips - The tie strips shall be shop-fabricated of hot rolled steel conforming to the minimum requirements of ASTM A570, Grade 50 or

equivalent. Galvanization shall conform to AASHTO M111. Tie straps may be partially bent before shipment to the precast yard. Minimum bending radius shall be one inch. Final bending may be accomplished at the precast yard.

- iii. Reinforcing Mesh - Reinforcing mesh shall be shop fabricated of cold drawn steel wire conforming to the minimum requirements of AASHTO M 32 (ASTM A82) and shall be welded into the finished mesh fabric in accordance with AASHTO M 55 (ASTM A185). Galvanization shall be applied after the mesh is fabricated and conform to the minimum requirements of AASHTO M 111.
- iv. Fasteners - Fasteners shall be high strength hexagonal cap screw bolts and nuts conforming to AASHTO M 164 (ASTM A325). Galvanizing fastener elements, including washers, shall be in accordance with AASHTO M 232 (ASTM A153). Bolts and nuts nominal diameter will be shown in the plans and supplied in accordance with the fasteners as specified previously.
- v. Steel Strap Connections - The steel strap connection bar and plate shall meet the same requirements as the reinforcing and tie strips specified above. Bolts, nuts, and washers shall conform to the requirements for the fasteners specified above. Coatings for connecting devices shall be as specified below.
- vi. Clevis Loop and Mesh Loop - Clevis loops and mesh loops shall be fabricated of cold drawn steel wire conforming to the requirements of AASHTO M 32 and welded in accordance with AASHTO M 55 and shall develop a minimum stress of $0.9 F_y$.
- vii. Connector Bar - Connector bar shall be fabricated of cold drawn steel wire conforming to the requirements of AASHTO M 32.

Holes for bolts shall be punched in the location shown. Surfaces resulting from punching holes for bolts shall be galvanized in accordance with AASHTO M 111. Those parts of the connecting devices which are threaded shall be galvanized in accordance with AASHTO M 232. Alignment pins are to be hot dip galvanized.

All connecting devices shall be to the dimensions shown on the plans. Connecting members and soil reinforcement devices shall be assembled prior to galvanization. All connecting devices shall be true to size and free from defects that may impair their strength or durability.

Any damage sustained by any part of the connecting devices, bolts or reinforcing devices during any phase of fabrication, storage or erection shall be repaired to the satisfaction of the Engineer at no increase in contract cost.

- Concrete Leveling Pad, Traffic Barrier, and Coping - The concrete shall conform to the requirements of the Standard Specifications for 3,000 psi concrete.
- Acceptance of Material - The Contractor shall furnish the Engineer a Certificate of Compliance certifying the above materials comply with the applicable contract specifications. A copy of all test results performed by the Contractor necessary to assure contract compliance shall be furnished to the Engineer.

2. Construction

- a. Wall Excavation - Unclassified excavation shall be in accordance with the requirements of the Standard Specifications and in reasonably close conformity with the limits and construction lines shown on the plans. Temporary excavation support as required shall be the responsibility of the Contractor.
- b. Foundation Preparation - The foundation for the MSE wall shall be graded level for a minimum width equal to the width of the reinforced volume and leveling pad plus 1 foot, or as shown on the plans, using the top of the leveling pad as the grade elevation. Prior to wall construction, the foundation shall be compacted to 95 percent of optimum density, as directed by the Engineer. Any foundation soils found to be unsuitable shall be removed as directed by the Engineer and replaced with select backfill material compacted to 95 percent of the maximum density as determined by AASHTO T 99. The Contractor shall conduct any ground improvement required by the contract plans as part of foundation preparation.

At each block foundation level, a precast reinforced or a cast-in-place unreinforced concrete leveling pad of the type shown on the plans shall be provided. The concrete shall be Class A concrete with compressive strength of 3,000 psi (28-day strength). The leveling pad shall be cured a minimum of 12 hours before placement of wall panels.

- c. Wall Erection - Where a proprietary wall system is used, a field representative shall be available during the erection of the wall to assist the fabricator, Contractor, and Engineer. If there is more than one wall of the same type on the project, this requirement will apply to construction of the initial wall only. After the initial wall, the representative will be available on an as-needed basis, as requested by the Engineer, during construction of the remainder of the walls. Wall erection shall be in conformance with the latest edition of the MSE wall construction manual as published by the wall supplier.

It shall be the responsibility of the Contractor to consult with the designer/supplier and to utilize the proper methods necessary to achieve a vertical face for the final wall. Blocks should be placed in successive horizontal lifts as backfill placement proceeds per the manufacturer's recommendations.

Cast-in-place concrete shall be placed on top of wall panels to allow precast coping elements on top of the wall to be brought to proper grade.

Prior to placing any select backfill material on any soil reinforcement device, all connections to the blocks shall be completed.

- d. Backfill Placement - Backfill placement shall closely follow the erection of each lift of blocks. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials including blocks, soil reinforcements, and connections, or misalignment of the facing blocks or reinforcing elements. Any wall materials which may become damaged or disturbed during backfill placement, or due to wall settlement prior to completion of the project shall be either removed and replaced at the Contractor's expense or corrected, as directed by the Engineer. Any misalignment or distortion of the wall facing blocks due to placement of backfill outside the limits of this section shall be corrected, as directed by the Engineer. Backfill placement methods near the facing shall assure that no voids exist directly beneath the reinforcing elements.

Backfill shall be compacted to 95 percent of the maximum density as determined by AASHTO T 99. When the backfill supports a spread footing of a bridge or other structural load, the top 5 feet shall be compacted to 100 percent of the maximum density. For backfills containing more than 30 percent retained on the $\frac{3}{4}$ inch sieve, a method compaction consisting of a minimum of 2 passes of a steel drum roller or tracked equipment equivalent or larger than a Caterpillar D6 Dozer shall be used.

The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer. Backfill materials shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniformly acceptable throughout the entire lift. The optimum moisture content shall be determined in accordance with AASHTO T 99.

At each soil reinforcement device level, backfill shall be compacted to the full length of reinforcement devices and be sloped to drain away from the wall before placing and attaching the next layer of reinforcement devices. The compacted backfill shall be level with the connecting device before the reinforcement device can be connected. Compaction within 3 feet of the back of the wall facing shall be achieved with at least 3 passes of a lightweight mechanical tamper, roller, or vibratory system.

Unless otherwise indicated on the plans or directed by the Engineer, soil reinforcement devices shall be placed at 90 degrees to the face of the wall. The maximum lift thickness before compaction shall be 10 inches and shall closely follow modular block erection. The Contractor shall decrease this lift thickness, if required, to obtain the specified density.

At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing to rapidly direct runoff or rainwater away from the wall face. In addition, the Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

G. Anchored Wall (See QPL for Approved Manufacturer/Supplier)

Part A - Part A covers specifications for permanent ground anchor walls exclusive of the ground anchors.

1. Design Criteria

Unless otherwise directed the Contractor shall select the type of wall element to be used. The wall shall be designed for shear, moment, and lateral and axial capacity in accordance with AASHTO LRFD procedures. The Contractor shall be responsible for determining the length of the wall element and required section necessary to resist loadings due to earth, and water forces while controlling ground movements. Structure design life and corrosion protection requirements for sheet-piles and soldier beams will be provided on the contract drawings. Soil properties, load and resistance factors, anchor tendon corrosion protection requirements, wall finish and color requirements, and appurtenance locations are given in the contract plans or specifications.

The Contractor shall be familiar with the requirements for ground anchors described in Part B, "Ground Anchors". The Contractor shall incorporate all dimensional and location restrictions on ground anchor locations, spacing, and length of anchor bond length and unbonded length that may affect the design of the wall system covered by this section.

- The wall system shall be designed to resist maximum anticipated loadings calculated for the effects of any special loadings shown on the contract plans.
- The wall shall be designed to ensure stability against passive failure of the embedded portion of the vertical wall elements (below the base of excavation).
- The axial load carrying capacity of the embedded portion of the vertical wall elements (below the base of the excavation) shall be evaluated. The wall shall be designed to resist vertical loads including vertical anchor forces and the weight of the lagging and the vertical wall elements. Relying on transfer of vertical load into the soil behind the wall by friction shall not be permitted, unless approved by the Engineer.
- Permanent facing shall be precast or cast-in-place reinforced concrete. Architectural facing treatments, if required, shall be as indicated on the contract drawings. The facing shall extend a minimum of 2 feet below the gutter line or, if applicable, the ground line adjacent to the wall unless otherwise indicated on the contract drawings.
- The Contract Plans will provide minimum requirements of design elements in order to provide global stability requirement such as minimum embedment of vertical pile elements or minimum lengths of unbonded (free length) zone for anchors. The wall design shall provide these minimum requirements.
- Wall Drainage. The wall drainage system shall operate by gravity and shall be capable of relieving water pressures on the back face of the wall under anticipated worst case water pressure conditions. When drainage systems are incorporated into the specific design, hydrostatic head on the back of the wall shall not exceed 6 inches above the elevation of the drainage collection pipe.

2. Materials

The Contractor shall not deliver materials to the site until the Engineer has approved the submittals outlined in Section 3.0 in Part B below. The Contractor shall protect the materials from the elements by appropriate means. Prestressing steel strands and bars shall be stored and handled in accordance with the manufacturer's recommendations and in such a manner that no damage to the component parts occurs. All steel components shall be stored under cover and protected against moisture.

- Soldier Beam and Structural Steels
 - i. Steel Soldier Beams - Steel soldier beams shall be of the type and weight indicated on the approved working drawings. Steel soldier beams shall conform to the requirements of AASHTO M 183 (ASTM A36) or AASHTO M 223 (ASTM A572) unless otherwise specified.
 - ii. Steel Sheet Piles - Steel sheet piles shall be of the type and weight indicated on the approved working drawings. Steel sheet piles shall conform to the requirements of AASHTO M 202 (ASTM A328) or AASHTO M 270 (ASTM A 709) Grade 50.
 - iii. Steel Plate - Steel used to fabricate steel studs and other devices shall conform to the requirements of AASHTO M 169 (ASTM A108)
 - iv. Steel Tube - Steel tube shall conform to the requirements of ASTM A500.
 - v. Reinforcing Steel - Reinforcing steel shall conform to ASTM A615. The required Grade of all reinforcing shall be shown on the plans.

- Concrete
 - i. Cement - Hydraulic cement shall be as specified in **901.01** or a Type II and shall conform to AASHTO M 85 (ASTM C150).
 - ii. Structural Concrete - Structural concrete shall conform to the requirements of **604** of the Standard Specifications. Structural concrete shall have a minimum 28-day compressive strength of 3000 psi, unless otherwise noted on the contract drawings.
 - iii. Lean-Mix Concrete Backfill - Lean-mix concrete backfill shall consist of hydraulic cement conforming to **901.01** of the Standard Specifications and AASHTO M 85 (ASTM C150), fine aggregate, and water. Each cubic yard of lean-mix concrete backfill shall consist of a minimum of one sack (94lbs) of hydraulic cement.
- Drainage Materials
 - i. Drainage Aggregate - Drainage aggregate to be used as a drainage medium shall conform to **903.17** of the Standard Specifications.
 - ii. Preformed Permeable Geocomposite Drains - The preformed permeable geocomposite drains shall be continuous and a minimum of 1 foot wide. The drains shall be placed in sections with a minimum overlap of 1 foot and be spliced to assure continuous drainage.
 - iii. Pipe and Perforated Pipe - Pipe and perforated pipe shall conform to **610** of the Standard Specifications.
- Lagging
 - i. Temporary Timber Lagging - Temporary timber lagging shall be construction grade rough cut and shall be a minimum of 3 inches thick. Where necessary, the Contractor shall provide certification that the timber conforms to the grade, species, and other specified requirements. If the timber is to be treated with a preservative, a certificate of compliance shall be furnished.
 - ii. Permanent Timber Lagging - Permanent timber lagging shall conform to all requirements of Temporary Timber Lagging and shall be constructed from structural stress-graded lumber.

3. Construction

- General Considerations

Wall elements for anchored walls designed and constructed in accordance with this special provision shall be either continuous interlocking sheet-piles or steel soldier beams that are either driven or placed in pre-drilled holes that are subsequently backfilled with lean mix or structural concrete.

- Excavation

Excavation below a level of anchors shall be limited to 2 feet below the anchor level and shall not commence below this level until anchors at that level have been installed, load tested, locked off and accepted by the Department. Placement of timber lagging shall immediately follow excavation in the front of the wall.

- Driven Sheet Pile and Soldier Beam Installation.

Driven sheet piles and soldier beams shall be driven to the specified minimum tip elevation shown on the approved working drawings. The Contractor shall select a sheet pile or soldier beam section that satisfies all design criteria. The Contractor shall select a driving method and pile driving and ancillary equipment consistent with the expected ground conditions at the site. The sheet-pile or soldier beam shall be driven to the specified minimum tip elevation or to the approved elevation based on bearing capacity without damaging the sheet pile or soldier beam. The interlocks between adjacent sheet piles shall not be damaged. Equipment shall be used to permit the impact energy to be distributed over the tops of the sheet pile or soldier beam.

- Soldier Beam Installation in Pre-drilled Holes
 - i. Excavations required for soldier beam placement shall be performed to the dimensions and elevations on the approved working drawings. The methods and equipment used shall be selected by the Contractor.
 - ii. The Contractor shall ensure that the sidewalls of the pre-drilled holes (i.e., shafts) do not collapse during drilling. Uncased shafts may be used where the sides and the bottom of the shaft are stable and may be visually inspected prior to placing the soldier beam and concrete. Casing or drilling muds shall be used where the sides of the shaft require additional support.
 - iii. The Contractor shall provide equipment for checking the dimensions and alignment of each shaft excavation. The dimensions and alignment shall be determined by the Contractor but shall be observed by the Inspector. The Inspector will check the alignment of the drilling equipment at the beginning of shaft construction and periodically thereafter. Final shaft depth shall be measured after final cleaning by the Contractor.
 - iv. Loose material shall be removed from the bottom of the shaft. No more than 2 feet of standing water shall be left in the bottom of the shaft prior to beginning soldier beam installation.
 - v. The soldier beam shall be placed in the shaft without difficulty and aligned prior to general placement of concrete. The Contractor may place up to 2 feet of concrete at the bottom of the shaft to assist in aligning the soldier beam. The soldier beam shall be blocked or clamped in place at the ground surface, prior to placement of concrete.
 - vi. For shafts constructed without casing or drilling muds, concrete (either structural or lean-mix backfill) may be placed by free-falling the concrete from the ground surface down the shaft and around the soldier beam. If casing is used, the placement of concrete shall begin prior to casing removal. Remove the casing while the concrete remains workable. For shafts constructed using slurry, concrete shall be placed using the tremie method from the bottom of the shaft. The tremie pipe shall be withdrawn slowly as the level of the concrete rises in the shaft and the level of the tremie pipe outlet shall never exceed the height of the slurry.
- Wall Tolerances
 - i. Soldier beams shall be placed at the locations shown on the approved working drawings and shall not deviate by more than 1 foot along the horizontal alignment of the wall. The wall shall not deviate from the vertical alignment

shown of the contract drawings by more than 4 inches in each plane.

- ii. The soldier beam or sheet pile tip shall be installed to within 1 foot of the specified tip elevation shown on the approved working drawings.
- iii. Whenever a soldier beam deviates in location or plumbness by more than the tolerance given in these guidelines, the Contractor, has the option, may provide corrective measures such as 1) rebuilding soldier beams; 2) redesigning soldier beam; 3) adjust soldier beam spacing by adding additional soldier beams; 4) redesigning concrete facing; 5) building up the soldier beam section, or 6) other methods.

- **Welding and Splicing**

Splicing of sheet piles or soldier beams shall not be permitted, unless approved by the Department. All structural welding of steel and steel reinforcement shall be performed by certified welders qualified to perform the type of welding shown on the shop drawings. All sheet piles or soldier beams shall be cutoff to a true plane at the elevations shown on the approved working drawings. All cutoff lengths shall remain the property of the Contractor and shall be properly disposed.

- **Timber Lagging Installation**

- i. Timber lagging shall be placed from the top-down in sufficiently small lifts immediately after excavation to prevent erosion of materials into the excavation. Prior to lagging placement, the soil face shall be smoothed to create a contact surface for the lagging. Large gaps behind the lagging shall be backfilled and compacted prior to applying any loads to the ground anchors.
- ii. A gap shall be maintained between each vertically adjacent lagging board for drainage between adjacent lagging sections. In no case shall lagging be placed in tight contact to adjacent lagging.

- **Drainage System Installation**

- i. The Contractor shall handle preformed permeable geocomposite drains in such a manner as to ensure the geocomposite drain is not damaged in any way. Care shall be taken during placement of the geocomposite drain not to entrap dirt or excessive dust in the geocomposite drain that could cause clogging of the drainage system. Delivery, storage, and handling of the geocomposite drains shall be as provided in the plans or based on manufacturer's recommendations.
- ii. Drainage geocomposite strips shall be placed and secured tightly against the timber lagging with the fabric facing the lagging. A continuous sheet of drainage geocomposite that spans between adjacent soldier beams shall not be allowed. Seams and overlaps between adjacent composites shall be made according to the special provisions or manufacturer's recommendations and specifications. Repairs shall be performed at no additional cost to the Department and shall conform to the plans or manufacturer's recommendation.
- iii. Where drainage aggregate is used to construct a vertical drain behind the permanent wall and in front of the lagging, the drainage aggregate shall be placed in horizontal lifts. The construction of the vertical drain should closely follow the construction of the precast facing elements. Care should be exercised

to ensure that connection devices between wall elements and facing elements are not damaged during the placement of the drainage aggregate.

- iv. Perforated collector pipe shall be placed within the permeable material to the flow line elevations and at the location shown on the approved working drawings. Outlet pipes shall be placed at the low end of the collector pipe and at other locations shown or specified in the approved working drawings.
- Concrete Facing Installation

For permanent cast-in-place and precast concrete facings, concrete manufacture, handling, placement, and finishing shall conform to the requirements in Section 8 “Concrete Structures” of the *AASHTO-LR FD Bridge Construction Specifications with interims*. Connections used to secure the facing to wall elements shall conform to the details shown on the approved working drawings. The exposed surface of the concrete facing shall receive a Class I finish as specified in Section 8 “Concrete Structures,” unless a special architectural treatment is specified.

Part B, Anchored Wall (See QPL for Approved Systems) – Part B covers specifications for the design, construction, and testing of Permanent Ground Anchors.

1. Description

The work covered under this section includes the furnishing of all materials, labor, tools, equipment, and other incidental items for the designing, detailing, and construction of permanent ground anchors. All other items included in the construction of the permanent ground anchors not specifically mentioned herein shall conform to all applicable sections of the Standard Specifications, henceforth referred to as the Standard Specifications, the current *AASHTO LRFD Bridge Design Specifications* with latest revisions, the current *AASHTO LRFD Bridge Construction Specifications* with interims, and the latest version of Post Tensioning Institute (PTI) Standards, including: 1. *PTI, “Post Tensioning Manual”*, 2. *PTI “Specification for Unbonded Single Strand Tendons”*, 3. *PTI “Recommendations for Prestressed Rock and Soil Anchors.”*

Unless otherwise noted the Contractor shall select the ground anchor type, drilling method, grouting method, and grout pressures, determine the ground anchor capacity, bond length, free stressing (unbonded) length, and anchor diameter. The Contractor shall be responsible for installing ground anchors that will develop the load-carrying capacity indicated on the approved working drawings in accordance with the testing subsection of this section. The anchor tendon shall be protected from corrosion as shown on the approved working drawings and in accordance with the requirements of this specification.

2. Design Criteria

- Unless otherwise directed the Contractor shall select the type of tendon to be used. The tendon shall be sized so the design load does not exceed 60 percent of the specified minimum tensile strength of the prestressing steel. The lock-off load for the tendon shall be chosen based on anticipated time or activity dependent load changes but shall not exceed 70 percent of the specified minimum tensile stress of the prestressing steel. The prestressing steel shall be sized so the maximum test load does not exceed 80 percent of the specified minimum tensile strength of the prestressing steel.
- The Contractor shall be responsible for determining the bond length necessary to develop the design load indicated on the approved working drawings. The minimum

bond length shall be 15 feet for strand tendons in rock and 10 feet for bar tendons in rock. The minimum bond length shall be 15 feet for strand and bar tendons in soil. The minimum tendon bond length shall be 10 feet.

- The free stressing length (unbonded length) for rock and soil anchors shall not be less than 10 feet for bar tendons and 15 feet for strand tendons. The free stressing length shall extend at least 5 feet or 20 percent of the height of the wall, whichever is greater, behind the critical failure surface. The critical failure surface shall be evaluated using slope stability or similar procedures.

3. Submittals

Requirements for submittals are as outlined above and include the following:

- Contractor qualifications as outlined in Part A, of these anchored wall design and construction requirements.
- The working drawings and design submission shall include the following:
 - a) A ground anchor schedule giving:
 - Ground anchor number
 - Ground anchor design load
 - Type and size of tendon
 - Minimum total anchor length
 - Minimum bond length
 - Minimum tendon bond length
 - Minimum unbonded length
 - b) A drawing of the ground anchor tendon and the corrosion protection system including details for the following:
 - Spacers and their location
 - Centralizers and their location
 - Unbonded length corrosion protection system
 - Bond length corrosion protection system
 - Anchorage and trumpet
 - Anchorage corrosion protection system
- Certificates of Compliance for the following materials, if used. The certificate shall state that the materials or assemblies to be provided will fully comply with the requirements of the contract.
 - a) Prestressing steel, strand, or bar
 - b) Hydraulic cement
 - c) Prestressing hardware
 - d) Bearing plates
 - e) Corrosion protection system
- The Contractor shall submit to the Engineer for review and approval or rejection mill test reports for the prestressing steel and the bearing plate steel. The Engineer may require the Contractor to provide samples of any ground anchor material intended for use on the project. The prestressing steel and bearing plates shall not be incorporated in the work without the Engineer's approval.
- The Contractor shall submit to the Engineer for review and approval or rejection calibration data for each test jack, load cell, primary pressure gauge and reference pressure gauge to be used. Testing cannot commence until the Engineer has approved

these calibrations.

- The Contractor shall submit to the Engineer within twenty calendar days after the completion of the ground anchor work a report containing the following:
 - a) Prestressing steel manufacturer's mill test reports for the tendons incorporated in the installation
 - b) Grouting records indicating the cement type, quantity injected and the grout pressures
 - c) Ground anchor test results
 - d) As-built drawings showing the location and orientation of each ground anchor, anchor capacity, tendon type, total anchor length, bond length, unbonded length, and tendon bond length as installed, and locations of all instruments installed by the Department.
- Existing Conditions – Prior to beginning work, the Department shall provide utility location plans to the Contractor. The Contractor is responsible for contacting a utility location service to verify the location of underground utilities before starting work. The Contractor shall survey the condition of adjoining properties and make records and photographs of any evidence of settlement or cracking of any adjacent structures. The Contractor's report of this survey shall be delivered to the Department before work begins.

4. Materials

- General
 - a) The Contractor shall not deliver materials to the site until the Engineer has approved the submittals outlined in Section 3 in Part B of Anchored Walls.
 - b) The Contractor shall protect all materials from theft, vandalism, and the elements by appropriate means. Prestressing steel strands and bars shall be stored and handled in accordance with the manufacturer's recommendations and in such a manner that no damage to the component parts occurs. All steel components shall be protected from the elements at all times. Cement and additives for grout shall be stored under cover and protected against moisture.
- Anchorage Devices
 - a) Stressing anchorages shall be a combination of either steel bearing plate with wedge plate and wedges, or a steel bearing plate with a threaded anchor nut. The steel bearing and wedge plate may also be combined into a single element. Anchorage devices shall be capable of developing 95 percent of the specified minimum ultimate tensile strength of the prestressing steel tendon. The anchorage devices shall conform to the static strength requirements of Section 3.1.6 (1) and Section 3.1.8 (1) and (2) of the latest edition of the PTI "Guide Specifications for Post-Tensioning Materials."
 - b) The bearing plate shall be fabricated from steel conforming to AASHTO M 183 or M 222 specifications, or equivalent, or may be a ductile iron casting conforming to ASTM A536.
 - c) The trumpet shall be fabricated from a steel pipe or tube or from PVC pipe. Steel pipe or tube shall conform to the requirements of ASTM A53 for pipe or ASTM A500 for tubing. Steel trumpets shall have a minimum wall thickness of 0.1 inch for diameters up to 4 inches and 0.2 inch for larger diameters. PVC

pipe shall conform to ASTM D1785, Schedule 40 minimum. PVC trumpets shall be positively sealed against the bearing plate and aligned with the tendon to prevent cracking during stressing.

- d) Anchorage covers shall be fabricated from steel or plastic with a minimum thickness of 0.1 inch. The joint between the cover and the bearing plate shall be watertight.
 - e) Wedges shall be designed to preclude premature failure of the prestressing steel due to notch or pinching effects under static and dynamic strength requirements of Section 3.1.8 (1) and 3.1.8 (2) of the PTI *"Post Tensioning Manual."* Wedges shall not be reused.
 - f) Wedges for epoxy coated strand shall be designed to be capable of biting through the epoxy coating and into the strand. Removal of the epoxy coating from the strand to allow the use of standard wedges shall not be permitted. Anchor nuts and other threadable hardware for epoxy coated bars shall be designed to thread over the epoxy coated bar and still comply with the requirements for carrying capacity.
- Prestressing Steel
 - a) Ground anchor tendons shall be fabricated from single or multiple elements of one of the following prestressing steels:
 - Steel bars conforming to AASHTO M 275
 - Seven-wire, low relaxation strands conforming to AASHTO M 203
 - Compact, seven-wire, low-relaxation strands conforming to ASTM A7791
 - Epoxy coated strand conforming to ASTM A882
 - Epoxy coated reinforcing steel bars conforming to ASTM A775
 - b) Centralizers shall be provided at maximum intervals of 10 feet with the deepest centralizer located 1 foot from the end of the anchor and the upper centralizer for the bond zone located no more than 5 feet from the top of the tendon bond length. Spacers shall be used to separate the steel strands of strand tendons. Spacers shall be provided at maximum intervals of 10 feet and may be combined with centralizers.

- Prestressing Steel Couplers

Prestressing steel bar couplers shall be capable of developing 100 percent of the minimum specified ultimate tensile strength of the prestressing steel bar. Steel strands used for a soil or rock anchor shall be continuous with no splices, unless approved by the Engineer.

- Centralizers

- a) Centralizers shall be fabricated from plastic, steel, or material, which is non-detrimental to the prestressing steel. Wood shall not be used. The centralizer shall be able to support the tendon in the drill hole and position the tendon so a minimum of 2 inches of grout cover is provided and shall permit grout to freely flow around the tendon and up the drill hole.
- b) Centralizers are not required on pressure injected anchors installed in coarse grained soils when the grouting pressure exceeds 145 psi or on hollow stem-augured anchors when they are grouted through the auger with grout having a

slump of 9 inches or less.

- Spacers

Spacers shall be used to separate elements of a multi-element tendon and shall permit grout to freely flow around the tendon and up the drill hole. Spacers shall be fabricated from plastic, steel, or material, which is non-detrimental to the prestressing steel. Wood shall not be used. A combination centralizer-spacer may be used.

- Tendon Bond Length Encapsulations

When the contract plans require the tendon bond length to be encapsulated to provide additional corrosion protection, the encapsulation shall be fabricated from one of the following:

- a) High density corrugated polyethylene tubing conforming to the requirements of AASHTO M 252 and having a minimum wall thickness of 0.06 inch except pre-grouted tendons, which may have a minimum wall thickness of 0.04 inch.
- b) Deformed steel tubing or pipes conforming to ASTM A52 or A500 with a minimum wall thickness of 0.2 inch.
- c) Corrugated, polyvinyl chloride tubes manufactured from rigid PVC compounds conforming to ASTM D1784, Class 13464- B.
- d) Fusion-bonded epoxy conforming to the requirements of AASHTO M 284.

- Heat Shrinkable Sleeves

Heat shrinkable sleeves shall be fabricated from a radiation cross-linked polyolefin tube internally coated with an adhesive sealant. Prior to shrinking, the tube shall have a nominal wall thickness of 0.025 inch. The adhesive sealant inside the heat shrinkable tube shall have a nominal thickness of 0.02 inch.

- Sheath

A sheath shall be used as part of the corrosion protection system for the unbonded length portion of the tendon. The sheath shall be fabricated from one of the following:

- a) A polyethylene tube pulled or pushed over the prestressing steel. The polyethylene shall be Type II, III or IV as defined by ASTM D1248 (or approved equal). The tubing shall have a minimum wall thickness of 0.06 inch.
- b) A hot-melt extruded polypropylene tube. The polypropylene shall be cell classification B55542-11 as defined by ASTM D4101 (or approved equal). The tubing shall have a minimum wall thickness of 0.06 inch.
- c) A hot-melt extruded polyethylene tube. The polyethylene shall be high density Type III as defined by ASTM D1248 (or approved equal). The tubing shall have a minimum wall thickness of 0.06 inch.
- d) Steel tubing conforming to ASTM A500. The tubing shall have a minimum wall thickness of 0.2 inch.
- e) Steel pipe conforming to ASTM A53. The pipe shall have a minimum wall thickness of 0.2 inch.
- f) Plastic pipe or tube of PVC conforming to ASTM D1784 Class 13464-B. The pipe or tube shall be Schedule 40 at a minimum.
- g) A corrugated tube conforming to the requirement of the tendon bond length

encapsulation Subsection 4.g. above.

- Bondbreaker

The bondbreaker shall be fabricated from a smooth plastic tube or pipe having the following properties: (1) resistant to chemical attack from aggressive environments, grout, or corrosion inhibiting compound; (2) resistant to aging by ultraviolet light; (3) fabricated from material non-detrimental to the tendon; (4) capable of withstanding abrasion, impact, and bending during handling and installation; (5) enable the tendon to elongate during testing and stressing; and (6) allow the tendon to remain unbonded after lockoff.

- Cement Grout

Hydraulic cement conforming to **901.01** of Standard Specifications and AASHTO M 85 (ASTM C150) shall be used for grout. The grout shall be a pumpable neat mixture of cement and water and shall be stable (bleed less than 2 percent), fluid, and provide a minimum 28-day compressive strength of at least 3,000 psi measured in accordance with ASTM C109 at the time of stressing.

- Admixtures (Approved on the QPL)

Admixtures which control bleed, improve flowability, reduce water content, and retard set may be used in the grout subject to the approval of the Engineer. Admixtures, if used, shall be compatible with the prestressing steels and mixed in accordance with the manufacturer's recommendation. Expansive admixtures may only be added to the grout used for filling sealed encapsulations, trumpets, and anchorage covers. Accelerators shall not be permitted.

- Water

Water for mixing grout shall be potable, clean, and free of injurious quantities of substances known to be harmful to hydraulic cement or prestressing steel.

- Corrosion Inhibiting Compound

The corrosion inhibiting compound placed in either the free length or the trumpet areas shall be an organic compound (i.e., grease or wax) with appropriate polar moisture displacing, corrosion inhibiting additives and self-healing properties. The compound shall permanently stay viscous and be chemically stable and nonreactive with the prestressing steel, the sheathing material, and anchor grout.

- Grout Tubes

Grout tubes shall have an adequate inside diameter to enable the grout to be pumped to the bottom of the drill hole. Grout tubes shall be strong enough to withstand a minimum grouting pressure of 145 psi. Post-grout tubes shall be strong enough to withstand post-grouting pressures.

5. Construction

a. Tendon Storage and Handling

- Tendons shall be handled and stored in such a manner as to avoid damage or corrosion. Damage to the prestressing steel, the corrosion protection, and/or the epoxy coating as a result of abrasions, cuts, nicks, welds, or weld splatter will be cause for rejection by the Engineer. The prestressing steel shall be protected if welding is to be performed in the vicinity.

Grounding of welding leads to the prestressing steel is forbidden. Prestressing steel shall be protected from dirt, rust, or other deleterious substances. A light coating of rust on the steel is acceptable. If heavy corrosion or pitting is noted, the Engineer shall reject the affected tendons.

- The Contractor shall use care in handling and storing the tendons at the site. Prior to inserting a tendon in the drill hole, the Contractor and the Inspector shall examine the tendon for damage to the encapsulation and the sheathing. If, in the opinion of the Inspector, the encapsulation is damaged, the Contractor shall repair the encapsulation in accordance with the tendon supplier's recommendations. If, in the opinion of the inspector, the smooth sheathing has been damaged, the Contractor shall repair it with ultra-high molecular weight polyethylene tape. The tape should be spiral wound around the tendon to completely seal the damaged area. The pitch of the spiral shall ensure a double thickness at all points.
- Banding for fabricated tendons shall be padded to avoid damage to the tendon corrosion protection. Upon delivery, the fabricated anchors, or the prestressing steel for fabrication of the tendons on site and all hardware shall be stored and handled in such a manner to avoid mechanical damage, corrosion, and contamination with dirt or deleterious substances.
- Lifting of the pre-grouted tendons shall not cause excessive bending, which can debond the prestressing steel from the surrounding grout.
- Prestressing steel shall not be exposed to excessive heat (i.e., more than 446° F).

b. Anchor Fabrication

- Anchors shall be either shop or field fabricated from material conforming to Part B, Anchored Wall, Part 4 Materials and as shown in the approved working drawings and schedules.
- Prestressing steel shall be cut with an abrasive saw or, with the written approval of the prestressing steel supplier, an oxyacetylene torch.
- All of the tendon bond length, especially for strand, must be free of dirt, manufacturer's lubricants, corrosion-inhibitive coatings, or other deleterious substances that may significantly affect the grout- to-tendon bond or the service life of the tendon.
- Pre-grouting of encapsulated tendons shall be done on an inclined, rigid frame or bed by injecting the grout from the low end of the tendon.

c. Drilling

- Drilling methods shall be left to the discretion of the Contractor, whenever possible. The Contractor shall be responsible for using a drilling method to establish a stable hole of adequate dimensions, within the tolerances specified. Drilling methods may involve, amongst others, rotary, percussion, rotary/percussive or auger drilling, or percussive or vibratory driven casing.
- Holes for anchors shall be drilled at the locations and to the length, inclination and diameter shown on the approved working drawings. The drill bit or casing crown shall not be more than 0.12 inch smaller than the specified hole diameter. At the ground surface the drill hole shall be located within 1 foot of

the location shown on the approved working drawings. The drill hole shall be located so the longitudinal axis of the drill hole and the longitudinal axis of the tendon are parallel. In particular, the ground anchor hole shall not be drilled in a location that requires the tendon to be bent in order to enable the bearing plate to be connected to the supported structure. At the point of entry, the ground anchor shall be installed within plus/minus 3 degrees of the inclination from horizontal shown on the approved working drawings. At the point of entry, the horizontal angle made by the ground anchor and the structure shall be within plus/minus 3 degrees of a line drawn perpendicular to the plane of the structure unless otherwise shown on the approved working drawings. The ground anchors shall not extend beyond the right of- way or easement limits shown on the contract drawings.

d. Tendon Insertion

- Tendons shall be placed in accordance with the approved working drawings and details and the recommendations of the tendon manufacturer or specialist anchor Contractor. The tendon shall be inserted into the drill hole to the desired depth without difficulty.
- Each anchor tendon shall be inspected by Department field personnel during installation into the drill hole or casing. Damage to the corrosion protection system shall be repaired, or the tendon replaced if not repairable. Loose spacers or centralizers shall be reconnected to prevent shifting during insertion. Damaged fusion bonded epoxy coatings shall be repaired in accordance with the manufacturer's recommendations. If the patch is not allowed to cure prior to inserting the tendon in the drill hole, the patched area shall be protected by tape or other suitable means.

- e. The rate of placement of the tendon into the hole shall be controlled such that the sheathing, coating, and grout tubes are not damaged during installation of the tendon. Anchor tendons shall not be subjected to sharp bends. The bottom end of the tendon may be fitted with a cap or bullnose to aid its insertion into the hole, casing, or sheathing.

f. Grouting

- The Contractor shall use a neat cement grout or a sand- cement grout. The cement shall not contain lumps or other indications of hydration. Admixtures, if used, shall be mixed in accordance with the manufacturer's recommendation.
- The grouting equipment shall produce a grout free of lumps and undispersed cement. A positive displacement grout pump shall be used. The pump shall be equipped with a pressure gauge to monitor pressures. The pressure gauge shall be capable of measuring pressures of at least 145 psi or twice the actual grout pressure used by the Contractor, whichever is greater. The grouting equipment shall be sized to enable the grout to be pumped in one continuous operation. The mixer should be capable of continuously agitating the grout.
- The grout shall be injected from the lowest point of the drill hole. The grout may be pumped through grout tubes, casings, hollowstem-augers, or drill rods. The grout can be placed before or after insertion of the tendon. The quantity of the grout and the grout pressures shall be recorded. The grout pressures and grout take shall be controlled to prevent excessive heave or

- After the tendon is installed, the drill hole may be filled in one continuous grouting operation except that pressure grouting shall not be used in the free length zone. The grout at the top of the drill hole shall not contact the back of the structure or the bottom of the trumpet.
- If the ground anchor is installed in a fine-grained soil using drill holes larger than 6 inches in diameter, then the grout above the top of the bond length shall be placed after the ground anchor has been tested and stressed. The Engineer will allow the Contractor to grout the entire drill hole at the same time if the Contractor can demonstrate that their particular ground anchor system does not derive a significant portion of its load-carrying capacity from the soil above the bond length portion of the ground anchor.
- If grout protected tendons are used for ground anchors anchored in rock, then pressure grouting techniques shall be utilized. Pressure grouting requires that the drill hole be sealed and that the grout be injected until a minimum 50 psi grout pressure (measured at the top of the drill hole) can be maintained on the grout for at least 5 minutes.
- The grout tube may remain in the hole on completion of grouting if the tube is filled with grout.
- After grouting, the tendon shall not be loaded for a minimum of 3 days.

g. Anchorage Installation

- The anchor bearing plate and the anchor head or nut shall be installed perpendicular to the tendon, within plus/minus 3 degrees and centered on the bearing plate, without bending or kinking of the prestressing steel elements. Wedge holes and wedges shall be free of rust, grout, and dirt.
- The stressing tail shall be cleaned and protected from damage until final testing and lock-off. After the anchor has been accepted by the Engineer, the stress tail shall be cut to its final length according to the tendon manufacturer's recommendations.
- The corrosion protection surrounding the unbonded length of the tendon shall extend up beyond the bottom seal of the trumpet or 4 inches into the trumpet if no trumpet seal is provided. If the protection does not extend beyond the seal or sufficiently far enough into the trumpet, the Contractor shall extend the corrosion protection or lengthen the trumpet.
- The corrosion protection surrounding the unbonded length of the tendon shall not contact the bearing plate or the anchor head during testing and stressing. If the protection is too long, the Contractor shall trim the corrosion protection to prevent contact.

h. Corrosion Protection

- Protection Requirements

Corrosion protection requirements shall be determined by the Department and shall be shown on the contract plans. The corrosion protection systems shall be designed and constructed to provide reliable ground anchors for temporary and permanent structures.

- Anchorage Protection
 - a) All stressing anchorages permanently exposed to the atmosphere shall receive a grout-filled cover, except, for restressable anchorages where a corrosion inhibiting compound must be used. Stressing anchorages encased in concrete at least 2 inches thick do not require a cover.
 - b) The trumpet shall be sealed to the bearing plate and shall overlap the unbonded length corrosion protection by at least 4 inches. The trumpet shall be long enough to accommodate movements of the structure and the tendon during testing and stressing. On strand tendons, the trumpet shall be long enough to enable the tendon to make a transition from the diameter of the tendon along the unbonded length to the diameter of the tendon at the wedge plate without damaging the encapsulation.
 - c) The trumpet shall be completely filled with grout, except restressable anchorages must use corrosion inhibiting compounds. Compounds may be placed any time during construction. Compound filled trumpets shall have a permanent seal between the trumpet and the unbonded length corrosion protection. Grout must be placed after the ground anchor has been tested and stressed to the lock-off load. Trumpets filled with grout shall have either a temporary seal between the trumpet and the unbonded length corrosion protection or the trumpet shall fit tightly over the unbonded length corrosion protection for a minimum of 4 inches.
- Unbonded Length Protection
 - a) Corrosion protection of the unbonded length shall be provided by a combination of sheaths, sheath filled with a corrosion inhibiting compound or grout, or a heat shrinkable tube internally coated with a mastic compound, depending on the tendon class. The corrosion inhibiting compound shall completely coat the tendon elements, fill the void between them and the sheath and fill the interstices between the wires of 7-wire strands. Provisions shall be made to retain the compound within the sheath.
 - b) The corrosion protective sheath surrounding the unbonded length of the tendon shall be long enough to extend into the trumpet but shall not come into contact with the stressing anchorage during testing. Any excessive protection length shall be trimmed off.
 - c) For pre-grouted encapsulations and all Class I tendons, a separate bond breaker or common sheath shall be provided for supplemental corrosion protection or to prevent the tendon from bonding to the grout surrounding the unbonded length.
- Unbonded Length/Bond Length Transition

The transition between the corrosion protection for the bonded and unbonded lengths shall be designed and fabricated to ensure continuous protection from corrosive attack.
- Tendon Bond Length Protection for Grout Protected Tendons (Class II)
 - a) Cement grout can be used to protect the tendon bond length in non-aggressive ground when the installation methods ensure that the grout will

remain fully around the tendon. The grout shall overlap the sheathing of the unbonded length by at least 1 inch.

- b) Centralizers or grouting techniques shall ensure a minimum of 0.5 inch of grout cover over the tendon bond length.

- Tendon Bond Length Protection for Encapsulated Tendons (Class I)

- a) A grout-filled, corrugated plastic encapsulation or grout-filled, deformed steel tube shall be used. The prestressing steel can be grouted inside the encapsulation prior to being placed.
- b) Centralizers or grouting techniques shall ensure a minimum of 0.5 inch of grout cover over the encapsulation.

- Epoxy

A fusion-bonded epoxy may be used to provide a layer of protection for the steel tendon in addition to the cement grout.

- Coupler Protection

- a) On encapsulated bar tendons (Class I), the coupler and any adjacent exposed bar sections shall be covered with a corrosion-proof compound or wax-impregnated cloth tape. The coupler area shall be covered by a smooth plastic tube, complying with the requirements set forth in 4.9, overlapping the adjacent sheathed tendon by at least 1 inch. The two joints shall be sealed each by a coated heat shrink sleeve of at least 6 inches in length or approved equal. The corrosion-proof compound shall completely fill the space inside the cover tube.
- b) Corrosion protection details for strand couplers, if specifically permitted, shall be submitted for approval of the Engineer.

- i. Stressing, Load Testing, and Acceptance

- General

Each ground anchor shall be tested. No load greater than 10 percent of the design load can be applied to the ground anchor prior to testing. The maximum test load shall be no less than 1.33 times the design load and shall not exceed 80 percent of the specified minimum ultimate tensile strength of the prestressing steel of the tendon. The test load shall be simultaneously applied to the entire tendon. Stressing of single-element tendons shall not be permitted.

- Stressing Equipment

The testing equipment shall consist of:

- a) A dial or vernier scale capable of measuring to the nearest .001 inch shall be used to measure the ground anchor movement. The movement measuring device shall have a minimum travel equal to the theoretical elastic elongation of the total anchor length at the maximum test load and it shall have adequate travel so the ground anchor movement can be measured without resetting the device at an interim point.
- b) A hydraulic jack and pump shall be used to apply the test load. The jack and a calibrated primary pressure gauge shall be used to measure the

applied load. The jack and primary pressure gauge shall be calibrated by an independent firm as a unit. The calibration shall have been performed within 45 working days of the date when the calibration submittals are provided to the Engineer. Testing cannot commence until the Engineer has approved the calibration. The primary pressure gauge shall be graduated in 100 psi increments or less. The ram travel shall be at least 6 inches and preferably not be less than the theoretical elongation of the tendon at the maximum test load. If elongations greater than 6 inches are required, re-stroking can be allowed.

- c) A calibrated reference pressure gauge shall also be kept at the site to periodically check the production (i.e., primary pressure) gauge. The reference gauge shall be calibrated with the test jack and primary pressure gauge. The reference pressure gauge shall be stored indoors and not subjected to rough treatment.
 - d) The Contractor shall provide an electrical resistance load cell and readout to be used when performing an extended creep test.
 - e) The stressing equipment shall be placed over the ground anchor tendon in such a manner that the jack, bearing plates, load cells and stressing anchorage are axially aligned with the tendon and the tendon is centered within the equipment.
 - f) The stressing equipment, the sequence of stressing and the procedure to be used for each stressing operation shall be determined at the planning stage of the project. The equipment shall be used strictly in accordance with the manufacturer's operating instructions.
 - g) Stressing equipment shall preferably be capable of stressing the whole tendon in one stroke to the specified test load and the equipment shall be capable of stressing the tendon to the maximum specified test load within 75 percent of the rated capacity. The pump shall be capable of applying each load increment in less than 60 seconds.
 - h) The equipment shall permit the tendon to be stressed in increments so that the load in the tendon can be raised or lowered in accordance with the test specifications and allow the anchor to be lift-off tested to confirm the lock off load.
 - i) Stressing equipment shall have been calibrated, within an accuracy of plus or minus 2 percent, a maximum of 45 days prior to use. The calibration certificate and graph shall be available on site at all times. The calibration shall be traceable to the National Institute of Standards and Technology (NIST).
- Load Test Setup
 - a) Dial gauges shall bear on the pulling head of the jack and their stems shall be coaxial with the tendon direction. The gauges shall be supported on an independent, fixed frame, such as a tripod, which will not move as a result of stressing or other construction activities during the operation.
 - b) Prior to setting the dial gauges, the Alignment Load (AL) shall be accurately placed on the tendon. The magnitude of the AL depends on the type and

- length of the tendon.
- c) Re-gripping of strands, which would cause overlap wedge bites, or wedge bites on the tendon below the anchor head, shall be avoided.
 - d) Stressing and testing of multiple element tendons with single element jacks is not permitted.
 - e) Stressing shall not begin until the grout has reached adequate strength.
- Performance Tests

Five percent of the ground anchors or a minimum of 3 ground anchors, whichever is greater, shall be performance tested in accordance with the procedures described in this section. The Engineer shall select the ground anchors to be performance tested. The remaining ground anchors shall be tested in accordance with the proof test procedures.

The performance test shall be made by incrementally loading and unloading the ground anchor in accordance with the schedule provided below. The load shall be raised from one increment to another immediately after recording the ground anchor movement. The ground anchor movement shall be measured and recorded to the nearest (0.001) of an inch with respect to an independent fixed reference point at the alignment load and at each increment of load. The load shall be monitored with the primary pressure gauge. The reference pressure gauge shall be placed in series with the primary pressure gauge during each performance test. If the load determined by the reference pressure gauge and the load determined by the primary pressure gauge differ by more than 10 percent, the jack, primary pressure gauge and reference pressure gauge shall be recalibrated at no expense to the Department. At load increments other than the maximum test load, the load shall be held just long enough to obtain the movement reading.

- The maximum test load in a performance test shall be held for 10 minutes. A load cell shall be used to monitor small changes in load during constant load-hold periods.
- The jack shall be adjusted as necessary in order to maintain a constant load. The load-hold period shall start as soon as the maximum test load is applied and the ground anchor movement, with respect to a fixed reference, shall be measured and recorded at 1, 2, 3, 4, 5, 6, and 10 minutes. If the ground anchor movement between 1 minute and ten 10 minutes exceeds 0.04 inch, the maximum test load shall be held for an additional 50 minutes. If the load hold is extended, the ground anchor movement shall be recorded at 15, 20, 30, 40, 50 and 60 minutes.

Steps for the Performance Test – The steps for the performance test are detailed in the table on the following page:

Performance Test Steps

| Step | Loading | Applied Load | Record and Plot Total Movement (d_i) | Record and Plot Residual Movement (d_{ri}) | Calculate Elastic Movement (d_{ei}) |
|--|--|--------------|--|--|---|
| 1 | Apply alignment load (AL) | | | | |
| 2 | Cycle 1 | 0.25DL | d_{t1} | | $d_{t1} - d_{r1} = d_{e1}$ |
| | | AL | | d_{r1} | |
| 3 | Cycle 2 | 0.25DL | d_2 | | $d_{t2} - d_{r2} = d_{e2}$ |
| | | 0.50DL | d_{t2} | | |
| | | AL | | d_{r2} | |
| 4 | Cycle 3 | 0.25DL | d_3 | | $d_{t3} - d_{r3} = d_{e3}$ |
| | | 0.50DL | d_3 | | |
| | | 0.75DL | d_{t3} | | |
| | | AL | | d_{r3} | |
| 5 | Cycle 4 | 0.25DL | d_4 | | $d_{t4} - d_{r4} = d_{e4}$ |
| | | 0.50DL | d_4 | | |
| | | 0.75DL | d_4 | | |
| | | 1.00DL | d_{t4} | | |
| | | AL | | d_{r4} | |
| 6 | Cycle 5 | 0.25DL | d_5 | | $d_{t5} - d_{r5} = d_{e5}$ |
| | | 0.50DL | d_5 | | |
| | | 0.75DL | d_5 | | |
| | | 1.00DL | d_5 | | |
| | | 1.2DL | d_{t5} | | |
| | | AL | | d_{r5} | |
| 7 | Cycle 6 | 0.25DL | d_6 | | |
| | | 0.50DL | d_6 | | |
| | | 0.75DL | d_6 | | |
| | | 1.00DL | d_6 | | |
| | | 1.2DL | d_6 | | |
| | | 1.33DL | d_{t6} , zero reading for creep test | | |
| 8 | Hold load for 10 minutes while recording movement at specified times. If the total movement measured during the load hold exceeds the specified maximum value, then the load hold should be extended to a total of 60 minutes. | | | | |
| 9 | Cycle 6 cont'd | AL | | d_{r6} | Cycle 6: $d_{tn} - d_{r6} = d_{e6}$ |
| Notes: AL = Alignment Load, DL = Design Load, d_i = total movement at a load other than maximum for cycle, i = number identifying a specific load cycle. | | | | | |

- **Proof Tests**

The proof test shall be performed by incrementally loading the ground anchor in accordance with the following schedule. The load shall be raised from one increment to another immediately after recording the ground anchor movement. The ground anchor movement shall be measured and recorded to the nearest 0.001 inch with respect to an independent fixed reference point at the alignment load and at each increment load. The load shall be monitored with the primary pressure gauge. At load increment other than the maximum test load, the load shall be held just long enough to obtain the movement reading.

Proof Test Schedule

| Step | Load |
|-------------|-------------------------|
| 1 | AL |
| 2 | 0.25DL |
| 3 | 0.50DL |
| 4 | 0.75DL |
| 5 | 1.00DL |
| 6 | 1.20DL |
| 7 | 1.33DL |
| 8 | Reduce to lock-off load |
| 9 | AL (optional) |
| 10 | Adjust to lock-off load |

- The maximum test load in a proof test shall be held for 10 minutes. The jack shall be adjusted as necessary in order to maintain a constant load. The load-hold period shall start as soon as the maximum test load is applied and the ground anchor movement with respect to a fixed reference shall be measured and recorded at 1, 2, 3, 4, 5, 6, and 10 minutes. If the ground anchor movement between 1 minute and 10 minutes exceeds 0.04 inch, the maximum test load shall be held for an additional 50 minutes. If the load hold is extended, the ground anchor movements shall be recorded at 15, 20, 30, 40, 50, and 60 minutes.

- **Extended Creep Tests**

- a) The Department shall determine if extended creep testing is required and select those ground anchors that are to be creep tested. If creep tests are required, at least 2 ground anchors shall be tested. The stressing equipment shall be capable of measuring and maintaining the hydraulic pressure within 50 psi.

- b) The extended creep test shall be made by incrementally loading and unloading the ground anchor in accordance with the performance test schedule. At the end of each loading cycle, the load shall be held constant for the observation period indicated in the creep test schedule below. The times for reading and recording the ground anchor movement during each observation period shall be 1, 2, 3, 4, 5, 6, 10, 15, 20, 25, 30, 45, 60, 75, 90, 100, 120, 150, 180, 210, 240, 270 and 300 minutes as appropriate for the load increment. Each load-hold period shall start as soon as the test load is applied. In a creep test, the primary pressure gauge and reference pressure

gauge will be used to measure the applied load and the load cell will be used to monitor small changes in load during constant load-hold periods. The jack shall be adjusted as necessary in order to maintain a constant load.

- c) The Contractor shall plot the ground anchor movement and the residual movement measured in an extended creep test. The Contractor shall also plot the creep movement for each load hold as a function of the logarithm of time.

Extended Creep Test Schedule

| Load | Observation period (min) |
|-------------|---------------------------------|
| AL | |
| 0.25DL | 10 |
| 0.50DL | 30 |
| 0.75DL | 30 |
| 1.00DL | 45 |
| 1.20DL | 60 |
| 1.33DL | 300 |

- **Ground Anchor Acceptance Criteria**

A performance-tested or proof-tested ground anchor with a 10-minute load hold shall be acceptable if the: (1) ground anchor resists the maximum test load with less than 0.04 inch of movement between 1 minute and 10 minutes; and (2) total elastic movement at the maximum test load exceeds 80 percent of the theoretical elastic elongation of the unbonded length.

- a) A performance-tested or proof-tested ground anchor with a 60-minute load hold shall be acceptable if the: (1) ground anchor resists the maximum test load with a creep rate that does not exceed 0.08 inch in the last log cycle of time; and (2) total elastic movement at the maximum test load exceeds 80 percent of the theoretical elastic elongation of the unbonded length.
- b) A ground anchor subjected to extended creep testing is acceptable if the: (1) ground anchor resists the maximum test load with a creep rate that does not exceed 0.08 inch in the last log cycle of time; and (2) total elastic movement at the maximum test load exceeds 80 percent of the theoretical elastic elongation of the unbonded length.
- c) The initial lift-off reading shall be within plus or minus 5 percent of the designated lock-off load. If this criterion is not met, then the tendon load shall be adjusted accordingly and the initial lift-off reading repeated.

- **Procedures for Anchors Failing Acceptance Criteria**

- a) Anchors that do not satisfy the minimum apparent free length criteria shall be either rejected and replaced at no additional cost to the Department or locked off at no more than 50 percent of the maximum acceptable load attained. In this event, no further acceptance criteria are applied.
- b) Regroutable anchors which satisfy the minimum apparent free length criteria, but which fail the extended creep test at the test load may be post

grouted and subjected to an enhanced creep criterion. This enhanced criterion requires a creep movement of not more than 0.04 inch between 1 and 60 minutes at test load. Anchors which satisfy the enhanced creep criterion shall be locked off at the design lock-off load. Anchors which cannot be post grouted or regrowable anchors that do not satisfy the enhanced creep criterion shall be either rejected or locked off at 50 percent of the maximum acceptable test load attained. In this event, no further acceptance criteria are applied. The maximum acceptable test load with respect to creep shall correspond to that where acceptable creep movements are measured over the final log cycle of time.

- c) In the event that the anchor fails, the Contractor shall modify the design and/or construction procedures. These modifications may include, but are not limited to, installing additional anchors, modifying the installation methods, reducing the anchor design load by increasing the number of anchors, increasing the anchor length, or changing the anchor type. Any modification of design or construction procedures shall be at no change in the contract price. A description of any proposed modifications must be submitted to the Engineer in writing. Proposed modifications shall not be implemented until the Contractor receives written approval from the Engineer.
- Anchor Lock-Off
 - a) After testing has been completed, the load in the tendon shall be such that after seating losses (i.e., wedge seating); the specified lock-off load has been applied to the anchor tendon.
 - b) The magnitude of the lock-off load shall be specified in the approved working drawings, or as determined by the designer.
 - c) The wedges shall be seated at a minimum load of 50 percent F_{pu} . If the lock-off load is less than 50 percent F_{pu} , shims shall be used under the wedge plate and the wedges seated at 50 percent F_{pu} . The shims shall then be removed to reduce the load in the tendon to the desired lock-off load. Bar tendons may be locked off at any load less than 70 percent F_{pu} .
- Anchor Lift-Off Test

After transferring the load to the anchorage, and prior to removing the jack, a lift-off test shall be conducted to confirm the magnitude of the load in the anchor tendon. This load is determined by reapplying load to the tendon to lift off the wedge plate (or anchor nut) without unseating the wedges (or turning the anchor nut). This moment represents zero time for any long-time monitoring.

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SPECIAL PROVISION

REGARDING

HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS

Scope

These design requirements shall apply to **713**-Highway Signing, **714**-Roadway and Structure Lighting, and **730**-Traffic Signals of the current Standard Specifications.

Description

The design of the supports for overhead sign bridges and butterfly configurations, high mast lighting, luminaires, CCTV camera poles, and traffic signal strain poles and mast arm structures shall be in accordance with the American Association of Highway and Transportation Officials (AASHTO) LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1st edition, with addenda.

General Conditions

All overhead sign bridges and butterfly sign structures, traffic signal strain poles and mast arm structures and high mast light poles 90-feet or greater in height, shall be designed using the Fatigue Category 1 provisions found in the subject specifications except that, design for galloping-induced fatigue and truck-induced gust fatigue, are excluded. Fatigue designs are not required for luminaire poles less than 55-feet in height, span-wire poles, or roadside sign poles.

In lieu of designing for galloping-induced fatigue in mast arm pole assemblies, a 60-inch by 16-inch by 0.125 gauge aluminum or galvanized steel panel shall be installed horizontally near the end of the mast arm with the long axis of the panel collinear with the long axis of the mast. The panel shall be mounted at such a height as to provide a least a 6-inch clearance from the top of the signal assembly or sign blank located on the mast arm within the length of the anti-galloping panel. The panel and attachment hardware shall be shown on the shop drawings, and is considered an item included in the price bid for the mast arm assembly.

Additionally, all mast arm connections to the support pole shall be accomplished using a wrap-around ring stiffener assembly.

The design coordination instructions are as follows:

- a. The Basic Wind Speed shall be 120 mph for Extreme 1 Limit State.
- b. The Design Life shall be 50 years resulting in a 1,700 year Recurrence Interval.

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STATE
(Rev. 08-29-19)
(Rev. 03-02-22)

OF

TENNESSEE
January 1, 2015
City of Franklin
Williamson County

SPECIAL PROVISION

REGARDING

SECTION 730 – TRAFFIC SIGNALS

DESCRIPTION

730.01 Description of Work

This work consists of furnishing and installing all necessary materials and equipment to complete in-place traffic signal systems, modify existing systems, or both, all as shown on the Plans or the Standard or Special Details, City of Franklin Standard Drawings and as specified in these Specifications. Unless otherwise shown on the Plans or specified in the Special Provisions, all materials shall be new.

Where existing systems are to be modified, incorporate the existing material into the revised system, salvage it for return to the City of Franklin, or abandon it as specified or as directed by the Engineer.

Furnish and install all incidental parts that are not shown on the Plans or specified herein, but that are necessary to complete the traffic signal or other electrical systems, or that are required for modifying existing systems, as though such parts were shown on the Plans or specified herein. Include the costs of such incidentals in bid price for other items. All systems shall be complete and in operation to the Engineer's satisfaction at the time of completion of the work. This is to include but not limited to the traffic signal system work, traffic signal communications, traffic signs, traffic markings and any other work required to ensure that the traffic signal system can function as per the final plans.

Notify the Department and the City in writing when the work is complete in order that the final inspection can be scheduled and performed by the Department and City of Franklin.

Operate and maintain the traffic signal system until such time that system testing is complete and a final inspection is performed. All discrepancies found in the inspection shall be corrected to the satisfaction of the Department and the City of Franklin. The City of Franklin will assume maintenance responsibilities once all discrepancies are corrected and a written final acceptance document is produced by the City.

GENERAL REQUIREMENTS

730.02 Regulations and Code

Ensure that all equipment provided conforms to NEMA Standards Publication, Traffic Control Systems, latest revision, or the Radio Manufacturers Association, whichever is applicable. In addition to the requirements of these Specifications, the Plans, and the Special Provisions, all material and work shall conform to the requirements of the NEC and the NESC; the Standards of ASTM, ANSI, ITE, and IMSA; the MUTCD; and the City of Franklin adopted codes and permitting process.

Wherever reference is made to the NEC, or the Standards mentioned above, consider the reference to mean the code or standard that is in effect on the date of advertising the bids or authorization for force account.

730.03 Submittal Data Requirements

Within 30 days after the issuance of the work order, submit to the Engineer, the Traffic Operations Division, and the City of Franklin, one collated set of the manufacturer's descriptive literature and technical data that fully describes the types of signal equipment proposed for use. In the descriptive literature, identify the manufacturer and models and include sufficient information for the Engineer to determine if the equipment or material meets the requirements of the Plans and these Specifications. Include with these sets of submittal data a list of the materials submitted along with descriptive material for, but not limited to, the following items:

1. Controller
2. Cabinet and Exhaust Fan
3. Detectors/Detection Devices
4. Signal Heads including Lamp Information and Mounting Hardware
5. Loop Wire and Loop Sealant
6. Shielded Detector Cable
7. Signal Cable
8. Cable for Span Wire, Guys, and similar features
9. Pull Boxes
10. Conduit
11. Coordination Equipment
12. Support Pedestals, Poles and Mast Arms
13. Communication Cable
14. Communications Equipment
15. Electrical Service Connection

Also include in the submittal sets detailed scale drawings of all non-standard or special equipment and of all proposed deviations from the Plans. Upon request, submit for approval sample articles of materials proposed for use. The Department and the City of Franklin will not be liable for any materials purchased; labor performed, or delay to the Work prior to such approval.

In addition to the above, submit to the Engineer a notarized letter certifying that all traffic signal materials listed in the submittal conform to the Plans and Specifications along with a copy of a statement from the City of Franklin that the system is acceptable. Any material substitutions requested by the City of Franklin shall meet minimum Department and City standards and shall be approved by the Department and City in writing prior to purchase or installation. Once approval has been given, provide proof of order of said materials within seven days of approval. The Department and City will not be liable for any materials purchased; labor performed, or delay to the Work regarding such approval.

Submit an electronic copy in PDF format of "Design" or "Shop" drawings, indicating the proposed dimensions and material specification for each of the supports and mast arms involved, to the Division of Structures for approval purposes within 30 days after the work order is issued. The Department and City will review these drawings at the earliest possible date, and will return the electronic copy marked "Approved for Fabrication," or "Returned for Revisions as Noted." Respond by taking appropriate action to ensure the earliest possible correction of these items so as not to delay the installation.

730.04 Mill Test Reports and Certification

Provide Mill Test Reports (MTR) or Certifications of Conformance to the Specifications for Materials and Design for all materials incorporated into the Work. Supply the following prior to acceptance of the structures:

1. MTRs for MAJOR structural items only, as identified in Table 730.04-1, shall include both physical and chemical descriptions of the material as supplied to the fabricator. When physical properties are altered during the fabrication, supplement the MTR covering chemical composition with certified test reports indicating the physical properties of this material after fabrication.

2. Certifications of Conformance to the Specifications for all remaining material not covered by MTR as identified in Table 730.04-1.
3. Certification that all welding was performed by operators qualified as follows: Steel welders to AWS and aluminum welders to ASME.
4. Certification of Conformance to the Specification for the Design of all components not completely dimensioned and detailed on the Standard Drawing.

Table 730.04-1: Required Mill Test Reports and Certifications

| Component Materials | MTR | Certification |
|---|------------|----------------------|
| Tubes for arms and poles | X | |
| Base Castings | X | |
| Anchor Bolts | X | |
| Pole tops, misc. fittings, and hardware | | X |
| Fabricated or cast-type arm connections | | X |
| Galvanizing | | X |

730.05 Working Drawings

Provide within the controller cabinet and to the City of Franklin an electrical schematic diagram of the cabinet and system wiring. Submit manufacturer’s instructions for installation, maintenance, and operation of all equipment to the City of Franklin and also place a copy within the controller cabinet. Place all such materials inside a plastic envelope mounted in the cabinet.

730.06 Guarantee

Guarantee the Traffic Signal System(s) installed under these Specifications, including all equipment, parts, and appurtenances in connection therewith, to the City and State against defective workmanship and materials for a period of not less than 1 year following the date the signal system is installed and made operational, except in no case shall this guarantee expire prior to 3 months after the final acceptance of the Project. Upon completion of the Project, turn over to the City of Franklin all warranties or guarantees on equipment and materials that are offered by the manufacturers as normal trade practice.

730.07 Training

Provide to the City of Franklin and/or the Department a training session on the controller and associated cabinet equipment to be supplied on the Project. The training session shall last for a minimum 8 hours unless the City and/or the Department determines a lesser time is adequate. Train the user in the complete operation and programming features of all controllers. Provide this training prior to the acceptance of the Project at a facility agreed upon by the City of Franklin.

After the required training, certify to the Engineer that training has been completed.

This training requirement shall not apply if a training program meeting these criteria has been provided to the City of Franklin by this vendor and/or manufacturer on the equipment being bid within 18 months prior to the date of the invitation to bid. This requirement shall apply if the bidder is proposing new, upgraded, or modified equipment not covered in the previous training program.

MATERIALS AND INSTALLATION**730.08 Excavating and Backfilling**

Perform excavation needed to install conduit, foundations, and other equipment, so as to cause the least possible damage to the streets, sidewalks, and other improvements. Excavate trenches no wider than necessary to properly install the electrical equipment and foundations. Do not begin excavating until immediately before installing conduit and other equipment. Place the material from the excavation where it will cause the least disruption and obstruction to vehicular and pedestrian traffic and the least interference with the surface drainage.

Backfill the excavations and compact to at least the density of the surrounding material. Remove all surplus excavation material and dispose of outside the highway right-of-way, in accordance with **203.07**, or as directed by the Engineer.

After backfilling, keep excavations well-filled, and maintain in a smooth and well-drained condition until permanent repairs can be made.

At the end of each day's work, and at all other times when construction operations are suspended, remove all equipment and other obstructions from that portion of the roadway used by public traffic, and park a minimum of 30 feet from the edge of pavement unless otherwise protected by guardrail, bridge rail, or barriers installed for other purposes.

Perform excavation in the street or highway so as to restrict no more than one traffic lane in either direction at any time. Do not obstruct traffic during hours of peak flow unless otherwise approved by the Engineer. Incorporate construction signing in accordance with the MUTCD.

730.09 Removing and Replacing Improvements

Replace or reconstruct, with the same kind of materials as found on the Work, improvements, such as sidewalks, curbs, gutters, Portland cement concrete and asphalt concrete pavement, bituminous surfacing, base material, and all other improvements removed, broken, or damaged.

Before removing the sidewalk and pavement material, use an abrasive type saw to cut, to a minimum depth of 2 inches, the outline of all areas to be removed in Portland cement concrete sidewalks and in all pavements. Use any method satisfactory to the Engineer to cut the remainder of the required depth. Make cuts neat and true with no shatter outside the removal area.

Whenever a part of a square or slab of existing concrete sidewalk or driveway is broken or damaged, remove the entire square or slab and reconstruct the concrete as specified above.

Perform all work in accordance with these Specifications, or the applicable local ordinance, whichever is of a higher standard. Consider this removal and replacement work to be incidental to other items.

730.10 Foundations

Construct foundations for posts, standards, and cabinets of Class A Portland cement concrete in accordance with Department or City of Franklin Standard Drawings, as applicable.

Pour foundations for posts, standards, and pedestals after the post, standard, pedestal, or anchor bolts or reinforcing steel is in proper position. Form the exposed portions to present a neat appearance. Rest the bottom of concrete foundations on firm undisturbed ground.

Construct forms to be true to line and grade. Finish tops of footings for posts and standards, except special foundations, to curb or sidewalk grade or as ordered by the Engineer. Use rigid forms, securely braced in place. Place conduit ends and anchor bolts by means of a template until the concrete sets. Moisten both the forms and the ground that will

be in contact with the concrete before placing concrete. Do not remove forms until the concrete has cured for at least 12 hours and hardened sufficiently to allow form removal without causing damage to the concrete.

Apply an ordinary surface finish to exposed surfaces of concrete. Wherever the edge of a concrete foundation or sidewalk section is within 18 inches of any existing concrete improvement, extend the sidewalk section to meet the existing improvement.

Where obstructions prevent the construction of planned foundations, construct a foundation satisfactory to the Engineer.

730.11 Anchor Rods

Furnish, with anchor-base type rods, anchor bolts meeting the requirements of ASTM F1554, grade as required by design. Fit each anchor bolt with two heavy hex nuts. Hot-dip galvanize all nuts and not less than 10 inches of the threaded ends of anchor bolts according to ASTM A153. The anchor bolts shall be capable of resisting at yield strength stress the bending moment of the shaft at its yield strength stress.

Set standards, posts, and pedestals plumb by adjusting the nuts before the foundation is finished to final grade. Do not use shims or similar devices for plumbing or raking. After plumbing or raking has been completed, cut off anchor bolts 1/4 inch above the top nut, and paint the exposed surface with rust protective paint.

Furnish all anchor bolts and nuts required for relocating existing standards and posts.

730.12 Pull Boxes

Construct and install pull boxes as shown on the Plans and the TDOT and City of Franklin Standard Drawings or as directed by the Engineer. Additional pull boxes may be required where traffic signal and/or electrical conduit runs are more than 150 feet long. The maximum spacing between traffic signal and electrical pull boxes shall be 150 feet, unless otherwise directed by the Engineer. Maximum spacing for fiber optic pull boxes shall be 500 feet. Install pull boxes wherever practicable out of the line of traffic. Set covers level with the pavement, or with the curb or sidewalk grade, or with the surrounding ground as required. Pull box covers shall be stamped with either the words "TRAFFIC SIGNALS" or "COF FIBER OPTIC" inscribed to the same specifications as directed by TDOT and City of Franklin standard drawings and specifications.

Place electrical conductors within pull boxes so as to be clear of the metal frame and cover.

Rest the bottom of the pull box firmly on a bed of crushed stone with a minimum depth of 12 inches below the bottom, and extending 6 inches beyond the outside edge of the pull box, unless otherwise directed by the Engineer.

A. Concrete Pull Boxes

Construct concrete pull boxes of a mixture of one part cement, two parts sand, and four parts gravel or 1-inch crushed stone with reinforcement placed as shown on the Standard Drawings. Reinforcement shall consist of welded wire reinforcement, 4 x 4 inches - No. 4/4 at 85 pounds per 100 square feet, meeting the requirements of **907.03**. Pull boxes may be poured in place or precast. The color of the pull box concrete material shall match the surrounding concrete color.

Install a cast iron frame and cover of the dimensions shown on the Drawings in each pull box. Provide castings of Class 30, meeting the requirements of **908.07**. The covers shall have a roughened top surface of 1/8 inch in relief. Provide notches for removing the cover. Inscribe the words "TRAFFIC SIGNALS" on top of the covers with letters 1-1/2 inches high and 1/8 inch in relief as shown on the Drawings.

The frame shall have a minimum weight of 42 pounds. The cover shall be of the "Extra Heavy" type with a minimum weight of 54 pounds.

B. Reinforced Plastic or Epoxy Mortar Pull Boxes

Ensure that pull boxes composed of reinforced plastic or epoxy mortar are designed and tested to temperatures of -50 °F and meet the requirements of the following: ASTM D543, ASTM D570, ASTM D790, and ASTM D635, and are based on a 30,000-pound single axle load over a 10 x 20 inch area. The top of the pull box shall consist of a concrete frame (ring) and cover. The color of the pull box concrete material shall match the surrounding concrete color. Inscribe the words "TRAFFIC SIGNALS" or "COF FIBER OPTIC", as applicable on top of the covers.

C. Precast Composite Concrete Pull Boxes (Fiber Optic Type A and B)

Pull Box and cover shall be precast composite polymer concrete product. Pull boxes with a polymer cover but other material for the box will not be accepted.

Pull Boxes and covers shall be single-stack open-bottom assemblies configured as shown in the Plans.

Vertical Design / Test Load shall be - 22,500lbs/33,750lbs. Loadings shall comply with ANSI 77 2007 and shall exceed Tier 15 test provisions for both the cover and sidewall.

Pull Box shall meet NEC for handhold enclosures.

Inscribe the words "COF Fiber Optic" on top of the covers with letters 1-1/2 inches high and 1/8 inch in relief as shown on the Plans.

730.13 Transformer Base

Fabricate the transformer base from steel plate and sheet, and design it to harmonize with the shaft. Provide each transformer base with:

1. One 7-1/2 x 9 inch minimum handhole, with a cover secured with stainless steel fastening screws;
2. Four galvanized steel bearing plates to fasten the base to the anchor bolts;
3. Four galvanized steel bolts, nuts, and washers to fasten base and standard; and
4. One 1/2-inch, 13 UNC grounding nut welded to the inside of the base opposite the handhole opening.

Ensure that the strength of the transformer base is comparable with that of the shaft.

When a transformer base is required, no handhole will be required in the shaft.

730.14 Conduit

Furnish and install plastic and steel conduit in accordance with these Specifications and close conformity with the lines shown on the Plans or as established by the Engineer.

Threads shall be clean cut, straight, and true and of sufficient length to allow proper coupling. Do not use long running threads on any part of the Work. Protect threads in transit and during installation, and provide conduit with proper supports and protection during construction to prevent damage. Properly thread, ream, and cap all ends of pipe installed for future connections to prevent water and foreign matter from entering the conduit system. Provide threaded ends with approved conduit bushings.

Signal conduit shall be a minimum 2 inches in diameter, and detector conduit a minimum 1 inch in diameter, unless otherwise specified or directed by the Engineer. Conduit for service connections shall be 1 inch in diameter. Do not use conduits smaller than 1 inch in diameter unless otherwise specified, except grounding conductors at service points shall be enclosed in 3/4-inch diameter conduit. Larger-sized conduit may be used, at no additional cost to the Department, in which case it shall be for the entire length of the run with no reducing couplings allowed.

A. Materials

Provide conduits and fittings of the type as shown in the construction plans or as directed by the Engineer and as follows:

1. Steel Conduit

- a. Rigid conduit and fittings shall be heavy-wall, hot dipped galvanized steel conforming to Federal Specification WW-C-581-d(3) and ANSI C80.1. It shall be galvanized inside and out and shall meet the requirements of ASTM A53. Each length shall bear the label of Underwriters Laboratories, Inc.
- b. Flexible conduit shall be galvanized flexible steel meeting Federal Specification WW-C-581-d(3), ANSI C80.1 and UL Standard 6 with a minimum 40-mil thickness of polyvinyl chloride (PVC) coating conforming to ASTM D746.

2. Plastic Conduit. For plastic conduit, provide high impact PVC, Schedule 40 or Schedule 80.**3. High-Density Polyethylene (HDPE).** Materials used for the manufacture of HDPE conduit and fittings shall be per ASTM F2160 and consist of a Standard Dimension Ratio (SDR) 9-11. No other substitutions shall be allowed unless directed by the Engineer. HDPE conduit can be used with preassembled cable and rope-in-conduit.

Conduit shall be extruded from colored material for uniform full-thickness coloring. All continuous flexible conduit shall be labeled with durable identification giving the name of the manufacturer, conduit size (inner diameter trade size and wall thickness/rating), manufacturer/date codes, the legend "COF Communications" and sequential foot marking. Labeling shall occur a maximum of every 2 ft.

4. Coupling

- a. Make every effort to minimize coupling. Couplings are permitted only with the Engineer's prior approval.
- b. Couplings shall be airtight and watertight.
- c. All couplings shall be installed in accordance with the conduit and the coupling manufacturer's recommendations.
- d. Only couplings of the type specified below and approved by the conduit manufacturer are permitted.
- e. Couplings shall be accomplished only by hydraulic press-on or electro-fusion coupling methods.
- f. Use hydraulic press-on couplings of seamless tool-grade tubular aluminum with sealing ring barbs and center stop.
- g. Use hydraulic compression duct coupling tools and follow all manufacturer's installation procedures, fully inserting both conduit sections to the coupling center stop.
- h. Use pre-fabricated electro-fusion couplings that are field-installed using the coupling manufacturer's recommended automatic self-monitoring fusing machine and installation procedures.
- i. Do not use any other coupling methods.

B. Installation

All bends shall be in strict compliance with the NEC.

Lay conduits to a minimum depth of 6 inches below subgrade but not less than 24 inches below pavement grade except when approved by the Engineer; conduit may be laid at a depth of not less than 24 inches below top of curb when placed in back of the curb. Place conduit runs for detectors parallel to existing or proposed curbs and not more than 18 inches behind the curb face unless other specified. Place steel conduit or Schedule 80 PVC conduit under existing pavements by approved jacking or drilling methods. Do not disturb pavements without the Engineer's approval. Where trenching is allowed in a traffic bearing area, use PVC conduit (Schedule 40) encased in concrete.

Conduits shall be continuous and extend from end point (i.e. pull box, foundation signal pole, pedestal pole, etc.) to another end point, or as directed by the Engineer. Conduit splicing shall not be permitted between end points.

After completing the installation of the conduit, test all conduits installed under the Contract with a mandrel having a diameter 1/4-inch smaller than the conduit and a length of 2 inches. Repair, to the Engineer's satisfaction, all conduits that will not allow passage of the mandrel; if repairs cannot be accomplished, remove and replace the conduit at no additional cost to the Department. After the mandrel test, scour all conduits with a stiff wire brush slightly larger in diameter than the conduit. Clear all conduits in the Engineer's presence.

Extend conduits terminating in anchor base standards and pedestals approximately 2 inches above the foundation and slope them toward the hand-hole opening. Conduits shall enter concrete pull boxes from the bottom and shall terminate not less than 2 inches or more than 4 inches above the bottom of the box and near the box walls to leave the major portion of the box clear.

Clean existing underground conduit to be incorporated into a new system by blowing with compressed air and wire brush mandrel, or by other means approved by the Engineer.

Seal all open conduit entrance holes, with or without cables, with conduit duct seal putty. Where cables enter the conduit, the sealant shall be applied after installing the cable. These locations shall consist of conduit ends in pull boxes, cabinet bases and weather heads.

All fiber optic conduit installed shall include a polyolefin pull string for future conductor pulls and shall have a tracer wire (#10 AWG bare copper stranded) for all fiber optic conduit installations.

AWG#14 trace/locate wire shall be installed in all empty conduit runs and spliced between boxes to form a continuous run. Any fiber optic conduit shall be terminated in "Type B" fiber optic pull box unless otherwise specified. Fiber optic conduit shall have Type 2 Warning Tape installed a minimum of twelve (12) inches below finished grade.

730.15 Conductors

Furnish and install conductors in accordance with these Specifications and close conformity as shown on the Plans, or as directed by the Engineer.

Traffic Control Conductors shall be rated at 600 volts. Run all conductors, except loop conductors and cables run along messengers, in conduit, except where run inside poles. Where signal conductors are run in lighting standards containing high voltage street lighting conductors, encase the signal conductors in flexible or rigid metal conduit. Where telephone circuits are introduced into controller foundations, encase the telephone conductors in flexible metal conduit and in conformance with the NEC.

Conductors for traffic loops shall be continuous AWG No. 14 XLP stranded wire to the detector terminals or spliced with shielded detector cable within a pull box, conduit, or pole base.

Detector cable shall be two conductor twisted pair shielded AWG No. 14 stranded meeting IMSA Specification No. 50-2.

730.16 Cable

All signal cable shall conform to applicable IMSA Specification No. 19-1 or 20-1. Use stranded cable color coded AWG No. 14 for all signal and accessory circuits. Retain the same color identification for the entire length of a circuit run.

730.17 Wiring

1. Terminate all wiring to screw terminals using lugs.
2. Make all splices with solderless connectors, and insulate splices with weatherproof tape applied to a thickness equal to the original insulation.
3. Splices shall be permitted only in pull boxes, pole base, or controller cabinets. 4. Attach cables to messenger with non-corrosive lashing rods or stainless steel wire lashings.
5. All wiring within enclosed cabinets shall be neatly formed and harnessed and shall have sufficient length for access and servicing.

730.18 Service Connection

Coordinate service connection details and metering with the local utility as directed by the Engineer and in conformance with the City and County requirements. Obtain an electrical permit from the City of Franklin Codes Department prior to constructing the service installation.

Provide AC service installation to supply the following:

1. 100-amp main breaker with one (1) 50-amp breaker for the traffic signal installation, three (3) 30 amp breakers, one each for the illuminated signs, safety lighting and a spare which may be used for project specific ITS infrastructure.
2. Each 30-amp breaker shall be labeled for its use. Locate photocell for illuminated street name signs and safety lighting at the service disconnect with a test/bypass switch.

Underground service connection shall be installed per the City of Franklin Standard Drawings. The electrical service pedestal shall be a Milbank Model No. CP3B51110A22SL1, Tesco Model No. 26-000 M, or approved equivalent.

730.19 Sealant

Provide sealant material selected from the Qualified Products List maintained by the Department's Material and Test Division for sealing saw-cuts. The sealant material shall resist the upward movement of loop and lead-in and shall exhibit stable dielectric characteristics, including a low permittivity and high dielectric strength. It shall bond to the roadway paving material, preventing entry of moisture, and shall remain flexible without melting through the anticipated temperature and weather conditions. Inductive loop detectors shall be installed without flexible tube or backer rod.

730.20 Strand Cable

Span cable for suspending signal heads between pole supports shall be 7-strand, Class A, copper-covered steel wire strand or greater, meeting the requirements of ASTM A460, with a minimum breaking strength as noted on the Plans. An acceptable alternate is 7-strand steel wire with a Class A zinc coating meeting the requirements of ASTM A475, with a minimum breaking strength as shown on the Plans.

Strand cable for messenger wire (other than span wire as specified above) and pole guy cable use shall be of the diameter(s) shown on the Plans and shall meet the requirements of ASTM A475 for zinc-coated steel wire strand, 7-strand Siemens-Martin Grade with a Class A zinc coating or greater.

A Figure 8 cable combining the messenger cable and conductor cable in an insulated jacket is an acceptable alternate to conductor cable lashed to a messenger cable.

730.21 Bonding and Grounding

Make metallic cable sheaths, conduit, transformer bases, anchor bolts, and metal poles and pedestals mechanically and electrically secure to form a continuous system, and ensure they are effectively grounded. Bonding and grounding jumpers shall be copper wire or copper strap of not less than the same cross-sectional area as No. 6 AWG.

Furnish and install a ground electrode at each service point. Ground electrodes shall be one-piece lengths of copperweld ground rod not less than 8 feet in length and 1/2 inch in diameter, installed in accordance with the NEC. Ground the conduit and neutral as required under the NEC, except that grounding conductors shall be No. 6 AWG or approved equal, as a minimum. Enclose exposed ground conductors in 1/2-inch diameter conduit, and bond to the electrode with a copperweld ground clamp.

730.22 Field Test

Prior to completing the work, conduct the following tests on all traffic signal and lighting circuits in the Engineer's presence:

1. Test for ground in circuit.
2. Conduct a megger test on each circuit between the circuit and ground. The insulation resistance shall be not less than the values specified in Section 119 of the NEC.
3. Conduct a functional test to demonstrate that each part of the system functions as specified or intended herein. The functional test shall be submitted and approved by the Engineer.
4. Test all detector loops and leads before and after they are sealed in the pavement to ensure there are no shorts to ground in the system and to ensure that the loop plus lead-in inductance is within the operating range of the detector.

Replace or repair, in a manner approved by the Engineer, all faults in material or in the installation revealed by these tests. Repeat the applicable testing until no fault appears.

Prior to turn on for full signal actuated functionality, a new traffic signal shall be placed into flash operation for a minimum of 7 days prior to the activation of the signal to normal operation, unless otherwise directed by the Engineer.

730.23 Inspection

After completion of the installation and before final acceptance of the Project, conduct a full operational check of the system under actual traffic conditions in the presence of the Engineer. The operational check shall cover a minimum time period of 30 calendar days. During this period, perform all necessary adjustments and replace all malfunctioning parts of the equipment required to place the system in an acceptable operational condition at no additional cost to the Department. Perform all work and furnish all materials required under these Specifications subject to the direct supervision, inspection, and approval of the Engineer. Provide the Engineer and authorized representatives free access to the work, and to all plants, yards, shops, mills, and factories where, or in which, articles or materials to be used or furnished in connection with such work are being prepared, fabricated, or manufactured. Provide full and sufficient information to determine that the performance of the work, the character of materials, and the quality of workmanship and materials meets the intent of these Specifications.

Only perform work in the presence of the Engineer or the Inspector appointed by the Engineer, unless permission to do otherwise has first been obtained. The Engineer may reject any work that is performed or constructed in the absence of the Engineer or Inspector, without such permission having been granted, either expressly or by implication.

The inspection of the work shall not relieve the obligation to properly fulfill the Contract as specified. If the Engineer finds a part of the work, or the materials used in the work, to be defective or unsuitable at any time prior to final acceptance, repair or replace such defective or unsuitable work or material.

Request the presence of an Engineer or Inspector in connection with the work under these Specifications at least 24 hours before such services will be required.

SIGNAL HEADS

730.24 Signal Heads

Signal heads shall meet the latest requirements published in the Equipment and Materials Standards of the Institute of Transportation Engineers (ITE) for Adjustable Face Vehicle Traffic Control Signal Heads and the National Electrical Code. The arrangement of traffic signal heads shall be mounted as shown on the Plans or as specified by the Engineer and be in accordance with the latest versions of the MUTCD and the TDOT Traffic Design Manual.

Each vehicle signal head shall:

1. Be of the adjustable, colored lens, vertical type with the number and type of lights detailed as specified herein and as shown on the Plans;
2. Provide a light indicator in one direction only;
3. Be capable of adjustment (without attachments) through 360 degrees about a vertical axis;
4. Signals mounted on mast arms shall be done with an "Astro-Brac Clamp Kit, Galvanized Cable Mount" type hardware, Skyclamp Cable Clamp Kit SBC64-CCK, or approved equivalent

All circular indications shall use 12-inch Light Emitting Diodes (LED), lenses unless otherwise shown on the Plans. All arrow indications shall use 12-inch LED lenses, unless otherwise shown on the plans. All lenses shall be polycarbonate. All new vehicle signal heads installed at any one intersection shall be of the same style and from the same manufacturer. All exposed metal signal housings, doors, visors, backplates and framework parts shall be painted with a powder coated finish and be in accordance to the MUTCD specifications. Apply one or more coats of primer to all signal heads, signal head and mountings, followed by two coats of high quality synthetic resin enamel of Traffic Signal Black meeting or exceeding Federal Specifications TT-C-595 Gloss Black. Apply one or more coats of primer to all signal hoods followed by two coats of high quality synthetic resin enamel of Traffic Signal Black meeting or exceeding Federal Specifications TT-C-595 Gloss Black. Apply one or more coats of primer to louvers as specified, signal hood interiors, and back plates, followed by two coats of Lusterless Black Enamel meeting or exceeding Master Painters Institute (MPI) Reference 94. Examine all factory enameled equipment and materials for damaged paint after installation, and repair such damaged surfaces to the Engineer's satisfaction. Factory applied enamel finish in good condition and of appropriate color will be acceptable.

Suspensions for span wire mounting of multi-faced signal heads and signal head clusters (such as a 5-section signal head) shall include an approved swivel type balance adjuster for proper vertical alignment.

Signal head housings shall be cast aluminum and all associated parts/hardware shall be of non-corrosive material. The signal hood shall be of the cutaway tunnel type, secured to the front section of the door with four stainless steel machine screws that thread into tapped holes in the door. Ensure that all signal heads meet the minimum Contract requirements for adjustable face vehicle traffic control signal heads. In addition to these requirements, comply with the following:

A. Optical Units

Traffic signal indications shall be LED type and meet the Institute for Transportation Engineers (ITE) latest LED specifications. All LED indications shall have a five year warranty.

A. Signal Head Mounting and Mounting Brackets

Furnish signal heads that either have integral serrations or are equipped with positive lock rings and fittings designed to prevent heads from turning due to external forces. Lock ring and connecting fittings shall have serrated contacts. Provide signals with water-tight fittings.

Support bracket-mounted signal heads, as shown on the Plans, by mounting brackets consisting of assemblies of 1-1/2 inch standard pipe size. Ensure that all members are both plumb or level, symmetrically arranged, and securely assembled. Conceal all conductors within poles and mounting assembly. Secure each slip fitter to the pole.

B. Directional Louvers

Where shown on the Plans, furnish and install louvers in the hoods of the signal head sections designated.

Directional louvers shall have a snug fit in the signal hoods. Construct the outside cylinder and vanes from a non-ferrous metal or galvanized sheet steel. Louvers shall be painted with a powder coated finish and as specified above.

C. Back Plates

Where shown on the Plans, furnish and attach back plates to the signal heads. All back plates shall be louvered and constructed of Polycarbonate. Other materials such as plastic or fiberglass may be used where approved. In fabricating back plates, bend back the inside vertical edges, adjacent to the signal head, to form mounting brackets for attaching to the signal. Form back plates in two or more sections and bolt together, thus allowing for installation after signal heads are in place. Back plates shall have a dull black appearance in the front and back with applied 2" retro reflective yellow border (ASTM Type XI) 3M Diamond Grade 4000 series prismatic sheeting, Avery Dennison T-11500 OmniCube series sheeting, or approved equal, unless noted otherwise in plans.

D. Wiring

Signal head leads shall be No. 18 AWG stranded with 221 °F thermoplastic insulation. Wire a separate white (common) lead to each socket shell; and wire a colored lead, corresponding to the color code shown on the Plans, to each socket terminal. Provide leads of sufficient length to allow connection to the terminal block specified. Provide each complete signal head with a minimum 4-point terminal block, properly mounted in a signal section. Stud type terminal blocks shall have not less than 1/4-inch edge clearance to any portion of the stud. Exterior wiring shall have a 360-degree drip loop in advance of entering the head.

Signal heads and pedestrian signal heads shall be installed with a minimum single 7 conductor cable and as indicated on the plans.

All new and existing cables shall be labeled in the cabinet, pole/pedestal bases and pull boxes using the convention of TDOT Standard Drawings. Each wire shall be identified by a circular plastic tag, 1 3/8" diameter with preprinted lettering of minimum 1/4" height. Tags shall be permanently fastened to wire by means of nylon self-clinching straps. Marking shall indicate "GRD" for all ground and grounded neutral conductors. Companion circuit conductors shall be marked "CKT" followed by the designated characters as shown on the plans.

E. Pedestrian Signals

Pedestrian signal heads shall meet the latest requirements published in the Equipment and Materials Standards of the Institute of Transportation Engineers (ITE) for Adjustable Face Pedestrian Signal Heads”, the National Electrical Code and be compatible with NEMA standards. The arrangement of pedestrian signal heads shall be mounted as shown on the Plans or as specified by the Engineer and be in accordance with the latest versions of the MUTCD and the TDOT Traffic Design Manual. The pedestrian indications including countdowns shall be LED symbols and in conformance with the Institute for Transportation Engineers (ITE) latest countdown and LED specifications. All LED indications shall have a five year warranty.

In addition, where pedestrian signal heads are provided, they shall:

1. Include a pedestrian change interval countdown display where the calculated pedestrian change interval is more than 7 seconds;
2. Include Accessible Pedestrian Signals and pedestrian pushbuttons complying with MUTCD Accessible Pedestrian Signals section;
3. Incorporate a locator tone meeting the requirements of the MUTCD Accessible Pedestrian Signals;
4. include a pedestrian pushbutton with tactile vibrating arrow button and audible sound.

The pedestrian countdown display shall conform to the latest FCC regulation on Emission of Electronic Noise.

The manufacturer must supply certification, which includes a copy of the test report by an independent technical laboratory as to the compliance with ITE specifications (where it applies). The report shall also indicate that the tests were performed only after the modules received a thirty (30) minute operational warm-up period immediately preceding the tests.

The housing door, door latch, and hinges shall be of aluminum or polycarbonate or approved equal. Hinge pins shall be stainless steel. Provide the door with a neoprene gasket capable of making a weather resistant, dust-proof seal when closed.

All pedestrian signal heads, mountings, outside of hoods, and pedestrian push button housings shall have a powder coated finish (if aluminum) or colored resin (if polycarbonate) in accordance to MUTCD specifications. All pedestrian signals shall be painted with black enamel meeting or exceeding Federal Specifications TT-C-595 Gloss Black. The interior of signal hoods shall have one or more coats of primer followed by two coats of Lusterless Black Enamel meeting or exceeding MPI Reference 94. Examine all factory enameled equipment and materials for damaged paint after installation and repaint such damaged surfaces to the Engineer's satisfaction. Factory applied enamel finish in good condition and of appropriate color shall be acceptable, as approved by the Engineer.

F. Signal Head Installation

Install signal heads and pedestrian signal heads with the faces completely covered until the entire installation is ready for operation.

CONTROLLERS – GENERAL**730.25 Controllers**

A controller shall consist of the complete electrical mechanism for controlling the operations of traffic control signals, including the timing mechanism and necessary auxiliary equipment, mounted in a cabinet. A minimum of 30 days prior to turn on, contact the City of Franklin Traffic Operations Center to arrange the delivery of the new controller for programming by the City. Upon City installation of the timings in the controller, retrieve the controller and install it at the intersection.

Controller equipment shall be permanently marked with the manufacturer’s name or trademark, part number, and serial number.

Controllers must meet the following applicable industry standards and amendments:

1. NEMA TS2 Controller NEMA TS-2-2016
2. ATC Controller AASHTO/ITE/NEMA ATC 5.2b
3. All NEMA TS2 and ATC controllers must provide functionality that meets or exceeds operational characteristics, including NTCIP support, as described in NEMA TS-2-2016.
4. ATC controllers with NEMA TS2 Type 2 connectors shall be utilized by the City.

With the latest upgrade of the TACTICS central system software, the City of Franklin requires the Siemens M60 type ATC Series Traffic Controller. The controller mechanism shall meet or exceed the current NEMA Traffic Signal Systems Standard. Provide Standard A, B, C and D Connectors and Synchronous Data Link Control (SDLC) connectors. Submit private laboratory certification that the proposed unit is in complete compliance with the NEMA standards in effect at the time of the advertisement for bids.

The controller shall have all timing values entered via a front panel mounted keyboard, as well as a cable connection with a laptop computer. The keyboard and connection port shall be integral parts of the controller unit.

Each controller shall have all operating timing parameters as specified in NEMA on a per phase basis, including all Volume/Density features. Each phase shall have a defined Last Car Passage feature wherein the last vehicle receiving the Phase Green shall receive at least one full Passage Time increment.

The controller shall have all of the following keyboard entered values or parameters:

1. Start on condition of the controller where the user can select via the keyboard the following:
 - a. Phases to start in
 - b. Phase display to be on
 - c. Overlap display start-on condition
 - d. Normal start-up display shall be main street green phase(s), with concurrent overlaps green
2. Phase recall functions:
 - a. Non-lock detector
 - b. Lock detector call
 - c. Minimum recall
 - d. Maximum recall
 - e. Pedestrian recall
 - f. Non-actuated phase
 - g. Phase not active, phase omitted
 - h. Pedestrian phase omitted
3. All phase interval timing values except the Phase Yellow Clearance shall be as per NEMA. Each controller Phase Yellow Clearance Interval is 3 seconds as a minimum.

The controller shall have a back-lit liquid crystal display for each ring of the controller to provide an English language menu for programming with displays for programming or reading all controller features. The dynamic displays for real-time operation shall be able to display the following values for each ring or phase(s) concurrently:

1. Per Phase Display:
 - a. Phase Vehicle Call
 - b. Phase Pedestrian Call
 - c. Phase is Next In Service

- d. Phase is In Service
 - e. Phase Pedestrian Intervals in Service
2. Per Ring Display:
- a. Ring Gapped Out
 - b. Ring Maximum Green Termination
 - c. Ring was Force Off Terminated
 - d. Ring Maximum Green II in effect
 - e. Ring Phase in Service Operating:
 - i. Lock Call
 - ii. Non-Lock Call
 - iii. Minimum Recall
 - iv. Maximum Recall
 - v. Pedestrian Recall
 - vi. Non-Actuated Mode
3. Per Ring Display of Timing Values (Real Time). The following values shall be selectively displayed and shall display the current value in a real time mode.
- a. Minimum Green Interval
 - b. Passage Timer
 - c. Pedestrian Interval Timing
 - d. Maximum Green Timer
 - e. Time Before Reduction Timer
 - f. Time to Reduce Timer

It shall be possible to inspect and alter any currently programmed value while the controller is in operation without affecting the field operation. The controller shall continue to operate the intersection as values are inspected or altered.

The controller shall store all operator entered data in EEPROM devices that require no battery to support value storage. No internal components of circuitry shall require battery support.

Except for replacing controllers in existing systems, all new installations must include controllers that capture high resolution event-based data elements to provide the automated traffic signal performance measures.

The manufacturer must supply certification of the conformance to the above requirements at the time of the bid.

In addition to the above requirements, the controller shall:

1. Have all timing values entered via a front panel mounted keyboard. This keyboard shall be an integral part of the controller unit.
2. Have an English language menu for programming or reading all controller features.
3. Continue to operate the intersection as values are inspected or altered.
4. Include the ability to upload and/or download the controller software operating system and user programmed database to or from external media (datakey, usb, sd card etc).
5. Support Flashing Yellow Arrow for Permissive Left-turn Movements applications
6. Assure overlap omit by ped call

Surge Protection Devices

The cabinet shall have Surge Protective Devices (SPDs) for the main AC power input, all signal head field wiring terminals, interconnect cable terminals and loop lead-in cable terminals which are located in the cabinet. Furnish SPDs to provide effective defense against high transient voltages caused by lightning discharges or other sources. SPDs must be unobstructed and accessible from the front side of any panel used in the cabinet. The SPD for the main AC power input of the cabinet must be connected on the load side of the cabinet circuit breaker. SPDs must meet the following minimum requirements:

1. AC power SPD:
 - a. Must be UL 1449 4th Edition Listed
 - b. Parallel connected device
 - c. UL Nominal Surge Rating (In): 20kA
 - d. UL Short Circuit Current Rating (SCCR): 150kA minimum
 - e. Surge current rating: 50kA per phase minimum
 - f. Visual status indication
 - g. Remote signalization contacts for monitoring purposes
 - h. 10 year manufacturer's warranty minimum
2. DC power SPD:
 - a. Must be UL 1449 4th Edition recognized
 - b. Parallel connected device
 - c. UL Nominal Surge Rating (In): 10kA minimum
 - d. Must provide protection between all +/-Gnd connections
 - e. Surge current rating: 20kA per phase minimum
 - f. Visual status indication
 - g. Remote signalization contacts for monitoring purposes
 - h. 10 year manufacturer's warranty minimum
3. Data and communication SPD:
 - a. Must be UL 497B listed
 - b. 10 year manufacturer's warranty minimum
4. Signal and interconnect cable field wiring terminal SPD:
 - a. Clamp the surge voltage to a level no greater than twice the peak operating voltage of the circuit being protected.
 - b. Withstand a surge current of 1000A with an 8 by 20 μ s waveform six times (at 1 second intervals between surges) without damage to the suppressor.
 - c. 10 year manufacturer's warranty minimum
5. Loop lead-in cable field wiring terminal SPD:
 - a. Protect the detector unit loop inputs against differential (between the loop lead) surges, and against common mode (between loop leads and ground) surges
 - b. Clamp the surge voltage to 25 V or less when subjected to repetitive 300A surges
 - c. Withstand repetitive 400A surges with an 8 by 20 μ s waveform without damage
 - d. 10 year manufacturer's warranty minimum

All SPDs must be installed according to the SPD manufacturer's instructions and not affect the operation of equipment. SPD leads must be kept as short and straight as possible.

CABINETS – GENERAL

730.26 Cabinets

Cabinets must be permanently marked with a label including the manufacturer's name or trademark, model/part number, and the year and month of manufacture. The label should be placed on the inside of the main door using a water resistant method. The label must be visible after installation.

Cabinets shall be provided as a complete unit and have all terminals and facilities necessary for traffic signal control as shown on the plans and shall meet at a minimum, the following requirement:

NEMA TS2 Type 1 Controller Cabinet NEMA TS 2 2016

The manufacturer must supply certification of the conformance to the above requirements at the time of the bid. Cabinets shall also be in accordance with the latest version of the TDOT Traffic Design Manual.

Two paper copies of the cabinet wiring diagram shall be provided with each cabinet. The nomenclature of signal heads, vehicular movements and pedestrian movements on the wiring diagram must be in accordance with the signal operating plan. Documentation must include a list identifying the termination points of cables used for vehicular and pedestrian signal heads, detector loop lead-ins, and pedestrian pushbutton wires. A heavy duty, resalable plastic bag must be mounted on the backside of main cabinet door for storing cabinet documentation.

House the controller in a rigid, weatherproof cabinet, constructed, finished, and equipped as follows, and as shown on the Plans and Standard Details:

1. Material, Workmanship, Dimensions and Layout

- a. Completely fabricated from .125" thick type 5052-H32, vinyl coated, mill finished aluminum utilizing intermittently welded construction, waterproofed with silicone sealant. Mill finish aluminum shall be required unless noted on plans to be powder coated or vinyl wrapped. Wraps shall be customizable to work with local artists and photographs. Wrap graphics and text shall be provided by the City. Cabinet wrap shall be installed at traffic cabinet manufacturer's facility by personnel certified by the wrap manufacturer or by field personnel certified by the wrap manufacturer. Wrap shall be made of a 2 mils (not millimeters) conformable graffiti-resistant vinyl. Material shall utilize a non-flammable, self-extinguishing grey opaque adhesive that blocks substrate color from showing through. Wrap shall be laminated with an optically clean UV protectant gloss laminate that resists and protects against light abrasion, scratching, spray paint, markets, adhesives and/or chemicals. Wrap shall have a material warranty of 1 year from the date of installation.
- b. All pad mounted cabinets shall be 56" in height. The width of the cabinet shall be 44" . The depth of the cabinet shall be a maximum of 27" unless a different size is specified in the plans. The inside of the cabinet shall be able to house the battery backup system by double stacking the load bays and allowing battery shelves next to the load bay terminals towards the bottom of the cabinet. Due to many size differences between manufactures we will accept cabinet height sizes from 55" to 57" so long as shelving and terminals as specified are adequately allowed.
- c. Internal attaching components shall include a total of 12 adjustable "C" channel mounting studs for shelving and panels., 4 per side, and 4 slotted rails on the rear wall.
- d. Two full width shelves shall be in the top controller compartment portion of the cabinet. A slide out laptop shelf with storage shall be mounted below the second from the top shelf. Two additional shelves shall be located in the lower portion of the cabinet alongside the double stack load bays to accommodate the battery backup/UPS components.

- e. Thermo-convection air ventilation system utilized with provisions for mounting fan for forced air cooling. A minimum of two fans with thermostats shall be included. Exhaust outlet openings are provided under the roof over-hang.
- f. All internal and external hardware shall utilize non-corrosive material.

2. Doors

- a. The door openings shall be double flanged on the top, bottom and sides to prevent water from entering the cabinet. The openings shall include a mount for two door-operated switches.
- b. Doors shall be provided with a three-point locking mechanism.
- c. 3/4" diameter stainless steel inward turning handle on the controller compartment door. Provide handle for padlocking.
- d. Doors shall be equipped with industrial Medeco Signal Cabinet Lock P/N TrafficCab 101 Lock and Medeco XT Slim Line, or as specified in the plans. A minimum of one Medeco key shall be supplied with each cabinet.
- e. Door shall accommodate louvered inlet with filter to prevent dirt from entering with air flow.
- f. A closed-cell neoprene door seal gasket shall be used.
- g. Doors are to be mounted with 4 stainless steel hinges utilizing a non-removable 1/4" diameter hinge pin for support, carriage bolted in place for ease of door removal.
- h. A 2" deep, fabricated switch compartment is included with a standard "police" lock and 18-gauge stainless steel continuous hinge with a 1/8" diameter hinge pin riveted in place shall be included on both doors. Compartments shall be mounted flush to the door.

3. Back Panel

- a. Shall be wired for 8 vehicle movements, 4 pedestrian phases and 4 overlaps (sixteen channels). Pedestrian phases shall be LS9-LS12 and Overlaps shall be LS13-LS16.
- b. Sixteen NEMA input and output indicating load switches and bases shall be provided.
- c. Shall be wired for 8 flash relay bases to allow any loadswitch (phase) outputs to flash Yellow, Red, or no-flash.
- d. Cabinet Main Back Panel signal outputs shall use both color-coded red, yellow and green wires and red, yellow and green labels for easy identification.
- e. All pedestrian and overlap signal wires shall feed to their back-panel positions from below the terminal strips and not travel over the face of the back-panel and other signal wires.
- f. Provide 4 terminal screw downs per channel, one each for red, yellow, green and flash.
- g. Color-coded labels shall be placed on the inside of the front cabinet door to illustrate the procedure for changing the signal output flash colors.
- h. All detection shall utilize the SDLC port.

4. Bus Interface Unit (BIU)

Cabinet shall include:

- a. One BIU that shall be a NEMA designated BIU2 as listed in Table 8-1 of NEMA Standards Publication No. TS 2-2003 or later revision.
- b. One SDLC distribution panel with connectors for 10 SDLC cables.
- c. Three SDLC cables one each for MMU, Controller, and detector rack BIU.
- d. The cabinet assembly shall have provision for supporting detection inputs by means of NEMA TS2 BIU method. When using the TS2 BIU method, the detection technology shall use a standard BIU to route detector calls to the controller via the SDLC Port bus.

5. Cabinet Mounting. Mount cabinets as shown on the Plans and per the City of Franklin Standard Details.

6. Ventilation. Unless otherwise specified, provide ventilation as follows:

- a. On all cabinets housing controllers, mount a screened, rain-tight vent, 1-1/2 inches in diameter or larger, on the cabinet top.
- b. Provide screened or filtered inlet ventilation openings, equal to or greater in area than top vents, located in the bottom or lower back side of Type I and II cabinets or around the lower 8 inches portion of Type III cabinets.
- c. Construct the vents so as to project within the cabinet no more than necessary to provide for lock nuts and gaskets to retain the vent.
- d. Locate vents so as to not interfere with the mounting of controller equipment.

7. Cabinets with Exhaust Fans. Exhaust fans shall consist of an electric fan with ball or roller bearings and a capacity of at least 100 cubic feet per minute. Mount the fan in a rain-tight housing attached to the top of the controller cabinet.

The fan shall be controlled by a thermostat having a temperature differential between turn-on and turn-off of 15 °F (-0, +5 °F), adjustable for turn-on through a minimum calibrated range of from 100 °F to 150 °F.

Whenever a fan is to be installed, provide the air inlet filter and filter holder shown in the Standard Details, or approved equal. Internally seal other air inlets. Provide exhaust fans in all cabinets that house controllers, with the exception of flasher controllers.

8. Auxiliary Equipment. With the exception of cabinets used in special applications (Type I and II), provide all cabinets with the following:

- a. Substantial shelves or brackets to support controller and auxiliary equipment as indicated in these specifications.
- b. Panel for terminals arranged for adequate electrical clearance. Panels should be located in the cabinet as described below:

| | |
|-----------------------------|------------------|
| - Detectors | Lower left wall |
| - AC power | Lower right wall |
| - Auxiliary/police switches | Door |
| - Load switch bay | Back wall |
| - Generator Plug | Side Wall |

- c. The cabinet shall include an LED light and GFI duplex receptacle which can be used when the main circuit breaker is off.
- d. Control panel assembly consisting of:
 - 1. Power supply connections made to a 30-ampere circuit breaker mounted on the cabinet separate from the signal terminal panel. The circuit breaker shall be a magnetic trip type, having an interrupting capacity of at least 2,000 amperes at 125 volts AC. The circuit shall trip between 101% and 125% of rated load, with an inverse time delay characteristic provided. Instantaneous tripping shall occur at ten times the nominal rating. All controllers shall be internally fused.
 - 2. Service line surge protection as noted in 730.25 of the SPD specifications.
 - 3. Electrical service termination point sized to accept No. 4 AWG copper wire
 - 4. Ground fault receptacle
 - 5. LED cabinet lights shall be dimmable and switchable to reduce glare at night time.
 - 6. Circuit breakers in accordance to the National Electric Code for:
 - (a) Main power input to provide all power associated with normal operation.
 - (b) Flasher power input to provide all power associated with flash operation.
 - (c) Service power to provide power for the lamp and duplex receptacle and cabinet light.
 - 7. Copper ground bus (minimum of 12 positions).
- e. Flasher mechanism independent of controller. The cabinet shall be wired for and include a NEMA flasher mounted on the back panel. All cabinets shall have a two-circuit flasher. The flasher shall have output indicators mounted on the front of the flasher case and shall be rated at a minimum of 15 amperes.
- f. General purpose relays, where required to perform specified functions. All relays external to the controller or appurtenances shall meet NEMA standards. In addition:
 - 1. Flash transfer relays shall be of heavy-duty type and have a minimum contact rating of 10 amperes. Contacts shall be of silver material to reduce contact pitting.
 - 2. Unless otherwise specified, each cabinet shall include six (6) flash transfer relays.
 - 3. Flash transfer relays shall support Flashing Yellow Arrow for Permissive Left-turn movement applications.
- g. Type II, III, IV, and V cabinets, when specified as housing for traffic actuated controllers, with two or more insulated terminal blocks mounted within the housing, one or more for terminating each field wire.
- h. A minimum of 12 available bare ground positions tied to AC Common Return.
- i. Earth (driven) ground tie point to terminate a single No. 4 AWG copper ground.
- j. A tie point to tie all ground systems within the cabinet to a single reference point. All grounds (AC - return, Chassis, and Logic Ground) must be referenced to a single ground point at the electric service.
- k. A panel (police subpanel) shall contain the following:
 - 1. A main power switch, which shall be wired to remove all cabinet power when in the Off position.
 - 2. An Automatic Flash switch, which shall be wired as follows:

- (a) The Flash position shall cause the cabinet to provide Flash Operation. The controller shall continue to operate, and Stop Time shall be applied to the controller.
 - (b) Auto/Manual switch to activate Manual Control Enable.
 - (c) Manual control pushbutton switch with self-coiling cord. Cord shall attach to a 2 position terminal strip via fork type connector
 - (d) Upon return from Flashing to Automatic, the controller shall initialize in the Start-Up Display condition as programmed in the controller, typically major road phases.
3. A panel mounted inside the main door shall contain the following switches:
- (a) A technician Stop-Time switch to apply Stop Time to each controller ring.
 - (b) An Interval Advance switch, enabled only by the Stop Time switch, to be momentary pushbutton switch to apply Interval advance to the timer.
 - (c) A Signal On-Off switch, which shall remove the AC power applied to the signal heads for normal operation while the controller continues to operate.
 - (d) Individual phase vehicle and pedestrian detector test switches to be miniature toggle of the On-Off Momentary type to place (only as specified in the plans or by the City):
 - i. No Call - Call provided by detectors
 - ii. Locked detector call
 - iii. Momentary detector call

Insulate or shield switch terminals on back of main cabinet door so that no live parts are exposed.

Leads from the terminal block to the auxiliary door switches shall be no less than No. 18 AWG stranded, with TW plasticized polyvinyl chloride or nylon insulation enclosed in an insulating loom, and shall be of sufficient length to allow full opening of the main cabinet door.

- l. The cabinet shall be wired with the appropriate number of load switches to accommodate vehicular and pedestrian phasing according to plans. At a minimum, cabinets shall include 16 load switch bases. The load switch wiring shall support Flashing Yellow Arrow for Permissive Left-turn Movement applications.
- m. All cabinet wiring shall be neatly routed and labeled, laced and permanently secured. All cable shall be secured to the panel, where practical. There shall be no holes drilled through the cabinet walls to mount panels or secure cables.
- n. All terminals in the cabinet shall be of the barrier type. The following field connector terminals shall be provided:
 - 1. Four (4) signal output positions per load switch bay (R-Y-G-FL).
 - 2. Ten (10) positions per phase for vehicle loop detector harness.
 - 3. One position per phase for pedestrian detector inputs.
- o. Cabinets shall have, at a minimum, SDLC communication between the controller, MMU, Detector Rack, Radar Detector (if applicable) and Video Detection (if applicable).
- p. Cabinets shall have two 4-way electrical outlet assemblies (Non GFI) that has 120 VAC from the OUTPUT side of the Main Power Surge unit for pluggable equipment.
- q. Cabinets shall support Flashing Yellow Arrow for Permissive Left-turn Movements applications.
- r. All cabinets shall be supplied with a Malfunction Management Unit (MMU) and shall meet at a minimum, the following requirement:

NEMA TS2 Malfunction Management Unit NEMA TS 2 2016

The manufacturer must supply certification of the conformance to the above requirements at the time of the bid.

According to NEMA TS2 the MMU shall be able to detect the presence of voltage on conflicting on conflicting field connection terminals, the absence of proper voltages on all the signal field connection terminals of a channel, and shall be capable of monitoring for the presence of satisfactory operating voltages within the Controller Unit (CU) and the MMU itself. The MMU shall be able to operate as a Type 16 with sixteen channels or as a Type 12 with twelve channels (compatible with NEMA TS1 cabinets).

The MMU shall have an Ethernet port configurable by the City of Franklin to be on the City's network.

The MMU shall be able to be configured for Flashing Yellow Arrow operation.

The MMU shall have fault logging features that include at a minimum:

- Date of Fault
 - Time of Fault
 - Fault Condition
 - Power Failure
- Faults and logs shall be stored in non-volatile memory for remote user retrieval

The MMU shall be an EDI – MMU2-16LEip Enhanced NEMA Signal Monitor w/ Ethernet Port or approved equivalent.

- s. The cabinet shall include an Opticom Auxiliary Interface Panel (AIP) and Opticom GPS Radio (3101) mounted to the side of the cabinet
- t. A generator plug with automatic hot swap bypass switch shall be included with the cabinet and mounted on the side of the cabinet. The bypass shall prevent utility back feed and fail-to-line in the event of generator or Uninterruptable Power Supply (UPS) failure.

9. Enhanced Operational Features.

- a. When shown on the Plans, or specified in the Special Provisions, supply certain enhanced operational features of controllers. When required, these inputs and outputs shall be accessed to the controller by a dedicated fourth (or "D" Connector). Provide a connector of a type as determined by the manufacturer, and that meets the following requirements:
 - b. This connector shall not be mateable to any other connector in the cabinet.
 - c. All operating voltages in this connector shall be NEMA DC level voltages.
 - d. No special operating features shall enter or exit the controller on any NEMA pin designated as "Spare" or "Future."
 - e. When the "D" connector is not connected to the controller, the cabinet facility shall operate as a standard NEMA cabinet facility with no operational loss of standard NEMA features.
 - f. If the "D" connector is used as the input source for Pre-Emption operation, wire the cabinet facility so that the cabinet facility will NOT perform any operation other than FLASH unless the "D" connector is terminated at the correct termination point and all cabinet features including Pre-Emption are operational.

730.27 Auxiliary Equipment for Traffic Signal Controllers

Furnish and install the following auxiliary equipment in each cabinet for traffic actuated controllers.

A. The Cabinet shall include a TS2-1 to TS2-2 power adaptor cable (A cable).

B. Load Switches

Provide each cabinet complete, with the necessary number of NEMA load switches and Flash Transfer relays necessary to affect the specified signal sequence and phasing. Load switches shall:

1. Meet NEMA standards.
2. Have front-face mounted LED indicators to indicate the “On” condition of both the Input and Output circuits.
3. Use replaceable “cube” type circuitry or encapsulated discrete component construction. No unencapsulated discrete component constructions are acceptable.

Load switches shall be PDC SSS86I/O.

C. Time Clock Switches

Where shown on the Plans, provide time clock switches of solid state circuitry, continuous duty, with a 7-day cycle clock operating from the 120-volt AC service line. Provide switching for a minimum of one independent output and ensure the time of day selection is adjustable to within 1 minute of the desired time. Provide a battery backup system that can maintain time keeping and memory a minimum of 24 hours after power interruption. Furnish an omitting device as an integral part of the time switch to allow the switching operation to be skipped for any preselected day or days of the week. The time clock shall automatically compensate for daylight savings time changes. When the time clock is supplied as an internal component of the controller, supply the clock feature to provide for the selection of Maximum Green II on time of day, day of week, week of year basis. Time clocks shall meet NEMA environmental specifications.

When required in the traffic signal plans, the auxiliary equipment listed below shall meet the following requirements:

A. Uninterruptable Power Supply (UPS)

The uninterruptible battery back-up system for the traffic signal cabinet shall have a programmable digital display with remote monitoring capabilities, including UPS fail, AC fail, on battery and low battery. The UPS shall be a double conversion, power conditioning unit to fully power the traffic signal, including full signal and cabinet operation, in the event of a power failure for a minimum of 2 hours. The traffic signal shall be able to go into ‘flash’ condition for an additional 2 hours for a minimum UPS backup power requirement of 4 hours total. The UPS shall be able to accommodate an average system operating demand of 450 watts with a peak of 750 watts (usually found under all-red traffic signal operation conditions).

UPS assemblies should include off-the-shelf deep cycle Lithium Ion Phosphate batteries or approved equivalent. Loss of utility power, transfer from utility power to battery power, and transfer back to utility power must not interfere with normal operation of connected equipment. In the event of UPS failure or battery depletion, connected equipment must be energized automatically upon restoration of utility power. Removal and replacement of the UPS must not disrupt the operation of the equipment being protected.

All harnesses necessary to connect and operate the system must be included. All connectors must be keyed to prevent improper connection.

UPS assemblies shall be installed in accordance with the manufacturer’s recommendations.

An UPS operation and maintenance manual shall be provided in the cabinet where the UPS is installed with cabinet wiring schematics, electrical interconnection drawings, parts layout and parts lists.

The UPS shall include a manufacturer’s warranty covering defects for a minimum of three years (5 years for the external batteries) from the date of final equipment acceptance. The warranty must include provisions for providing a replacement UPS within 10 calendar days of notification for any UPS found to be defective during the warranty period at no cost to the maintaining agency.

The UPS shall have communications capability with the City’s current TCP/IP Ethernet network for remote monitoring. Should the UPS not have an Ethernet RJ45 communication port compatible with the City’s network requirements, a device with the capability to support IP/Ethernet communications to the UPS from the City of Franklin TOC shall be provided.

Operating temperature range: -30° F to 165° F

The UPS batteries and controller must be able to fit into the TS2 Type 1 cabinet, as specified.

B. Communications

Ethernet switches shall be a hardened, three 10/100/1000 Base-TX, with two Gigabit combo ports that utilize SFP modules for fiber and twisted pair copper communication mediums. The switch shall offer centralized and convenient management through a windows-based utility. The module shall support transmission utilizing Category 5e cable or better, multimode, or single-mode fiber. The module shall support the Ethernet data IEEE 802.3 protocol using Auto-negotiating and Auto-MDI/MDI-X features. The switch shall be specified, approved, and accepted by the City of Franklin Information Technology (IT) Department.

C. Fiber optic cables

Single-mode type cable shall be between 8-9 μm core diameter, with at least 12 fibers per cable unless otherwise specified. A fiber optic drop cable shall be a minimum of 6 fibers (each type) and be spliced into the trunkline in a splice enclosure either aerially or in a pull box. 50ft. of slack shall be provided, either lashed to a span aerially, or coiled in a pull box for underground installations. Termination panels shall be provided with sufficient size to provide for a neat installation, and enough panel space to accommodate the specified number of fibers for termination. ST connectors shall be used unless otherwise specified. Any necessary jumpers shall be provided for installed equipment.

MISCELLANEOUS TRAFFIC SIGNALS

730.28A Flashing School Signals

When shown on the Plans, provide flashing school signals compatible with the City of Franklin’s current school flashing system and that conform to the following:

1. The signal shall produce two alternate flashing lights within the marginal limits of a school speed limit sign. Details of the sign construction shall be as shown on the Plans. Sign colors shall conform to the MUTCD and be constructed of materials complying with these specifications.
2. The two LED lenses shall be yellow in color and a minimum of 12 inches in diameter. The LED lenses shall be part of a weather-proof and water-tight optical unit. The LED lenses shall meet the same requirements for vehicular signal head LED lenses. Mount the lenses in the sign using a molded endless rubber gasket with the sign being mounted to the signal case.

3. Provide a two circuit type flasher unit to provide alternating equal on-off operation. The flashing mechanism shall produce between 50 and 60 flashes per minute through two 120-volt, 60-cycle AC, 15-ampere circuits. The flasher shall be of solid state construction.
4. Wire the unit for external circuits.
5. The signal shall be actuated by time switch meeting **730.27**. Locate the timing device in a remote mounted control cabinet.
6. Where an illuminated speed limit indication is shown on the Plans, the numeral message shall be illuminated in Portland Orange in a rectangular lens and illuminated only during the period when the signal produces two alternately flashing amber lights.

In addition, the Time Clock Unit/Switch used for Flashing School Signals shall be a programmable module that allows a user to define the time and day that the school speed zone flasher assembly will initiate and terminate flashing operation. The module shall be installed within the pole-mounted signal cabinet provided as part of project. The time clock shall be compatible with the cabinet's wiring relays and termination panels and the battery power supply system. The time clock switch provided shall also have the following features/capabilities outlined below:

1. Daylight Savings Time shall be a user-programmable setting, in addition to having automated compensation per TDOT specifications.
2. The unit shall provide a minimum 12-character, multi-line alpha-numeric LCD back-lit display capable of displaying all programming parameters.
3. The unit shall be capable of being programmed manually (using an integral keyboard pad) or programmed externally using an optional software program via a laptop computer and cable connection (compatible software program is a separate and distinct item from the time switch unit, and if required, will be separately specified and noted in list of estimated project quantities).
4. Unit shall provide automatic Leap Year compensation.
5. The time clock switch shall be capable of up to minimum 24-hours of capacitive back-up operation, 48 hours desirable, in the event of power interruption.
6. Unit shall be compatible with the supplied solar powered power system / battery unit
7. Time clock switch shall be capable of being programmed for one (1) Normal / Main program, and an additional minimum of 12 Exception periods /programs allowing holiday, vacation and custom skip plans. The exception programs will allow for the Normal / Main program to be skipped or allow for flasher operation on alternative schedules (i.e. early release days, summer school, etc).
8. Unit shall conform to TDOT standard specification subsection 730.27 – Auxiliary Equipment for Traffic Actuated Controller – Time Clock Switches except as superseded herein.
9. Unit shall have non-volatile program memory to allow retention during power loss.

730.28B Solar Power Flashers

When required, the solar power flasher equipment listed below shall meet the following requirements:

1. Solar panel and mounting equipment shall be installed on cantilever pole shaft as illustrated on layout detail sheet and as directed by manufacturer instructions.

2. Solar power unit assembly shall include all required mounting equipment, wiring/cables, battery supply, battery charging unit and other ancillary equipment necessary to operate the solar panel and properly charge the battery. The photovoltaic array shall include mounting bracket assembly to permit adjustment of the array to optimal sun exposure. The photovoltaic module shall be mounted and aligned per manufacturer recommendations to maximize solar exposure.
3. Battery unit shall meet manufacturer specifications required to operate and power L.E.D. signal displays and continuous time clock switch operation. Battery shall be compatible with cabinet equipment, including the time clock switch and the flasher signal displays. Battery unit shall meet minimum environmental and performance specifications required for system operation as recommended by solar panel and time clock switch manufacturers.
4. Solar panel and battery supply shall be of a size and power rating necessary to provide required power to time switch clock and flasher signal displays. Obtain the power load requirements from the solar power equipment manufacturer and provide as required. On a typical school day, it should be expected that the flasher system will operate up to four (4) hours per day with the time clock continuously operating to maintain its clock timer. Provide a solar system sizing report from the manufacturer indicating the power supply requirements of the proposed system required to meet the expected power demand.
5. The photovoltaic modules shall be warranted for a minimum of five (5) years from date of installation.
6. The battery system shall be a gelled-electrolyte type battery with capacity to provide a minimum of five (5) days continuous operation of the flasher assembly without charging. Batteries shall be field replaceable. Batteries shall have prorated warranty of a minimum of five (5) years from date of installation.

730.28C Portable Traffic Signals

Portable Traffic Signals (PTS) consists of furnishing, installing and configuring a complete PTS system that may be used in construction zones or in other temporary signal locations. The work will be at various sites throughout the state of Tennessee and will consist of providing all labor, materials, equipment and incidentals necessary to make functional the PTS in accordance with these specifications.

The PTS shall be trailer or cart mounted units that provide for easy transportation and quick setup and deployment. There shall be 2 unit options and each unit shall be self-contained.

1. Type 1 units are typically used for long term projects (i.e. projects 5 days or longer in duration) and shall include 2 signal heads per trailer with an upper signal head mounted on an overhead mast arm that can be extended over the travel lane, and a lower signal head mounted on the vertical upright of the trailer.
2. Type 2 units are typically used for short term projects (i.e. projects 4 days or shorter in duration) and shall include 1 signal head that is mounted on the vertical upright of the trailer or cart. Cart-mounted units shall meet the requirements of and be listed on the Department's QPL or Standard Drawings. If the project duration is extended beyond 4 days, then Type 1 units should be substituted in lieu of the Type 2 units for all PTS within the signal system.

The PTS shall be MUTCD Compliant and utilize standard ITE signal heads, and adhere to the ITE Specifications and Standards for Vehicle Traffic Control Signal Heads, Light Emitting Diode (LED) Circular Signal Supplement. The unit shall be solar powered and communicate via a wireless or hardwire connection. The unit shall include all the major components listed below or be able to perform the functions of these components. The major components of the unit shall include but are not limited to the trailer or cart, telescoping mast arm (on Type 1 units only), signal head(s) and back plates, traffic signal controller with operating software, solar charging system with batteries, input and output devices, flasher units, conflict monitor, relays, communications system and other equipment required for the safe operation and installation of the unit.

The PTS signal heads and all applicable components of the PTS shall meet the physical display and operational requirements of conventional traffic signals as specific in the MUTCD.

1. For Type 1 units, each unit shall contain 2 signal heads with an upper signal head mounted on an overhead mast arm that can be extended over the travel lane with a minimum clearance of 17 feet measured from the bottom of the signal head unit to the road surface. The lower signal head shall be mounted to the vertical upright of the trailer at a minimum height of 8 feet from the bottom of the signal head unit to the road surface. The signal heads shall also include black back plates that can be easily removed. The signal heads shall have the ability to be rotated 180 degrees to face in the opposite direction and shall have the ability to rotate and lock in approximately 10 degree increments to position the signal head for the optimum visibility to motorists.
2. For Type 2 units, the signal head of the unit shall be mounted to the vertical upright at a minimum height of 8 feet from the bottom of the signal head unit to the road surface. The signal head shall also include black back plate that can be easily removed. The PTS shall be easily rotated to position the signal head for optimum visibility to motorists.

The PTS shall include a solid-state controller with operating temperature range of -40°F to +180°F and compliance with NEMA TS-5 Performance Standard. The controller or programming module shall have an easy to read front panel indicator display. The display shall be backlit and have the capability to facilitate programming and display the currently operating program for each vehicular approach. The controller shall be capable of operating the PTS system in a fixed time, traffic actuated, or manual control mode. Each PTS in a connected system shall have the capability to serve as either the master or slave signal. Each PTS shall include a Conflict Monitor Unit (CMU), or Malfunction Management System (MMS) to ensure phase conflicts do not exist during operation.

1. A minimum of 5 automatic time-of-day timing plans within a 24-hour period should be available in fixed time mode. The operating system should have the ability to control a minimum of 4 traffic phases with programmable cycle time adjustments and user adjustable red, amber, minimum green and maximum green times. The operating system shall also have the capability of facilitating standby modes of red, red flash and yellow flash.
2. The system shall also have the ability to operate in vehicle actuation mode when vehicle detection detectors are used. The operating system shall have the capability to allow the PTS to be connected to and controlled by a standard NEMA controller.
3. The system shall have the capability to be configured and controlled remotely using a handheld wireless remote control with the capability of being operated at a distance up to ¼ mile from the master.
4. The system shall have the capability of remote monitoring for reporting, at a minimum, signal location and status, battery voltage and system defaults. The remote monitoring shall have capability to alert designated individuals if a fault condition occurs.
5. The operating system shall include password protection to prevent unauthorized programming.

The PTS shall communicate with all other PTS within the signal system via license-free wireless 900 MHZ radio link communications. The radio units shall maintain communications at a minimum distance of 1 mile. The radio system shall conform to the applicable Federal Communications Commission (FCC) requirements, including FCC 90.17, and all applicable state and local requirements. The PTS shall be in direct communication at all times either by wireless or hardwire connection to provide for the required conflict monitor.

The system shall also have the ability to operate in vehicle actuation mode when vehicle detection detectors are used. For Type 1 units, the PTS detector shall be a high-definition, multi-beam, microwave radar stop bar detector for each vehicular approach. The Type 1 radar detector shall have a minimum range of 140 feet and shall be mounted at a minimum height of 17 feet measured from the top of the road surface. For Type 2 units, the PTS detector shall be a

radar detector for each vehicular approach. The Type 2 radar detector shall have a minimum range of 140 feet and shall be mounted and have complete radar detection functionality at a minimum height of 8 feet measured from the top of the road surface.

The PTS shall be equipped with a solar power array, charging unit and battery system. For Type 1 units, the number and size of batteries shall be sufficient to operate the signal for a minimum of 21 days at 70 degrees without additional charging or assist from the solar array. An on-board battery charger shall be compatible with both the solar array and with a 120V AC power source. The solar panel array shall provide for a minimum of 440 watts of solar collection capability. For Type 2 units, the PTS shall have batteries sufficient to operate the signal for a minimum of 5 days at 70 degrees without additional charging or assist from a solar array. All instrumentation for the electrical system and battery compartment shall be mounted in a lockable weatherproof enclosure. Solar panels shall be secured to the mounting brackets for theft prevention. All wiring for the unit shall be protected against weather and damage.

The trailer or cart, and all mounted components, shall conform to the wind loading requirements (90 mph minimum) as described in the AASHTO Standard Specifications for Highway Signs, Luminaries and Traffic Signals. The wind load calculations shall be completed by an independent third-party, and stamped by a U.S. Registered Professional Engineer. The trailer or cart shall be made of structural steel and shall include 4 leveling/stabilizer jacks capable of lifting the trailer or cart a minimum of 6 inches. The trailer or cart shall be equipped with a hydraulic or electric lift system sufficient for 1 person to be able to raise and lower the vertical upright and/or horizontal mast arm to and from the operating position. For Type 1 or 2 units, the trailer or cart shall be equipped to provide legal and safe transport on the public highway system at speeds up to 55 mph. All exterior metal surfaces, except signal heads and back plates, shall be powder-coat painted highway safety orange.

The PTS work shall meet the following general requirements:

1. Be responsible for locating the PTS in the appropriate location based on MUTCD and ITE standards for visibility to motorists and for safe operation.
2. Be responsible for providing all hardware, software, communications equipment and licenses to operate a complete PTS system.
3. Be responsible that all PTS equipment is installed according to the manufacturer's recommendations including wireless or hardwire connections.
4. Be responsible for transport, setup, configuration, operation and monitoring of the PTS throughout the entire project. The Engineer shall approve all timing and settings that are used for operation of the signal.
5. As directed by the Engineer, it may be necessary to relocate the PTS during the project. The cost of the relocation shall be included in the PTS price bid.

DETECTORS

730.29 Detectors

Provide detectors, of the type shown on the Plans, to actuate signal phases of traffic actuated controllers. Provide ample lightning protection to provide effective defense against high transient voltages caused by lightning discharges or from other sources. The lightning protection unit must withstand repeated 400-ampere surges on a 9 x 20 microsecond waveform. Also, the unit must be a two-stage device capable of clamping a minimum of one hundred 300-ampere surges to 25 volts within 40 nanoseconds for surge applied across the two detector leads.

A. Inductive Loop Detection System

Inductive loop detector units (loop amplifiers) shall meet at a minimum, the following requirement:

NEMA TS2 Inductive Loop Detector Units NEMA TS 2 2016

Detector loops shall be installed in accordance with TDOT Standard Drawing T-SG-3, standard notes and details of detector loops

Loop amplifiers shall be of the multi-channel, rack-mounted type meeting the standards of the latest NEMA TS2 revision for detector rack configuration. The number of detector channels shall be as specified in the plans. The front of the rack-mounted detector shall provide an LCD display for programming and monitoring.

The rack-mounted loop amplifiers shall be powered by a 24V DC power supply external to the controller unit as defined in NEMA TS-2 Section 5.3.5. All loop amplifiers shall be of the type to provide both "Extended" and "Delayed" outputs.

The loop detector amplifier shall be full automatic, requiring no adjustments to effect operational ability other than setting of the operating frequency and sensitivity. The amplifier shall:

1. Sense any legal motor vehicle traveling at speeds up to 65 miles per hour.
2. Have both a "Pulse" and "Presence" Output:
 - a. Pulse output shall generate an output of 125 ±25 millisecond output for each vehicle entry.
 - b. Presence output shall provide a continuous output for up to 60 minutes as long as a vehicle is within the detection zone.
3. Provide at least four user selectable sensitivity ranges.
4. Be supplied with at least three frequency ranges for crosstalk minimization.
5. Have a front-face mounted indicator to indicate active output of the internal relay. This indicator shall indicate the presence of:
 - a. Normal Output
 - b. Delayed Output
 - c. Extended Output
6. Have a front-panel mounted "Reset" switch that when pressed shall cause the unit to completely re-tune itself.
7. Have Delayed or Extended timing features with the following ranges:
 - a. Delayed output of 0 to 30 seconds in 1-second increments.
 - b. Extended output of 0 to 10 seconds in 1/4-second increments.
8. Have internal diagnostics to determine the operational ability of the loop. These diagnostics shall determine if a loop is opened or shorted, and shall provide a visible indication of such condition. Additionally, if such a condition occurs, the amplifier unit shall default to a "constant" output.
9. Provide output by a mechanical relay, which shall be "off" to provide an output.
10. Have all delay functions wired to the associated plan phase green to inhibit that function during controller phase green.
11. Be able to operate with loop lead-in lengths of at least 2,000 feet. All loop head and homerun wire to be continuous with no splices within the roadway.

Comply with the details of the detector loop installation as shown on the Plans or Standard Drawings.

B. Video Detection System (VDS)

When specified in the plans, the equipment shall consist of all items necessary to provide a complete functional video detection system that process images and provide detection outputs to the traffic signal controller. The VDS shall be capable of the following:

1. Be capable of NEMA TS2 operation.
2. Be waterproof and weather resistant.
3. Provide user-defined detection zone programming via a graphical user interface (GUI) and any necessary equipment for future programming. The configuration database shall have the ability to be stored on removable data storage external to the video card.
4. Display programmable detection zones and detection activations overlaid on live video inputs. It shall detect vehicles in real time as they travel across each detection zone.
5. Have a minimum of 24 programmable detection zones per camera.
6. Shadow rejection without special hardware.
7. Non-impaired operation under light intensity changes.
8. Maintain operation during various weather conditions (e.g. rain, fog, snow).
9. Anti-vibration, 5% rejection based on image change.
10. Ability to select direction of flow parameters.
11. Ability to properly detect directionally.
12. Ability to configure presence, pulse, extend and delay outputs.
13. Ability to set up a minimum of six detection zones per camera view to count the number of vehicles detected and stores the information for retrieval.
14. Variable focus providing a minimum of 4 to at least 40 degree horizontal field of view.
15. Store detection zones in non-volatile memory.
16. Have no splices between the processors and the cameras.
17. Provide LED indicators to show active detection.
18. Have an internal heater to assure proper operation of the equipment during low temperatures.
19. Have surge ratings as set forth in NEMA specifications.
20. Have a two-year warranty and updates of all software shall be available without charge during the warranty period.

VDS shall be of a single 4K resolution, fish-eye type camera equivalent to Mivision SmartView 360 and components as listed below:

- a. SmartView 360 camera
- b. SmartSense cabinet interface device
- c. SmartLink network device

C. Radar Vehicle Detection System (RVDS)

When specified in the plans, the equipment shall consist of all items necessary to provide a complete functional RVDS that process high-definition, multi-beam radar electromagnetic waves and provide detection outputs to the traffic signal controller.

RVDS shall be capable of NEMA TS2 operation.

The RVDS shall consist of the following components:

1. Radar sensor (1)
2. Detector rack interface module (1)
3. Power and surge protection panel or module (1) (cabinet interface devices that combine one or more of the above components shall be acceptable as well).
4. All associated equipment required to setup and operate in a field environment including software, serial and ethernet communication ports, cabling, electrical connectors and mounting hardware.

The RVDS shall be capable of the following:

1. The RVDS shall be able to operate in all types of weather conditions including: rain, snow, sleet, ice, fog and windblown dust.
2. Lightning and surge protection will be provided for power connections and communications links to the radar RVDS.
3. Provide a “fail safe” operation that triggers when communication between the radar vehicle sensor and the interface module is broken. Contact closure from the interface module will occur on all programmed detector channels associated with the affected radar sensor when the failsafe is triggered and will remain in this state until communication is re-established between the interface module and the radar vehicle sensor.
4. Comply with all applicable Federal Communications Commission (FCC) requirements. The manufacturer will provide documentation of compliance with FCC specifications.
5. Shall maintain frequency stability without the use of manual tuning elements by the user.
6. Shall provide a minimum of 4 separate RF channels selectable by the user to avoid interference with other devices working on the same frequency.
7. The communication port(s) shall support a communication speed that will not introduce excessive latency between when a vehicle is detected and the contact closure in the traffic signal cabinet.
8. The interface modules that utilize the detector rack must operate at 12V or 24V DC. Shelf mounted interface modules must operate within a range of 89V to 135V AC, 60 Hz single phase. Power to the RVDS radar sensor must be from the transient protected side of the AC power distribution system in the traffic control cabinet in which the RVDS is installed.
9. RVDS documentation shall include a comprehensive user guide as well as quick reference guide(s).
10. Shall have the ability to configure presence, pulse, extend and delay outputs.

RVDS shall be above-ground radar presence detector equivalent to Wavetronix SmartSensor radar devices, equivalent to the City's current RVDS, as listed below:

- a. Stop Bar Presence Detector – Wavetronix SmartSensor Matrix SS-225
- b. Advanced Detection – Wavetronix SmartSensor Advance SS-200V
- c. Mid-block Detection and Monitoring – Wavetronix HD
- d. Cabinet Interface Device – Wavetronix Click 656
- e. Detector Rack Cards – Wavetronix Click 112/114
- f. Serial to Ethernet – Wavetronix Click 301

D. Wireless Magnetometer Detection System (WMDS)

When specified in the plans, the equipment shall consist of all items necessary to provide a complete functional wireless magnetometer detection system that process changes to earth magnetic field and provide detection outputs to the traffic signal controller.

WMDS shall be capable of NEMA TS2 operation.

The WMDS shall consist of the following components:

1. In-pavement sensors
2. All wireless communication equipment needed to establish communication links to the controller cabinet.
3. Interface modules compatible with NEMA TS-2 V2.06b cabinet detector rack.
4. Surge protection for the WMDS and system software for set-up and monitoring of the WMDS.

The WMDS shall be capable of the following:

1. Detecting a variety of vehicle types including motorcycles, automobiles and large trucks. The system must allow the user to select sensitivity levels that adjust the amount of hysteresis to the magnetic field needed to achieve contact closure to the assigned detector channel. Magnetometer sensitivity level adjustments must allow for different levels of vehicle detection.
2. The ability to configure presence, pulse, extend and delay outputs.
3. WMDS equipment failure such as: the sensor, communications link, access point radio, repeater radio (if used) or interface module, shall result in constant vehicle call "fault state" on the affected detector channel to the traffic controller.
4. Detection accuracy must be comparable to properly operating inductive loops.
5. Provide real-time vehicle detection (within 150 milliseconds (ms) of vehicle arrival). Once detection is achieved by the sensor, the traffic controller must receive contact closure to the assigned detector channel within the 150 ms time frame.
6. The in-pavement sensor must operate on batteries without the need for underground power or communication cable connections to the unit.
7. The average operating life span of the sensor under battery power must be a minimum of 10 years.
8. The interface module must provide 2 or 4 detector channels. Sensors must be assignable to the available detector channels on the interface module using software provided with the WMDS.
9. The front face of the module shall identify detector channel 1 and detector channel 2. Each must use an LED to indicate contact closure on the channel. When vehicle detection is achieved, the LED will be on and contact closure applied to the detector channel. During periods of no vehicle detection the LEDs will be in an off state and no contact closure will be applied to the detector channel.
10. The interface module will use an LED indication to indicate a "fault state" with the WMDS. When the fault state is active contact closure will be applied to the appropriate detector channel.

The WMDS shall be equivalent to Sensys detection of the type and parts listed below, consistent with the City's current WMDS:

- Sensys VSN240-F-2 Flush-Mount Sensor
- Sensys FLEX-RPT3-SLR Solar Repeater
- Sensys FLEX-ANT-2 Long Range External Antenna
- Sensys FLEX-ANT-1 Standard External Antenna
- Sensys FLEX-ISOL-M Isolator Module
- Sensys APCC-SPP Digital Radio
- Sensys FLEX-CTRL-M-E Control Module, Enhanced
- Sensys FLEX-CONN-M Stand-Alone Unit

E. Pedestrian Push Buttons

Where shown on the Plans, furnish and install pedestrian push buttons of substantial tamper-proof construction. They shall consist of a direct push type button and single momentary contact switch in a cast metal housing. Operating voltage for pedestrian push buttons shall not exceed 24 volts.

Provide a weatherproof assembly, constructed to prevent electrical shocks under any weather condition.

Where a pedestrian push button is attached to a pole, the housing shall be shaped to fit the curvature of the standard or post to which it is attached to provide a rigid installation.

Unless otherwise specified, install the push button and sign on the crosswalk side of the pole.

Pedestrian push buttons shall have a transient protection that meets NEMA specifications.

Accessible pedestrian push buttons shall be in accordance with PROWAG requirements. Submit accessible pedestrian push buttons to TDOT and the City of Franklin for review and approval.

The pedestrian push buttons shall be equivalent to the Polara iNavigator system, consistent with the City's current pedestrian detection.

F. Emergency Vehicle Priority Control System

The City of Franklin uses a Global Traffic Technologies GPS Opticom emergency vehicle priority control system in conjunction with the traffic signal installation. To ensure priority control system integrity, operation and compatibility, all components at all intersections shall be from the same manufacturer. Priority control shall be provided on the applicable approaches of the intersection as indicated on the plans. Intersection detection equipment will consist of Model 3100 GPS Radio Unit containing a GPS receiver with antenna and a 2.4 GHz spread spectrum transceiver with antenna mounted atop of the signal cabinet, both connected to an Opticom Model 764 Multimode Phase Selector located in the intersection controller cabinet. The multimode phase selector shall be installed in a 1045B Opticom Card Rack or Opticom Model 760 card rack. Preempt panel shall be wired for R/R F/H Opticom

MISCELLANEOUS

730.30 Internally Illuminated Street Name Signs

Internally illuminated Light Emitting Diode (LED) signs shall be Temple Edge-Lit, Transportation Control Systems Britelite Edge Lit, or approved equal. This specification shall govern for LED street name signs which are rigid bracket-attached to traffic pole shafts and/or mast arms. All materials used in fabrication shall be new and of good quality.

A. Sign Dimensions

The LED internally illuminated street name sign shall be capable of being constructed in standard widths from 24-120 inches in length, according to the construction plans. The height of the signs shall be 22 inches to accommodate 12-inch upper case letters / 9-inch lower case letters and 2.5-inch clearance from the vertical sides. Street name legend shall be a mixed upper and lower case letters, with a superscripted extension.

B. Sign Sheeting

Sign shall have a single side message as shown on the design sheets. The message should be bright white letters. The background shall be a green 3M™ Electrocut™ film, Avery Dennison film, or approved equal.

The Manufacturer/Vendor shall supply shop drawing submittals on the fixtures, sign, sign message and mounting hardware. Where the Manufacturer/Vendor has not previously supplied the item to the City of Franklin that Supplier shall provide a full-size physical prototype of all equipment to the City for review and approval.

C. Hardware

The sign shall be rigid-mounted to a pole shaft or mast arm. The method of mounting shall be by banding. Unless otherwise shown on the plans or required in this specification, all fasteners and screws in or on the fixture shall be stainless steel type 302 or 305, brass or aluminum. All steel nuts, bolts, and hardware for sign attachment shall be stainless steel type 302 or 305.

The plans are to show the location on the mast arms for the clamp-on street signs, when required, as well the location and details for the wire entrance. Offset mounting brackets with clamps and adapters shall be attached at two-foot spacing on the back side panel for use of Band-It material, Uline material, or approved equal to rigidly mount the sign to the mast arm. The sign bracket itself shall clamp the top and bottom frame of the sign. The adapters shall swivel around the mid-height level of the sign, and be lockable to allow for leveling of the sign.

All wiring connections within the sign fixture shall terminate through an U.L. approved junction box.

All conductors inside the sign fixture and on the load side of the power source shall be U.L. listed appliance material (no smaller than #14 AWG) stranded copper wire with thermoplastic insulation.

730.31A Fiber Optic Cable (OSP)

All outside plant trunk cables used in the project shall be stranded loose tube design. Drop cables shall be central core or stranded loose tube design. The cable configurations shall be dictated by the particular communication path, data rate, & distance of the optical path.

Cable configurations required shall be displayed in the design plan set.

1. General Considerations

The cable shall meet all requirements stated in this specification. The cable shall be a listed product of the United States Department of Agriculture Rural Utilities Services (RUS) 7 CFR1755.900 and the ANSI/ICEA Standard for Fiber Optic Outside Plant Communications Cable, ANSI/ICEA S-87-640-1992.

The cable shall be new, unused, and of current design and manufacture.

2. Fiber Characteristics

All fibers in the cable must be usable fibers and meet required specifications.

Each optical fiber shall consist of a doped silica core surrounded by a concentric silica cladding. The fiber shall be matched clad design.

SINGLE-MODE: The single-mode fiber utilized in the cable specified herein shall conform to the following specifications:

- a. Typical Core Diameter: 8.3 μm .
- b. Cladding Diameter: 125.0 \pm 1.0 μm .
- c. Core-to-Cladding Offset: $< \square 0.8 \mu\text{m}$.
- d. Cladding Non-Circularity: $\square \square < 1.0\%$. Defined as: $[1 - (\text{min. cladding dia.} / \square \square \text{max. cladding dia.})] \times 100$
- e. Coating Diameter: 245 \pm 10 μm .
- f. Colored Fiber Diameter: nominal 250 μm .

- g. Attenuation Uniformity- No point discontinuity greater than 0.10 dB at either 1310 nm or 1550 nm.
- h. Attenuation at the Water Peak- The attenuation at 1383 ± 3 nm shall not exceed 2.1 dB/km.
- i. Cutoff Wavelength- The cabled fiber cutoff wavelength (λ_{ccf}) shall be < 1250 nm.
- j. Mode-Field Diameter: 9.30 ± 0.50 μm at 1310 nm 10.50 ± 1.00 μm at 1550 nm
- k. Zero Dispersion Wavelength (λ_0)- 1301.5 nm $< \lambda_0 < 1321.5$ nm.
- l. Zero Dispersion Slope (So)- < 0.092 ps/(nm²km).
- m. Polarization Mode Dispersion < 0.5 ps/sq.rt. km

The coating shall be a dual layered, UV cured acrylate applied by the fiber manufacturer.

The coating shall be mechanically strippable without damaging the fiber.

3. Fiber Specification Parameters

Required Fiber Grade - Maximum Individual Fiber Attenuation for single-mode fibers shall be 0.40dB/km @ 1310nm, 0.30dB/km @ 1550.

The maximum dispersion shall be ≤ 3.2 ps/(nm_km) from 1285 nm through 1330 nm and shall be ≤ 18 ps/(nm_km) at 1550 nm.

4. Specifications for Outdoor Trunk Cables

Optical fibers shall be placed inside a loose buffer tube. The nominal outer diameter of the buffer tube shall be 3.0 mm.

Each buffer tube shall contain up to 12 fibers.

The fibers shall not adhere to the inside of the buffer tube.

Each fiber shall be distinguishable from others by means of color coding in accordance with EIA/TIA-598-A, "Optical Fiber Cable Color Coding." The ink for coloring fibers shall be UV cured; no thermal inks shall be used in the coloring process.

Buffer tubes containing fibers shall also be color coded with distinct and recognizable colors in accordance with EIA/TIA- 598, "Optical Fiber Cable Color Coding."

- a. Buffer tube colored stripes shall be inlaid in the tube by means of co-extrusion when required. The nominal stripe width shall be 1 mm.
- b. For dual layer buffer tube construction cables, standard colors are used for tubes 1 through 12 and stripes are used to denote tubes 13 through 24. The color sequence applies to tubes containing fibers only, and shall begin with the first tube. If fillers are required, they shall be placed in the inner layer of the cable. The tube color sequence shall start from the inside layer and progress outward.

In buffer tubes containing multiple fibers, the colors shall be stable during temperature cycling and not subject to fading or smearing onto each other or into the gel filling material. Colors shall not cause fibers to stick together.

The buffer tubes shall be resistant to external forces and shall meet the buffer tube cold bend and shrink back requirements of 7 CFR 1755.900.

Fillers may be included in the cable core to lend symmetry to the cable cross-section where needed.

The central anti-buckling member shall consist of a glass reinforced plastic rod. The purpose of the central member is to prevent buckling of the cable.

Each buffer tube shall be filled with a non-hygroscopic, non-nutritive to fungus, electrically non-conductive, homogenous gel. The gel shall be free from dirt and foreign matter. The gel shall be readily removable with conventional nontoxic solvents.

Buffer tubes shall be stranded around the dielectric central member using the reverse oscillation, or "SZ", stranding process. Water blocking yarn(s) shall be applied longitudinally along the central member during stranding.

For single layer cables, a water blocking tape shall be applied longitudinally around the outside of the stranded tubes/fillers. The tape shall be held in place by a single polyester binder yarn. The water blocking tape shall be non-nutritive to fungus, electrically non-conductive and homogenous. It shall also be free from dirt and foreign matter. Dual layer cables shall be water blocked in a similar fashion.

Two polyester yarn binders shall be applied contra helically with sufficient tension to secure the buffer tube layer to the central member without crushing the buffer tubes. The binders shall be non-hygroscopic, non-wicking and dielectric with low shrinkage.

The cable shall contain at least one ripcord under the sheath for easy sheath removal.

Tensile strength shall be provided by high tensile strength aramid yarns and/or fiberglass yarns.

The high tensile strength aramid yarns and/or fiberglass yarns shall be helically stranded evenly around the cable core.

The cable shall be sheathed with medium density polyethylene. The minimum nominal jacket thickness shall be 1.4 mm. Jacketing material shall be applied directly over the tensile strength members and water blocking tape. The polyethylene shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus.

The jacket or sheath shall be free of holes, splits, and blisters.

The cable jacket shall contain no metal elements and shall be of a consistent thickness.

The cable jacket shall be marked with "Manufacturer Optical Cable," sequential foot markings, year of manufacture, fiber count and fiber types, EX (72f, 36 sum, and 36 mm 62.5/125). The actual length of the cable shall be within $-0\pm 1\%$ of the length markings. The marking shall be in contrasting color to the cable jacket. The height of the marking shall be approximately 2.5 mm.

The maximum pulling tension shall be 2700 N (608 lbf) during installation (short term) and 890 N (200 lbf) long term installed.

The shipping, storage, and operating temperature range of the cable shall be -40degreeC to $\pm 70\text{degreeC}$. The installation temperature range of the cable shall be -30degreeC to $\pm 70\text{degreeC}$.

5. Specifications for Drop Cable (to Controllers, VMS, Camera locations, etc.)

The City of Franklin specifies that the Fiber Connections Inc. "Gator Patch ITS Drop Cable" Model # GP20L006FRB-xx-1 shall be used in each location (xx is cable length to splice pull box plus additional 20 feet slack for splicing in meters), Z Stack Pre-Terminated All-purpose Patch Panel, or approved equal. This unit is the fiber termination panel to be mounted in the cabinet and the attached drop cable is run to the trunk cable splice pull box where a mid-span splice will be made.

6. General Cable Performance Specifications for OSP cables

When tested in accordance with FOTP-3, "Procedure to Measure Temperature Cycling Effects on Optical Fiber, Optical Cable, and Other Passive Fiber Optic Components," the change in attenuation at extreme operational temperatures (-40degreeC to \pm 70degreeC) shall not exceed 0.2 dB/km at 1550 nm for single-mode fiber and 0.5dB/km at 1300 nm for multimode fiber.

When tested in accordance with FOTP-82, "Fluid Penetration Test for Filled Fiber Optic Cable." a one meter length of unaged cable shall withstand a one meter static head or equivalent continuous pressure of water for one hour without leakage through the open cable end.

When tested in accordance with FOTP-81, "Compound Flow (Drip) Test for Filled Fiber Optic Cable", the cable shall exhibit no flow (drip or leak) of filling or flooding compound at 65degreeC.

When tested in accordance with FOTP-41, "Compressive Loading Resistance of Fiber Optic Cables, the cable shall withstand a minimum compressive load of 220 N/cm (125 lbf/in) applied uniformly over the length of sample. The load shall be applied at the rate of 3 mm to 20 mm per minute and maintained for 10 minutes. The change in attenuation shall not exceed 0.4 dB during loading and 0.2 dB after loading at 1550 nm for single-mode.

When tested in accordance with FOTP-104, "Fiber Optic Cable Cyclic Flexing Test," the cable shall withstand 25 mechanical flexing cycles around a sheave diameter not greater than 20 times the cable diameter. The change in attenuation shall not exceed 0.1 dB at 1550 nm for single-mode fiber.

When tested in accordance with FOTP-25, "Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies," the cable shall withstand 25 impact cycles. The change in attenuation shall not exceed 0.2 dB at 1550 nm for single-mode fiber.

When tested in accordance with FOTP-33, "Fiber Optic Cable Tensile Loading and Bending Test," using a maximum mandrel and sheave diameter of 560 mm, the cable shall withstand a tensile load of 2700 N (608 lbf). The change in attenuation shall not exceed 0.2 dB during loading and 0.1dB after loading at 1550 nm for single-mode.

When tested in accordance with FOTP-85, "Fiber Optic Cable Twist Test," a length of cable no greater than 4 meters will withstand 10 cycles of mechanical twisting. The change in attenuation shall not exceed 0.1 dB at 1550 nm for single-mode fiber.

When tested in accordance with FOTP-37, "Low or High Temperature Bend Test for Fiber Optic Cable", the cable shall withstand four full turns around a mandrel of 10 times the cable diameter after conditioning for four hours at test temperatures of -30degreeC and \pm 60degreeC. Neither the inner or outer surfaces of the jacket shall exhibit visible cracks, splits, tears or other openings. Optical continuity shall be maintained throughout the test.

7. Quality Assurance Provisions

All optical fibers shall be proof tested by the fiber manufacturer at a minimum load of 100 kpsi.

All optical fibers > 1000 meters shall be 100% attenuation tested. The attenuation of each fiber at both operational windows shall be provided with each cable reel.

The cable manufacturer shall be ISO 9001 registered.

8. Packaging

Top and bottom ends of the cable shall be available for testing.

Both ends of the cable shall be sealed to prevent the ingress of moisture.

Each reel shall have a weatherproof reel tag attached identifying the reel and cable.

9. Pre-Terminated Drop Cable Assemblies

These assemblies shall be employed when connecting a camera, controller, VMS or other device to the trunk cable and mid-span splice techniques will be used.

Cable used for Drop cable assemblies shall conform to section FOC – 1.5.

10. System configuration - Drop & Insert Applications

Signal from the TOC to local controllers, cameras, and/or variable message signs will be conveyed via the trunk & drop cables in a closed loop configuration. At each controller, the applicable fibers will be routed in & out of the applicable housing using a specified Gator Patch and a mid-span access splice point. Only fibers required for the drop & insert shall be cut, no other fibers in the cable shall be cut without the direction of the engineer.

The length of the drop cable shall be determined after the traffic signal cabinet, pull boxes, and conduit has been installed to insure proper sizing. Twenty feet of drop cable shall be coiled neatly in the pull box with the splice enclosure to provide slack.

11. Fiber Optic Patch Cables (Jumpers)

Any patch cords used for system configuration shall be compatible with fiber types and connectors specified herein. Single-mode patch cords shall be yellow in color and each jacketing material shall conform to the appropriate NEC requirement for the environment in which installed. All cordage shall incorporate a 900um buffered fiber, aramid yarn strength members, and an outer jacket. Patch cords may be simplex or duplex, depending on the application. Single-mode fibers shall be 1.0dB/km @ 1310nm, 0.75dB/km @ 1550.

12. Fiber Optic Connectors

All connectors used in the communication system shall be FC compatible, ceramic ferrule connectors. Factory terminated connectors shall be heat cured epoxy type with a maximum measured loss of ≤ 0.30 dB; No field installable connectors accepted. The operating temperature of all connectors in the system shall be - 40C to ± 70 C with no more than a 0.20dB change across the temperature range.

13. Fiber Optic Closures

Aerial, Pole Mount, Pedestal, and Hand Hole Environments; OSP Closure for Aerial, Pole Mount, Pedestal, and Hand Hole will incorporate the following features:

The closure shall be capable of accepting up to six cables in a butt splice.

The closure shall be capable of storing up to 90" lengths of expressed buffer tubes.

Assembly shall be accomplished without power supplies, torches, drill kits or any special tools. Reentry shall require no additional materials. Sealing shall be accomplished by enclosing the splices in a polypropylene dome that is clamped together with a stainless steel latch and sealed with an O-ring.

Closure shall be capable of strand mounting with the addition of a strand mounting bracket.

Splice case shall be non-filled (no encapsulate), will prevent water intrusion and shall allow re-entry without any special tools. The closure shall be capable of preventing a 10 feet water head from intruding into the splice compartment for a period of 7 days. Testing of the closure is to be accomplished by the placing of the closure into a pressure vessel and filling the vessel with tap water to cover the closure. Apply continuous pressure to the

vessel to maintain a hydrostatic head equivalent to 10 feet on the closure and cable. This process shall be continued for 7 days. Remove the closure, open to check for the presence of water. Any intrusion of water in the compartment containing the splices constitutes a failure. Ensure that the water immersion test has been performed by the manufacturer or an independent testing laboratory, and the appropriate documentation has been submitted to the city.

Buried-OSP Closure for buried applications will incorporate the following features:

Splice case must handle up to four cables. A butt adapter, if applicable could be used to increase capacity to eight cables.

The closure shall be capable of accommodating splice organizers which accept mechanical, single fiber fusion, or multi fiber splices. The closure shall have provisions for storing fiber splices and un-spliced fiber/buffer tubes. The closure shall hold a minimum of 2 splice trays to a maximum of 15 splice trays with each tray housing up to 24 splices. The closure shall be UL rated. Closure re-entry and subsequent reassembly shall not require specialized tools or equipment.

For compression testing, the closure shall not deform more than 10% in its largest cross-sectional dimension when subjected to a uniformly distributed load of 1760 Newtons at -18°C and $+38^{\circ}\text{C}$. 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 minimum of 15 minutes. The measurement shall then be taken with the weight in place. Ensure that the compression test has been performed by the manufacturer or an independent testing laboratory, and the appropriate documentation has been submitted to the City.

14. Fiber Optic Termination Hardware

For cross connect applications inside controller cabinets, the fiber optic cable shall be terminated using a 900 μm fan-out modular design for the fiber count being terminated. The nonmetallic fan-out shall attach directly to the buffer tube and transition the 250 μm coated fibers into the fan-out tubing. The fan-out shall be housed in a Wall Mount Distribution cabinet equipped with the appropriate number of adapters. The fibers shall be connected to the transmission equipment via FC/FC fiber optic patch cables. This hardware scheme shall also be utilized for wall mount applications.

For rack mount applications, the fiber optic cable shall be terminated using a 900 μm fan-out modular design for the fiber count being terminated. The non-metallic fan-out shall attach directly to the buffer tube and transition the 250 μm coated fibers into the fan-out tubing. The fan outs shall be housed in a Fiber Distribution Center sized for 50% growth based on the initial installation. Appropriate panels for FC adapters shall be included based on the population of the fiber cable installed. If fusion or mechanical pigtail splicing is used for termination points, a splice housing with appropriate 900 μm pigtails and splice trays shall be used in conjunction with the Fiber Distribution Center.

15. Installation

a. Aerial Installations

All fiber optic components will be installed in accordance with the manufacturer's instructions. All necessary interconnections, services, and adjustments required for a complete and operable data transmission system shall be provided. All pole attachments, service loops, and conduit risers will be placed to minimize the possibility of damage as well as to facilitate future expansion or modernization.

Cable between controllers shall be lashed to a 1/4" EHS messenger with stainless steel lashing wire for aerial installations. The installation will be accomplished in accordance with accepted OSP construction practices. Precautions shall be taken to ensure the installation specifications for the cable are not exceeded (tension, minimum bend radius). The cable shall be marked with an orange weatherproof identifying tag at each pole

location, with print "Caution, Fiber optic Cable".

The cable shall be installed in continuous runs as indicated on the plans. Splices shall be allowed only at drop points and only those fibers necessary to complete the communication path shall be spliced (mid-span access). All other fibers in the cable(s) shall be left undisturbed; with a minimum of 5 feet of buffer tube coiled inside the closure.

Sufficient slack shall be left at each drop point to enable access of the cable components and splicing to occur on the ground (typical 2 x strand height plus 15 ft) (60 feet). For aerial slack storage at splice points, a radius controlling device, commonly referred to as a SNO-SHOE shall be used for securing resulting cable slack at aerial splice points and shall be mounted directly to the strand.

For aerial cable runs exceeding 6 pole spans between splice points (indicated on the plans), two opposing SNO-SHOES shall be placed on the span 50' apart to provide for a 100' service loop for future drops and for slack for repair and pole relocations.

b. Underground Installations

Install fiber-optic cable underground in conduit using cable pulling lubricants approved by the fiber-optic cable manufacturer and the Engineer.

Obtain approval of cable pulling lubricant and method of pulling before installing underground fiber-optic cable.

Use a dynamometer (clutch device) so as not to exceed the maximum allowable pulling tension if the cable is pulled by mechanical means. Do not use a motorized vehicle to generate cable pulling forces.

Keep tension on the cable reel and pulling line at the start of each pull. Do not release tension if the pulling operation is halted. Restart the pulling operation by gradually increasing tension until the cable is in motion.

For pulling cable through manholes, junction boxes, and vaults, feed the cable by manually rotating the reel. Do not pull cable through intermediate junction boxes, handholes, or openings in conduit unless otherwise approved.

For underground installations, the following minimum slack requirements apply; 50 feet at the pull box locations or controller location for midspans, 15' for point to point applications for each cable.

Install communications cable identification markers on each communications cable entering a junction box.

Drop cable shall be routed to the controller cabinets via conduit risers or underground conduit as illustrated in the plans. The cable entrance shall be sealed to prevent water ingress.

The minimum requirement for fiber protection outside a fiber optic enclosure in all cases shall be 3.0mm Fan-out tubing, containing a hollow 900um tube, aramid strength members and an outer jacket, and shall be secured to the cable sheath.

The minimum requirement for fiber protection inside wall mount or rack mount fiber enclosure shall be 900um buffering, intrinsic to the cable in the case of tight buffered fibers, or in the case of 250um coated fibers, a fan-out body & 900um tubing secured to the buffer tube(s).

c. Splicing Methods

All splices shall be accomplished by means of the fusion splice technique and shall not induce more than 0.1 dB attenuation for each splice, and 0.07 dB averages for all splices. Splices found to exceed 0.1 dB attenuation shall be re-spliced, at no additional cost to the Department or City of Franklin, as applicable

until this requirement is met.

Only splice fibers at locations that are identified in the Plans. At these splicing locations, splice all the fibers that are identified on the associated Splice Diagrams in the Plans. Splice Diagrams in the Plans shall not be revised without approval from the Engineer. All splices shall be protected and stored in fiber optic splice closures or aerial splice enclosures.

16. Testing and Documentation

a. OTDR Testing

Prior to the installation, perform on-site on the reel testing. Test all fibers in each reel of cable prior to installation. This testing is for both continuity and attenuation. The tests shall be conducted at 1310nm for single mode fibers. The testing shall be performed using an Optical Time Domain Reflectometer (OTDR) via a "pigtail" splice. The resultant OTDR trace(s) shall reflect overall length and attenuation expressed in db/km. All test results shall be within $\pm 3.0\%$ of factory supplied attenuation measurements for single mode fibers. Testing shall be done in one direction only. Hard copy or disk based (with applicable software) OTDR traces for the testing shall be supplied to the City of Franklin prior to installation of cables. Factory results for installed cable may be accepted at own risk. In either case, on-the-reel test results or factory measurements shall be provided to the City for each cable installed.

Following installation, each section of the installed cable shall be tested for continuity and attenuation as indicated above. The traces shall demonstrate that no change in transmission characteristics has occurred during installation and that any splices meet the requirements herein. This testing can be done in conjunction with the End-to-End testing described below. The traces shall be included in the documentation package provided at the conclusion of the contract.

b. Attenuation Testing

Only completely connected spans will be tested for final End-to-End attenuation (power loss). The testing shall be performed at 1310 nm and 1550 nm for single-mode fibers. The testing shall be conducted using "hand-held" optical test sets and shall be conducted using a two-jumper reference. The testing shall be in one direction only. The results shall be tabulated and be included in the documentation package provided at the conclusion of the contract. Overall loss for each link shall not exceed the cumulative specified losses of the components in the link.

EXAMPLE:

@850nm, a 1 km link with 2 splices and a connector on each end shall not exceed:

5.0dB((3.5dB \pm .25dB \pm .25dB \pm .5dB \pm .5dB))

c. Testing Of Continuous Fiber Optic Cable

The fibers in this installation shall be tested for final End-To-End attenuation (power loss). The overall loss for this link shall not exceed the manufacturer's specifications. The fibers are being installed for future use when demanded and must be operable at this time.

At the conclusion of the contract, 2 copies of system documentation package shall be provided. It shall include at a minimum:

- 1) Post installation OTDR traces for each fiber.
- 2) End-to-End Attenuation measurement for each fiber.
- 3) A splice plan showing the location and configuration of any splices in the system as well as how the transmission scheme is set up.

- 4) Reference manuals for equipment provided.

730.31B ITS Device Control Cabinet**1. Materials**

Material, equipment, and hardware furnished under this section must be pre-approved by the Engineer.

Provide a Type B Model 336A cabinet specifically wired for either CCTV, DMS, WMS or PCS, dependent on the application for the installation.

2. Functional Requirements

The Type B cabinets shall be provided with fully wired back and side panels with all necessary terminal boards, wiring harnesses, connectors and attachment hardware for each cabinet location. All equipment shall be shelf mounted. All terminals and panel facilities shall be placed on the lower portion of the cabinet walls below the shelves.

Submit a cabinet layout for each installation for review by the Engineer. Only cabinets with approved layouts will be accepted by the Department or City of Franklin, as applicable. Each field cabinet shall, as a minimum, be supplied with the following:

- a. Fan and Thermostat
- b. Left Side Power Distribution Panel
- c. Air Filter
- d. Adjustable Shelves (1-4 as required)
- e. Back Panel
- f. Right Side Panel
- g. Locking Mechanism
- h. Lock
- i. Ground Bus (2)
- j. Surge Protection (for Solid State Equipment)
- k. Terminal Blocks
- l. Duplex Power Outlets (GFI protected)
- m. Drawer that opens and slides out for placement of notebook computer
- n. All necessary installation and mounting hardware.

3. CCTV Cabinets

Provide and install all equipment, hardware and software to provide for functional camera installation. The camera installation shall provide an operating camera with equipment ready for future fiber optic communications with the City of Franklin's Transportation Operations Center (TOC).

4. Construction Methods

The cabinet will be secured using 3 steel banding.

One 2-inch conduit nipple will connect the cabinet with the interior of the pole.

Metered power leads, data cables and communications cables shall be run on the interior of the pole.

Handholes shall be provided near the base of poles and near the device location for access to install and maintain the data leads. Strain relief J-hooks will be provided on the interior of the pole at the device location handhole.

Cabinet shall be mounted 48" above finish grade.

730.31C Closed Circuit Television (CCTV) Camera

1. Materials

Provide a High Definition (HD) IP Power-Over-Ethernet (POE) CCTV PTZ camera, control and communications hardware, enclosure, cabling and mounting apparatus. The CCTV and mounting apparatus shall be an Axis Q6135-LE, Cohu RISE 4228 HD, or equal approved by the City of Franklin.

2. Installation Requirements

All equipment shall be installed according to the manufacturer's recommendations, the Plans and as follows:

- a. Materials and associated accessories/adapters shall not be applied contrary to the manufacturer's recommendations and standard practices.
- b. Shall include all materials needed to permanently mount the CCTV camera to the support structure as indicated in the plans.
- c. Furnish and install all cabling and all ancillary equipment required to provide a complete and fully operational CCTV system site as shown on the plans.
- d. Verify all wiring meets NEC requirements where applicable.
- e. Cameras shall be mounted in positions which allow 360-degree continuous rotation and mounting arm position shall be approved by the Engineer prior to pole placement.
- f. Furnish and install all appropriate field surge protection devices and ensure proper ground per manufacturer recommendations.
- g. Coordinate with the Department or City of Franklin, as applicable, for IP addresses, and video encoding settings for all CCTV camera sites prior to turn-on/installation and site testing.
- h. The CCTV system shall be compatible with, and integrated into the existing TOC video wall and CCTV control software. Coordinate with the TOC operations personnel for integration of the new CCTV cameras into the existing video wall and video control software systems. Integrate and test all video control and display of the cameras at the TOC.

730.31D CCTV Pole and Lowering Device

1. Materials

Material, equipment, and hardware furnished under this section must be pre-approved by the Engineer.

In addition, provide a galvanized steel pole standard with a length of 50 feet or as shown in plans. The pole standard shall be designed according to AASHTO Standards and Specifications For Structural Supports For Highway Signs, Luminaires, and Traffic Signals (Current Edition, et al). The pole standards shall be designed for a wind velocity of 90 miles per hour. The steel support shall be finished by the manufacturer in a black gloss color.

Determine the size and design of all steel CCTV support poles and foundations. Shop drawings for the proposed poles shall be submitted to the City of Franklin for review and approval.

Provide a lowering device compatible with the City of Franklin CCTV equipment.

The pole base will provide three 2-inch, non-metallic (High Impact Schedule 80 PVC) conduits into the interior of the pole. One of the conduits will contain the metered power service lines. One conduit will contain the communications cable (Fiber optic or hardwire). The remaining conduit will be a spare with a pull rope installed between the main pull box and the pole foundation.

Metered power leads, data cables and communications cables shall be run on the interior of the pole.

Handholes shall be provided near the base of poles and near the device location for access to install and maintain the data leads. Strain relief J-hooks will be provided on the interior of the pole at the device location handhole.

2. Functional Requirements - Camera Lowering Device Requirements for 50' poles

a. General

The work under this item specifies the additional requirements for the 50' poles which should be equipped with the Camera Lowering Device (CLD). The Camera Lowering Device shall be safely operable by one trained technician working alone, to lower the Camera Assembly to ground level for maintenance as necessary and return the Camera

Assembly to the pole top mounting and secure it in place, eliminating the need for access by a bucket truck. The camera lowering device shall be installed at camera sites as indicated on the plans. Weatherproof connectors (camera to the lowering device) shall allow for adaptation of the camera and the dome type housing for lowering and hoisting. Lifting and lowering shall be done with a motorized gear box (winch). The CLD should be a stand-alone device mounted on a camera pole and included in the cost of the 50' pole. An integrated CLD with pole assembly may be procured provided it meets all specifications.

Design the required pole mounting adapters, brackets and mounting hardware, including extensions and cable entry to the camera mounting pole to accommodate the dome enclosure with pan/tilt unit and pole combination. The pole mounting adapter shall be electrically bonded to the pole. The pan and tilt unit shall be electrically bonded to the mounting adapter. An individual CLD shall be furnished and installed at each CCTV site designed to support and lower a standard closed circuit television camera, lens, housing, PT mechanism, cabling, connectors and other supporting field components without damage or causing degradation of camera operations. This CLD shall consist of an arm mounted suspension contact unit attached to the galvanized steel pole at locations as shown on the Plans. The CLD shall include a tracking guide system permitting the moveable portion of the system to align in the same position every time the system is operated thereby eliminating the need to re-orientate the camera. The electrical / signal connector shall mate without any degradation of performance due to vibration or movement during operation. The cables for the CLD shall not come into contact with any other cables inside the pole.

The entire device, complete with the camera, shall be tested by an independent laboratory experienced in structural, mechanical and electrical testing. It shall be shown to withstand wind forces of greater than 90 mph with a 1.3 gust factor. Certified and dated test reports from the testing facility shall be submitted to the Engineer within 10 days after the testing for review and approval. The top of the pole deflection shall not exceed 1 inch deflection from Center (2-inch deflection diameter) due to 30 mph (non-gust) winds.

All designs, testing results and shop drawings of the camera mounting, lowering device and structural design shall be in compliance with the Contract Documents and Plans and submitted to the Engineer for review and approval 90 days after the Notice to Proceed. Arrange for a factory representative to assist with the assembly and testing of the first CLD onto the pole assembly. Copies of written installation and operating instructions shall be furnished to the Engineer as required by the Contract Documents.

All external components of the CLD shall be made of corrosion resistant materials, anodized, galvanized, or otherwise protected from the environment and dissimilar metals by industry accepted coatings to withstand exposure to a corrosive environment. All pulleys for the camera lowering device and portable lowering tool

shall

have sealed, and self-lubricated bearings. At the discretion of the Engineer, an integrated CLD with pole assembly may be procured.

b. Suspension Unit

Design the required pole mounting adapters, brackets and mounting hardware. The CLD shall have a minimum load capacity 200 pounds with a 10 to 1 safety factor. The enclosure receptacle and camera enclosure shall incorporate a mating device. The mating device shall have a minimum of 2 latching devices. These latching devices shall securely hold the camera housing and its control equipment free of vibration or motion between the enclosure receptacle and camera enclosure. The latching devices shall lock and unlock by alternately raising and lowering the camera enclosure. When the camera enclosure is latched, all weight shall be removed from the lowering cable. The enclosure receptacle and camera enclosure shall have a heavy-duty tracking guide. The tracking guide and latching devices shall lock the camera enclosure in the same position each time.

Sufficient electrical contacts shall be provided to support all camera functions. The electrical contacts shall be gold coated to prevent corrosion. In addition, replaceable gaskets shall be provided to seal from moisture and dust the electrical contacts and latching devices.

The CLD shall be designed to preclude the lifting cable from contacting the CCTV cabling. The only cable permitted to move within the pole or lowering device during lowering or raising shall be the stainless steel lowering cable. All other cables shall remain stable and secure during lowering and raising.

The CLD shall support the Camera Assembly a minimum of 20" from the pole. The CLD shall be designed to permit a ± 3 degree of horizontal adjustment for leveling the dome enclosure. The lowering cable shall be a minimum 5/32" diameter stainless steel aircraft cable with a minimum breaking strength of 2400 pounds.

Weights and/or counterweights shall be provided as necessary to assure that the alignment pin and connectors are proper for the camera support to be raised into position without binding and that sufficient weight is present on the camera and its control components that it can be lowered properly.

c. Portable Camera Lowering Device Tool

Furnish and test one Portable Lowering Tool capable of being operated by a hand winch and an electric drill motor, which is fully compatible with the CLD and the Steel Camera Pole and meets the following requirements:

- 1) The Portable Lowering Tool shall be one recommended by the manufacturer of the CLD
- 2) The Portable Lowering Tool shall have a minimum load capacity of 200 pounds with a 10 to 1 safety factor.
- 3) The tool shall consist of a lightweight metal frame and winch assembly with cable, a quick release cable connector, an adjustable safety clutch and a variable speed industrial duty electric drill motor.
- 4) This tool shall be compatible with the hand hole of the pole and the CLD inside the hand hole.
- 5) When attached to the hand hole, the tool will support itself and the load assuring lowering operations and provide a means to prevent freewheeling when loaded.
- 6) The Portable Lowering Tool shall be delivered to the Engineer upon project completion.
- 7) The Portable Lowering Tool shall have a reduction gear to reduce the manual effort required to

operate the lifting mechanism.

- 8) The Portable Lowering Tool shall be provided with an adapter for operating the lowering device by a portable drill using a clutch mechanism.
- 9) The Portable Lowering Tool shall be equipped with a positive locking mechanism to secure the cable reel during raising and lowering operations.

d. Construction Methods

Install the CCTV pole standard per the TDOT Standard Specifications, and pole manufacturer's design standards.

The CCTV camera shall be installed per the manufacturer Installation and Operation Manual, in the outdoor pendant configuration.

The CCTV control and communications hardware and enclosure shall be wired and installed per the City of Franklin Standard Detail manufacturer Installation and Operations Manuals indicated above.

TRAFFIC SIGNAL SUPPORTS

730.32 Cantilever Signal Supports

This Subsection applies to the manufacture of steel poles and mast arms for the support of traffic signals. The height of poles, shaft dimensions and wall thickness shall meet the design requirements and mounting height of traffic signals as set forth in these Specifications and shown on the Plans. The Plans indicate bracket/mast arm lengths.

Furnish poles consisting of a straight or uniformly tapered shaft, cylindrical or octagonal in cross-section, having a base welded to the lower end and complete with anchor bolts. All castings shall be clean and smooth with all details well defined and true to pattern. Steel castings shall conform to ASTM A27, Grade 65-35. Gray iron castings shall conform to ASTM A126, Class A.

All mast arms shall be compatible with the poles in material, strength, shape, and size.

Determine the size and design of all steel signal support poles and foundations. Shop drawings for the proposed poles, support structures and foundations shall be submitted to the Department and the City of Franklin for review and approval.

A. Anchor Base

Secure an anchor base of one-piece cast steel or steel plate of adequate strength, shape, and size to the lower end of the shaft. Place the base so as to telescope the shaft, and weld at the top and bottom faces with continuous fillet welds so that the welded connection develops the full strength of the adjacent shaft section to resist bending action. Provide each base with a minimum of four holes to receive the anchor bolts. Provide cast steel bases with removable cast iron covers for anchor bolts and tapped holes for attaching covers with hex head cap screws.

Provide a welded frame handhole, 5 x 8 inches minimum and located with a clear distance above the base of no less than the pole diameter, "D". Weld a 1/2-inch 13 UNC grounding nut to the inside of the pole at a point readily accessible for wiring.

B. Shaft

Fabricate shafts from the best, hot-rolled basic open hearth steel. The shaft shall have only one longitudinal electrically welded joint and may have electrically welded intermediate transverse full penetration circumferential

joints, at intervals of not less than 10 feet. The shaft shall be longitudinally cold-rolled to flatten the weld and increase the physical characteristics so that the metal will have minimum yield strength of 48,000 pounds per square inch. Where transverse full penetration circumferential welds are used, the shaft fabricator shall furnish to the Engineer certification that: (1) all such welds have been radiographed and ultrasonically tested by an independent testing laboratory using a qualified Nondestructive Testing (NDT) technician and (2) the NDT equipment has been calibrated annually.

Fit the shaft with a removable pole cap, a J-hook wire support welded inside near the top, and a flange plate assembly to match that welded to the butt end of the mast arm.

C. Mast Arms

Provide mast arms fabricated and certified in the same manner as the upright shafts and that have the same physical characteristics.

The mast arms shall meet the design requirements necessary to support rigidly mounted traffic signals as shown on the Plans. All arms shall include a removable cap at the tip, grommets wire outlets, and signal hanger assemblies of the type and number shown on the Plans, and a flange plate welded to the butt end to provide a rigid connection to the mast. The assembly shall be constructed so that all wiring can be concealed internally.

Connect mast arms to the upright pole at a height necessary to provide a minimum clearance of 16 feet 6 inches and a maximum clearance of 19 feet under the traffic signal heads. Install separate signal heads to provide the same clearance.

D. Finish

Galvanize steel poles, mast arms, and hardware in accordance with ASTM A123.

Galvanize all steel and cast iron components, hardware, and threaded fasteners, except anchor bolts, after fabrication in accordance with ASTM A123, or A153 or A385, as applicable.

The steel supports shall be finished by the manufacturer in Franklin Green (Downtown Historical District) or Black, as specified by the plans. Any deficiencies in the finish shall be touched upon a method approved by the manufacturer and the City of Franklin.

730.33 Steel Strain Poles

Provide steel strain poles consisting of a uniformly tapered or equivalent upright shaft fitted with a removable pole top, J-hook wire support and 45-degree wire inlet near the top, a span wire clamp, a 5 x 8 inch handhole with reinforced frame and cover, bent anchor bolts, and all other accessories needed to make a complete installation. The pole and all of its component parts shall be designed to support tethered traffic signals of the type and number shown on the Plans, suspended from a span wire assembly. Fabricate and certify the poles as specified for the upright shafts in **730.32**.

Determine the size and design of all steel strain poles and foundations. Shop drawings for the proposed poles shall be submitted to the Department and the City of Franklin for review and approval.

Determine the shaft length required to meet field conditions and vertical clearances of signal heads over the roadway. The signal head clearance shall be a minimum of 16 feet 6 inches and a maximum of 19 feet. Fasten the span wire no closer than 1 foot 6 inches from the top of the pole.

Unless otherwise specified, provide all strain pole traffic signal supports with a one-piece anchor type base, fabricated from drop forged or cast steel of sufficient cross-section to fully develop the ultimate strength of the poles. Fasten the base to the pole with a welded connection that develops the full strength of the pole. Provide the base with a minimum of four holes of sufficient size to accommodate the proper size anchor bolts that are capable of resisting at yield

strength stress, the bending moment of the shaft at its yield strength stress. Provide removable cast iron covers for the anchor bolts.

The shaft shall be fabricated from material providing minimum yield strength of 48,000 pounds per square inch after fabrication.

Galvanize the steel poles and hardware in accordance with ASTM A123.

Galvanize all steel and cast iron components, hardware, and threaded fasteners, except anchor bolts, after fabrication in accordance with ASTM A123, or A153 or A385, as applicable.

730.34 Pedestal Support Signal Poles

Provide pedestal poles consisting of one upright pole with suitable base and other accessories or hardware as required making a complete installation.

All poles shall be made of one continuous piece from top of base connection for the entire height of the pole. The cross-section shall be either cylindrical or octagonal and may or may not be uniformly tapered from butt to tip.

The cross-section at the tip shall have a 4-1/2 inch outside diameter.

The steel supports shall be finished by the manufacturer in Franklin Green (Downtown Historical District) or Black, as specified by the plans. Any deficiencies in the finish shall be touched up in a method approved by the manufacturer and the City of Franklin.

A. Type "A" Pedestal (Aluminum)

Pedestals shall be of uniform octagonal or cylindrical cross-section of the tubular tapered type fabricated of one full length sheet.

Bases shall be octagonal or square in shape, of the ornamental type fabricated of cast material. Provide a handhole in each base.

Caps shall be of the nipple or tenon type mounting fabricated of cast material.

Furnish bases with four steel anchor bolts of sufficient size and length to securely anchor the base to the concrete footing. Weld the shaft to the cast metal base. Refer to the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (current edition).

Type A pedestal shaft shall be fabricated from aluminum tubing 6063-T4 heat treated to T-6 temper after fabrication, and meeting ASTM B221.

Type A anchor base shall be made of sand-cast aluminum alloy 356-T6 meeting ASTM B26 - SF 70A-T5 specifications.

B. Type "B" Pedestal (Steel)

Pedestals shall be fabricated from a 4-1/2 inch (outside diameter) seamless steel pipe.

Bases shall be octagonal in shape of the ornamental type fabricated of cast or malleable iron and shall have minimum height of 12 inches. The top opening of the base shall be threaded to receive the shaft. Provide a handhole in each base.

Furnish bases with four steel anchor bolts of sufficient length to securely anchor the base to the concrete footing.

730.35 Wooden Pole Signal Supports**A. General**

Provide wooden poles of the class and length shown on the Plans and that meet **917.11**. Set poles to the depth shown on the Plans, and fit them with all the necessary hardware to make the installation complete.

The signal head clearance shall be 16 feet 6 inches minimum and 19 feet maximum. Fasten the span wire at least 2 feet below the top of the pole.

B. Guying Components

Guy clamps shall be steel, 3-bolt type, 6 inches in length, and of the proper strand size to fit the wire used. The clamp bolts shall have upset shoulders fitting into the clamp plate. Substitution of the cable grip is subject to the Engineer's approval.

Attach guy wire to the pole with a 5/8-inch diameter x 12-inch length single strand angle-type eye bolt with 2 x 2 inch square cut washers; lock washer, and square nut.

Instead of the eye bolt specified above, an angle single strand eye of drop forged steel may be used, fastened on threaded end of span wire eye bolt.

Sidewalk guy fittings shall consist of 2-inch inside diameter standard galvanized steel pipe of required length with malleable iron pole plate and guy clamp. Fasten the pole plate to the pole with a 3/8-inch thru bolt and 1/2-inch lag screws.

All guying components and hardware shall be galvanized in accordance with ASTM A123 or A153.

Anchors for guys shall be of the pressed steel four-way expanding fluke type or of the steel or malleable iron sliding plate type. The minimum unexpanded diameter shall be 8 inches, and the minimum expanded area shall be 110 square feet. Coat anchors with a black asphaltic paint.

Guy anchor rods shall be drop-forged steel, 3/4-inch diameter and 7-foot minimum length, threaded, of the single thimble eye type, with a square anchor bolt nut.

730.36 Pole Location

Install all signal support poles at the locations shown on the Plans or where directed by the Engineer. Some field adjustments may be required in order to avoid conflicts with either underground, above ground or overhead utilities. Determine and stake the optimum locations for the poles/controller and for receiving approval from the City of Franklin before installation begins. Proper roadside clear zones shall be followed.

COMPENSATION**730.37 Method of Measurement**

Measurement for traffic signals will be on a per item basis for each item to be furnished and installed, as specified herein and shown on the Plans.

With regard to items for signal head assemblies, each item to be furnished, installed, or both furnished and installed shall be distinguished with a code number as follows:

1. The first digit is the number of faces per assembly.
2. The second digit will indicate the number of 12-inch lenses per assembly (including arrow lenses).
3. The third digit is the quantity of 8-inch lenses per assembly.
4. The letter "A" indicates an arrow lens and the digit following the "A" indicates the number of 12-inch arrow lenses per assembly.
5. The letter "H" or "V" indicates the arrangement of arrow signal lenses to be horizontal or vertical with respect to solid ball indications.

EXAMPLE:

1 5 0 A 2 H

Digits indicate the following:

1 = one face

5 = five 12-inch lenses

0 = zero 8-inch lenses

A2 = two 12-inch arrow lenses

H = Arrow lenses placed horizontally with respect to circular indications

A. Removal of Signal Equipment

The Department will measure items of equipment or material designated or required for removal on a per each intersection basis. Removal and salvage of all signal heads, poles, control equipment, cabinets, span wire, cable, and similar features to be performed at an intersection shall be included as a unit cost per each intersection. This includes the cost of stockpiling salvable equipment and delivery to the City of Franklin, as noted in the Plans. Remove any traffic control related equipment that is in conflict with the proposed equipment and deliver to the City of Franklin Street Department facility. All new or temporary signals shall be removed and stockpiled in such a manner that the removed equipment will not be damaged. Poles shall be removed complete and undamaged. The pole shall be cleaned of any concrete foundation material. Any damage due to negligence or lack of proper care of equipment shall be replaced in kind. The replacement of the equipment shall be at no additional cost to the Department or City of Franklin. All such removed and salvageable equipment is now and shall remain the property of the City of Franklin.

Signal Head Assembly (includes Pedestrian Signal Heads)

The Department will measure signal heads of the type shown on the Plans by the individual assembly complete in place, per each. This item shall include the signal heads, terminals, lamps, attachment hardware, cable connection, and testing.

Pull Box

The Department will measure each pull box of the type required as one complete unit, installed, per each. This item includes the pull box, excavation, backfilling, crushed stone base, and other incidental items as called for in the Plans or Standard Drawings.

Electrical Service Connection

The Department will measure Electrical Service Connections on a per each signal installation basis. This item includes the electrical service supplied to the weatherhead by the local utility, all necessary materials and labor for connection of the electrical service from the controller to the weatherhead, the wiring of the controller and detectors, and all incidentals necessary to render a complete and operable system.

Signal Cable

The Department will measure the length of Signal Cable of each size (number of conductors) installed in linear feet to the nearest foot from point to point along the routing for each cable.

The Department will make horizontal measurements by center to center measurement from:

1. Pole to pole
2. Pole to signal head (when terminating in a signal head)
3. Pull box to pull box
4. Pull box to pole
5. Pull box to pole-mounted or base-mounted controller

For cable inside mastarms, the Department will measure from center of vertical support to signal head where cable terminates.

The Department will make vertical measurement by one of the following:

1. For cable inside poles or conduit risers, the distance from ground level to the point of attachment of the span wire.
2. For cable inside mast arm supports, the distance from ground level to the mast arm connection.
3. For cable to pole-mounted controller,
 - a. From ground level to bottom of controller.
 - b. From bottom of controller to point of attachment of span wire.
4. For cable to pole-mounted signal head or pushbutton,
 - a. From ground level to bottom of signal head or pushbutton
 - b. From bottom of signal head or pushbutton to point of attachment of span wire.

The Department will make no additional allowance for slack length, length inside equipment or supports (except as noted), length for the required 360-degree drip loop, and similar instances requiring additional length of cable.

Span Wire

The Department will measure Span Wire Assembly, Tether Wire Assembly, and Messenger Cable by type in linear feet to the nearest foot. The measurement will be made from center to center of poles. These items include attachment hardware, strain insulators, and other hardware shown in the Plans as part of the assembly. The Department will make no additional allowance for slack length and other instances requiring additional length of wire.

Steel Conduit Riser Assembly

The Department will measure conduit riser assemblies per each for each size conduit riser installed on the outside of a pole, as shown on the Plans. This item includes conduit, weatherhead, conduit, fittings, nuts, washers, banding, clamps, grounding, and other items necessary for installation.

Conduit

The Department will measure conduit in linear feet to the nearest foot for each size and type of conduit installed.

The Department will measure underground conduit along the conduit by one of the following:

1. From the face of curb to the center of a pull box, pole or controller foundation,
2. From center to center of pull boxes,
3. From center to center of a pull box and a pole or controller foundation, or
4. From center to center of pole foundations or pole foundation and controller foundation.

The Department will add:

1. 1 foot to the above measurements for each entry to a pull box or pole foundation and each exit of a pull box or pole foundation.
2. 3 feet to the measurement for each capped extra entry (conduit stub) or exit to a pull box or pole foundation installed, as shown on the Plans.
3. 3 feet to the measurement for each connection between underground conduit and above ground riser.
4. 3 feet to the measurement for each entry or exit to a foundation for a base-mounted controller.

This item includes trenching, backfilling, sealing, capping, fittings, bushings, banding, grounding, and other accessories and hardware required for installation of the conduit system.

Vehicle Detector (Description)

The Department will measure vehicle detector loop amplifier per each unit, including the cable and associated hardware necessary to electrically connect the amplifier to the controller and loop lead in.

The Department will measure two and four channel card rack type amplifiers per each unit, including the cable, card rack(s), and associated hardware necessary to electrically connect the amplifiers to the controller and loop lead-ins.

The Department will measure radar detectors per each including all mounts/supports, cable boxes, conductors, detector rack cards, interface devices and all items necessary for a fully functioning Wavetronix detection system.

The Department will measure Radio/GPS activated priority control detectors with all antennas, radio units, phase selectors, cable, interface devices and all items necessary for a fully functioning Radio/GPS activated priority control system.

The Department will measure wireless magnetometer detectors per each including all in-pavement installations, repeaters, mounts/supports, isolators, access point controller cards, radio wired interface devices and all items necessary for a fully functioning wireless detection system.

Shielded Detector Cable

The Department will measure the two-conductor shielded detector cable installed between the controller cabinet and the loop detector wires in linear feet to the nearest foot.

The Department will make horizontal measurements (overhead and underground) by one of the following:

1. From center to center of pull boxes,
2. From center to center of pull box and pole,
3. From center to center of poles, or
4. From center to center of pull box or pole and controller foundation.

The Department will make vertical measurements by one of the following:

1. From ground level to the point of attachment of span wire, inside pole or conduit riser,
2. From the bottom of controller cabinet to the point of attachment of span wire, or
3. From ground level to the bottom of controller.

The Department will make no additional allowance for slack length, length inside equipment or supports (except as noted), splices, and similar instances requiring additional length of cable.

Saw Slot

The Department will measure the length of saw slot for installation of detection loop and lead wiring in linear feet to the nearest foot. Measurement for detection loops in the traffic lanes will be made based on the loop size shown on the Plans (the nominal length plus the nominal width) times 2. The Department will make no additional allowance for saw overruns to obtain full depth of saw slot or diagonal cuts to prevent sharp bends in the loop wire. The Department will measure saw slot for detection loop leads from the conduit entry at the face of curb or edge of pavement and along the route of the lead-in to the detection loop.

This item includes backing rods, or polyethylene foam sealant, loop sealant, and all other incidentals necessary to render a complete and operable system.

Loop Wire

The Department will measure the length of loop wire for installation of detection loops and lead-ins in linear feet to the nearest foot. Measurement will be made from the pull box or pole to the detection loop, around the loop the required number of turns and back to the pull box, pole, or point of splice. The Department will make no additional allowance for slack length, length inside equipment or supports, splices, and similar instances requiring additional length of wire.

This item includes electrical connections, testing, and all other incidentals necessary to render a complete and operable system.

Controller

The Department will measure controllers as one complete unit, installed, per each. This item includes all auxiliary equipment shown the Plans to provide signalization control as shown on the Plans, and all hardware, including the cabinet (and cabinet foundation, if base-mounted), necessary for installation.

Wood Pole

The Department will measure Wood Poles, of the type and size shown on the Plans, per each, installed.

Guying Device

The Department will measure Guying Devices, of the type shown on the Plans, per each, installed. This item includes the guy wire, anchor, clamps, and all other components shown on the Plans necessary for installation.

Steel Strain Pole

The Department will measure Steel Strain Poles of the type and size shown on the Plans, per each, installed. This item includes the pole, foundation, anchor bolts, grounding, and all other hardware shown on the Plans necessary for a complete installation.

Cantilever Signal Support

The Department will measure Cantilever Signal Supports, of the type and size shown on the Plans, per each, installed. This item includes the vertical pole shaft, mast arm, foundation, anchor bolts, grounding, and all other hardware shown on the Plans necessary for a complete installation.

Service Cable

The Department will measure two conductor power service cables, of the type and size shown on the Plans, in linear feet to the nearest foot, installed. Horizontal runs will be measured center to center of poles. Vertical runs will be measured from the ground to the weatherhead inside a pole or conduit riser, or from the ground to the

bottom of the controller, or from the bottom of the controller to the weatherhead. This item includes all necessary attachment hardware. The Department will make no additional allowance for slack length or other instances requiring additional length of cable.

Pedestrian Pushbutton with Sign

The Department will measure Pedestrian Pushbutton with Sign as one complete unit, in place, per each. This item includes the pushbutton, sign, mounting hardware, wiring of pushbutton, testing, and all other incidentals necessary for a complete installation.

Pedestrian Signal Display with Pushbutton and Sign

The Department will measure Pedestrian Signal Display with Pushbutton and Sign as one complete unit, in place, per each. This item includes the signal heads, terminals, lamps, cable connections, pushbutton, sign, all attachment hardware, testing, and other incidentals necessary for a complete installation.

Portable Traffic Signal

The Department will measure Portable Traffic Signal, of the type shown on the Plans or as directed by the Engineer, per each, installed. This item includes the all of the software and hardware necessary for a complete installation.

Pedestal Support Signal Pole

The Department will measure Pedestal Support Signal Poles, of the type and size shown on the Plans, per each, installed. This item includes the vertical pole shaft, base, foundation, anchor bolts, grounding, and all other hardware shown on the Plans necessary for a complete installation.

Internally Illuminated Street Name Signs

The Department will measure Internally Illuminated Street Name Signs of the type and size shown on the Plans, per each, installed. This item shall include the street name sign, terminals, lamps, attachment hardware, electrical connection, and testing for a complete installation.

Fiber Optic Drop Cable

The Department will measure Fiber Optic Drop Cable, of the type and size shown on the Plans, in linear feet to the nearest foot, installed. Horizontal runs will be measured center to center of poles. Vertical runs will be measured from the ground to the weather head inside a pole or conduit riser, or from the ground to the bottom of the controller, or from the bottom of the controller to the weather head. This item includes all necessary attachment hardware.

Interconnect Cable – Fiber Optic

The Department will measure Interconnect Cable - Fiber Optic, of the type and size shown on the Plans, in linear feet to the nearest foot, installed. Horizontal runs will be measured center to center of poles. Vertical runs will be measured from the ground to the weather head inside a pole or conduit riser, or from the ground to the bottom of the controller, or from the bottom of the controller to the weather head. This item includes all necessary attachment hardware.

Fiber Optic-Splice Closure & Aerial Splice Closure

The Department will measure the Fiber Optic Splice Closure, as shown on the Plans, per each installed. This item includes all materials, labor, tools, equipment, and incidentals necessary to complete the work, and all testing and documentation.

Fiber Optic Termination Panel

The Department will measure Fiber Optic Termination Panel, of the type and size shown on the Plans, per each installed. Termination panels shall contain the necessary fiber optic connector modules, label covers and associated splicing for locations indicated on the Plans. This item includes all materials, labor, tools, equipment, and incidentals necessary to complete the work, and all testing and documentation.

Fiber Optic Fusion Splice

The Department will measure Fiber Optic Fusion Splice, as shown on the Plans, per each splice location installed. The item shall include but not limited to, all fusion splices at that given location, all ancillary and incidental materials, testing, documentation, and all labor and equipment necessary to complete the work for all necessary splices at a given location. This price shall be full compensation for all labor, tools, materials, equipment, and incidentals necessary to complete the work.

Fiber Optic Fusion Splice

The Department will measure Fiber Optic Storage Bracket (Aerial), of the type and size shown on the plans, per each installed. This item shall include all materials, labor, tools, equipment, and incidentals necessary to complete the work, and all testing and documentation.

CCTV Camera System

The Department will measure CCTV Camera System, as shown on the Plans, per each installed and fully operational. This item shall include furnishing, installing, system integration, training, documentation, and testing of a complete CCTV Camera System including the CCTV Camera Assembly, PT unit, zoom lens, enclosure, camera controller/receiver, coaxial cable (if required and approved), outdoor rated category 5e cable, control/signal cable, power cable, surge suppressors and conduit between the camera and the cabinet, connections to support structures, attachment hardware and brackets and all incidental items to provide and install the CCTV Camera System as intended, as well as the satisfactory completion of all testing requirements and all work, equipment and appurtenances as required for a full CCTV Camera System.

This item shall also include all local configuration and control manufacturer software, system documentation including: shop drawings, operations and maintenance manuals, wiring diagrams, block diagrams and other materials necessary to document the operation of the CCTV Camera System; integration and configuration into the existing TOC video wall and controller, and testing for display of the video on the existing video wall.

CCTV Pole and Lowering Device

The Department will measure CCTV Pole and Lowering Device, of the type and size shown on the Plans, per each, installed. This item includes the pole, foundation, anchor bolts, grounding, lowering device, portable lowering device tool, and all other hardware necessary for a complete installation.

730.38 Basis of Payment

The Department will pay for accepted quantities, complete in place, at the contract prices as follows:

| <i>Item</i> | <i>Pay Unit</i> |
|------------------------------------|-----------------|
| Traffic Signal | Lump Sum |
| Removal of Signal Equipment | Each |
| Signal Head Assembly (Description) | Each |

| | |
|--|-------------|
| Install Pull Box (Description) | Each |
| Electrical Service Connection | Each |
| Signal Cable – (Description) | Linear Feet |
| Span Wire Assembly (___ pounds min. break strength) | Linear Feet |
| Tether Wire Assembly – ___" Diameter | Linear Feet |
| Messenger Cable – ___" Diameter | Linear Feet |
| Riser Assembly (Description) | Each |
| Conduit ___" Diameter (Type) | Linear Feet |
| Vehicle Detector (Description) | Each |
| Shielded Detector Cable | Linear Feet |
| Saw Slot | Linear Feet |
| Loop Wire | Linear Feet |
| Controller (Description) | Each |
| Wood Pole (Description) | Each |
| Guying Device (Description) | Each |
| Steel Strain Pole (Description) | Each |
| Cantilever Signal Support (Description) | Each |
| Pedestal Support Signal Pole (Description) | Each |
| Service Cable | Linear Feet |
| Pedestrian Pushbutton with Sign | Each |
| Pedestrian Signal Display with Pushbutton and Sign | Each |
| Portable Traffic Signal (Type) | Each |
| Internally Illuminated Street Name Signs | Each |
| Fiber Optic Drop Cable (Description) | Linear Feet |
| Interconnect Cable - Fiber Optic (Description) | Linear Feet |
| Fiber Optic Splice Closure | Each |
| Fiber Optic Aerial Splice Closure | Each |
| Fiber Optic Termination Panel (Description) | Each |
| Fiber Optic Fusion splice | Each |
| Fiber Optic Storage Bracket (Description) | Each |
| CCTV Camera System | Each |
| CCTV Pole (Description with lowering device) | Each |

The unit price to be paid includes the cost of furnishing and installing, complete in place, each of the various types of equipment required by the Summary of Quantities shown on the Plans. Total payment is full compensation for all materials, labor, equipment, and incidentals necessary to produce a completely operative and finished installation of a traffic signal or traffic signal system as shown on the Plans and as specified herein, including restoration of pavements, sidewalks, and appurtenances damaged or destroyed during construction and tests. All additional materials and labor not specifically shown or called for, which are necessary to complete the traffic signal installation or traffic signal system described, will be considered incidental to the system and no additional allowance will be made.

SPECIAL PROVISION
REGARDING
UTILITY RECORD DRAWINGS

PART 1 – GENERAL

1.1 SCOPE

1.1.1 General

The following specifications define the requirements for the preparation and submittal of the Utility Record Drawings for all utilities included in the Contract Documents.

1.1.2 Work Included

The Contractor shall, unless specified otherwise, provide all materials, equipment, tools, and labor necessary for surveying as-built utility installations, and preparation and submittal of Utility Record Drawings. All surveying and Utility Record Drawings must be done by a Professional Surveyor licensed in the State of Tennessee.

1.1.3 Location of the Work

The location of this work is as shown in the Contract Documents.

1.1.4 Coordination of the Work

The Contractor shall be responsible for the satisfactory coordination of the surveying activities with other construction and activities in the area. Delays in work resulting from lack of such harmony shall not in any way be a cause for extra compensation by any of the parties.

1.1.5 Working Hours

The work shall be carried out in accordance with local ordinance and not to cause any unreasonable nuisance to affected residents. Under emergency conditions, this limitation may be waived by the consent of the City of Franklin, TN.

1.2 METHOD OF MEASUREMENT & PAYMENT

All surveying and record preparation must be done by a Professional Surveyor licensed in the State of Tennessee. The work shall be measured, and the compensation determined in the following manner:

1.2.2 Record Drawings

The preparation and submittal of the record drawings shall be paid for on a lump sum basis including preparing and submitting the Professional Surveyor signed and sealed set of Record Drawings in accordance with the requirements listed in this special provision.

1.3 SUBMITTALS

1.3.1 The contractor shall submit the Record Drawings, which are signed and sealed by a State of Tennessee Registered Surveyor, in the following formats: two (2) full-size (paper size shall be 22" x 34" or 24" x 36" with a maximum scale of 1"= 50'), one (1) digital PDF to the same scale as the full-size paper drawings, and Computer-Aided Design and Drafting (CADD) digital files in AutoCAD (DWG) or MicroStation (DGN) format, prepared utilizing the same coordinate system as shown in the Contract Documents.

PART 2 – PRODUCTS**2.1 MATERIALS**

The contractor shall furnish all materials of adequate quality for the purpose intended, including all stakes, pipes, paint, and all other materials necessary to properly perform the required work. Stakes and pipes shall be suitable for general field construction staking and shall be durable enough to last from installation of the utility to the surveying for the preparation of the Record Drawings. Any stakes and pipes damaged during the duration of the contract shall be replaced and re-set at their proper location with no additional compensation being made therefore.

PART 3 – EXECUTION**3.1 GENERAL**

3.1.1 The Engineer of Record will provide the CADD Drawings to the project's contractor for use by the Professional Surveyor for the production of the Record Drawings.

3.2 SURVEYING REQUIREMENTS

All surveying for the project shall be done by or under the supervision of a Tennessee licensed Professional Surveyor. The Professional Surveyor shall review the work, resolve problems, and make decisions in a timely manner.

3.3 SURVEYING FOR RECORD DRAWINGS

The contractor shall only be required to provide Record Drawings for the various systems listed below in sections 3.3.1 thru 3.3.10 that have been or will be modified, altered, installed, constructed, or otherwise disturbed as a part of the construction contract to which this Special Provision has been attached or included.

3.3.1 Property Lines and Easements

The surveyor shall show all property lines and easements included in the Contract Documents.

3.3.2 Stormwater Record Drawings

The following stormwater items shall be included: stormwater culverts and pipes (including: material, slope and length), structures (manholes, catch basins, junction boxes, end walls, outlet structures, etc. [including rim elevations and inverts]) and permanent stormwater Best Management Practices (BMPs) with depicting 1' contours and 25' around the permanent stormwater BMPs (including: detention ponds, retention ponds, bioretention ponds, infiltration trenches, etc.).

3.3.3 City of Franklin, TN Traffic Signals and Fiber Optics Record Drawings:

The following traffic signal and fiber optics shall be included: signal poles, pedestrian poles, CCTV poles, school zone flashers, signal cabinets, conduit (including: conduit size, number of conduit, material, length, description of utility located in conduit, etc.), electrical service pedestals, pull boxes and vehicle detectors.

3.3.4 Street and/or Site Lighting System:

The following street and pedestrian lighting systems shall be included: light poles, pull boxes, conduit (including: conduit size, number of conduit, material, length, description of utility located in conduit, etc.), controller cabinets and service pedestal.

3.3.5 Water Record Drawings:

The following potable water items shall be included: public and private water mains (including: size and material), private laterals (including: size and material), valves (including type: gate valve, blow off valve, air release valve, etc.), meters and enclosures (including: type, size and material), backflow preventers and enclosures (including: type, size and material) and fire suppression items (including: hydrants, meters, fire department connections, etc.). Reference specific utility provider technical specifications and guidelines for additional requirements.

3.3.6 Sanitary Sewer Record Drawings:

The following sanitary sewer items shall be included: public and private gravity sanitary sewer mains (including: material, slope and length), structures (including: rim elevations and all inverts), cleanouts, private laterals (including: size and material), low pressure pumps (including size), force mains (including: material, slope, depth and length), pump stations (including: buildings, driveways, fences, enclosures, etc.), and valves (including valve type).

3.3.7 Reclaimed Water Record Drawings:

The following reclaimed water items shall be included: public and private reclaimed water mains (including: size and material), private laterals (including size and material), valves (including type [e.g. gate valve, blow off valve, air release valve, etc.]), meters / meter boxes (including size), backflow preventers and enclosure (including: type, size and material) and fire hydrants.

3.3.8 Natural Gas Record Drawings:

The following natural gas items shall be included: public and private gas mains (including: size and material), valves (including: size and type), regulating stations, services, and meters.

3.3.9 Electrical and Communications Record Drawings:

The following electrical and communications (*i.e.* phone, cable, fiber optic, etc.) items shall be included: pole locations, riser poles, conduit (including: conduit size, number of conduit, material, length, description of utility located in conduit, etc.), pull boxes, transformers/switches, equipment pads, vaults/manholes (including rim elevations), services runs, service pedestals and meters.

3.3.10 Irrigation:

The following irrigation items shall be included: irrigation tap locations, meter locations, pump stations, backflows, controllers, sensors, all pipe sizes/materials, sleeves, valve locations, sprinkler heads, etc. Plans shall include dimensional data from building walls, curbs, sidewalks, etc.

END OF SPECIAL PROVISION

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PROPOSAL

TO THE CITY OF FRANKLIN, TENNESSEE

By submitting this Proposal, the undersigned bidder represents that it has carefully examined the site of the work described herein, has become familiar with local conditions and the character and extent of the work; has carefully examined the Plans, the *Standard Specifications for Road and Bridge Construction* (January 1, 2021) adopted by the State of Tennessee, Department of Transportation, with subsequent revisions which are acknowledged to be a part of this Proposal, the Special Provisions, the Proposal Form, the Form of Contract, and the Form of Contract Payment and Performance Bond; and thoroughly understands their stipulations, requirements, and provisions.

The undersigned bidder has determined the quality and quantity of materials required; has investigated the location and determined the sources of supply of the materials required; has investigated labor conditions; and, has arranged for the continuous prosecution of the work herein described.

By submitting this Proposal, the undersigned bidder agrees to provide all necessary equipment, tools, labor, incidentals, and other means of construction, to do all the work, and furnish all the materials of the specified requirements which are necessary to complete the work in accordance with the Plans, and the Specifications, and agrees to accept as payment in full the unit prices for the various items described in the Specifications that are set forth in this Proposal. The bidder understands that the quantities of work specified are approximate only and are subject to increase or decrease and that any such increase or decrease will not affect the unit prices set forth in this Proposal. Compensation for "extra work" which may be required by the CITY OF FRANKLIN in connection with the construction and completion of the work but which was not reflected in the Plans and Specifications at the time of bidding, will be made in the following manner: work for which there is a unit price set forth in this Proposal will be compensated at that unit price; work for which there is no unit price set forth in this Proposal will be compensated in accordance with the applicable Tennessee Department of Transportation Standard Specifications.

By submitting this Proposal, the parties hereto, in the performance of this Contract, shall not act as employees, partners, joint ventures, or associates of one another. It is expressly acknowledged by the parties hereto that such parties are independent contracting entities and that nothing in this Contract shall be construed to create an employer/employee relationship or to allow either to exercise control or direction over the manner or method by which the other transacts its business affairs or provides its usual services. The employees or agents of one party shall not be deemed or construed to be the employees or agents of the other party for any purpose whatsoever.

By submitting this Proposal, the undersigned bidder, if awarded the contract, agrees that it will be responsible for compliance with the Patient Protection and Affordable Care Act ("PPACA") with respect to itself and its employees, including any obligation to report health insurance coverage, provide health insurance coverage, or pay any financial assessment, tax, or penalty for not providing health insurance. The Contractor shall indemnify the State and hold it harmless for any costs to the State arising from Contractor's failure to fulfill its PPACA responsibilities for itself or its employees.

By submitting this Proposal, the undersigned bidder, if awarded the contract, shall be registered with the Department of Revenue for the collection of Tennessee sales and use tax or provide confirmation from the Department of Revenue that the bidder is not required to register for the Tennessee sales and use tax. This registration requirement is a material requirement of this Contract.

By submitting this Proposal, the undersigned bidder hereby agrees to be bound by the award of the Contract and, if awarded the Contract on this Proposal, to execute the required Contract and the required Contract Payment and Performance Bond within ten (10) days after receipt of notice of the award. The undersigned bidder submits herewith the required Proposal guaranty in an amount of not less than five percent (5%) of the total amount of the Proposal offered and agrees and consents that the Proposal guaranty shall immediately be at the disposal of the CITY OF FRANKLIN, not as a penalty, but as an agreed liquidated damage if the required Contract and Contract Payment and Performance Bond are not executed within ten days from receipt of the notice of award.

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each bidder is not on the list created pursuant to § 12-12-106. This list is generated to identify entities ineligible to contract with the State of Tennessee or any political subdivision of the State per the Iran Divestment Act, T.C.A. §§ 12-12-101 – 113, and the current list may be found at the Tennessee Department of General Services, Central Procurement Office, website under the Public Information Library webpage at the following link: https://www.tn.gov/content/dam/tn/generalservices/documents/cpo/library/public-information-library/List_of_persons_pursuant_to_Tenn._Code_Ann._12-12-106_Iran_Divestment_Act_updated_with%20NY12.04.23.pdf

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THIS PROPOSAL SUBMITTED BY:

Bidder (1)

By: _____

Printed Name and Title

Address

City/State/Zip

Bidder (1) being _____ composed of officers, partners, or owners as
a _____ follows:
(Type of business entity)

Name/Title Name/Title

Name/Title Name/Title

Name/Title Name/Title

Bidder (2)*

By: _____

Printed Name and Title

Address

City/State/Zip

Bidder (2) being _____ composed of officers, partners, or owners as
a _____ follows:
(Type of business entity)

Name/Title Name/Title

Name/Title Name/Title

Name/Title Name/Title

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BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

| FOOTNOTE(S) | ITEM NO. | ITEM DESCRIPTION | UNIT | EST QTY (PART) | EST QTY (NON-PART) | EST QTY (TOTAL) | UNIT PRICE | EXT. AMOUNT |
|-------------|-----------|--|------|----------------|--------------------|-----------------|------------|-------------|
| | 105-01 | CONSTRUCTION STAKES, LINES AND GRADES | LS | 1 | 0 | 1 | | |
| 9, 31 | 201-01 | CLEARING AND GRUBBING | LS | 1 | 0 | 1 | | |
| 18, 40 | 202-01 | REMOVAL OF STRUCTURES AND OBSTRUCTIONS | LS | 1 | 0 | 1 | | |
| | 202-04.01 | REMOVAL OF STRUCTURES (CANTILEVER AND RAILING) | LS | 1 | 0 | 1 | | |
| 19 | 203-01 | ROAD & DRAINAGE EXCAVATION (UNCLASSIFIED) | C.Y. | 164,567 | 0 | 164,567 | | |
| 14 | 203-02.01 | BORROW EXCAVATION (GRADED SOLID ROCK) | TON | 93,033 | 0 | 93,033 | | |
| | 203-03 | BORROW EXCAVATION (UNCLASSIFIED) | C.Y. | 25,289 | 0 | 25,289 | | |
| | 203-04 | PLACING AND SPREADING TOPSOIL | C.Y. | 3,032 | 0 | 3,032 | | |
| 20 | 203-05 | UNDERCUTTING | C.Y. | 16,394 | 0 | 16,394 | | |
| 21 | 203-06 | WATER | M.G. | 5,732 | 0 | 5,732 | | |
| | 203-07 | FURNISHING & SPREADING TOPSOIL | C.Y. | 15,375 | 0 | 15,375 | | |
| 1 | 204-07 | BEDDING MATERIAL (PIPE) CLASS B | C.Y. | 1,743 | 0 | 1,743 | | |
| | 204-08 | FOUNDATION FILL MATERIAL | C.Y. | 14 | 0 | 14 | | |
| 34 | 204-08.01 | BACKFILL MATERIAL (FLOWABLE FILL) | C.Y. | 42 | 1,979 | 2,021 | | |
| 4 | 209-03.53 | STREAM MITIGATION - ARTICULATED CONCRETE MAT | S.Y. | 1,500 | 0 | 1,500 | | |
| | 209-05 | SEDIMENT REMOVAL | C.Y. | 1,062 | 0 | 1,062 | | |
| 42 | 209-06.05 | BALED HAY OR STRAW | BALE | 48 | 0 | 48 | | |
| 2, 22 | 209-08.02 | TEMPORARY SILT FENCE (WITH BACKING) | L.F. | 126,000 | 0 | 126,000 | | |

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East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

| FOOTNOTE(S) | ITEM NO. | ITEM DESCRIPTION | UNIT | EST QTY (PART) | EST QTY (NON-PART) | EST QTY (TOTAL) | UNIT PRICE | EXT. AMOUNT |
|-------------|-----------|---|------|----------------|--------------------|-----------------|------------|-------------|
| 7, 22 | 209-08.07 | ROCK CHECK DAM | EACH | 5 | 0 | 5 | | |
| 7, 22 | 209-08.08 | ENHANCED ROCK CHECK DAM | EACH | 28 | 0 | 28 | | |
| 7 | 209-09.04 | SEDIMENT FILTER BAG(15' X 10') | EACH | 6 | 0 | 6 | | |
| 7, 22 | 209-09.43 | CURB INLET PROTECTION (TYPE 4) | EACH | 1 | 0 | 1 | | |
| 7, 23, 43 | 209-10.02 | 8IN SKIMMER W/6IN HEAD | EACH | 4 | 0 | 4 | | |
| 23 | 209-11.01 | SEDIMENT BASIN RISER (48", STRUCTURE B5) | EACH | 1 | 0 | 1 | | |
| 23 | 209-11.02 | SEDIMENT BASIN RISER (48", STRUCTURE F9) | EACH | 1 | 0 | 1 | | |
| 23 | 209-11.03 | SEDIMENT BASIN RISER (48", STRUCTURE K7) | EACH | 1 | 0 | 1 | | |
| 23 | 209-11.04 | SEDIMENT BASIN RISER (48", STRUCTURE J34) | EACH | 1 | 0 | 1 | | |
| 23 | 209-11.05 | SEDIMENT BASIN RISER (48", STRUCTURE J7) | EACH | 1 | 0 | 1 | | |
| 23 | 209-11.06 | SEDIMENT BASIN RISER (48", STRUCTURE X2) | EACH | 1 | 0 | 1 | | |
| 23 | 209-11.07 | SEDIMENT BASIN RISER (48", STRUCTURE X4) | EACH | 1 | 0 | 1 | | |
| | 209-11.20 | SEDIMENT BASIN BAFFLES | L.F. | 760 | 0 | 760 | | |
| 7, 23 | 209-40.41 | CATCH BASIN FILTER ASSEMBLY (TYPE 1) | EACH | 13 | 0 | 13 | | |
| 7, 23 | 209-40.42 | CATCH BASIN FILTER ASSEMBLY (TYPE 2) | EACH | 48 | 0 | 48 | | |
| 7, 23 | 209-40.43 | CATCH BASIN FILTER ASSEMBLY (TYPE 3) | EACH | 10 | 0 | 10 | | |
| 7, 23 | 209-40.44 | CATCH BASIN FILTER ASSEMBLY (TYPE 4) | EACH | 4 | 0 | 4 | | |
| 7, 23 | 209-40.45 | CATCH BASIN FILTER ASSEMBLY(TYPE 5) | EACH | 11 | 0 | 11 | | |
| 7, 23 | 209-40.46 | CATCH BASIN FILTER ASSEMBLY (TYPE 6) | EACH | 135 | 0 | 135 | | |

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BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

| FOOTNOTE(S) | ITEM NO. | ITEM DESCRIPTION | UNIT | EST QTY (PART) | EST QTY (NON-PART) | EST QTY (TOTAL) | UNIT PRICE | EXT. AMOUNT |
|-------------|-----------|---|------|----------------|--------------------|-----------------|------------|-------------|
| 7, 23 | 209-40.47 | CATCH BASIN FILTER ASSEMBLY (TYPE 7) | EACH | 31 | 0 | 31 | | |
| | 209-65.04 | TEMPORARY IN STREAM DIVERSION | L.F. | 30 | 0 | 30 | | |
| 24 | 303-01 | MINERAL AGGREGATE, TYPE A BASE, GRADING D | TON | 63,598 | 0 | 63,598 | | |
| | 303-01.02 | GRANULAR BACKFILL (BRIDGES) | TON | 268 | 0 | 268 | | |
| 44 | 303-10.01 | MINERAL AGGREGATE (SIZE 57) | TON | 12 | 0 | 12 | | |
| | 307-01.21 | ASP. CONC. MIX (PG70-22) (BPMB-HM) GR. A-S | TON | 8,509 | 0 | 8,509 | | |
| | 307-02.01 | ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING A | TON | 16,130 | 0 | 16,130 | | |
| | 307-02.08 | ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING B-M2 | TON | 9,523 | 0 | 9,523 | | |
| 17 | 308-01.10 | COLD IN-PLACE RECYCLED BITUMINOUS PAVEMENT | TON | 2,500 | 0 | 2,500 | | |
| | 402-01 | BITUMINOUS MATERIAL FOR PRIME COAT (PC) | TON | 169 | 0 | 169 | | |
| | 402-02 | AGGREGATE FOR COVER MATERIAL (PC) | TON | 671 | 0 | 671 | | |
| | 403-02.01 | TRACKLESS TACK COAT | TON | 52 | 0 | 52 | | |
| 7, 15 | 407-20.05 | SAW CUTTING ASPHALT PAVEMENT | L.F. | 3,313 | 0 | 3,313 | | |
| | 411-01.11 | ACS MIX (PG64-22) GRADING E RDWY | TON | 1,677 | 0 | 1,677 | | |
| | 411-02.10 | ACS MIX (PG70-22) GRADING D | TON | 3,750 | 0 | 3,750 | | |
| 17 | 411-50.02 | ASPHALT CONC. MAINT. MIX (PG64-22) GRADING D (PLACED) | TON | 1,250 | 0 | 1,250 | | |
| 16 | 415-01.02 | COLD PLANING BITUMINOUS PAVEMENT | S.Y. | 21,710 | 0 | 21,710 | | |
| 7, 15 | 502-04.01 | SAWING CONCRETE PAVEMENT (FULL DEPTH) | L.F. | 100 | 0 | 100 | | |
| | 604-01.20 | BOX TUBE SAFETY RAIL | L.F. | 1,021 | 0 | 1,021 | | |

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BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

| FOOTNOTE(S) | ITEM NO. | ITEM DESCRIPTION | UNIT | EST QTY (PART) | EST QTY (NON-PART) | EST QTY (TOTAL) | UNIT PRICE | EXT. AMOUNT |
|-------------|-----------|--|------|----------------|--------------------|-----------------|------------|-------------|
| | 604-02.01 | CLASS A CONCRETE (BOX BRIDGES) | C.Y. | 118 | 0 | 118 | | |
| | 604-02.02 | STEEL BAR REINFORCEMENT (BOX BRIDGES) | LB. | 21,022 | 0 | 21,022 | | |
| 1 | 604-02.03 | EPOXY COATED REINFORCING STEEL | LB. | 3,850 | 0 | 3,850 | | |
| 1 | 604-03.09 | CLASS D CONCRETE (BRIDGE DECK) | C.Y. | 13 | 0 | 13 | | |
| 1 | 604-04.01 | APPLIED TEXTURE FINISH (NEW STRUCTURES) | S.Y. | 94 | 0 | 94 | | |
| | 604-04.10 | GRAFFITI PROTECTION SYSTEM (NON-SACRIFICIAL) | S.Y. | 94 | 0 | 94 | | |
| 1 | 604-05.31 | BRIDGE DECK GROOVING (MECHANICAL) | S.Y. | 28 | 0 | 28 | | |
| 48, 50 | 604-07.01 | RETAINING WALL (WALL B) | S.F. | 3,401 | 0 | 3,401 | | |
| 48, 50 | 604-07.02 | RETAINING WALL (WALL C) | S.F. | 2,872 | 0 | 2,872 | | |
| 48, 50 | 604-07.03 | RETAINING WALL (WALL D) | S.F. | 2,872 | 0 | 2,872 | | |
| 48, 50 | 604-07.04 | RETAINING WALL (WALL ME) | S.F. | 15,310 | 0 | 15,310 | | |
| 50 | 604-07.05 | RETAINING WALL (WALL G1) | S.F. | 1,473 | 0 | 1,473 | | |
| 50 | 604-07.06 | RETAINING WALL (WALL H1) | S.F. | 4,098 | 0 | 4,098 | | |
| 46, 50 | 604-07.08 | RETAINING WALL (WALL K1) | S.F. | 1,444 | 0 | 1,444 | | |
| 48, 50 | 607-07.09 | RETAINING WALL (WALL L) | S.F. | 3,823 | 0 | 3,823 | | |
| 48, 50 | 607-07.10 | RETAINING WALL (WALL P1) | S.F. | 1,750 | 0 | 1,750 | | |
| 48, 50 | 607-07.11 | RETAINING WALL (WALL P2) | S.F. | 2,481 | 0 | 2,481 | | |
| 48, 50 | 607-07.12 | RETAINING WALL (WALL P3) | S.F. | 516 | 0 | 516 | | |
| 36 | 607-03.02 | 18" CONCRETE PIPE CULVERT (CLASS III) | L.F. | 10,640 | 0 | 10,640 | | |

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BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

| FOOTNOTE(S) | ITEM NO. | ITEM DESCRIPTION | UNIT | EST QTY (PART) | EST QTY (NON-PART) | EST QTY (TOTAL) | UNIT PRICE | EXT. AMOUNT |
|-------------|-----------|--|------|----------------|--------------------|-----------------|------------|-------------|
| 36 | 607-05.02 | 24" CONCRETE PIPE CULVERT (CLASS III) | L.F. | 2,584 | 0 | 2,584 | | |
| 36 | 607-06.02 | 30" CONCRETE PIPE CULVERT (CLASS III) | L.F. | 496 | 0 | 496 | | |
| 36 | 607-07.02 | 36" CONCRETE PIPE CULVERT (CLASS III) | L.F. | 404 | 0 | 404 | | |
| 36 | 607-09.02 | 48" CONCRETE PIPE CULVERT (CLASS III) | L.F. | 35 | 0 | 35 | | |
| | 611-07.01 | CLASS A CONCRETE (PIPE ENDWALLS) | C.Y. | 16 | 0 | 16 | | |
| | 611-07.02 | STEEL BAR REINFORCEMENT (PIPE ENDWALLS) | LB. | 292 | 0 | 292 | | |
| | 611-07.54 | 18IN ENDWALL (CROSS DRAIN) 3:1 | EACH | 12 | 0 | 12 | | |
| | 611-07.57 | 24IN ENDWALL (CROSS DRAIN) 3:1 | EACH | 6 | 0 | 6 | | |
| | 611-07.60 | 30IN ENDWALL (CROSS DRAIN) 3:1 | EACH | 2 | 0 | 2 | | |
| 5, 13 | 611-12.02 | CATCH BASINS, TYPE 12, > 4' - 8' DEPTH | EACH | 181 | 0 | 181 | | |
| 5, 13 | 611-12.03 | CATCH BASINS, TYPE 12, > 8' - 12' DEPTH | EACH | 11 | 0 | 11 | | |
| 5, 13 | 611-12.04 | CATCH BASINS, TYPE 12, > 12' - 16' DEPTH | EACH | 4 | 0 | 4 | | |
| 5, 13 | 611-12.05 | CATCH BASINS, TYPE 12, > 16' - 20' DEPTH | EACH | 2 | 0 | 2 | | |
| 5, 13 | 611-14.02 | CATCH BASINS, TYPE 14, > 4' - 8' DEPTH | EACH | 21 | 0 | 21 | | |
| 5, 13 | 611-14.03 | CATCH BASINS, TYPE 14, > 8' - 12' DEPTH | EACH | 7 | 0 | 7 | | |
| 5, 13 | 611-14.04 | CATCH BASINS, TYPE 14, > 12' - 16' DEPTH | EACH | 1 | 0 | 1 | | |
| 5, 13 | 611-14.05 | CATCH BASINS, TYPE 14, > 16' - 20' DEPTH | EACH | 1 | 0 | 1 | | |
| 13 | 611-42.01 | CATCH BASINS, TYPE 42, 0' - 4' DEPTH | EACH | 3 | 0 | 3 | | |
| 13 | 611-42.02 | CATCH BASINS, TYPE 42, > 4' - 8' DEPTH | EACH | 11 | 0 | 11 | | |

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BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

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|-------------|-----------|---|------|----------------|--------------------|-----------------|------------|-------------|
| 13 | 611-42.03 | CATCH BASINS, TYPE 42, > 8' - 12' DEPTH | EACH | 2 | 0 | 2 | | |
| 1 | 617-02 | BRIDGE DECK CRACK SEALING | L.F. | 72 | 0 | 72 | | |
| 1 | 620-05.01 | CONC PARAPET SINGLE SLOPE (STD-1-1SS) | L.F. | 72 | 0 | 72 | | |
| | 620-06 | CONCRETE RAILING | L.F. | 1,973 | 0 | 1,973 | | |
| 47 | 621-05.02 | TEMPORARY SHORING | LS | 1 | 0 | 1 | | |
| | 701-01.01 | CONCRETE SIDEWALK (4") | S.F. | 60,852 | 0 | 60,852 | | |
| 25 | 701-02 | CONCRETE DRIVEWAY | S.F. | 6,373 | 0 | 6,373 | | |
| 26 | 701-02.02 | CONCRETE DRIVEWAY (8") | S.F. | 1,357 | 0 | 1,357 | | |
| | 701-02.03 | CONCRETE CURB RAMP | S.F. | 925 | 0 | 925 | | |
| | 702-01.01 | EXTRUDED SLOPING CURB | L.F. | 1,018 | 0 | 1,018 | | |
| 38 | 702-01.02 | CONCRETE CURB | L.F. | 40 | 0 | 40 | | |
| 38 | 702-03 | CONCRETE COMBINED CURB & GUTTER | C.Y. | 2,543 | 0 | 2,543 | | |
| | 705-01.04 | METAL BEAM GUARD FENCE | L.F. | 438 | 0 | 438 | | |
| | 705-06.10 | GR TERMINAL TRAILING END (TYPE 13) MASH TL3 | EACH | 1 | 0 | 1 | | |
| | 705-06.11 | GR TERMINAL (IN-INLINE) MASH TL3 | EACH | 3 | 0 | 3 | | |
| | 705-06.20 | TANGENT ENERGY ABSORBING TERM MASH TL-3 | EACH | 2 | 0 | 2 | | |
| | 705-06.25 | THREE BEAM BRIDGE TRANSITION MASH TL-3 | EACH | 5 | 0 | 5 | | |
| | 705-06.30 | GR TERMINAL (ENERGY ABSORBING) MASH TL2 | EACH | 6 | 0 | 6 | | |
| 8 | 706-01 | GUARDRAIL REMOVED | L.F. | 2,060 | 0 | 2,060 | | |

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EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

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|-------------|-----------|---|------|----------------|--------------------|-----------------|------------|-------------|
| | 706-06.03 | RADIUS RAIL | L.F. | 325 | 0 | 325 | | |
| | 706-10.26 | ROUNDED END ELEMENT | EACH | 1 | 0 | 1 | | |
| | 706-10.80 | MICHIGAN AND MODIFIED MICHIGAN END SHOE | EACH | 5 | 0 | 5 | | |
| 1 | 707-07.01 | CHAIN-LINK FENCE (BRIDGES) | S.F. | 740 | 0 | 740 | | |
| 3, 27 | 707-08.11 | HIGH-VISIBILITY CONSTRUCTION FENCE | L.F. | 2,400 | 0 | 2,400 | | |
| 39 | 708-02.02 | MARKERS (CONCRETE R.O.W. POSTS) | EACH | 48 | 0 | 48 | | |
| 10 | 709-05.05 | MACHINED RIP-RAP (CLASS A-3) | TON | 410 | 0 | 410 | | |
| | 709-05.06 | MACHINED RIP-RAP (CLASS A-1) | TON | 886 | 0 | 886 | | |
| | 709-05.08 | MACHINED RIP-RAP (CLASS B) | TON | 34 | 0 | 34 | | |
| | 710-02 | AGGREGATE UNDERDRAINS (WITH PIPE) | L.F. | 32,979 | 0 | 32,979 | | |
| 28 | 712-01 | TRAFFIC CONTROL | LS | 1 | 0 | 1 | | |
| 29 | 712-02.02 | INTERCONNECTED PORTABLE BARRIER RAIL | L.F. | 7,600 | 0 | 7,600 | | |
| | 712-02.47 | BRIDGE MOUNTED INTERCONNECTED PORTABLE BARRIER RAIL | L.F. | 72 | 0 | 72 | | |
| 29 | 712-04.01 | FLEXIBLE DRUMS (CHANNELIZING) | EACH | 174 | 0 | 174 | | |
| 30 | 712-04.10 | TEMPORARY FLEXIBLE TUBULAR DELINEATOR | EACH | 60 | 0 | 60 | | |
| | 712-04.50 | BARRIER RAIL DELINEATOR | EACH | 760 | 0 | 760 | | |
| 29 | 712-06 | SIGNS (CONSTRUCTION) | S.F. | 939 | 0 | 939 | | |
| 29 | 712-07.03 | TEMPORARY BARRICADES (TYPE III) | L.F. | 567 | 0 | 567 | | |
| 7, 52 | 712-08.01 | UNIFORMED POLICE OFFICER | DOLL | 50,000 | 0 | 50,000 | | |

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East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

| FOOTNOTE(S) | ITEM NO. | ITEM DESCRIPTION | UNIT | EST QTY (PART) | EST QTY (NON-PART) | EST QTY (TOTAL) | UNIT PRICE | EXT. AMOUNT |
|-------------|-----------|--|------|----------------|--------------------|-----------------|------------|-------------|
| 7 | 712-08.03 | ARROW BOARD (TYPE C) | EACH | 1 | 0 | 1 | | |
| | 712-09.08 | REMOVABLE PAVEMENT MARKING (6" LINE) | L.F. | 2,500 | 0 | 2,500 | | |
| | 713-02.21 | SIGN POST DELINEATION ENHANCEMENT | L.F. | 4 | 0 | 4 | | |
| 41 | 713-15 | REMOVAL OF SIGNS, POSTS AND FOOTINGS | LS | 1 | 0 | 1 | | |
| 45 | 713-15.35 | METAL BARRICADE (TYPE III) | EACH | 24 | 0 | 24 | | |
| 53 | 713-16.04 | CHANGEABLE MESSAGE SIGN UNIT | EACH | 4 | 0 | 4 | | |
| 6, 12 | 713-16.20 | SIGNS (STOP, R1-1, 30"x30") | EACH | 5 | 0 | 5 | | |
| 6, 12 | 713-16.21 | SIGNS (SPEED LIMIT, R2-1, 24"x30") | EACH | 7 | 0 | 7 | | |
| 6, 12 | 713-16.22 | SIGNS (DEAD END, W14-1, 30"x30") | EACH | 2 | 0 | 2 | | |
| 6, 12 | 713-16.23 | SIGNS (KEEP RIGHT, R4-7, 24"x30") | EACH | 7 | 0 | 7 | | |
| 6, 12 | 713-16.24 | SIGNS (OBJECT MARKER, OM1-1, 18"x18") | EACH | 7 | 0 | 7 | | |
| 6, 12 | 713-16.25 | SIGNS (NO MOTOR VEHICLES, R5-3, 24"x24") | EACH | 4 | 0 | 4 | | |
| 6, 12 | 713-16.26 | SIGNS (ADA ACCESSIBLE ROUTE, R4-4 (MOD), 36"x30") | EACH | 2 | 0 | 2 | | |
| 6, 12 | 713-16.27 | SIGNS (ADVANCE INTERSECTION LANE CONTROL, R3-8, 30"x48") | EACH | 1 | 0 | 1 | | |
| 6, 12 | 713-16.28 | SIGNS (STREET NAME, D3-1, 36"x8") | EACH | 10 | 0 | 10 | | |
| 6, 12 | 713-16.29 | SIGNS (STOP AHEAD, W3-1A, 36"x36") | EACH | 2 | 0 | 2 | | |
| 6, 12 | 713-16.30 | SIGNS (SIDEWALK CLOSED, R9-9, 12"x24") | EACH | 2 | 0 | 2 | | |
| 37 | 716-02.04 | PLASTIC PAVEMENT MARKING(CHANNELIZATION STRIPING) | S.Y. | 1,432 | 0 | 1,432 | | |
| 37 | 716-02.05 | PLASTIC PAVEMENT MARKING (STOP LINE) | L.F. | 152 | 0 | 152 | | |

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East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

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|-------------|-----------|---|------|----------------|--------------------|-----------------|------------|-------------|
| 37 | 716-02.06 | PLASTIC PAVEMENT MARKING (TURN LANE ARROW) | EACH | 4 | 0 | 4 | | |
| 32, 37 | 716-02.09 | PLASTIC PAVEMENT MARKING (LONGITUDINAL CROSS-WALK) | L.F. | 30 | 0 | 30 | | |
| 37 | 716-04.05 | PLASTIC PAVEMENT MARKING (STRAIGHT ARROW) | EACH | 2 | 0 | 2 | | |
| 37 | 716-04.15 | PLASTIC PAVEMENT MARKING-BIKE SYMBOL/ARROW SHARED | EACH | 5 | 3 | 8 | | |
| 33 | 716-05.01 | PAINTED PAVEMENT MARKING (4" LINE) | L.M. | 28.00 | 0 | 28.00 | | |
| | 716-05.05 | PAINTED PAVEMENT MARKING (STOP LINE) | L.F. | 156 | 0 | 156 | | |
| | 716-05.06 | PAINTED PAVEMENT MARKING (TURN LANE ARROW) | EACH | 10 | 0 | 10 | | |
| | 716-05.20 | PAINTED PAVEMENT MARKING (6" LINE) | L.M. | 5.00 | 0 | 5.00 | | |
| 33 | 716-12.01 | ENHANCED FLATLINE THERMO PVMT MRKNG (4IN LINE) | L.M. | 9.00 | 0 | 9.00 | | |
| | 716-12.04 | ENHANCED FLATLINE THERMO PVMT MRKNG (4IN DOTTED LINE) | L.F. | 400 | 0 | 400 | | |
| | 717-01 | MOBILIZATION | LS | 1 | 0 | 1 | | |
| | 730-02.48 | SIGNAL HEAD MODIFICATION (RELOCATION) | EACH | 1 | 0 | 1 | | |
| 7, 10 | 740-10.03 | GEOTEXTILE (TYPE III)(EROSION CONTROL) | S.Y. | 2,700 | 0 | 2,700 | | |
| 2, 7 | 740-11.03 | TEMPORARY SEDIMENT TUBE 18IN | L.F. | 11,150 | 0 | 11,150 | | |
| | 801-01.07 | TEMPORARY SEEDING (WITH MULCH) | UNIT | 650 | 0 | 650 | | |
| | 801-01.38 | NATVE SEED MIX FINAL STABLIZATN OF SLOPES | UNIT | 31 | 0 | 31 | | |
| 7 | 801-02 | SEEDING (WITHOUT MULCH) | UNIT | 650 | 0 | 650 | | |
| | 801-03 | WATER (SEEDING & SODDING) | M.G. | 787 | 0 | 787 | | |
| 35 | 803-01 | SODDING (NEW SOD) | S.Y. | 72,179 | 0 | 72,179 | | |

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East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

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|-------------|-----------|--|------|----------------|--------------------|-----------------|------------|-------------|
| 11 | 805-01.03 | TURF REINFORCEMENT MAT (CLASS III) | S.Y. | 217 | 0 | 217 | | |
| 4 | 805-12.02 | EROSION CONTROL BLANKET (TYPE II) | S.Y. | 60,500 | 0 | 60,500 | | |
| 4, 45 | 805-12.04 | EROSION CONTROL BLANKET (TYPE IV) | S.Y. | 2,635 | 0 | 2,635 | | |
| 51 | 806-02.03 | PROJECT MOWING | CYCL | 12 | 0 | 12 | | |
| 49 | 920-11 | CONCRETE PARAPET RAIL WITH MOMENT SLAB | L.F. | 1,471 | 0 | 1,471 | | |
| 54 | 202-04.01 | REMOVAL OF STRUCTURES (CANTILEVER AND RAILING) | LS | 1 | 0 | 1 | | |
| 54 | 604-02.03 | EPOXY COATED REINFORCING STEEL | LB. | 3,850 | 0 | 3,850 | | |
| 54 | 604-03.09 | CLASS D CONCRETE (BRIDGE DECK) | C.Y. | 13 | 0 | 13 | | |
| 54 | 604-04.01 | APPLIED TEXTURE FINISH (NEW STRUCTURE) | S.Y. | 94 | 0 | 94 | | |
| 54 | 604-05.31 | BRIDGE DECK GROOVING (MECHANICAL) | S.Y. | 28 | 0 | 28 | | |
| 54 | 617-02 | BRIDGE DECK CRACK SEALING | L.F. | 72 | 0 | 72 | | |
| 54 | 620-05.01 | CONC PARAPET SINGLE SLOPE (STD-1-1SS) | L.F. | 72 | 0 | 72 | | |
| 54 | 707-07.01 | CHAIN-LINK FENCE (BRIDGES) | S.F. | 740 | 0 | 740 | | |
| 56 | 714-01.36 | ROADWAY LIGHTING | LS | 1 | 0 | 1 | | |
| | 714-03.01 | DIRECT BURIAL CONDUIT (2" PVC, SCHEDULE 40) | L.F. | 16,325 | 0 | 16,325 | | |
| | 714-03.02 | DIRECT BURIAL CONDUIT (3" PVC, SCHEDULE 40) | L.F. | 70 | 0 | 70 | | |
| | 714-03.03 | DIRECT BURIAL CONDUIT (1" PVC, SCHEDULE 40 WITH PULL TAPE) | L.F. | 160 | 0 | 160 | | |
| | 714-03.04 | DIRECT BURIAL CONDUIT (3/4" PVC, SCHEDULE 40 WITH PULL TAPE) | L.F. | 60 | 0 | 60 | | |
| 59 | 714-05.05 | PULL BOXES (SMALL) | EACH | 75 | 0 | 75 | | |

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|-------------|-----------|---|------|----------------|--------------------|-----------------|------------|-------------|
| 60 | 714-05.06 | PULL BOXES (LARGE) | EACH | 2 | 0 | 2 | | |
| | 714-05.07 | PULL BOXES (ELECTRICAL ROUND, 4", 1" KNOCKOUT, TUNNEL LIGHTING) | EACH | 1 | 0 | 1 | | |
| 66 | 714-08.09 | LIGHT STANDARDS (ROADWAY, 30' SQUARE ALUMINUM, BLACK) | EACH | 31 | 0 | 31 | | |
| 67 | 714-08.10 | LIGHT STANDARDS (ROADWAY, 25' SQUARE ALUMINUM, BLACK, WALL MOUNTED) | EACH | 7 | 0 | 7 | | |
| 68 | 714-08.11 | LIGHT STANDARDS (DECORATIVE, 16' ALUMINUM, BLACK) | EACH | 22 | 0 | 22 | | |
| | 714-08.28 | FOUNDATION FOR LIGHT STANDARDS - ROADWAY (FOUNDATION PREPARATION, INCLUSIVE OF ALL RELATED ITEMS FOR ROADWAY LIGHT STANDARDS, INCLUDING BUT NOT LIMITED TO CONCRETE CAST IN-PLACE FOUNDATION, 24" DIAMETER, 6'-6" DEPTH. NO. 2 REINFORCING STEEL BAR, NO. 4 REINFORCING STEEL BAR, 8' GROUND ROD 5/8" DIA COPPER-CLAD STEEL, EQUAL TO BLACKBURN #6258, GROUND BONDING CLAMP FOR 5/8" GROUND ROD, BREAKAWAY FUSE HOLDER FOR EACH POLE MOUNT, HOMAC #SLK-M, FUSE FOR BREAKAWAY FUSE HOLDER, LITTLEFUSE #FLM9, PARALLEL BONDING CONNECTOR FOR POLE GROUNDS, ANDERSON #C-4-L OR EQUAL, SUBMERSIBLE SECONDARY CONNECTORS HOMAC RAB-4 OR CMC #SSBC350-4LI, ABOVE GRADE CONNECTOR FOR #12 CONDUCTOR, RED WIRE NUT) | EACH | 46 | 0 | 46 | | |
| 58 | 714-08.32 | REMOVAL OF LIGHT STANDARD & FOUNDATION | EACH | 6 | 0 | 6 | | |

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|-------------|-----------|---|------|----------------|--------------------|-----------------|------------|-------------|
| | 714-08.43 | FOUNDATION FOR LIGHT STANDARDS - ROADWAY (FOUNDATION PREPARATION, INCLUSIVE OF ALL RELATED ITEMS FOR ROADWAY LIGHT STANDARDS, INCLUDING BUT NOT LIMITED TO CAST IN PLACE FOUNDATION, 24" DIAMETER, 4' DEPTH, NO. 2 REINFORCING STEEL BAR, NO. 4 REINFORCING STEEL BAR, 8' GROUND ROD 5/8" DIA COPPER-CLAD STEEL, EQUAL TO BLACKBURN #6258, GROUND BONDING CLAMP FOR 5/8" GROUND ROD, BREAKAWAY FUSE HOLDER FOR EACH POLE MOUNT, HOMAC #SLK-M, FUSE FOR BREAKAWAY FUSE HOLDER, LITTLEFUSE #FLM9, PARALLEL BONDING CONNECTOR FOR POLE GROUNDS, ANDERSON #C-4-L OR EQUAL, SUBMERSIBLE SECONDARY CONNECTORS HOMAC RAB-4 OR CMC #SSBC350-4LI, ABOVE GRADE CONNECTOR FOR #12 CONDUCTOR, RED WIRE NUT) | EACH | 22 | 0 | 22 | | |
| | 714-09.47 | LED LUMINAIRE (ROADWAY) | EACH | 38 | 0 | 38 | | |
| | 714-09.48 | LED LUMINAIRE (DECORATIVE ROADWAY) | EACH | 22 | 0 | 22 | | |
| 69 | 714-09.49 | LED LUMINAIRE (PEDESTRIAN TUNNEL) | EACH | 1 | 0 | 1 | | |
| | 714-25.01 | ELECTRICAL CONNECTION (SERVICE / METER PEDESTAL) | LS | 2 | 0 | 2 | | |
| 57 | 714-25.22 | INSTALL SVC RISER (ROADWAY LIGHTING SERVICE RISER PER MTEMC STANDARDS; ALL INCLUSIVE) | EACH | 2 | 0 | 2 | | |
| 62 | 714-70.02 | #10 AWG WIRE WHITE INSL SOLID COPPER | L.F. | 350 | 0 | 350 | | |
| 61 | 714-70.55 | #10 AWG GROUND WIRE GREEN INSL SOLID COPPER | L.F. | 14,350 | 0 | 14,350 | | |
| 63 | 714-70.56 | #4 BARE SOFT DRAWN COPPER FOR LIGHT POST GROUNDING | L.F. | 700 | 0 | 700 | | |
| 64 | 714-70.57 | #4 AWG GROUND WIRE BARE SOLID COPPER | L.F. | 20 | 0 | 20 | | |
| 65 | 714-70.59 | #4 COPPER THHN OR THWN, WHITE, FOR SERVICE GROUNDED CONDUCTOR | L.F. | 85 | 0 | 85 | | |
| 70 | 725-02.25 | FIELD HUB SWITCH (INSTALL ONLY) | EACH | 1 | 0 | 1 | | |

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|-------------|-----------|--|------|----------------|--------------------|-----------------|------------|-------------|
| 71 | 725-03.80 | CCTV CAMERA SYSTEM | EACH | 1 | 0 | 1 | | |
| | 725-10.64 | FIBER OPTIC CABLE (72 COUNT) | L.F. | 10,838 | 0 | 10,838 | | |
| | 730-03.24 | INSTALL PULL BOX (FIBER OPTIC-TYPE B) | EACH | 19 | 0 | 19 | | |
| 72 | 730-12.14 | CONDUIT 3" DIAMETER (JACK AND BORE) | L.F. | 60 | 0 | 60 | | |
| 72 | 730-12.27 | CONDUIT 3" DIAMETER (PVC SCHEDULE 40) | L.F. | 7,300 | 0 | 7,300 | | |
| | 713-02.15 | FLEXIBLE TUBULAR DELINEATOR | EACH | 4 | 0 | 4 | | |
| | 713-16.36 | SIGNS (SIDEWALK ENDS, R9-9 (MODIFIED), 24" X 12", UNIT PRICE BID INCLUDES SQUARE TUBE PERFORATED POST P8) | EACH | 2 | 0 | 2 | | |
| | 730-02.48 | SIGNAL HEAD MODIFICATION (RELOCATION) | EACH | 1 | 0 | 1 | | |
| | 790-42.08 | 2~2" PVC SCHEDULE 40 (PRIMARY DITCH DETAIL 2G) (INCLUDES INSTALLATION, CLEAN GRAVEL, EXCAVATION, INSPECTION) | L.F. | 153 | 0 | 153 | | |
| | 790-42.09 | 2~4" PVC SCHEDULE 40 (PRIMARY DITCH DETAIL 2G) (INCLUDES INSTALLATION, CLEAN GRAVEL, EXCAVATION, INSPECTION) | L.F. | 156 | 0 | 156 | | |
| | 790-42.10 | 2" PVC SCHEDULE 80 ELBOW (36" RADIUS) (INCLUDES INSTALLATION, CLEAN GRAVEL, EXCAVATION, INSPECTION) | EACH | 4 | 0 | 4 | | |
| | 790-42.11 | 4" PVC SCHEDULE 80 ELBOW (48" RADIUS) (INCLUDES INSTALLATION, CLEAN GRAVEL, EXCAVATION, INSPECTION) | EACH | 12 | 0 | 12 | | |
| | 790-43.47 | PRIMARY PULLBOX (48" L X 30" W X 36" D), MTEMC-ELECTRICAL LOGO (INCLUDES INSTALLATION, CLEAN GRAVEL, INSTALLATION) | EACH | 3 | 0 | 3 | | |
| | 707-01.11 | CHAIN LINK FENCE (6-FOOT) | L.F. | 0 | 140 | 140 | | |
| | 707-01.12 | END & CORNER POST ASSEMBLY (CHAIN-LINK FENCE 6') | EACH | 0 | 14 | 14 | | |
| | 707-01.13 | GATE-CHAIN-LINK FENCE 6 FOOT (10' WIDE GATE) | EACH | 0 | 1 | 1 | | |
| 73 | 791-01.04 | 4IN STEEL GAS MAIN | L.F. | 0 | 95 | 95 | | |

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BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

| FOOTNOTE(S) | ITEM NO. | ITEM DESCRIPTION | UNIT | EST QTY (PART) | EST QTY (NON-PART) | EST QTY (TOTAL) | UNIT PRICE | EXT. AMOUNT |
|-------------|-----------|---|------|----------------|--------------------|-----------------|------------|-------------|
| 73 | 791-01.06 | 8IN STEEL GAS MAIN | L.F. | 6,764 | 0 | 6,764 | | |
| 73 | 791-01.09 | 4IN STEEL GAS MAIN (INSTALLED WITH AND ABOVE THE 8IN STEEL GAS MAIN) | L.F. | 0 | 104 | 104 | | |
| 73 | 791-03.02 | 2IN PE GAS MAIN | L.F. | 0 | 32 | 32 | | |
| 73 | 791-03.04 | 4IN PE GAS MAIN | L.F. | 0 | 52 | 52 | | |
| 73 | 791-03.09 | 2IN PE GAS MAIN (INSTALLED WITH AND ABOVE THE 8IN STEEL GAS MAIN) | L.F. | 0 | 1,530 | 1,530 | | |
| 73 | 791-03.10 | 4IN PE GAS MAIN (INSTALLED WITH AND ABOVE THE 8IN STEEL GAS MAIN) | L.F. | 0 | 893 | 893 | | |
| 74 | 791-04.10 | HDD 3/4IN PE SERVICE PIPE (DIRECTIONAL BORE TO BE USED ONLY IF NECESSARY) | L.F. | 121 | 0 | 121 | | |
| 74 | 791-04.13 | HDD 4IN PE SERVICE PIPE (DIRECTIONAL BORE TO BE USED ONLY IF NECESSARY) | L.F. | 31 | 0 | 31 | | |
| 75 | 791-06.03 | CONNECTION TO 4" EX PE GAS MAIN | EACH | 0 | 2 | 2 | | |
| 75 | 791-06.09 | CONNECT TO EX 3/4" GAS SERVICE LINE | EACH | 5 | 0 | 5 | | |
| 75 | 791-06.34 | CONNECT TO EX 8" STEEL GAS MAIN W/ STOPPER | EACH | 4 | 0 | 4 | | |
| 75 | 791-06.38 | CONNECT TO 8" EX STEEL MAIN W/ BOTTOM OUT STOPPER FITTING | EACH | 1 | 0 | 1 | | |
| 76 | 791-07.09 | 2 IN STEEL GAS VALVE ASSEMBLY | EACH | 0 | 1 | 1 | | |
| 76 | 791-07.10 | 4 IN STEEL GAS VALVE ASSEMBLY | EACH | 0 | 5 | 5 | | |
| 76 | 791-07.12 | 8 IN STEEL GAS VALVE ASSEMBLY | EACH | 1 | 0 | 1 | | |
| 77 | 791-08.07 | 3/4IN PE SERVICE PIPE (AN ADDITIONAL 300' OF QTY. HAS BEEN ADDED TO THIS ITEM FOR ADDITIONAL WORK AS DETERMINED BY THE ENGINEER) | L.F. | 847 | 0 | 847 | | |
| 79 | 791-08.41 | GAS MAIN REMOVAL (REMOVAL/DISPOSAL OF EXISTING 8" GAS MAIN TO ACCOMODATE ROADWAY CONSTRUCTION; QTY INCLUDES AN ADDITIONAL 200' AS DIRECTED BY THE ENGINEER) | L.F. | 1,622 | 0 | 1,622 | | |

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BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

| FOOTNOTE(S) | ITEM NO. | ITEM DESCRIPTION | UNIT | EST QTY (PART) | EST QTY (NON-PART) | EST QTY (TOTAL) | UNIT PRICE | EXT. AMOUNT |
|-------------|-----------|--|------|----------------|--------------------|-----------------|------------|-------------|
| 78 | 791-09.02 | 3-WIRE CATHODIC PROTECTION STATION | EACH | 0 | 2 | 2 | | |
| 78 | 791-09.04 | 4" REGULATING STATION (W/ OPTION #4 ENCLOSED - STD 10-002-05) (REGULATING STATION SHALL BE PREFABRICATED BY APPROVED VENDOR) | EACH | 2 | 0 | 2 | | |
| 79 | 791-09.08 | REMOVAL REGULATING STATION (2' BELOW PROPOSED GRADE) | EACH | 2 | 0 | 2 | | |
| 79 | 791-09.23 | REMOVAL OF EXISTING FARM TAP (2' BELOW PROPOSED GRADE) | EACH | 5 | 0 | 5 | | |
| 80 | 791-10.01 | RETIRE IN PLACE 3/4 IN SERV CUT & PLUG | EACH | 5 | 0 | 5 | | |
| 80 | 791-10.05 | RETIRE IN PLACE 4" PE CUT & PLUG | EACH | 1 | 0 | 1 | | |
| 80 | 791-10.07 | RETIRE IN PLACE 8" STEEL GAS MAIN CUT & PLUG | EACH | 15 | 0 | 15 | | |
| | 791-11.02 | CONCRETE CAP (CLASS A) | LS | 1 | 0 | 1 | | |
| 75 | 791-15.71 | INSTALL TEMPORARY FARM TAP AS REQUIRED | EACH | 2 | 0 | 2 | | |
| 73 | 791-99.03 | SLUG TRAP (ATMOS ENERGY TO PROVIDE PREFABRICATED MATERIAL) | LS | 0 | 1 | 1 | | |
| 81 | 791-99.04 | GAS MAIN UTILITY AS-BUILTS (SEE SPECIAL PROVISION REGARDING UTILITY RECORD DRAWINGS) | LS | 0.50 | 0.50 | 1 | | |
| 82 | 795-01.06 | 8" SLIP JOINT WATER LINE (CLASS 52) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE) | L.F. | 11 | 4,920 | 4,931 | | |
| 82 | 795-02.03 | 4" HDPE WATER LINE (DR11) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE) | L.F. | 1,508 | 0 | 1,508 | | |
| 83 | 795-05.55 | HDD 3" FPVC CASING PIPE | L.F. | 682 | 0 | 682 | | |
| 82 | 795-05.92 | 4" FPVC CASING PIPE OPEN CUT (USE AS DIRECTED BY ENGINEER) | L.F. | 50 | 0 | 50 | | |
| 82 | 795-05.93 | 3" FPVC CASING PIPE OPEN CUT (USE AS DIRECTED BY ENGINEER) | L.F. | 100 | 0 | 100 | | |
| 84 | 795-06.05 | CONNECT TO 8IN WATER LINE | EACH | 1 | 4 | 5 | | |
| 84 | 795-06.07 | CONNECT TO 12IN WATER LINE | EACH | 0 | 1 | 1 | | |

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BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

| FOOTNOTE(S) | ITEM NO. | ITEM DESCRIPTION | UNIT | EST QTY (PART) | EST QTY (NON-PART) | EST QTY (TOTAL) | UNIT PRICE | EXT. AMOUNT |
|-------------|-----------|--|------|----------------|--------------------|-----------------|------------|-------------|
| | 795-06.32 | CUT AND CAP 4" WATER LINE | EACH | 0 | 5 | 5 | | |
| | 795-06.34 | CUT AND CAP 8" WATER LINE | EACH | 1 | 0 | 1 | | |
| | 795-06.37 | CUT AND CAP 12" WATER LINE | EACH | 2 | 0 | 2 | | |
| 85 | 795-08.05 | 8" GATE VALVE ASSEMBLY | EACH | 1 | 4 | 5 | | |
| 86 | 795-09.01 | 3/4" WATER SERVICE ASSEMBLY (MILCROFTON TO PROVIDE AND INSTALL METERS) | EACH | 6 | 0 | 6 | | |
| | 795-09.51 | DISCONNECT/RECONNECT EXISTING WATER METER | EACH | 4 | 0 | 4 | | |
| 82 | 795-09.60 | 3/4" PEXa SERVICE PIPE (QTY INCLUDES AN ADDITIONAL 450' TO RECONNECT SERVICE AS APPROVED MUD) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE) | L.F. | 1,367 | 0 | 1,367 | | |
| 82 | 795-09.62 | 1" PEXa SERVICE PIPE (QTY INCLUDES TEMPORARY SERVICE) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE) | L.F. | 630 | 0 | 630 | | |
| 82 | 795-09.64 | 2" PEXa SERVICE PIPE (QTY INCLUDES TEMPORARY SERVICE) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE) | L.F. | 334 | 0 | 334 | | |
| 86 | 795-10.03 | 1" COMBINATION AIR/VACUUM RELEASE VALVE ASSEMBLY | EACH | 3 | 5 | 8 | | |
| 86 | 795-11.01 | BLOW OFF ASSEMBLY | EACH | 1 | 0 | 1 | | |
| 86 | 795-11.02 | FIRE HYDRANT ASSEMBLY (INCLUDES ALL REQUIRED 6" RESTRAINED JOINT DIP AND VALVE) | EACH | 4 | 0 | 4 | | |
| 88 | 795-12.27 | REMOVAL/DISPOSAL OF EXISTING 4" WATER MAIN TO ACCOMMODATE ROADWAY CONSTRUCTION (QTY INCLUDES AN ADDITIONAL 400' AS DIRECTED BY THE ENGINEER) | L.F. | 455 | 0 | 455 | | |
| 88 | 795-12.28 | REMOVAL/DISPOSAL OF EXISTING 8" WATER MAIN TO ACCOMMODATE ROADWAY CONSTRUCTION | L.F. | 42 | 0 | 42 | | |
| 88 | 795-12.29 | REMOVAL/DISPOSAL OF EXISTING 12" WATER MAIN TO ACCOMMODATE ROADWAY CONSTRUCTION (ATTACHED TO BRIDGE PARAPET) | L.F. | 87 | 0 | 87 | | |
| | 795-13.01 | DI FITTINGS (INCLUDES FITTINGS, GLANDS AND RESTRAINT DEVICES DESCRIBED IN POUNDS) | LB. | 520 | 2,690 | 3,210 | | |

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BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

| FOOTNOTE(S) | ITEM NO. | ITEM DESCRIPTION | UNIT | EST QTY (PART) | EST QTY (NON-PART) | EST QTY (TOTAL) | UNIT PRICE | EXT. AMOUNT |
|-------------|-----------|---|------|----------------|--------------------|-----------------|------------|-------------|
| 87 | 795-14.01 | CONCRETE CAP (AS DIRECTED BY MUD) | L.F. | 0 | 30 | 30 | | |
| 89 | 795-30.26 | OPEN CUT 3" CASING PIPE (SCH 40 PVC) | L.F. | 133 | 0 | 133 | | |
| | 795-99.05 | POLYETHYLENE PIPE PROTECT - 8" (PER ANSI/AWWA C105/A21.5 - INSTALLED ON NEW MAINS AS DIRECTED BY MUD) | L.F. | 0 | 600 | 600 | | |
| | 795-99.06 | WATER UTILITY AS-BUILTS (SEE SPECIAL PROVISION REGARDING UTILITY RECORD DRAWINGS) | LS | 0.24 | 0.76 | 1 | | |
| 90 | 797-01.02 | 6" FORCE MAIN (CLASS 350) (QTY INCLUDES 259 ADDITIONAL LF FOR TEMPORARY RELOCATIONS TO ACCOMMODATE PHASED CONSTRUCTION) (PRICE INCLUDES 14AWG, TYPE THHN SOLID COPPER DETECTION WIRE) | L.F. | 0 | 5,002 | 5,002 | | |
| 95 | 797-06.91 | OPEN CUT 18" STEEL CASING PIPE | L.F. | 0 | 80 | 80 | | |
| | 797-08.01 | DI FITTINGS (INCLUDES FITTINGS, GLANDS AND RESTRAINT DEVICES DESCRIBED IN POUNDS) | LB. | 0 | 3,000 | 3,000 | | |
| 92 | 797-08.62 | 6" GATE VALVE ASSEMBLY | L.F. | 0 | 4 | 4 | | |
| 92 | 797-08.68 | 6" INSERTION VALVE (INSTALLED WITH NO SYSTEM SHUT DOWN - AS DIRECTED BY THE ENGINEER FOR FLOW CONTROL) | EACH | 0 | 2 | 2 | | |
| 93 | 797-09.19 | COMBINATION AIR/VACUUM RELEASE VALVE | EACH | 0 | 2 | 2 | | |
| 91 | 797-09.46 | CUT AND CAP / PLUG 6" FORCE MAIN | EACH | 0 | 12 | 12 | | |
| 91 | 797-10.17 | CONNECT TO 6" FORCE MAIN | EACH | 0 | 10 | 10 | | |
| 96 | 797-11.46 | CONCRETE CAP (CLASS A CONCRETE - AS DIRECTED BY THE ENGINEER) | L.F. | 0 | 30 | 30 | | |
| 97 | 797-99.01 | POLYETHYLENE ENCASEMENT PER ANSI/AWWA C105/A21.5 (INSTALLED ON NEW MAINS AS DIRECTED BY COF INSPECTOR) | L.F. | 0 | 4,435 | 4,435 | | |
| 94 | 797-99.02 | REMOVAL OF EXISTING FM AIR VALVE / MANHOLE | EACH | 0 | 1 | 1 | | |

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BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - PROJECT ESTIMATED QUANTITIES

| FOOTNOTE(S) | ITEM NO. | ITEM DESCRIPTION | UNIT | EST QTY (PART) | EST QTY (NON-PART) | EST QTY (TOTAL) | UNIT PRICE | EXT. AMOUNT |
|--------------------------------------|-----------|---|------|----------------|--------------------|-----------------|------------|-------------|
| 94 | 797-99.03 | REMOVAL OF EXISTING 6" FORCE MAIN TO ACCOMMODATE ROADWAY CONSTRUCTION (QTY INCLUDES AN ADDITIONAL 150' AS DIRECTED BY THE ENGINEER) | L.F. | 0 | 1,122 | 1,122 | | |
| | 797-99.04 | FORCE MAIN UTILITY AS-BUILTS (SEE SPECIAL PROVISION REGARDING RECORD DRAWINGS) | LS | 0 | 1 | 1 | | |
| TOTAL BID PRICE (IN FIGURES): | | | | | | | | |

TOTAL BID PRICE (IN WORDS):

TOTAL BID PRICE (IN FIGURES):

END - EXHIBIT A - Part 1 of 2 - PROJECT ESTIMATED QUANTITIES

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BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements
(COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A – Part 2 of 2 – FOOTNOTES

1. TO BE USED AS DIRECTED FOR ADDITIONAL TRENCH BACKFILL ON STORM DRAIN ROADWAY CROSSINGS, OR AS DIRECTED BY THE ENGINEER.
2. ITEM 209-08.02 & 740-11.03 MAY BE INTERCHANGED BASED ON CONSTRUCTION ACTIVITIES.
3. TO BE USED AT THE LIMIT OF CONSTRUCTION ON FRONTAGE ROAD NORTH, TO PROTECT STREAMS, OR AS DIRECTED BY THE ENGINEER.
4. TO BE USED FOR SLOPE STABILIZATION, AS APPROVED BY THE ENGINEER.
5. CURB IRON TO HAVE A SOLID BACK PER CITY OF FRANKLIN REQUIREMENTS.
6. SIGNS SHALL BE FIELD STAKED PRIOR TO INSTALLATION. A FIELD INSPECTION SHALL BE MADE BY THE ENGINEER AND ACCEPTED PRIOR TO INSTALLATION BY THE CONTRACTOR.
7. TO BE USED AS DIRECTED BY THE ENGINEER.
8. COORDINATE WITH ENGINEER PRIOR TO REMOVAL.
9. PRIOR TO REMOVAL OF VEGETATION THE CONTRACTOR SHALL SUBMIT A PLAN OF OPERATIONS FOR APPROVAL BY THE ENGINEER.
10. TO BE USED ON THE CONSTRUCTION ENTRANCE PROVIDING INGRESS/EGRESS TO THE SITE, FOR 6" SEDIMENT FILTER BAG BASE OR AS DIRECTED BY THE ENGINEER.
11. TO BE USED FOR DITCH STABILIZATION, AS APPROVED BY THE ENGINEER.
12. INCLUDES PERFORATED/KNOCKOUT SQUARE TUBE POST (COORDINATE WITH STD. DRAWING T-S-17).
13. UNIT COST IS FOR A COMPLETE SYSTEM, INCLUSIVE OF ALL EXCAVATION, BACKFILL, CASTINGS, BRICK WORK AND APPURTENANCES NECESSARY FOR A COMPLETE INSTALLATION.
14. TO BE USED FOR RETAINING WALL BACKFILL. COORDINATE WITH RETAINING WALL DETAILS.
15. FOR CONNECTIONS AT EXISTING ROADWAYS, DRIVEWAYS AND BUSINESS ENTRANCES. IF THE CONTRACTOR ELECTS TO SAW CUT FOR OTHER PURPOSES, PAYMENT SHALL BE DISALLOWED UNLESS PRE-APPROVED BY THE ENGINEER.
16. TO BE USED AS DIRECTED BY THE ENGINEER . UNIT PRICE INCLUDES ALL WORK NECESSARY TO PREPARE THE AREA FOR PAVING.
17. TO BE USED AS DIRECTED BY THE ENGINEER FOR TEMPORARY ASPHALT MAINTENANCE DURING CONSTRUCTION.
18. WORK TO BE DONE IN ACCORDANCE WITH SECTION 202-01 OF THE STANDARD SPECIFICATIONS, INCLUSIVE BUT NOT LIMITED TO ITEMS SUCH AS, CURBS (CONCRETE/ASPHALT), MAILBOXES AND ALL OTHER ITEMS WITHIN THE GRADING LIMITS UNLESS OTHERWISE NOTED TO REMAIN.
19. INCLUDES 618 C.Y. FOR CONSTRUCTION ENTRANCE.
20. UNIT PRICE BIDS INCLUDES RIPRAP CLASS A-3 BACKFILL OR APPROVED ALTERNATE.

EXHIBIT A – Part 2 of 2 – FOOTNOTES (Continued)

21. INCLUDES 451 MG FOR EARTHEN EMBANKMENT.
22. AFTER THE INITIAL INSTALLATION ALL COST ASSOCIATED WITH REP AIR, MAINTENANCE AND REPLACEMENT DURING THE LIFE OF THIS CONTRACT SHALL BE AT THE CONTRACTORS EXPENSE.
23. INCLUDES ALL COST ASSOCIATED WITH INSTALLATION AND MAINTENANCE DURING THE LIFE OF THIS CONTRACT.
24. INCLUDES 5,500 TONS FOR MAINTENANCE OF TRAFFIC.
25. MINIMUM 6" CONCRETE THICKNESS W/ FIBER MESH. UNIT COST INCLUDES 4" MINIMUM AGGREGATE CLASS "A" GRADING "D" BASE.
26. TO BE USED FOR THE CONCRETE APPROACH APRON, EXTENDING TO THE RIGHT-OF-WAY LIMIT, MINIMUM 8" CONCRETE THICKNESS W/ FIBER MESH. UNIT COST INCLUDES 4" MINIMUM AGGREGATE CLASS "A" GRADING "D" BASE.
27. INCLUDES 1,785 L.F. TO BE USED IN CONJUNCTION WITH EROSION CONTROL FEATURES. UNIT PRICE BID INCLUDES COST OF ADJUSTMENTS, RELOCATIONS AND MAINTENANCE THROUGHOUT THE LIFE OF THE PROJECT AS CONSTRUCTION PHASES EVOLVE.
28. UNIT PRICE BID INCLUDES INSTALLATION AND REMOVAL COST OF ALL CONFLICTING PAVEMENT MARKINGS (TEMPORARY OR PERMANENT) INCLUSIVE OF TEMPORARY MARKINGS ON THE FINAL ASPHALT TOPPING.
29. ESTIMATED QUANTITY IS BASED ON PHASE WHICH REQUIRES HIGHEST QUANTITY. COORDINATE WITH TRAFFIC CONTROL TABULATION BLOCK.
30. 36" TO 42" HEIGHT. ESTIMATED QUANTITY IS BASED ON PHASE WHICH REQUIRES HIGHEST QUANTITY. COORDINATE WITH TRAFFIC CONTROL TABULATION BLOCK.
31. THIS WORK CONSISTS OF CLEARING, GRUBBING, REMOVING, AND DISPOSING OF ALL VEGETATION AND DEBRIS WITHIN THE DESIGNATED LIMITS, EXCEPT SUCH OBJECTS THAT ARE TO REMAIN OR ARE TO BE REMOVED ACCORDING TO OTHER ITEMS OF WORK. THIS WORK ALSO INCLUDES PRESERVING FROM INJURY OR DEFACEMENT ALL VEGETATION AND OBJECTS DESIGNATED TO REMAIN.
32. QUANTITY IS CALCULATED FROM FACE OF CURB TO FACE OF CURB.
33. INCLUDES LINE TYPES SSWL, SSYL, DSYL, SBYL & SBWL.
34. TO BE USED AS DIRECTED FOR ADDITIONAL TRENCH BACKFILL ON STORM DRAIN (1,979 CY) AND BOX/SLAB (42 CY) ROADWAY CROSSINGS, OR AS DIRECTED BY THE ENGINEER.
35. SOD TO BE INSTALLED ON TOPSOIL HAVING A MINIMUM DEPTH OF 6 INCHES.
36. UNIT PRICE BID INCLUDES TRENCH EXCAVATION, BACKFILL AND BEDDING OF THE PROPOSED PIPE CULVERT. COORDINATE WITH STANDARD DRAWING D-PB-1 AND D-PB-2.
37. CONTRACTOR MAY ELECT TO SUBSTITUTE PREFORMED PLASTIC FOR THERMOPLASTIC. PREFORMED PLASTIC SHALL BE PAID FOR AT THE SAME UNIT PRICE AS BID FOR THERMOPLASTIC.
38. TO BE USED FOR UNPROTECTED END CURB TRANSITION.
39. COORDINATE WITH DETAIL SHEETS FOR R.O.W. MONUMENT SPECIFICATIONS.

EXHIBIT A – Part 2 of 2 – FOOTNOTES (Continued)

40. THIS WORK CONSISTS OF REMOVING, ENTIRELY OR PARTIALLY, AND DISPOSING OF ALL BUILDINGS, FENCES, STRUCTURES, OLD PAVEMENTS, ABANDONED PIPE LINES, AND OTHER OBSTRUCTIONS NOT DESIGNATED OR PERMITTED TO REMAIN, EXCEPT FOR OBSTRUCTIONS TO BE REMOVED AND DISPOSED OF UNDER OTHER CONTRACT ITEMS. THE WORK ALSO INCLUDES BACKFILLING THE RESULTING TRENCHES, HOLES, AND PITS, AND SALVAGING DESIGNATED MATERIALS.
41. THIS WORK CONSISTS OF REMOVING, ENTIRELY OR PARTIALLY, AND DISPOSING OF ALL SIGNS AND FOOTINGS UNLESS DESIGNATED ON THE PLANS TO REMAIN. THE WORK ALSO INCLUDES BACKFILLING THE RESULTING TRENCHES, HOLES, AND PITS, AND SALVAGING DESIGNATED MATERIALS.
42. HAY BALES TO BE USED FOR CONCRETE WASHOUTS ONLY.
43. INCLUDES COSTS FOR ROCK PAD FOR SKIMMER TO REST UPON.
44. FOR 6" SEDIMENT FILTER BAG BASE.
45. SEE SHEET 16C. TO BE INSTALLED JUST SOUTH OF KING RICHARDS CT.
46. INCLUDES ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO DRILL THE SOLDIER PILE FOUNDATIONS AND PROVIDE TEMPORARY SUPPORT FOR THE FOUNDATION PRIOR TO THE INSTALLATION OF THE SOLDIER PILE AND FOUNDATION CONCRETE. ALSO INCLUDES COST OF STRUCTURAL STEEL FOR THE SOLDIER PILE AND ALL STEEL CONNECTING HARDWARE AND GUIDE ANGLES. ALL STRUCTURAL STEEL FOR SOLDIER PILES SHALL BE ASTM A992 GRADE 50. ITEM ALSO INCLUDES COST OF GALVANIZING FOR ALL STRUCTURAL STEEL COMPONENTS, INCLUDING STEEL HARDWARE AND GUIDE ANGLES. GALVANIZATION SHALL MEET THE REQUIREMENTS OF ASTM A123 AND REPAIRED ACCORDING TO ASTM A780. ITEM ALSO INCLUDES ALL LABOR, EQUIPMENT AND INCIDENTALS NECESSARY FOR THE INSTALLATION OF THE STEEL SOLDIER PILES AS DETAILED IN THE CONTRACT PLANS AND IN ACCORDANCE WITH SPECIAL PROVISION 624.
47. INCLUDES ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO STABILIZE EXCAVATIONS REQUIRED TO CONSTRUCT THE PROPOSED RETAINING WALL.
48. RETAINING WALLS B,C,D,ME,L,P 1,P2,&P3 ARE TO BE MSE CONCRETE PANEL TYPE WALL TO BE DESIGNED BY THE CONTRACTOR'S ENGINEER. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR REVIEW IN ACCORDANCE WITH THE STANDARD TDOT SPECIFICATIONS (2015 EDITION) AND TDOT SPECIAL PROVISION 624.
49. SEE SHEET 18AG FOR STATION LOCATIONS.
50. APPLIED TEXTURE FINISH AND NON-SACRIFICIAL ANTI-GRAFFITI COATING INCLUDED WITH THE COST OF THE RETAINING WALL.
51. EACH MOWING EVENT SHALL BE NEGOTIATED AS A PERCENT OF A FULL CYCLE.
52. ALL COSTS FOR UNIFORMED POLICE OFFICERS TO BE INCLUDED WITH ITEM NO. 712-02 "TRAFFIC CONTROL."
53. CHANGEABLE MESSAGE SIGN UNIT SHALL BECOME THE PROPERTY OF THE CITY OF FRANKLIN AT THE END OF THE PROJECT, SHALL BE IN LIKE-NEW CONDITION, AND WITH FULL MANUFACTURER WARRANTY.
54. COORDINATE WITH STRUCTURE DRAWINGS FOR ADDITIONAL FOOTNOTES.

EXHIBIT A – Part 2 of 2 – FOOTNOTES (Continued)

55. COORDINATE WITH MTEMC GUIDELINES.
56. INCLUDES THE FOLLOWING: 1 CUTLER HAMMER #BR120, 1-POLE, 20AMP BREAKER (TUNNEL), 1 CUTLER HAMMER NEMA 3R LOAD CENTER, #CH8B125R, (PLAYERS MILL SIGNAGE), 10 CUTLER HAMMER #BR230, 2-POLE, 30 AMP BREAKER (ROAD AND BIKE), LOAD CENTER, #CHSB 125R, (PLAYERS MILL SIGNAGE), 1 3/4" X 611 GALVANIZED PENDANT NIPPLE, 1,950 LF OF #12 SOLID TYPE UF-B FOR LIGHT POST RISERS, 3,770 LF OF #12 COPPER, THHN OR THWN, GREEN GROUND/GROUNDING CONDUCTOR, 5,150 LF OF #10 COPPER, THHN OR THWN, INCLUDES TWO (2) CIRCUIT CONDUCTORS, 28,750 LF OF #8 COPPER, THHN OR THWN, INCLUDES TWO (2) CIRCUIT CONDUCTORS, BLACK, RED, OR BLUE, 250 LF OF #2 COPPER, THHN OR THWN, INCLUDES TWO (2) SERVICE CONDUCTORS, PERMITS, INSPECTION FEES, AS-BUILT DRAWINGS AND ANY OTHER ITEM OR ITEMS THE CONTRACTOR FEELS ARE NECESSARY FOR A COMPLETE LIGHTING SYSTEM. DAY/NIGHT CONTROL VIA PHOTO SENSOR SHOULD BE DONE AT MILLBANK PEDESTAL, NOT AT EACH INDIVIDUAL LIGHT.
57. RISER ASSEMBLY (3" SCHEDULE 80 PVC, WITH PULL TAPE, ELECTRICAL GRAY, SERVICE RISER, INCLUSIVE OF SCHEDULE 80 PVC MIN 24" LONG RADIUS ELBOW, AND 4 @ 22.5 DEGREE RIGID NON-METALLIC ELBOW, CARLON #UA5FNB, 3" PVC MALE, LOCKNUT & PLASTIC BUSHING CARLON #UA5FNB, 3" PVC MALE, LOCKNUT & PLASTIC BUSHING).
58. POLE AND LUMINAIRE ARE TO BE RETURNED TO THE CITY OF FRANKLIN STREETS DEPARTMENT IN WORKING CONDITION FOR LATER USE.
59. PULL BOXES (SMALL PULL BOX, CDR#PA10-1324-18-0299, QUAZITE #PG2436Z510MT, HIGHLINE #PHA243618SE1-32, 94 OLDCASTLE #243618PB7021, 1/2" GRAVEL FOR BOX INSTALLATIONS).
60. PULL BOXES (LARGE PULL BOX, QUAZITE #PG2436Z510MT-B, HIGHLINE #PHA243618SE1-32, OLDCASTLE #243618PB7021, 1/2" GRAVEL FOR BOX INSTALLATIONS).
61. THHN OR THWN, GROUND/GROUNDING CONDUCTOR.
62. THHN OR THWN, NEUTRAL/GROUNDED CONDUCTOR.
63. 20 LF SOFT DRAWN COPPER FOR LIGHT POST GROUNDING AND 680 LF OF THHN OR THWN, WITH 2 SERVICE CONDUCTORS, BLACK, RED OR BLUE.
64. FOR SERVICE ENTRANCE GROUNDING.
65. THHN OR THWN, WHITE, FOR SERVICE GROUNDED CONDUCTOR.
66. STREET LIGHT (LUMINAIRE, LIGHT EMITTING DIODE "LED" - COOPER #USSL-G-A02-D-U-T3-SA-BK-10K-4N7, SQUARE ALUMINUM LIGHTING POLE, 30', BLACK, HAPCO #11-290-A4-D).
67. STREET LIGHT (LUMINAIRE, LIGHT EMITTING DIODE "LED" - COOPER #USSL-G-A02-D-U-T3-SA-BK-10K-4N7, SQUARE ALUMINUM LIGHTING POLE, 25', BLACK, HAPCO #11-250-A4-D).
68. STREET LIGHT (LUMINAIRE, HOLOPHANE GRANVILLE II LED #GVD804KASMB3RSG, DECORATIVE ALUMINUM POST, 16', BLACK, HOLOPHANE BURLINGTON #BLA16S4J11P05ABGBK).
69. STREET LIGHT (LUMINAIRE, COOPER LUMARE QUAD CAST #QDCAST1A, INTERMATIC STEM MOUNT PHOTO CONTROL (PLAYERS MILL SIGNAGE), COOPER JUNCTION BOX, METAL, PAINTED, 24"X24"X6", 3R, #24246 RTSC NK).

EXHIBIT A – Part 2 of 2 – FOOTNOTES (Continued)

70. THE CONTRACTOR IS TO INSTALL "FIELD HUB SWITCH" AS SUPPLIED BY THE CITY OF FRANKLIN.
71. INCLUDES SURGE PROTECTION (POE) DEVICE AND POE EXTENDER UNIT. ITEM ALSO INCLUDES 12 FOOT POWDER COATED BLACK EXTENSION ARM.
72. INCLUDES PULL STRING AND 14 AWG, TYPE THHN SOLID COPPER WIRE.
73. INCLUDES ALL MATERIALS INCLUDING SAND/STONE BEDDING, FLOWABLE FILL, TEMPORARY PAVEMENT IN OR OUT OF ROW, LABOR, EQUIPMENT FOR COMPLETE INSTALLATION OF PIPE INCLUDING BUT NOT LIMITED TO TRAFFIC CONTROL, EXCAVATION INCLUDING DIRT/ROCK, BACKFILLING, CREEK CROSSINGS PER SWPPP, COUPLINGS, FITTINGS, PIPE FUSION, APPURTENANCES, MAINTAINING THE TRENCH, PURGE POINT INSTALLATION, TESTING BY UTILITY SPECIFICATIONS TO INCLUDE BUT NOT LIMITED TO AIR, NITROGEN, HYDROSTATIC OR X-RAY, DEW POINT OR DRYING, AND ANY OTHER LABOR OR MATERIAL REQUIRED TO COMPLETE THE WORK AS SPECIFIED ON THE PLANS.
74. INCLUDES ALL MATERIALS, LABOR, EQUIPMENT, AND TRAFFIC CONTROL, INCLUDING BUT NOT LIMITED TO FLUID CONTAINMENT FOR COMPLETE HORIZONTAL DIRECTIONAL DRILLING INSTALLATION OF CASING PIPE OR UNCASSED CARRIER PIPE IN BOTH UNCONSOLIDATED SOIL AND/OR ROCK. STEEL PIPE INCLUDES SPECIAL COATING AS SPECIFIED ON PLANS AND SPECS. IF CASING PIPE HAS CARRIER PIPE, THE CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM PRICE.
75. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT, NECESSARY FOR CONNECTING TO EXISTING GAS LINE, INCLUDING TRAFFIC CONTROL.
76. INCLUDES TRANSITION FITTINGS, VALVES, VALVE BOX, BOX ADJUSTMENT, VALVE BOX COLLAR, VALVE MARKER, EXCAVATION, BEDDING, BACKFILL, COUPLINGS, FUSION TEES, TAP OF EXISTING LINE, AND ALL OTHER NECESSARY MATERIALS AND LABOR FOR COMPLETE INSTALLATION OF ASSEMBLY, INCLUDING TRAFFIC CONTROL.
77. INCLUDES ALL MATERIALS, PARTS, LABOR, EQUIPMENT, MACHINERY, TOOLS, OR APPARATUS NECESSARY FOR INSTALLATION OF GAS SERVICE ASSEMBLIES AS DESCRIBED IN THE PLANS AND SPECS. INSTALLATION FOR LONG SIDE AND SHORT SIDE APPLICATIONS. SERVICE PIPE SHALL BE PAID PER LINEAR FOOT INSTALLED. REMOVE FARM TAPS AS REQUIRED.
78. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT FOR COMPLETE INSTALLATION OF INDIVIDUAL ITEM AS SPECIFIED ON BID FORM AND UTILITY SPECIFICATIONS. COST INCLUDES, GRAVEL PAD, STEEL BARRICADE, MINOR GRADING, REGULATING STATION, TESTING, ETC.
79. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT FOR REMOVAL OF ITEM.
80. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT FOR RETIREMENT OF ITEM INCLUDING STABILIZING THE ITEM OF PLANT PER UTILITY SPECIFICATIONS.
81. AS-BUILT DATA WILL BE COLLECTED USING LOCUSVIEW BY GAS SUBCONTRACTOR.
82. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT FOR COMPLETE INSTALLATION OF PIPE INCLUDING BUT NOT LIMITED TO TRAFFIC CONTROL, MATERIALS, EQUIPMENT, EXCAVATION IN BOTH UNCONSOLIDATED AND ROCK, REMOVAL AND REPLACEMENT OF UNSUITABLE SOIL, ENVELOPE/BEDDING MATERIAL, BACKFILLING, FLOWABLE FILL, THRUST BLOCKING CONCRETE DEADMAN, PIPE FUSION, TRACER WIRE, WARNING TAPE, APPURTENANCES,

EXHIBIT A – Part 2 of 2 – FOOTNOTES (Continued)

- TEMPORARY/PERMANENT SHORING, MAINTAINING THE TRENCH, TESTING, FLUSHING, DISINFECTION, BACTERIOLOGICAL SAMPLING, TEMPORARY/PERMANENT SURFACE RESTORATION, AND ANY OTHER LABOR OR MATERIAL REQUIRED TO COMPLETE THE WORK AS SPECIFIED ON THE PLANS.
83. INCLUDES ALL MATERIALS, LABOR, EQUIPMENT, AND TRAFFIC CONTROL, INCLUDING BUT NOT LIMITED TO FLUID CONTAINMENT FOR COMPLETE HORIZONTAL DIRECTIONAL DRILLING INSTALLATION OF CASING PIPE OR UNCASSED CARRIER PIPE IN BOTH UNCONSOLIDATED SOIL AND/OR ROCK. IF CASING PIPE HAS CARRIER PIPE, THE CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM.
 84. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT NECESSARY FOR CONNECTING TO AN EXISTING WATER LINE INCLUDING TRAFFIC CONTROL.
 85. INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO FITTINGS, VALVES, VALVE STEM EXTENSIONS, VALVE BOX AND COVER, BOX ADJUSTMENT, VALVE BOX COLLAR, VALVE MARKER, EXCAVATION, BEDDING, BACKFILL, BLOCKING, AND TRAFFIC CONTROL.
 86. INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO MACHINERY, TOOLS OR APPARATUS NECESSARY FOR INSTALLATION OF ASSEMBLIES AS DESCRIBED IN THE PLANS AND SPECS EXCEPT FOR SERVICE LINE WHICH IS PAID SEPARATELY FOR EACH FOOT INSTALLED.
 87. INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT FOR COMPLETE INSTALLATION OF UNIT OR LUMP SUM ITEM AS SPECIFIED IN THE BID FORM.
 88. INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT FOR REMOVAL OF ITEM.
 89. INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO CASING PIPE, PIPE SPACERS, CASING END SEALS, FITTINGS, TRACER WIRE, WARNING TAPE, UTILITY LINE MARKERS AND TRAFFIC CONTROL. IF CASING PIPE HAS CARRIER PIPE, THE CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM.
 90. INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT FOR COMPLETE EXCAVATION INCLUDING BUT NOT LIMITED TO BEDDING, BACKFILLING, THRUST BLOCKING, PIPE FUSION, APPURTENANCES, FLOWABLE FILL, MAINTAINING THE TRENCH, TESTING, CHECK DAMS, AND ANY OTHER LABOR OR MATERIAL REQUIRED TO COMPLETE THE GRAVITY SEWER LINES OR FORCE MAINS AS SPECIFIED ON THE PLANS. ALL MATERIAL PER CITY OF FRANKLIN SPECIFICATIONS.
 91. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT NECESSARY FOR CONNECTING TO AN EXISTING FORCE MAIN, SEWER LINE, PUMP STATION, OR MANHOLE AS SPECIFIED ON PLANS, INCLUDING TRAFFIC CONTROL.
 92. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT, INCLUDING BUT NOT LIMITED TO VALVE, VALVE BOX, BOX ADJUSTMENT, VALVE BOX COLLAR, VALVE MARKER, EXCAVATION, BEDDING, BACKFILL, BLOCKING, AND TRAFFIC CONTROL.
 93. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT, INCLUDING BUT NOT LIMITED TO MACHINERY, TOOLS, OR APPARATUS NECESSARY FOR INSTALLATION OF ASSEMBLIES AS DESCRIBED AND DETAILED IN THE PLANS AND SPECS.

EXHIBIT A – Part 2 of 2 – FOOTNOTES (Continued)

94. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT, FOR RETIRE IN PLACE OR REMOVAL ITEMS AS SPECIFIED ON THE BID FORM INCLUDING TRAFFIC CONTROL.
95. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT INCLUDING BUT NOT LIMITED TO CASING PIPE, PIPE SPACERS, CASING END SEALS, STONE BACKFILL, TEMPORARY PAVEMENT, AND ANY OTHER APPURTENANCE TO COMPLETE THE WORK AS SPECIFIED ON THE PLANS, AND TRAFFIC CONTROL.
96. CAST-IN-PLACE CONCRETE IS A PAY ITEM WHEN USED IN CONJUNCTION WITH CONCRETE ENCASEMENT, CONCRETE CAPS, AND CONCRETE ANCHORS. CAST-IN-PLACE CONCRETE IS NOT A PAY ITEM WHEN USED IN CONJUNCTION WITH CONCRETE THRUST BLOCKS.
97. PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING AND INSTALLING POLYETHYLENE ENCASEMENT PER FOOT. MEASUREMENT SHALL BE MADE ALONG THE CENTERLINE OF THE PIPE TO INCLUDE FIRE HYDRANT BRANCHES.

END of BID FORM – EXHIBIT A – Part 2 of 2 - FOOTNOTES

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PROPOSAL CERTIFICATION

CONTRACT NO. 2024-0246

The undersigned, being first duly sworn, certifies on behalf of the bidder that it has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this Proposal or Contract. This is an official document that is required or authorized by law to be made under oath and is presented in an official proceeding. A person who makes a false statement in this certification is subject to the penalties of perjury.

The undersigned further certifies that said bidder is not under the control of any person, firm, partnership, or corporation, which has or exercises any control of any other person, firm, partnership, or corporation, which is submitting a bid on this Contract.

_____ Sworn to and subscribed before me
Bidder (1) this _____ day of _____,
By: _____

_____ Notary Public
Printed Name and Title My commission expires _____

(Seal)

_____ Sworn to and subscribed before me
Bidder (2) this _____ day of _____,
By: _____

_____ Notary Public
Printed Name and Title My commission expires _____

(Seal)

***NOTE: The signature and information for Bidder (2) is to be provided when there is a joint venture.**

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CITY OF FRANKLIN, TENNESSEE

PROPOSAL BOND

CONTRACT NO. 2024-0246

Principal: _____
Print Name of Principal

Surety: _____
Print Name of Surety

KNOW ALL MEN BY THESE PRESENTS, that we, the Principal and Surety above named, are held and firmly bound unto the CITY OF FRANKLIN in the full and just sum of five percent (5%) of the total amount bid by the Principal for the project stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

NOW, THEREFORE, the condition of this obligation is: the Principal shall not withdraw its bid within sixty (60) days after the opening of the bids, or within such other time period as may be provided in the Proposal, and if the CITY OF FRANKLIN shall award a Contract to the Principal, the Principal shall, within ten (10) days after written notice of the award is received by him, fully execute a Contract on the basis of the terms, conditions and unit prices set forth in his Proposal or bid and provide bonds with good and sufficient surety, as required for the faithful performance of the Contract and for the protection of all persons supplying labor, material, and equipment for the prosecution of the work. In the event the Principal withdraws its bid after bids are opened, or after award of the Contract has been made fails to execute such the Contract and/or such additional documents as may be required and to provide the required bonds within the time period specified above, then the amount of the Proposal Bond shall be immediately paid to the CITY OF FRANKLIN, not as a penalty, but as agreed upon liquidated damages.

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IN WITNESS WHEREOF, the Principal has caused these presents to be signed by a duly authorized official and the Surety has caused these presents to be duly signed and sealed by an authorized agent or attorney-in-fact.

Principal (1) Surety (1)

By: _____ By: _____
General Agent or Attorney-in-Fact

Print Name and Title Date

Date (Seal)

Principal (2) Surety (2)

By: _____ By: _____
General Agent or Attorney-in-Fact

Print Name and Title Date

Date (Seal)

***NOTE: The signature and information for Principal(2) and Surety(2) is to be provided when there is a joint venture.**

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CITY OF FRANKLIN, TENNESSEE

PROPOSAL GUARANTEE

CONTRACT NO. 2024-0246

Bidder: _____
Print Name of Bidder

KNOW ALL MEN BY THESE PRESENTS, that the above-named Bidder has tendered the attached cashier's or certified check in an amount equal to five percent (5%) of the total amount it bid for the project stated above, payable to the CITY OF FRANKLIN, to be held pending the fulfillment of the following obligation conditions.

NOW, THEREFORE, the condition of this obligation is: the Bidder shall not withdraw its bid within sixty (60) days after the opening of the bids, or within such other time period as may be provided in the Proposal, and if the CITY OF FRANKLIN shall award a Contract to the Bidder, the Bidder shall, within ten (10) days after it receives written notice of the award, fully execute a Contract on the basis of the terms, conditions and unit prices set forth in its Proposal or bid and provide bonds with good and sufficient surety, as required for the faithful performance of the Contract and for the protection of all persons supplying labor, material, and equipment for the prosecution of the work. In the event the Bidder withdraws its bid after bids are opened, or after award of the Contract has been made fails to execute such the Contract and/or such additional documents as may be required and to provide the required bonds within the time period specified above, then the CITY OF FRANKLIN shall cash the attached check and retain the funds, not as a penalty, but as agreed upon liquidated damages.

IN WITNESS WHEREOF, the Bidder has caused these presents to be signed by a duly authorized official.

| | |
|----------------------|----------------------|
| _____ | _____ |
| Bidder (1) | Bidder (2)* |
| By: _____ | By: _____ |
| _____ | _____ |
| Print Name and Title | Print Name and Title |
| _____ | _____ |
| Date | Date |

***NOTE: The signature and information for Bidder(2) is to be provided when there is a joint venture.**

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CITY OF FRANKLIN, TENNESSEE

CONTRACT NO. 2024-0246

This agreement is made and executed in three (3) originals, between the CITY OF FRANKLIN, and _____ hereinafter referred to as the "Contractor."

WITNESSETH

The CITY OF FRANKLIN did advertise for, receive and accept a bid from the Contractor for work on the above identified contract.

In consideration of the agreements herein contained, to be performed by the parties hereto and of the payments hereafter agreed to be made, it is mutually agreed by both parties that:

1. The contract between the parties consists of the following "Contract Documents" all of which constitute one instrument:
 - (a) the Instructions to Bidders
 - (b) the Proposal
 - (c) all conditions and terms of this Contract form
 - (d) the Contract Payment & Performance Bond and/or Letter of Credit, where applicable
 - (e) the most current version of the *Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction* (herein referred to as *TDOT Standard Specifications*)
 - (f) Supplemental Specifications
 - (g) Revisions and Additions
 - (h) Special Provisions
 - (i) Addenda
 - (j) The most current version of the TDOT Standard Drawings
 - (k) The Contract Plans,
 - (l) The Work Order
 - (m) Construction Changes
 - (n) Supplemental Agreements

All of the provisions contained in the listed Contract Documents are incorporated herein by reference with the same force and effect as though set out in full.

2. The Contract Documents are intended to be complementary and to describe and provide for a complete work. Requirements in one of these are as binding as if occurring in all of them. In case of discrepancy, Supplemental Specifications will govern over the TDOT Standard Specifications; the TDOT Standard Specifications will govern over the local government standard specifications; the Contract Plans will govern over both Supplemental and Standard Specifications, and Special Provisions will govern over both Plans and Specifications. In interpreting Plans, calculated dimensions will govern over scaled dimensions. Contract Plans, typical cross sections and approved working drawings will govern over Standard Drawings.
3. The Contractor agrees to furnish all materials, equipment, machinery, tools and labor and to perform the work required to complete the project in a thorough and

workmanlike manner, to the satisfaction of the appropriate official of the CITY OF FRANKLIN.

4. The CITY OF FRANKLIN agrees to pay to the Contractor such unit prices for the work actually done as are set out in the accompanying proposal, in the manner provided for in the TDOT Standard Specifications, Supplemental Specifications and applicable Special Provisions.
5. The Contractor shall, at all times, observe and comply with all applicable federal, state and local laws, ordinances and regulations and shall indemnify and hold harmless the CITY OF FRANKLIN and all of its officers, agents and servants against any claim of liability or assessment of fines or penalties arising from or based upon the Contractor's and/or its employees' violations of any such law ordinance or regulation. The Contractor shall maintain documentation for all charges against the CITY OF FRANKLIN under this Contract. The books, records and documents of the Contractor insofar as they relate to the work performed or money received under this contract shall be maintained for a period of seven (7) full years from the date of the final payment and shall be subject to audit at any reasonable time and upon reasonable notice by the CITY OF FRANKLIN, the State, the Comptroller of the Treasury, the Tennessee Department of Transportation, or their duly appointed representatives.
6. The Contractor shall be responsible for any and all injury or damage to persons or to property arising from the prosecution of the work and due to any act, omission, neglect or misconduct in its manner or method of prosecuting the work or due to its non-execution of the work or due to defective work or materials. The Contractor shall provide proof of adequate and appropriate general liability insurance providing liability coverage in an amount not less than \$1 million dollars per occurrence and \$300,000 per claimant, naming the CITY OF FRANKLIN as an additional insured.
7. The Contractor shall indemnify and hold harmless the CITY OF FRANKLIN and all of its officers, agents and employees from all suits, actions or claims of any character arising from the Contractor's acts or omissions in the prosecution of the work, use of unacceptable materials in constructing the work, infringement of patent, trade mark or copyright, or claims for Workers' Compensation. If any such suit, action or claim is filed, the CITY OF FRANKLIN may retain from the monies due to the Contractor under this Contract a sum deemed sufficient by the CITY OF FRANKLIN to protect the CITY OF FRANKLIN from loss therefrom. Upon resolution of the suit, action or claim, any remaining retained funds will be released.
8. Upon execution of this Contract, the Contractor shall be prepared to begin the work to be performed under the Contract, but will not proceed until it has received official "Notice to Proceed". This official notice will stipulate the date upon which it is expected that the Contractor will begin his work, and from which date the working days tabulated against its time limit will begin. All other requirements in regard to the beginning of construction set forth in the Proposal and Special Provisions will date from the official notice.

IN WITNESS WHEREOF, the parties hereto have cause this Contract to be signed and executed by their respective authorized agents or officials.

Contractor 1 Contractor 2*

By: _____ By: _____

Print Name and Title Print Name and Title

Date Date

CITY OF FRANKLIN, TENNESSEE

This Contract is accepted _____ day of _____
this _____

and is effective on the _____ day of _____,

[CITY/COUNTY Official]

Approved:

CITY OF FRANKLIN Attorney

***NOTE: The signature and information for Contractor 2 is to be provided when there is a joint venture.**

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CONTRACT PAYMENT AND PERFORMANCE BOND

Note: to be filled out post-award

CONTRACT NO. 2024-0246

Be it known that _____,
as Principal, and _____,
as Surety(ies), all authorized to do business in the State of Tennessee, hereby bind themselves to the CITY OF FRANKLIN, and other potential claimants, for all obligations incurred by the Principal under its contract with CITY OF FRANKLIN, for the construction of the above identified contract; in the full contract amount of _____ (\$_____).

The obligations of the Principal and Surety(ies) under these payment and performance bonds shall continue in full force and effect until all materials, equipment and labor have been provided AND all requirements contained in the contract, plans and specifications have been completed in a timely, thorough and workmanlike manner. The parties agree that these bonds are statutory in nature and are governed by the provisions contained in Title 12, chapter 4 and Title 54, chapter 5 of the Tennessee Code Annotated relating to bonds required of contractors and that those provisions constitute a part of this bond.

By this instrument, the Principal and Surety(ies) specifically bind themselves, their heirs, successors, and assigns, *in solido*, under the following bonds:

Payment Bond. To the CITY OF FRANKLIN and all "Claimants," as contemplated by T.C.A. Title 54, chapter 5, in the full contract amount of

(\$_____),
in order to secure the payment in full of all timely claims under the project.

Performance Bond. To the CITY OF FRANKLIN in the full contract amount of

(\$_____),
in order to secure the full and faithful performance and timely completion of the project according to its plans and specifications, inclusive of overpayments to the contractor and liquidated damages as assessed.

Upon receipt of notice that the Principal is in default under the contract, the Surety(ies) shall undertake to complete performance, without regard to cost. If the Surety(ies) fail or refuse to complete performance of the contract, the CITY OF FRANKLIN may then proceed with the work in any lawful manner that it may elect until it is finally completed. When the work is thus finally completed, the total cost of the same will be computed. All costs and charges incurred by the CITY OF FRANKLIN in completing the Work will be deducted from any monies due or which may become due to the Principal. If the total costs of completion exceeds the sum which would have been payable under the Contract, then the Principal and the Surety(ies), *in solido*, shall be liable for and shall pay to the CITY OF FRANKLIN the amount of such excess.

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In witness whereof we have signed this instrument as dated.

Principal/Contractor 1:

By: _____ Date: _____

Printed Name and Title

**(For Joint Venture)
Principal/Contractor 2:**

By: _____ Date: _____

Printed Name and Title

Surety 1:

Surety 2:

By: _____ By: _____

Attorney-in-Fact

Attorney-in-Fact

Printed Name

Printed Name

Agency Name

Agency Name

Street Address

Street Address

City/State/Zip

City/State/Zip

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Subsequent correspondence/communication from CITY OF FRANKLIN with respect to monthly progress reports and/or the contract bonds should be directed to:

For Surety 1:

For Surety 2:

| | |
|--------------|--------------|
| Name | Name |
| Address | Address |
| City | City |
| State/Zip | State/Zip |
| Phone Number | Phone Number |
| Fax Number | Fax Number |

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