



SPECIFICATIONS

FOR

Issue for Bidding Submission

REHABILITATION OF ROUTE 010ZZ QUEBEC ROAD

TENSAS RIVER NATIONAL WILDLIFE REFUGE

**BALLARD CLC, INC.
PROJECT NO. 243600**

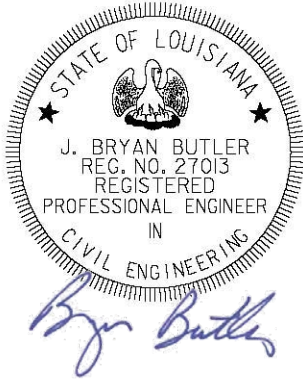
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ARCHITECTURE | ENGINEERING | SURVEYING

REHAB RT.#010ZZ, QUEBEC ROAD PROJECT
TENSAS NATIONAL WILDLIFE REFUGE

SECTION 00 00 00
SEALS PAGE



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**REHAB RT.#010ZZ, QUEBEC ROAD PROJECT
TENSAS NATIONAL WILDLIFE REFUGE**

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SECTION 00 01 15

LIST OF DRAWING SHEETS

The drawings listed below accompanying this specification form a part of the contract.

<u>Drawing No.</u>	<u>Title</u>
GENERAL	
1	TITLE SHEET & VICINITY MAP
1a	SUMMARY OF ESTIMATED QUANTITIES
1b	PAVEMENT REPAIR & CRACK SEALING TABLES
2	TYPICAL SECTIONS & REPAIR DETAILS
3-58	ROAD PLAN & PROFILES
59-90	ROAD CROSS SECTIONS
EXISTING CONDITIONS	
E1-E17	EXISTING DAMAGED AREAS
LA DOTD STANDARD PLANS	
BM-01	TYPICAL SECTIONS FOR CROSS DRAINS & SIDE DRAINS (SHEET 2)
EC-01	TEMPORARY EROSION CONTROL DETAILS (SHEET 1)
EC-01	TEMPORARY EROSION CONTROL DETAILS (SHEET 2)
PM-01	CENTERLINE AND EDGELINE MARKINGS
PM-02	PAVEMENT WORD AND SYMBOL MARKINGS
PM-05	TYPICAL INTERSECTION STRIPING LAYOUTS
PM-07	RAILROAD CROSSING LAYOUT
PM-08	PEDESTRIAN/BIKE STRIPING LAYOUT
TTC-00 (A)	TEMPORARY TRAFFIC CONTROL – GENERAL NOTES SHEET
TTC-00 (B)	TEMPORARY TRAFFIC CONTROL – GENERAL NOTES SHEET
TTC-00 (C)	TEMPORARY TRAFFIC CONTROL – GENERAL NOTES SHEET
TTC-00 (D)	TEMPORARY TRAFFIC CONTROL – LAYOUT FOR PLACEMENT OF ROAD WORK
TTC-01	TEMPORARY TRAFFIC CONTROL – FOR WORK GREATER THAN 15 FEET FROM THE TRAVELED WAY
TTC-02	TEMPORARY TRAFFIC CONTROL – LAYOUT FOR WORK LESS THAN 15 FEET FROM THE TRAVELED WAY

TTC-04	TEMPORARY TRAFFIC CONTROL – LAYOUT FOR LANE CLOSURES ON TWO LANE ROADS WITH TWO-WAY TRAFFIC (FLAGGING OPERATIONS)
TTC-18	TEMPORARY TRAFFIC CONTROL – FOR MOVING OPERATIONS ON TWO-WAY TWO-LANE ROADWAY
TTC-19	TEMPORARY TRAFFIC CONTROL – FOR TRAFFIC SIGNAL INSTALLATION AND MAINTENANCE AT AN INTERSECTION

--- END ---

01 00 00

GENERAL REQUIREMENTS

01 1 00 SUMMARY OF WORK

- A. Work: Includes all necessary materials, labor superintendence, management, fees, assessments, and costs to design and construct the project in accordance with the contract documents. The project consist of rebuilding portions of the road and overlaying the road surface with 2 inches of asphalt
- B. This project is on the Tensas National Wildlife Refuge located in Madison, Parish. The project includes construction of new road sections with an overlay and overlaying the remaining road for the Tensas National Wildlife Refuge.
- C. Base Bid Tasks shall be included at Contract Award.
- D. Option Bid Tasks may be exercised at the time of award or during the Contract Period of Performance. Option Bid Tasks may or may not be exercised at any time during the Contract's Period of Performance. No Option Bid Tasks included in this Contract.
- E. The price of any necessary ancillary Work (any trade) including mobilization and demobilization shall be included as incidental to the price offered for the principal price line(s) listed in the solicitation.
- F. The solicitation may include multiple Work Items (price lines), and the USFWS reserves the right to award any (or any combination of) Work Items to the extent of available funds.
- G. The contractor shall furnish all labor, equipment, materials, and supplies necessary to result in one hundred (100) percent complete, usable systems and facilities. Contractor shall bring any discrepancies to the Contracting Officer's attention during tendering. Failure to bring discrepancies to attention of the CO during tendering shall be the responsibility of the contractor during construction.
- H. The Contractor shall not take advantage of any apparent error, omission, discrepancy, or ambiguity on the Drawings or Specifications. If any error, omission, discrepancy, or ambiguity is found by the Contractor in the Drawings or Specifications, the Contractor shall timely refer the same to the Contracting Officer (CO) prior to beginning work on affected task(s), for interpretation and decision through RFI, and such decision shall be final.
- I. The Contracting Officer shall have the right to correct apparent errors or omissions in the Statement of Work and to make such interpretations as they may deem necessary for the proper fulfillment of the Contract Documents. During the course of the work, should any party discover any unaddressed conflicts, ambiguities, or discrepancies between the Drawings and the Specifications to which the Contractor has failed to call attention prior to submitting the offer, then the CO will interpret the intent of the Drawings and Specifications and the Contractor hereby agrees to abide by the CO's interpretation and agrees to carry out the work in accordance with the decision of the CO. In such event, the Contractor will be held to have included in the offer the most expensive material and/or method of construction.
- J. ACCESS TO SITE
 - 1. General: Contractor shall have limited use of premises for construction operations during construction period. Contractor's use of premises is limited by USFWS's need for

- uninterrupted operations and the right to perform work in affected areas.
2. Use of Site: Limit use of Project site to areas indicated within the Contract limits or approved of by Contracting Officers Technical Representative (COR). Do not disturb portions of Project site beyond areas in which the Work is indicated.

01 11 10 INSTRUCTIONS

- A. Demolition, Disposal, Recycling, and Construction Activities on U.S. Fish and Wildlife Service Tensas National Wildlife Refuge shall be coordinated with the refuge manager. Contractor is required to provide a written Action Plan for Demolition, Disposal, Recycling, and Construction Activities. The written Action Plan be approved by the Contracting Officer before Demolition, Disposal, Recycling, and Construction Activities can begin in the area in its entirety.
- B. Means and methods of construction are solely the responsibility of the Contractor and shall be such as the Contractor or their subcontractors may choose; subject, however, to the Contracting Officer's right to reject means and methods proposed which, in their opinion:
 1. Constitute a hazard to the work, persons, or property.
 2. Will not produce finished work in accordance with terms of the Contract.
 3. Are contrary to specified means or methods included in the Contract.

01 1 15 LOCATION OF THE WORK

- A. Quebec Road is located at Latitude N 32° 25' 36.53" and Longitude 93° 18' 8.68".
- B. The Project is accessible from existing roads.

01 11 16 REFUGE MANAGER

- A. Refuge Manager:
Nathan J. Renick
Tensas National Wildlife Refuge
2312 Quebec Road
Tallulah, LA 71282
Phone: (318) 574-2664 Ext. 101
Email: nathan.renick@fws.gov

01 11 20 PRE-OFFER BID MEETING

- A. Pre-Offer Bid Meeting: Refer to Solicitation for scheduled meeting day and time.

01 11 25 INQUIRIES

- A. Questions shall be directed to the USFWS Contracting Officer, Refer to Solicitation.

01 11 30 SPECIAL NOTICES

- A. Period of Performance: Refer to Solicitation.
- B. Contractor is solely responsible for paying any fees, permits, inspections, taxes, and similar associated with the Work.
- C. Deliverables: 100% Completed Work in accordance with the Contract Documents.
- D. Comply with Davis-Bacon Wage Rates and Buy American. Contractor shall ensure employees and subcontractors are paid on time according to a pre-determined pay period or pay schedule. The pay period or pay schedule shall be mutually agreeable between the Contractor and its employees and/or subcontractors.

- E. Hazardous Materials: The Work entails no known materials regulated as “hazardous” or similar designation. However, the Contractor shall exercise health and safety measures appropriate for the Site Conditions.
- F. The contractor or the contractor’s designated representative (who will oversee the actual construction work) shall attend a pre-construction meeting with the contracting officer’s representative at the project site prior to mobilization. The contractor or the contractor’s designated representative shall be on site while any contract related work is in progress.
- G. Remove and dispose of all demolition items in a legal manner of USFWS property and in accordance with all Federal, State, and Local Regulations.

01 11 40 WORK RESTRICTIONS

- A. Service outages: Limit service outages to a maximum of 4 hours unless written permission is obtained from COR and Station Manager.
- B. Work Hours: On-site construction work shall be conducted during normal business hours of operation for that facility, which are typically Monday through Friday, 8:00 AM to 4:30 PM except on federal holidays, unless approved otherwise. Requests to change working hours shall be submitted in writing to the CO at least 48 hours in advance.
- C. Housing for workers and campsites are not available on site unless explicitly indicated otherwise in the Task Order.
- D. Government buildings and other facilities are not available for storage of Contractors materials, equipment, or tools. Government owned equipment is not available for Contractors use to accomplish any Work.
- E. Habitat Restrictions: Wildlife habitat issues may restrict building seasons. Coordinate with COR for requirements.
- F. Accomplish the Construction Work in a manner, which does not interfere with ongoing refuge operations. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by USFWS or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to the requirements indicated:
 - Notify USFWS COR not less than 10 days in advance of proposed utility interruptions.
 - Do not proceed with utility interruptions without USFWS and utility company written permission.

01 20 00 PAYMENT PROCEDURES

- A. Measurement: No measurement of the work shall be made, unless unit prices are included in the project.
- B. Payment: Monthly payment shall be made for approved work performed in accordance with the contract requirements under the items listed in the Schedule of Items and on the basis of approved Schedule of Values.
- C. Application for Payment:
 - 1. Schedule of Values:
 - a. Contractor shall prepare a Schedule of Values in the format (or approved equivalent format) of FWS form E15.
 - b. Contractor shall submit a detailed Schedule-of-Values within 7 days prior to the

start of on-site construction work and shall format the schedule-of-values to match the Pricing Schedule and provide sufficient additional detail to allow accurate calculation of monthly progress payments.

2. Certified Payrolls: Contractor shall submit certified payrolls current to within 1 week of payment application period.
3. Invoicing:
 - a. The prime contractor shall e-mail the preliminary pay request to the COR prior to uploading their pay request to the Internet Processing Platform (IPP) Website (<https://www.ipp.gov/>). The pay request shall include a schedule of values with percentage or work completed.
 - b. The COR will return a signed and approved invoice to the contractor which will then be uploaded into IPP.

01 31 00 PROJECT MANAGEMENT AND COORDINATION

- A. The standard Government forms, specifications, associated plans, solicitation provisions, and contract clauses made a part of the contract are essential parts thereof, the requirements in one are as binding as though contained in all. They are intended to be mutually supplementary to describe and provide for a completed project.
- B. The provisions of Standard Government Forms shall govern in cases of conflict with specifications, contract provisions, and supplemental agreements forms. In all cases of dispute, the Contracting Officer shall decide which part or parts of the specifications apply to any given parts of the work with respect to such conflict.
- C. Coordination
 1. Coordinate scheduling, submittals, and work of the various sections of specifications to ensure efficient and orderly sequence of installation of interdependent construction elements.
 2. Verify and confirm all dimensions and conditions shown or implied on the Drawings and specifications as well as the physical conditions of the site. Notify COR of discrepancies prior to start of work for resolution.
 3. Verify that utility requirement characteristics of operating equipment are compatible with building utilities.
 4. Provide field surveying to accurately establish the horizontal and vertical locations of the work.
 5. Government furnished drawings shall not be scaled to obtain missing or conflicting dimensions. The Contractor shall monitor dimensions and details as the work progresses and any errors or discrepancies discovered shall be promptly reported to the COR.
- D. Accomplish construction work in a manner that does not interfere with ongoing station operations, nor allow any construction material, soil, or debris to enter waters of the State.

01 31 10 CONTRACT ADMINISTRATION

- A. Authority of the Contracting Officer's Representative (COR) is limited to the following functions:
 1. Inspect and either accept or reject Construction Work and Materials, including approval or disapproval of materials, submittals, and shop drawings.
 2. Ensure compliance with technical contract terms and conditions.
 3. Clarify specifications and drawings in which clarification would not result in modifications of contract cost or time. Any resulting disagreements are to be immediately referred to the Contracting Officer.
 4. Verify and recommend payment estimates on progress payments and forward progress payments to the Contracting Officer for approval.

5. Conduct "Labor Standards Interviews" in accordance with instructions from the Contracting Officer. Any known or suspected violations shall be reported immediately to the Contracting Officer.
 6. Enforce safety requirements in accordance with the Federal Acquisition Regulations (FAR) and Technical Specifications.
 7. The COR may perform any duties of the Inspector in Section D.
- B. The COR is not authorized to take the following actions, all of which remain the sole responsibility of the Contracting Officer:
1. Make any changes to the contract provisions, period of performance, or contract terms and conditions.
 2. Make decisions concerning any claims and disputes.
- C. The COR shall immediately notify the Contracting Officer of any problems encountered including, but not restricted to, maintaining completion schedules.
- D. Authority of the Inspector: An inspector employed by the Government may assist the COR in observing the Work, obtaining measurements, and enforcing strict compliance with the terms and conditions of the Contract.
1. The Inspector shall have free access to the jobsite at all times while construction work is in progress, and the Contractor shall furnish such information and assistance as necessary.
 2. The Inspector shall record the construction work accomplished.
 3. The Inspector may reject unsuitable Materials or Construction Work that does not comply with the terms and conditions of the contract until the situation has been referred to and resolved by the COR and/or Contracting Officer.
 4. The Inspector shall observe and ensure construction is performed in conformance with the contract health and safety requirements.
 5. The Inspector shall conduct wage rate interviews and report suspected labor standard violations to the Contracting Officer.
 6. The Inspector shall check and verify the progress payment requests.

01 31 20 PERFORMANCE OF WORK BY THE CONTRACTOR

- A. Work procedures and methods may be of the Contractor's choosing, provided that the methods follow general best practices and are calculated to secure results that satisfy the requirements of the contract.
- B. The Contractor shall provide the COR all reasonable facilities for obtaining information respecting the character of the materials and progress of the Work. The Contractor shall furnish information to include the number of Workers employed, their pay rate, time worked, and other elements of cost requested by the COR. No personal information from personnel should be included for PII purposes.

01 31 30 GENERAL TECHNICAL REQUIREMENTS

- A. Perform the Work in accordance with Contract Documents (Drawings and Technical Specifications) and provisions of the Contract.
- B. Comply with the current edition of OSHA and the National Fire Protection Association (NFPA) 101 Life Safety Code, International Building Code, American Welding Society Standards, American Concrete Institute recommended practices, International Plumbing Code, International Mechanical Code, National Electrical Code, and applicable Federal, State, and Local laws and regulations.
- C. If the code provisions conflict, the more stringent code provision(s) shall govern. In any instances where the Design Drawings and Technical Specifications do not specify explicit materials or

methods, then Contractor shall perform the Work in accordance with the minimum requirements of the code applicable to the Work.

- D. Field Verify and Validate Dimensions, Elevations, and Project Area Features before commencing construction. Notify the CO and COR of any conflicts.
- E. Welding shall be performed by licensed welders and in compliance with AWS Recommended Practices. Welds shall have structural integrity and be neat in appearance.

01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION

- A. The Contractor shall provide daily activity logs and checklists to record daily activities and submit them biweekly to the Contracting Officer or their Representative.
 - 1. Provide construction photographs of the project on a once-per-week basis. In addition:
 - a) Final Completion Photographs: Contractor shall provide a final set of photographs after date of Substantial Completion and all temporary structures have been removed.
- B. Schedule:
 - 1. Distribution: At Preconstruction Meeting, submit initial schedule.
 - 2. Develop schedule on commercially available computer scheduling software
 - 3. Provide schedule showing work break down structure or precedence diagram.
 - 4. Identify day, date, duration, and float for each work activity.
 - 5. Break down activities by, skill set or trade, geographic location within project,
 - 6. Identify all interfaces with government that may impact schedule. Keep government interfaces from critical path to maximum extent practical.
 - 7. Update schedule to reflect changes/delays in the work.
 - 8. Provide 3-4 week look ahead Schedules. Update Schedule every week and submit to COR. Coordinate activities with Station manager.
- C. Project meetings
 - 1. Preconstruction Meeting: Project Manager/COR will arrange a Preconstruction Meeting prior to start of any construction. Require attendance by all parties affected by the work. Take and distribute meeting notes to all affected parties.
 - 2. Progress Meetings: As required by the progress of the project, Contractor will coordinate progress job meetings. Require attendance by all parties affected by the work.
 - 3. Contractor will take and distribute meeting notes to all affected parties. Notes should be distributed within 72 hours of meetings.

01 33 00 SUBMITTAL PROCEDURES

- A. Master Submittal List: Submit Master submittal register identifying all submittals required. Submit register at Pre-construction meeting. Identify each submittal by title and appropriate specification section along with responsible party to review/approve. Sequentially number each submittal. See Appendix B for Submittal Register.
- B. Electronically transmit submittals with the Government-furnished Submittal Form 4-18 that will also be used as the document for approving or disapproving submittals. Government shall furnish R1-67 in Word format for use. Submit R1- 67 form in Word format for transmittal sheet of each submittal. Obtain written approval before items are ordered. Use a separate R1-67 form for each broad category of material to avoid confusion should a re-submittal be necessary.
- C. Submit all submittals to the COR, viewed and signed by the Contractor, indicating they comply with the contract requirements. Submittals without the Contractor's signature will be returned without action.

- D. Submittals shall contain detailed product literature, shop drawings, material samples, and/or finish samples fully describing the items proposed for installation.
- E. Conspicuously mark the item submitted to explicitly indicate the specific options, models, mechanical/electrical characteristics, trim styles, colors, sizes, etc. Annotate the submittal to cross reference to the mark numbers/group numbers shown on the drawings and/or specification.
- F. Tab and index submittals containing more than ten pages.
- G. Explicitly and clearly indicate all features that differ from the contract requirements.
- H. Submittals will be returned to the Contractor within 14 working days of the date received by the COR.
- I. Submit documentation for all products, materials, and equipment proposed for use.
- J. Material Certifications:
 - 1. Submit manufacturer's certificate indicating that the material or product conforms or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product but must be acceptable to COR.
- K. Samples:
 - 1. Submit exact product or material to be used.
 - 2. Submit product sample of size specified and of sufficient size to clearly show the characteristics, integral parts, and attachment of the product or system.
 - 3. Submit interior and exterior color and texture samples at one time for coordinated review by COR.
- L. Submittal reviews by USFWS does not waive or alter the contract requirements. Any deviation from the contract requirements must be specifically brought to the attention of the COR and CO, in writing and upon the drawings, or by appropriate change order.

01 34 00 BASELINE SUBMITTAL LIST

- A. **Descriptive Product Literature:** Provide Descriptive Product Literature for the principal components of any trade work. See also individual design drawings and technical specifications for specific requirements.
- B. **Progress Schedule:** Submit the proposed progress work schedule for approval within 15 days after award of contract. Itemize each principal component/phase of work and the calendar days of anticipated performance. Submit a revised schedule any time the actual work progress delays the scheduled time by more than 14 calendar days.
- C. **Schedule of Values:** Submit a detailed Schedule-of-Values within 7 days prior to the start of on-site work. Format the schedule-of-values to match the Schedule of Items and show sufficient additional detail to allow accurate calculation of monthly progress payments. Lump sum items shall be broken down into their component parts as applicable with a cost shown for each, i.e., mobilization, bond and insurance, and the principal components of the work.
- D. **Subcontract List:** Submit each proposed subcontractor on a SF 1413 (Statement and Acknowledgment) in accordance with Paragraph (d)(1) of FAR Clause 52.222-11. SF 1413s within 14 days after award of the contract.
- E. **Key Personnel Names:** Within 14 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list work addresses, telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of

individuals assigned as alternates in the absence of individuals assigned to Project.

1. Project Superintendent with a minimum of ten (10) years of experience in coordinating subcontractors in construction industry.
- F. **Site Specific Safety Plan,):** Prepare and Submit Site Specific Safety Plan, Job Hazards Analysis (JHA), and Health and Safety Plan (HSP). Provide Detailed Project Data in the Site Specific Safety Plan, Job Hazards Analysis (JHA), and Health and Safety Plan (HSP).
- G. **Testing Agency Qualifications:** For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience, include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- H. **Permits, Licenses, and Certificates:** Submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.
- I. **Quality Control Plan (QCP):** Prepare and Submit **Quality Control Plan (QCP)**. Provide delineation of Laboratory and Institute (Onsite) Tests and Inspections to be performed by the Contractor's Independent Testing Agency under subcontract. Refer to Technical Specifications for Scope and Quantity of Tests and Inspections required for the Project. Refer to General Requirements Division 1, Section **01 44 00** Testing and Inspection and related Technical Specifications for specific requirements.
- J. **Construction Daily Reports:** For the Duration of the Construction Contract, submit a Construction Daily Report for each Work Day, which includes the Contract Number, Title and Location of Project, Report Number, Prime Contractor Designation, Subcontractor Designation, Superintendent Designation, Morning Weather Description, Afternoon Weather Description, Maximum Daily Temperature, and Minimum Daily Temperature. Also, include the Day's Scheduled Activity Number(s), Work Location(s), Work Description(s), Employer(s), Number of Worker(s), Trade(s), Number of Work Hour(s), Work Item(s) Completed, and Job Safety Checklist(s). The contractor may include additional entry fields on their Construction Daily Reports at their own discretion.
- K. **Site Observation and Inspection Reports:** For the Duration of the Construction Contract, prepare and submit Site Observation and Inspection Reports for each Work Day. Site Observation and Inspection Reports shall be prepared and submitted by the Third Party Testing Company under subcontract to the Prime Contractor. Where necessary, the Prime Contractor will take corrective actions if the Inspection Company notes any deficiencies.
- L. **Quality Control Test Reports:** For the Duration of the Construction Contract, perform Quality Control Tests and prepare and submit Quality Control Test Reports for each material to be provided and installed.
- M. Close-Out Documents: Submit documents listed in **Specification 01 78 00**.

01 35 00 SPECIAL PROCEDURES

- A. Rollover Protection and Seat Belts: In addition to the Safety and Health requirements of clause Federal Acquisition Regulation (FAR) 52.236-13 of Part 2, Section I of this Contract, rollover protection and seat belts required by 29CFR 1926 (OSHA) shall be extended to include equipment regardless of the year of manufacture.
- B. Immediately stop work if paleontological, archaeological, or historical remains (including burials or skeletal material) are encountered, immediately stop the work and notify the Inspector, Contracting Officer's Technical Representative, or Contracting Officer. The Contracting Officer will notify the Regional Archaeologist so the provisions of 36 CFR 800.7 (Resourced Discovered

During Construction) and other relevant laws are followed. Work will cease in the immediate vicinity until permitted to resume by written order from the Contracting Officer. Work in other areas may proceed as approved by the regional Archaeologist.

- C. Hazardous Materials: The proposed work areas are believed not to contain any hazardous materials. Should any unknown hazardous materials be encountered, stop work immediately and notify COR in writing of such condition. Initiate and maintain, throughout the performance of this contract, an effective safety and health program that provides adequate policies, procedures, and practices to protect employees from, and allow them to recognize, job-related safety and health hazards.

01 40 00 QUALITY REQUIREMENTS

- A. Quality Control: The Quality Control (QC) process is managed by contractors, subcontractors, or construction managers to ensure the construction process and final product meet specified standards. QC involves on-site inspections, material testing, and monitoring workmanship to identify and address defects or issues promptly. Contractors and subcontractors are responsible for detecting and rectifying deficiencies to prevent any compromise to the overall project quality. Detailed records of inspections, observations, corrective actions, and completion must be maintained throughout the QC process.
 - 1. The contractor is responsible for ensuring the overall quality of all its own work and the work performed by their subcontractors under this contract.
 - 2. All work performed must meet or exceed the standards outlined in the technical divisions of this specification.
 - 3. If the CO identifies work that does not comply with the specifications or drawings, the contractor will be notified in writing of the nonconformance. The contractor must correct the deficiencies and provide the CO with written documentation of the corrective actions taken within seven days.
 - 4. Supervision: A Project Manager or Project Superintendent must be present during all on-site work. This individual should have a thorough understanding of the project and be able to read, write, and speak fluent English to ensure effective communication.
- B. Noncompliance with Quality Control Requirements: Failure of the contractor to comply with the above requirements may be cause for termination for default.
- C. Quality Control Procedures
 - 1. Monitor quality control over Contractor staff, subcontractors, suppliers, manufacturer's, products, services, site conditions, and workmanship.
 - 2. Comply fully with manufacturer's published instructions, including each step-in-sequence of installation.
 - 3. Should manufacturer's published instructions conflict with Contract Documents, request clarification from Contracting Officer before proceeding.
- D. Comply with specified standards as a minimum quality for Work, except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform Work by persons who are thoroughly qualified and trained in their respective trade, to produce workmanship of specified quality.

- F. Perform tests required by governing authorities and utilities having jurisdiction.
- G. Maintain check-off list of Work that does not comply with Contract Documents, stating specifically what is non-complying, the date on which faulty Work was originally discovered, and the date on which faulty Work was corrected. No requirement to report deficiencies corrected same day it was discovered. Submit copy of Non-Compliance Check-Off List of non-complying work items to Contracting Officer on a weekly basis.
- H. Prior to final acceptance by Contracting Officer, submit a certification signed by Contractor to the Contracting Officer stating that all Work has been inspected and all Work, except as specifically noted, is complete and in compliance with Contract Documents.
- I. Project Safety:
 - 1. The Contractor is responsible for safety on the project site at all times, from issuance of the Notice to Proceed until final completion and acceptance of the project by the Contracting Officer.
 - 2. The Contractor is responsible for ensuring that all onsite activities, equipment, and facilities constructed by the Contractor, subcontractor, or supplier conform fully to the standards of the Department of Labor, Occupational Safety and Health Administration (OSHA) 29 CFR 1926 and 1910; and DOI and FWS policies.
 - 3. Adhere to all current Federal, State, and Local safety requirements. In the event where any safety standard referenced herein conflicts with another, the more stringent shall govern.
 - 4. Initiate and maintain, throughout the performance of this contract, an effective safety program that provides adequate policies, procedures, and practices to protect their employees from, and allow them to recognize, job-related safety and health hazards.
 - 5. Include in safety program, provisions for the identification, evaluation, prevention and control of general work site hazards, specific job hazards, and potential hazards that may arise from foreseeable construction methods and conditions, as well as providing a competent person to conduct frequent and regular inspections.
 - 6. Each employee for all contractors and subcontractors must be instructed in the recognition and avoidance of unsafe conditions and the regulations applicable to the work environment.
 - 7. Provide barricades and warning devices as necessary to safeguard the public, workers, and government personnel.
 - 8. Where project work affects public roads, provide signage in accordance with the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) as published by the US Department of Transportation, Federal Highway Administration.

01 41 00 REGULATORY REQUIREMENTS

- A. Regulatory Requirements:
 - 1. Comply with all applicable Federal, State, and Local environmental laws, regulations, and standards. This condition applies to, but is not limited to, laws, regulations, and standards governing noise levels, air and water quality, and cultural resources.
 - 2. Comply with the current edition of the National Fire Protection Association (NFPA) 101 Life Safety Code, International Building Code, Architectural Barriers Act (ABA), National Electric Code, International Plumbing Code, and International Mechanical Code
 - 3. If the code provisions conflict, the more stringent code provision shall govern.
 - 4. In any instances where the drawings and specifications do not specify explicit materials or methods, then perform the work in accordance with the minimum requirements of the code applicable to the work.
- B. Permit Responsibility:
 - 1. In general, customary mechanical and electrical trade permits may be required. The Contractor shall arrange for, obtain, and pay for any customary mechanical and electrical trade permits and licenses.

2. Include fees for items above as a line item in the Schedule of Values.
3. FWS will obtain natural resource permits associated with in-stream work.

01 42 00 REFERENCES

A. Acronyms

1. USFWS, US FWS, US & FWS, FWS, Owner, Government, and Service, are all intended to mean:
 U.S. Fish & Wildlife Service, Region
 4
 Southeast Region
 1875 Century Center Blvd.
 Atlanta, GA 30345
2. CO: Contracting Officer
3. COR: Contracting Officers Technical Representative
4. CGS: Division of Contracting and General Services, USFWS
5. DOI: Department of Interior
6. EN: Division of Engineering, USFWS
7. D/B: Design Builder or Design Build entity
8. FF&E: Furnishings, Fixtures, and Equipment
9. NWR: National Wildlife Refuge
10. NWRC: National Wildlife Refuge Complex
11. NFH: National Fish Hatchery
12. NFHC: National Fish Hatchery Complex

B. Definitions

1. Allowance(s): A specific monetary sum included in the basic contract amount for a contract element that is undefined. Allowance includes all labor, materials, incidental expenses, taxes, and contractor markups for incorporation of the element into the project. Allowances will be paid for on a time and materials basis after submittal and approval of a detailed cost break down and a contract modification has been issued. Should the allowance amount exceed the actual cost, savings will accrue to the Owner. Should the allowance not cover the cost, an equitable contract modification will be issued.
2. Authority Having Jurisdiction: Division of Engineering, Region 1, U.S. Fish & Wildlife Service
3. Industry Standard: A reference standard that establishes a level of quality, performance, or other characteristic of a material or system.
4. Local Authority Having Jurisdiction: Duly adopted local code authority, agency, or serving utility governing or serving the location of the project.
5. Remove and Replace (RR): Remove existing component or assembly and replace in kind with new materials of same type, design, quality, and operating characteristics.
6. Remove and Salvage (RSALV): Remove component, equipment or assembly intact and turn over to government for their use.
7. Refurbish (RFR): Restore component, equipment, or assembly "as new". Refurbishing includes but is not limited to, cleaning, restoring finishes, making inoperable items operable, rewiring, relamping, custom manufacturing unavailable parts, and replacing missing parts. If necessary for refurbishment, remove component, equipment, or assembly intact, refurbish, and reincorporate it into the project.
8. Remove and Reinstall (RSR): Remove component, equipment, or assembly intact. Store and protect removed items, reincorporate into project in same condition prior to removal.
9. Unit Price: Establishment of a price based on a per unit basis or task basis for work to be provided in the project. Unit prices will be good for the duration of the project. Quantities will be measured and only actual quantities installed will be paid for. Unit prices should include all costs including taxes and fee for furnishing and installing into the project. When unit prices are within 10% of estimated amounts, the initial unit price will be valid. When unit price quantity exceeds 10% of estimated amounts unit price may be

renegotiated.

01 44 00 TESTING AND INSPECTION

- A. Contractor to employ and pay for services of an independent testing agency or laboratory acceptable to Owner to perform specified testing.
 - 1. Prior to start of Work, submit name, address, and telephone number of testing laboratory, and the names of the full-time specialist(s) and the responsible officer. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of deficiencies reported by inspection.
- B. The independent firm will perform tests, inspections and other services specified in individual specification sections and as required by Engineer.
 - 1. Laboratory: Authorized to operate in State of Louisiana.
 - 2. Laboratory Staff: Maintain full time specialist on staff to review services.
 - 3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.
- C. Testing, inspections, and source quality control may occur on or off project site, as appropriate. Perform off-site testing as required by Owner's Representative.
- D. Reports will be submitted by independent firm to Engineer, Contractor, and authority having jurisdiction, indicating observations and results of tests, and indicating compliance or non-compliance with Contract Documents.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
- F. Testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- G. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Engineer.
- H. Agency Responsibilities:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Owner's Representative and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Owner's Representative and Contractor of observed irregularities or non-conformance of Work or products.
 - 6. Perform additional tests required by Architect/Engineer.
 - 7. Attend preconstruction meetings and progress meetings.
- I. Agency Reports: After each test, promptly submit two copies of report to Owner's Representative, Contractor, and authority having jurisdiction. When requested by Engineer, provide interpretation of test results. Include the following:
 - 1. Date issued
 - 2. Project title and number
 - 3. Name of inspector
 - 4. Date and time of sampling or inspection
 - 5. Identification of product and specifications section

6. Location in Project
 7. Type of inspection or test
 8. Date of test
 9. Results of tests
 10. Conformance with Contract Documents
- J. Limits On Testing Authority:
1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency or laboratory may not approve or accept any portion of the Work.
 3. Agency or laboratory may not assume duties of Contractor.
 4. Agency or laboratory has no authority to stop the Work.

01 51 00 TEMPORARY FACILITIES

- A. Provide temporary facilities and utilities required including heat, light, power, water, telephone, sanitary facilities, job offices, storage enclosures, safety devices, construction aids, and support equipment.
- B. Coordinate on-site parking and access with Station Manager.
- C. Maintain all fire access lanes and fire parking areas clear of all construction materials, vehicles, and equipment.
- D. Comply with all applicable federal, state, and local environmental laws and regulations. This condition applies to, but is not limited to, laws, regulations, and standards governing noise levels, air and water quality , and cultural resources.
- E. Protect adjacent vegetation, property, structures, and improvements from damage.
- F. Coordinate with the local FWS staff to select a construction staging area
- G. Provide safety equipment and methods as necessary to perform the work in a safe manner in accordance with federal and state health and safety regulations. Provide temporary fencing, barricades, and warning devices as necessary to safeguard the public and government personnel.

01 61 00 BASIC PRODUCT REQUIREMENTS

- A. Definition: "Product" means new material, machinery, components, equipment, fixtures, and systems of current manufacturer included in the work, and not including machinery and equipment used for preparation, fabrication, conveying, and erection of the work. Products may include existing materials or components required for reuse.
- B. Provide Products that comply with Contract Documents, are undamaged and new at time of installation.
- C. Provide Products complete with accessories, trim, finish, safety guards, and other devices and details needed for complete installation and intended use and effect.
- D. Substitutions may be considered when Contractor becomes aware of a product or procedure that is more environmentally sensitive.
- E. Provide interchangeable components of the same manufacturer, for similar components.
- F. Use of asbestos or lead containing products is prohibited.

- G. Product Selection:
1. Comply with specified industry standards.
 2. Provide products in size, type, and quantity indicated and specified, unless variations are accepted by CO in writing.
 3. Provide products with capacities, sizes, and performance ratings indicated and specified, unless variations are accepted by CO in writing.
 4. Two or more products of the same kind shall be identical and by the same manufacturer.

01 63 00 PRODUCT SUBSTITUTION PROCEDURES

- A. Product Options
1. For Products specified by Reference Standards or by description only, select any Product meeting those standards or description.
 2. For Products specified by naming one or more manufacturers and allowing no options for substitutions, use products of manufacturers named and meeting specifications.
 3. For Products specified by naming one or more manufacturer's with a provision for substitutions, Contractor must submit a Request for Substitution for any manufacturer not specifically named.
 4. Use of the terms "or equal", "approved", or approved substitution", means substitutions are allowed.
 5. When a single product or material is identified and substitutions are allowed, it is the intent of the specified product or material to provide a level of quality, design and performance for evaluation of substitutions.
- B. Substitution Representations
1. A substitution request constitutes a representation that the Contractor has investigated the proposed product and determined that it meets or exceeds the quality level of the specified product or system.
 2. The contractor will provide the same warranty for the substitution as for the specified product.
 3. The contractor will coordinate the installation and make changes to the work, which may be required for the work to be completed with no additional cost to the government.
 4. Waive claims for additional costs or time extensions which may subsequently become apparent.
 5. Reimburse the government for review or redesign services associated with re-approval.
- C. Substitution Procedures
1. Submit substitution requests on a copy of the CSI Substitution Request Form.
 2. Submit a separate request for each product, supported with complete data, drawings, and samples as appropriate.
 3. Substitution requests for a multiple list of mechanical and electrical components in one category of work by one manufacturer may be listed on one Substitution Request Form.
 4. COR will notify Contractor, in writing, of decision to accept or reject substitution request.

01 66 00 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Transport and handle Products in accordance with manufacturer's instructions, using means and methods that will prevent damage, deterioration, and loss, including theft.
- B. Schedule Product delivery to minimize long-term storage at Project site and prevent overcrowding of construction spaces.
- C. Coordinate Product delivery with installation schedule to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other

losses.

- D. Deliver Products to Project site in undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- E. Promptly inspect shipments to ensure that Products comply with project requirements, quantities are correct, Products are undamaged, and properly protected.
- F. Store and protect Products in accordance with manufacturers' published instructions, with seals and labels intact and legible.
- G. Store Products subject to damage by elements above ground, under cover in weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's published instructions.
- H. For exterior storage of fabricated Products, place on sloped supports, above ground.
- I. Provide off-site storage and protection when Project site does not permit on-site storage or protection.
- J. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of Product.
- K. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

01 71 00 EXAMINATION

- A. Verification of Conditions: Verify that field measurements, surfaces, substrates, and conditions are as required, and ready to receive Work.
- B. Report in writing to COR prevailing conditions that will adversely affect satisfactory execution of the Work. Do not proceed with Work until unsatisfactory conditions have been corrected.
- C. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the US Fish and Wildlife Service. How can the contractor be aware of all unsuitable conditions before beginning work?

01 73 00 EXECUTION

- A. Manufacturer's Instructions
 - 1. Handle, store, fabricate, erect, install, connect, apply, clean, condition and adjust products and systems in accordance with manufacturer's printed instructions and in conformance with requirements specified herein.
 - 2. Obtain and distribute copies of manufacturer's printed fabrication, installation, and application instructions to parties involved in the construction.
 - 3. Review and resolve conflicts between manufacturer's instructions and contract documents with COR prior to fabrication and installation of products and systems
- B. Perform the work in accordance with the technical specifications and other provisions of this contract.

01 73 00 CUTTING AND PATCHING

- A. Accomplish cutting and patching to:
 - 1. Incorporate new work into existing work
 - 2. Remove defective noncomplying work
 - 3. Uncover defective work or work not installed in proper sequence
 - 4. Observe work covered by contractor prior to acceptance
 - 5. Provide openings in elements of work for penetration of mechanical and electrical and other utility work
 - 6. Remove samples of work for testing
- B. Employ original or skilled and experienced installer to perform cutting and patching.
- C. Execute cutting and remove materials by methods which will prevent damage to other work and provide proper substrate for installation of repairs or new work
- D. Submit written request in advance of cutting or altering elements that may affect:
 - 1. Structural integrity of element
 - 2. Integrity of weather exposure or moisture resistance of elements
 - 3. Efficiency, maintenance, or safety of element
 - 4. Visual qualities of sight exposed elements
 - 5. Work of owner or separate contractor
- E. Identify any hazardous material or hazardous condition exposed during the cutting to the COR for decision or remedy.
- F. Provide shoring, bracing, and support to maintain structural integrity of the project.
- G. Restore work with new products in accordance with specified requirements.
- H. Patch and repair adjacent surfaces to comply with specified tolerances and finishes.
- I. Refinish exposed surfaces to natural breaks in the existing finished surface
- J. Refinish continuous surfaces or elements to nearest intersection.
- K. Refinish entire unit or assembly.
- L. Fill openings made oversized to install equipment, utility lines, and sleeves until finished surface is tight against penetrating material allowing for movement of penetrating member.
- M. Maintain integrity of fire rating of any element, wall assembly, floor assembly, and roof and ceiling assembly.

01 74 00 CLEANING

- A. Cleaning During Construction:
 - 1. Maintain areas free of waste materials, debris, and rubbish. Maintain work areas and site in a clean and orderly condition.
 - 2. Periodically collect and remove waste materials, debris, and rubbish from work areas
 - 3. Upon Substantial Completion of the Work, or a portion of the Work, remove all debris, trash, construction wastes, materials, equipment, machinery, and tools arising from the Work to permit Government to occupy the Project or a portion of the Project for its intended use.
 - 4. Restore Contractor-used areas to their original or better condition.
 - 5. Minimize creation of construction, deconstruction, and demolition waste. Minimize factors that contribute to waste such as over-packaging, improper storage, ordering error, poor

- planning, breakage, mishandling, and contamination.
 - 6. Develop a Waste Management Plan to ensure that existing site and building materials are reused, salvaged, or recycled.
 - 7. Minimize the total project waste sent to landfills by diverting as much waste as possible. Dispose of all materials that cannot be salvaged, reused, or recycled in a legal manner at licensed off-site disposal facilities.
- B. Final Cleaning:
- 1. Leave project broom clean and ready for occupancy.
 - 2. Remove temporary protection and facilities installed during construction to protect previously completed installations during remainder of construction.
 - 3. Dispose of all debris and rubbish legally in licensed disposal facilities

01 77 00 CLOSEOUT PROCEDURES

- A. Thoroughly familiarize the local Field Station staff with the improvements and train them to be proficient in operation and maintenance.
- B. Deliver to the project site any specialty tools, spare materials, maintenance materials, or similar devices such that the Field Station staff is able to operate and maintain the work.
- C. Prefinal Walk-Through:
 - 1. Notify the COR and schedule a preliminary walk through at an appropriate time prior to the anticipated date of completion of all work.
 - 2. Contractor shall develop a punch list of items yet to be completed or deficiencies to be corrected during the prefinal walk-through.
 - 3. The Contractor representative responsible for the work shall be present at the preliminary walk through and shall submit a preliminary list of unfinished work
- D. Final Walk Through: Schedule final walk through upon completion of the work identified on the punch list.
- E. The time required for walk throughs and for making any corrections as a result thereof shall be included in the contract performance time.
- F. Adjust operating products and equipment to ensure smooth unhindered operation.
- G. Identify all closeout procedures on the project schedule.

01 78 00 CLOSEOUT SUBMITTALS

- A. Submit a full-size set of red-lined drawings and a complete set of specifications that clearly indicates the as-constructed work. Submit one set of marked up record drawings, one set of reproducible CAD drawings showing as-constructed conditions, and one electronic copy on a USB flash drive complying with FWS CAD Standards.
- B. Submit fully executed manufacturer's standard material, product, and equipment warranties, assigned to the U.S. Fish & Wildlife Service. Compile, prepare, and aggregate O&M data to include clarifying and updating the original sequences of operation to as-built conditions. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01 33 00 Submittal Procedures. Submit a List of sub-contactors' contact information.
- C. Submit all regulatory-agency clearance documents indicating the work complies with their

requirements, including but not limited to, finalized structural, plumbing, gas, and electrical inspections, septic system and well approvals, and material testing and inspection reports.

- D. After completion of the work and prior to final payment, submit a Release of Claims (Form DI-137 provided by USFWS), properly executed by the Contractor, releasing claims against the United States arising out of this contract, other than claims specifically excepted from the operation of the release.

END OF SECTION

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QUALITY CONTROL SUPPLEMENTAL REQUIREMENTS**PART 1 - GENERAL****1.1 SUMMARY**

- A. This Section includes administrative and procedural requirements for quality control.
- B. This Section defines the requirements for conditional acceptance and final acceptance of in-place work. The contractor is responsible for maintaining the integrity of the conditionally accepted work for the duration of the contract. Any and all work conditionally accepted by the owner that has deteriorated due to adverse weather conditions, construction traffic, or any other reason shall be reprocessed, reworked, replaced, regraded, recompact, etc., as necessary to meet the plans and specifications at no additional cost to the Owner. The Owner reserves the right to retest the in-place work at any time prior to final acceptance. The costs associated with the retests of conditionally accepted work that has deteriorated shall be the responsibility of the Contractor.
- C. The tests taken as described below represent a homogenous material, in-place, and will be treated as such, unless obvious deficiencies are noted in the designated test area. Regardless of the outcome of tests as described below, the obvious deficiencies regardless of size will render the area unacceptable to the Owner.

1.2 QUALITY ASSURANCE

- A. Contractor shall supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise detrimental exposure during construction period.
- B. Quality Control Representative: The Contractor shall designate and provide a full-time "Quality Control Representative." This function may be assigned to the Project Manager, superintendent, or engineer. It is intended that this function shall have the responsibility for: quality management, ensuring that the execution of Work provides a level of quality consistent with good workmanship, industry standards, and acceptable to the Owner's Representative; monitoring Work to ensure compliance with scheduling and requesting all inspections required by authorities having jurisdiction; correction and follow-up inspection of all variant, nonconforming, or deficient items; maintaining a daily log of project conditions, status of inspections, defect and omission notices, and Contract modifications; conducting quality control briefings with all personnel who will perform work on site; assisting environmental control manager in the enforcement of the housekeeping plan to ensure that trash and scrap are regularly cleaned up and disposed of in an approved manner; and preparing substantial completion punch-list for the Contractor's use.
- C. Ensure that all persons and subcontractors performing Work are qualified to produce workmanship of specified quality.
- D. Monitor quality control over services, site conditions, and workmanship to ensure that Work complies with Contract Documents.
- E. Contractor shall order, schedule and coordinate laboratory services to perform materials testing in accordance with the frequencies stated below. Installed work that is untested and unapproved due to lack or neglect in scheduling field testing services shall be done at Contractor's risk and payment may be delayed. Contractor shall create a weekly schedule of anticipated tests to be performed by Laboratory and furnish to the Engineer and the Laboratory by 12:00 A.M. each Friday. Contractor shall notify the Laboratory and Engineer at least 24 hours in advance of each test required.

- F. When test results indicate that construction materials and or placement is not as specified, the material shall be removed and replaced to meet specification requirements, at no additional expense to the Owner. Retests of corrected or replacement of deficient work shall be performed to determine conformance with specification requirements. Cost of re-testing shall be the responsibility of the Contractor.
- G. Comply with specified reference standards as minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- H. Provide all surveying services necessary to establish all vertical and horizontal controls and construction staking required for layout of the work based on Survey monuments indicated in the plans and as specified in the Special Conditions.
- I. Should specified reference standards conflict with Contract Documents, request clarification in writing from Owner's Representative before proceeding.
- J. Contractual relationship of parties to the Contract shall not be altered from Contract Documents by mention or inference otherwise in any reference.
- K. Clean and protect Work in progress and adjoining Work on basis of continuous maintenance.

1.3 CONTROL OF WORK AND MATERIALS BY CONTRACTOR

- A. The Contractor shall select, employ, and pay for services of an independent commercial testing laboratory for testing that are required to validate that proposed materials to be furnished to the site meet specifications. Furnish material certifications and or laboratory tests results in accordance with the submittal requirements of the particular technical specification.
- B. Contractor is responsible for all testing and sampling required in the specifications that are not specifically identified below in subsection titled MINIMUM TESTING FREQUENCY.

1.1 RESPONSIBILITIES OF LABORATORY ENGAGED BY CONTRACTOR

- A. Cooperate with the Engineer/Architect, and Owner's Representative.
- B. Attend Pre-Construction Conference at a time, date, and location to be determined after award of a construction contract.
- C. Provide qualified adequate personnel to perform inspections, sampling, and testing in accordance with specified standards and frequencies stated herein and other sections of the technical specifications.
- D. Determine compliance of materials and mixes with requirements of Contract Documents.
- E. Promptly notify Contractor and Project Representative of observed irregularities or nonconformance of Work or products with Contract Documents.

1.2 LABORATORY REPORTS

- A. After each inspection and test, provide "pencil" copy of daily reports of each test conducted to Owner's Representative. Promptly distribute copies of formal written reports as follows:
 - 1. Project Representative: Two (2) copies
 - 2. Engineer: One (1) copy.
 - 3. Contractor: Two (2) copies.

B. Each report shall include

1. Date.
2. Project title and number.
3. Name of Contractor.
4. Name and signature of person submitting report.
5. Date and time of sampling or inspection.
6. Identification of Specification Section and product.
7. Location of test with respect to road station or structure location.
8. Type of inspection or test standard.
9. Record of temperature and weather conditions.
10. Results of tests and statement as to compliance or noncompliance with Contract Documents.

C. When requested, provide additional interpretation of test results.

1.3 LIMITS OF LABORATORY AUTHORITY

A. Laboratory and inspection personnel shall not be authorized to:

1. Release, revoke, alter, relax, or enlarge any requirements of Contract Documents.
2. Perform any duties of Contractor.
3. Approve or accept any portion of Work.
4. Stop the Work unless significant safety violation is apparent.

1.4 MINIMUM TESTING FREQUENCY.

The Contractor will employ an independent commercial testing laboratory to perform the following field tests and reports that shall be scheduled and coordinated by the Contractor:

A. Section 002200 -Earthwork.

1. The following number of tests will be the minimum acceptable for each type installation. In-Place Densities (Acceptable test methods: ASTM D 2922 Nuclear Method) & Moisture Content
 - a. Under Paved Areas: One test every 200 foot per lane per lift of fill or fraction thereof.
 - b. Over-excavation Under Paved Areas: One test per each occurrence per lane per lift of fill or fraction thereof.
 - c. Under Unpaved Areas: One test per lift of fill per 1,000 linear feet of right of way or fraction thereof.
2. Optimum Moisture and Laboratory Maximum Density (Test methods: ASTM D 698)
 - a. Tests shall be made for each type material or source of material including borrow material to determine the optimum moisture and laboratory maximum density values. One representative test per 10,000 square feet per lift of fill and backfill, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.
1. Optimum Moisture and Laboratory Maximum Density (Test methods: ASTM D 698)
 - a. Tests shall be made for each type material and source of material and each visual change in the characteristics of the borrow material to determine the optimum moisture and laboratory maximum density values. One representative test per 200 cubic yards of fill and backfill, or when any

change in material occurs which may affect the optimum moisture content or laboratory maximum density.

B. Section - 02234 Aggregate Base Course

1. The following number of tests will be the minimum acceptable for each type installation. In-Place Densities (Test methods: ASTM D 2922 Nuclear Method) & Moisture Content
 - a. One test every 250 foot per lane per lift of fill or fraction thereof.
2. Optimum Moisture and Laboratory Maximum Density (Test methods: ASTM D 1557)
 - a. Tests shall be made for each type material or source of material and when any change in material occurs which may affect the optimum moisture content or laboratory maximum density. One representative test per 750 linear feet per lift of fill per lane, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.
3. Thickness Determinations:
 - a. Measure the thickness of the compacted section at location of in-place density test.
 - b. Take the measurements in holes through the section of not less than 3-inches in diameter.
4. Gradation:
 - a. One test each per source or noticeable change in material.

1.1 EXAMINATION OF CONDITIONS

- A. Examine substrates and conditions under which Work is to be performed. Do not commence Work over unsatisfactory conditions detrimental to proper and timely execution of Work.
- B. Prior to proceeding with Work, correct unsatisfactory conditions.
- C. Commencement of installation constitutes acceptance of conditions, and cost of any corrective measures are responsibility of Contractor.

1.2 COMPLIANCE WITH MANUFACTURER'S INSTRUCTIONS

- A. Require compliance with manufacturer's printed installation instructions, including each step in sequence. Do not omit preparatory steps or installation procedures unless specifically modified or exempted by Contract Documents.
- B. Maintain one set of complete instructions at Project site during installation and until completion.
- C. Should Project conditions or specified requirements conflict with manufacturer's instructions, request clarification in writing from Owner's Representative.

1.3 PRODUCT INSTALLATION

- A. Handle, install, erect, connect, condition, use, adjust, and clean products in strict accordance with manufacturer's instructions and in conformance with specified requirements.

- B. Install Work true to line, plumb, and level.
- C. Verify and coordinate clearances, dimensions, and installation of adjoining construction, equipment, or apparatus.
- D. Verify dimensions for products to be fitted into Work. Whenever stock manufactured products are specified, verify actual space requirements for setting or placing into allotted space. No extra cost will be allowed for adjustment of Work to accommodate a particular product.

1.4 FIELD SAMPLES

- A. Field samples are defined as representative material from an area of partial installation at Project site and made available for Owner's Representative's review and approval of visual features and workmanship. Field samples may be incorporated into the Work as determined by the Owner's Representative.
- B. Provide field samples at site as required by individual Specification Sections or requested by the Engineer.

1.5 MANUFACTURER'S FIELD SERVICES AND REPORTS

- A. Submit qualifications of field observer thirty (30) calendar days in advance of required observations; observer is subject to approval of Owner's Representative.
- B. When specified in individual Specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces, quality of workmanship, and conditions of installation as applicable, and to initiate instructions when necessary.
- C. Report observations and site decisions or instruction given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.
- D. Submit reports within seven (7) calendar days of observation. Distribute copies to the Owner's Representative, Project Representative, Project site file, subcontractor, and other entities requiring information.

END OF SECTION

SECTION 31 00 00

EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes all necessary labor, equipment, material, transportation, and workmanship necessary to build the earthen foundations for, roads, ditches, and etc. to the lines and grades shown on the Drawings.
- B. Site Conditions: Prior construction and development of the Project area has consisted of road construction and repairs.
- C. Related Sections: The following Sections contain requirements that relate to this Section.
 - 1. Section 01 40 00: Quality Requirements
 - 2. Section 01 57 20: Environmental Protection
 - 3. Section 31 10 00: Site Clearing
 - 4. Section 32 10 00: Stone Aggregate Base Course
- D. Related Documents:
 - 1. Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - 2000 Edition.

1.2 QUALITY ASSURANCE

- A. General: Coordination and scheduling of materials testing in accordance with the frequencies stated below shall be the responsibility of the Contractor. Cost of testing shall be responsibility of Contractor except as noted in Section 01 40 00 - Requirements.
- B. When test results indicate that construction materials and or placement is not as specified, the material shall be removed, replaced and re-compacted to meet specification requirements, at no additional expense to the Owner. Retests on re-compacted areas shall be performed to determine conformance with specification requirements. Cost of re-testing shall be the responsibility of the Contractor.
- C. Degree of Compaction: Degree of compaction required is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 698. This will be abbreviated below as a percent of laboratory maximum density.
- D. Provide all surveying services necessary to establish all vertical and horizontal controls and construction staking required for layout of the work based on Survey monuments indicated in the plans and as specified in the Special Conditions.
- E. Water Pollution: The Contractor shall comply with the applicable provisions of Section 01 57 20 Environmental Protection. The Contractor shall protect adjacent waterways from contamination and increased turbidity due to earthwork operations by all means necessary, and limit runoff of stormwater from disturbed areas as necessary to meet the requirements and restrictions of agencies having jurisdiction.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. **Satisfactory materials** shall be dry native unsegregated on-site soils with less than 5% organic materials, maximum silt quantity of 50% and clumps of soil mass greater than 3-inches. Soils shall be capable drying and compaction by equipment manipulation to meet density requirements. Small quantities of silts and fine sands shall be blended with the prevalent soil to ensure a homogeneous subgrade layer.
- B. **Select Fill** material shall consist of homogeneous sandy clay or clayey sand free of organic matter and debris, and possessing a plastic index between 8 and 20, with a liquid limit of 40 or less.
- C. Unsatisfactory materials shall be materials that do not comply with the requirements for satisfactory materials. Unsatisfactory materials include but are not limited to silty soils and other soils materials containing roots and other organic matter, trash, debris, soil clumps or stones larger than 3 inches, frozen or wet materials and materials classified in ASTM D 2487, as PT, OH, OL, ML and MH. Unsatisfactory materials also include man-made fills, refuse, or compacted backfills from previous construction.

2.2 UNSTABLE SOIL MATERIAL

- A. Unstable material shall consist of insitu silts or borrow materials too wet to properly support embankment, base, utility pipe, conduit, or appurtenant structure or which is in the opinion of the Engineer is soft, wet, weak or contains deleterious material and cannot be compacted to the required densities. Notify Engineer of discovery of this condition in writing within 24 hours.

PART 3 - EXECUTION

3.1 GENERAL

- A. Prior to beginning rough grading, excavation and embankment construction, completely remove and dispose of all trees, brush, stumps, roots, grass, weeds, rubbish and all other obstructions within the construction limits of the project area in accordance with Section 31 10 00 - Site Clearing.
- B. Coordinate the construction of cuts and fills with installation of utilities that will be located under the roadway section to eliminate excavations into the prepared subgrade.
- C. Coordinate installation of storm drainage improvements to allow removal of surface runoff from areas to be disturbed by excavation and embankment operations.
- D. The exposed subgrade between subsequent roadway subbase or base or final surface shall be proof-rolled by the Contractor to locate areas of soft or weak soils and construction that does not comply with the specifications. Substitute methods for determining soft or weak soils shall be submitted by Contractor for consideration and approval by Engineer.
- E. The Contractor shall be responsible for maintaining the stability of the subgrade in cut and embankment sections even after conditional acceptance by the Engineer. Construction activities which may cause subsequent subgrade damage shall be avoided. Contractor shall correct degraded areas to the original compaction requirements. Owner reserves the right to perform additional testing of in-place work to insure compliance with the specification.
- F. These conditions shall apply to the subgrades of each component of the roadway structure scheduled by the Contractor for construction at different times.

3.2 EXCAVATION:

- A. All natural sloughs, swales, ditches, drains and depressions shall be excavated and cleared of muck, silts, vegetative organic materials and all miscellaneous deleterious matter and

disposed of on-site beyond the limits of construction in dedicated areas as shown or as directed by the Engineer at no direct pay.

- B. After the site is cleared and stripped of topsoils and visible unsatisfactory materials, the exposed subgrade, shall be rough graded within the construction limits to the general lines and grades indicated. Soft or wet areas which will not support construction equipment shall be excavated and the in-place soils replaced with satisfactory material and compacted in accordance with the requirements for embankment.
- C. Soil Materials resulting from excavations and rough grading operations that do not meet the requirements for Satisfactory Fill Materials as defined above may be used in the construction of embankments or may be hauled and stockpiled at the designated locations. Soil materials that do meet the requirements for Top Soil Materials or which can be amended to topsoil shall be stockpiled for reuse as noted in this section and on the plans.
- D. When rough grading is within 0.2 feet of final lines and grades shown in the plans, scarify and recompact the subgrade section to achieve a minimum of 92 percent of laboratory density in the top 8 inches of the finished subgrade with a moisture content at the time of compaction at optimum moisture to a plus 4 percent. The subgrade shall be reprocessed and recompact until these requirements are achieved.
- E. Completing rough grading. Proof-roll the resulting exposed subgrade using a loaded tandem axle dump truck, or similar equipment in a single pass over all areas to locate and identify any soft or weak areas. Multiple passes over previously rolled areas of the subgrade are not required nor desired as excessive traffic may result in pumping. Excessive deflection, as determined by the Engineer, shall be corrected by removal of soft or wet soil materials and replaced with select dry soil and compacted in accordance with the requirements for embankment.
- F. The prepared subgrade shall be tested for in-place density in accordance with Section 01 40 00.
- G. When specified compaction has been achieved, finalize excavation to the subgrade lines and grades shown on the typical sections, including shaping and sloping and other work necessary to bring the earthwork to the required cross sections to allow construction of indicated subbase layers.
- H. Finished excavation shall be tested for in-place density in accordance with Section 01 40 00.
- I. Stockpiled materials shall be located, covered, shaped or otherwise treated to prevent erosion and/or sediment runoff as specified in Section 31 32 11.

3.3 EMBANKMENTS:

- A. Embankments for roadway sections and within 5 feet of new roadway pavement shall be constructed with satisfactory materials from borrow sources or onsite materials.
- B. After the site is cleared and stripped of topsoils and visible unsatisfactory materials, the exposed subgrade, in areas to receive fill, shall be proof-rolled using a loaded tandem axle dump truck, or similar equipment in a single pass over all areas to locate and identify any soft or weak areas. Multiple passes over previously rolled areas of the subgrade are not required nor desired as excessive traffic may result in pumping. Excessive deflection, as determined by the Engineer, shall be corrected by removal of soft or wet soil materials and replaced with select dry soil and compacted in accordance with the requirements for embankment.
- C. After proof rolling and acceptance, and before placing fills, the existing surface of the exposed sub-grade shall be scarified to a minimum depth of 8 inches and re-compacted at least 92% of maximum density as determined by ASTM D698 with a moisture content at the

time of compaction of optimum to plus 4 percent.

- D. The prepared subgrade shall be tested for in-place density in accordance with Section 01 40 00.
- E. The subgrade shall contain adequate strength to support construction equipment required to construct subsequent embankments.
- F. Place **satisfactory** material in lifts not exceeding 8 inches in loose thickness and compact.
- G. Each embankment lift shall be tested for in-place density in accordance with Section 01 40 00.
- H. Excessive deformation, pumping, rutting, or yielding, under the load of construction equipment as determined by the Engineer, shall be excavated to remove soft or wet soil materials and replaced with select dry soil and compacted in accordance with the requirements for embankment.
- I. Perform final grading to the lines and elevations shown in the plans and on the typical sections including shaping and sloping and other work necessary to bring the earthwork to the required cross sections to allow installation of specified subbase layers and base course materials.
- J. When preparing the existing surface layers on which subsequent embankment lifts, base or sub-base course will be placed, the Contractor shall attempt all normal earthwork construction methods before undercutting or modifying the soils will be considered by the Owner.
- K. Unpaved areas and beyond 5 feet of paved areas: Place satisfactory material in maximum 12 inch loose lifts and compact uniformly to at least 90% of maximum density and grade to within 0.1-foot of the required elevations and contours as shown on the drawings or typical section.

3.4 CORRECTION OF DEFECTS UNDER PAVEMENT:

- A. If at any time the subbase material should become soft or unstable due to delays in the operations, lack of drainage, weather conditions, or operations controlled by the Contractor, the effected area of the subbase course shall be excavated and replaced with select material, shaped and re-compacted as specified above. Other deficiencies appearing in the subbase, which in the opinion of the Owner's Representative would impair the structural efficiency of the base course placement and compaction shall be excavated and replaced with select material where necessary and recompacted at no direct pay.
- B. Repaired work shall be retested for compliance with compaction requirements by the Contractor prior to placement of subsequent base and wearing courses.

3.5 MAINTENANCE

- A. The Contractor shall protect the completed subbase course from damage from the contractor's operations to prevent contamination, segregation, soft spots, wet spots, laminations and other deficiencies, and shall satisfactorily maintain the completed course to the lines and grades shown on the plans. Any damaged course shall be repaired by the contractor at no direct pay. When patching of the course is required, in addition to removing damaged or unsound course, the contractor shall remove a sufficient width and depth of course to ensure satisfactory placement of patching material.

3.6 FINAL GRADING

- A. Finish grades within limits of construction as well as other disturbed areas shall be in

accordance with the plans, cross-sections, and typical sections. Areas outside of pavement shall be free of depressions and irregular high spots. Transition final grades to existing grades beyond rights-of-way and easements as required to maintain positive drainage. Seed, fertilize and mulch disturbed in accordance with Section 329219. Contractor repair or correct any settlement of earthwork operations until final acceptance. Repaired sections shall be reseeded. The Contractor shall protect the new work and repair or correct any damage or deterioration at no cost to Owner.

3.7 CLEANING

- A. Keep excavated areas free from debris and stored materials that could damage surfaces or interfere with progress of Work.
- B. Remove excess materials from the Site promptly to prevent large accumulation. Store reusable material neatly in designated locations.
- C. Maintain construction access roads. Minimize traffic of construction equipment on the completed subgrade.

END OF SECTION

SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section and the plans describe the work required and also the work that will be performed by others.
- B. Areas within the Project limits shall be cleared and grubbed of grass and other debris as required for construction and/or as identified on the plans. All areas beyond the designated limits of construction and disturbed by the Contractor shall be restored as directed by the Engineer at no additional cost to the Owner.
- C. This Section includes the following:
 - 1. Protection of Existing Trees
 - 2. Topsoil Stripping
 - 3. Sawcutting and Removal of Existing Pavement
 - 4. Removal of Debris
 - 5. Disposal of Waste Materials

1.2 SUBMITTALS

- A. Layout of Contractor proposed staging and/or storage areas to be disturbed.
- B. Verification that utility owners have been notified and buried lines have been marked on the ground prior to excavation.
- C. Contractor's detailed Storm Water Pollution Prevention Plan and Notice of Intent shall be submitted and approved prior to beginning Clearing & Grubbing operations.

1.3 PROJECT CONDITIONS

- A. Traffic: Conduct site clearing operations to ensure minimum interference with roads, streets, and other adjacent occupied or used facilities.
- B. Protection of Existing Improvements: Provide protections necessary to prevent damage to existing improvements.
 - 1. Protect improvements on adjoining properties including the Owner's property.
 - 2. Restore damaged improvements to their original condition, as acceptable to parties having jurisdiction.
- C. Project Area: The Project Area shown on the drawings is defined as the area on-site and also located within the streets or highway rights-of-way or easements when so noted.
- D. Protection of Existing Trees: Protect all existing trees outside of the construction limits against any cutting, breaking or skinning roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, or vehicular traffic, or parking of vehicles within drip line.
- E. Protection of Existing Topsoil and Ground Cover: Protect existing topsoil and grasses from removal or disturbance in those areas not designated for earthwork operations as a part of this contract.
- F. Explosives: Use of explosives will not be permitted under this Contract.
- G. Existing Utilities:

1. Locations of existing utilities shown on the plans are approximate. Contractor shall hand excavate and probe to locate actual location of utilities and protect from any damage before commencing work. Record actual locations of existing utilities for use during construction and for permanent Record Drawings for Owner.
2. Contractor shall call 1-800-272-3020 "One Call" on "Dottie" 48 hours prior to construction to locate utility lines in the area in which work can be accomplished within a reasonable amount of time, i.e., one week.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 SITE CLEARING

- A. General: Remove, grass, and other vegetation, fences, improvements, or obstructions, located within the designated limits as shown on the plans.
- B. Within all areas to be excavated or filled, strip and remove minimum 6-8 inches of existing topsoil, or as necessary to remove vegetation, including grasses, roots, woody materials, and other ground cover.
 1. Stockpile topsoil that is satisfactory for reuse in areas on the site as approved by the Engineer. Construct storage piles to provide free drainage of surface water.
 2. Dispose of unsuitable or excess topsoil as specified for disposal of waste material.
- C. Clearing and Grubbing: Designated areas shown on the plans shall be cleared and grubbed.
- D. Sawcutting and Removal of Existing Pavement: When shown on the plans Contractor shall demolish and remove pavement as required for installation of the new work. Removal of the pavement shall be to neat straight lines, preceded by sawcutting to a minimum of at least (2) one-half the thickness of the pavement or greater as necessary to insure a clean cut. Protect remaining pavement edge to prevent raveling. Re-cut if raveling occurs. Remove existing pavement and base, within the limits shown, for construction of new work.
- E. Removal of Waste Material and Debris: Remove any and all debris within the areas on the plans designated to be cleared. Debris including demolished pavement, trash, limbs and slash, downed timber, construction or building materials, concrete and stones larger than 6 inches in diameter.
- F. Removal of Improvements: Remove all designated existing above-grade and below-grade improvements to minimum depth of two feet and as necessary to facilitate new construction.

3.2 DISPOSAL OF WASTE MATERIALS

- A. Burning onsite is not permitted.
- B. Debris, construction waste, trash, and etc. shall be removed off site and disposed of in a legal manner.
- C. Maintain cleanliness on all roadways and other public roadways and other public areas used by debris removal equipment.

END OF SECTION

SECTION 31 32 11

SOIL SURFACE EROSION CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes but is not limited to the following:
 - 1. Rock Filter Dams, Rip Rap, Silt Fences, and Baled Hay Filters
 - 2. Seeding
 - 3. Mulching
 - 4. Maintenance and Removal of All Sediment and Erosion Control Measures
- B. Related Sections: The following sections contain requirements that relate to this Section:
 - 1. Section 31 10 00: Site Clearing
 - 2. Section 31 00 00: Earthwork
 - 3. Section 32 92 19: Seeding and Mulching
- C. Related Documents
 - 1. Louisiana Standard Specification for Roads and Bridges (2016) (LSSRB)
 - 2. Erosion Control Details included in the Construction Drawings.
 - 3. Basic Pollution Prevention Plan developed by the Engineer and included in Section 01 57 23 Environmental Protection.
 - 4. U.S. Environmental Protection Agency (EPA) regulations under the National Pollution Discharge Elimination System (NPDES), Detailed Pollution Prevention Plan developed by the Contractor.

1.2 SUBMITTALS

- A. General: Submit to the Owner's Representative the following items in accordance with Section 01 30 00.
 - 1. Product data and descriptive literature for all pre-manufactured erosion control devices.
 - 2. Laboratory certification of materials to be used.
 - 3. Seed certifications.
 - 4. The Contractor shall prepare and submit Contractor's detailed Storm Water Pollution Prevention Plan to Engineer for review and commentary.
 - 5. Submit Notice of Intent (N.O.I.) directly to the EPA and copy to Engineer prior to starting work.

1.3 OPERATIONS AND MAINTENANCE

- A. Operations
 - 1. Construction period erosion control shall be provided by a coordinated program of measures in compliance with U.S. EPA rules and regulations under the National Pollution Discharge Elimination System (NPDES) program. The Contractor shall provide temporary stabilization measures where areas are exposed during clearing and grubbing, earthwork and any other element of work with the potential of soil loss.
 - 2. Permanent control measures shall eliminate or minimize soil erosion measures after construction. This shall be accomplished by constructing the proposed site improvements, including roadways, parking areas, and buildings, and by seeding and mulching the remaining exposed soil to produce a healthy stand of grass.

3. The purpose of temporary control measures is to eliminate or minimize soil erosion during construction.
 4. Temporary erosion and sedimentation controls include, but are not limited to silt fences and hay bale filters. Temporary controls shall be constructed as to ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by regulatory requirements or applicable permit conditions.
 5. Contractor is responsible for providing effective temporary erosion and sediment control measures during construction or until final controls become effective.
 6. Work shall not commence until appropriate erosion control devices are in place. All permanent erosion control features shall be incorporated into the project at the earliest practical time.
- B. Maintenance: Maintenance of the erosion and sedimentation control facilities shall be the responsibility of the Contractor. Maintenance shall include the inspection of facilities after each significant rainfall event and on a periodic basis. Immediately after a storm event, erosion and sedimentation facilities and measures shall be cleaned, repaired and replaced as needed. Silt fences shall be inspected and restored to an upright and effective position after storms or at any time they are observed to be in need of maintenance. Contractor shall maintain the erosion and sedimentation control facilities until permanent protections are in place.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Seeding and mulching shall conform to Section 32 92 19.
- B. Rip Rap in the form of durable stone in accordance with (LSSRB) Section 711, Class 130 lb.
- C. Silt fences, hay bale filters, rock filter dams and other temporary erosion controls shall meet the requirement of the (LSSRB) standard details for "Temporary Erosion, Sediment and Water Pollution Control Measures".

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Submit a schedule at the preconstruction conference for providing the soil erosion and sediment control measures required by the plans and specifications.
 1. Incorporate the project's permanent erosion control features into the project at the earliest possible time. Perform and schedule clearing and grubbing and earthwork operations that allow permanent erosion control features to follow as soon as possible.
 2. Seed and Mulch: Install seed and mulch as required in Section 32 92 19.
 3. Maintain all sediment and erosion control facilities as required to assure their effective and continued function.
 4. Install temporary erosion controls in accordance with project details as necessary.
 5. Completely remove all sediment and erosion control measures not required for subsequent construction at the completion of each phase of construction. Restore all disturbed areas to the satisfaction of the Owner's Representative before acceptance.

END OF SECTION

RIPRAP**PART 1 - GENERAL****1.1 SUMMARY**

- A. This Section includes all labor, materials, equipment and transportation and performing all work necessary to furnish and place riprap in accordance with these Specifications and in conformity to the lines, grades, and thicknesses shown on the plans or as directed.
- B. Related References: Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - Latest Edition.

PART 2 - PRODUCTS**2.1 MATERIALS**

- A. Riprap shall be from an approved source listed in the DOTD QPL2. Stone riprap shall not disintegrate upon exposure to the elements or be easily broken from handling, and shall be reasonable free from earth and other foreign materials. In accordance with AASHTO T 85, the stone shall be at least 150 pounds per cubic foot based on the bulk specific gravity. The least dimension of any individual stone shall be at least 1/3 its maximum dimension. Each shipment of stone shall be reasonably well graded within its specified limits and conform to the following:

<u>Class</u>	<u>Stone Size (lb.)</u>	<u>Diameter (ft)</u>	<u>% Smaller Than</u>
30 lb.	140	1.17	100
	60	0.90	42-100
	30	0.72	15-50
	10	0.50	0-15
55 lb.	275	1.50	100
	110	0.90	42-100
	55	0.88	15-50
	20	0.63	0-15
130 lb	650	2.0	100
	260	1.46	45-100
	130	1.17	15-50
	40	0.79	0-15

- B. Geotextile Fabric, Class D. conforming to Section 1019 of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - Latest Edition.

PART 3 - EXECUTION**3.1 PREPARATION**

- A. Riprap: Areas in which riprap is to be placed shall be graded to the required section. Riprap shall be placed on the prepared slope or the area in a manner which will produce a reasonably well-graded mass of stone with a minimum percentage of voids. The entire

mass of stone shall be placed in accordance with the lines, grades, and thicknesses at one operation and to avoid displacing underlying material. Placing of riprap in layers, or dumping into chutes, or by similar methods likely to cause segregation will not be permitted.

- B. Geotextile Fabric: When specified, geotextile fabric shall be placed on the prepared slope or area in accordance with Section 203.11(c) of the (La DOTD) - (LSSRB) - Latest Edition before placement of riprap. Care shall be taken not to damage the geotextile fabric when placing riprap. Placing riprap by rolling down slope, or dropping riprap from extreme heights, or similar methods will not be permitted. Damaged geotextile fabric shall be replaced.

END OF SECTION

ASPHALT CRACK SEALING

PART 1 GENERAL

1.1 DESCRIPTION

This work consists of sealing cracks in existing asphalt pavement.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D5078	(2016) Standard Specification for Crack Filler, Hot-Applied, for Asphalt Concrete and Portland Cement Concrete Pavements
ASTM D6690	(2015) Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements
ASTM D789	(2015) Determination of Relative Viscosity and Moisture Content of Polyamide (PA)

1.3 DELIVERY, STORAGE, AND HANDLING

Inspect materials delivered to the job site for defects; unload and store them with a minimum of handling to avoid damage. Provide storage facilities at the job site to protect materials from the weather and maintain them at the temperatures recommended by the manufacturer.

1.4 EQUIPMENT, TOOLS, AND MACHINES

Equipment, tools, and machines used in performance of the work are subject to approval by the Contracting Officer. Maintain in satisfactory working condition at all times.

1.4.1 Waterblasting Equipment

Include with the waterblasting equipment a trailer-mounted water tank, pumps, high-pressure hose, wand with safety release cutoff control, nozzle, and auxiliary water resupply equipment. Use water tank and

auxiliary resupply equipment with sufficient capacity to permit continuous operations. Use hoses, wands, and nozzles capable of cleaning the crack faces and the pavement surface on both sides of the crack for a width of at least 1/2 inch beyond the crack. Use pump with a mounted pressure gauge that shows the pressure in psi at which the equipment is operating at all times. Limit the

pressure so that the sides of the crack are not damaged during the cleaning operation.

1.4.2 Hot-Compressed Air Lance

A lance capable of providing clean, oil-free compressed air at a volume of 100 cubic feet per minute at a pressure of 120 pounds per square inch and at a temperature of 2000 degrees F.

1.4.3 Squeegee

A hand-held squeegee for ensuring that the crack is filled to the existing surface.

1.4.4 Hand Tools

Hand tools may be used, when approved, for removing defective sealant from cracks and repairing or cleaning the crack faces.

1.4.5 Crack Sealing Equipment

Provide unit applicators, used for heating and installing the hot-poured crack sealant materials, that are mobile and equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the crack to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. Allow the sealant to circulate through the delivery hose and return to the inner kettle when not in use, due to the applicator unit design. A crack sealant applicator wand attached to a heated hose that is attached to a heated sealant chamber.

1.5 ENVIRONMENTAL REQUIREMENTS

Apply the materials only when the ambient air temperature and the pavement temperature within the joint wall are at least 50 degrees F and rising. Do not apply sealant if moisture is observed in the crack.

PART 2 PRODUCTS

2.1 SEALANTS

Provide sealants conforming to ASTM D6690, Type II.

2.2 FILLER

Provide fillers conforming to ASTM D5078, hot-applied, pourable, self-adhesive mastic composed of composed of highly modified polymer asphalt binder and durable lightweight construction aggregate such as Crafcro PolyPatch or approved equal.

PART 3 EXECUTION

3.1 PREPARATION OF CRACKS

Immediately before the installation of the crack sealant, thoroughly dry and clean the cracks to remove oxidized pavement, loose aggregate and foreign debris. Prepare cracks as follows:

3.1.1 Cracks

3.1.1.1 Hairline Cracks

Cracks that are less than 1/4 inch wide do not need to be sealed.

3.1.1.2 Small Cracks

For cracks that are 1/4 to 3/4 inch wide, sandblast or waterblast, and clean and dry using compressed air.

3.1.1.3 Medium Cracks

Sandblast or waterblast cracks that are 3/4 to 2 inches wide and clean and dry using compressed air. Fill flush to 1/4 inches below the existing surface with an approved filler.

3.1.1.4 Large Cracks

Repair cracks that are greater than 2 inches wide using pothole repair techniques instead of sealing.

3.1.2 Existing Sealant Removal

Cut loose the in-place sealant from both crack faces and to a depth shown on the drawings using a concrete saw or hand tools. Remove sealant to a depth sufficient to accommodate any backer rod material that is required to maintain the depth of new sealant to be installed. Prior to further cleaning operations, remove all the old loose sealant remaining in the crack opening by blowing with compressed air.

3.1.3 Sandblasting and Waterblasting

Sandblast or waterblast clean the crack faces and the pavement surfaces extending a minimum of 1/2 inch from the crack edges. Use a multiple-pass technique until the surfaces are free of dust, dirt, old sealant residue, or foreign debris that might prevent the sealant material from bonding to the asphalt pavement. After final cleaning and immediately prior to sealing, blow out the cracks with compressed air and leave them completely free of debris and water. Ensure that blasting does not damage the pavement.

3.1.4 Rate of Progress of Crack Preparation

Limit the stages of crack preparation, to only that linear footage that can be sealed during the same day.

3.2 PREPARATION OF SEALANT

Do not heat hot-poured sealants in excess of the safe heating temperature recommended by the manufacturer, as shown on the sealant containers.

Withdraw and waste sealant that has been overheated or subjected to application temperatures for over 4 hours or that has remained in the applicator at the end of the day's operation.

3.3 INSTALLATION OF SEALANT

Submit manufacturer's instructions 7 calendar days prior to the use of the material on the project. Installation of the material will not be allowed until the instructions are received.

3.3.1 Time of Application

Seal cracks immediately following final cleaning and drying of the crack walls. Place sealant only when cracks are dry. Reclean cracks that cannot be sealed under the conditions specified, or when rain interrupts sealing operations, and allow to dry or dry by mechanical means prior to installing the sealant.

3.3.2 Sealing the Crack

Immediately preceding, but not more than 50 feet ahead of the crack sealing operations, perform a final cleaning and drying with compressed air. Fill the cracks from the bottom of reservoir up to 1/4 inch below the pavement surface. Remove excess or spilled sealant from the pavement by approved methods and discard it. Install the sealant in a manner which prevents the formation of voids and entrapped air. Several passes with the applicator wand may be necessary to obtain the specified sealant depth from the pavement surface. Do not use gravity methods or pouring pots to install the sealant material. Do not permit traffic over newly sealed pavement until authorized by the Contracting Officer's Representative. Check cracks frequently to ensure that the newly installed sealant is cured to a tack-free condition within 3 hours.

Immediately notify the Contracting Officer of the location of any sealant that has not cured to a tack-free condition within 3 hours.

3.4 CRACK SEALANT INSTALLATION TEST SECTION

Prior to the cleaning and sealing of the cracks for the entire project, construct a test section at least 200 feet long using the specified materials and approved equipment to demonstrate the proposed sealing of all cracks of the project. Following the completion of the test section and before any other crack is sealed, inspect the test section to determine that the materials and installation meet the requirements specified. If materials or installation do not meet requirements, remove the materials and reclean and reseal the cracks at no cost to the Government. When the test section meets the requirements, it may be incorporated into the permanent work and paid for at the contract unit price per linear foot for sealing items scheduled. Seal all other cracks in the manner approved and successfully completed for sealing the test section.

3.5 CLEANUP

Upon completion of the project, remove unused materials from the site and leave the pavement in a clean condition.

-- END --

32 10 00

STONE AGGREGATE BASE COURSE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes all labor, materials, equipment and transportation and performing all work necessary to construct a base course composed of aggregate upon the prepared base in accordance with these Specifications and with the lines, grades, notes and typical cross sections shown on the Drawings.
- B. Related Sections: The following Sections contain requirements that relate to this Section.
 - 1. Quality Control
- C. Related Documents: Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - latest Edition.

1.2 SUBMITTALS

- A. Submit complete laboratory analysis and obtain approval of the material by the Engineer prior to placement.

1.3 QUALITY ASSURANCE

- A. General: Coordination and scheduling of materials testing in accordance with the frequencies stated below shall be the responsibility of the Contractor. Cost of testing shall be responsibility of the Contractor as noted in Quality Control.
- B. When test results indicate, as determined by the Owner's Representative, that construction materials and or placement is not as specified, the material shall be removed, replaced and re-compacted to meet specification requirements, at no additional expense to the Owner. Retests on re-compacted areas shall be performed to determine conformance with specification requirements. Cost of re-testing shall be the responsibility of the Contractor.
- C. Degree of Compaction: Degree of compaction required is expressed as a percentage of the maximum density obtained by the test procedure presented in ASTM D 1557 (Modified Proctor). This will be abbreviated below as a percent of laboratory maximum density.
- D. The Contractor shall provide all surveying services necessary to establish all vertical and horizontal controls and construction staking required for layout of the work based on Survey monuments indicated in the plans and as specified in the Special Conditions.

1.4 WEATHER LIMITATIONS

- A. Placement of aggregate surface course will not be permitted when the subgrade or stockpiles are frozen, when the ambient air temperature is below 35° F, or in the rain.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Stone or Recycled Portland Cement Concrete: Aggregate shall conform to requirements of Section 1003.01 and Section 1003.03 (d or e) of the Louisiana Department of Transportation (La DOTD) -

Louisiana Standard Specifications for Roads and Bridges (LSSRB) - latest Edition. The material shall consist of durable particles of stone mixed with approved binding materials.

The material shall be placed in a single course and compacted by the "Density Control" method.

B. Source: The stone shall be secured from sources obtained by the Contractor and approved by the Owner's Representative.

C. Gradation:

	PERCENT PASSING
1-1/2 inch sieve	100 percent
1 inch sieve	90-100 percent
3/4 inch sieve	70-100 percent
No. 4 sieve	35-65 percent
No. 40 sieve	12-32 percent
No. 200 sieve	5-12 percent

The fraction of stone passing in No. 40 sieve comply with the following:

Liquid Limit (Max.)	25
Plasticity Index (Max.)	4

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall control the selection, placement, compaction, moisture content, density, thickness, width surface finish, and grade so that the completed surface course is uniform and conforms to the plan dimensions and other acceptance requirements as provided herein. Contractor shall perform the thickness and surface tests necessary to verify compliance.

B. Equipment: Contractor shall furnish any and all equipment as necessary for the proper construction of the work, in accordance with Section 301.03 (c) of the LSSRB - latest edition, and without damage to the underlying base.

C. Limits of Construction: Construct the surface to the full dimensions shown on the Drawings.

3.2 PERFORMANCE

A. Transporting Stone: Transport stone to the point where it is to be used, over rock previously placed if practicable, and dump on the end of the preceding spread. No hauling over the base or dumping on the base will be permitted.

B. Spreading Crushed Stone:

1. Spread stone uniformly and remove and replace all segregated areas of fine or coarse rock with well-graded rock.
2. Construction equipment shall be of appropriate weight to spread and compact the stone without disturbing the base.
3. Surface areas that deform or experience pumping, rutting, or yielding, more than one/quarter (1/4) inch under the load of construction equipment shall be excavated to a depth of 2 feet, rerecompacted as specified or replaced with additional aggregate base course and re-compacted at no additional cost to the owner.

C. Compacting and Finishing Surface:

1. After the spreading of material, finish and shape its surface so as to produce the required grade and cross section after compaction, free of scabs and laminations. Prior to the material for the Prime Coat, conduct the density tests for the lower course and determine that the required compaction has been obtained.
 2. Moisture Content: Moisture content of the installed surface course shall be 3 percent of optimum. Wet or dry the material as required for specified moisture content. If the material is deficient in moisture, add water and uniformly mix in by discing the surface course to its full depth. If the material contains an excess of moisture, allow to dry until the required moisture content is attained before being compacted. In wetting or drying operations manipulate the entire width and depth of the surface as a unit.
 3. Density Requirements: Compact each lift to a density of not less than 95 percent of the maximum dry density as determined by ASTM D1557.
- D. During final compacting operations, if blading of any areas is necessary to obtain the true grade and cross section, complete the compacting operations for such areas prior to making the density determinations on the final lift of the finished surface.

3.3 PROTECTION & CURING

- A. The base course shall be covered with asphalt prime coat in accordance with Section 02507 as soon as practical to avoid water infiltration due to rainfall. Complete coverage of asphalt prime coat shall be maintained from initial application until the placement of the next course.

3.4 ACCEPTANCE TESTING

- A. Prior to Laboratory Testing the Contractor shall physically identify the area to be tested; schedule a visual inspection with the Architects Representative including proof-rolling the area. Based on field observation, the Architects Representative will determine if the area appears to be homogenous allowing the field tests to represent the designated area. Laboratory tests shall be performed within 48 hours of conditional acceptance of the area to be tested, providing no significant weather changes. The Architects Representative may be present at during field testing and may determine the location of specific tests.
- B. Allow testing agency to inspect and test surface course. Contractor shall not proceed with covering up untested areas until test results for previously completed work verify compliance with requirements.
- C. The Contractor shall coordinate and schedule testing on in-place work in accordance with Quality Control section. Any area that is deficient or not in compliance with the specifications, whether identified by testing or inspection, shall be corrected by the Contractor as provided above.
- D. If in the opinion of the Architect Representative the base has deteriorated, additional inspections and tests and repairs may be required prior to placement of subsequent material at no additional cost to the Owner.

3.5 MINIMUM TESTING FREQUENCY

The Contractor will employ a local independent commercial testing laboratory to perform the following field tests and reports that shall be scheduled and coordinated by the Contractor:

- A. Section – 32 10 00 Aggregate Base Course
1. The following number of tests will be the minimum acceptable for each type installation.
In-Place Densities (Test methods: ASTM D 2922 Nuclear Method) & Moisture Content
 - a. One test every 2500 square foot per lift of fill or fraction thereof.
 2. Optimum Moisture and Laboratory Maximum Density (Test methods: ASTM D 1557)
 - a. Tests shall be made for each type material or source of material and when any change in material occurs which may affect the optimum moisture content or laboratory maximum density. One representative test per 7,500 square foot per lift

- of fill per lane, or when any change in material occurs which may affect the optimum moisture content or laboratory maximum density.
3. Thickness Determinations:
 - a. Measure the thickness of the compacted section at location of in-place density test.
 - b. Take the measurements in holes through the section of not less than 3-inches in diameter.
 4. Gradation:
 - a. One test each per source or noticeable change in material or
 - b. One test per 30 calendar days or
 - c. One test per 2,000 tons or fraction thereof.

3.6 CORRECTION OF DEFECTS

- A. If at any time the base material should become mixed with the surface course material, dig out and remove the mixture, replace the materials removed with clean surface material, and shape and compact the base as specified above.
- B. If cracks or checks appear in the surface, which in the opinion of the Owner's Representative would impair the structural efficiency of the surface course, remove such cracks or checks by re-scarifying, reshaping, adding surface material where necessary and recompacting.
- C. Testing Surface: Contractor shall check the finished surface with a templet cut to required crown and cross section and with a 10-foot straightedge laid parallel to the centerline of the road. Correct all irregularities greater than 3-inch by scarifying and by removing or adding Select Soil as may be required, thoroughly mixing with in place material and recompacting the entire area as specified hereinbefore.

3.7 MAINTENANCE

- A. The Contractor shall protect the completed surface course from damage from the contractor=s operations to prevent contamination, segregation, soft spots, wet spots, laminations and other deficiencies, and shall satisfactorily maintain the completed course to the lines and grades shown on the plans. Any damaged course shall be repaired by the contractor at no cost to the Owner. When patching of the course is required, in addition to removing damaged or unsound course, the contractor shall remove sufficient width and depth of course to ensure satisfactory placement of patching material.

END OF SECTION

ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes all labor, materials, equipment, tools and transportation and performing all work necessary for the construction of asphaltic concrete paving composed of a mixture of aggregates, mineral filler and asphalt cement properly applied upon a prepared base, in accordance with these Specifications and in conformity with the lines, grades, thickness and typical cross sections shown on the Drawings.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Section 32 10 00: Stone Aggregate Soil Base Course
 - 2. Section 32 12 10: Asphalt Prime and Tack Coats
- C. Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - 2016 Edition.

1.2 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Material Certificates signed by material producer and Contractor, certifying that each material item complies with or exceeds specified requirements.

1.3 SITE CONDITIONS

- A. Weather Limitations: Apply prime and tack coats when ambient temperature is above 50 deg F (10 deg C) and when temperature has not been below 35 deg F (1 deg C) for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture.
- B. Construct hot-mixed asphalt surface course when atmospheric temperature is above 50 deg F (4 deg C) and when base is dry. Base course may be placed when air temperature is above 40 deg F (minus 1 deg C) and rising.
- C. Grade Control: Establish and maintain required lines and elevations.
- D. Provide all surveying services necessary to establish all vertical and horizontal controls and construction staking required for layout of the work based on Survey monuments indicated in the plans and as specified in the Special Conditions.

1.4 QUALITY ASSURANCE

- A. General: Coordination and scheduling of materials testing in accordance with the frequencies stated below shall be the responsibility of the Contractor. Cost of testing shall be responsibility of Contractor except as noted in Division 1 - Section 01 40 00 - Quality Control.
- B. When test results indicate, as determined by the Engineer, that materials installed are not as specified, the material shall be removed and replaced to meet specification requirements, at no additional expense to the Owner. Retests or additional tests on failed areas as provided below may be performed to determine conformance with specification requirements. Inspections and

test results shall be certified by a registered professional civil engineer. These certifications shall state that the tests and observations were performed by or under the supervision of the engineer and that the results are representative of the materials or conditions being certified by the tests.

- C. Standards: Comply with the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - Latest Edition., hereinafter referred to as Louisiana Specifications, Sections 501 and 503, except as amended herein. The La DOTD Specifications are hereby made a part of this Contract to the extent they are applicable thereto and shall be as binding upon the Contractor as though reproduced herein in their entirety.
- D. Provide copies of all delivery tickets covering asphaltic concrete delivered to the site.

PART 2 - PRODUCTS

2.5 MATERIALS

- A. General: Use locally available materials and gradations that exhibit a satisfactory record of previous installations.
- B. Coarse Aggregate: Course aggregate for asphalt paving shall be gravel, stone or crushed slag conforming to Section 501 and Section 1003 of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - Latest Edition.
- C. Fine Aggregate: Fine aggregate shall meet the requirements of Section 501 and Section 1003 of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - Latest Edition.
- D. Mineral Filler: Limestone dust, pulverized hydrated lime, shell dust, portland cement or cement stack dust conforming to Section 501 and Section 1003 of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - Latest Edition.
- E. Asphalt Cement: Asphalt cement grade AC-30 conforming to Section 501 and Section 1002 of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - Latest Edition.
- F. Prime Coat and Tack Coat: Per Section 32 12 10.

2.6 ASPHALT-AGGREGATE MIXTURE

- A. Provide plant-mixed, hot-laid asphalt-aggregate mixture complying with La DOTD Specifications, Section 501, Type 3 Wearing Course as shown on the Drawings.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

- A. General: Remove loose material from compacted base surface immediately before applying prime coat. Work to conform to Section 501.05 of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - Latest Edition.
- B. Proof-roll prepared base surface to check for unstable areas and areas requiring additional compaction.

- C. Do not begin paving work until deficient subbase areas have been corrected and are ready to receive paving.
- D. Prime Coat: Apply at rate of 0.35 to 0.40 gal. per sq. yd., over compacted base. Apply material to penetrate and seal, but not flood, surface. Cure and dry a minimum of 24 hours to obtain penetration and evaporation of volatile.
- E. Tack Coat: Apply to contact surfaces of previously constructed asphalt or Portland cement concrete and surfaces abutting or projecting into hot-mixed asphalt pavement. Distribute at rate of 0.25 to 0.30 gal. per sq. yd. of surface per table 507-1 of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - Latest Edition.
- F. Exercise care in applying bituminous materials to avoid smearing of adjoining concrete surfaces. Remove and clean damaged or defaced surfaces.

3.2 PLACING MIX

- A. General: Place hot-mixed asphalt mixture on prepared surface, spread, and strike off. Spread mixture at minimum temperature of 250 deg F. Place areas inaccessible to equipment by hand. Place each course to required grade, cross-section, and compacted thickness. Work shall conform to Section 501.07 of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - Latest Edition.
- B. Pavement Placement: Place asphaltic concrete in strips not less than 10 feet wide, unless otherwise approved by the Engineer. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips.
- C. Immediately correct surface irregularities in finish course behind paver. Remove excess material forming high spots with shovel or lute.
- D. Joints: Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density, and smoothness as other sections of hot-mixed asphalt course. Clean contact surfaces and apply tack coat. Joint construction to conform to Section 501.06 of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - Latest Edition.

3.3 ROLLING AND COMPACTION

- A. General: Begin rolling when mixture will bear roller weight without excessive displacement in accordance with Section 501.08 of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - Latest Edition.
- B. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling and repair displaced areas by loosening and filling, if required, with hot material.
- C. Intermediate Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue intermediate rolling until mixture has been evenly compacted.
- D. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and a mat density of 96 percent maximum laboratory density is obtained.
- E. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
- F. Patching: Remove and replace paving areas mixed with foreign materials and defective

areas. Cut out such areas and fill with fresh, hot hot-mixed asphalt. Compact by rolling to specified surface density and smoothness.

- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.4 TOLERANCES

- A. Surface Smoothness: Surfaces shall be checked with a 10 ft straight edge will not be acceptable if exceeding the following tolerances for smoothness:
 - 1. Wearing Course Surface: 1/8 inch Transverse; 3/8 inch Cross Slope.
 - 2. Binder Course: 1/4 inch Transverse; 1/2-inch Cross Slope.
- B. Corrections shall be made in accordance with Section 501.10(e) of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - Latest Edition.

3.5 ACCEPTANCE TESTING

- A. Allow testing agency to inspect and test asphaltic concrete paving. Contractor shall not proceed with covering up untested areas until test results for previously completed work verify compliance with requirements.
- B. The Contractor will perform testing on in-place work in accordance with Section 01 40 00 - Quality Control. Any area that is deficient or not in compliance with the specifications, whether identified by testing or inspection, shall be corrected by the Contractor as provided above.

END OF SECTION

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Paint on pavement surfaces, in form of traffic lanes, and other detail pavement markings.

1.2 RELATED REQUIREMENTS (not used)

1.3 APPLICABLE PUBLICATIONS

- A. Comply with references to extent specified in this section.
- B. Federal Specifications (Fed. Spec.):
 - 1. TT-B-1325D - Beads (Glass Spheres) Retro-Reflective.
 - 2. TT-P-1952F - Paint, Traffic and Airfield Marking, Waterborne.
- C. Master Painters Institute (MPI):
 - 1. No. 97 - Traffic Marking Paint, Latex.

1.4 SUBMITTALS

- A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Submittal Drawings:
 - 1. Show pavement marking configuration and dimensions.
 - 2. Show international symbol of accessibility at designated parking spaces.
- C. Manufacturer's Literature and Data:
 - 1. Description of each product.
 - 2. Application instructions.
- D. Samples:
 - 1. Paint: 200 mm (8 inches) square, each type and color.
- E. Certificates: Certify products comply with specifications.
- F. Qualifications: Substantiate qualifications comply with specifications.
 - 1. Installer with project experience list.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Regularly installs specified products.
 - 2. Installed specified products with satisfactory service on five similar installations for minimum five years.
 - a. Project Experience List: Provide contact names and addresses for completed projects.

1.6 DELIVERY

- A. Deliver products in manufacturer's original sealed packaging.

- B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, color, production run number, and manufacture date.
- C. Before installation, return or dispose of products within distorted, damaged, or opened packaging.

1.7 STORAGE AND HANDLING

- A. Store products indoors in dry, weathertight conditioned facility.
- B. Protect products from damage during handling and construction operations.

1.8 FIELD CONDITIONS

- A. Environment:
 - 1. Product Temperature: Minimum 13 degrees C (55 degrees F) for minimum 48 hours before installation.
 - a. Surface to be painted and ambient temperature: Minimum 10 degrees C (50 degrees F) and maximum 35 degrees C (95 degrees F).
- B. Field Measurements: Verify field conditions affecting traffic marking installation. Show field measurements on Submittal Drawings.

1.9 WARRANTY

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 SYSTEM PERFORMANCE

- A. Design paint complying with specified performance:
 - 1. Application: Fed. Spec. TT-P-1952.

2.2 PRODUCTS - GENERAL

- A. Provide each product from one manufacturer and from one production run.

2.3 SANDBLASTING EQUIPMENT

- A. Air compressor, hoses, and nozzles of proper size and capacity as required for cleaning painted surfaces. Compressor to provide minimum 0.08 cu. m/s (150 cfm) of air at pressure of minimum 625 kPa (90 psi) at each nozzle used.

2.4 PAINT APPLICATOR

- A. Apply marking paint with approved mechanical equipment. Provide equipment with constant agitation of paint and travel at controlled speeds. Synchronize one or more paint "guns" to automatically begin and cut off paint flow in case of skip lines. Equipment to have manual control to apply continuous lines of varying length and marking widths as indicated on Drawings. Provide pneumatic spray guns for hand application of paint in areas where mobile paint applicator cannot be used. Use separate piece of equipment when equipment does not have glass bead dispenser. Adjust and synchronize equipment with paint applicator to distribute reflective beads on paint lines uniformly within ten seconds without any waste.

2.5 PAINT

- A. Paint: MPI No. 97. For obliterating existing markings comply with Fed. Spec. TT-P-1952. Provide minimum 18 L (5 gallons) containers.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine and verify substrate suitability for product installation.
 - 1. Allow new pavement surfaces to cure for period of minimum 14 days before application of marking materials.
- B. Protect existing construction and completed work from damage.
- C. Clean substrates. Remove contaminants capable of affecting subsequently installed product's performance.
 - 1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or combination of these methods.
 - 2. Completely remove rubber deposits, existing paint markings, and other coatings adhering to pavement with scrapers, wire brushings, sandblasting, mechanical abrasion, or approved chemicals as directed by Contracting Officer's Representative.
 - 3. As an option, comply with Fed. Spec. TT-P-1952 for removal of existing paint markings on asphalt pavement. Apply black paint in as many coats as necessary to completely obliterate existing markings.
 - 4. Scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application, where oil or grease are present on old pavements to be marked, .
 - a. After cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through new paint.
 - 5. Clean and dry surface before pavement marking. Do not begin any marking until Contracting Officer's Representative inspected surface and gives permission to proceed.

3.2 TEMPORARY PAVEMENT MARKING

- A. Apply Temporary Pavement Markings of colors, widths and lengths shown on drawings or directed by Contracting Officer's Representative. After temporary marking has served its purpose and when so ordered by Contracting Officer's Representative, remove temporary marking by carefully controlled sandblasting, approved grinding equipment, or other approved method to prevent damage on applied surface.
- B. As an option, provide approved preformed pressure sensitive, reflective, adhesive tape type of temporary pavement marking of required colors, widths and lengths in lieu of temporary painted and reflective marking. Continuous durability and effectiveness of such marking is required during period for which its use is required. Remove any unsatisfactory tape type marking and replace with painted and reflective markings.

3.3 INSTALLATION - GENERAL

- A. Install products according to manufacturer's instructions and approved submittal drawings.
 - 1. When manufacturer's instructions deviate from specifications, submit proposed resolution for Contracting Officer's Representative consideration.

3.4 PAINT APPLICATION

- A. Apply uniformly painted and reflective pavement marking of required colors, length, and width with true, sharp edges and ends on properly cured, prepared, and dried surfaces.
- B. Comply with details as indicated on drawings and established control points.
- C. Apply paint at wet film thickness of 0.4 mm (0.015 inch). Disperse reflective glass beads evenly on wet paint at rate of 720 g/L (6 pounds per gal.) of paint. Apply paint in one coat. When directed by Contracting Officer's Representative, apply additional coats at markings showing light spots. Comply with paint manufacturer's maximum drying time requirements to prevent undue softening of asphalt, and pick-up, displacement, or discoloration by tires of traffic.
- D. When deficiency in marking drying occurs, discontinue paint operations until cause of slow drying is determined and corrected.
- E. Remove and replace marking applied less than minimum material rates, deviates from true alignment, exceeds stipulated length and width tolerances, or shows light spots, faulty distribution of beads, smears, or other deficiencies or irregularities.
- F. Remove marking by carefully controlled sandblasting, approved grinding equipment, or other approved method to prevent damage on applied surface.

3.5 DETAIL PAVEMENT MARKING APPLICATION

- A. Apply Detail Pavement Markings, exclusive of actual traffic lane marking as follows:
 - 1. At locations as indicated on drawings.
- B. Install detail pavement markings of colors, widths and lengths, and design pattern at locations indicated on drawings.

3.6 TOLERANCES

- A. Length and Width of Lines: Plus, or minus 75 mm (3 inches) and plus or minus 3 mm (1/8 inch), respectively, in case of skip markings.
- B. Length of intervals exceeding line length tolerance are not acceptable.

3.7 CLEANING

- A. Remove excess paint before paint sets.

3.8 PROTECTION

- A. Protect pavement markings from traffic and construction operations.
 - 1. Protect newly painted markings from vehicular traffic until paint is dry and track free.
 - 2. Place warning signs at beginning of wet line, and at points well in advance of marking equipment for alerting approaching traffic from both directions.

3. Place small flags or other similarly effective small objects near freshly applied markings at frequent intervals to reduce crossing by traffic.
- B. Repair damage.

--- E N D ---

SECTION 32 92 19

SEEDING AND MULCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. The work consists of establishing a stand of grass on roadway slopes, open areas, embankment fill slopes, and all areas disturbed by earthwork operations including temporary staging and material stockpile areas. Also included are mulching, fertilizing, watering, and maintenance as required to produce a healthy stand of grass.
- B. Related Documents: Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - 2016 Edition.

1.2 SUBMITTALS

- A. Certification: Furnish copy of laboratory test report for each lot of seed furnished in accordance with Section 1018.18 (b) of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - 2016 Edition.

1.3 GUARANTEE

- A. All seeded areas shall be guaranteed for six (6) months after date of final acceptance to produce a well established stand of grass, free of erosion.
- B. Replacement of seeded areas that have not produced a well established stand of grass with 90 percent area coverage: Any seeded areas showing indication of probable non-survival or lack of health and vigor, or which do not exhibit the characteristics to meet specifications, shall be re-seeded within 14 days of notice from the Owner's Representative. All replacement seeding shall be furnished/installed at no additional cost to the Owner and shall be guaranteed for twelve months. All replacements shall meet original specifications.
- C. The Contractor will notify the Owner ten days prior to the end of the guarantee period and such guarantee shall be extended until notification is received.
- D. At the end of the guarantee period, all seeded areas that are dead or in unsatisfactory growth shall be replaced within two weeks.

1.4 AUTHORIZATION TO PROCEED

- A. Prior to beginning final seeding and mulching operations for a particular area, the Contractor shall request authorization to proceed from the Owner's Representative. The request shall state and certify that the particular designated areas are free of construction debris and the requirements specified in Section 31 00 00 Earthwork and Section 31 23 00.10 Excavation, Trenching and Backfill for Utility Systems have been completed, and shall request an inspection with the Engineer to check the work. The request in the form of a letter to the Owner's Representative shall provide a place for the approval signature.

1.5 FIELD QUALITY CONTROL

- A. Each lot of seed and fertilizer shall be tested by the Contractor upon request of Owner's Representative:

Fertilizer: AOAC Official Methods of Analysis.

Seed: USDA Rules and Regulations under Federal Seed Act.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Seed:

1. The seed shall meet the tolerance for germination and purity in accordance with the U.S. Department of Agriculture Rules and regulations under the latest edition of the Federal Seed Act and the requirements of Section 1018.18 of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - 2016 Edition.. Seed shall be packaged by the dealer and shall be delivered to the site in sealed containers which shall bear the Dealer's guaranteed analysis in accordance with Louisiana Seed Law.
2. Grass seed for all disturbed areas shall be types "D", or H" as listed in Table 1 of Section 717, Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - 2016 Edition. Seed shall be applied at the rate shown in the table. Seed mixture shall be determined by planting dates as shown in the table. The separate types of seed used shall be thoroughly dry mixed immediately before sowing. Seed which has become wet shall not be used. All seed shall also meet all applicable state laws, and shall be approved by the Owner's Representative before being sown.

B. Mulch:

1. Dry Mulch: The mulch material shall conform to Section 1018.19 of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - 2016 Edition.

C. Curled Wood Matting:

1. Curled Wood Matting shall conform to Section 1018.24(b) of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - 2016 Edition.
2. Staples shall conform to Section 1018.24(c) of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - 2016 Edition.

D. Commercial Fertilizer:

1. Commercial fertilizers shall comply with applicable State of Louisiana fertilizer laws and shall comply with Section 718 and Subsection 1018.16 of the Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - 2016 Edition.
2. The numerical designations for fertilizer indicate the minimum percentages respectively of (1) total nitrogen, (2) available phosphoric acid and (3) water soluble potash, contained in the fertilizer.

E. Agricultural Lime:

1. Agricultural Lime shall comply with Section 718 and Subsection 1018.17 of the

- F. Water for Grassing: The water used in the grassing operations shall be obtained by the Contractor. The water shall be free of excess and harmful chemicals, acids, alkalies, or any substance which might be harmful to plant growth or obnoxious to traffic. Salt water shall not be used.

2.2 EQUIPMENT

- A. Fertilizer Spreader: The device for spreading fertilizer shall be capable of uniformly distributing the material at the specified rate.
- B. Seed Spreader: The seed spreader shall be an approved mechanical hand spreader or other approved type of spreader.
- C. Equipment for Blowing Mulch: The mulching equipment shall distribute mulch evenly by blowing it over an area.
- D. Disc: A cultipacker, small disc, or other suitable equipment will be required for discing the areas.
- E. Rollers: A turf roller or other suitable equipment will be required for rolling the grassed areas.
- F. Hydraulic Mulcher: The mulch shall be mixed in standard hydraulic equipment to form a homogenous slurry. The equipment shall be capable of spraying the slurry, under pressure, uniformly over the soil surface at the material application rate indicated. A continuous agitation system that keeps all materials in uniform suspension throughout the mixing and distribution, cycles is required.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Cleaning:
 - 1. Keep excavated areas free from debris and stored materials that could damage surfaces or interfere with progress of Work.
 - 2. Remove excess materials from the Site promptly to prevent large accumulation. Store reusable material neatly in designated locations.
 - 3. On a daily basis and upon the completion of the Work of this Section, dispose of, away from the Site, debris, trash, containers, residue, remnants and scraps which result from the Work of this Section. Contractor shall not discard any construction materials such as welding rods, nails, rebar scraps, etc. on the ground. All waste shall be placed in a location for periodic pickup.
- B. Topsoil which was removed from the site and stockpiled during earthwork operations shall be placed to a depth of 4 inches in all fill areas which are to be grassed and as directed by the Owner's Representative. Topsoil shall be placed in lieu of other fill material to the grades shown on the Drawings. Topsoil shall be free of roots, brush and other extraneous material. Contractor shall be responsible for the costs of importing suitable topsoil if there is not a sufficient supply of suitable topsoil on site.
- C. The ground to be seeded shall be prepared by disc harrowing and thoroughly pulverizing the soil to a depth of 4 inches. The prepared soil shall be loose. The soil shall then be smoothed and fine graded to the elevations shown on the Drawings. It shall be reasonably free of large clods, roots and other material which will interfere with the work and subsequent mowing and maintenance operations.

3.2 APPLICATION

A. General:

1. Weather Limitations: Fertilizing, seeding or mulching operations will not be permitted when wind velocities exceed 15 miles per hour. Seed shall be sown only when the soil is moist and in proper condition to induce growth. No seeding shall be done when the ground is unduly wet, or otherwise not in a tillable condition.
2. Sequence of Operations: The operations involved in the work shall proceed in the following sequence: Preparation, and application of lime, fertilizing of the ground, seeding, rolling, and spraying of mulch.

B. Lime:

1. Test soil for pH as provided below and uniformly apply lime in accordance with Section 718 LSSRB.
2. Soil pH: Prior to seeding and fertilizing, Contractor shall test representative areas to determine soil pH and the requirements for lime application. Topsoils having a pH of less than 7.0 shall receive lime applications of a minimum 2 tons per acre to raise the pH to between 7.0 and 8.0 standard units.

C. Fertilizing:

1. The fertilizer shall be spread uniformly at a rate based on the type of fertilizer used and by a spreading device capable of uniformly distributing the material at the specified rate. Rates are as follows: Type 8-8-8, 1000 pounds per acre; Type 12-12-12, 667 pounds per acre; Type 13-13-13, 615 pounds per acre; Type 16-16-16, 500 pounds per acre.
2. On steep slopes, where the use of a machine for spreading or mixing is not practicable, the fertilizer shall be spread by hand.

D. Seeding:

1. For all Bermuda or Rye grass areas, while the soil is still loose and moist, the seed shall be scattered uniformly over the grassing area. Rates are as specified in Table 1, Section 717 of Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - 2016 Edition.

A. Mulching:

1. As required to prevent recurring erosion problems and required repairs to eroded surfaces, Contractor shall apply approximately 2 inches, loose thickness, of the mulch material uniformly over the seeded area, and the mulch material cut into the soil with the equipment specified, so as to produce a loose mulched thickness of 3 to 4 inches. Care shall be exercised that the materials are not cut too deeply into the soil.

- B. Rolling: Immediately after completion of the mulching, the entire seeded and mulched area shall be rolled thoroughly with the equipment specified to produce a smooth surface. At least two trips over the entire area will be required.

C. Curled Wood Matting:

1. Curled wood matting shall be placed as shown on the plans and as requested by the Owner's Representative in areas that continue to erode after seeding and mulching have occurred.
2. Contractor shall place curled wood matting in accordance with Section 720.04(b) Louisiana Department of Transportation (La DOTD) - Louisiana Standard Specifications for Roads and Bridges (LSSRB) - 2016 Edition.

- D. Watering: The seeded areas shall be watered so as to provide optimum growth conditions for the establishment of the grass. In no case, however, shall the period of maintaining such moisture be less than 2 weeks after the planting.
- E. Maintenance:
1. The Contractor shall, at his expense, maintain the seeded areas in a satisfactory condition until final acceptance of the project. Such maintenance shall include the repairing of any damaged areas where the establishment of the grass stand does not appear to be developing satisfactorily, or where erosion has washed away an area and filling and leveling are required.
 2. Replanting or repair necessary due to the Contractor's negligence, carelessness or failure to provide routine maintenance shall be at the Contractor's expense.
 3. All areas which do not show a satisfactory catch of grass shall be re-seeded at intervals of 21 days until a dense lawn of permanent grasses with at least 90 percent area coverage, free from any bare spots, areas of washout or erosion damage has been established.
 4. Seeded areas shall be maintained by the Contractor as long as necessary to establish a dense cover as specified above.
- F. Mowing: One complete mowings shall be included in the base price for seeding and mulching. The mowing shall be done just prior to final inspection.

END OF SECTION

Appendix A

Geotechnical Report



Geotechnical Testing Laboratory, Inc.

Engineering and Construction Materials Testing Services

October 14, 2024

Ballard CLC, Inc.
1009 Bayou Place
Alexandria, Louisiana 71303

Attention: Mr. Bryan Butler, P.E.

**RE: Geotechnical Investigation Services
USFWS – Tensas National Wildlife Refuge
Quebec Road Remediation
Tallulah, Madison Parish, Louisiana
Report Number 10-24-139**

Dear Mr. Butler:

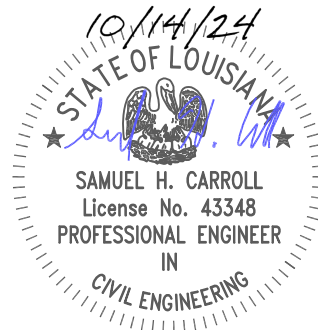
Geotechnical Testing Laboratory, Inc. is pleased to submit this report of subsurface exploration for the above referenced project. Included in the report are the results of the exploration and recommendations concerning the design and construction of the pavements as well as general site development.

We appreciate the opportunity to have provided you with our geotechnical engineering services. If you have any questions concerning this report, or if we may be of further service, please contact our office.

Respectfully submitted,
Geotechnical Testing Laboratory, Inc.

Samuel "Heath" Carroll, P.E.
Louisiana Registration No. 43348

Ken Gorsha
President



Distribution: Ballard CLC, Inc.

NJG/krq

Geotechnical Investigation Services
USFWS – Tensas National Wildlife Refuge
Quebec Road Remediation
Tallulah, Madison Parish, Louisiana
Report Number 10-24-139

Prepared For:

Ballard CLC, Inc.
1009 Bayou Place
Alexandria, Louisiana 71303

Prepared By:

Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, Louisiana 71301

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APPENDICES

Appendix A – Field and Laboratory Procedures
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Geotechnical Investigation Services
USFWS – Tensas National Wildlife Refuge
Quebec Road Remediation
Tallulah, Madison Parish, Louisiana
Report Number 10-24-139

Introduction:

This report transmits the findings of a geotechnical investigation performed for the above-referenced project. The purpose of this investigation was to define and evaluate the general subsurface conditions in the immediate vicinity of the proposed road. Specifically, the study was planned to determine the following:

- Subsurface stratigraphy within the limits of our exploratory borings.
- Classification, strength, and compressibility characteristics of the supporting strata.
- An evaluation of the subsurface conditions to provide recommendations for a flexible surfaced pavement section for unspecified traffic.

The purpose of this report is to provide the civil engineer and other design team professionals with recommendations for the design and construction of the proposed project. This report should not be used by the contractor in lieu of project plans and specifications.

Project Authorization:

Formal authorization to perform the work was provided by Mr. Bryan Butler, P.E. with Ballard CLC, Inc. (Client), by accepting our September 17, 2024 written proposal. Written authorization to proceed was provided on September 20, 2024. Field procedures were conducted on October 2 & 3, 2024. To accomplish the intended purposes, a three-phase study program was conducted which included:

- a field investigation consisting of 31 exploratory test borings with samples obtained at selected intervals;
- a lab testing program designed to evaluate the pertinent physical properties of the encountered strata; and,
- an engineering analysis of the field and laboratory test data to provide our recommendations for stone-surfaced pavement sections.

No additional analysis was requested. A brief description of the field and laboratory test procedures are provided in the Appendix.

Project Description:

We understand the project consists of remediating approximately 10.2 miles of Quebec Road from Interstate 20 to the Tensas National Wildlife Reserve in Tallulah, Madison Parish, Louisiana. As a result of their worsening conditions, five (5) prioritized sections of the roadway are located between the following coordinates:

Prioritized Section No.	Beginning GPS Coordinates Approximate	Ending GPS Coordinates Approximate
No. 1	32° 25' 36.17" N / 91° 18' 08.70" W	32° 25' 33.86" N / 91° 18' 08.45" W
No. 2	32° 24' 58.07" N / 91° 18' 05.56" W	32° 23' 52.33" N / 91° 18' 45.72" W
No. 3	32° 23' 35.91" N / 91° 18' 47.07" W	32° 23' 20.84" N / 91° 18' 53.63" W
No. 4	32° 21' 17.11" N / 91° 19' 12.69" W	32° 21' 12.31" N / 91° 19' 04.47" W
No. 5	32° 25' 32.13" N / 91° 18' 08.23" W	32° 25' 25.84" N / 91° 18' 07.52" W

The remainder of the roadway between the prioritized sections appears in relatively good condition, and will be discussed further in this report. GPS coordinates at each boring location can be found in the "Notes" section at the bottom of the boring log.

The new pavement will reportedly accommodate an unspecified amount of light automotive vehicles and pickup trucks, and an unspecified amount of agricultural equipment and fully-loaded 18-wheelers will utilize the pavement during harvest-time. Information provided to this office indicates that slight grade increases will be made for most of the pavement areas in the form of reconstruction or overlay, while low areas of the roadway will see increases of approximately 12-inches. If larger grade changes are anticipated, these should be discussed with our geotechnical engineer prior to finalizing design.

If any of this information should change significantly or be in error, it should be brought to our attention so that we may review recommendations made in this report.

Road Conditions:

The existing pavement in all prioritized sections is currently exhibiting distress in the form of longitudinal cracks, transverse cracks, eggshell (alligator) cracking, and severe rutting and displacement of the base and subgrade. In some areas, the underlying base has projected through the asphalt surfacing, and the possibility exists that some slope failures have occurred along the road shoulders. The remainder of the road between the prioritized sections is in relatively good condition, and is experiencing random cracking. Asphalt patches were observed in some areas of the road.

Subsurface Stratigraphy:

The subsurface conditions for the proposed improvements were explored by drilling a total of 31 borings to a depth of approximately five (5) feet. The surface thicknesses and stratification of the soils encountered during field drilling operations are presented on the logs of borings in the Appendix. The thicknesses shown on the logs represent the conditions encountered at the actual boring locations and variations may occur throughout the project. The lines of demarcation represent the approximate boundary between the soil types, but the actual transition may be gradual. The following subsurface descriptions are of a generalized nature to highlight the major stratification features. The boring logs should be reviewed for more detailed information.

In order of increasing depth, the borings generally encountered the following soil strata: chemically treated soil (A-4), silty sand (A-2-4 to A-4), slightly clayey silty sand to sandy silt (A-4), lean clay (A-4, A-6 and A-7-6), and fat clay (A-7-6).

Groundwater Conditions:

Groundwater seepage was not observed during advancement of the test borings and, after short time lapses, the borings remained dry and un-caved. The subsurface water regime is always subject to change with variations in climatic conditions and will likely coincide seasonal fluctuations. Future construction activities may also alter the surface and/or subsurface drainage patterns of this site. Therefore, groundwater conditions should be explored at the start of construction by others due to short-term observations by our field crew.

Perched water may be briefly encountered in low quantities during earthwork and is typically due to storage of recent rainfall or by a barrier to capillary evaporation. Where perched water is encountered, the contractor should expect to excavate gravity drainage ditches to divert it away from the construction area. Additionally, soft, wet and pumpable soils can be expected below

perched water tables. In structural areas, these should be removed to firm ground and replaced with select fill soils compacted to project specifications as defined later in this report.

Geotechnical Recommendations:

Based on the planned type of roadway and the results of this investigation, we feel that the proposed roadway should perform satisfactorily below the intended traffic loadings, provided the subgrade has been prepared as recommended herein.

The information for the design of the pavement system(s) is presented below. All referenced sections are in accordance with the State of Louisiana, Department of Transportation and Development, Standard Specifications for Roads and Bridges, 2016 Edition.

Pavement Recommendations:

Our scope of services did not include extensive sampling and CBR testing of existing subgrade or potential sources of imported base material for the specific purpose of a detailed pavement analysis. Instead, we have assumed pavement related design parameters that are considered to be typical for the area soil types. It has been assumed that the constructed pavement subgrade will consist of well compacted soils. Based on experience, it is anticipated that the compacted native subgrade will yield a California Bearing Ratio (CBR) no greater than 5.0.

The satisfactory performance of pavements depends upon several factors including the characteristics of the supporting soil, the magnitude and frequency of wheel load applications, quality of construction materials, the contractor's placement and workmanship abilities, good drainage, and the desired period of design life.

The general pavement design information presented in this report is based on subsurface conditions inferred by the test borings, and past experience in the locale. The published information was utilized in conjunction with the available field and laboratory test data to develop general pavement designs based on the AASHTO structural numbering system.

Traffic and Design Data:

The commercial pavement sections presented herein are based upon minimum material thicknesses. For the purposes of this report, we have assumed average daily traffic will consist of light automotive and pickup trucks, and seasonal agricultural traffic will consist of and unknown amount of agricultural equipment and fully-loaded 18-wheelers. As previously stated, the new pavement grades may increase anywhere from two (2) to 12 inches. If larger grade changes are anticipated, these should be discussed with our geotechnical engineer prior to finalizing design.

Remediation of Prioritized Sections:

Due to deep rutting and pumping of the base and subbase in these sections, remediation consisting of stabilization with Portland cement is not recommended. Consequently, the complete repair of these sections is as follows:

The road should be cut and/or filled and shaped to an elevation that will result in the placement of at least 12 inches of Aggregates for Base Course meeting the requirements contained in Section 1003.03.1. After leveling as required by the grading plan, the entire pavement subgrade should be proof-rolled with a heavy, loaded pneumatic-tired vehicle such as a 20 to 25 ton loaded dump truck. It is recommended that all areas beneath the pavement be proof-rolled to identify loose or soft soils.

All proof-rolling and undercutting activities should be witnessed by GTL or authorized representative and should be performed during a period of dry weather. Any weak areas which yield under the proof-roll, or any areas with a tendency to pump should be mitigated. Such mitigation may include over-excavation and backfilling, using crushed stone or native materials, reprocessing to remove moisture.

After proof-rolling but prior to placing fill, the exposed subgrade should be scarified and then processed to a moisture content between one (1) percentage point below and three (3) percentage points above the Standard Proctor optimum. The subgrade soils should be re-compacted to a density of at least 92 percent of the Standard Proctor test DOTD TR 418 Method A (ASTM D-698) maximum dry density for a depth of at least eight (8) inches below the surface.

The subgrade should be compacted within the range of one (1) percentage point below to three (3) percentage points above the optimum moisture content value and a minimum of 95 percent of the maximum density as determined by the Standard Proctor test DOTD TR 418 Method A (ASTM D-698). As a guideline, it is recommended that field density tests be taken at a frequency of not less than one (1) test per 5,000 square feet of surface area per lift or a minimum of four (4) per lift for each tested area for the pavement.

Once compaction is complete, the roadbed should be shaped and crowned to shed water to the pavement edges.

Treated Subgrade Layer:

In lieu of mitigating weak areas of the subgrade with crushed stone, and if 92-percent compaction of the subgrade cannot be achieved, then a treated subgrade layer should be considered.

The treatment of subgrade soils should consist of mixing with Portland cement or a combination of Portland cement and lime conditioning, and compacting, finishing, and curing. In-place treatment with Portland cement should be in accordance with Section 303. When central plant mixing is used, it should conform to Section 301. Treatment with lime should be in accordance with Section 304 for Type C treatment. The minimum quantities of Portland cement and lime should be in accordance with the following:

<u>PI</u>	<u>Lime or Cement (Percent by Volume)</u>
0-15	9% cement
16-25	6% lime and 9% cement
26-35	9% lime and 9% cement

The engineer has the option of increasing or decreasing the percentage of cement and lime based on field conditions.

If methods to compact the subgrade fail, we anticipate the conditioning the subgrade with 9% hydrated lime, followed by treatment with 9% by volume of Portland cement.

Geogrid:

Prior to placing the Base Course Aggregate, a single layer of Tensar TriAx TX 160 or approved equal should be placed on the compacted subgrade. If installed in accordance with manufacturers recommendations, the polypropylene product will add stiffness and rigidity below the stone, and will greatly reduce or prevent potholing.

Aggregates for Base Course:

Stone aggregate should consist of 100 percent stone meeting the grading requirements in Table 1003-6 and have a maximum Liquid Limit of 25 and Plasticity Index of five (5). Tests for aggregate durability should have an abrasion loss of 40 percent or less. Unfortunately, these tests are often overlooked in private projects, frequently allowing substandard materials to be used, resulting in unsatisfactory performance of paving. The stone base should be compacted to 95 percent of the maximum density defined by the Modified Proctor (ASTM D-1557).

Asphalt Curing Membrane:

Upon completion of intermediate finishing, immediately protect the base course against drying by applying an asphalt curing membrane in accordance with Section 506. Asphalt for the curing membrane should be an emulsified asphalt or an emulsified petroleum resin (EPR-1) complying with Section 1002. Water should comply with Section 1018.01.

Slope Failures on Any Road:

Slope failures are common along roads with steep side slopes and deep ditches that tend to hold water, and are evidenced by wide longitudinal cracks differential settlement along the road shoulders. In order to prevent the future occurrence of this phenomenon after reconstruction, these failures may be repaired by excavating approximately two (2) feet of material down through the failure, and backfilling with layers of crushed stone meeting the requirements of Section 1003.03.1 – Table 6. After excavation, smooth the subgrade and install a layer of Tensar TriAx TX 140 or 150 Geogrid in accordance with manufacturers recommendations. In “headerbank” fashion install a minimum eight (8) inch layer of base course aggregate and compact to a minimum of 92 percent of the maximum density defined by DOTD TR 418, Method G (Modified Proctor). All subsequent base course aggregate layers should be compacted to the same minimum density. As an option, Geogrid may be placed atop the initial and subsequent lift of base course aggregate. Alternate methods of repair presented by others will require approval from this office.

Asphaltic Concrete Mixtures:

The hot-mixed asphaltic concrete (HMAC) should be furnished and constructed in accordance with Section 502 – Table 6, and should minimally consist of two (2) inches of binder course mix followed by a two (2) inch wearing surface for all prioritized sections and sections requiring milling and overlay as discussed below. The field density results should be based on the Theoretical Maximum Specific Gravity in accordance with DOTD TR 327, and will require a minimum density of 92.0 percent for each mix type. Placement and processes should follow the general guidelines set forth in Sections 502 and 503.

Remediation of the Remainder of the Roadway:

As previously mentioned, the remainder of the roadway between the prioritized sections appears in relatively good condition. Consequently, remediation of these sections will require milling the top four (4) inches of existing asphaltic concrete. After milling, the mill areas should be proof-rolled to reveal any weak or areas that yield or rut excessively. Areas that rut excessively should be mitigated utilizing one of the methods below. Alternate methods of remediation presented by others will require our approval.

The following methods of remediation should be utilized beneath all roads to be milled, patched, and overlaid:

Full-Depth Asphalt - Remove failed areas to a depth of at least four (4) to six (6) inches, and replace with hot-mixed asphaltic concrete (HMAC). The percent compaction required for all asphalt patches will be the density achieved by using a pneumatic roller or motor grader.

Crushed Stone - Remove failed areas to a depth of at least six (6) inches, and replace with crushed stone meeting Base Course Aggregates discussed further in this report. If stable ground does not exist prior to stone placement, then the excavation should be lined with a single layer of Tensar BX 1100 or 1200, or approved equal. Compaction should be a minimum of 92 percent of the maximum density defined by the Modified Proctor (DOTD TR418, Method G).

Asphalt Tack Coat:

Prior to overlay, a tack coat consisting of an undiluted modified asphalt emulsion should be applied. Asphalt materials and general process should follow the general guidelines set forth in Section 504.

Drainage:

Shallow gravity ditches should be established along the sides of the realigned roadway with side slopes cut at a maximum 3H:1V. The bottoms of the ditches should be a minimum of 24 inches below the final surface elevation of the pavements and should be checked to ensure rapid drainage of runoff away from the sides of the roadbed. Water must not be allowed to pond or stand in the ditches near the perimeter of the roadway.

Excavation Safety Considerations:

The contractor should be aware that slope height, slope inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, or federal safety regulations, e.g., OSHA Standards for Excavations, Title 29, Part 1926, successor regulations as well as other building code requirements. Such regulations are strictly enforced and, if not followed, the owner, contractor, and earthwork and utility subcontractors could be liable for substantial penalties.

The owner and the contractor should make themselves aware of and become familiar with applicable local, state, and federal safety regulations, including the current Occupational Safety and Health Association (OSHA) Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility of the contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. We are providing this information solely as a service to our client. Under no circumstances should the information provided herein be construed that GTL is assuming responsibility for construction site safety of the contractor's activities. Such responsibility is not being implied and should not be inferred.

Weather Considerations:

The soils encountered in the surficial zone at this site are expected to be relatively sensitive to disturbances caused by construction traffic when wet. The contractor should be aware of the importance of proper maintenance of surface drainage. Depending on weather-related ground conditions, contractor's maintenance of drainage during construction, and other factors, some difficulty may be encountered by the contractor in achieving compaction on initial lifts of fill placed on loose or soft subgrade. This will be exacerbated by wet weather, particularly if the contractor allows surface drainage to enter and pond in the excavations.

During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support characteristics. In addition, soil which becomes wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and pavement construction activities during dry weather. Earthwork activities performed during cooler; wetter months may certainly offer more difficulties than if performed during warmer, drier periods.

If construction is performed during wet conditions, work platforms can be created for earthwork by mixing fly ash, hydrated lime, cement, or combinations of these additives. Quick lime may also be used in areas where dusting is of concern, if proper worker safety considerations are observed. Pumping subgrades are possible at the site and it is recommended that bid documents incorporate this possibility into the bid schedule.

The use of geotextiles and geogrids may be warranted in situations where the subgrade is very wet and highly unstable, if such use is necessary to maintain a mandatory construction schedule during wet weather.

Groundwater Control:

Due to potential variations in groundwater levels, difficulty during excavation and construction of the proposed pavement is possible. Shallow groundwater was not encountered at this site. However, it is reasonable to anticipate that groundwater conditions may vary as noted previously. It is suggested that contract documents address the need for maintaining controls to preclude water from draining into excavations. Some dewatering through shaping of work areas to shed water, and construction of temporary ditches with sumps and pumping may be necessary to remove the loose soils and allow placement of imported fill in a dry manner. Excavated soils intended for re-use as select fill may require special methods in order to dry the soil to a suitable moisture content prior to re-placing the soil as select fill.

Protection of Work:

Subgrade areas, base courses, and lifts of fill that have been successfully moisture conditioned, processed, and compacted in lifts to the required density, successfully proof-rolled, and approved must be protected from changes in moisture and other influences. Satisfactorily completed areas may be adversely affected by prolonged exposure to dry weather, precipitation, equipment traffic, or by excavations and uncontrolled backfilling for utilities, and other disturbances rendering such areas unsatisfactory. Such areas should be reworked prior to continuing with subsequent construction.

Geotechnical Risk:

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed pavements will perform as planned. The engineering recommendations presented in the preceding sections constitutes GTL's professional estimate of those measures that are necessary for the proposed pavements to perform according to the proposed design based on the information generated and referenced during this evaluation, and GTL's experience in working with these conditions.

Limitations:

The exploration and analysis of the subgrade conditions reported herein are considered sufficient in detail and scope to form a reasonable basis for the pavement design. The recommendations submitted are based on the available soil information and preliminary design details furnished for the proposed project. Any revision of the plans for the proposed project from those enumerated in this report should be brought to our attention so that we may determine if changes in the recommendations are required. If deviations from the noted subsurface conditions are encountered during construction, GTL should be retained to

determine if changes in pavement recommendations are required. If GTL is not retained to perform these functions, we will not be responsible for the performance of the pavements.

The findings, recommendations, specifications, or professional advice contained herein have been made after being prepared in accordance with generally accepted professional engineering practice in the fields of geotechnical engineering, soil mechanics, and engineering geology. No other warranties are implied or expressed.

The scope of services did not include any environmental assessment for the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site. Any statements in this report or on the boring logs regarding odors, colors, or unusual or suspicious items or conditions are strictly for the information of the client. Prior to purchase or development of this site, an environmental assessment is advisable.

The scope of services did not include a geologic investigation to address any faults, large scale subsidence, or other macro geologic features not specifically addressed in this report or the agreement between GTL and the client.

After the plans and specifications are more complete, it is recommended that the soils engineer be provided the opportunity to review the final design and specifications in order that the earthwork recommendations may be properly interpreted and implemented. At that time, it may be necessary to submit supplementary recommendations.

This report has been prepared for the exclusive use of our client for the specific application to the referenced project. GTL cannot be responsible for interpretations, opinions, or recommendations made by others based on the data contained in this report.

This report was prepared for design purposes only and may not be sufficient for purposes of preparing an accurate bid for construction. Contractors reviewing this report are advised that the discussions and recommendations contained herein were provided exclusively to and for use by the project owner.

END OF REPORT TEXT

SEE FOLLOWING APPENDIX w/BORING LOGS & TEST RESULTS

APPENDIX A

FIELD AND LABORATORY PROCEDURES

Field and Laboratory Procedures
USFWS - Tensas National Wildlife Refuge
Quebec Road Remediation
Tallulah, Madison Parish, Louisiana
Report Number 10-24-139

I. Field Operations:

Subsurface conditions were evaluated by advancing 31 intermittent auger borings on October 2 & 3, 2025 throughout the subject road. The boring locations were selected and marked in the field by representatives of Geotechnical Testing Laboratory, Inc. An illustration of the approximate boring locations is provided on Plan of Borings herein. Descriptive terms used on the Summary of Tests are in accordance with the American Association of State Highway and Transportation Officials (AASHTO).

A truck-mounted drilling rig was used to make the test borings. Each boring was advanced in the dry using flight auger drilling techniques. Measurements of the asphaltic concrete and underlying base are made in the field. Samples of the subgrade were obtained from the top one foot of the borehole, and at a depth of one (1) to three (3) feet afterwards. In some cases, the top foot contains multiple soils layers. Consequently, the entire sample is combined and classified to determine if a combination of the materials encountered are usable beneath flexible and rigid surfaces.

Evidence of chemically treated soil was determined by spraying a mixture of phenolphthalein and distilled water along the boring walls. The phenolphthalein mixture will turn a purplish color in the presence of cement or hydrated lime. No chemical treatment was detected.

The presence of ground water was monitored during drilling operations. Initial water seepage readings are provided under "Groundwater Information" in the right hand column of the Log of Boring.

II. Laboratory Studies:

Upon return to the laboratory, all samples were visually examined and representative samples were selected for testing. Tests were performed on selected samples recovered from the test borings to verify classification and to determine pertinent engineering properties of the substrata. Individual test and ASTM designations are provided below:

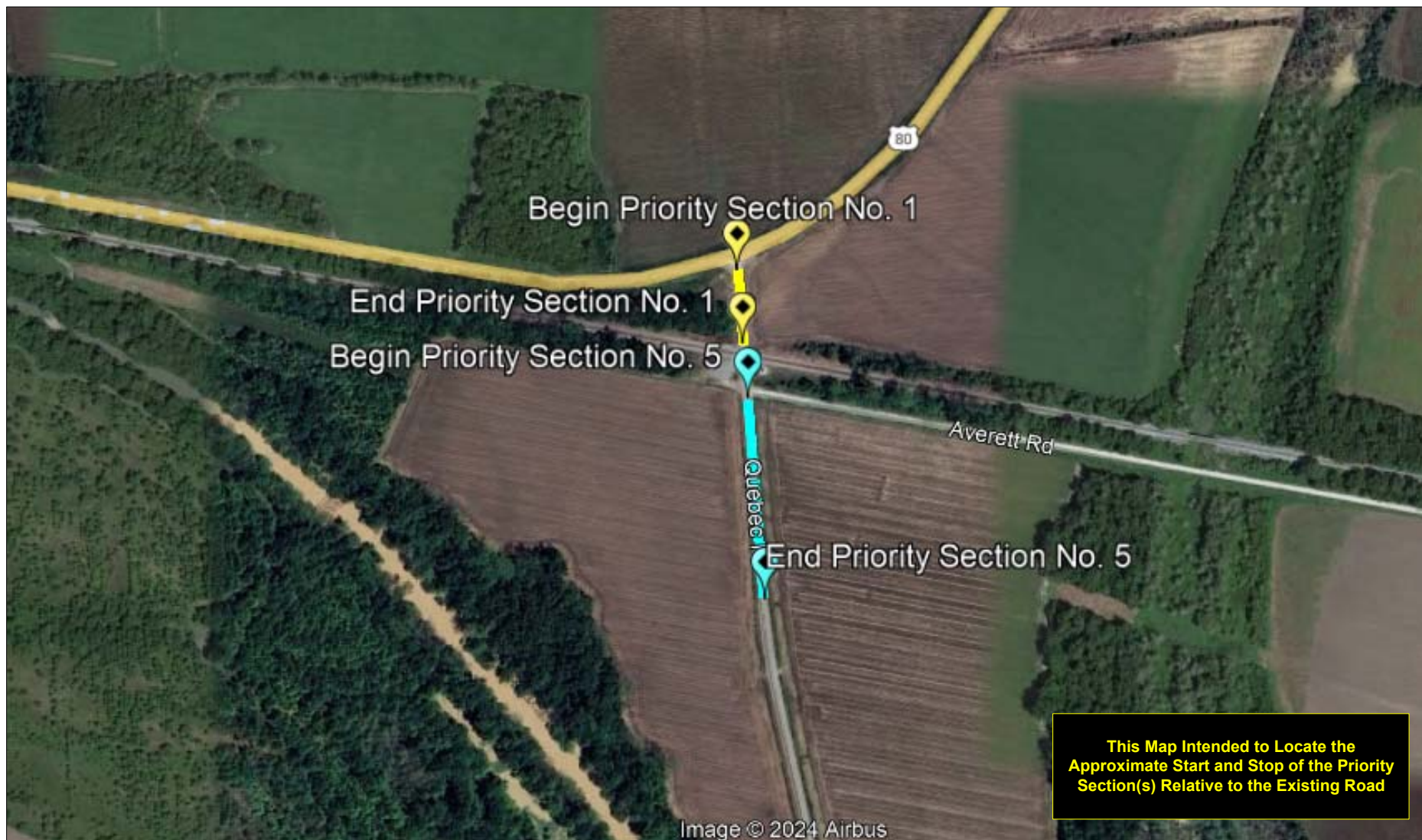
Test	DOTD Designations
Atterberg Limits	DOTD TR 428
Moisture Content	DOTD TR 403
Mechanical Analysis of Soils	DOTD TR 407

Results for soil classifications are located on the Log of Boring in their respective columns under "Laboratory Data."

Samples obtained during our field studies and not consumed by laboratory testing procedures will be retained free of charge for a period of 30 days. Arrangements for storage beyond that period of time must be made in writing to **Geotechnical Testing Laboratory, Inc.**

APPENDIX B

LOCATION MAPS



Location Map - Priority Section Nos. 1 & 5

PROJECT

USFWS - Tensas National Wildlife Refuge, Quebe Road Remediation, Tallulah, Madison Parish, Louisiana

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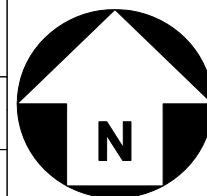
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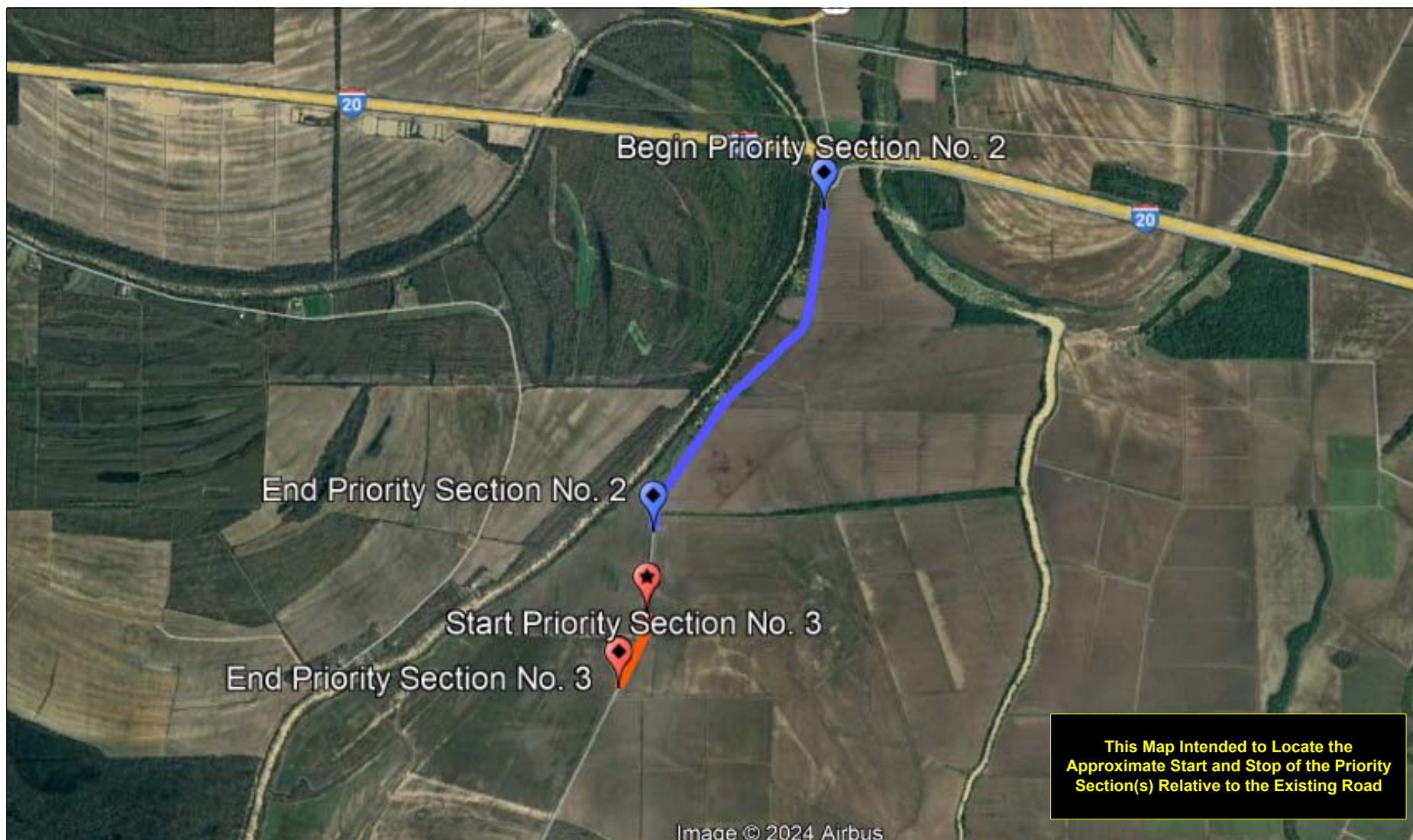
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10-24-139

Ballard, CLC, Inc.





Location Map - Priority Section Nos. 2 & 3

PROJECT

USFWS - Tensas National Wildlife Refuge, Quebe Road Remediation, Tallulah, Madison Parish, Louisiana

SCALE

Not to Scale

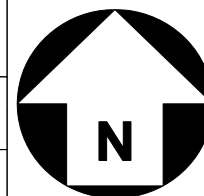
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FILENAME

10-24-139

Ballard, CLC, Inc.





Location Map - Priority Section No. 4

PROJECT

USFWS - Tensas National Wildlife Refuge, Quebe Road Remediation, Tallulah, Madison Parish, Louisiana

SCALE

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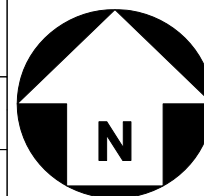
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10/9/24

FILENAME

10-24-139

Ballard, CLC, Inc.



APPENDIX C

BORING LOGS AND SOIL CLASSIFICATION CHART








LOG OF BORING QR- 1 - S1A

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

		FIELD DATA			LABORATORY DATA						DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEMBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel CHECKED BY: K. Gorsha	
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
											DESCRIPTION OF STRATUM	
	1			4	NP	NP	NP	30			±6.00" of Degraded Stone Aggregate over Brown Silty SAND (A-2-4) <div>1.0'</div>	
	2			26	46	22	24	95			Brown & Gray LEAN to FAT CLAY (A-7-6) <div>5.0'</div>	
	3											
	4			26								
	5										Boring Terminated @ 5.0 Feet	
											NOTES: Boring Drilled in Priority Section No. 1 GPS Coordinates: 32° 25' 35.21" N / 91° 18' 8.53" W Stratification Is Not Exact	
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE												








LOG OF BORING QR- 2 - S5A

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

FIELD DATA				LABORATORY DATA						DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger		
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
											DESCRIPTION OF STRATUM	
	1			14	22	17	5	64			±3.00" of Asphaltic Concrete over Brown & Gray, Slightly Clayey, Sandy SILT (A-4) - SILT 30%; SAND 36%; CLAY 34% 1.0'	
	2			37	60	26	34	99			Brown & Gray FAT CLAY (A-7-6) 3.0'	
	3			26							Brown & Gray LEAN to FAT CLAY (A-7-6) 5.0'	
	4											
	5										Boring Terminated @ 5.0 Feet	
NOTES: Boring Drilled in Priority Section No. 5 GPS Coordinates: 32° 25' 30.82" N / 91° 18' 8.13" W Stratification Is Not Exact												
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE												








LOG OF BORING QR- 3 - S5B

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

		FIELD DATA			LABORATORY DATA						DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEMBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel CHECKED BY: K. Gorsha	
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
											DESCRIPTION OF STRATUM	
	1			7	NP	NP	NP	49			±3.00" of Asphaltic Concrete over Brown & Gray Silty SAND to Sandy SILT (A-4) - SILT 28%; SAND 51%; CLAY 21% <div>1.0'</div>	
	2			25	49	24	25	98			Brown & Gray LEAN to FAT CLAY (A-7-6) <div>5.0'</div>	
	3											
	4			27								
	5											
Boring Terminated @ 5.0 Feet												
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE											NOTES: Boring Drilled in Priority Section No. 5 GPS Coordinates: 32° 25' 27.73" N / 91° 18' 7.79" W Stratification Is Not Exact	

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE

NOTES:
Boring Drilled in Priority Section No. 5
GPS Coordinates: 32° 25' 27.73" N / 91° 18' 7.79" W
Stratification Is Not Exact

LOG OF BORING QR- 4

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger			
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:	
											No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
DESCRIPTION OF STRATUM												
				15	NP	NP	NP	49			±2.50" of Asphaltic Concrete over ±6.50" of Chemically Treated Soil - SILT 36%; SAND 51%; CLAY 13%	
	1										Brown & Gray LEAN CLAY (A-6)	
	2			27	38	23	15	97			3.0'	
	3										Brown & Gray LEAN to FAT CLAY (A-7-6)	
	4			27							5.0'	
	5										Boring Terminated @ 5.0 Feet	
NOTES: N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE												
GPS Coordinates: 32° 25' 18.41" N / 91° 18' 5.76" W Stratification Is Not Exact												

LOG OF BORING QR- 5

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

FIELD DATA		LABORATORY DATA								DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger		
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:	
											No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
DESCRIPTION OF STRATUM												
				11	NP	NP	NP	55			±3.00" of Asphaltic Concrete over ±8.00" of Chemically Treated Soil	
	1										.917'	
	2			24	43	24	19	96			Brown & Gray LEAN CLAY (A-7-6)	
	3											
	4			22								
	5										5.0'	
Boring Terminated @ 5.0 Feet												
NOTES: Boring Drilled Between Priority Sections No. 5 & No. 2 GPS Coordinates: 32° 25' 3.33" N / 91° 18' 4.38" W Stratification Is Not Exact												
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE												

LOG OF BORING QR- 6 - S2A

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

		FIELD DATA			LABORATORY DATA						DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEMBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:	
											No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
DESCRIPTION OF STRATUM												
				9	NP	NP	NP	47			±3.00" of Asphaltic Concrete over ±6.00" of Chemically Treated Soil .750'	
	1										Brown & Gray LEAN CLAY (A-7-6)	
	2			26	42	23	19	95				
	3											
	4			23								
	5										5.0'	
Boring Terminated @ 5.0 Feet												
NOTES: Boring Drilled in Priority Section No. 2 GPS Coordinates: 32° 24' 55.38" N / 91° 18' 5.89" W Stratification Is Not Exact												
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE												








LOG OF BORING QR- 7 - S2B

SHEET 1 of 1

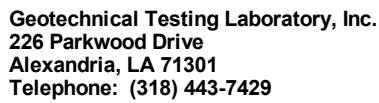


Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

		FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger		
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel CHECKED BY: K. Gorsha		
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion		
											SURFACE ELEVATION: Not Determined		
											DESCRIPTION OF STRATUM		
				4	NP	NP	NP	43			±3.00" of Asphaltic Concrete over ±6.00" of Chemically Treated Soil <div>750'</div>		
	1										Brown & Gray LEAN to FAT CLAY (A-7-6)		
	2			28	49	24	25	98					
	3												
	4			25									
	5										<div>5.0'</div>		
											Boring Terminated @ 5.0 Feet		
												NOTES: Boring Drilled in Priority Section No. 2 GPS Coordinates: 32° 24' 50.37" N / 91° 18' 6.42" W Stratification Is Not Exact	
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE													

SHEET 1 of 1



DRILLING METHOD(S):
CME 45B, 4.5" I.D. Hollow Stem Auger

GROUNDWATER INFORMATION:
No Water Seepage Noted While Drilling
No Water Observed Upon Completion

SURFACE ELEVATION: Not Determined

±3.00" of Asphaltic Concrete over ±3.00" of Chemically Treated Soil	.500'
	1.0'

Brown & Gray LEAN to FAT CLAY (A-7-6)

Boring Terminated @ 5.0 Feet

Boring Drilled in Priority Section No. 2
GPS Coordinates: 32° 24' 45.57" N / 91° 18' 7.45" W
Stratification Is Not Exact

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE




LOG OF BORING QR- 9 - S2D

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger			
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion	
					LL	PL	PI				SURFACE ELEVATION: Not Determined	
					DESCRIPTION OF STRATUM							
				5	NP	NP	NP	35			±3.00" of Asphaltic Concrete over ±6.00" of Chemically Treated Soil .750'	
	1										Brown & Gray LEAN to FAT CLAY (A-7-6)	
	2			28	54	25	29	98			3.0'	
	3										Brown & Gray FAT CLAY (A-7-6)	
	4			31							5.0'	
	5										Boring Terminated @ 5.0 Feet	
											NOTES: Boring Drilled in Priority Section No. 2 GPS Coordinates: 32° 24' 40.64" N / 91° 18' 8.43" W Stratification Is Not Exact	
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE												

LOG OF BORING QR-10 - S2E

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**

DRILL DATE: **10/2/24**

FIELD DATA				LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb/Sq. Ft.)	DRILLER: C. Deshotel CHECKED BY: K. Gorsha	
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion	
					LL	PL	PI				SURFACE ELEVATION: Not Determined	
					DESCRIPTION OF STRATUM							
				23	NP	NP	NP	71			±2.50" of Asphaltic Concrete over ±8.00" of Chemically Treated Soil <div>.875'</div>	
	1										Brown & Gray FAT CLAY (A-7-6)	
	2			30	57	25	32	99				
	3											
	4			30								
	5										5.0'	
Boring Terminated @ 5.0 Feet												
NOTES: Boring Drilled in Priority Section No. 2 GPS Coordinates: 32° 24' 35.86" N / 91° 18' 9.40" W Stratification Is Not Exact												
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE												

LOG OF BORING QR-11 - S2F

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

		FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger		
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEMBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha	
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion		
											SURFACE ELEVATION: Not Determined		
											DESCRIPTION OF STRATUM		
				26	NP	NP	NP	73			±3.00" of Asphaltic Concrete over ±6.00" of Chemically Treated Soil .750'		
	1										Brown & Gray FAT CLAY (A-7-6)		
	2			27	58	25	33	96					
	3												
	4			33	67	27	40	99					
	5										5.0'		
												Boring Terminated @ 5.0 Feet	

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**

DRILL DATE: 10/2/24

FIELD DATA				LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
											DESCRIPTION OF STRATUM	
				25	29	20	9	95			±3.00" of Asphaltic Concrete over ±6.00" of Chemically Treated Soil <div>.750'</div>	
	1										Brown & Gray FAT CLAY (A-7-6)	
	2			36	67	28	39	98				
	3											
	4			31								
	5										5.0'	
Boring Terminated @ 5.0 Feet												
NOTES: Boring Drilled in Priority Section No. 2 GPS Coordinates: 32° 24' 28.52" N / 91° 18' 16.69" W Stratification Is Not Exact												

LOG OF BORING QR-13 - S2H

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger			
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:	
											No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
DESCRIPTION OF STRATUM												
				21	25	18	7	60			±3.00" of Asphaltic Concrete over ±7.00" of Chemically Treated Soil	
	1										Brown & Gray FAT CLAY (A-7-6)	
	2			33	61	25	36	98				
	3											
	4			26								
	5										5.0'	
Boring Terminated @ 5.0 Feet												
NOTES: Boring Drilled in Priority Section No. 2 GPS Coordinates: 32° 24' 25.16" N / 91° 18' 20.97" W Stratification Is Not Exact												

LOG OF BORING QR-14 - S2I

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

FIELD DATA		LABORATORY DATA								DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger			
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha	
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:		
											No Water Seepage Noted While Drilling No Water Observed Upon Completion		
											SURFACE ELEVATION: Not Determined		
DESCRIPTION OF STRATUM													
				27	23	18	5	78			±3.00" of Asphaltic Concrete over ±5.00" of Chemically Treated Soil		
	1										Brown & Gray FAT CLAY (A-7-6)		
	2			31	55	24	31	97					
	3												
	4			33									
	5										5.0'		
												Boring Terminated @ 5.0 Feet	

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE

LOG OF BORING QR-15 - S2J

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

		FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger		
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha	
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion		
											SURFACE ELEVATION: Not Determined		
											DESCRIPTION OF STRATUM		
				31	21	17	4	78			±3.00" of Asphaltic Concrete over ±5.00" of Chemically Treated Soil .667'		
	1										Brown & Gray FAT CLAY (A-7-6)		
	2			36	68	27	41	96					
	3												
	4			32									
	5										5.0'		
												Boring Terminated @ 5.0 Feet	

LOG OF BORING QR-16 - S2K

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

		FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:	
											No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
DESCRIPTION OF STRATUM												
				24	26	18	8	62			±.3.00" of Asphaltic Concrete over ±.6.00" of Chemically Treated Soil .750'	
	1										Brown & Gray FAT CLAY (A-7-6)	
	2			32	58	24	34	98				
	3											
	4			27								
	5										5.0'	
Boring Terminated @ 5.0 Feet												
NOTES: Boring Drilled in Priority Section No. 2 GPS Coordinates: 32° 24' 14.08" N / 91° 18' 32.52" W Stratification Is Not Exact												
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE												

LOG OF BORING QR-17 - S2L

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

		FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEMBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel CHECKED BY: K. Gorsha	
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
											DESCRIPTION OF STRATUM	
				26	NP	NP	NP	81			±3.00" of Asphaltic Concrete over ±6.00" of Chemically Treated Soil 	

LOG OF BORING QR-18 - S2M

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

		FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger		
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha	
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:		
											No Water Seepage Noted While Drilling No Water Observed Upon Completion		
											SURFACE ELEVATION: Not Determined		
DESCRIPTION OF STRATUM													
				29	NP	NP	NP	73			±3.00" of Asphaltic Concrete over ±6.00" of Chemically Treated Soil .750'		
	1										Brown & Gray LEAN to FAT CLAY (A-7-6)		
	2			28	54	24	30	99					
	3												
	4			29									
	5										5.0'		
												Boring Terminated @ 5.0 Feet	

LOG OF BORING QR-19 - S2N

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/2/24**

		FIELD DATA			LABORATORY DATA						DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEMBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:	
											No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
DESCRIPTION OF STRATUM												
				31	NP	NP	NP	70			±3.00" of Asphaltic Concrete over ±5.00" of Chemically Treated Soil .667'	
	1										Brown & Gray LEAN to FAT CLAY (A-7-6) 	

LOG OF BORING QR-20 - S20

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**

DRILL DATE: **10/2/24**

SOIL SYMBOL	FIELD DATA			LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb/Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											LL	PL
DESCRIPTION OF STRATUM												
				27	NP	NP	NP	71			±3.00" of Asphaltic Concrete over ±7.00" of Chemically Treated Soil .833'	
	1										Brown & Gray LEAN to FAT CLAY (A-7-6)	
	2			26	50	24	26	98			3.0'	
	3										Brown & Gray FAT CLAY (A-7-6)	
	4			31							5.0'	
	5										Boring Terminated @ 5.0 Feet	
											NOTES: Boring Drilled in Priority Section No. 2 GPS Coordinates: 32° 23' 57.50" N / 91° 18' 44.93" W Stratification Is Not Exact	
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE												

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE

SHEET 1 of 1

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/3/24**

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SHEET 1 of 1

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/3/24**

FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger			
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:	
											No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
DESCRIPTION OF STRATUM												
				12	NP	NP	NP	42			±3.00" of Asphaltic Concrete over ±4.00" of Chemically Treated Soil	
	1										.583'	
	2			39	60	26	34	98			Brown & Gray FAT CLAY (A-7-6)	
	3											
	4			37								
	5										5.0'	
Boring Terminated @ 5.0 Feet												
NOTES: Boring Drilled Between Priority Sections No. 2 & No. 3 GPS Coordinates: 32° 23' 44.27" N / 91° 18' 46.43" W Stratification Is Not Exact												

LOG OF BORING QR-23 - S3A

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/3/24**

FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger			
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion	
					LL	PL	PI				SURFACE ELEVATION: Not Determined	
					DESCRIPTION OF STRATUM							
				15	NP	NP	NP	40			±2.50" of Asphaltic Concrete over ±6.00" of Chemically Treated Soil .625'	
	1										Brown & Gray FAT CLAY (A-7-6)	
	2			34	63	25	38	97				
	3											
	4			35								
	5										5.0'	
Boring Terminated @ 5.0 Feet												
NOTES: Boring Drilled in Priority Section No. 3 GPS Coordinates: 32° 23' 32.92" N / 91° 18' 47.43" W Stratification Is Not Exact												
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE												

LOG OF BORING QR-24 - S3B

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/3/24**

		FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEMBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel CHECKED BY: K. Gorsha	
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:	
											No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											LL	PL
DESCRIPTION OF STRATUM												
				24	29	22	7	80			±3.00" of Asphaltic Concrete over ±6.00" of Chemically Treated Soil 	


LOG OF BORING QR-25 - S3C

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/3/24**

		FIELD DATA			LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEMBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel CHECKED BY: K. Gorsha		
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion		
											SURFACE ELEVATION: Not Determined		
											DESCRIPTION OF STRATUM		
				16	NP	NP	NP	45			±3.00" of Asphaltic Concrete over ±6.00" of Chemically Treated Soil 		

LOG OF BORING QR-26

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**

DRILL DATE: **10/3/24**

FIELD DATA				LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb/Sq. Ft.)	DRILLER: C. Deshotel CHECKED BY: K. Gorsha	
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:	
											No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
DESCRIPTION OF STRATUM												
				20	NP	NP	NP	70			±2.50" of Asphaltic Concrete over ±5.00" of Chemically Treated Soil .625'	
	1										Brown & Gray LEAN to FAT CLAY (A-7-6)	
	2			30	54	26	28	98				
	3											
	4			31								
	5										5.0'	
Boring Terminated @ 5.0 Feet												
NOTES: Boring Drilled Between Priority Sections No. 3 & No. 4 GPS Coordinates: 32° 23' 57.02" N / 91° 19' 7.37" W Stratification Is Not Exact												

LOG OF BORING QR-27

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/3/24**

FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger			
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:	
											No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
DESCRIPTION OF STRATUM												
				17	NP	NP	NP	46			±3.00" of Asphaltic Concrete over One (1) layer of Geogrid Fabric over ±7.00" of Chemically Treated Soil	
	1										.833'	
	2			34	58	26	32	96			Brown & Gray FAT CLAY (A-7-6)	
	3											
	4			32								
	5										5.0'	
Boring Terminated @ 5.0 Feet												
NOTES: Boring Drilled Between Priority Sections No. 3 & No. 4 GPS Coordinates: 32° 22' 33.06" N / 91° 19' 18.10" W Stratification Is Not Exact												

LOG OF BORING QR-28

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**

DRILL DATE: **10/3/24**

FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger		
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ. FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				
DRILLER: C. Deshotel CHECKED BY: K. Gorsha											
GROUNDWATER INFORMATION: No Water Seepage Noted While Drilling No Water Observed Upon Completion											
SURFACE ELEVATION: Not Determined											
DESCRIPTION OF STRATUM											
				18	NP	NP	NP	60			±3.00" of Asphaltic Concrete over ±5.00" of Chemically Treated Soil .667'
1											Brown & Gray FAT CLAY (A-7-6)
2				33	59	25	34	97			
3											
4				31							
5											
Boring Terminated @ 5.0 Feet											
NOTES: Boring Drilled Between Priority Sections No. 3 & No. 4 GPS Coordinates: 32° 22' 8.20" N / 91° 19' 19.83" W Stratification Is Not Exact											
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE											

LOG OF BORING QR-29

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/3/24**

		FIELD DATA			LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTERBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel CHECKED BY: K. Gorsha		
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:		
											No Water Seepage Noted While Drilling No Water Observed Upon Completion		
											LL	PL	PI
DESCRIPTION OF STRATUM													
											±3.00" of Asphaltic Concrete over ±4.00" of Chemically Treated Soil	.583'	
	1			24	48	24	24	95			Brown & Gray LEAN to FAT CLAY (A-7-6)	3.0'	
	2			30									
	3												
	4			33							Brown & Gray FAT CLAY (A-7-6)	5.0'	
	5												
Boring Terminated @ 5.0 Feet													
NOTES: Boring Drilled Between Priority Sections No. 3 & No. 4 GPS Coordinates: 32° 21' 42.75" N / 91° 19' 19.80" W Stratification Is Not Exact													
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE													

LOG OF BORING QR-30 - S4A

SHEET 1 of 1



Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/3/24**

FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger			
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:	
											No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
DESCRIPTION OF STRATUM												
				23	NP	NP	NP	42			±2.50" of Asphaltic Concrete over ±6.00" of Chemically Treated Soil over one (1) layer of fabric	
	1										Brown & Gray LEAN to FAT CLAY (A-7-6)	
	2			27	53	24	29	99				
	3											
	4			27								
	5										5.0'	
Boring Terminated @ 5.0 Feet												
NOTES: Boring Drilled in Priority Section No. 4 GPS Coordinates: 32° 21' 16.72" N / 91° 19' 11.67" W Stratification Is Not Exact												

N - STANDARD PENETRATION TEST RESISTANCE
P - POCKET PENETROMETER RESISTANCE








LOG OF BORING QR-31 - S4B

SHEET 1 of 1























Geotechnical Testing Laboratory, Inc.
226 Parkwood Drive
Alexandria, LA 71301
Telephone: (318) 443-7429

CLIENT: **Ballard CLC, Inc.**
PROJECT: **Quebec Road Remediation**
LOCATION: **Tallulah, Madison Parish, Louisiana**
FILE NO.: **10-24-139**
DRILL DATE: **10/3/24**

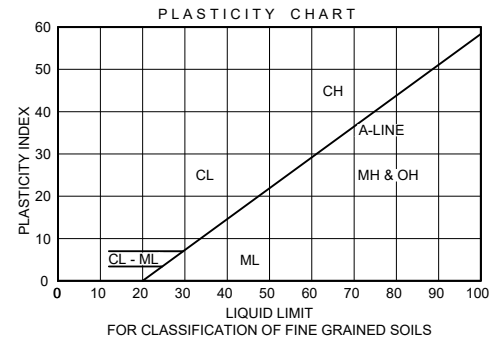
		FIELD DATA		LABORATORY DATA							DRILLING METHOD(S): CME 45B, 4.5" I.D. Hollow Stem Auger	
SOIL SYMBOL	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT	MOISTURE CONTENT (%)	ATTEMBERG LIMITS			MINUS NO. 200 SIEVE (%)	DRY DENSITY (Lbs./Cu.Ft.)	COMPRESSIVE STRENGTH (Lb./Sq. Ft.)	DRILLER: C. Deshotel	CHECKED BY: K. Gorsha
					LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX				GROUNDWATER INFORMATION:	
											No Water Seepage Noted While Drilling No Water Observed Upon Completion	
											SURFACE ELEVATION: Not Determined	
DESCRIPTION OF STRATUM												
				20	NP	NP	NP	61			±3.00" of Asphaltic Concrete over ±6.00" of Chemically Treated Soil .750'	
	1										Brown & Gray LEAN to FAT CLAY (A-7-6)	
	2			27	52	24	28	98				
	3											
	4			28								
	5										5.0'	
Boring Terminated @ 5.0 Feet												
NOTES: Boring Drilled in Priority Section No. 4 GPS Coordinates: 32° 21' 13.87" N / 91° 19' 6.03" W Stratification Is Not Exact												
N - STANDARD PENETRATION TEST RESISTANCE P - POCKET PENETROMETER RESISTANCE												

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			SYMBOL & LETTER	DESCRIPTION
COARSE-GRAINED SOILS More than half of material larger than No. 200 sieve size	GRAVELS More than half of coarse fraction larger than No. 4 sieve size	Clean Gravels (Little or no fines)	 GW	WELL GRADED GRAVEL, GRAVEL-SAND MIXTURE
			 GP	POORLY GRADED GRAVEL, GRAVEL-SAND MIXTURE
		Gravels with fines (Appreciable amount of fines)	 GM	SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURE
			 GC	CLAYEY GRAVEL, GRAVEL-SAND-CLAY MIXTURE
	SANDS More than half of coarse fraction smaller than No. 4 sieve size	Clean Sands (Little or no fines)	 SW	WELL GRADED SAND, GRAVELLY SAND
			 SP	POORLY GRADED SAND, GRAVELLY SAND
		Sands with fines (Appreciable amount of fines)	 SM	SILTY SAND, SAND-SILT MIXTURE
			 SP-SM	SLIGHTLY SILTY SAND
			 SC	CLAYEY SAND, SAND-CLAY MIXTURE
			 ML	SILT WITH LITTLE OR NO PLASTICITY
FINE-GRAINED SOILS More than half of material smaller than No. 200 sieve size	SILTS AND CLAYS Liquid limit less than 50		 ML	CLAYEY SILT, SILT WITH SLIGHT TO MEDIUM PLASTICITY
			 ML	SANDY SILT
			 CL	SILTY CLAY, LOW TO MEDIUM PLASTICITY
			 CL	SANDY CLAY, LOW TO MEDIUM PLASTICITY (30% TO 50% SAND)
	SILTS AND CLAYS Liquid limit greater than 50		 MH	SILT, FINE SANDY OR SILTY SOIL WITH HIGH PLASTICITY
			 CH	CLAY, HIGH PLASTICITY
			 OH	ORGANIC CLAY OF MEDIUM TO HIGH PLASTICITY
	HIGHLY ORGANIC SOILS		 PT	PEAT, HUMUS, SWAMP SOIL
	SEDEMENTARY ROCK TYPES:		 LS	LIMESTONE
			 MARL	MARL

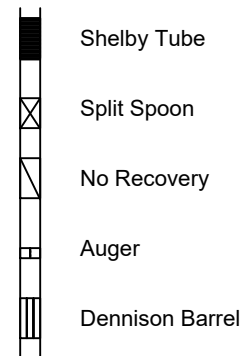
TERMS CHARACTERIZING SOIL STRUCTURE

Slickensided	- Clays with polished and striated planes created as a result of volume changes related to shrinking, swelling and/or changes in overburden pressure.
Fissured	- Clays with a blocky or jointed structure generally created by seasonal shrinking and swelling.
Laminated	- Composed of thin alternating layers of varying color and texture.
Calcareous	- Containing appreciable quantities of calcium carbonate.
Parting	- Paper thin (less than 1/8 inch).
Seam	- 1/8 inch to 3 inch thickness.
Layer	- Greater than 3 inches in thickness.



SAMPLE TYPES

(Shown in Sample Column)



DENSITY AND CONSISTENCY

COARSE-GRAINED SOILS		FINE-GRAINED SOILS		
DENSITY	PENETRATION RESISTANCE, N	CONSISTENCY	COHESION	PENETRATION RESISTANCE, N
	Blows per Foot		Kips/Sq. Ft	Blows per Foot
Very loose	0 - 2	Very Soft	<0.25	0 - 2
Loose	4 - 10	Soft	0.25 - 0.50	2 - 4
Medium Dense	11 - 30	Firm	0.50 - 1.00	4 - 8
Dense	31 - 50	Stiff	1.00 - 2.00	8 - 15
Very Dense	>50	Very Stiff	2.00 - 4.00	15 - 30
		Hard	>4.00	>30

PARTICLE SIZE IDENTIFICATION

Cobbles	- Greater than 3 inches
Gravel	- Coarse - 3/4 inch to 3 inches Fine - 4.76 mm to 3/4 inch
Sand	- Coarse - 2 mm to 4.76 mm Medium - 0.42 mm to 2 mm Fine - 0.074 mm to 0.42 mm
Silt & Clay	- Less than 0.074 mm

RELATIVE COMPOSITION

Slightly	5 - 15%
With	16 - 29%
Sandy	30 - 50%
(or gravelly)	

CLASSIFICATION, SYMBOLS AND TERMS USED ON GRAPHICAL BORING LOGS

Appendix B

Submittal Register

U.S. Army Corps of Engineers (USACE)																		CONTRACT NO.								
SUBMITTAL REGISTER																										
For use of this form see ER 415 1-10; the proponent agency is CECW-EC.																										
TITLE AND LOCATION														CONTRACTOR				SPECIFICATION SECTION								
Rehabilitation of Rout 010ZZ Quebec Road, Tensas River NWR, Madison Parish, LA																										
ACTIVITY NO.	TRANSMITTAL NO.	ITEM NO.	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL										CLASSIFICATION		CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			GOVERNMENT ACTION		REMARKS	
					DATA	DRAWINGS	INSTRUCTIONS	SCHEDULES	STATEMENTS	REPORTS	CERTIFICATIONS	SAMPLES	RECORDS	O&M MANUALS	INFORMATION	GOVERNMENT	REVIEWER	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERNMENT	CODE		DATE
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.	z.	aa.
			01 32 01.01	Precon Submi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>			
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			01 33 00	Submittals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>			
				Master List	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>			
			01 34 00	Baseline	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>			
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				Sch of Values	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>			
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					DATA	DRAWINGS	INSTRUCTIONS	SCHEDULES	STATEMENTS	REPORTS	CERTIFICATIONS	SAMPLES	RECORDS	O&M MANUALS	INFORMATION ONLY	GOVERNMENT REVIEW	REVIEW	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERNMENT	CODE		DATE
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.	z.	aa.
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			32 01 17	AST Crk Seal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>			
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					DATA	DRAWINGS	INSTRUCTIONS	SCHEDULES	STATEMENTS	REPORTS	CERTIFICATIONS	SAMPLES	RECORDS	O&M MANUALS	INFORMATION	GOVERNMENT	REVIEWER	SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERNMENT	CODE		DATE
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.	p.	q.	r.	s.	t.	u.	v.	w.	x.	y.	z.	aa.
			32 01 17	Methods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>			
			32 10 00	Base Course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>			
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			32 17 23	Pave Mark	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>			
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			32 92 19	Seed & Mulc	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>			
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				Methods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>			
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