MSD of Buncombe County

Carrier Bridge Pump Station (Pipeline River Crossings)

Construction Documents
Project Manual

Issued for Bids

January 2025

HDR Project No. 10195480

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APPENDICES

ADVERTISEMENT FOR BIDS

Sealed bids will be received by the Metropolitan Sewerage District (DISTRICT) of Buncombe County, North Carolina at the second floor conference room of the MSD W. H. Mull Building, 2028 Riverside Drive in Asheville, North Carolina, until **2:00 PM** (local time), **Thursday, February 27, 2025,** and shall be immediately opened publicly and read aloud for the project described as follows:

Carrier Bridge Pump Station Replacement
Pipeline River Crossings
Project No. 2019045

generally consisting of the furnishing of all services, supplies, materials and equipment and performing of all labor for the construction of approximately 425 LF two (2) parallel 36-inch force main, 347 LF of 60-inch gravity pipe, and fittings, including manholes and all related appurtenances. Installation of the pipes require two (2) open cut river crossings of the French Broad River; downstream river crossing for the parallel 36-inch force mains and upstream river crossing for the 60-inch gravity pipe.

A pre-bid walk through meeting for the project is NOT mandatory but HIGHLY ENCOURAGED for CONTRACTORS. The on-site visit will be scheduled for Thursday, February 6, 2025, at 10:00 AM at Jones Farm Road entrance to the Biltmore Estate off Brevard Road in Asheville, NC 28806. The site visit will continue on to the French Broad River Park located at 508 Riverview Drive in Asheville, NC 28806. Those planning to attend the meeting must contact Darin Prosser by Monday, February 3, 2025, by 5:00 PM. Contact Darin at dprosser@msdbc.org or (828)225-8280.

Complete plans, specifications and contract documents may be **examined** at the DISTRICT website: http://www.msdbc.org/adsforprojects.php

Copies of the complete plans, specifications and contract documents may be **obtained** from:

Attention: Amanda Cutshaw *(must be included when making request by mail)*
Metropolitan Sewerage District of Buncombe County
2028 Riverside Drive
Asheville, N.C. 28804
(828) 225-8277
E-mail address: acutshaw@msdbc.org

The plans, specifications, and contract documents on the DISTRICT'S website are provided as a courtesy to interested parties. **Contractors planning to submit a bid for DISTRICT projects must purchase an official set of plans and specifications in order to be a registered plan holder.**

A non-refundable deposit of seventy-five dollars ($75.00) is required. Orders for plans and specifications which are to be delivered by parcel post or other carriers will not be accepted for a period of five (5) days prior to bid date.

The Metropolitan Sewerage District of Buncombe County encourages qualified minority businesses to bid on or participate as a subcontractor in District Contracts. To learn more about the Minority Businesses in the Asheville area, access the *Office of Historically Underutilized Businesses* for the State of North Carolina at www.doa.state.nc.us/hub. Local minority vendors are listed on this site.

All bidders must have current North Carolina licenses for all work for the project.

Each bid shall be accompanied by a deposit with the Metropolitan Sewerage District of Buncombe County of cash, or a cashier's check, or a certified check on some bank or trust company insured by the Federal Deposit Insurance Corporation in an amount equal to not less than five percent (5%) of the bid amount. In lieu of making the cash deposit as above described, a satisfactory Bid Bond in the amount of 5% of the total bid, executed by a corporate surety licensed under the laws of North Carolina to execute such bonds, shall be submitted with each bid, conditioned that the surety will upon demand forthwith make payment to the obligee upon said bond if the bidder fails to execute the contract in accordance with the bid bond. This deposit shall be retained if the successful bidder fails to execute the contract within ten (10) days after the award of bid or fails to give satisfactory surety as required in North Carolina General Statute Section 143-129.

Each Bidder must be appropriately licensed as a Contractor as provided in Chapter 87 of the North Carolina General Statute. Each Bidder must comply with MSD's Guidelines for Recruitment and Selection of Minority Business.

The successful bidder will be required to furnish a Performance Bond and a Payment Bond in the amount of one hundred percent (100%) of the contract amount. Those bonds shall meet the requirements of North Carolina General Statute Section 143-129 and of Article 3 of Chapter 44A of the North Carolina General Statute.

No bid may be withdrawn after bids have been opened, except as provided in North Carolina General Statute Section 143-129.1.

The contract shall be awarded to the lowest responsive, responsible bidder, taking into consideration quality, performance and time of delivery. The DISTRCT reserves the right to reject any and all bids, including, without limitation, the right to reject any or all non-conforming, non-responsive, unbalanced or conditional bids, and to reject the bid of any bidder if the DISTRICT believes that it would not be in the best interest of the DISTRICT to make an award to that bidder. The DISTRICT also reserves the right to waive informalities.

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY, NORTH CAROLINA

BY: Thomas E. Hartye, P.E.
GENERAL MANAGER

1. Purpose.

The Metropolitan Sewerage District of Buncombe County, North Carolina (MSD) is committed to environmental quality through ongoing continual improvement with conformance to the ISO14001 standard.

2. Scope.

MSD is committed to environmental awareness with all vendors and contractors who work for or on our behalf. We strive to outreach with our vendors and contractors to promote continual improvement and teambuilding.

3. MSD Environmental Policy

MSD is committed to ensuring environmental quality by:

- *Monitoring our processes and operations for continual improvements.*
- *Setting and reviewing environmental objectives and targets for pollution prevention.*
- *Dedicating our organization to complying with applicable Federal, State and Local regulations.*

4. Vendor / Contractor ISO14001 Environmental Conformance

- *Knowledge of MSD ISO14001 Program and Environmental Policy*
- *Compliance with applicable Federal, State, Local rules and regulations*
- *If applicable, follow MSD standard operating procedures*
- *Promote Pollution Prevention at all times*
- *Recycle waste debris when possible*
- *Be aware of Emergency Response Procedures*

5. Pollution Prevention Strategies

Materials Management

√ Sand, dirt must be contained to prevent entering storm drains.
√ Apply water to control dust
√ Check dumpsters for leaks
√ Label all hazardous materials and hazardous wastes in accordance with local, State and Federal regs.
√ Fuel storage containers must be double walled or have secondary containment
√ Dispose of hazardous waste correctly

Spill Prevention and Control

√ Report hazardous materials spills to owner immediately
√ Keep spill cleanup materials available on-site and contain spills immediately

Equipment Maintenance and Cleaning

√ Inspect vehicles and equipment for leaks and repair promptly
√ Do not clean vehicles at job site

Earthwork

√ Keep all excavated soil on the site where it is least likely to collect in the street.
√ Use erosion control measures to minimize flow of silt off-site

Dewatering Operations

√ Water must be filtered / cleaned prior to entering into storm sewer.
√ In areas of known contamination, testing is required prior to discharge of groundwater. Contaminated groundwater must be taken off site.

Saw Cutting / Concrete Waste Management

√ Cover or barricade storm drains when saw cutting to keep slurry out of storm sewer
√ Collect slurry and dispose in concrete washout area
√ Remove slurry immediately if it enters a catch basin
√ Wash out concrete trucks off site or in pit / designated area. Allow water in pit to evaporate.

Painting

√ Never rinse paint brushes into street gutters or storm sewer
√ Dispose of oil based paints / unusable thinner as hazardous waste

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ARTICLE I PREPARATION OF BIDS:

All Bids shall be prepared in accordance with the following requirements:

1. The Bid form furnished by the DISTRICT shall be used and shall not be altered.

2. Entries shall be typed or written in ink; signatures shall be written in ink.

3. The Bidder shall submit a unit or lump sum price for every item in the Bid form unless specific directions in the Invitation for Bids allow for partial Bids. The unit or lump sum bid prices for the various Contract Items shall be typed or written figures in ink, and shall be clearly legible.

4. A Total Bid shall be entered in the Bid form for every item on which a unit price has been submitted. The Total Bid for each item other than lump sum items shall be determined by multiplying each unit price bid by the quantity for that item, and shall be written in figures in the "Total Bid" column in the Bid form. In case of a discrepancy between the unit price bid for a Contract Item and the Total Bid for that item, the unit price bid shall govern. In the case of lump sum items, the price shall be written in figures in the "Total Bid" column in the Bid form.

5. The Total Contract Bid Price shall be written in figures in the proper place in the Bid form. The Total Contract Bid Price shall be determined by adding the Total Bid for each item.

6. Changes in any entry shall be made by marking through the entry in ink and making the correct entry adjacent thereto in ink. The individual signing the Bid shall initial the change in ink.

7. The Bid shall be properly executed. In order to constitute proper execution, the Bid shall be executed in strict compliance with the following. No other forms of execution will be accepted.

   a. If a Bid is by an individual, it shall show the name and address of the individual and shall be signed by the individual.

   b. If the Bid is by a Corporation, it shall be executed in the name of the Corporation by the President or Vice-president. It shall be attested by the Secretary or Assistant Secretary. The seal of the Corporation shall be affixed. The Bid shall show the address of the principal office of the Corporation.

   c. If the Bid is made by a Partnership, it shall be executed in the name of the Partnership by one of the general partners. The address of the Partnership shall also be shown.

   d. If the Bid is a joint venture, it shall be executed by each of the joint venturers with an address for each joint venturer and the address for the joint venture itself.

8. The Bid shall not contain any unauthorized additions, deletions or conditional bids.

9. The Bidder shall not add any provisions reserving the right to accept or reject an award, or to enter into a Contract pursuant to an award.

10. The Bid shall not contain irregularities of any kind which, in the opinion of the DISTRICT, make the Bid incomplete, indefinite, or ambiguous as to its meaning.

11. Alternative Bids will not be considered unless specifically called for. Where numbered

Alternate Bid Items are provided under any Contract, each Bidder must submit a bid price for each numbered Alternate Item.

12. All attachments, certifications or acknowledgements attached to the Bid shall be executed in the same manner as the Bid.

ARTICLE II FILING OF PROPOSALS:

Each Bid shall be made on the forms incorporated in these documents. Clear and legible duplicate copies of the blank bid document forms provided may be used for entry. One (1) copy of each of these bid document forms are to be used to prepare the Contractor's bid proposal. It is not necessary to submit the entire specifications documents on the bid date, only the forms specified below. The Contractor (bidder) is cautioned that all spaces on the Proposal must be fully completed, including all identified or voluntary alternates, if any, and that the Proposal must be properly signed with the name of the company, its authorized representatives, and shall be fully executed in all respects. If this is a Formal Contract, the Bid Security documents shall be fully executed and signed/sealed by the Bidder and the Security Company and shall be witnessed and notarized as required by NC Statutes. This includes the Power of Attorney, attached and properly executed by the Security Company. All documents submitted with the bid shall be original documents and clearly show the original signatures and seals.

Formal Bid Contracts (Bid Bond required):

Bids shall be submitted in a two (2) envelope system. The outer envelope shall bear the project name and project number and shall be sealed and addressed to the Metropolitan Sewerage District of Buncombe County, North Carolina, 2028 Riverside Drive, Asheville, North Carolina 28804. The **name, address, and license number of the bidder,** as well as the type of contract, if applicable, shall also be shown on the outside (Single-Prime-General, or Separate-Prime-General, Plumbing, HVAC or Electrical). The outer envelope shall contain the following documents, fully executed and signed/sealed as required in these Instructions to Bidders:

1. Proposal Guaranty (Bid Security) and Power of Attorney

2. Certification of receipt of Addenda written on Contractor's letterhead

3. Non-Collusion Affidavit

4. A sealed smaller envelope containing the proposal and Schedule of Estimated Quantities and Bid Prices and marked on the outside "PROPOSAL". This envelope should also contain the project name and the name, address, and license number of the bidder. **Attached to the proposal shall be the appropriate MBE form(s).**

ARTICLE III OPENING OF PROPOSALS:

Bids received prior to the advertised hour of opening will be securely kept, sealed. The officer whose duty it is to open them will decide when the specified time has arrived, and no Bid received thereafter will be considered; except that when a Bid arrives by mail after the time fixed for opening, but before the reading of all other Bids is completed, and it is shown to the satisfaction of the DISTRICT that the non-arrival on time was due solely to delay in the mail for which the bidder was not responsible, such Bid will be received and considered. Mailed Bids will be treated in every respect as though filed in

person and will be subject to the same requirements. Bids received subsequent to the advertised hour of opening will be returned to the Bidder unopened.

The Bid opening will be open to all interested parties.

Bid tabulation forms will be prepared by the ENGINEER and will be provided to all interested parties attending the bid opening. Forms will contain the names of prospective bidders and blank spaces for recording the bidder's license number, bid security, base bid and alternates, if any. Spaces for unit prices will not be provided.

Approximately five (5) minutes prior to the designated time for receiving bids the ENGINEER or his representative will announce the "official time" that will be used in declaring the bidding closed.

At the time fixed for the opening of Bids, the ENGINEER will declare the bidding closed. After which, the ENGINEER will determine if at least three (3) bids (sealed envelopes) have been received for the contract. Should there not be at least three, the bids will not be opened. The bids will be returned to the bidders and they will be requested to submit a bid proposal with a re-advertisement.

Since this is a public bid opening, all bids will then be opened and read aloud to the assembled group, beginning with the General Contract bids. The following order will be observed for Formal Bid Contracts:

1. The outer envelopes of all bidders will be opened prior to reading any "Proposals". Prior to opening an outer envelope, the name of the bidder and license number as it appears on the envelope will be announced to the assembled group.

2. With the opening of the bidder's outer envelope, a preliminary determination will be made that bid security and other required certifications are enclosed with the bid.

3. If all of the required material is not with at least three (3) of the bids for a particular contract, the sealed envelopes marked "Proposal" will not be opened.

4. If it is determined that at least three (3) of the outer envelopes appear to be in order, the sealed envelopes containing the bid proposals shall be opened and the bids read aloud. After such determination, all remaining bids may be opened and read aloud without first making a preliminary determination as to the adequacy of bid security.

If this is an informal bid contract, the envelope will be opened and a determination will be made that all the required documents are enclosed and properly executed.

ARTICLE IV WITHDRAWAL OR REVISION OF BIDS:

A Bidder may, without prejudice to himself, withdraw a Bid after it has been delivered to the DISTRICT provided such withdrawal is made in accordance with N.C. General Statute Section 143-129.1.

Only those persons authorized to sign Bids shall be recognized as being qualified to withdraw a Bid.

ARTICLE V ADDENDA AND INTERPRETATIONS:

No interpretations of the meaning of the Plans, Specifications or other portions of the Contract Documents will be made orally.

Every request for interpretation of Plans, Specifications or any portion of the Contract Documents shall be in writing and must be addressed to the office of the DISTRICT, and to be given consideration must be received by the DISTRICT at least five (5) days prior to the date fixed for the opening of Bids. DISTRICT shall determine, in its sole discretion, whether or not a request for clarification or interpretation requires a formal Addendum. Written Addenda, if issued, will be sent by certified or registered mail with return receipt requested, or facsimile with confirmation, or by e-mailed PDF with confirmation, to all holders of Contract Documents at the respective addresses, facsimile numbers, or e-mail addresses furnished for such purposes not later than three (3) days prior to the day fixed for the opening of bids.

Failure of any Bidder to receive any such Addenda shall not relieve said Bidder from any obligation under his Bid as submitted. All Addenda so issued shall become part of the Contract Documents.

Prospective Bidders are cautioned concerning the use of a Post Office Box address as telegraphic Addenda cannot be sent to Post Office Boxes.

ARTICLE VI DISCREPANCY IN BIDS:

In the event there is a discrepancy in any Bid between the unit prices and the extended totals, the unit prices shall govern. Bids which do not contain a price for every numbered item contained in the applicable Bid form will not be accepted, unless otherwise specified.

ARTICLE VII QUALIFICATIONS OF BIDDERS:

The DISTRICT may make such investigation as he deems necessary to determine the qualifications of the Bidder to perform the work and the Bidder shall furnish to the DISTRICT all such information and data for this purpose as the DISTRICT may request. The DISTRICT reserves the right to reject any and all Bids if the evidence submitted by, or investigation of, such Bidder fails to satisfy the DISTRICT that such Bidder is properly qualified to carry out the obligations of the Contract, and to complete the work contemplated therein. Conditional bids will not be accepted.

The Bidder shall submit, with his Bid, a list of Subcontractors, Suppliers, etc., indicating projects recently completed of a similar nature along with names, addresses and phone numbers of their clients for reference of qualifications.

Bidders shall comply with all applicable laws regulating the practice of General Contracting as contained in Chapter 87 of the General Statutes of North Carolina.

All Bidders must be Utility or Unclassified Contractors licensed in the State of North Carolina to perform work of a nature as required by the Contract Documents.

ARTICLE VIII BID SECURITY:

For Formal Bid Contracts, each bid must be accompanied by a Bid Bond, cash, cashiers check or a certified check of the Bidder made payable to the DISTRICT in an amount not less than five percent (5%) of the amount of the Bid. Bid Bonds shall be issued by a corporate surety licensed under the laws of North Carolina to execute such bonds.

When the Bidder elects to submit a certified check or cashiers check as his Bid Bond, the check shall be drawn on a bank or trust company insured by the Federal Deposit Insurance Corporation.

Where alternate items are included in the Bid, the amount of bid security shall be not less than five percent (5%) of the base bid and all alternates combined.

Please note that while not required, it is helpful to use the Bid Bond form already provided in these contract documents. All language contained within this bond form is acceptable to the District. Non-MSD forms may contain unacceptable language and cause your bid to be rejected. Please also note that the use of "AIA" type bid bonds is not acceptable and will cause your bid to be rejected.

The security of the Bidders will be released upon the earlier to occur of (a) the expiration of five days after the Contract has been signed by the accepted Bidder and the DISTRICT; or (b) the expiration of sixty (60) days after the day the bids are opened, upon demand of any such bidders whose bid has not been accepted prior to such demand.

In the event that all Bids are rejected, the security of all Bidders whose security has not been previously returned will be returned at the time of such rejection.

ARTICLE IX RESPONSIBILITIES OF BIDDERS:

Each bidder shall, by careful examination, satisfy himself as to the nature and location of the work, the conformation of the ground, the character, quality and quantity of the facilities needed preliminary to and during the prosecution of the work, the general and local conditions, and all other matters which can in any way affect the work or the cost thereof under the Contract.

The Bidder shall make his own determination as to the nature and extent of the utility facilities, including proposed adjustments, new facilities, or temporary work to be performed by the utility owner or his representative; and as to whether or not any utility work is planned by the DISTRICT in conjunction with the project construction. The Bidder shall consider in his Bid all the permanent and temporary utility facilities in their present or relocation positions, whether or not specifically shown on the Plans or covered in the project Special Conditions. It will be the Bidder's responsibility to anticipate any additional costs to him resulting from such utility work and to reflect these costs in his Bid for the various items in the Contract.

The failure or omission of any Bidder to thoroughly examine and familiarize himself with the Contract Documents or to receive or examine any form, instrument or document or visit the site and acquaint himself with the conditions there existing shall in no way relieve any Bidder from any obligation in respect to his bid.

No verbal agreement or conversation with any officer, agent or employee of the DISTRICT, either before or after the execution of the Contract, shall affect or modify any of the terms or obligations therein.

ARTICLE X COLLUSIVE AGREEMENTS:

Each Bidder submitting a Bid to the DISTRICT for any portion of the work contemplated by the documents on which bidding is based, shall execute and attach thereto an affidavit substantially in the form herein provided, to the effect that he has not entered into a collusive agreement with any person, firm or corporation in regard to any Bid submitted.

Before executing any Sub-contract, the successful Bidder shall submit the name of any proposed Sub-contractor for prior approval and an affidavit substantially as above.

ARTICLE XI TAXES

The Bidder shall include in his Bid the cost of all sales and use taxes and furnish to the DISTRICT at the end of each month and upon completion of his Contract, a statement setting forth all such taxes paid. This statement shall indicate the amount paid to each firm and be adequate for audit by the State Department of Revenue and must be accompanied by copies of invoices.

ARTICLE XII COMPARISON OF BIDS:

Bids will be compared on the basis of the totals of the approximated quantities comprising all items, at the unit and lump sum prices bid for these items. The resulting total Contract Bid Price will be compared which will include and cover the furnishing of all materials, and the performance of all labor necessary, and completing of all the work called for under the accompanying Contract, and in the manner set forth and described in the Contract Documents.

The lowest Bidder under each Contract will be that Bidder whose Bid totals the lowest number of dollars as determined above.

When numbered Alternate bid items are required, the lowest Bidder is the Bidder whose Base Bid and Bid for the Alternate or combination of Alternates selected by the DISTRICT results in the lowest total amount. The DISTRICT reserves the right to select any Alternate or combinations of Alternates.

Where estimated quantities are included in certain items of the Bid, they are for the purpose of comparing bids. While they are believed to be close approximations, they are not guaranteed, and settlement will be made from such items upon the basis of work as actually executed at the unit prices in the Bid as accepted.

ARTICLE XIII AWARD OF CONTRACT:

The contract shall be awarded to the lowest responsive, responsible bidder, taking into consideration quality, performance and time of delivery. The DISTRCT reserves the right to reject any and all bids, including, without limitation, the right to reject any or all non-conforming, non-responsive, unbalanced or conditional bids, and to reject the bid of any bidder if the DISTRICT believes that it would not be in the best interest of the DISTRICT to make an award to that bidder. The DISTRICT also reserves the right to waive informalities.

When Alternate Bid items are required in the Bid, the Contract will be awarded to that responsible Bidder whose Base Bid and Bid for the Alternate or combination of Alternates selected by the DISTRICT results in the lowest total amount.

These Bids are asked for in good faith, and awards will be made as soon as practicable, provided satisfactory Bids are received.

The DISTRICT may reject any bid not prepared and submitted in accordance with the provisions

of the bid documents.

The right is reserved to waive informalities in bidding, to reject any or all Bids, or to accept a Bid other than the lowest submitted if such action is deemed to be in the best interest of the DISTRICT.

ARTICLE XIV COMMENCEMENT OF WORK:

Upon execution and delivery of the Contract and the delivery of the required performance and payment bonds and insurance certificates and policies, the CONTRACTOR will be notified to proceed with the Work of the Contract. The work of the Contract shall be commenced within ten (10) days following such notification or as otherwise specified in the Notice to Proceed.

The CONTRACTOR shall notify the DISTRICT in writing, of his intention to enter upon the site of the work at least five (5) days in advance of such entrance.

ARTICLE XV DAMAGES FOR FAILURE TO EXECUTE CONTRACT:

If an accepted Bidder shall fail or refuse to sign and deliver this Contract and the required surety bonds and insurance documentation within ten (10) days after he has received Notice of Award of his Bid, the DISTRICT shall retain, as partial damages for such failure or refusal, the Bid security of such defaulting Bidder. In addition to such damages, the DISTRICT reserves the right to pursue any other remedies it may have against such defaulting Bidder.

ARTICLE XVI EQUAL EMPLOYMENT OPPORTUNITY

Attention of Bidders is particularly called to the requirements for insuring that employees and applicants for employment are not discriminated against because of their race, color, religion, sex, or national origin.

ARTICLE XVII WAGES AND SALARIES

The Bidder and his Subcontractors shall be required to pay all employees the minimum prevailing wage and salary rates for the full length of the contract.

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ARTICLE I: APPLICATION

The requirements of the Metropolitan Sewerage District (DISTRICT) Guidelines for Recruitment and Selection of Minority Businesses for Participation in Sewage Construction Contracts are hereby made a part of these contract documents. These requirements shall apply to all contractors regardless of ownership. A copy of the Metropolitan Sewerage District Guidelines for Recruitment and Selection of Minority Businesses for Participation in Sewage Construction Contracts is attached:

ARTICLE II: MINORITY BUSINESS ENTERPRISE GOALS

The goal for Minority Business Enterprise (MBE) participation on DISTRICT projects has been set at **Twelve (12)** percent.

The Bidder shall provide, with the bid, documented proof in the form of MBE Form 1, MBE UTILIZATION COMMITMENT, that these goals have been met or exceeded;

OR

If minority participation is less than Twelve (12) percent, provide with the bid, 1) the Checklist for Review of Good Faith Efforts, and 2) MBE Form 1 (MBE UTILIZATION COMMITMENT) identifying the amount of MBE participation.

NOTE: If the Bidder awards ALL subcontracts to MBE's, the Checklist for Review of Good Faith Efforts listed above will not be required; however, this shall be noted on MBE Form 1.

OR

If there is no minority participation, provide with the bid, MBE Form 2, CERTIFICATION REGARDING SUBCONTRACTING PRACTICES, and upon request, information sufficient for the DISTRICT to determine that the Bidder does not customarily subcontract work on this type of project.

Failure to provide this evidence may result in rejection of the bid and award to another responsible, responsive bidder.

NOTE REGARDING MBE FORM 3:

Bidders employing MBE's shall provide with the bid, or within 72 hours from the receipt of bids, a Letter of Intent **(MBE Form 3)**, complete with a description of the scope of services and dollar value for each MBE firm proposed for use in this contract. Failure to provide the documentation as listed in these provisions may result in rejection of the bid and award to another responsible, responsive bidder. The DISTRICT reserves the right to waive any irregularities in MBE documentation if they can be resolved prior to award of the contract, and the DISTRICT finds it to be in its best interest to do so and award the contract.

ARTICLE III: SUBCONTRACTOR PAYMENT REQUIREMENTS

North Carolina General Statute 143-134.1 states that the percentage of retainage on payments made by the prime contractor to the subcontractor shall not exceed the percentage of retainage on payments made by the DISTRICT to the prime CONTRACTOR. Failure to comply with this provision shall be considered a breach of the contract, and the contract may be terminated in accordance with the termination provisions of the contract.

The CONTRACTOR shall provide an itemized statement of payments to each MBE subcontractor with each request for payment or before final payment is processed.

ARTICLE IV: PROGRAM COMPLIANCE REQUIREMENTS

All written statements, certifications or intentions made by the Bidder shall become a part of the agreement between the CONTRACTOR and DISTRICT for performance of this contract. Failure to comply with any of these statements, certifications or intentions, or with the MBE Guidelines shall constitute a breach of the contract. A determination by the DISTRICT that any information submitted either prior to award of the contract or during the performance of the contract is inaccurate, false or incomplete, shall constitute a breach of the contract. Any such breach may result in termination of the contract in accordance with the termination provisions contained in the contract. It shall be solely at the option of the DISTRICT whether to terminate the contract for breach.

In determining whether a CONTRACTOR has made good faith efforts to include minority participation, DISTRICT will evaluate all efforts made by the CONTRACTOR and will determine compliance. DISTRICT may take into account any or all of the following:

1. Whether the Bidder attended any pre-bid meetings scheduled by the DISTRICT;

2. Whether the Bidder advertised in general circulation, trade association, and minority-focused media concerning the subcontracting opportunities;

3. Whether the Bidder provided written notice to a minimum of three MBE's for each portion of the work subcontracted, that their interest in the contract was being solicited in sufficient time to allow the MBE's to participate effectively;

4. Whether the Bidder followed up initial solicitations of interest by contacting MBE's to determine with certainty whether the MBE's were interested;

5. Whether the Bidder selected portions of the work to be performed by MBE's in order to increase the likelihood of meeting MBE goals (including, where appropriate, breaking down contracts into economically feasible units to facilitate MBE participation);

6. Whether the Bidder provided interested MBE's with adequate information about the Plans, Specifications and requirements of the contract;

7. Whether the Bidder negotiated in good faith with interested MBE's and not rejecting MBE's as unqualified without sound reasons based upon a thorough investigation of their capabilities.

ARTICLE V - CHECKLIST FOR REVIEW OF GOOD FAITH EFFORTS

(Must be submitted with Bid under certain conditions – See Article II)

1. Have you attended any of the pre-bid conferences scheduled?
( ) Yes ( ) No ( ) None Scheduled

2. Have you advertised for at least three (3) consecutive days in general circulation, trade association, construction and minority focused media regarding subcontracting opportunities with your firm at least fifteen (15) days prior to bid opening on formal projects?
( ) Yes ( ) No (Show how and attach proof)

3. Have you utilized the services of state and/or federal minority business assistance, minority contractors' group, available minority community organizations, , and other organizations that provide assistance in the recruitment and placement of minorities and women? ( ) Yes ( ) No (Show how and attach proof)

4. Have you provided interested MBE's with adequate and equal access to information about the plans, specifications and requirements of the contract and insurance or licenses?
( ) Yes ( ) No

5. Did you provide written notice to all appropriate certified MBE's within the identified subcontracting / supplier / service categories that their interest in the contract was being solicited and in sufficient time to allow the MBE'S to participate? Additionally, did the solicitation contain a description and location of the project, the work for which the subcontractors' bids are being solicited, date, time and location where the subcontractors' bids are to be submitted, locations where bidding documents could be reviewed?
( ) Yes ( ) No

6. Have you selected portions of the work to be performed by MBE's in order to increase the likelihood of meeting MBE's goals including breaking it into economically feasible units where appropriate?
( ) Yes ( ) No

7. Have you designated someone in your firm to be the single contact for MBE's that may have questions, etc.? ( ) Yes ( ) No (Please indicate name of person and title)
_____.

8. Did you follow up initial solicitations of interest by contacting MBE's to determine with certainty whether they are interested in bidding? ( ) Yes ( ) No

9. Did you negotiate in good faith with interested MBE's, not rejecting MBE's as unqualified without sound reasons based on a thorough investigation of their capabilities?
( ) Yes ( ) No (Show how)

COMPANY NAME OF BIDDER: _____ Signature

_____ _____ Title

ARTICLE VI: MBE FORM 1

(Must be submitted with Bid if any subcontractors are used.)

MBE UTILIZATION COMMITMENT

We, _____, do certify that on the

Carrier Bridge Pump Station Replacement – Pipeline River Crossings,
Project No. 2019045

that we will expend a minimum of _____% of the total dollar amount of the contract with minority business enterprises. MBE's will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below. If the Bidder intends to subcontract, this form must be completed regardless of the amount or lack of participation attained.

Name and Phone Number of Firm	Indicate MBE	Description of Work	% of Contract

The undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the **Metropolitan Sewerage District**. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the Bidder to the commitment herein set forth.

(Name of Bidder)

Date: _____

By: _____
Title: _____

ARTICLE VII: MBE FORM 2

(Must be completed with Bid if MBE Form 1 is not submitted)

CERTIFICATION REGARDING SUBCONTRACTING PRACTICES

We, _____, hereby certify that it is our intent to perform
(Name of Bidder)

100% of the work required for **Carrier Bridge Pump Station Replacement – Pipeline River Crossings, Project No. 2019045.**

In making this certification, the Bidder states the following:

1. That the Bidder does not customarily subcontract elements of this type project, and normally performs and has the capability to perform and will perform all elements of the work on this Project with his/her own current work forces; and

2. That, if requested, the Bidder agrees to submit the following information after bid and before the award of the contract:

   * List of the scope of services involved in this project.
   * List of previous projects of this type that Bidder has performed with his/her forces.
   * Payrolls from the above-mentioned jobs which illustrate Bidder's employee's job classifications needed to perform the elements of the work on the Project or a breakdown of Bidder's entire work force which illustrates the number of employees in each job classification.
   * Name and phone number of the Field Supervisors for these jobs.
   * List of equipment Bidder owns that has been used on previous projects.
   * Copies of lease agreements for equipment that was leased.

The Bidder agrees to provide any additional information requested for the statement contained in Paragraph Number 1 above.

The undersigned hereby certifies that he or she has read this certification and is authorized to bind the Bidder to the commitments herein contained.

Date: _____

(Name of Bidder)

By: _____

Title: _____

ARTICLE VIII: MBE FORM 3

LETTER OF INTENT TO PERFORM AS A SUBCONTRACTOR OR PROVIDE MATERIALS OR SERVICES

SUBJECT: **Carrier Bridge Pump Station Replacement – Pipeline River Crossings, Project No. 2019045**

TO: _____
(Name of Prime Bidder)

The undersigned intends to perform work in connection with the above project as a Minority Business Enterprise.

The MBE status of the undersigned **is / is not** (circle one) certified by the Office of Historically Underutilized Businesses for the State of North Carolina. The DISTRICT encourages all qualified MBE's to become certified by this office.

The undersigned is prepared to perform the following described work or provide materials or services in connection with the above project (specify in detail particular work items, materials or services to be performed or provided):

at the following price: _____.

You have projected the following commencement date for such work, and the undersigned is projecting completion of such work as follows:

Items	Projected Commencement Date	Projected Completion Date

Subcontracting at any tier must be reported and is subject to all MBE compliance requirements. This form shall be used for MBE subcontracting at any level.

Date: _____

Name of Minority Contractor

_____

By: _____

Title: _____

ARTICLE IX: THE METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY, NORTH CAROLINA GUIDELINES FOR RECRUITMENT AND SELECTION OF MINORITY BUSINESSES FOR PARTICIPATION IN SEWAGE CONSTRUCTION CONTRACTS

These guidelines establish goals for minority participation in single-prime and separate-prime sewage construction contracts. Legislation provides that public bodies shall have a verifiable percentage goal for participation by minority businesses in the total value of work for each project for which a contract or contracts are awarded. These guidelines are published to accomplish that end.

SECTION 1: INTENT AND APPLICATION OF GUIDELINES

It is the intent of these guidelines that The Metropolitan Sewerage District of Buncombe County, North Carolina, (DISTRICT) as awarding authority for sewage construction projects, and the contracts and subcontractors performing the construction contracts awarded, shall make a good faith effort to attain a verifiable goal of 12% participation by minority businesses in each construction project. Nothing contained in these guidelines shall be construed to require DISTRICT to award contracts to or to make purchases of materials or equipment from minority-business contractors who do not submit the lowest responsible responsive bid or bids.

These guidelines shall apply to all contracts for the erection, construction, alteration, or repair of any buildings or other construction projects when the entire cost of such work shall exceed $100,000.00.

SECTION 2: DEFINITIONS

1. Minority - a person who is a citizen or lawful permanent resident of the United States and who is:

    a. Black, that is, a person having origins in any of the black racial groups in Africa;

    b. Hispanic, that is, a person of Spanish or Portuguese culture with origins in Mexico, South or Central America, or the Caribbean Islands, regardless of race;

    c. Asian American, that is, a person having origins in any of the original peoples of the Far East, Southeast Asia, and Asia, the Indian subcontinent, the Pacific Islands;

    d. American Indian or Alaskan Native, that is, a person having origins in any of the original peoples of North America; or

    e. Female.

2. Minority Business - Means a business:

a. In which at least fifty-one percent (51%) is owned by one or more minority persons, or in the case of a corporation, in which at least fifty-one (51%) of the stock is owned by one or more minority persons; and

b. Of which the management and daily business operations are controlled by one or more of the minority persons who owns it.

3. District - The Metropolitan Sewerage District of Buncombe County, North Carolina.

4. Bidder - Any person, firm, partnership, corporation, association, or joint venture seeking to be awarded a public contract or subcontract.

5. Contract - A mutually binding legal relationship or any modification thereof obligating the Contractor to fumish labor, equipment, materials, or services for the erection, construction, alteration, or repair of any buildings or other construction projects and obligating the DISTRICT to pay for them.

6. Contractor - Any person, firm, partnership, corporation, association, or joint venture which has contracted with the DISTRICT to perform a Contract to which these guidelines apply.

7. Subcontractor - Any person, firm, partnership, corporation, association, or joint venture under contract with a CONTRACTOR for supplying materials or labor, equipment, materials or services. The subcontractor may or may not provide materials in his subcontract. Work subcontracted in an emergency and which could not have been anticipated is excluded as part of this program.

8. Verifiable goal - means:

a. For purposes of separate-prime contract system, that the DISTRICT has adopted written guidelines specifying the actions that will be taken to ensure a good faith effort in the recruitment and solicitation of minority businesses for participation in contracts awarded; and

b. For purposes of separate-prime contract system, that the DISTRICT has adopted written guidelines specifying the actions that the prime CONTRACTOR must take to ensure a good faith effort in the recruitment and solicitation of minority businesses for participation in contracts awarded; the required actions must be documented in writing by the CONTRACTOR to the DISTRICT.

SECTION 3: RESPONSIBILITIES

1. The State of North Carolina has an established program in which it lists certified minority and women businesses persons who may qualify as Minority or Woman-owned Business Enterprises (MBE/WBE). The State of North Carolina accepts certification through the ***Office for Historically Underutilized Businesses*** (www.doa.state.nc.us/hub). Current information on the program, certification and searching for minority vendors can be found at this website.

2. DISTRICT/The Metropolitan Sewerage District of Buncombe County, North Carolina.

   Under the single-prime contract system and the separate-prime contract system, the DISTRICT shall:

   a. Fully explain the bidder's responsibilities and this program at the pre-bid conference, if scheduled, conducted by the representative of the DISTRICT. Said conference will be open to all known and anticipated prime contractors, subcontractors, material suppliers, and other bidders.

   b. Be responsible for reviewing the apparent low bidder's compliance with the items listed in the proposal that must be complied with, if the bid is to be considered responsive and responsible. The DISTRICT reserves the right to reject any and all bids and to waive informalities.

   c. Identify or determine the work areas of a contract where MBE's may have an interest in performing contract work.

3. Prime Contractor(s)

   Under the single-prime contract system and the separate-prime contract system, the prime contractor(s) shall:

   a. Attend the scheduled pre-bid conference.

   b. Identify or determine those work areas of a subcontract where MBEs may have an interest in performing subcontract work.

   c. Notify certified MBE's of potential subcontracting opportunities listed in the proposal at least ten (10) days prior to the scheduled day of bid opening. The notification will include the following:

      (1) A description of the work for which the sub-bid is being solicited.

      (2) The date, time and location where sub-bids are to be submitted.

      (3) The name of the individual within the company who will be available to answer questions about the project.

      (4) Where bid documents may be reviewed.

(5) Any special requirements that may exist, such as insurance, licenses, bonds and financial arrangements.

If there are more than three (3) certified MBE's in the area of the project, the CONTRACTOR(s) shall notify three (3), but may contact more, if the CONTRACTOR(s) so desires.

d. During the bidding process, comply with the DISTRICT's requirements listed in the contract documents for minority participation.

e. Submit with the bid a description of that portion of the work to be executed by MBE's expressed as a percentage of the total contract price.

f. Upon being named the apparent low bidder, provide the necessary documentation as listed in the contract documents provided by the DISTRICT. Failure to comply with procedural requirements as defined in contract documents may render the bid as non-responsive and may result in rejection of the bid and award to the next lowest responsible and responsive bidder.

g. During the construction of a project, if it becomes necessary to replace an MBE subcontractor, advise the DISTRICT.

h. If during the construction of a project additional subcontracting opportunities become available, make a good faith effort to solicit bids from MBE's.

4. MBE Responsibilities

While MBE's are not required to become certified in order to participate in this program, it is recommended that they become certified in the State of North Carolina by the N.C. Office for Historically Underutilized Businesses and should take advantage of the appropriate technical assistance that is made available. In addition, MBE's who are contacted by the DISTRICT or bidders should respond promptly whether or not they wish to submit a bid.

SECTION 4: DISPUTE PROCEDURES

It is the policy of the Metropolitan Sewerage District of Buncombe County, North Carolina, that disputes with another person that involve a person's rights, duties or privileges, should be settled through informal procedures. To that end, MBE disputes arising under these guidelines should be resolved, if possible, by informal proceedings arranged by the General Manager or his designee.

SECTION 5: EFFECTIVE DATE

These guidelines became effective on July 17, 2002. Copies of these guidelines may be obtained from the MSD Construction Office, 2028 Riverside Drive, Asheville, North Carolina, 28804; telephone number (828) 254-9646.

SECTION 6: GUIDELINES AND COMPLIANCE DOCUMENTATION TO BE PART OF CONTRACT DOCUMENTS

These guidelines will be included in the contract to each construction bid package and provisions for documenting contractual compliance in providing for MBE participation in the construction program will be included in each construction bid package.

Section V - Non-Collusion Affidavit Of Prime Bidder

State of North Carolina
County of Buncombe

_____, being first duly sworn, deposes and says that:

1) He/She is President of _____(Company/Corporation), that has submitted the attached bid for **Carrier Bridge Pump Station Replacement – Pipeline River Crossings, Project No. 2019045.**

2) He/She is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

3) Such Bid is genuine and is not a collusive or sham bid;

4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including this affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly with any other Bidder, firm, or person to submit a collusive or sham Bid in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm, or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit, or cost element of the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Metropolitan Sewerage District of Buncombe County or any person interested in the proposed Contract; and

5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

Signed: _____

Title: _____

Subscribed and sworn before me this the _____ day of _____, 20____.

_____(Seal)
Notary Public

My Commission Expires: _____

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Date: _____

To: Metropolitan Sewerage District
Buncombe County, North Carolina
Asheville, North Carolina

_____
Individual or Firm Name of Bidder

Ladies and/or Gentlemen:

In response to your request the undersigned Bidder submits the following proposal for constructing the proposed project described and specified in the attached documents titled:

Carrier Bridge Pump Station Replacement
Pipeline River Crossings
Project No. 2019045

1. Bidder proposes and agrees, in event this proposal is accepted, to enter into a contract with the Metropolitan Sewerage District of Buncombe County, North Carolina (herein designated and referred to as the DISTRICT, in the form herein specified, to furnish all materials, equipment, machinery, tools, means of transportation, power and fuel and to perform all labor necessary for or incidental to the construction of the aforementioned improvements, all in complete accordance with the requirements of the attached contract documents and plans, to the entire satisfaction of the DISTRICT, at the unit and/or lump sum prices we have inserted opposite each item of work listed in the accompanying "Schedule of Estimated Quantities and Bid Prices" and/or bid sheet, which is an integral part of this proposal.

2. In submitting this proposal the Bidder understands and agrees that a contract may be awarded for the work as may appear to the interest of the DISTRICT; that the quantities as stated are approximate only and that no claim shall be made against the DISTRICT on account of any excess or deficiency, either absolute or relative, therein; that the estimated quantities will be used as a basis for canvassing and evaluating proposals and for determining the estimated amount of the contract, and that, within the limits of available funds, the DISTRICT reserves the right to increase or decrease the estimated quantities, stated above by such amounts as may be necessary to complete the work, provided, however, that the stated unit prices shall remain firm and unchanged.

3. Bidder hereby declares that the only person or persons interested in this proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this proposal or in the contract to be entered into, that this proposal is made without connection with any other person, company or parties making a proposal, and that this proposal is in all respects fair and made in good faith without collusion or fraud.

4. Bidder further declares that he has examined the site of the work and the building and labor conditions and has informed himself fully in regard to all conditions pertaining to the place where the work is to be done; that he has examined the plans and specifications for the work and the other contract documents relating thereto and has read all Special Conditions furnished prior to the opening of bids; and that he has satisfied himself relative to the work to be performed.

5. Bidder further proposes and agrees, that, if awarded a contract for this project, he will commence work immediately on the date stated in a written notice from the DISTRICT to commence work; that he will furnish all materials, and perform all labor for the completion of the contract and will complete same, including all accepted alternates thereto, within the time stated below, and that on his failure to complete the work within such time he will pay to the DISTRICT for each calendar day that the work, or any part thereof remains uncompleted beyond such specified time, the amount specified, this payment to be made as liquidated damages.

All WORK of the Agreement is to be completed within four hundred fifty **(450) calendar days** and the amount of liquidated damages shall be $ 1000.00 each calendar day until complete.

6. And the Bidder further declares that accompanying this proposal is a certified check or satisfactory bid bond in the sum of five percent (5%) of this proposal, and it is hereby agreed that in case of the withdrawal of this proposal without the consent of the DISTRICT within sixty (60) days after the bid opening, or that in case of failure on the part of the undersigned to execute the contract as aforesaid and to deliver same and the required security for the faithful performance of the contract, (executed in the form annexed hereto) to said DISTRICT within ten days from the date a notice of acceptance of this proposal is given to the undersigned personally, or by mail to the address as herein stated, then the undersigned Bidder will be deemed to have abandoned the contract, and thereupon the amount of such check or bond shall be absolutely due and payable thereunder to the DISTRICT.

7. The Bidder understands that the DISTRICT shall withhold a Five Percent (5%) retainage from progress payments until the Project is fifty percent (50%) complete. In accordance with NCGS 143-134.1 the DISTRICT will then retain this constant amount, while retaining no further retainage, until the project is one hundred percent (100%) complete. If the DISTRICT becomes dissatisfied with performance of the CONTRACTOR after reducing or holding the Five Percent (5%) retainage, the DISTRICT may reinstitute such retainage until the Project has been completed, or may withhold up to two and one-half (2.5) times the value of any incomplete Work.

Nothing in this section shall be deemed to preclude the DISTRICT from withholding full or partial payment for defective Work or Work that has not been fully completed in accordance with the Project Specifications and the Contract Documents, to the satisfaction of the ENGINEER.

_____
Individual or Firm Name of Bidder

By: _____

Title: _____

State License No. _____ Type: _____ Limit: _____ Expir. Date: _____

Bidder's Address: _____

Note: If the Bidder is a corporation give the following information:

State in which it is incorporated _____

Address of Principal Office _____

The Bidder acknowledges receipt of the following addenda:

No.	Date
_____	_____
_____	_____

Contractor Name of Bidder

_____

SCHEDULE OF ESTIMATED QUANTITIES AND BID PRICES

Carrier Bridge Pump Station Replacement - Pipeline River Crossings, Project No. 2019045
METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

ITEM NO.	DESCRIPTION	QTY	UNITS	BID	TOTAL
1	MOBILIZATION (3% MAX)	1	LS	$	$
2	TEMPORARY ACCESS TO FORCE MAINS	1	LS	$	$
3	TEMPORARY ACCESS TO GRAVITY SEWER	1	LS	$	$
4	TEMPORARY COFFERDAM FOR FORCE MAINS	1	LS	$	$
5	TEMPORARY COFFERDAM FOR GRAVITY SEWER	1	LS	$	$
6	36" FORCE MAINS	1	LS	$	$
7	60" GRAVITY SEWER	1	LS	$	$
8	FLOOD RECOVERY	2	EA	$	$
	TOTAL BID PRICE				$

TOTAL WRITTEN BID PRICE_____

_____and _____/100 dollars.

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STATE AND COUNTY SALES/USE TAX CERTIFICATION

I, _____, of _____

hereby certify that the companies cited have been paid the North Carolina Sales Tax and the Buncombe County Tax, as shown on the materials purchased by us, and that these materials became a part of the **Carrier Bridge Pump Station Replacement – Pipeline River Crossings, Project No. 2019045** for North Carolina, through _____ (date).

Please see attached...

Name of Firm: _____

Signature: _____

Title: _____

SWORN TO AND SUBSCRIBED before me, this the _____ day of _____, 20____.

_____ _____

My Commission Expires Notary Public

(Seal)

Section VIII - State and County Sales/Use Tax Statement

CONTRACTOR NAME__ _____ _____ _____ _____ __

PROJECT NAME AND NO. _____

INVOICE NO.	INVOICE DATE	VENDOR NAME	SUBTOTAL AMOUNT OF INVOICE	SALES TAX STATE	SALES TAX COUNTY	TOTAL TAX	TOTAL INVOICE
TOTALS MUST BE SHOWN							

(PAID INVOICES ATTACHED IN ORDER)

BID BOND (PENAL SUM FORM)

Bidder Name: [Full formal name of Bidder] Address *(principal place of business)*: [Address of Bidder's principal place of business]	**Surety** Name: [Full formal name of Surety] Address *(principal place of business)*: [Address of Surety's principal place of business]
Owner Name: [Full formal name of Owner] Address *(principal place of business)*: [Address of Owner's principal place of business]	**Bid** Project *(name and location)*: [Owner project/contract name, and location of the project] Bid Due Date: [Enter date bid is due]
Bond Penal Sum: [Amount] Date of Bond: [Date]	

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

Bidder	Surety
_____ *(Full formal name of Bidder)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature) (Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title:	Title:

Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
   3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
   3.2. All Bids are rejected by Owner, or
   3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

AGREEMENT

BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between [name of contracting entity] ("Owner") and [name of contracting entity] ("Contractor").

Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

Owner and Contractor hereby agree as follows:

ARTICLE 1—WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described in the Advertisement for Bids.

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **Carrier Bridge Pump Station (Pipeline River Crossings).**

ARTICLE 3—ENGINEER

3.01 The Owner has retained HDR Engineering, Inc. of the Carolinas to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

3.02 The part of the Project that pertains to the Work has been designed by "Engineer".

ARTICLE 4—CONTRACT TIMES

4.01 *Time is of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.03 *Contract Times: Days*

A. The Work will be substantially complete within 450 days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 480 days after the date when the Contract Times commence to run.

4.05 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. *Substantial Completion:* Contractor shall pay Owner $1000 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.

B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

4.07 Owner reserves the right to withhold from payments due Contractor under the Contract amounts for liquidated damages (if any), special damages (if any), and performance damages (if any) in accordance with the Contract.

ARTICLE 5—CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:

A. For all Work other than Unit Price Work, a lump sum of $[number].

All specific cash allowances are included in the above price in accordance with Paragraph 13.02 of the General Conditions.

B. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item). Refer to the Bid Schedule.

The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.

C. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment) $[amount].

ARTICLE 6—PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the last day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.

    a. 95 percent of the value of the Work completed (with the balance being retainage).

        1) If 50 percent or more of the Work has been completed, as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

    b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

    c. If the character and progress of the Work becomes unsatisfactory to Owner and Engineer after reducing the retainage, the Owner may resinstitute retainage until the Project has been completed, or may withhold up to two and one-half (2.5) times the value of any incomplete Work.

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

6.04 *Consent of Surety*

A. Owner will not make final payment, or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

ARTICLE 7—CONTRACT DOCUMENTS

7.01 *Contents*

A. The Contract Documents consist of all of the following:

1. This Agreement.
2. Bonds:
    a. Performance bond (together with power of attorney).
    b. Payment bond (together with power of attorney).
3. General Conditions.
4. Supplementary Conditions.
5. Wage Determination Schedule.

7. Specifications as listed in the table of contents of the project manual (copy of list attached).

8. Drawings (not attached but incorporated by reference) consisting of [number] sheets with each sheet bearing the following general title: [title on Drawings].

10. Addenda (numbers [number] to [number], inclusive).

11. Exhibits to this Agreement (enumerated as follows):

    a. [list exhibits]

12. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:

    a. Notice to Proceed.

    b. Work Change Directives.

    c. Change Orders.

    d. Field Orders.

    e. Warranty Bond, if any.

B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 7.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 *Contractor's Representations*

A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:

1. Contractor has examined and carefully studied the Contract Documents, including Addenda.

2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.

5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in

the Supplementary Conditions, with respect to Technical Data in such reports and drawings.

6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.

7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

8. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.03 *Standard General Conditions*

A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on [indicate date on which Contract becomes effective] (which is the Effective Date of the Contract).

	Contractor:
_____	_____
(typed or printed name of organization)	*(typed or printed name of organization)*
By: _____	By: _____
(individual's signature)	*(individual's signature)*
Date: _____	Date: _____
(date signed)	*(date signed)*
Name: _____	Name: _____
(typed or printed)	*(typed or printed)*
Title: _____	Title: _____
(typed or printed)	*(typed or printed)*
	*(If **[Type of Entity]** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*
Attest: _____	Attest: _____
(individual's signature)	*(individual's signature)*
Title: _____	Title: _____
(typed or printed)	*(typed or printed)*
Address for giving notices:	Address for giving notices:
_____	_____
_____	_____
_____	_____
Designated Representative:	Designated Representative:
Name: _____	Name: _____
(typed or printed)	*(typed or printed)*
Title: _____	Title: _____
(typed or printed)	*(typed or printed)*
Address:	Address:
_____	_____
_____	_____
_____	_____
Phone: _____	Phone: _____
Email: _____	Email: _____
*(If **[Type of Entity]** is a corporation, attach evidence of authority to sign. If **[Type of Entity]** is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)*	License No.: _____ *(where applicable)*
	State: _____

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PERFORMANCE BOND

Contractor	**Surety**
Name: [Full formal name of Contractor] Address *(principal place of business)*: [Address of Contractor's principal place of business]	Name: [Full formal name of Surety] Address *(principal place of business)*: [Address of Surety's principal place of business]
Owner	**Contract**
Name: [Full formal name of Owner] Mailing address *(principal place of business)*: [Address of Owner's principal place of business]	Description *(name and location)*: [Owner's project/contract name, and location of the project] Contract Price: [Amount from Contract] Effective Date of Contract: [Date from Contract]

Bond

Bond Amount: [Amount]

Date of Bond: [Date]

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

Contractor as Principal	Surety
_____ *(Full formal name of Contractor)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:

    3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;

    3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

    3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

    5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

    5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

    5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

    5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

   7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

   7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

   7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.

12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such

statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

14. Definitions

    14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

    14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

    14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

    14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

    14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

16. Modifications to this Bond are as follows: [Describe modification or enter "None"]

PAYMENT BOND

Contractor	**Surety**
Name: [Full formal name of Contractor] Address *(principal place of business)*: [Address of Contractor's principal place of business]	Name: [Full formal name of Surety] Address *(principal place of business)*: [Address of Surety's principal place of business]
Owner	**Contract**
Name: [Full formal name of Owner] Mailing address *(principal place of business)*: [Address of Owner's principal place of business]	Description *(name and location)*: [Owner's project/contract name, and location of the project] Contract Price: [Amount, from Contract] Effective Date of Contract: [Date, from Contract]

Bond

Bond Amount: [Amount]

Date of Bond: [Date]

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

Contractor as Principal	Surety
_____ *(Full formal name of Contractor)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond will arise after the following:
    5.1. Claimants who do not have a direct contract with the Contractor
        5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
        5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).
    5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
    7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
    7.2. Pay or arrange for payment of any undisputed amounts.
    7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

    16.1. *Claim*—A written statement by the Claimant including at a minimum:

        16.1.1. The name of the Claimant;

        16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;

        16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;

        16.1.4. A brief description of the labor, materials, or equipment furnished;

16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;

16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;

16.1.7. The total amount of previous payments received by the Claimant; and

16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

18. Modifications to this Bond are as follows: [Describe modification or enter "None"]

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared By

EJCDC®
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

ACEC
AMERICAN COUNCIL OF ENGINEERING COMPANIES

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

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

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*

a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.

c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.

d. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.

21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.

23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.

    a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.

    b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.

    c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.

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

26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.

28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.

32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.

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

35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.

36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.

39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.

42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.

44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

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

46. *Technical Data*

    a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.

    b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.

    c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.

47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.

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

49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*: The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*: The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*: The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

1. does not conform to the Contract Documents;

2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

3. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).

E. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

F. *Contract Price or Contract Times*: References to a change in "Contract Price or Contract Times" or "Contract Times or Contract Price" or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term "or both" is not expressed.

G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).

B. *Evidence of Contractor's Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.

C. *Evidence of Owner's Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.

B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

G. Nothing in the Contract Documents creates:

1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or

2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

A. *Standards Specifications, Codes, Laws and Regulations*

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or

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

3.04 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

4.03 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. Abnormal weather conditions;

3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and

4. Acts of war or terrorism.

D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:

1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.

2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.

3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.

E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:

1. The circumstances that form the basis for the requested adjustment;

2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;

3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;

4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and

5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.

F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.

G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;

2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and

3. Technical Data contained in such reports and drawings.

B. *Underground Facilities*: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

C. *Reliance by Contractor on Technical Data*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

D. *Limitations of Other Data and Documents*: Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

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

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

3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or

4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;

2. is of such a nature as to require a change in the Drawings or Specifications;

3. differs materially from that shown or indicated in the Contract Documents; or

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

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;

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

c. Contractor failed to give the written notice required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:

1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;

4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.

C. *Engineer's Review*: Engineer will:

1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;

2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;

3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and

4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

F. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and

c. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;

2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

of construction to be employed by Contractor, and safety precautions and programs incident thereto;

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

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.

H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.

B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.

C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.

E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.

F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.

H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.

D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.

F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

H. Contractor shall require:

1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and

2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.

I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.

K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.

M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.

N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

A. *Required Insurance*: Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.

B. *General Provisions*: The policies of insurance required by this Paragraph 6.03 as supplemented must:

1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;

3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;

4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and

5. include all necessary endorsements to support the stated requirements.

C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:

1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;

2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;

3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and

5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.

B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.

D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.

B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.

C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

A. *Contractor's Request; Governing Criteria*: Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that the proposed item:

1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

3) has a proven record of performance and availability of responsive service; and

4) is not objectionable to Owner.

b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 *Substitutes*

A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:

    a. will certify that the proposed substitute item will:

        1) perform adequately the functions and achieve the results called for by the general design;

        2) be similar in substance to the item specified; and

        3) be suited to the same use as the item specified.

    b. will state:

        1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;

        2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

        3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

    c. will identify:

        1) all variations of the proposed substitute item from the item specified; and

        2) available engineering, sales, maintenance, repair, and replacement services.

    d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.

B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.

F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.

J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.

K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.

L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.

M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.09 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.

C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.

B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.

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

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.

F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.

H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).

J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

1. Before submitting a Shop Drawing or Sample, Contractor shall:

a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determine and verify:

1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;

2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;

c. confirm that the Submittal is complete with respect to all related data included in the Submittal.

2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.

1. *Shop Drawings*

a. Contractor shall submit the number of copies required in the Specifications.

b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.

2. *Samples*

a. Contractor shall submit the number of Samples required in the Specifications.

b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Engineer's Review of Shop Drawings and Samples*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. *Resubmittal Procedures for Shop Drawings and Samples*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.

2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. *Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs*

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:

   a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.

   b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.

   c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.

2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03. 2.04, and 2.05.

F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.

B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:

1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and

2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.

C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:

1. Observations by Engineer;

2. Recommendation by Engineer or payment by Owner of any progress or final payment;

3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. Use or occupancy of the Work or any part thereof by Owner;

5. Any review and approval of a Shop Drawing or Sample submittal;

6. The issuance of a notice of acceptability by Engineer;

7. The end of the correction period established in Paragraph 15.08;

8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.

E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.

B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.

C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.

E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:

1. Checking for conformance with the requirements of this Paragraph 7.19;

2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and

3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.

F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.

G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.

D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. An itemization of the specific matters to be covered by such authority and responsibility; and

3. The extent of such authority and responsibilities.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.

1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.

2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.

C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

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

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.

B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

A. Engineer has the authority to reject Work in accordance with Article 14.

B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.

C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.

D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

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

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.

C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and

4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

B. If Owner has issued a Work Change Directive and:

1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.

2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.

B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.

B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.

C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);

2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or

3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will be determined as follows:

1. A mutually acceptable fixed fee; or

2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;

b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;

c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;

d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and

f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.

B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

A. *Purpose and Content*: Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal*: Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.

2. *Supporting Data*: The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.

    a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.

    b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

    The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review*: Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.

4. *Engineer's Full Review and Action on the Change Proposal*: Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and

4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.

5. Other costs consisting of the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.

2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.

3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work does not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. The cost of purchasing, renting, or furnishing small tools and hand tools.

3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

6. Expenses incurred in preparing and advancing Claims.

7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:

a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.

b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:

1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.

2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.

2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.

C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.

2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

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

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or

   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

    a. to supervise, direct, or control the Work;

    b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;

    c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;

    d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or

    e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

    a. the Work is defective, requiring correction or replacement;

    b. the Contract Price has been reduced by Change Orders;

    c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

    d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

    e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

    a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. The Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. The Contract Price has been reduced by Change Orders;

i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;

j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or

l. Other items entitle Owner to a set-off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.

2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.

2. The final Application for Payment must be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents;

   b. consent of the surety, if any, to final payment;

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

d. a list of all duly pending Change Proposals and Claims; and

e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Final Application and Recommendation of Payment*: If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Notice of Acceptability*: In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.

D. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.

E. *Final Payment Becomes Due*: Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such adjacent areas;
2. correct such defective Work;
3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.

B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.

C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.

D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

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

F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

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

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

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and

2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:

1. in person, by a commercial courier service or otherwise, to the recipient's place of business;

2. by registered or certified mail, postage prepaid, to the recipient's place of business; or

3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SUPPLEMENTARY CONDITIONS

OF THE CONSTRUCTION CONTRACT

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SUPPLEMENTARY CONDITIONS

OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms, if any, used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The paragraph address system used in these Supplementary Conditions is the same as the paragraph address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC-4.05."

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

SC-1.01.A.40 Add the following to Paragraph 1.01.A.40:

Trucking, shipping, delivery firms, consultants, and entities performing testing or inspection retained by Contractor or any Subcontractor are considered to be Subcontractors.

SC-1.01.A.45 Add the following to Paragraph 1.01.A.45:

Entities that rent construction equipment or machinery, but are not incorporated into the Work, are considered to be Suppliers. If such rental entity furnishes both equipment and one or more personnel to operate and maintain the equipment, such entity is a Subcontractor.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

SC-2.01 Delete Paragraphs 2.01.B. and C. in their entirety and insert the following in their place:

B. *Evidence of Contractor's Insurance:* When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies (including all endorsements, and identification of applicable self-insured retentions and deductibles) of insurance required to be provided by Contractor in this Contract. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

2.02 *Copies of Documents*

SC-2.02 Delete Paragraph 2.02.A in its entirety and insert the following new paragraph in its place:

A. Owner shall furnish to Contractor 5 paper copies of conformed Contract Documents incorporating and integrating all Addenda and amendments, if any, negotiated prior to the Effective Date of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional paper copies of the conformed Contract Documents will be furnished upon request at the cost of reproduction.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

SC-3.01 Add the following new paragraphs immediately after Paragraph 3.01.E:

F. The Specifications and other verbal components of the Contract Documents may vary in form, format, and style. Some Specification sections are written in varying degrees of streamlined or declarative style and some Specifications sections may, in comparison, employ a more-narrative style. Omissions of such words and phrases as "Contractor shall," "in conformity with," "as shown," or "as specified" are intentional in streamlined language in the Contract Documents. Omitted words and phrases are incorporated by inference. Similar types of provisions may appear in various parts of a Specifications section or elsewhere in the Contract Documents. Contractor shall not attempt to take advantage of any variation of form, format or style in Change Proposal(s) and Claim(s).

G. Cross referencing of Specification sections in a Specifications section's heading "Related Sections includes, but are not necessarily limited to: "and elsewhere within each Specifications section is provided as an aid and convenience to Contractor. Contractor shall not rely on cross referencing indicated and is responsible for coordinating the entire Work and providing a complete Project whether or not cross referencing is provided in each Specifications section or whether or not cross referencing is complete.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.05 *Delays in Contractor's Progress*

SC-4.05.C Amend Paragraph 4.05.C by adding the following subparagraphs:

5. *Weather-Related Delays*

a. If "abnormal weather conditions" as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: (1) that weather conditions were abnormal for the period of time in which the delay occurred, (2) that such weather conditions could not have been reasonably anticipated, and (3) that such weather conditions had an adverse effect on the Work on the critical path at the time of the delay.

b. The existence of abnormal weather conditions will be determined in accordance with Section 01 30 00 Special Conditions.

ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

5.03 *Subsurface and Physical Conditions*

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:

Report Title	Date of Report	Technical Data
Geotechnical Data Report – New Force Main Sewer Pipeline Proposed Carrier Bridge Pump Station Replacement Project	January 15, 2020	Entire report
Report of Additional Subsurface Exploration and Geotechnical Evaluation – Carrier Bridge Pump Station Replacement	June 13, 2024	Entire report

F. Drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site are not known to the Owner.

SC-5.04.A Add the following new paragraph immediately after Paragraph 5.04.A.4:

5. Contractor encounters human remains, recognizes the existence of burial markers, archaeological sites, historical sites, artifacts of potential archaeological or historical interest, or wetlands not shown or indicated in the Contract Documents, Contractor shall immediately cease operations that may disturb such area(s) and secure the adjacent Work; and Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations (Contractor shall continue to suspend such operations until otherwise instructed by Owner but shall continue with all other operations that do not affect those remains or features);

5.06 *Hazardous Environmental Conditions*

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

4. No reports or drawings related to Hazardous Environmental Conditions at or adjacent to the Site are known to the Owner.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (2010, 2013, or 2018 edition).

2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (2010, 2013, or 2018 edition).

6.02 *Insurance—General Provisions*

6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

D. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Jones Act (if applicable)	
Bodily injury by accident—each accident	$1,000,000
Bodily injury by disease—aggregate	$2,000,000
Employer's Liability	
Each accident	$1,000,000
Each employee	$1,000,000
Policy limit	$1,000,000
Stop-gap Liability Coverage	
For work performed in monopolistic states, stop-gap liability coverage must be endorsed to either the worker's compensation or commercial general liability policy with a minimum limit of:	$1,000,000

F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:

1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
2. damages insured by reasonably available personal injury liability coverage, and
3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage.
    a. Such insurance must be maintained for three years after final payment.
    b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
4. Underground, explosion, and collapse coverage.
5. Personal injury coverage.
6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:
1. Any modification of the standard definition of "insured contract" (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
2. Any exclusion for water intrusion or water damage.
3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
4. Any exclusion of coverage relating to earth subsidence or movement.
5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability (other than worker's compensation).
6. Any limitation or exclusion based on the nature of Contractor's work.
7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	**Policy limits of not less than:**
General Aggregate	$5,000,000
Products—Completed Operations Aggregate	$5,000,000

Commercial General Liability	Policy limits of not less than:
Personal and Advertising Injury	$2,500,000
Bodily Injury and Property Damage—Each Occurrence	$2,500,000

J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	$1,000,000
Each Accident	$1,000,000
Property Damage	
Each Accident	$1,000,000

K. *Umbrella or Excess Liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	$5,000,000
General Aggregate	$5,000,000

L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements:* Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein. If such umbrella or excess liability policy was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of $5,000,000 after accounting for partial attribution of its limits to underlying policies, as allowed above.

N. *Contractor's Professional Liability Insurance:* If Contractor will provide or furnish professional services under this *Contract*, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance must cover negligent acts, errors, or omissions

in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

Contractor's Professional Liability	Policy limits of not less than:
Each Claim	$1,000,000
Annual Aggregate	$2,000,000

6.04 *Builder's Risk and Other Property Insurance*

SC-6.04 Supplement Paragraph 6.04 with the following provisions:

F. *Builder's Risk Requirements:* The builder's risk insurance must:

1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).

    a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.

    b. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake, volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance will be provided through other insurance policies acceptable to Owner and Contractor.

2. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

3. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of contractors, engineers, and architects).

4. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).

5. extend to cover damage or loss to insured property while in transit.

6. allow for the waiver of the insurer's subrogation rights, as set forth in this Contract.

7. allow for partial occupancy or use by Owner by endorsement, and without cancellation or lapse of coverage.

8. include performance/hot testing and start-up, if applicable.

9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions, or until written confirmation of Owner's procurement of property insurance following Substantial Completion, whichever occurs first.

10 include as named insureds the Owner, Contractor, Subcontractors (of every tier), and any other individuals or entities required by this Contract to be insured under such builder's risk policy. For purposes of Paragraphs 6.04, 6.05, and 6.06 of the General Conditions, and this and all other corresponding Supplementary Conditions, the parties required to be insured will be referred to collectively as "insureds."

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provision:

G. *Coverage for Completion Delays:* The builder's risk policy will include, for the benefit of Owner, loss of revenue and soft cost coverage for losses arising from delays in completion that result from covered physical losses or damage. Such coverage will include, without limitation, fixed expenses and debt service for a minimum of 12 months with a maximum deductible of 30 days, compensation for loss of net revenues, rental costs, and attorneys' fees and engineering or other consultants' fees, if not otherwise covered.

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

H. *Builder's Risk and Other Property Insurance Deductibles:* The purchaser of any required builder's risk, installation floater, or other property insurance will be responsible for costs not covered because of the application of a policy deductible.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.02 *Supervision and Superintendence*

SC-7.02 Add the following to Paragraph 7.02, following Paragraph 7.02.B:

C. Unless Owner otherwise agrees in writing, the superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

SC-7.03 Add the following new paragraph immediately after Paragraph 7.03.C:

D. Contractor shall be responsible for the cost of overtime (premium) pay and other expense incurred by Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services,

occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

7.14 *Hazard Communication Programs*

SC-7.14 Add the following new paragraph immediately after Paragraph 7.14.A:

B *Single Prime Contract*: Contractor shall be responsible for coordinating exchange of safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws and Regulations. Contractor shall provide a centralized location for the maintenance of the safety data sheets or other hazard communication information required to be made available by any employer on the Site. Location of the material safety data sheets or other hazard communication information shall be readily accessible to the employees of employers on the Site.

SC-7.16.E.1 Delete in its entirety Paragraph 7.16.E.1.b, and replace with the following:

b. Engineer will provide timely review of such Submittals in accordance with the Schedule of Submittals accepted by Engineer. When Engineer deems such Submittals to be not in conformance with the Contract Documents, Engineer will furnish to Contractor written indication of such non-acceptance. When such Submittals are acceptable, Engineer's acceptance will be indicated in accordance with Specifications Section 01 33 00 – Submittal Procedures.

ARTICLE 8—OTHER WORK AT THE SITE

No Supplementary Conditions in this Article.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.13 *Owner's Site Representative*

SC-9.13 Add the following new paragraph immediately after Paragraph 9.12 of the General Conditions:

9.13 *Owner's Site Representative*

A. Owner will furnish an "Owner's Site Representative" (OSR) to represent Owner at the Site and assist Owner in observing the progress and quality of the Work. The Owner's Site Representative is not Engineer's consultant, agent, or employee. Owner's Site Representative will be designated by the Owner. The authority and responsibilities of Owner's Site Representative follow:

1. Conduct inspections of the Work, materials, and tests for compliance with the Contract Documents. Such inspections shall take place during normal times with the Contractor provided safe access to the Work.

2. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings

(but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.

3. *Review of Work; Defective Work*

    a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.

    b. Observe whether any Work in place appears to be defective. This does not impose on either OSR or Engineer any obligation to find all, or any specific element of, defective Work, for which Contractor remains solely responsible.

    b. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.

4. *Inspections and Tests*

    a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to (1) code-required tests and special inspections, and (2) those performed by public or other agencies having jurisdiction over the Work.

    b. Observe specific tests, inspections, and other field quality control required by the Contract Documents and performed by Contractor, Subcontractor, Supplier, or by testing or laboratories retained by any of them, .

    c. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.

5. *Payment Requests:* Review Applications for Payment with Contractor and advise Contractor regarding quantities or extent of the Work eligible for payment.

6. *Completion*

    a. Participate in Engineer's visits regarding inspection for Substantial Completion.

    b. Assist in the augmenting or amending the punch list of items to be completed or corrected prior to final inspection.

    c. *Final Inspection*: Participate in Engineer's visit to the Site, in the company of Owner and Contractor, regarding completion of the Work, and prepare a final punch list (if any) of items to be completed or corrected by Contractor.

    d. Observe whether items on the final punch list have been completed or corrected.

    e. *Record Documents*: Periodically during the Work, review with Contractor the status of Contractor's record documents required by the Contract Documents and advise Contractor on whether such record documents appear to comply with the Contract's requirements for record documents. Review final record documents submitted by Contractor.

7. The OSR will not:

    a. Authorize any deviation from the Contract Documents or substitution of materials, equipment (including "or-equal" items), or procedures or sequences indicated in the Contract Documents.

b. Advise on, issue directions relative to, or assume control or responsibility over any aspect of the means, methods, techniques, sequences or procedures of construction.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

SC-10.03 Add the following new subparagraph immediately after Paragraph 10.03.A:

1. On this Project, by agreement with Owner, the Engineer will not furnish a Resident Project Representative to represent Engineer at the Site or assist Engineer in observing the progress and quality of the Work.

ARTICLE 11—CHANGES TO THE CONTRACT

No Supplementary Conditions in this Article.

ARTICLE 12—CLAIMS

No Supplementary Conditions in this Article.

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

13.01 *Cost of the Work*

SC-13.01.B.5.c.(1) Supplement Paragraph 13.01.B.5.c.(1) by adding the following subparagraphs:

a) Prior to commencing Work at the Site, submit to Owner, through Engineer, copies of the equipment rental agreements for Owner's approval.

b) Should Contractor perform Work using rented construction equipment or machinery without Owner's written approval of the associated rental agreement and the parties subsequently disagree on the applicable rental rates, use of such construction equipment and machinery will be compensated on the basis of the rental rate book indicated in Paragraph SC-13.01.B.5.c.(2).

c) When the rental rate book is used basis for determining compensation for construction equipment and machinery leased from a rental firm, the hourly rate for such equipment shall be determined in accordance with Paragraph 13.01.B.5.(2) of the General Conditions.

SC-13.01.B.5.c.(2) Supplement Paragraph 13.01.B.5.c.(2) by adding the following sentence:

The equipment rental rate book that governs the included costs for the rental of machinery and equipment owned by Contractor (or a related entity) under the Cost of the Work provisions of this Contract shall be determined by Owner in negotiation with the Contractor.

SC-13.01.B.5.c Supplement Paragraph 13.01.B.5.c by adding the following subparagraphs:

4) *Inactive Equipment and Machinery*: Rental of construction equipment and machinery shall cease when the use thereof is no longer necessary for the Work. Periods of inactivity for such construction equipment or machinery will not be compensable unless agreed upon in writing by Owner, unless the costs of disassembly, removal, transportation, reassembly, and remobilization, as submitted to and accepted by Owner (with advice of Engineer) would exceed the cost of continuing to rent the item(s) during the period(s) of inactivity. Contractor is responsible for obtaining Owner's written approval for compensation for construction equipment and machinery for periods of inactivity. Owner is not responsible for retroactively approving such inactivity. "Period of inactivity" for such items includes periods when the construction equipment or machinery is not used or necessary for the logical and efficient progression of the Work, or when other, available equipment or machinery is suitable for performing the given task.

5) *Condition of Equipment and Machinery*: Construction equipment and machinery will be compensable only for serviceable construction equipment and machinery capable of efficiently performing its intended function at the Site. Construction equipment and machinery not in compliance with this Paragraph SC-13.01.B.5.c.5) is not eligible for compensation.

6) *Capped Compensation*: Compensation paid Contractor for a given item of Contractor-owned construction equipment or machinery will be capped at, and shall not exceed, the comparable purchase price of such item of equal or comparable capacity and capability.

SC-13.01.C.2 Supplement Paragraph 13.01.C.2 by adding the following definition of small tools and hand tools:

a. For purposes of this paragraph, "small tools and hand tools" means items in one or more of the following categories: (1) Items that are ordinarily required for the performing worker's job function, including but not limited to equipment which ordinarily has no associated licensing, insurance, or substantive storage costs; such as hammers, wrenches, socket tools, manual saws, power saws, chainsaws, common power tools, impact drills, threaders, benders, transits and theodolites and related equipment, and other tools transportable by hand, regardless of ownership of such items; (2) Items such as gang-boxes, ladders, hand carts and similar wheeled items manually operated by workers, extension cords, and similar items; (3) common testing equipment such as insulation testers (megger-testing equipment), amp meters, gas detectors, pressure gauges, and similar items; (4) A purchase price (if purchased new, at retail) of $500, although such limit is not absolute, and certain items may be deemed by Owner or Engineer as "small tools or hand tools" (and not eligible for compensation) even though such item may have a purchase price greater than the amount indicated in this Paragraph 13.01.C.2.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

No Supplementary Conditions in this Article.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

No Supplementary Conditions in this Article.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

No Supplementary Conditions in this Article.

ARTICLE 18—MISCELLANEOUS

No Supplementary Conditions in this Article.

EXHIBIT A—

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SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Location and description of Work and prior uses of the Site.
2. Construction Contracts for this Project.
3. Others retained by Owner for the Project.
4. Work by others under Owner's control on other projects.
5. Work by others not under Owner's control.
6. Work by Owner.
7. Sequence and progress of Work.
8. Contractor's use of the Site.
9. Easements and rights-of-way.
10. Utility owners.
11. Tree trimming, clearing, and tree removal.

1.2 LOCATION AND DESCRIPTION OF WORK

A. The Work is located in Asheville, North Carolina at French Broad River Park, 508 Riverview Drive, Asheville, NC 28806; Carrier Park, 220 Amboy Road, Asheville, NC 28806; and within the Biltmore Estate propery, 1 Lodge Street, Asheville, NC 28803.

B. The Project includes constructing the Work broadly described below, in accordance with the Contract Documents, with all related appurtenances. Work shown on the Drawings, or indicated in the Specifications, or indicated elsewhere in the Contract Documents is part of the Work, regardless of whether indicated below. The Work includes, but is not limited to, the following:

1. Site work.
2. Construction of temporary access and cofferdams within the French Broad River.
3. Open-cut river crossings.
4. Installation of sanitary sewer force mains.
5. Installation of gravity sanitary sewer.

C. Contracting Method: The Project will be constructed under a single prime construction Contract.

D. Hazardous Environmental Conditions:

1. To the best of Owner's knowledge, information, and belief, the prior use of the Site included a public park with various above and below ground utilities.

1.3 CONSTRUCTION CONTRACTS FOR THIS PROJECT

A. Single Prime Construction Contract: The Contract requires all the Work for the Project not expressly allocated to Owner or others in the Contract Documents.

1.4 OTHERS RETAINED BY OWNER FOR THE PROJECT

A. Engineer:

1. Engineer is identified in the Agreement.
2. Engineer's responsibilities for the Project, relative to Contractor, are indicated throughout the Contract Documents.

3. Whether the Engineer will furnish the services of a Resident Project Representative (RPR) for the Project is indicated in the Supplementary Conditions.

B. Non-Professional Services Contracted by Owner: Owner will retain services of the following entities to perform the services indicated relative to the Project. Contractor shall coordinate and schedule the Work with, and cooperate with, the entities performing the following services for Owner.

1. Code-Required Special Inspections and Testing:
   a. Owner has, or will, retain the services of a qualified testing laboratory to perform code-required testing and special inspections for the Work and selected other provisions of the Contract Documents related to field testing.

1.5 WORK BY OTHERS UNDER OWNER'S CONTROL - OTHER PROJECTS

A. Other construction contracts have been or will be awarded by Owner that are in close proximity to or border on the Work of this Project. Work under these other contracts is briefly described in this Article.

B. Indicate name and contract designation of other project:

1. Principal Work Location: Carrier Bridge Pump Station, 510 Riverview Drive, Asheville, NC 28806 and adjacent areas.
2. Scope:
   a. Project involves: Construction of a new pump station, force mains, and gravity influent sewer.
3. Contract times expected to start running on December 2025.
4. Approximate Substantial Completion: December 2028.
5. Approximate Final Completion: February 2028.

1.6 WORK BY OTHERS NOT UNDER OWNER'S CONTROL

A. Work by Utility Owners and Transportation Facility Owners:

1. Owner is not aware of any work by Utility or Transportation Facility Owners (not under Owner's control).

1.7 WORK BY OWNER

A. Owner will perform the following in connection with the Work:

1. Operate all existing valves, flow-control gates, pumps, equipment, and appurtenances that will affect Owner's operations or facility processes, unless otherwise specified or indicated.
2. Cut all trees within the Carrier Park and French Broad River Park project areas to within 3-feet of the ground. Tree cutting on the Biltmore property will be the responsibility of the Contractor.

1.8 SEQUENCE AND PROGRESS OF WORK

A. Sequencing:

1. Incorporate sequencing of the Work into the Progress Schedule.
2. Sequencing Requirements:
   a. The downstream crossing, located at French Broad River Park, shall be completed prior to beginning the upstream crossing, located at Carrier Park.
   b. Other sequencing requirements are identified on the Drawings.

1.9 CONTRACTOR'S USE OF SITE

A. Use of Site - General:

1. Contractors shall share use of the Site with other contractors and others specified in Articles 1.3 through 1.6 (inclusive) of this Section.

2. Relocate stored materials and equipment that interfere with operations of Owner, other contractors, and others performing work for Owner.

B. Owner will occupy the Site jointly with Contractor during construction for performance of Owner's typical operations. Coordinate with Owner in all construction operations to minimize conflicts between Contractor and Owner's employees and others under Owner's control. If the Site is a treatment facility or other production facility, Owner will have Owner's suppliers for deliveries of chemicals and other items accessing the Site from time to time, possibly on a daily basis.

1.10 EASEMENTS AND RIGHTS-OF-WAY

A. Easements and Rights-of-Way - General:

1. Easements and rights-of-way required for the permanent improvements included in the Work will be provided by Owner in accordance with the General Conditions and Supplementary Conditions.
2. Confine construction operations within Owner's property, public rights-of-way, easements obtained by Owner, and limits shown, and property for which Contractor has made arrangements directly with property owner(s).
3. Use care in placing construction tools, machinery and equipment, excavated materials, and materials and equipment to be incorporated into the Work to avoid damaging property and interfering with traffic.
4. Do not enter private property outside the construction limits without permission from the owner of the property.

B. On Private Property:

1. General limits of Owner-furnished easements are shown on the Drawings.

C. Within Highway and Railroad Rights-of-Way:

1. Permits required for the permanent facilities will be obtained by Owner. Contractor shall obtain and pay for work permits and fees for safety and inspection forces to be furnished by the right-of-way owner.
2. Work performed and Contractor's operations within rights-of-way, including railroad and highway rights-of-way, shall comply with requirements of right-of-way owner and owners of facilities thereon, and with applicable work permits, and orders of authorities having jurisdiction over right-of-way.

1.11 UTILITY OWNERS

A. Utilities known to Engineer and that may have Underground Facilities or other facilities in the vicinity of the Work are:

1. City of Asheville
2. Duke Energy Progress
3. AT&T
4. Spectrum
5. Dominion Energy

B. Utilities and their owners indicated in the Contract Documents are for Contractor's convenience. Neither Owner nor Engineer will be liable to Contractor or any utility owner for failure to indicate utility, its owner, or complete and correct contact information in the Contract Documents where Contractor's reasonable and ordinarily-exercised diligence would reveal the presence of the utility and its owner. Nothing in the Contract mitigates Contractor's responsibilities under the General Conditions, and Laws and Regulations, including "call before you dig" regulations.

1.12 TREE TRIMMING, CLEARING, AND TREE REMOVAL

A. Provide all required labor and equipment for trimming, clearing, and tree removal not performed by the Owner.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

SECTION 01 13 00
PUBLIC IMPACT MITIGATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Contractual requirements for the protection of the public and the reduction of impacts to the public

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 - Procurement and Contracting Requirements.
2. Division 01 - General Requirements.

1.2 QUALITY ASSURANCE

A. Referenced Standards:

1. Occupational Safety and Health Administration (OSHA).
2. Governing Noise Control, Emissions Control, Fugitive Dust Control Bylaw, or similar regulation.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 GENERAL

A. The Project is located in close proximity to residences, public parks and roads. It is of prime importance that the Contractor implements all practical mitigation measures to reduce impact to the neighborhood during the execution of the Work.

B. The Contractor shall cooperate with the Owner and Engineer, the various utility companies, suppliers, other contractors, property owners and local residents.

C. The Contractor shall ensure that its staff, subcontractors and suppliers behave in a professional manner to other contractors, Owner and Engineer staff and the general public.

3.2 PUBLIC RELATIONS AND COOPERATION

A. The Engineer has produced the following communications protocol which outlines the project team's roles and responsibilities. The Contractor shall follow this communications protocol. The Owner is the primary communicator with the public and the media. However, the Contractor will have a role with the public on site as defined below. The Contractor shall refer any media requests to Owner.

B. For on-site communication with the public, the Contractor shall appoint a community liaison person to notify the affected residents and establishments during utility disruption, perceived or actual safety issues, parking and traffic changes, etc. This person shall be a member of the Contractor's crew who is onsite the majority of the time.

C. The community liaison person shall work independently as necessary on time sensitive issues and with the Owner's Representative when time permits in such situations. The community liaison person shall promptly address concerns or negative impacts arising from execution of the Work.

D. The Contractor, at the Engineer's reasonable request, shall change methods or timing or performing portions of the Work in order to reduce public impacts or address concerns of the public.

E. The Contractor shall work with the Engineer to locate noisy, odorous or exhaust producing equipment or activities away from high impact areas.

3.3 PARTNERING

A. The Contractor shall partner with the Owner and Engineer in addressing local residents' concerns regarding construction work. The Contractor's Project Manager or other senior employee and community liaison person shall attend public meetings organized by Owner with area residents.

B. The Contractor shall be required to make and keep commitments to local residents regarding aspects of the construction work that impact local residents.

C. The Contractor shall address Public Impact Mitigation as a standing agenda item for regular construction progress meetings.

3.4 ACCESS AND PUBLIC SAFETY

A. The Contractor shall effectively warn and protect the public from any danger or harm related to the implementation of the work. This includes appropriate signage and fencing to restrict public access to the construction site.

B. No material or equipment shall be stored where it may interfere with the free and safe passage of public traffic, or in such a manner that it may create a hazard to the public. At the end of each day's work, and at other times when construction operations are suspended for any reason, the Contractor shall remove all equipment and other obstructions from that portion of the all areas open for use by public traffic.

3.5 SITE CLEANLINESS

A. The Work Site shall be kept in a clean and neat condition and shall not be unnecessarily encumbered with equipment, materials, or debris.

B. The Contractor shall, at all times conduct the work in an orderly and tidy manner, and shall at suitable intervals, acceptable to the Engineer, remove from the Work Site any accumulation of rubbish or refuse matter. At no time shall any person employed by the Contractor, or by any sub-contractors, discard litter or garbage or recyclables on or adjacent to the Work Site, except into suitable containers provided by the Contractor for this purpose.

C. The Contractor shall ensure that roads, sidewalks, and driveways impacted by the work are clean and swept at the end of the day, or as directed by the Engineer.

D. The Contractor shall prevent spillage from vehicles on public or private roads along which excavated spoil, construction materials, or refuse, is hauled, through tarping or other means. Where any such spillage occurs, it shall be promptly cleaned up.

E. The Contractor shall have appropriate equipment readily available for dust and mud control.

F. If the Contractor fails to clean the Work Site to the satisfaction of the Engineer, the Owner may undertake the work and deduct the associated cost from payments due to the Contractor.

3.6 WORK HOURS AT THE WORK SITE

A. Unless otherwise noted or agreed upon by the Engineer, the hours of work shall be from 7:00 am to 6:00 pm on any weekday. No work on Saturday or Sunday or an Owner holiday.

B. The Contractor shall schedule noisy work, including, but not limited to, pile driving, jack hammering, vacuum trucks, between 8:00 am and 5:00 pm.

C. Before and after the hours of work the Contractor shall avoid nuisance noise including offloading of equipment or materials, warming up of heavy equipment, car stereos, slamming tailgates, backup beepers, workers yelling or any other thing that will generate nuisance noise.

3.7 SEGREGATION OF THE WORK SITE

A. The Contractor shall limit the Work, to within the temporary construction easement boundaries shown on the Contract Drawings.

B. The Contractor shall provide unimpeded public access to the areas beyond the limits of the Work and prevent the public from entering all areas where Work is being performed.

C. At the end of each working day, or if left unattended, any open excavation shall be securely fenced. Moduloc type construction fencing shall be used in urban areas.

D. The Contractor shall protect the public through means such as fencing around equipment, or as otherwise directed by the Engineer.

3.8 PARKING

A. The following parking, in order of preference, is available to the Contractor for worker parking throughout the Contract duration and as directed by the Engineer:

1. Parking which the Contractor can create and maintain at the Work Site in compliance with all other requirements regarding vehicles on the Work Site;

B. The Contractor shall coordinate and cooperate with the Engineer in the establishment and assignment of all work parking at the identified locations or any other location authorized by the Engineer, all at no extra cost to the Owner.

C. Where necessary, the Contractor shall be responsible for moving employees between parking area(s) and Work Site.

3.9 NOISE

A. The Contractor shall comply with the governing municipality's noise bylaw or the requirements below whichever is more stringent. Measurement of noise levels for the purpose of checking compliance with this requirement shall be done in accordance with the requirements of the applicable noise bylaw.

B. At no time during specified working hours shall the noise generated by the work, exceed the applicable bylaw limits, or, where no bylaw limits apply, "continuous" noise levels shall not exceed 85 dBA at the nearest property line, where "continuous" noise level is the noise level exceeded for more than 3 minutes in any 15 minute period.

C. The Contractor shall cooperate with the Engineer in choosing a location for stationary equipment to minimize noise to the public.

D. The potential for noise impact to the commercial and residential properties adjacent to the Work Site and access roads has been predicted based upon anticipated construction activities and equipment. Noise monitoring may be conducted in the neighborhood by the Engineer throughout the project. If measurements indicate that the required noise levels are not being met, the Contractor shall identify and implement noise control measures necessary to comply with applicable bylaws and these contractual requirements.

3.10 EQUIPMENT NOISE LIMITS

A. Prior to mobilization, the Contractor shall submit to Engineer a list of all major equipment to be used on the Work Site throughout the Contract which will generate more that 85 dBA. This list shall include make, model and age, plus anticipated noise level based on manufacturer's data and the contractors proposed noise reduction plans. The Engineer will accept or reject the use of specific equipment which produces higher noise levels. With the exception of any equipment specifically accepted by Engineer, the maximum acceptable noise level produced by any individual machine shall be 85 dBA when measured at 15 m from the equipment.

B. The work site shall be laid out to minimize the requirement for trucks and mobile equipment to back up. Back-up alarms shall be adjusted to be clearly audible above the ambient noise level, as required by OSHA but shall be no louder than necessary. Where after hours work is required and approved, OSHA approved alternatives to the use of back-up alarms may be required.

C. The Engineer reserves the right to test any equipment on the Work Site at any time to determine if equipment noise emission exceeded the Contract limits. The Contractor shall make any equipment, with operator, available for testing, at or near its working location, at no additional cost.

D. In the event that any equipment does not satisfy the Contract noise level limits, the equipment shall be replaced by a quieter machine or it shall be modified, for example, by providing better exhaust silencing or reducing its governed engine speed, or building a sound enclosure and the alternate or modified machine may then be re-tested. The cost of any re-testing by the Engineer will be charged to the Contractor.

3.11 MAINTENANCE AND USE OF EQUIPMENT

A. Regular maintenance of equipment shall be undertaken to reduce noise and emissions produced by that equipment. This includes, but not limited to, regular greasing of treads, chassis and pivot points, replacement of worn parts, brake checks, mechanical overhauls, attention to exhaust and emission control systems and any special acoustical fixtures.

B. All equipment used on the Work Site shall be equipped with, and operated with, all applicable covers, hoods, shields, and guards in place and latched shut, and all exhaust and emission control systems in place and fully operational. Air-powered equipment such as rock drills and jackhammers shall be equipped with effective mufflers on the air exhausts. The manufacturer's recommendation shall be followed.

C. Equipment, which is not in use, shall be shut down, and not left idling for periods longer than 15 minutes to reduce noise and negative impacts to air quality.

D. Brakes on trucks shall be adjusted and maintained to avoid objectionable brake "squeal" or noise. Engine brakes shall not be used anywhere on the Work Site or on any access roads, except in an emergency.

E. Operators of excavating equipment shall use minimum power consistent with reasonable operation of equipment, and shall avoid banging of buckets on truck bodies, or other objects.

3.12 BILTMORE PROPERTY

A. Contractor shall repair any damage to existing structures, walks, access roads, agricultural fields, and landscaping. Disturbed areas shall be restored in as good or better condition than existed prior to construction.

B. Contractor shall park all trucks and equipment, and place materials, in predesignated areas only. Do not park or place materials on roads or trails.

C. Contractor shall leave equipment and materials in an orderly fashion at the end of each workday.

D. Contractor shall abide by all posted speed limits and shall not impede traffic at any time.

E. Contractor shall make every effort not to spook horses and riders with use of equipment.

END OF SECTION

SECTION 01 22 00

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This section covers methods of measurement and payment for items of work under Bid Schedule.

1.2 GENERAL

A. The total bid price shall cover all work required by the Contract Documents. All costs in connection with the proper and successful completion of the work, including furnishing all materials, equipment, supplies, and appurtenances; providing all construction plans, equipment, and tools; and performing all necessary labor and supervision to fully complete the work, shall be included in the unit and lump sum prices bid. All work not specifically set forth as a pay item in the Bid Form shall be considered subsidiary obligations of Contractor and all costs in connection therewith shall be included in the prices bid.

1.3 ESTIMATED QUANTITIES

A. All estimated quantities stipulated in the Bid Form or other Contract Documents are approximate and are to be used only (a) as a basis for estimating the probable cost of the Work, and (b) for the purpose of comparing the bids submitted for the Work. The actual amounts of work done and materials furnished under unit price items may differ from the estimated quantities. The basis of payment for work and materials will be the actual amount of work done and materials furnished. Contractor agrees that he will make no claim for damages, anticipated profits, or otherwise on account of any difference between the amounts of work actually performed and materials actually furnished and the estimated amounts therefore.

Except where otherwise specified, the unit or lump sum bid price bid for each item of work which involves excavation or trenching shall include all costs for such work. No direct payment shall be made for excavation or trenching unless shown elsewhere.

1.4 MEASUREMENT AND PAYMENT

A. Mobilization:

1. Measurement for payment shall be per the bid form for the work described below. Payment will only be made for the actual quantity performed or installed that meets all requirements of the Contract Documents.
2. This work shall include all costs for bonds, insurance, permits, establishing field offices, moving construction equipment to the site, project management, demobilization, and other necessary but "nonscheduled" work.
3. Mobilization shall not exceed 3% of Total Bid.

B. Temporary Access to Force Mains:

1. Measurement for payment shall be per the bid form for the work described below. Payment will only be made for the actual quantity performed or installed that meets all requirements of the Contract Documents.
2. This work shall include providing all materials, labor, equipment, and appurtenances necessary to access both sides of the force main construction site, including: project survey control, construction surveying and staking; clearing; erosion and sediment control; maintenance and repair of access as required for continued use; restoration; and all other related and necessary materials, work, and equipment required, not included in other bid items, to provide a completed project in accordance with the Contract Documents.

C. Temporary Access to Gravity Sewer:

1. Measurement for payment shall be per the bid form for the work described below. Payment will only be made for the actual quantity performed or installed that meets all requirements of the Contract Documents.
2. The work shall include providing all materials, labor, equipment, and appurtenances necessary to access both sides of the gravity sewer construction site, including: project survey control, construction surveying and staking; clearing; erosion and sediment control; temporary bridges and culverts; temporary trail; construction traffic signs, flagging, and coordination; maintenance and repair of access as required for continued use; restoration; and all other related and necessary materials, work, and equipment required, not included in other bid items, to provide a completed project in accordance with the Contract Documents.

D. Temporary Cofferdam for Force Mains:

1. Measurement for payment shall be per the bid form for the work described below. Payment will only be made for the actual quantity performed or installed that meets all requirements of the contract documents.
2. The work shall include providing all materials, labor, equipment, and appurtenances necessary to construct the temporary cofferdams, including: design; regulatory agency coordination; construction surveying and staking; clearing; erosion and sediment control; river safety; construction of cofferdams on each side of the river; maintenance and repair of cofferdams; riverbank stabilization; removal of all temporary materials; restoration; and all other related and necessary materials, work, and equipment required, not included in other bid items, to provide a completed project in accordance with the Contract Documents.

E. Temporary Cofferdam for Gravity Sewer:

1. Measurement for payment shall be per the bid form for the work described below. Payment will only be made for the actual quantity performed or installed that meets all requirements of the Contract Documents.
2. Work shall include providing all materials, labor, equipment, and appurtenances necessary to construct the temporary cofferdams, including: design; regulatory agency coordination; construction surveying and staking; clearing; erosion and sediment control; river safety; construction of cofferdams on each side of the river; maintenance and repair of cofferdams; riverbank stabilization; removal of all temporary materials; restoration; and all other related and necessary materials, work, and equipment required, not included in other bid items, to provide a completed project in accordance with the Contract Documents.

F. 36-inch Force Mains:

1. Measurement for payment shall be per the bid form for the work described below. Payment will only be made for the actual quantity performed or installed that meets all requirements of the contract documents.
2. The work shall include: providing all materials, labor, equipment, and appurtenances necessary to install the pipe, including: construction surveying and staking; clearing; erosion and sediment control; furnishing, transporting, unloading and temporary storage, and installing all pipe, fittings, manholes, and all other materials; trench excavation including rock removal; pre- and post-construction CCTV inspection of 54” sewer; dewatering; pipe installation and jointing; constructing the specified bedding and backfilling including concrete encasement; compacting; restoration of all ground surfaces; legal disposal of spoil; testing; seeding; clean up; as-built survey and drawings; and all other related and necessary materials, work, and equipment required, not included in other bid items, to provide a completed project in accordance with the Contract Documents.

G. 60-Inch Gravity Sewer:

1. Measurement for payment shall be per the bid form for the work described below. Payment will only be made for the actual quantity performed or installed that meets all requirements of the contract documents.

2. The work shall include: providing all materials, labor, equipment, and appurtenances necessary to install the pipe, including: construction surveying and staking; clearing; erosion and sediment control; furnishing, transporting, unloading and temporary storage, and installing all pipe, manholes, and all other materials; trench excavation including rock removal; pre-blast surveys; dewatering; pipe installation and jointing; constructing the specified bedding and backfilling including concrete encasement; compacting; restoration of all ground surfaces; legal disposal of spoil; testing; seeding; clean up; as-built survey and drawings; and all other related and necessary materials, work, and equipment required, not included in other bid items, to provide a completed project in accordance with the Contract Documents.

H. Flood Recovery:

1. Measurement for payment shall be per the bid form for the work described below. Payment will only be made for the actual quantity performed or installed that meets all requirements of the contract documents.
2. The work shall include furnishing and installing all materials, labor, equipment, and appurtenances necessary to recover from site flooding for flood levels that both exceed the maximum cofferdam top elevations provided on the drawings and that overtop the installed cofferdam, including: removal of materials and equipment within cofferdam; construction delay during flood event; repair any changes or damage to cofferdam or other items; dewatering and mud/soil removal within cofferdam and installed sections of pipe; restarting construction; and all other related and necessary materials, work, and equipment required, not included in other bid items, to provide a completed project in accordance with the Contract Documents.
3. Payment will not be made for lower flood events that do not exceed the maximum cofferdam top elevations provided on the drawings regardless of the actual height of the constructed cofferdam. Payment will not be made due to flooding of the cofferdam caused by seepage underneath or through the cofferdam or from surface runoff into the cofferdam area.

END OF SECTION

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SECTION 01 25 13
PRODUCT SUBSTITUTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. The procedure for requesting substitution approval for a product which is specified by descriptive or performance criteria or defined by reference to one or more of the following:
   a. Name of manufacturer.
   b. Name of vendor.
   c. Trade name.
   d. Catalog number.
2. This Section does not address substitutions for major equipment. See "Instructions to Bidders."

B. Related Sections include but are not necessarily limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of The Contract.
2. Division 1 - General Requirements.

C. Requests for Substitution - General:

1. Base all bids on materials, equipment, and procedures specified.
2. Certain types of equipment and kinds of material are described in specifications by means of references to names of manufacturers and vendors, trade names, or catalog numbers. When this method of specifying is used, it is not intended to exclude from consideration other products bearing other manufacturer's or vendor's names, trade names, or catalog numbers, provided said products are capable of accomplishing the same tasks as the products specifically indicated.
3. Other types of equipment and kinds of material may be acceptable.

1.2 QUALITY ASSURANCE

A. In making request for substitution or in using an approved product, Contractor represents:

1. He has investigated proposed product and has determined that it is adequate or superior in all respects to that specified, and that it will perform function for which it is intended.
2. He will provide same guarantee for substitute item as for product specified.
3. He will coordinate installation of accepted substitution into work, to include building modifications if necessary, making such changes as may be required for work to be complete in all respects.
4. He waives all claims for additional costs related to substitution which subsequently arise.

1.3 DEFINITIONS

A. Product: Manufactured material or equipment.

1.4 PROCEDURE FOR REQUESTING SUBSTITUTION

A. See General Conditions.

B. For all materials, equipment, and procedures specified, submit requests for substitution after award of Contract. Requests must be submitted in writing by the Contractor only.

C. Transmittal Contents:

1. Product identification:
   a. Manufacturer's name.

b. Telephone number and representative contact name.
c. Specification section or drawing reference of originally specified product, including discrete name or tag number assigned to original product in the Contract Documents.

2. Manufacturer's literature clearly marked to show compliance of proposed product with Contract Documents.
3. Itemized comparison of original and proposed product addressing product characteristics including but not necessarily limited to:
   a. Size.
   b. Composition or materials of construction.
   c. Weight.
   d. Electrical or mechanical requirements.
4. Product experience:
   a. Location of past projects utilizing product.
   b. Name and telephone number of persons associated with referenced projects knowledgeable concerning proposed product.
   c. Available field data and reports associated with proposed product.
5. Data relating to changes in construction schedule.
6. Data relating to changes in cost.
7. Samples:
   a. At request of Engineer.
   b. Full size if requested by Engineer.
   c. Held until substantial completion.
   d. Engineer not responsible for loss or damage to samples.

1.5 APPROVAL OR REJECTION

A. Written approval or rejection of substitution given by the Engineer.

B. Engineer reserves the right to require proposed product to comply with color and pattern of specified product if necessary to secure design intent.

C. In event substitution results in a change of Contract price or time, provisions in General Conditions will be applied for adjustment.

D. It is the Contractor's responsibility, not Engineer’s, to prove that the proposed product is equal to or greater than the approved product.

E. Substitutions will be rejected if:

1. Submittal is not through the Contractor with his stamp of approval.
2. A detailed comparison of the proposed product to an approved product is not provided that clearly proves the product is equal to or greater.
3. Requests are not made in accordance with this Section.
4. In the Engineer's opinion, acceptance will require substantial revision of the original design.
5. In the Engineer's opinion, substitution is not equal to original product specified or will not perform adequately the function for which it was intended.

END OF SECTION

SECTION 01 26 13

REQUESTS FOR INFORMATION (RFI)

PART 1 - GENERAL

1.1 SUMMARY

A. This Specification Section specifies administrative and procedural requirements for handling and processing Requests for Information (RFI).

B. RFI is intended for requesting clarifications and interpretations of Contract Documents due to apparent inconsistencies, errors or omissions in Contract Documents, and due to unanticipated existing conditions.

C. RFI is not intended for general communication, requesting substitutions, Contractor's proposed changes, resolution of nonconforming work, or coordination between contractors or for general questions not related to Contract Documents.

D. RFI process is intended to be a cooperative effort between Engineer and Contractor to expedite responses to RFIs and maintain progress of Work without utilizing other lengthy procedures.

1.2 RFI SUBMITTAL PROCEDURE

A. All RFIs shall be submitted on the form attached to this Specification Section, or on mutually agreeable forms to be provided at the preconstruction meeting, and shall include all backup information.

1. Backup information shall include, but not be limited to Contractor verified field measurements, quantities, dimensions, installation requirements, materials, catalog number, and any other information that will assist the Owner in reviewing the RFI.

B. Within ten (10) working days of receipt of RFI, Engineer will either return a response to the RFI or notify Contractor when a response will be issued.

1.3 COMMENCEMENT OF RFI-RELATED WORK

A. No portion of the work requiring instruction from the Engineer shall begin until RFI has been reviewed by the Engineer and returned to Contractor with instruction or with notation indicating Engineer response is not necessary.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION

3.1 REQUESTS FOR INFORMATION

A. Review of Contract Documents and Field Conditions:

1. Before starting each portion of Work, Contractor shall carefully study and compare various Drawings, Specifications and other Contract Documents, coordination drawings, Shop Drawings, prior correspondence or documentation relative to that portion of Work, as well as information furnished by Owner.
2. Contractor and Subcontractors shall evaluate and take field measurements of conditions related to that portion of Work and shall observe any conditions at site affecting it.
3. These obligations are for purpose of facilitating coordination and construction by Contractor.

4. Any errors, inconsistencies or omissions discovered in Contract Documents shall be reported promptly to Engineer as a properly prepared and timely RFI.

B. Contractor's and Subcontractor's Responsibilities:

1. When interpretation, clarification or explanation of portion of Construction Documents is needed by Contractor, Subcontractor, Vendor or Supplier, the request shall be processed through Contractor.
    a. Review request for completeness, quality, proper referencing to Drawing or Specification Section and reason submitted.
    b. If request is not acceptable, it shall be returned to submitter with comments regarding reason for being returned.
    c. Make every attempt to validate, resolve or respond to RFI by thoroughly researching and reviewing Contract Documents and field conditions.
    d. Respond to RFI accordingly if review of RFI discloses a response or is related to coordination of construction or other issue not related to Contract Documents.
    e. If unable to respond to request, it shall be restated in clear, concise, correct, complete and easily understood manner, and rewritten if necessary, additional information included if necessary, and only then submitted to Engineer for response.
2. Follow these procedures in developing an RFI:
    a. List specific Contract Documents researched when seeking information being requested.
    b. Reference all applicable Contract Drawings by sheet number, section, detail, etc., Specifications by section and paragraph number, and reference any other relevant documents.
    c. The field titled "Regarding" on attached RFI form must be clear for future reference in reports or correspondence.
    d. Clearly state request and provide Contract Document references and any additional information needed so request can be fully understood, including sketches, photos or other reference material.
    e. Fully assess issues, suggest any reasonable solutions and include various factors, including potential costs, schedule impacts, if any, and recommendations which will aid in determining a solution or response.
        1) If a reasonable solution cannot be suggested, a statement to that effect should be so stated.
    f. Indicate reason request is being submitted.
    g. Any critical RFI's requiring a rapid response shall clearly indicate such with an explanation as to why RFI is critical.
    h. Priority for responses shall be indicated when multiple RFI's are submitted within short period of time.
3. Copies of responses to RFI's shall be distributed to all parties affected.
4. A response to RFI shall not be considered a notice to proceed with a change that may revise the Contract Sum or Contract Time, unless authorized by Owner in writing.
5. If response to RFI is determined incomplete, it shall be resubmitted with reason response is unacceptable and any necessary additional information within five (5) days of time of receipt of response to RFI.

C. RFI Submittal Numbering:

1. RFI's shall be assigned unique numbers in sequential order (1, 2, 3, 4, etc.).
2. A resubmitted RFI or a previously answered RFI requiring revising or further clarification shall be submitted using original RFI number proceeded by ".1" to indicate revision one of RFI (i.e.: RFI No. 34.1 for revision 1 to RFI No. 34).
3. Engineer may return RFI without response for following reasons:
   a. Request is unclear or incomplete.
   b. Detailed information not provided.
   c. Is related to construction means, methods or techniques.
   d. Is related to health or safety measures.
   e. Is due to Contractor's lack of adequate coordination.
   f. Is for coordination between Subcontractors.
   g. Is considered a "Substitution Request."
   h. Is considered a "Contractor Proposed Change."
   i. Is due to non-conformance.
   j. Response is required by another party.

END OF SECTION

EXHIBIT A

Request for Information Form

Contractor's RFI No. _____ Engineer's RFI No. _____

Contract: _____

Contractor: _____

Owner: _____ Owner's Contract No._____

Engineer **HDR Engineering, Inc. of the Carolinas** Engineer's Contract No._____

THIS REQUEST BY:_____ cc to:_____
(Name of the Contractor's Representative)

REFERENCE: DIVISION _____ SECTION _____ PLAN SHEET NO. _____

_____

_____

_____

_____

_____

ATTACHMENTS _____

INTERPRETATION BY: _____Date: _____, 20___
(Name of the Engineer's Representative)

_____

_____

_____

_____

_____

ATTACHMENTS_____

The General Conditions specifies that once the Engineer provides a response to a Contractor's RFI, that determination shall be final and binding on the Contractor unless the Contractor delivers to the Owner written notice of a change in the work within a certain period of time of receipt of that determination. See the GCs for further clarification.

cc to: _____

_____

SECTION 01 30 00
SPECIAL CONDITIONS

PART 1 - GENERAL

1.1 PRECONSTRUCTION CONFERENCE

A. A preconstruction conference shall be held at MSD in Asheville, North Carolina after award of Contract. Engineer will notify the Contractor as to the date and time of the conference in advance of the proposed date. Contractor's Project Manager and Project Superintendent and Contractor's Subcontractor Representatives shall attend.

1.2 PROJECT SIGNS

A. Signs permitted only upon approval of Owner.

1.3 DRAWINGS AND CONTRACT DOCUMENTS FOR CONTRACTOR USE

A. Contractor shall pick up all "no-charge" documents within 10 days from date of Notice to Proceed. Up to 5 sets will be provided.

B. Additional documents after "no-charge" documents will be furnished to Contractor at cost.

1.4 PROJECT PHOTOGRAPHS

A. Contractor shall take photographs along the entire alignment before any construction activities begin. At minimum photographs shall be taken to clearly indicate condition of every driveway and roadway that will be crossed and condition to lawn areas and landscaping of every property being impacted.

B. Contractor shall provide a complete digital set of color photographs to both the Owner and Engineer.

C. Contractor shall notify Owner and Engineer 48 hours in advance of taking the photographs to allow them to be present.

1.5 TESTING

A. Payment for Soil, Concrete and Other Testing:

1. Soils and concrete testing: The Owner will pay for "Passing" soils and "Passing" concrete tests on the Project. Costs of corrective action, costs of "Failing" soils and concrete tests, and cost of testing associated with establishment of mix design are the sole responsibility of the Contractor.
2. Other testing: Required testing, testing procedures, reports, certificates, and costs associated with all phases of securing required satisfactory test information which may be required by individual sections of Specifications or Drawings are the full responsibility of the Contractor.

1.6 ORDER OF CONSTRUCTION AND CONSTRUCTION SCHEDULE

A. Construction operations will be scheduled to allow the Owner uninterrupted operation of existing adjacent facilities. Coordinate connections with existing work to ensure timely completion of interfaced items

B. At no time shall Contractor or his employees modify operation of the existing facilities or start construction modifications without approval of the Owner except in emergency to prevent or minimize damage.

C. Within 10 days after award of Contract, submit for approval a critical path type schedule. Key PROJECT MILESTONES to be incorporated in Proposed Contract Schedule include but are not necessarily limited to the following for project:

1. Contract Notice to Proceed.
2. Mobilization: Contractor’s option.

3. Erosion control device installation.
4. Shop drawings submittal completion: See Section 01 33 00.
5. Substantial Completion for Project.
6. Start-up and Training.
7. Substantial and satisfactory completion (Final completion) for all Work.

Account for schedule of Subcontracts. Include proper sequence of construction, various crafts, purchasing time, shop drawing approval, material delivery, equipment fabrication, startup, demonstration, and similar time-consuming factors. Show on schedule as a minimum, earliest starting, earliest completion, latest starting, latest finish, and free and total float for each task or item.

No Work will be scheduled on New Years' Day, Martin Luther King Jr. Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the following day, Christmas Day and the previous day. Unless the Contractor given Engineer's Field Representative a 72-hour notice, no Work will be scheduled or performed on Saturday or Sunday. This requirement will be waived for any emergency that threatens the safety of the public or puts the Project at risk.

Evaluate schedule no less than monthly. Update, correct, and rerun schedule and submit to Engineer in triplicate with pay application to show rescheduling necessary to reflect true job conditions. When shortening of various time intervals is necessary to correct for behind schedule conditions, indicate steps to implement to accomplish work in shortest schedule. Information shall be submitted to Engineer in writing with revised schedule.

D. According to the North Carolina State Climate Office, the average number of days a year in which 0.10 inch or more of precipitation can be expected is 77. This equates to 55 work days (Monday through Friday). A time extension will not be considered unless more than 55 scheduled work-days receive more than 0.10 inch of precipitation. Precipitation occurring before the work-day has started or after the work day has ended will not counted.

E. If Contractor does not take necessary action to accomplish work according to schedule, he may be ordered by Owner in writing to take necessary and timely action to improve work progress. Order may require increased work forces, extra equipment, extra shifts or other action as necessary. Should Contractor refuse or neglect to take such action authorized, under provisions of this contract, Owner may take necessary actions including, but not necessarily limited to, withholding of payment and termination of contract.

F. Upon receipt of approved "Work Schedule," within 10 days, submit to Engineer an estimated payment schedule by each month of project duration. Include a composite curve to show estimated value of work complete and stored materials less specified retainage. Establish key dates when work will be 50, 80, 90, and 100 percent complete. During the course of work, update with new composite curves at key months or whenever variation is expected to be more than plus or minus 10 percent. Retain original or previous composite curves as dashed curves on all updates. Include a heavy plotted curve to show ACTUAL payment curve on all updates.

G. Furnish 3-week look ahead schedule at each construction meeting.

1.7 PROJECT MEETINGS

A. The Engineer will conduct construction meetings involving:

1. Contractor's project manager.
2. Contractor's project superintendent.
3. Owner's designated representative(s).
4. Engineer's designated representative(s).
5. Contractor's subcontractors as appropriate to the work in progress.

B. Meetings conducted may be called by Engineer at convenient times throughout the duration of the project.

C. The Engineer will take meeting minutes and submit copies of meeting minutes to participants and designated recipients identified at the Preconstruction Conference. Corrections, additions or deletions to the minutes shall be noted and addressed at the following meeting.

D. The Engineer will endeavor to schedule meetings for most convenient time frame.

E. The Contractor shall have available at each meeting up-to-date record drawings.

1.8 VIDEO RECORDING EQUIPMENT (NOT REQUIRED)

1.9 SPECIAL CONSIDERATIONS

A. Contractor shall be responsible for negotiations of any waivers or alternate arrangements required to enable transportation of materials to the site.

B. Maintain conditions of access road to site such that access is not hindered as the result of construction related deterioration.

C. Store and stockpile materials in an orderly manner and protect against damage.

D. Maintain in good repair temporary structures, fences, barricades, and other related items.

E. Electrical Power and Lighting. The electrical power required during construction shall be provided by each Contractor as required by him. This service shall be installed by a qualified electrical contractor. Lighting shall be provided by each Contractor in all spaces at all times where necessary for good and proper workmanship, for inspection or for safety.

F. Special Hazards. Each Contractor and his subcontractor's Public Liability and Property Damage Insurance shall provide adequate protection against the following special hazards:

1. Blasting
2. Excavation
3. Flooding

G. Safety. Each Contractor alone shall be solely and completely responsible for conditions of the job site in connection with his work, including safety of all persons and property, preparatory to and during performance of the Work. This requirement shall apply continuously and not be limited to normal working hours.

The Construction Documents, and the construction hereby contemplated are to be governed, at all times, by applicable provisions of local and State laws, and regulations, and Federal laws, including but not limited to, the latest amendments of the following: Department of Labor, Bureau of Labor Standards Safety and Health Regulations for Construction, and Williams and Steiger Occupational Safety and Health Act of 1970, including rules and regulations pursuant thereto, applicable to the Work and performance of the Contract (OSHA).

The duty of the Engineer to conduct construction review of each Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the construction site.

All explosives shall be stored in a secure manner and all storage places shall be marked clearly "DANGEROUS EXPLOSIVES", and shall be in the care of competent watchmen at all times.

H. Inspections by Federal and State Agencies. Authorized representatives and agents of the State and Federal Government shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

I. Water. Water used on the project shall be fresh and of drinkable quality. Water obtained from nearby streams will not be acceptable for use on the project. The Contractor shall make arrangements to purchase fresh water for his drinking, normal use and use in testing, disinfecting and flushing lines from the Owner.

1.10 DATA AND MEASUREMENTS

A. The data given in the specifications and shown on the Plans and Drawings is believed to be accurate but the accuracy is not guaranteed. The Contractor must take all levels, locations, measurements, and verify all dimensions of the job site prior to construction and must adapt his

work into the exact construction. Scale measurements taken from prints are not considered for more than reference, larger scale drawings take precedence over smaller scale, and shop drawings take precedence over all others.

1.11 REFERENCE POINTS

A. Contractor shall preserve and protect all reference points and pay for replacement of any destroyed reference points.

1.12 PROTECTION AND RESTORATION OF PUBLIC AND PRIVATE PROPERTY, INCLUDING EASEMENTS

A. General. Carefully protect all public and private property affected by construction operations. Such restorations shall include clearing of rock and debris, seeding, sodding, and transplanting of lawns, hedges, or ornamental plantings and repair or replacement of driveways, driveway culverts, walks, or other private facilities.

Trees that are to be protected will be shown on the Plans or will be marked by the Owner prior to construction. Prior to any clearing, the Contractor shall schedule a meeting with a representative of the Owner, and the Engineer to discuss the work and agree on marking trees that can be protected.

Confirm the marking of trees with the Inspector at least seventy-two (72) hours prior to the start of any construction, to insure that all trees to be protected have been marked.

Take every precaution to protect trees from damage by boarding or wrapping of trunks, tying back limbs, etc. On all standing trees, marked or otherwise, any broken limbs shall be neatly removed, any scarred or barked areas shall be neatly repaired, any cut roots shall be trimmed and all painted with a tree paint approved by the ENGINEER.

B. Repair of Lawn or "Kept" Areas. Any area stripped of vegetation shall not be left for more than fifteen (15) days without topsoiling and seeding. This includes stockpiled dirt, regardless of its location.

All areas disturbed by construction shall be regraded to original contours leaving the ground free from lumps, ridges and depressions which would cause standing water.

All lawn or "kept" areas shall be reseeded as per Section 32 92 00.

Properly care for all areas and supply sufficient water to ensure proper growth of grass.

Replant all areas where grass is not established at intervals of ten (10) days, continuing until a good growth of grass is established.

Topsoil as defined in this section shall be original topsoil removed and stockpiled for this purpose.

1.13 SITE CONDITIONS

A. The Contractor acknowledges that he has investigated prior to bidding and satisfied himself as to the conditions affecting the work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads, and uncertainties of weather, river stages, water tables, or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the work. The Contractor further acknowledges that he has satisfied himself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done on behalf of the Owner on the site or any contiguous site, as well as from information presented by the drawings and specifications made a part of this Contract, or any other information made available to him prior to receipt of Bids. Any failure by the Contractor to acquaint himself with the available information will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner assumes no responsibility for

any conclusions or interpretations made by the Contractor on the basis of the information made available by the Owner.

1.14 CLEANUP REQUIREMENTS

A. Cleanup operations shall be conducted daily.

1. Contractor shall keep the work areas free at all times from accumulations of waste materials and rubbish.
2. Roadways shall be cleaned and swept at the end of each workday.
3. Volatile waste shall be properly stored in covered metal containers and removed daily.
4. Wastes shall not be buried or burned on the site or disposed into storm drains, sanitary sewers, streams, or waterways. All wastes shall be removed from the site and disposed in a manner complying with local ordinances and anti-pollution laws.

B. Contractor shall make the necessary arrangements for proper off-site storage areas.

C. Contractor shall keep all equipment and materials within construction easements or road rights-of-way and protect private property from damage due to construction.

1.15 HISTORICAL AND ARCHAEOLOGICAL

A. If during the course of construction, evidence of deposits of historical or archaeological interest is found, the Contractor shall cease operations affecting the find and shall notify the Owner. No further disturbance of the deposits shall ensue until the Contractor has been notified by the Owner that Contractor may proceed. Compensation to the Contractor, if any, for lost time or changes in construction resulting from the find, shall be determined in accordance with changed or extra work provisions of the Contract Documents.

1.16 PERMITS

A. Appendix B provides the approved permits for this project. Contractor shall comply with all permit requirements. All costs to perform the work required shall be include in the appropriate bid items.

B. Contractor shall obtain the following permits at no cost to Owner and comply with all permit requirements:

1. Blasting Permit – City of Asheville
2. Driveway Access Permit (Lyman Street) – City of Asheville

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SECTION)

PART 3 - EXECUTION - (NOT APPLICABLE TO THIS SECTION)

END OF SECTION

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SECTION 01 32 17
CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Specific requirements for the preparation, submittal, updating, and status reporting of the construction Progress Schedule.

B. Related Specification Sections include, but are not necessarily limited to:

1. Division 00 - Procurement and Contracting Requirements.
2. Division 01 - General Requirements.

C. Review of the CPM Schedule:

1. In so far as the Contractor is solely responsible for its means and methods and the CPM schedule represents in part its means and methods, the review of the CPM schedules (preliminary, baseline, updates, revisions, etc.) is for compliance with the requirements as defined in the contract documents.
2. The review of the CPM schedule is not intended to be complete or exhaustive or check every activity and its relation to the work.
3. The Engineer will provide comments on the CPM schedule compliance with those contract requirements and anomalies that might appear to the Engineer.
4. If the Contractor fails to include contract requirements (e.g. specified cure times, commissioning periods) in the CPM schedule, or the Engineer fails to notify the Contractor of anomalies the Contractor is not relieved of the contract requirements.
5. Acceptance of the CPM schedule does not imply that the Owner has approved or accepted the Contractor's means and methods or sequence for performing the work to construct the project.
6. If the Contractor has questions or concerns about comments, the Contractor and Engineer shall meet to resolve those issues prior to issuance of future updates or revisions.

1.2 DEFINITIONS

A. The following definitions shall apply to this Specification Section:

1. EXECUTION OF THE CONTRACT: The date the contract is signed by the last party, either the Owner or the Contractor.
2. WORKING DAYS: Monday through Friday except holidays as directed by the Owner.
3. PRELIMINARY SCHEDULE: A schedule showing detailed activity for the first 90 days of the Project, and a general work plan for construction activity from the 91st day until the Contractual Completion Date.
4. BASELINE SCHEDULE: The initial detailed Progress Schedule prepared by the Contractor defining its plan for constructing the Project in accordance with the Contract Documents.
5. SCHEDULE UPDATE: The initially accepted Baseline Schedule, or subsequently approved Revised Baseline Schedules, updated each month to reflect actual start and finish dates of each schedule activity and the remaining duration of activities that began during the period.
6. CURRENT SCHEDULE: The current schedule is either the Baseline Schedule or Revised Baseline Schedule including and incorporating Schedule Updates.
7. REVISED BASELINE SCHEDULE: The initially accepted Baseline Schedule revised to reflect approved contract change orders and modifications.
8. RECOVERY SCHEDULE:
   a. A schedule indicating the Contractor's plan for recovering lost time.

b. A recovery schedule will be requested when the Contractor is forecasting at least 10 working days or more delays in meeting a contract milestone or the contract completion date.

9. SHORT INTERVAL SCHEDULE:
   a. Schedule prepared by the Contractor reflecting the work planned for the coming weeks.
   b. This is also known as a Look-Ahead Schedule.

1.3 SUBMITTALS

A. Preliminary Schedule:

1. Submittal and review:
   a. Submit within 10 days after Execution of the Contract or the effective date of the contract, whichever is earlier.
   b. The Engineer will review and provide comments to the Contractor within ten (10) working days after receipt of the schedule.
   c. The Contractor will review and modify the preliminary schedule and return the schedule within five (5) working days. If there are concerns about the comments provided, the Engineer and Contractor will meet to review and resolve those concerns.
2. Submittal package:
   a. Provide a detailed plan for the first ninety (90) days of the project and summary activities of the work to achieve the project milestones.
   b. CPM time-scaled network diagram:
      1) A printed logic diagram and PDF that include the following information:
         a) Unique activity number/identifier; numeric, alpha or combination of numeric/alpha.
         b) Activity description.
         c) Activity duration.
         d) Early start and early finish for each activity.
         e) Late start and late finish for each activity.
         f) Total float (TF) for each activity.
         g) Predecessor activities.
         h) Successor activities.
         i) Bar showing the early start and completion dates of each activity.
      2) The activities will be sorted by area, trades, and subcontractors as agreed on with the Engineer.
      3) Print the CPM time-scaled network diagram on minimum sheet size of 11 IN x 17 IN.

B. Baseline Schedule:

1. Submittal and review:
   a. Submit within 30 days after Execution of the Contract or the effective date of the contract, whichever is earlier.
   b. The Engineer shall review the baseline schedule and provide comments to the Contractor within twenty (20) working days after receipt of the schedule.
   c. After receiving comments, the Contractor and Engineer shall meet to review the comments within five (5) working days.
   d. After the meeting, the Contractor will modify the schedule as agreed and resubmit the baseline schedule within 5 working days.
   e. After the Engineer confirms that the Contractor has made the changes as agreed, the schedule will become the baseline schedule.
2. Submittal package:
   a. CPM time-scaled network diagram:
      1) A printed logic diagram and PDF that include the following information:

a) Unique activity number/identifier; numeric, alpha or combination of numeric/alpha.
b) Activity description.
c) Activity duration.
d) Early start and early finish for each activity.
e) Late start and late finish for each activity.
f) Total float (TF) for each activity.
g) Predecessor activities.
h) Successor activities.
i) Cost/budget to complete the work in the activity.
j) Resources needed to complete the activity.
k) Bar showing the early start and completion dates of each activity.

2) The activities will be sorted by area, trades, and subcontractors as agreed on with the Engineer.
3) Print the CPM time-scaled network diagram on minimum sheet size of 11 IN x 17 IN.

C. Schedule Updates:

1. Submittal and Review:
   a. The Contractor shall provide a Schedule Update on the 4th of each month after the Baseline Schedule is completed.
   b. The Engineer shall provide comments to the Contractor on the Schedule Update.
   c. The Contractor shall incorporate the Engineer comments into the next Schedule Update.
2. CPM time-scaled network diagram as described for the Baseline Schedule:
   a. Do not change the description of an activity number.
      1) Any activity added to the schedule shall have a new unique activity number and description.
      2) If activities are deleted, the deleted activity number(s) will not be used again.

D. Recovery Schedule:

1. When the activities on the critical path or the completion milestones appear to be fifteen (15) working days beyond the contract time, the Engineer may request and the Contractor shall provide a Recovery Schedule demonstrating how the Contractor will recover the lost time so that the Work will be completed within the Contract Time.
2. Provide the Recovery schedule within ten (10) working days after requested by the Engineer.
3. Activities will be added, or the durations modified to reflect the changes to the work.
4. The Engineer will review and provide comments to the Contractor on the Recovery Schedule within five (5) working days.
5. Incorporate the Engineer comments into the Recovery Schedule.
6. After acceptance by the Engineer, the Recovery Schedule use for future Schedule Updates.
7. CPM time-scaled network diagram as described for the Baseline Schedule:
   a. Do not change the description of an activity number.
      1) Any activity added to the schedule shall have a new activity number and description.
      2) If activities are deleted, the deleted activity number(s) will not be used again.
8. Provide a narrative with an explanation of the changes in logic and/or activity durations.

E. Short Interval Schedule:

1. Provide a three-month schedule each month during the Contract Time. This schedule can be reviewed at each progress meeting.
   a. Provide an accurate representation of the work performed the previous month and work planned for the current month and subsequent month.
2. Provide in a tabular format with bars or other graphic representing work duration.

a. Reference activity ID numbers on the Baseline, Revised Baseline, or Updated Schedule, whichever is being currently used.
b. Note by color, highlight or underscore all activities on the critical path.

3. Identify inspection hold points including special inspections needed before the Contractor can move forward with the work.
4. Identify the day materials provided by the Owner or others needed on site.
5. Identify utility tie-ins and traffic changes including road and/or lane closures.

1.4 GENERAL REQUIREMENTS

A. Prepare and submit construction progress schedules as specified herein.

1. Develop and maintain Baseline, Updates and Recovery schedules using Microsoft Project or equal as approved by the Engineer.
2. Include the following information:
   a. Construction start dates (Award date, Notice(s) to Proceed date).
   b. Procurement activities.
   c. Preparation of key submittals for materials and equipment.
   d. Engineers review and approval of key submittals.
   e. Material and equipment fabrication lead times.
   f. Material and equipment deliveries for Contractor, Owner and third parties.
   g. Curing of Concrete after placement for all structures
   h. Shutdowns.
   i. Utility tie-ins.
   j. Traffic changes and closures.
   k. Inspections and hold points.
   l. Testing of equipment and systems.
   m. Commissioning.
   n. Contract milestones:
      1) Intermediate milestones.
      2) Substantial Completion Date.
      3) Physical Completion Date.
3. The following CPM schedule outputs will be rejected without further review:
   a. Schedules indicating the start of the critical path at a date point or activity beyond the date of Notice to Proceed, or schedules indicating a discontinuous critical path from Notice to Proceed to Contract completion.
   b. Schedules defining critical activities as those on a path or paths having some minimum value of float.
   c. Schedules with multiple critical paths.
   d. Schedules indicating a completion date beyond the contractual completion date.

B. The number of activities shall be sufficient to assure adequate planning of the project, to permit monitoring and evaluation of progress, and to do an analysis of time impacts.

1. Work activities shall not exceed durations of 10 days or 2 weeks.
   a. Procurement and fabrication activity durations may exceed 10 days or 2 weeks.
2. Schedule activities shall include the following:
   a. A clear and legible description.
   b. At least one (1) predecessor and one (1) successor activity, except for project start and finish milestones.

C. Early Completion Schedule:

1. Contractor may show early completion time on any schedule provided that the requirements of the contract are met.
2. Contractor may increase early completion time by improving production, reallocating resources to be more efficient, performing sequential activities concurrently or by completing activities earlier than planned.
3. Any time between the Contractor's early completion and the Contract Time will be considered float.

D. Plan working durations to incorporate the effects of normal weather impacts.

E. Float:

1. The project owns the float, therefore neither the Owner nor the Contractor has exclusive use of the float; the float can used by either party.
2. Once float is used, liability for delay of the project completion date rests with the party actually causing delay to the project completion date.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

PART 3 - EXECUTION - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)

END OF SECTION

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SECTION 01 33 00
SUBMITTALS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mechanics and administration of the submittal process for:
   a. Shop Drawings.
   b. Samples.
   c. Informational submittals.
2. General content requirements for Shop Drawings.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 - Procurement and Contracting Requirements.
2. Division 01 - General Requirements.
3. Construction Progress Schedule submittal requirements are specified in Specification Section 01 32 17.
4. Technical Specification Sections identifying required submittals.

1.2 DEFINITIONS

A. Action Submittals:

1. Action Submittals require an explicit, written approval or other appropriate action by Engineer before Contractor may release the associated item(s) for raw materials procurement, fabrication, production, and shipment.
2. Unless otherwise indicated in the Contract Documents, Action Submittals include the following:
   a. Shop Drawings.
   b. Product data.
   c. Samples.
   d. Testing plans for quality control activities required by the Contract Documents.
   e. Delegated Designs: Design drawings, design specifications, calculations, reports, and other instruments of service sealed and signed by design professional retained by Contractor, Subcontractor, or Supplier for a portion of the completed Work as part of the completed Project. Engineer's approval or other appropriate action on such delegated design Submittals will be only for the limited purposes set forth in the General Conditions.

B. Informational Submittals:

1. Informational Submittals are Submittals, other than Action Submittals, required by the Contract Documents. Explicit response from Engineer is not required when such Submittal is acceptable and Engineer's acceptance thereof will be indicated in the Engineer's Submittals log. When Informational Submittal does not indicate full compliance with the Contract Documents, Engineer will indicate the non-compliance in a written response to Contractor.
2. Representative types of informational submittal items include but are not limited to:
   a. Warranties.

b. Construction photographs.
c. Shop Drawings, product data, Samples, and testing plans, submitted as a requirement of for delegated designs, bearing the Submittal approval stamp of associated design professional retained by Contractor, Subcontractor, or Supplier.

3. For-Information-Only submittals upon which the Engineer is not expected to conduct review or take responsive action may be so identified in the Contract Documents.

1.3 SUBMITTAL SCHEDULE

A. Schedule of Shop Drawings:

1. Submitted and approved within 20 days of receipt of Notice to Proceed.
2. Account for multiple transmittals under any specification section where partial submittals will be transmitted.

B. Shop Drawings: Submittal and approval prior to 30 PCT completion of project.

C. Informational Submittals:

1. Reports and installation certifications submitted within seven days of conducting testing, installation, or examination.
2. Submittals showing compliance with required qualifications submitted 20 days prior to any work beginning using the subject qualifications.

D. The submittal schedule shall include the following columns as a minimum:

Submittal Section	Submittal Description	Planned Submittal Date	Submittal Need Date	Actual Submittal Date	Actual Return Date	Disposition

1.4 PREPARATION OF SUBMITTALS

A. General:

1. All submittals and all pages of all copies of a submittal shall be completely legible.
2. Submittals which, in the Engineer's sole opinion, are illegible will be returned without review.
3. Minimize extraneous information for equipment and products not relevant to the submittal.
4. Contractors or vendors written comments on the submittal drawings shall be in green

B. Shop Drawings, Product Data, and Samples:

1. Scope of any submittal and letter of transmittal:
   a. Limited to one Specification Section.
   b. Submittals with more than one Specification section included will be rejected.
   c. Do not submit under any Specification Section entitled (in part) "Basic Requirements" unless the product or material submitted is specified, in total, in a "Basic Requirements" Specification Section.
2. Numbering letter of transmittal:

a. Include as prefix the Specification Section number followed by a series number, "-xx", beginning with "01" and increasing sequentially with each additional transmittal for that Specification Section.
b. If more than one submittal under any Specification Section, assign consecutive series numbers to subsequent transmittal letters.

3. Describing transmittal contents:
   a. Provide listing of each component or item in submittal capable of receiving an independent review action.
   b. Identify for each item:
      1) Manufacturer and Manufacturer's Drawing or data number.
      2) Contract Document tag number(s).
      3) Contract Drawing Section or detail number if appropriate.
      4) Specification Section Article/Paragraph number if appropriate.
      5) Unique page numbers for each page of each separate item.
   c. When submitting "or-equal" items that are not the products of named manufacturers, include the words "or-equal" in the item description.
4. Contractor certification of review and approval:
   a. Contractor's review and approval certification stamp shall be applied either to the letter of transmittal or a separate sheet preceding each independent item in the submittal.
      1) Stamp may be either a wet ink stamp or electronically embedded.
      2) Clearly identify the person who reviewed the submittal and the date it was reviewed.
      3) Shop Drawing submittal stamp shall read "(Contractor's Name) has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval as stipulated in the General Conditions."

   OR

   b. Execute Exhibit AA, Contractor's Submittal Certification form, to indicate Contractor has reviewed and approved the submittal contents.
      1) Clearly identify the person who reviewed the submittal and the date it was reviewed."
   c. Submittals containing multiple independent items shall be prepared with each item listed on the letter of transmittal or on an index sheet for all items listing the discrete page numbers for each page of each item, which shall be stamped with the Contractor's review and approval stamp.
      1) Each independent item shall have a cover sheet with the transmittal number and item number recorded.
         a) Provide clear space of 3 IN SQ for Engineer stamping.
      2) Individual pages or sheets of independent items shall be numbered in a manner that permits the entire contents of a particular item to be readily recognized and associated with Contractor's certification.
5. Resubmittals:
   a. Number with original Specification Section and series number with a suffix letter starting with "A" on a (new) duplicate transmittal form.
   b. Do not increase the scope of any prior transmittal.

c. Provide cover letter indicating how each "B", "C", or "D" Action from previous submittal was addressed and where the correction is found in the resubmittal.

d. Account for all components of prior transmittal.

1) If items in prior transmittal received "A" or "B" Action code, list them and indicate "A" or "B" as appropriate.

a) Do not include submittal information for items listed with prior "A" or "B" Action in resubmittal.

2) Indicate "Outstanding-To Be Resubmitted At a Later Date" for any prior "C" or "D" Action item not included in resubmittal.

a) Obtain Engineer's approval to exclude items.

6. For 8-1/2 x 11 IN, 8-1/2 x 14 IN, and 11 x 17 IN size sheets, provide three copies of each submittal for Engineer plus the number required by the Contractor.

a. The number of copies required by the Contractor will be defined at the Preconstruction Conference, but shall not exceed three.

b. All other size sheets:

1) Submit one reproducible transparency or high resolution print and one additional print of each Drawing until approval is obtained.

2) Utilize mailing tube; do not fold.

3) The Engineer will mark and return the reproducible to the Contractor for reproduction and distribution.

7. Do not use red color for marks on transmittals.

a. Duplicate all marks on all copies transmitted, and ensure marks are photocopy reproducible.

b. Engineer will use red marks or enclose marks in a cloud.

8. Transmittal contents:

a. Coordinate and identify Shop Drawing contents so that all items can be easily verified by the Engineer.

b. Provide submittal information or marks defining specific equipment or materials utilized on the Project.

1) Generalized product information, not clearly defining specific equipment or materials to be provided, will be rejected.

c. Identify equipment or material project use, tag number, Drawing detail reference, weight, and other Project specific information.

d. Provide sufficient information together with technical cuts and technical data to allow an evaluation to be made to determine that the item submitted is in compliance with the Contract Documents.

e. Do not modify the manufacturer's documentation or data except as specified herein.

f. Submit items such as equipment brochures, cuts of fixtures, product data sheets or catalog sheets not exceeding 11 x 17 IN pages.

1) Indicate exact item or model and all options proposed by arrow and leader.

g. When a Shop Drawing submittal is called for in any Specification Section, include as appropriate, scaled details, sizes, dimensions, performance characteristics, capacities, test data, anchoring details, installation instructions, storage and handling instructions, color charts, layout Drawings, rough-in diagrams, wiring diagrams, controls, weights and other pertinent data in addition to information specifically stipulated in the Specification Section.

1) Arrange data and performance information in format similar to that provided in Contract Documents.
2) Provide, at minimum, the detail specified in the Contract Documents.

h. If proposed equipment or materials deviate from the Contract Drawings or Specifications in any way, clearly note the deviation and justify the said deviation in detail in a separate letter immediately following transmittal sheet. Any deviation from plans or specifications not depicted in the submittal or included but not clearly noted by the Contractor may not have been reviewed. Review by the Engineer shall not serve to relieve the Contractor of the contractual responsibility for any error or deviation from contract requirements.

9. Samples:
   a. Identification:
      1) Identify sample as to transmittal number, manufacturer, item, use, type, project designation, tag number, Specification Section or Drawing detail reference, color, range, texture, finish and other pertinent data.
      2) If identifying information cannot be marked directly on sample without defacing or adversely altering samples, provide a durable tag with identifying information securely attached to the sample.
   b. Include application specific brochures, and installation instructions.
   c. Provide Contractor's review and approval certification stamp or Contractor's Submittal Certification form as indication of Contractor's checking and verification of dimensions and coordination with interrelated work.
   d. Resubmit revised samples of rejected items.

C. Informational Submittals:
   1. Prepare in the format and detail specified in Specification requiring the informational submittal.

1.5 TRANSMITTAL OF SUBMITTALS

A. Shop Drawings and Samples:
   1. Transmit all submittals to:

      HDR
      440 S. Church Street, Suite 1200
      Charlotte, North Carolina 28202-2075
      Attn: Matthew A. Shultz, PE
      matthew.shultz@hdrinc.com

   2. Utilize two copies of attached Exhibit A to transmit all Shop Drawings and samples.
   3. All submittals must be from Contractor.
      a. Submittals will not be received from or returned to subcontractors.

B. Informational Submittals:
   1. Transmit under Contractor's standard letter of transmittal or letterhead.
   2. Submit in triplicate or as specified in individual Specification Section.
   3. Transmit to:

      HDR
      440 S. Church Street, Suite 1200

Charlotte, North Carolina 28202-2075
Attn: Matthew A. Shultz, PE
matthew.shultz@hdrinc.com

C. Electronic Transmission of Submittals:

1. Transmittals shall be made electronically.
   a. Use HDR's Project Tracker Collaboration System (PTCS) (other commercial project collaboration application).
   b. Protocols and processes will be determined at the Pre-Construction Conference.
2. Provide documents in Adobe Acrobat Portable Document Format (PDF), latest version.
3. Do not password protect or lock the PDF document.
4. Drawings or other graphics must be converted to PDF file format from the original drawing file format and made part of the PDF document.
   a. Scanning of drawings is to be used only where actual file conversion is not possible and drawings must be scanned at a resolution of 300 DPI or greater.
   b. Required signatures may be applied prior to scanning for transmittal.
5. Electronic drawings shall be formatted to be at full-scale (or half-scale when printed to 11x17).
   a. Do not reduce drawings by more than 50 PCT in size.
   b. Reduced drawings shall be clearly marked "HALF-SIZE" and shall scale accurately at that size.
6. Rotate sheets that are normally viewed in landscape mode so that when the PDF file is opened the sheet is in the appropriate position for viewing.
7. Create bookmarks in the bookmarks panel for the cover, the Table of Contents, and each major section of the document.
8. Using Adobe Acrobat Standard or Adobe Acrobat Professional, set the PDF document properties, initial view as follows:
   a. Select File →Properties→Initial View.
   b. Select the Navigation tab: Bookmarks Panel and Page.
   c. Select the Page layout: Single Page.
   d. Select the Magnification: Fit Page.
   e. Select Open to page: 1.
   f. Set the file to open to the cover page with bookmarks to the left, and the first bookmark linked to the cover page.
9. Set the PDF file "Fast Web View" option to open the first several pages of the document while the rest of the document continues to load.
   a. To do this:
      1) Select Edit→Preferences→ Documents→Save Settings.
      2) Check the Save As optimizes for Fast Web View box.
10. File naming conventions:
    a. File names shall use the convention (XXXXXX-YY-Z.PDF) where XXXXXX is the Specification Section number, YY is the Shop Drawing Root number and Z is an ID number used to designate the associated volume.
11. Labeling:
    a. As a minimum, include the following labeling on all electronic media:

1) Project Name.
2) Equipment Name and Project Tag Number.
3) Project Specification Section.
4) Manufacturer Name.
5) Vendor Name.

12. Binding:
    a. Include labeled electronic media in a protective case.
        1) Bind protective case in three-ring binder, inserted at the front of the Final paper copy submittal.
        2) Protective case(s) to have means for securing electronic media to prevent loss (e.g., zip case, flap and strap, or equivalent).

1.6 ENGINEER'S REVIEW ACTION

A. Shop Drawings and Samples:

1. Items within transmittals will be reviewed for overall design intent and will receive one of the following actions:
    a. A - FURNISH AS SUBMITTED.
    b. B - FURNISH AS NOTED (BY ENGINEER).
    c. C - REVISE AND RESUBMIT.
    d. D - REJECTED.
    e. E - ENGINEER'S REVIEW NOT REQUIRED.
2. Submittals received will be initially reviewed to ascertain inclusion of Contractor's approval stamp.
    a. Submittals not stamped by the Contractor or stamped with a stamp containing language other than that specified herein will not be reviewed for technical content and will be returned rejected.
3. In relying on the representation on the Contractor's review and approval stamp, Owner and Engineer reserve the right to review and process poorly organized and poorly described submittals as follows:
    a. Submittals transmitted with a description identifying a single item and found to contain multiple independent items:
        1) Review and approval will be limited to the single item described on the transmittal letter.
        2) Other items identified in the submittal will:
            a) Not be logged as received by the Engineer.
            b) Be removed from the submittal package and returned without review and comment to the Contractor for coordination, description and stamping.
            c) Be submitted by the Contractor as a new series number, not as a re-submittal number.
    b. Engineer, at Engineer's discretion, may revise the transmittal letter item list and descriptions, and conduct review.
        1) Unless Contractor notifies Engineer in writing that the Engineer's revision of the transmittal letter item list and descriptions was in error, Contractor's review and approval stamp will be deemed to have applied to the entire contents of the submittal package.

4. Submittals returned with Action "A" or "B" are considered ready for fabrication and installation.
    a. If for any reason a submittal that has an "A" or "B" Action is resubmitted, it must be accompanied by a letter defining the changes that have been made and the reason for the resubmittal.
    b. Destroy or conspicuously mark "SUPERSEDED" all documents having previously received "A" or "B" Action that are superseded by a resubmittal.
5. Submittals with Action "A" or "B" combined with Action "C" (Revise and Resubmit) or "D" (Rejected) will be individually analyzed giving consideration as follows:
    a. The portion of the submittal given "C" or "D" will not be distributed (unless previously agreed to otherwise at the Preconstruction Conference).
        1) One copy or the one transparency of the "C" or "D" Drawings will be marked up and returned to the Contractor.
            a) Correct and resubmit items so marked.
    b. Items marked "A" or "B" will be fully distributed.
    c. If a portion of the items or system proposed are acceptable, however, the major part of the individual Drawings or documents are incomplete or require revision, the entire submittal may be given "C" or "D" Action.
        1) This is at the sole discretion of the Engineer.
        2) In this case, some Drawings may contain relatively few or no comments or the statement, "Resubmit to maintain a complete package."
        3) Distribution to the Owner and field will not be made (unless previously agreed to otherwise).
6. Failure to include any specific information specified under the submittal paragraphs of the Specifications will result in the submittal being returned to the Contractor with "C" or "D" Action.
7. Calculations required in individual Specification Sections will be received for information purposes only, as evidence calculations have been stamped by the professional as defined in the specifications and for limited purpose of checking conformance with given performance and design criteria. The Engineer is not responsible for checking the accuracy of the calculations and the calculations will be returned stamped "E. Engineer's Review Not Required" to acknowledge receipt.
8. Furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
9. Transmittals of submittals which the Engineer considers as "Not Required" submittal information, which is supplemental to but not essential to prior submitted information, or items of information in a transmittal which have been reviewed and received "A" or "B" action in a prior submittal, will be returned with action "E. Engineer's Review Not Required."
10. Samples may be retained for comparison purposes.
    a. Remove samples when directed.
    b. Include in bid all costs of furnishing and removing samples.
11. Approved samples submitted or constructed, constitute criteria for judging completed work.

a. Finished work or items not equal to samples will be rejected.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

EXHIBIT A # Shop Drawing Transmittal No.

_____-_____
(Spec Section) (Series)

Project Name:		Date Received:	
Project Owner:		Checked By:	
Contractor:	HDR Engineering, Inc.	Log Page:	
Address:	Address:	HDR No.:	
		Spec Section:	
		Drawing/Detail No.:	
Attn:	Attn:	1st. Sub	ReSub.
Date Transmitted:	Previous Transmittal Date:		

Item No.	No. Copies	Description	Manufacturer	Mfr/Vendor Dwg or Data No.	Action Taken*

Remarks:

* The Action designated above is in accordance with the following legend:

A - Furnish as Submitted

B - Furnish as Noted

C - Revise and Submit
1. Not enough information for review.
2. No reproducibles submitted.
3. Copies illegible.
4. Not enough copies submitted.
5. Wrong sequence number.
6. Wrong resubmittal number.
7. Wrong spec. section.
8. Wrong form used.
9. See comments.

D - Rejected

E - Engineer's review not required
1. Submittal not required.
2. Supplemental Information. Submittal retained for informational purposes only.
3. Information reviewed and approved on prior submittal.
4. See comments.

Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Any deviation from plans or specifications not depicted in the submittal or included but not clearly noted by the Contractor may not have been reviewed. Review by the Engineer shall not serve to relieve the Contractor of the contractual responsibility for any error or deviation from contract requirements.

Comments:

By Date

Distribution: Contractor | File | Field | Owner | Other

EXHIBIT AA

Contractor's Submittal Certification

Shop Drawing Transmittal No.: _____

Contract/Project Name: _____

_____

Company Name: _____

has

1. reviewed and coordinated this Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

2. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

3. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

4. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

☐ This Submittal **does not** contain any variations from the requirements of the Contract Documents.

☐ This Submittal **does** contain variations from the requirements of the Contract Documents. A separate description of said variations and a justification for them is provided in an attachment hereto identified as:

"Shop Drawing Transmittal No. _____Variation and Justification Documentation"

Insert picture file or electronic signature of Authorized Representative

_____ _____

Authorized Representative Date

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SECTION 01 35 05

ENVIRONMENTAL PROTECTION AND SPECIAL CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Addresses:

1. Minimizing the pollution of air, water, or land; control of noise, the disposal of solid waste materials, and protection of deposits of historical or archaeological interest.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SECTION)

PART 3 - EXECUTION

3.1 INSTALLATION

A. Employ and utilize environmental protection methods, obtain all necessary permits, and fully observe all local, state, and federal regulations.

B. Land Protection:

1. Except for any work or storage area and access routes specifically assigned for the use of the Contractor, the land areas outside the limits of construction shall be preserved in their present condition. Contractor shall confine his construction activities to areas defined for work within the Contract Documents.
2. Manage and control all borrow areas, work or storage areas, access routes and embankments to prevent sediment from entering nearby water or land adjacent to the work site.
3. Restore all disturbed areas including borrow and haul areas and establish permanent type of locally adaptable vegetative cover.
4. Unless earthwork is immediately paved or surfaced, protect all side slopes and backslopes immediately upon completion of final grading.
5. Plan and execute earthwork in a manner to minimize duration of exposure of unprotected soils.
6. Except for areas designated by the Contract Documents to be cleared and grubbed, the Contractor shall not deface, injure or destroy trees and vegetation, nor remove, cut, or disturb them without approval of the Engineer. Any damage caused by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at the Contractor's expense.

C. Surface Water Protection:

1. Utilize, as necessary, erosion control methods to protect side and backslopes, minimize and the discharge of sediment to the surface water leaving the construction site as soon as rough grading is complete. These controls shall be maintained until the site is ready for final grading and landscaping or until they are no longer warranted and concurrence is received from the Engineer. Physically retard the rate and volume of runon and runoff by:
   a. Implementing structural practices such as diversion swales, terraces, straw bales, silt fences, berms, storm drain inlet protection, rocked outlet protection, sediment traps and temporary basins.
   b. Implementing vegetative practices such as temporary seeding, permanent seeding, mulching, sod stabilization, vegetative buffers, hydroseeding, anchored erosion control blankets, sodding, vegetated swales or a combination of these methods.
   c. Providing Construction sites with graveled or rocked access entrance and exit drives and parking areas to reduce the tracking of sediment onto public or private roads.

2. Discharges from the construction site shall not contain pollutants at concentrations that produce objectionable films, colors, turbidity, deposits or noxious odors in the receiving stream or waterway.

D. Solid Waste Disposal:

1. Collect solid waste on a daily basis.
2. Provide disposal of degradable solid waste to an approved solid waste disposal site.
3. Provide disposal of nondegradable solid waste to an approved solid waste disposal site or in an alternate manner approved by Engineer and regulatory agencies.
4. No building materials wastes or unused building materials shall be buried, dumped, or disposed on the site.

E. Fuel and Chemical Handling:

1. Store and dispose chemical wastes in a manner approved by regulatory agencies.
2. Take special measures to prevent chemicals, fuels, oils, greases, herbicides, and insecticides from entering drainage ways.
3. Do not allow water used in onsite material processing, concrete curing, cleanup, and other waste waters to enter a drainage way(s) or stream.
4. The Contractor shall provide containment around fueling and chemical storage areas to ensure that spills in these areas do not reach waters of the state.

F. Control of Dust:

1. The control of dust shall mean that no construction activity shall take place without applying all such reasonable measures as may be required to prevent particulate matter from becoming airborne so that it remains visible beyond the limits of construction. Reasonable measures may include paving, frequent road cleaning, planting vegetative groundcover, application of water or application of chemical dust suppressants. The use of chemical agents such as calcium chloride must be approved by the Owner.
2. Utilize methods and practices of construction to eliminate dust in full observance of agency regulations.
3. The Engineer will determine the effectiveness of the dust control program and may request the Contractor to provide additional measures, at no additional cost to Owner.

G. Burning:

1. Do not burn material on the site. If the Contractor elects to dispose waste materials by burning, make arrangements for an off-site burning area, avoid nuisance to adjacent properties, and conform to all agency regulations.

H. Control of Noise:

1. Control noise by fitting equipment with appropriate mufflers.

I. Completion of Work:

1. Upon completion of work, leave area in a clean, natural looking condition.
2. Ensure all signs of temporary construction and activities incidental to construction of required permanent work are removed.

J. Historical Protection:

1. If during the course of construction, evidence of deposits of historical or archaeological interests are found, cease work affecting find and notify Engineer. Do not disturb deposits until written notice from Engineer is given to proceed.
2. The Contractor may request compensation for lost time or changes in construction to avoid the find based upon normal change order procedures.

END OF SECTION

SECTION 01 65 50

PRODUCT DELIVERY, STORAGE, AND HANDLING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Scheduling of product delivery.
2. Packaging of products for delivery.
3. Protection of products against damage from:
   a. Handling.
   b. Exposure to elements or harsh environments.

B. Related Sections include but are not necessarily limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.

C. Payment:

1. No payment will be made to Contractor for equipment or materials not properly stored and insured or without approved shop drawings.
   a. Previous payments for items will be deducted from subsequent progress estimate(s) if proper storage procedures are not observed.

1.2 DELIVERY

A. Scheduling:

1. Schedule delivery of products or equipment as required to allow timely installation and to avoid prolonged storage.

B. Packaging:

1. Deliver products or equipment in manufacturer's original unbroken cartons or other containers designed and constructed to protect the contents from physical or environmental damage.

C. Identification:

1. Clearly and fully mark and identify as to manufacturer, item, and installation location.

D. Protection and Handling:

1. Provide manufacturer's instructions for storage and handling.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SECTION)

PART 3 - EXECUTION

3.1 PROTECTION, STORAGE AND HANDLING

A. Manufacturer's Instruction:

1. Protect all products or equipment in accordance with manufacturer's written directions.
   a. Store products or equipment in location to avoid physical damage to items while in storage.
   b. Handle products or equipment in accordance with manufacturer's recommendations and instructions.
2. Protect equipment from exposure to elements and keep thoroughly dry.

3. Protect painted surfaces against impact, abrasion, discoloration, and other damage. Repaint damaged painted surfaces to satisfaction of OWNER and ENGINEER.

3.2 FIELD QUALITY CONTROL

A. Inspect Deliveries:

1. Inspect all products or equipment delivered to the site prior to unloading. Reject all products or equipment that are damaged, used, or in any other way unsatisfactory for use on Project.

B. Monitor Storage Area:

1. Monitor storage area to ensure suitable temperature and moisture conditions are maintained.

END OF SECTION

SECTION 01 70 00
CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Description of procedures to be followed and related work required to accomplish an orderly transfer of Project deliverables from the Contractor to the Owner.

B. Related Sections include but are not necessarily limited to:

1. Division 00 - Procurement and Contracting Requirements.
2. Division 01 - General Requirements.

1.2 DEFINITIONS

A. Punch List: The stated qualification accompanying either the Engineer's Certificate of Substantial Completion or the Certificate of Final Payment, or any list of construction items found to be deficient or incomplete through review of the Work by Engineer and communicated in writing to Contractor at any time during the Contract Period.

B. Record Drawings: Drawings showing changes made during actual construction.

1.3 SUBMITTALS

A. Substantial Completion:

1. Contractor to notify Engineer that the Contractor considers the Work as a whole to be in Substantial Completion and request for a Substantial Completion inspection.
2. Record Drawings.
3. A list of Work not yet completed not to be considered for Substantial Completion.

B. Final Completion:

1. Contractor to notify Engineer that the Contractor considers the entire Work to have progressed to final completion and provide the following documents:
   a. Submittals required for Substantial Completion, and;
   b. Record Drawings;
   c. "Contractor's Affidavit, Release, and Waiver of Claim."
   d. Consent of Surety to Final Payment with Power of Attorney attached.
   e. Sales Tax Certification.
   f. Evidence of payments, if requested by Owner.
   g. Final Payment Request.

PART 2 - PRODUCTS - (NOT APPLICABLE TO THIS SECTION)

PART 3 - EXECUTION

3.1 INSPECTION FOR FINAL ACCEPTANCE AND PAYMENT

A. When the items of Work on the Punch List(s) have been completed, and Contractor considers the Work of the entire Project is complete, he shall submit written certification that:

1. Contract Documents have been reviewed.
2. Work has been inspected for compliance with Contract Documents.
3. Work has been completed in accordance with Contract Documents.

4. Equipment and systems have been tested in the presence of Owner's representative and are operational.
5. Work is completed and ready for final inspection.

B. Engineer and Owner will make an inspection with the Contractor to verify the status of completion within 7 calendar days after receipt of such certification.

C. Should Engineer consider that the Work is incomplete or defective:

1. Engineer: Notify the Contractor in writing within 7 calendar days, listing the incomplete or defective work.
2. Contractor: Remedy the stated deficiencies, and send a second written certification to Engineer that the Work is complete.
3. Engineer will reinspect the Work.

D. When Engineer finds the Work acceptable in accordance with the Contract Documents: Engineer requests Contractor to make closeout submittals.

E. Reinspection costs incurred by the Engineer will be billed to the Owner and deducted by the Owner from the final payment to the Contractor.

3.2 FINAL APPLICATION FOR PAYMENT

A. Complete demobilization and stabilization prior to submitting final application for payment.

B. Submit final application for payment in accordance with procedures and requirements stated in the Conditions of the Contract.

C. Engineer will review application and recommend final payment within 7 calendar days of receipt of application.

END OF SECTION

SECTION 01 71 23
FIELD ENGINEERING

PART 1 - GENERAL

1.1 SUMMARY

A. Scope:

1. Contractor shall provide onsite recordkeeping, field engineering (not related to design of the completed Work), surveying and layout services, and professional services of the types indicated for the Project, including:
    a. Furnishing civil, structural, geotechnical, electrical, and other professional engineering and geology services, whether required by the Contract Documents or necessary in Contractor's judgment, to perform Contractor's means, methods, techniques, sequences, and procedures of construction. Such services do not include professional services associated with delegation of professional design responsibility, which (when required as part of the Work) is addressed elsewhere in the Contract Documents.
    b. Developing and making all detail surveys and measurements required for construction; including slope stakes, batter boards, and all other working lines, elevations, and cut sheets.
    c. Providing materials required for Contractor's benchmarks, control points, batter boards, grade stakes, structure and pipeline elevation stakes, and other items.
    d. Keeping a transit, theodolite, or total station (i.e., theodolite with electronic distance measurement device); leveling instrument; and related implements such as survey rods and other measurement devices, at the Site at all times, and having a skilled instrument person available when necessary for laying out the Work and verifying lines, grades, and elevations.
    e. Being solely responsible for all locations, dimensions, and levels of the Work. No data other than Change Order, Work Change Directive, or Field Order shall justify departure from dimensions and levels required by the Contract Documents.
    f. Rectifying all Work improperly installed because of not maintaining, not protecting, or removing without authorization established reference points, stakes, marks, and monuments.
    g. Providing such facilities and assistance necessary for Engineer and Resident Project Representative (if any) or Owner's Site Representative (if any) to check lines and grade points placed by Contractor.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Review requirements of this and other Specifications sections and coordinate other elements of the Work with field engineering, surveying, and layout Work and recordkeeping obligations set forth in this Specifications Section.

1.3 SUBMITTALS

A. Informational Submittals: Submit the following:

1. Temporary Cofferdam:
    a. Contractor shall perform all calculations and design for the temporary cofferdams.
    b. Detailed design must be completed by a professional engineer licensed in the state of North Carolina and be signed and sealed.
        1) The detailed design is not to be submitted. It shall be kept on file with the Contractor and only submitted to Owner or Engineer upon specific request.

c. A general plan, report and/or drawings, shall be prepared to provide general information only, including plan and section views, major materials of construction, and schedule of major activities. It should not contain calculations or detailed design drawings.

1) The plan will not be reviewed by Owner or Engineer.

2) The plan is to be provided to the regulatory agencies that are requiring this submittal for their review and comment and to check for compliance with permit requirements.

3) Contractor shall anticipate that minor comments will be provided by the regulatory agencies and a revised plan will need to be prepared and submitted back to them.

1.4 CONTRACTOR'S SURVEYOR

A. Qualifications:

1. Employ or retain the services, as needed, at the Site a surveyor with experience and capability of performing surveying and layout tasks required in the Contract Documents and as required for the Work. Comply with Laws and Regulations governing land surveying.
2. Contractor's surveyor shall possess not less than five years of experience performing duties similar in scope and complexity to those required of Contractor's surveyor on this Project.

B. Responsibilities of Contractor's Surveyor:

1. Providing required surveying equipment, including transit, theodolite, or total station; level; stakes; and surveying accessories.
2. Establishing required lines and grades for constructing all facilities, structures, pipelines, and site improvements, including outdoor electrical equipment and feeders.
3. Preparing and maintaining professional-quality, accurate, well-organized, legible notes of all measurements and calculations made while surveying and laying out the Work.
4. Prior to backfilling operations, survey, locate, and record on a copy of the Drawings accurate representation of buried Work and Underground Facilities provided and encountered.
5. Locating on a site plan of the Site the actual location of above-ground work to be indicated on record documents.
6. Complying with requirements of the Contract Documents relative to surveying and related Work.

PART 2 - PRODUCTS - (NOT USED)

END OF SECTION

SECTION 01 74 13
CLEANING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Intermediate and final cleaning of Work not including special cleaning of closed systems specified elsewhere.

B. Related Sections include but are not necessarily limited to:

1. Division 0 - Bidding Requirements, Contract Forms, and Conditions of the Contract.
2. Division 1 - General Requirements.

1.2 STORAGE AND HANDLING

A. Store cleaning products and cleaning wastes in containers specifically designed for those materials.

1.3 SCHEDULING

A. Schedule cleaning operations so that dust and other contaminants disturbed by cleaning process will not fall on newly painted surfaces.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents:

1. Compatible with surface being cleaned.
2. New and uncontaminated.
3. For Manufactured Surfaces: Material recommended by manufacturer.

PART 3 - EXECUTION

3.1 CLEANING - GENERAL

A. Prevent accumulation of wastes that create hazardous conditions.

B. Conduct cleaning and disposal operations to comply with laws and safety orders of governing authorities.

C. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains or sewers.

D. Dispose of degradable debris at an approved solid waste disposal site.

E. Dispose of non-degradable debris at an approved solid waste disposal site or in an alternate manner approved by Engineer and regulatory agencies.

F. Handle materials in a controlled manner with as few handlings as possible.

G. On completion of work, leave area in a clean, natural looking condition. Remove all signs of temporary construction and activities incidental to construction of required permanent Work.

H. Do not burn on-site.

3.2 EXTERIOR (SITE) CLEANING

A. Cleaning During Construction:

1. Construction debris:

a. Confine in strategically located container(s):
    1) Cover to prevent blowing by wind.
    2) Haul from site minimum once a week.
b. Remove from work area to container daily.

2. Vegetation:
    a. Keep weeds and other vegetation trimmed to 3 IN maximum height.
3. Soils, sand, and gravel deposited on paved areas and walks:
    a. Remove as required to prevent muddy or dusty conditions.
    b. Do not flush into storm sewer system.

B. Final Cleaning:

1. Remove trash and debris containers from site:
    a. Re-seed areas disturbed by location of trash and debris containers.
2. Clean paved roadways.

3.3 FIELD QUALITY CONTROL

A. Conduct an inspection with Engineer to verify condition of all work areas.

END OF SECTION

SECTION 31 10 00
SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Site clearing, tree protection, stripping topsoil and demolition.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 - Procurement and Contracting Requirements.
2. Division 01 - General Requirements.
3. Section 31 25 00 - Soil Erosion and Sediment Control.
4. Section 32 91 13 - Topsoiling and Finished Grading.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect existing trees and other vegetation to remain against damage.

1. Do not smother trees by stockpiling construction materials or excavated materials within drip line.
2. Avoid foot or vehicular traffic or parking of vehicles within drip line.
3. Provide temporary protection as required.

B. Repair or replace trees and vegetation damaged by construction operations.

1. Repair to be performed by a qualified tree surgeon/licensed arborist.
2. Remove trees which cannot be repaired and restored to full-growth status.
3. Replace with new trees of minimum 4 IN caliper or as required by local tree ordinance.

C. Owner will obtain authority for removal and alteration work on adjoining property, as applicable.

3.2 SITE CLEARING

A. Topsoil Removal:

1. Strip topsoil to depths encountered or as specified within the soils report, 4 IN minimum.
   a. Remove heavy growths of grass before stripping.
   b. Stop topsoil stripping sufficient distance from such trees to prevent damage to main root system.
   c. Separate from underlying subsoil or objectionable material.
2. Stockpile topsoil where directed by Engineer and/or as shown on the plans.
   a. Construct storage piles to freely drain surface water.
   b. Seed or cover storage piles to prevent erosion.
   c. Silt fence to be placed around perimeter of stockpile(s).
3. Do not strip topsoil in wooded areas where no change in grade occurs.
4. Borrow topsoil: Reasonably free of subsoil, objects over 2 IN DIA, weeds and roots.

B. Clearing and Grubbing:

1. Clear from within limits of construction all trees not marked to remain.

a. Include shrubs, brush, downed timber, rotten wood, heavy growth of grass and weeds, vines, rubbish, structures and debris.

2. Grub (remove) from within limits of construction all stumps, roots, root mats, logs and debris encountered.

C. Disposal of Waste Materials:

1. Do not burn combustible materials on site.
2. Remove all waste materials from site.
3. Do not bury organic matter on site.

END OF SECTION

SECTION 31 23 16.26
ROCK REMOVAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rock removal, including:
    a. Qualifications of blasters.
    b. Pre-blast surveys.
    c. General provisions for rock removal without blasting.
    d. Rock removal by blasting, use of explosives.
    e. Monitoring required during rock removal operations and post-removal evaluations.
    f. Unauthorized rock removal.

B. Related Requirements: Include, but are not necessarily limited to:

1. Section 31 23 33 – Trenching, Backfilling, and Compacting for Utilities.

1.2 REFERENCES

A. Terminology:

1. Terminology indicated below are not defined terms and are not indicated with initial capital letters, but when used in this section have the meaning indicated below:
    a. “Rock removal” means: removal of igneous, metamorphic, or sedimentary rock or stone; boulders over two cubic yards in volume in open areas and boulders over one cubic yard in volume in trenches; and mass concrete; that cannot be removed using rippers and therefore requires drilling and blasting or use of large excavator-mounted pneumatic breakers. Materials that do not qualify as rock removal are indicated in the “Payment Procedures” Article of this Section.

B. Reference Standards: Standards referenced in this section include, but are not necessarily limited to, the following:

1. American National Standards Institute (ANSI):
    a. A10.7 - Safety and Health Requirements for Construction and Demolition Use, Storage, Handling and Site Movement of Commercial Explosives and Blasting Agents

1.3 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Perform rock removal Work in compliance with Laws and Regulations, applicable permits, and requirements of authorities having jurisdiction.
2. Obtain municipal permit for blasting and use of explosives, as applicable.
3. Regardless of whether the Site is on land owned or under the jurisdiction of the United States federal government, comply with 43 CFR Part 423 section 24 (United States Department of the Interior, Bureau of Reclamation).
4. Blaster shall be licensed or certified, as applicable and possess other qualifications in accordance with the “Qualifications” provision of this Article.

B. Qualifications:

1. Professional Engineer:
    a. Contractor or blasting Subcontractor shall retain services of a professional engineer, licensed and registered in the same jurisdiction as the Site. Professional engineer shall

have not less than five years' experience performing preblast surveys, structural evaluations, and structural condition assessments.

b. Responsibilities include:

1) Preparing or supervising preparation of preblast surveys.

2) Preparing written requests for clarifications or interpretations of the Contract Documents for submittal to Engineer by Contractor.

3) Signing and sealing preblast survey reports.

4) Performing condition assessments of buildings and structures damaged by blasting or other rock removal method used by Contractor, and preparing and submitting evaluation reports.

2. Blasting Personnel:

a. Workers who transport, store, handle, or use explosives or blasting agents must be not less than 21 years of age. Each such worker must be able to give and understand written and verbal instructions to others engaged with such work and Contractor's site superintendent.

b. Blaster is a person responsible for, controlling, and executing blasting operations. Each blaster must be qualified through training, knowledge, and experience in transporting, storing, handling, and using explosives, and have a working knowledge of Laws and Regulations (including State and local requirements) pertaining to use of explosives in construction. Blasters must possess a current, valid Federal, State, or local license or certificate as a blaster using explosives. In addition, each blaster must possess documentation of having completed, within five years prior to performing blasting on the Project, a formal training course presented by an appropriate, bona fide third-party on blasting and proper use of explosives in construction. When such documentation of completion of formal training is not available, submit three recommendations from past employers or explosives manufacturers testifying to the blaster's knowledge and ability to perform in a safe manner the type of blasting required.

1.4 SUBMITTALS

A. Informational Submittals: Submit the following:

1. Special Procedural Submittals:

a. Notice of whether blasting will be used for rock removal and expected dates of proposed blasting, together with indication of proposed location, at or adjacent to the Site, of explosives storage magazines.

b. Blasting Permit: Copy of permit for blasting and use of explosives.

c. Description of the preblast warning system to be used at the Site.

2. Test and Evaluation Reports:

a. Preblast survey report, in accordance with the "Examination" Article of this Section.

3. Contractor-Proposed Modifications to the Work:

a. Contractor-proposed modifications (if any) to the Work requested to accommodate rock removal.

b. Should any Contractor-proposed modifications from Contract requirements be approved, a suitable Contract modification will be duly issued.

c. If no such request is submitted prior to start of the Work of this Section, Engineer will proceed on the premise that Contractor-proposed modifications are not intended.

4. Blasting records, when requested by Engineer, in accordance with the "Rock Removal and Disposal" Article of this Section.

5. Field Quality Control Results:

a. Vibration and overpressure monitoring results, in accordance with the "Field Quality Control" Article of this Section.

6. Qualifications Statements:

a. Professional engineer performing preblast survey and structural evaluations following rock removal.
b. Blasters

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Preblast Survey:

1. Preblast Survey - General:
   a. Perform preblast survey regardless of whether blasting and explosives will be used in rock removal Work.
   b. Preblast survey shall be performed or supervised by Contractor's or Subcontractor's professional engineer qualified in accordance with the "Qualifications" provision of this Section's "Quality Assurance" Article.
   c. Complete preblast survey and submit to Engineer before starting blasting and rock removal.
   d. Preblast Survey Limits:
      1) Preblast survey shall document, prior to commencement of rock removal operations, conditions, defects, and other physical factors that could reasonably be affected by rock removal operations, of buildings and structures, including, residences; commercial, industrial, and institutional; water supply wells; Underground Facilities and above-ground utilities; and other structures within the greater of the following distances from the limits of rock removal Work to be performed: 500 feet, or limit required by Laws and Regulations if greater.
      2) Preblast survey shall include structures such as dams, ponds and reservoirs, cisterns, structures of cultural or historical significance, and structures with unusually costly or vulnerable contents.
      3) Preblast survey shall document the species and sensitivity of livestock and other animals that could be affected by blasting.
   e. If, during the Work, Contractor is requested by a property owner or occupant to view alleged damage to property, Contractor shall give written notice to Owner (with copy to Engineer) prior to visiting the property.
2. Preparation for Preblast Survey:
   a. Contact all owners and occupants, or their legal representative, of properties within limits of preblast survey to obtain permission to conduct preblast survey of the associated property. If property owner or occupant (if any) does not grant permission to conduct preblast survey in a timely manner, contact property owner or occupant (if any) a second time by U.S. Postal Service registered mail/return receipt requested. Second request for permission to conduct preblast survey shall include description of preblast survey to be performed and purpose of preblast survey. Not less than 72 hours prior to start of blasting, provide to authority having jurisdiction, in writing, names and addresses of property owners or occupants (if any) who refused access, or who failed to respond to access requests for, preblast survey.
   b. Notify property owners and occupants not less than 48 hours prior to performing preblast survey.
   c. Not less than 48 hours before commencing rock removal, submit preblast survey report.
3. Method:
   a. Buildings, Structures, Underground Facilities, and above-ground utilities:
      1) Include in preblast survey detailed examination of interior and exterior of structures, Underground Facilities, and above-ground utilities located within specified limits of preblast survey.

2) Underground Facilities: With owner of Underground Facility, document condition of access points such as chambers, manholes, and vaults. Televise the following underground pipes or conduits:
    a) 54-inch gravity sewer. Perform CCTV inspection of all pipe sections within 100-feet of rock removal. Inspection shall be performed prior to rock removal and following rock removal. Inspections shall be performed during low flow conditions.
3) Obtain color photographs, video, and prepare sketches and written descriptions to document the condition of areas within specified limits of preblast survey.
4) Document evident structural faults or deficiencies and recent repairs.

4. Preblast Survey Report:
    a. Report - General:
        1) Prepare written report summarizing results of preblast survey.
        2) Not less than 48 hours before commencing rock removal operations, submit completed preblast survey report to each authority having jurisdiction for their reference, if required. Furnish preblast survey report, as a Submittal to Engineer. Retain copy of preblast survey report at the Site.
        3) Contractor's or Subcontractor's professional engineer shall sign and seal final preblast survey report.
    b. Contents: Preblast survey report shall contain the following:
        1) Location and description of each property within or partially within the required preblast survey limits.
        2) Descriptions of conditions of buildings, structures, Underground Facilities, above-ground utilities, wells, and other facilities included in the preblast survey.
        3) Summary of visual observations and inspections.
        4) Color photographs, sketches, and video as appropriate.
        5) All data, results, and yield estimates developed from water supply well assessments.
    c. Photographic Documentation: Provide video to present supplemental information, as necessary. Include in photographs and video (where appropriate) a scale to indicate dimensions. Label photographs with name of the professional engineer responsible for preblast survey, name of property owner, and sufficient information to determine the location of the image. In addition to photographs incorporated directly into preblast survey report, also include with Submittal electronic copies of photographs and video.
    d. Contractor's or Subcontractor's professional engineer shall report all findings that, in professional engineer's opinion, indicate that building, structure, Underground Facility, above-ground utility, or well will be adversely affected by the rock removal and blasting Work.

3.2 ROCK REMOVAL AND DISPOSAL

A. Rock Removal – General:

1. Contractor is solely responsible for method of rock removal employed, safety of all persons, and protection of property.
2. Avoid damaging or weakening foundations, buildings, structures, Underground Facilities, wells, sheeting, bracing, and other facilities.
3. Coordinate rock removal with other Work to avoid damage to new construction and possible decrease in concrete strength placed less than 28-days prior to rock removal operations.
4. Perform rock removal adjacent to Underground Facilities and above-ground utilities, life-safety facilities, and facilities that may pose hazards to health and safety, with utmost care, after properly notifying and coordinating with owners of such facilities, and authorities having jurisdiction.

5. Contractor shall promptly remedy property damaged during or as a result of rock removal operations, in manner acceptable to owner of the damaged property and Engineer at no additional cost to Owner or property owners.
6. Where conditions of hazard exist, or clearances with existing facilities, piping, or structures are very small, or where the potential for damage to persons or property is strong, perform rock removal by means other than blasting.

B. Blasting:

1. Perform blasting in accordance with Laws and Regulations, 43 CFR Part 423 Section 24, and ANSI A10.7 relative to blasting, and transporting, storing, and using explosives, and rock removal.
2. Advise Engineer in writing (as a Submittal) when Contractor intends to perform blasting and use explosives, and indicate proposed location, at or adjacent to the Site, of proposed explosives storage magazines.
3. Storage of Explosives:
   a. Restrict quantity of explosives stored at or adjacent to the Site to minimum necessary for the Work. Do not bring explosives to the Site until not more than 72 hours before initial blasting for the Project.
   b. Store explosives and blasting caps in separate magazines.
   c. Secure and protect explosives from theft, fire and inadvertent detonation.
   d. Use oldest stored explosives first.
   e. Maintain accurate, running inventory of all explosives stored at or adjacent to the Site. Such records are to be made available for inspection upon request of Owner, Engineer, or authority having jurisdiction.
   f. Promptly report loss or theft to appropriate authorities having jurisdiction.
4. Contractor shall prepare and comply with overall blasting plan for the Project and daily blasting plan. Such plans shall comply with 43 CFR Part 423 Section 24 and Laws and Regulations. Do not furnish such plans to Engineer or Owner.
5. Hold blasting charges above the design finished grades and minimize fractured rock from overblast.
6. Do not drill more than two feet below proposed subgrades to reduce the potential for fracturing rock below finished grade.
7. Notify in writing Owner, Engineer, owner's of Underground Facilities (located within the radius indicated for performance of preblast survey), and authorities having jurisdiction of intent to perform blasting not less than 24 hours prior to blasting. Such notice shall indicate locations of blasting.
8. Cover or otherwise suitably confine blasting. Mitigate to greatest extent practical, potential for discharge of debris, including fly rock resulting from blasting.
9. Implement adequate precautions to prevent accidental discharge of electric blasting caps caused by current induced by radar, radio transmitters, powerlines, and similar sources of electromagnetic radiation.
10. Post appropriate, temporary warning signs, not less than three feet by 3.5 feet in size at entrances to Work areas where blasting will be performed, clearly indicating a blasting zone. When blasting will include using electric blasting caps, temporary warning signs shall read "BLASTING ZONE — TURN OFF 2-WAY RADIOS AND CELLULAR TELEPHONES" and shall be provided not less than 1,000 feet from blasting location.
11. Prior to blasting, sound alarms, plainly audible within 250 feet of blasting location indicating imminence of blasting. Sound first audible alarm five minutes before blasting, and sound second audible alarm two minutes before blasting.
12. Keep records of all blasts, including: date; location, depth, number, and diameter of drill holes; type and quantity of explosives; and other pertinent data. Submit records to Engineer when requested.

13. Before sounding the “all-clear” audible signal, blaster must thoroughly inspect to determine if all charges have fired. Blaster must carefully check wiring and identify presence of unexploded charges and subsequently ensure safe and proper discharge or disposal. Before allowing other personnel to access area of the blast, ensure surfaces of fractured rock are safe.
14. Excavate and remove rock damaged by blasting outside limits of excavation and replace loose rock with backfill in accordance with the Contract Documents.
15. Immediately after blasting is completed, remove all unused explosives from the Site for proper disposal offsite.

C. Limiting Criteria for Vibration, Particle Velocity, and Airblast Overpressure:

1. Vibration, frequency, peak particle velocity, and overpressure generated by rock removal operations shall not exceed limits established by Laws or Regulations, 43 CFR Part 423 section 24.1.8 (“Damage Control”), and limits established by authorities having jurisdiction. When such requirements conflict, comply with the most-stringent requirement.
2. Peak airblast overpressure measured at location of nearest occupied, above-ground building or structure (considering wind direction) shall not exceed 0.014 psig.

D. Removal and Disposal of Rock:

1. Remove blasted or broken rock using suitable construction equipment and machinery in accordance with Section 31 23 33 - Trenching and Backfilling.
2. Do not use rock removed by Contractor as fill or backfill. Dispose of excavated rock offsite at Contractor’s expense in accordance with Laws and Regulations.

3.3 FIELD QUALITY CONTROL

A. Field Tests and Inspections:

1. Monitoring of Blasting, Hammering, or Other Rock Fracturing Operations:
   a. Perform seismic monitoring during blasting, breaking, and other rock removal operations (collectively, “rock blasting or breaking”), in accordance with Laws and Regulations and 43 CFR Part 423 Section 24.
   b. Monitor rock blasting or breaking to allow evaluation of compliance with limitations indicated in the Contract Documents and 43 CFR Part 423 Section 24. At minimum, monitor each rock blasting or breaking operation as follows:
      1) Rock blasting or breaking Monitoring Zone: Monitor vibrations at exterior walls of all buildings and structures within distance from rock blasting or breaking equal to radius indicated in this Section for preblast surveys.
      2) If no buildings or structures are located within indicated rock blasting or breaking monitoring zone, monitor vibrations at three equally spaced radial points located at perimeter of indicated rock blasting or breaking monitoring zone.
   c. Monitor overpressures for all buildings and structures within indicated rock blasting or breaking monitoring zone.
   d. Equipment for monitoring vibration and overpressure shall be appropriate for the intended purpose and not less in quality and functionality than that generally used by entities performing rock blasting or breaking of the type required for the Work.
   e. Submit vibration and overpressure monitoring results to Engineer within 24 hours of performing rock blasting or breaking. Include with such Submittal clear indication of whether results furnished are in accordance with Laws and Regulations and the Contract Documents. Where results obtained are not in complete accordance with Laws and Regulations and the Contract Documents, provide written explanation for results obtained, signed by blasting supervisor where applicable.
   f. Contractor’s monitoring does not relieve Contractor of responsibility for controlling vibration and overpressure during rock blasting or breaking.
2. Evaluations Following Rock blasting or breaking:

a. Upon completion of rock blasting or breaking, furnish written notice to all property owners and occupants within stipulated radius for preblast survey, advising of the conclusion of rock blasting or breaking operations and inviting them to notify Contractor of apparent damage to property alleged to have resulted from rock blasting or breaking. Such notice shall allow property owners and occupants 30 days to respond to Contractor.

b. When property owner or occupant, responding in a timely manner, alleges damage resulting from Contractor's rock blasting or breaking operations, retain services of the same professional engineer who sealed and signed preblast survey report to promptly investigate and report. Furnish to Engineer, as a Submittal, copy of evaluation report by Contractor's professional engineer.

c. Where such evaluation report indicates damage resulted from Contractor's rock blasting or breaking operations, promptly remedy such damage to satisfaction of owner and occupants of such property.

3.4 UNAUTHORIZED ROCK REMOVAL

A. Rock removal outside the limits shown or indicated in the Contract Documents or that is not approved by Engineer, including removal, disposal, and backfilling, will be at Contractor's expense.

B. Fill unauthorized excavation below pipe or foundation with compacted granular structural fill or controlled low-strength concrete material (flowable fill) in accordance with the Contract Documents as directed by Engineer in writing, at no additional cost to Owner.

END OF SECTION

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SECTION 31 23 16.43
TEMPORARY SUPPORT OF EXCAVATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Requirements for temporary (during construction) support of excavations including:
   a. Qualifications of Contractor's professional engineer (if any) retained for designing temporary support of excavations.
   b. Contractor's additional investigations and evaluations necessary for designing temporary support of excavations.
   c. Performance criteria and general provisions for temporary support of excavations.
   d. General provisions for temporary support of excavations, including supports Contractor proposes remain in place following construction.
   e. Trench boxes.
   f. Maintenance and removal of temporary support of excavations.

B. Related Requirements: Include, but are not necessarily limited to:

1. Section 31 23 33 – Trenching, Backfilling, and Compacting for Utilities.

1.2 PRICE AND PAYMENT PROCEDURES

A. Measurement and Payment:

1. No separate payment will be made for temporary support of excavations.

1.3 REFERENCES

A. Terminology:

1. Terminology indicated below are not defined terms and are not indicated with initial capital letters, but when used in this section have the meaning indicated below:
   a. "Sheeting" means: Long, structural sections of steel with a vertical interlocking system that create a continuous wall, often used for retaining soil or water. The terms "sheet piling", "sheeting", and "piling" (and derivative terms, such as "piles") have the same meaning. Certain types of soldier piles may qualify as sheeting.
   b. "Shoring" means: Temporary means of supporting the walls of an excavation or existing structure, that does not qualify as sheeting. Two basic types of shoring for excavations are timber shoring and aluminum hydraulic shoring; the latter is a lightweight system and equipment used for supporting trench excavations.
   c. "Subgrade" means: The uppermost surface of native soil material unmoved from cuts; the bottom of excavation.
   d. "Tie-backs" means: A method of laterally supporting sheeting or shoring when congestion within the limits of the excavation need to be minimized. Tiebacks generally consist of a central steel bar (or strand tendon), embedded in the soil, surrounded by an annulus of grout.
   e. "Trench box" means: A one- or two-sided shield, placed temporarily in an excavation, typically a trench, which protects workers inside the trench box in the event of collapse of the excavation wall. Trench boxes may be relocated within the excavation as the Work progresses. Trench boxes also shield workers from falling or dislodged materials. Trench boxes are not intended to shore up excavation walls or prevent collapse. The terms "trench box", "trench shield", and "shore shield" have the same meaning.
   f. "Wales" means: Beams that span across the face of sheeting or shoring distributing the earth and water pressures to either a raker or cross-strut. Struts, as used in this

Section, are structural elements that transfer the load from a temporary excavation support wall to an adjacent, parallel structure. Rakers are struts that are positioned at an angle extending from a temporary excavation support wall to a foundation block or supporting substructure. In this Section, the words “wales” and “walers” have the same meaning.

B. Reference Standards: Standards referenced in this section include, but are not necessarily limited to, the following:

1. American Institute of Steel Construction (AISC):
   a. ANSI/AISC 360 - Specification for Structural Steel Buildings.
2. American Welding Society (AWS):
   a. D1.1/D1.1M - Structural Welding Code – Steel.
3. United States Army Corps of Engineers (USACOE)
   a. Engineer Manual 1110-2-2504 - Design of Sheet Pile Walls.
4. United States Department of Transportation, Federal Highway Administration (FHWA)
   a. FHWA-IF-99-015 Geotechnical Engineering Circular No . 4 - Ground Anchors and Anchored Systems.

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Contractor’s Professional Engineer:
   a. Where necessary for performing the Work in accordance with this Section and when required by Laws or Regulations governing the practice of the associated design discipline or Laws or Regulations governing excavation safety and trench safety in construction, retain the services of a professional engineer, licensed and registered in the same jurisdiction as the Site, to evaluate subsurface conditions and design systems for temporary support of excavations.
   b. Professional engineer shall be appropriately licensed and registered for the professional services required by this Section, and shall be appropriately experienced in evaluating subsurface conditions and excavation conditions affecting health and safety of personnel and protection of property similar to those at the Site, and in designing and evaluating systems for temporary support of excavations.
   c. Responsibilities shall include:
      1) Evaluating existing subsurface data and information for the Site and adjacent areas, available to Contractor.
      2) Advising Contractor regarding additional subsurface investigations necessary to provide temporary support of excavations as required by this Section.
      3) Evaluating the potential effect on existing facilities, at and adjacent to the Site, of installing and removing temporary systems for supporting excavations.
      4) Personally designing or supervising the design of temporary supports for excavations, including preparing drawings, performance requirements, and specifications for temporary support of excavations, such as temporary sheeting, shoring, bracing, wales, tie-backs, and similar systems.
      5) Sealing and signing instruments of service developed for the Work, including calculations, evaluation reports, recommendations of a technical nature, drawings, specifications, and similar documents.
      6) Assisting Contractor with obtaining permits and approvals necessary for temporary support of excavations.
      7) Consulting with Contractor, including visiting the Site during construction as required by Contractor, during installation, use, and removal of temporary supports of excavations.

1.5 SUBMITTALS

A. Informational Submittals: Submit the following:

1. Advisory on Approach for Temporary Support of Excavations:
   a. Furnish document regarding Contractor's proposed approach for temporary support of excavations, indicating the following:
      1) General indication of Contractor's overall, intended approach for temporary support of excavations; for example, indicate whether excavations will be supported by a trench box, temporary sheeting, shoring, wales, tie-backs, or other method. Indicate where different approach will be used for different excavations or portions of excavations.
      2) Indication of whether Contractor or Subcontractor intends to retain services of a professional engineer relative to temporary support of excavations. When such individual or entity will be so retained, indicate name of entity and specific, individual design professional-in-responsible-charge, together with indication of type of license and registration and associated license and registration number and jurisdiction. If not previously furnished with Contractor's insurance documentation, furnish evidence that such professional engineer possesses professional liability insurance in accordance with the Contract Documents, including indication of whether required coverage limits have been eroded during the current policy by prior claims.
      3) Contractor-proposed modifications to the permanent Work requested to accommodate temporary support of excavations. In the event such changes are proposed, approval, if any, of such changes will be only via an appropriate Contract modification. If no such request is submitted prior to start of the Work of this Section, Engineer will proceed on the premise that Contractor-proposed modifications are not intended.
      4) Where temporary steel sheeting will be used for temporary support of excavations, indicate anticipated dates for installing such items and anticipated dates for removing such items.
      5) Description of how temporary support of excavations and operations will, or may, affect Owner, facility manager (if other than Owner), and other property owners and occupants.
      6) Indication of locations, if any, where temporary support of excavations are proposed to remain in place following construction and backfilling, and extent of Contractor's proposed modifications or partial removals of such systems.
      7) Indicate Project-specific sequence of installation and removal of temporary supports of excavations, including: installation and removal of wales, struts, and other supports; and locations and approximate elevations of interim (partial) backfilling against foundations, when interim (partial) backfilling is proposed.
      8) Where applicable, indicate intended monitoring including monitoring of deflection of permanent construction and settlement outside of excavations.
   b. Engineer's (or Owner's) review, comments upon, acceptance, or other appropriate action on such Submittal does not, in any way, reduce or mitigate Contractor's sole responsibility for construction means, methods, techniques, procedures, sequences, and associated safety and protection measures.
   c. Do not include in such Submittal: calculations, evaluation reports, recommendations, drawings, or specifications developed, sealed, and signed by Contractor or Subcontractor or by professional engineer retained by Contractor or Subcontractor. However, in the event of alleged or potential effect of temporary support of excavations on facilities or property, or in the event of disagreement between the parties concerning allegedly differing subsurface or physical conditions, promptly furnish such documents to Engineer and Owner upon request. Should such request be received by Contractor, furnishing such documents to Engineer and Owner will not, in any way, reduce or

mitigate Contractor's sole responsibility for construction means, methods, techniques, procedures, sequences, or associated safety and protection measures.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Description:

1. Provide temporary support of excavations comprised of materials and systems suitable for the intended purpose, excavation depth, subsurface conditions, other environmental factors, installation and removal methods, and duration of use.
2. Contractor shall determine necessary elements for temporary support of excavations for compliance with Laws and Regulations and the Contract Documents, while considering subsurface conditions, construction means, methods, techniques, procedures, and sequences, and associated safety and protection measures.
3. Previously-used materials, where used for temporary support of excavations, shall be in good condition and be neither damaged nor excessively pitted.
4. Steel materials and fabrications for temporary support of excavations shall be in accordance with ANSI/AISC 360 and welding shall be in accordance with AWS D1.1/D1.1M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification, Evaluation, and Assessment of Existing Conditions:

1. Evaluate information and data available to Contractor regarding subsurface and physical conditions at the Site and adjacent areas relative to temporary support of excavations. Perform additional investigations as necessary to enable Contractor to provide appropriate temporary support of excavations required to comply with Laws and Regulations and the Contract Documents.
2. Such investigations and evaluations by Contractor may include excavating (and subsequently backfilling), test pits to visually observe subsurface conditions and groundwater, test borings, sampling, and laboratory analyses. Obtain and record data and perform evaluations necessary for Contractor to provide temporary support of excavations as required.
3. As the Work progresses, evaluate performance of temporary support of excavations as necessary and modify temporary support of excavations as appropriate to comply with Laws and Regulations and the Contract Documents.

B. Installing the Work constitutes Contractor's approval of field conditions prevailing at the time of the Work and materials and design of temporary support of excavations used by Contractor.

3.2 GENERAL PROVISIONS FOR TEMPORARY SUPPORT OF EXCAVATIONS

A. Excavations in stable rock may be made with vertical sides without temporary support of the excavation. Under all other conditions, excavations shall be sloped and benched as appropriate for the subsurface conditions, or provided with temporary support of excavations.

B. Temporary Support of Excavations - General:

1. Provide temporary sheeting, shoring, wales, tie-backs, trench boxes, cofferdams, and other excavation supports as necessary and required for the Work, in accordance with Laws and Regulations and the Contract Documents.
2. Clearances and types of temporary sheeting, shoring, wales, tie-backs, and other excavation supports, insofar as they may affect the finished character of the Work and the design of sheeting to be left in place, will be subject to Engineer's approval; but Contractor is solely responsible for adequacy of all temporary sheeting, shoring, wales, tie-backs,

cofferdams, and other excavation supports, Contractor proposes remain in place following construction.

3. Installation:
    a. Steel work for temporary support of excavations shall be in accordance with ANSI/AISC 360 and AWS D1.1/D1.1M.
4. As excavation progresses, carry down temporary supports of excavation to required elevation at or below subgrade.

3.3 TRENCH BOXES

A. Installing and Using Trench Boxes:

1. Excavation of unclassified and other materials below bottom of trench box shall not exceed limits established in Laws and Regulations.
2. When using trench box for installing piping:
    a. Portions of trench box extending below the mid-diameter of an installed, rigid pipe, such as prestressed concrete pipe and other types of rigid pipe, shall be raised above the pipe's mid-diameter elevation prior to relocating the trench box within the excavation for further construction.
    b. Bottom of trench box shall not at any time extend below mid-diameter of installed pipe that is flexible or has flexing capability, such as steel, ductile iron, PVC, CPVC, polyethylene, and other pipe that has flexing capability.
3. When using trench box for installing structures, bottom of trench box shall not extend below elevation of top of granular base material of structure.

B. Removal or Relocation of Trench Boxes:

1. When removing trench box or relocating trench box within the excavation, exercise extreme care to prevent moving piping, structures, and other Underground Facilities, and prevent disturbance of bedding material for piping, structures, and other Underground Facilities.
2. When piping, structures, or other Underground Facilities are disturbed, remove and reinstall the disturbed items in accordance with the Contract Documents.

3.4 MAINTENANCE AND REMOVAL OF TEMPORARY SUPPORT OF EXCAVATIONS

A. Maintenance of Temporary Support for Excavations:

1. During construction, maintain temporary support of excavations as long as necessary until removal or Engineer's concurrence that such temporary support of excavations may remain in place following construction.
2. As necessary, promptly remedy deficiencies in temporary support of excavations.

B. Removal of Temporary Support of Excavations:

1. When temporary support of excavations are no longer necessary, remove from the Site all elements of temporary systems supporting excavations unless Owner (through Engineer) approves temporary support of excavations, or part thereof, continuing existence at the Site after final payment.
2. Perform such removal in manner not injurious to buildings, structures, Underground Facilities, and other facilities, their appearance, and adjacent construction.
3. Removal of Temporary Sheeting and Bracing:
    a. Remove from excavations sheeting, shoring, wales, and other elements of temporary supports, unless otherwise directed by Engineer in writing. Perform removal to avoid damaging the Work and adjacent construction. Removal shall be equal on both sides of excavation to ensure no unequal loads on buildings, structures, Underground Facilities, and other facilities.
    b. Defer removal of sheeting, shoring, wales, and other elements, where removal may cause soil to come into contact with concrete, until the following conditions are satisfied:

1) Concrete has cured for not less than seven days, and reached full design strength as indicated in the Contract Documents.
2) Wall and floor framing, up to and including grade level floors, is in place.

4. Requirements for removing and relocating trench boxes are indicated in the “Trench Boxes” Article of this Section.
5. Restore disturbed areas in accordance with the Contract Documents.

END OF SECTION

SECTION 31 23 19
DEWATERING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Dewatering system.
2. Surface water control system.
3. Monitoring wells.
4. System operation and maintenance.
5. Water disposal.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 - Procurement and Contracting Requirements.
2. Division 01 - General Requirements.
3. Section 31 23 33 - Trenching, Backfilling, and Compacting for Utilities.
4. Section 31 25 00 - Soil Erosion and Sediment Control.

1.2 QUALITY ASSURANCE

1.3 DEFINITIONS

A. Dewatering:

1. Lowering of groundwater table and intercepting horizontal water seepage to prevent groundwater from entering excavations, trenches and shafts.
2. Disposing of removed water.

B. Surface Water Control:

1. Removal of surface water within open excavations.

C. Foundations:

1. Footings, base slabs, foundation walls, mat foundations, grade beams, piers and any other support placed directly on soil or rock.

1.4 SUBMITTALS

A. Shop Drawings:

1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
2. Dewatering plan design data and Drawings including the following:
   a. Proposed type of dewatering system with complete description of equipment and instrumentation to be used.
   b. Arrangement, locations, and depths of system components.
   c. Filter types and sizes.
   d. Method of monitoring water quality.

B. Site Information:

1. Data in subsurface investigation reports was used for the basis of the design.
   a. Conditions are not intended as representations or warranties of accuracy or continuity between soil borings.
   b. The Owner or Engineer will not be responsible for interpretations or conclusions drawn from this data by Contractor.

2. Additional test borings and other exploratory operations may be performed by Contractor, at the Contractor's option; however, no change in the Contract Sum will be authorized for such additional exploration.
3. Site data provided is not contractual and shall be considered "for information only".

PART 2 - PRODUCTS

2.1 DEWATERING EQUIPMENT

A. Select dewatering equipment to meet specified performance requirements.

PART 3 - EXECUTION

3.1 DEWATERING

A. Review Geotechnical investigation before beginning excavation and determine where groundwater is likely to be encountered during excavation.

B. Where groundwater is or is expected to be encountered during excavation, install a dewatering system to prevent softening and disturbance of subgrade below foundations and fill material, to allow foundations and fill material to be placed in the dry, and to maintain a stable excavation side slope.

1. Employ dewatering specialist for selecting and operating dewatering system.
2. Groundwater shall be maintained at least 3 FT below the bottom of any excavation.
3. Install groundwater monitoring wells as necessary.
4. Keep dewatering system in operation until dead load of structure exceeds possible buoyant uplift force on structure.

C. Dispose of groundwater to an area which will not interfere with construction operations or damage existing construction.

1. Shut off dewatering system at such a rate to prevent a quick upsurge of water that might weaken the subgrade.
2. Discharge water into existing storm sewer system, drainage channels and settling basins.

3.2 SURFACE WATER CONTROL SYSTEMS

A. Provide ditches, berms, and other devices to divert and drain surface water from excavation area as specified in Specification Section 31 25 00.

B. Divert surface water and seepage water within excavation areas into sumps and pump water into drainage channels, storm drains and settling basins in accordance with requirements of the agencies having jurisdiction.

C. Control and remove unanticipated water seepage into excavation.

END OF SECTION

SECTION 31 23 33

TRENCHING, BACKFILLING, AND COMPACTING FOR UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavation, trenching, backfilling and compacting for all underground utilities.

1.2 QUALITY ASSURANCE

A. Referenced Standards:

1. ASTM International (ASTM):
   a. C33, Standard Specification for Concrete Aggregates.
   b. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).
   c. D2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
   d. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
   e. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

B. Owner may hire an independent soils laboratory to conduct in-place moisture-density tests for backfilling to assure that all work complies with this Specification Section.

1.3 DEFINITIONS

A. Excavation: All excavation will be defined as unclassified.

1.4 SUBMITTALS

A. Shop Drawings:

1. Product technical data including:
   a. Acknowledgement that products submitted meet requirements of standards referenced.
   b. Manufacturer's installation instructions.
2. Submit respective pipe or conduit manufacturer's data regarding bedding methods of installation and general recommendations.

B. Informational Submittals:

1. Blasting Plan and all related inspections and test results

1.5 SITE CONDITIONS

A. Avoid overloading or surcharge a sufficient distance back from edge of excavation to prevent slides or caving.

1. Maintain and trim excavated materials in such manner to be as little inconvenience as possible to public and adjoining property owners.

B. Provide full access to public and private premises and fire hydrants, at street crossings, sidewalks and other points as designated by Owner to prevent serious interruption of travel.

C. Protect and maintain bench marks, monuments or other established points and reference points and if disturbed or destroyed, replace items to full satisfaction of Owner and controlling agency.

D. Verify location of existing underground utilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Backfill Material: Per details on Drawings.

B. Bedding Materials: Per details on Drawings.

C. Flowable fill:

1. Description: Flowable fill shall be a mixture of cement, fly ash, fine sand, water, and air having a consistency which will flow under a very low head.
2. Material characteristics:
   a. The approximate quantities of each component per cubic yard of mixed material shall be as follows:
      1) Cement (Type I or II): 50 LBS.
      2) Fly ash: 200 LBS.
      3) Fine sand: 2,700 LBS.
      4) Water: 420 LBS.
      5) Air content: 10 percent.
   b. Actual quantities shall be adjusted to provide a yield of 1 cubic yard with the materials used.
   c. Approximate compressive strength should be 85 to 175 psi.
   d. Fine sand shall be an evenly graded material having not less than 95 percent passing the No. 4 sieve and not more than 5 percent passing the No. 200 sieve.

PART 3 - EXECUTION

3.1 GENERAL

A. Remove and dispose of unsuitable materials as directed by Geotechnical Engineer to site provided by Contractor.

3.2 EXCAVATION

A. Remove rock, clay, silt, gravel, hard pan, loose shale, loose stone and all other material as required to excavate the trench.. All excavation is unclassified. No additional payment will be made for removal of rock or any other material encountered during the excavation work

B. Groundwater Dewatering:

1. Where groundwater is, or is expected to be, encountered during excavation, install a dewatering system to prevent softening and disturbance of subgrade to allow undercutting (if needed), subgrade stabilization, pipe, bedding and backfill material to be placed in the dry, and to maintain a stable trench wall or side slope.
2. Groundwater shall be drawn down and maintained at least 3 FT below the bottom of any trench or manhole excavation prior to excavation.
3. Review soils investigation report before beginning excavation and determine where groundwater is likely to be encountered during excavation.
   a. Employ dewatering specialist for selecting and operating dewatering system.
4. Keep dewatering system in operation until dead load of pipe, structure and backfill exceeds possible buoyant uplift force on pipe or structure.
5. Dispose of groundwater to an area which will not interfere with construction operations or damage existing construction.
6. Install groundwater monitoring wells as necessary.
7. Shut off dewatering system at such a rate to prevent a quick upsurge of water that might weaken the subgrade.

8. Cost of groundwater dewatering shall be included in the price of the pipe and structures.

C. Trench Excavation:

1. Excavate trenches by open cut method to depth shown on Drawings and necessary to accommodate work.
   a. Support existing utility lines and yard piping where proposed work crosses at a lower elevation.
      1) Stabilize excavation to prevent undermining of existing utility and yard piping.
2. Open Trenches:
   a. No more than 100 LF at any one time.
3. Any trench or portion of trench, which is opened and remains idle for seven (7) calendar days, or longer, as determined by the Owner, may be directed to be immediately refilled, without completion of work, at no additional cost to Owner.
   a. Said trench may not be reopened until Owner is satisfied that work associated with trench will be prosecuted with dispatch.
4. Observe following trenching criteria:
   a. Trench size:
      1) Excavate width to accommodate free working space.
      2) Trench width at top of pipe or conduit shall per the drawing details.
      3) Cut trench walls vertically from bottom of trench to 1 FT above top of pipe, conduit, or utility service.
      4) Keep trenches free of surface water runoff.

D. Flowable Fill:

1. Flowable fill shall be:
   a. Discharged from a mixer by any means acceptable to the Engineer into the area to be filled.
   b. Placed in 4 FT maximum lifts to the elevations indicated.
      1) Allow 12 HR set-up time before placing next lift or as approved by the Engineer.
      2) Contractor shall place flowable fill lifts in such a manner as to prevent flotation of the pipe.
2. Flowable fill shall not be placed on frozen ground.
3. Subgrade on which flowable fill is placed shall be free of disturbed or softened material and water.
4. Flowable fill batching, mixing, and placing may be started if weather conditions are favorable, and the air temperature is 34 DegF and rising.
5. At the time of placement, flowable fill must have a temperature of at least 40 DegF.
6. Mixing and placing shall stop when the air temperature is 38 DegF or less and falling.
7. Each filling stage shall be as continuous an operation as is practicable.
8. Contractor shall prevent traffic contact with flowable fill for at least 24 HRS after placement or until flowable fill is hard enough to prevent rutting by construction equipment.
9. Flowable fill shall not be placed until water has been controlled or groundwater level has been lowered in conformance with the requirements of the preceding Groundwater Dewatering paragraph in PART 3 of this Specification Section.

3.3 PREPARATION OF FOUNDATION FOR PIPE LAYING

A. Rock Excavation:

1. Excavate minimum of 4 IN below bottom exterior surface of the pipe or conduit.
2. Backfill to grade with suitable earth or granular material per the trench detail.
3. Form bell holes in trench bottom.

B. Subgrade Stabilization:

1. Stabilize the subgrade when directed by the Owner.
2. Observe the following requirements when unstable trench bottom materials are encountered.
    a. Notify Owner when unstable materials are encountered.
        1) Define by drawing station locations and limits.
    b. Remove unstable trench bottom caused by Contractor failure to dewater, rainfall, or Contractor operations.
        1) Replace with subgrade stabilization with no additional compensation.

C. Construct a continuous and uniform bedding prior to pipe installation.

3.4 USE OF EXPLOSIVES

A. See Specification Section 31 23 16.26 – Rock Removal.

3.5 BACKFILLING METHODS

A. Do not backfill until tests to be performed on system show system is in full compliance with specified requirements.

B. Compacted Backfill:

1. Furnish as indicated on the Drawings.
2. Comply with the following:
    a. Place backfill in lifts thicknesses capable of being compacted to densities specified.
    b. Observe pipe manufacturer's recommendations regarding backfilling and compaction.
    c. Avoid displacing joints and appurtenances or causing any horizontal or vertical misalignment, separation, or distortion.

C. Water flushing for consolidation is not permitted.

3.6 COMPACTION

A. General:

1. Place and assure bedding, backfill, and fill materials achieve an equal or higher degree of compaction than undisturbed materials adjacent to the work.
2. In no case shall degree of compaction below minimum compactions specified be accepted.

B. Compaction Requirements: Per details on Drawings

3.7 FIELD QUALITY CONTROL

A. Testing:

1. Owner may hire testing firm to perform in-place moisture-density tests.
2. Costs of "Passing" tests paid by Owner.
3. Cost associated with "Failing" tests shall be paid by Contractor.
4. Assure Owner has immediate access for testing of all soils related work.
5. Ensure excavations are safe, per OSHA requirements, for testing personnel.

END OF SECTION

SECTION 31 25 00
SOIL EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Soil erosion and sediment control.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 - Procurement and Contracting Requirements.
2. Division 01 - General Requirements.

C. Comply with all permit requirements.

1.2 SUBMITTALS

A. Shop Drawings:

1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
2. Product technical data including:
   a. Acknowledgement that products submitted meet requirements of standards referenced.
   b. Manufacturer's installation instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

A. See details on Drawings.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prior to General Stripping Topsoil and Excavating install all erosion and sediment control devices.

B. Temporarily seed basin slopes and topsoil stockpiles:

1. Rate: 1/2 LB/1000 SQFT.
2. Reseed as required until good stand of grass is achieved.

3.2 DURING CONSTRUCTION PERIOD

A. Maintain all erosion and sediment control devices.

1. Inspect regularly especially after rainstorms.
2. Repair or replace damaged or missing items.

B. After rough grading, sow temporary grass cover over all exposed earth areas not draining into sediment basin or trap.

C. Do not disturb existing vegetation (grass and trees).

D. Excavate sediment out of basins and traps when capacity has been reduced by 50 PCT.

1. Remove sediment from behind silt fence and bales to prevent overtopping.

E. Topsoil and Fine Grade Slopes and Swales, etc.: Seed and mulch as soon as areas become ready.

3.3 NEAR COMPLETION OF CONSTRUCTION

A. Eliminate basins, dikes, traps, etc.

B. Grade to finished or existing grades.

C. Fine grade all remaining earth areas, then seed and mulch.

D. Following approval from permitting authority, removal all erosion and sediment control devices.

END OF SECTION

SECTION 31 32 19
GEOTEXTILES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Nonwoven geotextile material.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 - Procurement and Contracting Requirements.
2. Division 01 - General Requirements.

1.2 QUALITY ASSURANCE

A. Referenced Standards:

1. American Association of State Highway Transportation Officials (AASHTO):
   a. M288, Standard Specification for Geotextile Specification for Highway Applications.
2. ASTM International (ASTM):
   a. D3786, Standard Test Method for Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method.
   b. D4355, Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.
   c. D4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
   d. D4533, Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
   e. D4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
   f. D4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
   g. D4759, Standard Practice for Determining the Specification Conformance of Geosynthetics.
   h. D4833, Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.
   i. D4873, Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.
   j. D5261, Standard Test Method for Measuring Mass per Unit Area of Geotextiles.

B. Qualifications:

1. Each manufacturing, fabricating firm shall demonstrate five years continuous experience, including a minimum of 10,000,000 SQFT of geotextile installation in the past three years.
2. Installing firm shall demonstrate that the site Superintendent or Foreman has had responsible charge for installation of a minimum of 1,000,000 SQFT of geotextile.

1.3 DEFINITIONS

A. Manufacturer: Manufacturer producing geotextile sheets from resin and additives.

B. Installer: The Installers are the individuals actually performing the hands-on work in the field.

1.4 SUBMITTALS

A. Shop Drawings:

1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
2. Manufacturer's documentation that raw materials and roll materials comply with required geotextile physical properties.

3. Manufacturer and Installer quality control manuals.
4. Original test results for resins, roll material and factory seam tests at frequency specified in respective quality control manuals.
5. Proposed details of anchoring and overlapping if different than included in Contract Documents.

1.5 DELIVERY, STORAGE AND HANDLING

A. See Specification Section 01 65 50.

B. Label, handle, and store geotextiles in accordance with ASTM D4873 and as specified herein.

C. Wrap each roll in an opaque and waterproof layer of plastic during shipment and storage.

1. Do not remove the plastic wrapping until deployment.

D. Label each roll with the manufacturer's name, geotextile type, lot number, roll number, and roll dimensions (length, width, gross weight).

E. Repair or replace geotextile or plastic wrapping damaged as a result of storage or handling, as directed.

F. Do not expose geotextile to temperatures in excess of 71 DEGC (160 DEGF) or less than 0 DEGC (32 DEGF) unless recommended by the manufacturer.

G. Do not use hooks, tongs or other sharp instruments for handling geotextile.

1. Do not lift rolls lifted by use of cables or chains in contact with the geotextile.
2. Do not drag geotextile along the ground.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

1. GSE Lining Technology.
2. Propex Geosynthetics.
3. SKAPS Industries.
4. TenCate Mirafi.
5. Tenax.

B. Submit request for substitution in accordance with Specification Section 01 25 13.

2.2 MATERIALS AND MANUFACTURE

A. Geotextile:

1. Nonwoven pervious sheet of polymeric material.
2. Geotextile fibers:
   a. Long-chain synthetic polymer composed of at least 85 PCT by weight polyolefins, polyesters, or polyamides.
   b. Filaments resistant to deterioration by ultraviolet light, oxidation, and heat exposure.
   c. Do not as reclaimed or recycled fibers or polymer to the formulation.
3. Form geotextile into a network such that the filaments or yarns retain dimensional stability relative to each other, including the selvages.
4. The geotextile physical properties shall equal or exceed the minimum average roll values listed below.
   a. Values shown are for the weaker principal direction.
   b. Acceptance of geotextile shall be in accordance with ASTM D4759.

c. Geotextile: For use under riverbank stabilization stone.

PROPERTY	TEST METHOD	MINIMUM AVERAGE ROLL VALUE
Mass per Unit Area, OZ/SY	ASTM D5261	=8
AOS, U.S. Standard Sieve	ASTM D4751	70-100
Permittivity, SEC-1	ASTM D4491	=1.0
Puncture, LBS	ASTM D4833	=100
Grab Tensile, LBS	ASTM D4632	=200
Trapezoidal Tear, LBS	ASTM D4533	=100
Burst Strength, PSI	ASTM D3786	=300
Ultraviolet Degradation % retained @ 500 HRS	ASTM D4355	=50
Sewn Seam Strength, LBS	ASTM D4632	=220

B. Thread:

1. High-strength polyester, nylon, or other approved thread type.
2. Equivalent chemical compatibility and ultraviolet light stability as the geotextile.
3. Contrasting color with the geotextile.

PART 3 - EXECUTION

3.1 PREPARATION

A. Construct the surface underlying the geotextiles smooth and free of ruts or protrusions which could damage the geotextiles.

3.2 INSTALLATION

A. Install geotextiles in accordance with manufacturer's written recommendations.

B. Hand place geotextile.

1. No equipment will be permitted to traffic in direct contact with the geotextile.

C. Lay geotextile smooth so as to be free of tensile stresses, folds, and wrinkles.

D. Seam Construction:

1. Sew all Type I geotextile seams.
2. Broom clean existing geotextile and cut off to provide a clean area for seaming with the new geotextile.
3. Sew seams continuously using an SSA flat seam with one row of a two-thread 401 chain stitch unless otherwise recommended by the manufacturer.
4. Minimum distance from the geotextile edge to the stitch line nearest to that edge: 2 IN unless otherwise recommended by the manufacturer.
5. Tie off thread at the end of each seam to prevent unraveling.
6. Construct seams on the top side of the geotextile to allow inspection.
7. Sew skipped stitches or discontinuities with an extra line of stitching with 18 IN of overlap.
8. Geotextile seams may be sewn or overlapped.
   a. Construct overlapped seams in accordance with manufacturer's recommendations or as shown on Drawings.

E. Heat tack the geotextile overlaps as shown on the Drawings.

F. Protect geotextiles from clogging, tears, and other damage during installation.

G. Geotextile Repair:

1. Place a patch of the same type of geotextile which extends a minimum of 12 IN beyond the edge of the damage or defect.
2. Fasten patches continuously using a sewn seam or other approved method.
3. Align machine direction of the patch with the machine direction of the geotextile being repaired.
4. Replace geotextile which cannot be repaired.

H. Use adequate ballast (e.g., sandbags) to prevent uplift by wind.

I. Do not use staples or pins to hold the geotextile in place.

J. Do not leave geotextile uncovered for more than 14 days.

END OF SECTION

SECTION 31 37 00
STONE REVETMENT (RIP RAP)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Stone revetment (riprap) for protection of slopes and drainage ways against erosion.
    a. Channel protection.
    b. Embankment protection.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 - Procurement and Contracting Requirements.
2. Division 01 - General Requirements.
3. Section 31 32 19 - Geotextiles.

1.2 QUALITY ASSURANCE

A. Referenced Standards:

1. ASTM International (ASTM):
    a. C127, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate.
    b. D3744/D3744M, Standard Test Method for Aggregate Durability Index.
    c. D5312/D5312M, Standard Test Method for Evaluation of Durability of Rock for Erosion Control Under Freezing and Thawing Conditions.
    d. D5313/D5313M, Standard Test Method for Evaluation of Durability of Rock for Erosion Control Under Wetting and Drying Conditions.
    e. D5519, Standard Test Methods for Particle Size Analysis of Natural and Man-Made Riprap Materials.

1.3 SUBMITTALS

A. Shop Drawings:

1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
2. Product technical data including:
    a. Acknowledgement that products submitted meet requirements of standards referenced.
3. Certifications.
4. Test reports.
5. Submit all tests and certification in a single coordinated submittal.
    a. Partial submittals will not be accepted.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Riprap shall be made up of durable angular quarry stone.

B. Individual stones making up the riprap shall be resistant to weathering and shall not contain cracks, non-mineralized defects, shale, unsound sandstone, or organic material.

C. Neither the width nor thickness of any stone shall be less than one-third of the stone's length.

D. See details on Drawings for required riprap classes.

E. Gradation of the material:

2.2 MATERIAL QUALITY CONTROL

A. Geotextile:

1. See Section 31 32 19 for geotextile requirements.

B. Riprap:

1. Riprap material quality shall be evaluated using one of the following two methods:
   a. Specific rock properties:
      1) Quarry rock tests completed on rock that is representative of the material to be used on the project may be submitted for review if the testing was completed by a reputable testing company for State or Federal agency certification purposes within the last five years. The material testing requirements are as follows:
         a) Minimum Specific Gravity 2.5 per (ASTM C127).
         b) Durability Absorption Ratio less than 10 fails, greater than 23 passes, between 10 and 23 passes only if the Durability Index is greater than 52.
            (1) Durability Absorption Ratio = Durability Index / (PCT Absorption+1), Durability Index test ASTM D3744, Absorption test ASTM C127
         c) Maximum of 1 PCT loss due to Wetting and Drying test ASTM D5313/D5313M.
         d) Maximum of 5 PCT loss due to Freeze Thaw test ASTM D5312/D5312M.

PART 3 - EXECUTION

3.1 MATERIAL ACCEPTANCE

A. Final acceptance is determined at the in-place riprap installation which shall consist of a homogenous mass with a distribution of rock sizes that meets the specified gradation. Riprap transport, handling, and placement methods shall not cause breakage of individual rocks or segregation of riprap gradation.

B. Rock quality shall be determined at the quarry. Stone with a coloration or appearance dissimilar to the accepted material shall be rejected.

C. A representative gradation sample shall be located adjacent to the stockpile locations at both the quarry and project stockpile area for the duration of the project.

D. Arriving loads of material not bearing reasonable similarity to the representative gradation sample shall be rejected. The Contractor may arrange for gradation measurements of rejected loads at the project site. If the analysis proves the rejected stone meets the project requirements, then the Contractor shall be reimbursed for the gradation measurements.

E. The representative gradation sample must be of adequate size to demonstrate compliance with the specified gradation. The Contractor may use test Method A or B as defined in ASTM D5519 to determine the gradation. The minimum sample size shall be 20 times the largest individual stone of the gradation, unless a smaller sample size is approved by the Engineer.

F. The gradation test shall be performed by the Contractor or qualified geotechnical testing company, with the Engineer present, for each class of installed riprap and repeated for every 50,000 tons of placed material. If the gradation of installed riprap is questioned, then the Engineer may use ASTM D5519 Test Method D to determine if the installed material meets the specification.

G. The riprap gradation shall be produced at the quarry and shall not be accomplished by mixing at the project site.

H. The representative gradation sample may be incorporated into the project during final placement upon notification and approval by the Engineer.

3.2 PLACEMENT

A. Provide at least 24 HR notice for the Engineer to review the work in the field including the subgrade, geotextile fabric, and aggregate bedding. Do not place any geotextile fabric, aggregate bedding, or stone material on prepared base prior to the Engineer's review by Engineer. Placement of bedding, fabric, or riprap on ice or snow is not permitted.

B. Subgrade:

1. Compact fill areas to density specified for backfill.
2. Grade subgrade to elevations indicated in the plans within plus or minus 0.1 FT in dry areas and ±0.3 FT in areas that are underwater and do not require dewatering for construction.
3. The subgrade shall be smooth and free of topsoil, organic material, roots, sticks, debris, yielding material or other materials that would prevent meeting the specified subgrade elevation tolerance.
4. The Contractor, at no additional cost to the Owner, may decide to not grade the subgrade to the specified tolerance and increase the riprap layer thickness. The lack of subgrade preparation shall not result in a decreased riprap layer thickness or change in the top of riprap elevation unless the change is requested in writing and approved in writing by the Engineer.

C. Geotextile Fabric:

1. Place geotextile fabric only after inspection of subgrade by Engineer.
2. Place geotextile fabric in accordance with manufacturer specifications.
3. The ends of the geotextile fabric shall be buried and the placement sequence shall result in overlaps, with the upstream fabric overlapping the downstream fabric.
4. Fabric must be secured using pins or weights to prevent displacement by water, wind, or riprap placement.
5. Place a protective aggregate bedding layer over the geotextile fabric prior to placement of riprap to protect against punctures or tearing of the fabric.

D. Riprap:

1. Place riprap on prepared bedding only after the Engineer has reviewed the work.
2. Place riprap on prepared foundation per line and grade shown on the plans. The riprap thickness tolerance is +0.5 FT and -0 FT as measured over an area of 200 SQFT when placed in the dry, and 400 SQFT when placed underwater.
3. Riprap material shall be placed to result in a homogenous mass with a minimum of voids. Rearranging of individual rock may be required to obtain a suitable distribution of rock sizes.
4. Riprap placement methods shall not result in the following: cause breakage of individual rocks, result in segregation of riprap gradation, result in introduction of fines, or impact the filter material.
5. Individual stones making up the riprap shall not be dropped from a height greater than 1 FT above the geotextile, unless it can be demonstrated to the satisfaction of the Engineer that the geotextile fabric will not be damaged.
6. When placing riprap on a slope, start placement from the bottom of slope and proceed to top of slope.
7. Place rock to full thickness in a single operation to avoid displacing the underlying material.
8. The top of riprap shall match adjoining grades and allow for positive drainage.
9. Maintain the riprap until acceptance at project completion.

END OF SECTION

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SECTION 32 91 13
TOPSOILING AND FINISHED GRADING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Topsoiling and finished grading.

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 - Procurement and Contracting Requirements.
2. Division 01 - General Requirements.
3. Section 31 10 00 - Site Clearing.
4. Section 31 25 00 - Soil Erosion and Sediment Control.
5. Section 32 92 00 - Seeding, Sodding and Landscaping.

C. Location of Work: All areas within limits of grading and all areas outside limits of grading which are disturbed in the course of the work.

1.2 SITE CONDITIONS

A. Verify amount of topsoil stockpiled and determine amount of additional topsoil, if necessary to complete work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil:

1. Original surface soil typical of the area.
2. Existing topsoil stockpiled under Specification Section 31 10 00.
3. Friable, loamy soil capable of supporting native plant growth.

2.2 TOLERANCES

A. Finish Grading Tolerance: ±0.1 FT from required elevations.

PART 3 - EXECUTION

3.1 PREPARATION

A. Correct, adjust and/or repair rough graded areas.

1. Cut off mounds and ridges.
2. Fill gullies and depressions.
3. Perform other necessary repairs.
4. Bring all sub-grades to specified contours, even and properly compacted.

B. Loosen surface to depth of 2 IN, minimum.

C. Remove all stones and debris over 2 IN in any dimension.

3.2 PLACING TOPSOIL

A. Do not place when subgrade is wet or frozen enough to cause clodding.

B. Spread and lightly compact to a depth of 4 IN for all disturbed earth areas.

C. If topsoil stockpiled is less than amount required for work, furnish additional topsoil at no cost to Owner.

D. Provide finished surface free of stones, sticks, or other material 1 IN or more in any dimension.

E. Provide finished surface smooth and true to required grades.

F. Restore stockpile area to condition of rest of finished work.

3.3 ACCEPTANCE

A. Upon completion of topsoiling, obtain Engineer's acceptance of grade and surface.

B. Make test holes where directed to verify proper placement and thickness of topsoil.

END OF SECTION

SECTION 32 92 00

SEEDING, SODDING AND LANDSCAPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Seeding, sodding and landscape planting:
   a. Soil preparation.
   b. Lawn-type seeding.
   c. Pruning and repairing existing trees.

B. Related Specification Sections include but are not necessarily limited to:

1. Section 32 91 13 – Topsoiling and Finished Grading.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Seed Quality:

1. Fresh, clean, new-crop seed labeled in accordance with USDA Rules and Regulations under the Federal Seed Act in effect on date of bidding.
2. Provide seed of species, proportions, and minimum percentages of purity, germination and maximum percentage of weed seed as specified.
3. Approval of all seed for use shall be based on the accumulative total of PLS specified for each phase of work.

B. Seed Mixture: See Drawings.

C. Mulch:

1. For seeded areas:
   a. Clean, seed-free, threshed straw of oats, wheat, barley, rye, beans, peanuts, or other locally available mulch material which does not contain an excessive quantity of matured seeds of noxious weeds or other species that will grow or be detrimental to seeding, or provide a menace to surrounding land.
   b. Do not use material which is fresh or excessively brittle, or which is decomposed and will smother or retard growth of grass.
2. Native grass seeded areas: Weed-free hay, excluding brome or bluegrass hay, used on slopes 4:1 or greater.
3. Trees and shrubs: Hardwood chips, shredded bark, or other material as approved by the Engineer.

D. Fertilizer: See Drawings.

1. Commercial fertilizer meeting applicable requirements of State and Federal law.
2. Cyanic compound or hydrated lime not permitted in mixed fertilizers.
3. For lawn-type seeding and sod: 5-10-5 analysis.
4. For Crownvetch seeding: 8-16-16 analysis.
5. For sprigged or plugged lawns: 8-8-8 analysis.
6. For pasture seeding: 23-9-12 analysis.

E. Asphalt Binder: Emulsified asphalt per State specifications.

F. Water:

1. Water free from substances harmful to grass or sod growth.
2. Provide water from source approved prior to use.

G. Plants:

1. See plant list on Drawings.
2. Sound, healthy, vigorous, with normal top and root systems, free from disease, insect pests or their eggs, grown in same or colder climatic zone as project.
   a. Nursery grown stock, freshly dug.
      1) No heeled-in, cold storage or collected stock.
   b. Species and size as indicated on Drawings.

PART 3 - EXECUTION

3.1 SOIL PREPARATION

A. General:

1. Limit preparation to areas which will be planted soon after.
2. Provide facilities to protect and safeguard all persons on or about premises.
3. Protect existing trees designated to remain.
4. Verify location and existence of all underground utilities.
   a. Take necessary precaution to protect existing utilities from damage due to construction activity.
   b. Repair all damages to utility items at sole expense.
5. Provide facilities such as protective fences and/or watchmen to protect work from vandalism.
   a. Contractor to be responsible for vandalism until acceptance of work in whole or in part.

B. Preparation for Lawn-Type Seeding, Sprigging, Plugging or Sodding:

1. Loosen surface to minimum depth of 4 inches.
2. Remove stones over 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter.
3. Prior to applying fertilizer, loosen areas to be seeded with a double disc or other suitable device if the soil has become hard or compacted.
4. Correct any surface irregularities in order to prevent pocket or low areas which will allow water to stand.
5. Incorporate fertilizer into soil to a depth of at least 2 inches by disking, harrowing, or other approved methods.
6. Remove stones or other substances from surface which will interfere with turf development or subsequent mowing operations.
7. Grade lawn areas to a smooth, even surface with a loose, uniformly fine texture.
   a. Roll and rake, remove ridges and fill depressions, as required to meet finish grades.
   b. Limit fine grading to areas which can be planted soon after preparation.
8. Restore lawn areas to specified condition if eroded or otherwise disturbed after fine grading and before planting.

3.2 INSTALLATION

A. Lawn-Type and Pasture Seeding:

1. Do not use seed which is wet, moldy, or otherwise damaged.
2. Perform seeding work during dates listed on the Drawings.
3. Employ satisfactory methods of sowing using mechanical power-driven drills or seeders, or mechanical hand seeders, or other approved equipment.

4. Distribute seed evenly over entire area, 50% sown in one direction, remainder at right angles to first sowing.
5. Stop work when work extends beyond most favorable planting season for species designated, or when satisfactory results cannot be obtained because of drought, high winds excessive moisture, or other factors.
    a. Resume work only when favorable conditions develop.
6. Lightly rake seed into soil followed by light rolling or cultipacking.
7. Immediately protect seeded areas against erosion by mulching.
    a. Spread mulch in continuous blanket using 1-1/2 tons per acre to a depth of 4 or 5 straws.
8. Protect seeded slopes against erosion with erosion netting or other methods approved by Engineer.
    a. Protect seeded areas against traffic or other use by erecting barricades and placing warning signs.
9. Immediately following spreading mulch, anchor mulch using a rolling coulter or a wheatland land packer having wheels with V-shaped edges to force mulch into soil surface, or apply evenly distributed emulsified asphalt at rate of 10-13 GAL/1000 square feet.
    a. SS-1 emulsion in accordance with ASTM D5276 or RC-1 cutback asphalt in accordance with ASTM D2028 are acceptable.
    b. If mulch and asphalt are applied in one treatment, use SS-1 emulsion with penetration test range between 150-200.
    c. Use appropriate shields to protect adjacent site improvements.

3.3 PLANTING TREES, SHRUBS, AND GROUND COVERS

A. Notification:

1. Notify Engineer of source of plants and plant materials at least 30 days prior to planting to permit Engineer's inspection of source qualifications.

B. Preparation:

1. Handle plants so that roots or balls are adequately protected from breakage of balls, from sun or drying winds.
    a. Ensure tops or roots of plants are not permitted to dry out.
2. During transportation, protect materials from wind and sun to prevent tops and roots from drying out.
3. Protect tops of plants from damage.
    a. Plants with damaged tops will be rejected.
4. For purpose of inspection and planting identification, attach durable, legible labels to bundle or container of plant material delivered at the planting site.
    a. State correct plant name and size of each plant in weather-resistant ink on labels.
5. Do not prune trees and shrubs at nursery.

C. Planting Season:

1. Plant deciduous shade trees and shrubs any time the ground is suitable between October 15 and June 1.
2. Plant evergreen material between September 1 and June 1.
3. Plant ground covers between March 15 to June 1.

D. Planting Procedure:

1. Indicate locations of plants for approval by Engineer before excavating plant locations.
2. In event underground construction, utilities, obstructions, or rock are encountered in excavation of plantings, secure alternate locations from Engineer.
    a. Make said changes without additional compensation.

b. Where tree locations fall under existing overhead wires, or crowd existing trees, adjust locations as directed by Engineer.

3. Excavate pits and beds as necessary and in accordance with ANLA/ANSI Z60.1.
   a. Loosen bottom of pits prior to planting.
   b. Excavation is unclassified, excavate all materials without additional cost.
4. Tree and shrub pits to be circular in shape with vertical sides at least 1 foot greater in diameter than ball diameter.
   a. Pit to be of sufficient depth to provide 6 inches of planting soil under ball when set to natural grade.
5. Shrub and ground cover beds:
   a. Plant shrubs used in mass plantings in individual holes of required size.
   b. Strip all sod from among mass planting.
   c. For ground cover beds, remove sod from within limits of bed.
   d. Add soil amendments as specified and mix or rototill with existing topsoil to a depth of 6 inches.
6. Set plants straight or plumb, in locations when indicated and at such level that after settlement they bear same relationship to finished grade as they did in their former setting.
   a. Carefully tamp planting soil under and around base of balls to prevent voids.
   b. Remove burlap, rope and wires from top of balls.
   c. Do not remove burlap from sides and bottom of balls.
7. Backfill plants with planting soil.
   a. Tamp to 1/2 depth of pit and thoroughly water and puddle before bringing backfill to proper grade.
   b. After planting has been completed, flood pit again so that backfill is thoroughly saturated and settled.
8. After planting is complete, form a level saucer 3 inches high around each tree extending to limit of plant pit for watering purposes.
9. Mulch plant pit after saucer has been shaped.
   a. Mulch to limits of pit and uniformly over ground cover beds to a depth of 3 inches.
   b. In mass plantings of shrubs, mulch entire area uniformly among shrubs to a depth of 3 inches.
   c. If mulching is delayed and soil has dried out, water plants thoroughly before spreading mulch.
10. Staking: Stake trees immediately after planting as detailed on Drawings or in accordance with Nursery Standards.
11. Wrap deciduous trees 2 inches or more in caliper by neatly overlapping wrapping material between ground line and second branch.
    a. Place ties at top and bottom of wrapping material and not more than 12 inches apart between top and bottom ties.
12. Remove dead or damaged branches.
    a. Thin deciduous material to about two-thirds of initial branching.
    b. Remove only dead or damaged branches from evergreens.
13. Water plants during planting operations.
    a. Water each plant a minimum of once each week until final acceptance.
    b. Apply sufficient water to moisten backfill about each plant so that moisture will extend into the surrounding soil.

E. Pruning and Repairing Existing Trees:

1. Remove dead or dying limbs, repair and treat wounds, remove limbs that interfere with construction or with vehicular traffic and repair, rotted or decayed areas specifically noted on Drawings.
2. Procedure:
    a. To prevent stripping the bark, stub cut branches that are too large to be supported by hand.
    b. Coat branch cuts over 1 inch in diameter with an asphaltic varnish containing an antiseptic.
    c. Where existing trees interfere with construction, prune the limb back flush to the main trunk.
        1) Maintain 7 feet vertical clearance where evergreens overhang new sidewalks.
    d. Provide 10 feet vertical clearance along the main access road where the existing trees are subjected to vehicular traffic.
    e. Repair bark wounds by removing injured bark, shaping the wound to an elongated ellipse, disinfecting it and applying antiseptic paint.
        1) Repair all rotten areas.

3.4 MAINTENANCE AND REPLACEMENT

A. General:

1. Begin maintenance of planted areas immediately after each portion is planted and continue until final acceptance or for a specific time period as stated below, whichever is the longer.
2. Provide and maintain temporary piping, hoses, and watering equipment as required to convey water from water sources and to keep planted areas uniformly moist as required for proper growth.
3. Protection of new materials:
    a. Provide barricades, coverings or other types of protection necessary to prevent damage to existing improvements indicated to remain.
    b. Repair and pay for all damaged items.
4. Replace unacceptable materials with materials and methods identical to the original specifications unless otherwise approved by the Engineer.

B. Seeded or Sodded Lawns:

1. Maintain seeded lawns: 90 days, minimum, after installation and review of entire project area to be planted.
2. Maintenance period begins at completion of planting or installation of entire area to be seeded or sodded.
3. Engineer will review seeded or sodded lawn area after installation for initial acceptance.
4. Maintain lawns by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading, and replanting as required to establish a smooth, uniform lawn, free of weeds and eroded or bare areas.
5. Lay out temporary lawn watering system and arrange watering schedule to avoid walking over muddy and newly seeded areas.
    a. Use equipment and water to prevent puddling and water erosion and displacement of seed or mulch.
6. Mow lawns as soon as there is enough top growth to cut with mower set at recommended height for principal species planted.
    a. Repeat mowing as required to maintain height.
    b. Do not delay mowing until grass blades bend over and become matted.
    c. Do not mow when grass is wet.
    d. Time initial and subsequent mowings as required to maintain a height of 1-1/2 to 2 inches.

e. Do not mow lower than 1-1/2 inches.

7. Remulch with new mulch in areas where mulch has been disturbed by wind or maintenance operations sufficiently to nullify its purpose.
   a. Anchor as required to prevent displacement.
8. Unacceptable plantings are those areas that do not meet the quality of the specified material, produce the specified results, or were not installed to the specified methods.
9. Replant bare areas using same materials specified.
10. Engineer will review final acceptability of installed areas at end of maintenance period.
11. Maintain repaired areas until remainder of maintenance period or approved by Engineer, whichever is the longer period.

C. Trees and Shrubs:

1. Maintenance includes but is not limited to watering when necessary, removing dead or dying branches, removing sprouts and suckers; tightening, repairing or replacing tree stakes and wrapping; maintaining mulch to originally specified depth; and weeding plant beds and pits.
2. Remove and replace all new plants supplied, which are impaired, dead, or dying during one year from initial acceptance.
3. Engineer will review completed planting for acceptability of installation.
   a. Approval of planting denotes initial acceptance and the beginning of the maintenance period.
4. Maintenance will be required for transplanted material.
5. Maintenance period extends from start of transplanting operations through first full growing season.
6. Transplanted material will not be subject to replacement unless they were unacceptably maintained as specified for new trees and shrubs.

END OF SECTION

SECTION 33 05 16
PRECAST CONCRETE MANHOLE STRUCTURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Precast concrete round manhole structures and appurtenant items.
    a. Sanitary sewer manholes and appurtenances.

B. Related Specification Sections include but are not necessarily limited to:

1. Section 31 23 33 – Trenching, Backfilling, and Compacting for Utilities.
2. Section 40 05 00 – Pipe and Pipe Fittings Basic Requirements.

1.2 QUALITY ASSURANCE

A. Referenced Standards:

1. ASTM International (ASTM):
    a. A48/A48M, Standard Specification for Gray Iron Castings.
    b. C150/C150M, Standard Specification for Portland Cement.
    c. C478, Standard Specification for Precast Reinforced Concrete Manhole Sections.
    d. C923, Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.

1.3 SUBMITTALS

A. Shop Drawings:

1. Product technical data including:
    a. Acknowledgement that products submitted meet requirements of standards referenced.
    b. Manufacturer's installation instructions.
2. Fabrication and/or layout drawings:
    a. Include detailed diagrams of manholes showing typical components and dimensions, reinforcements and other details.
    b. Itemize, on separate schedule, sectional breakdown of each manhole structure with all components and refer to drawing identification number or notation.
    c. Indicate knockout elevations for all piping entering each manhole.
3. Buoyancy uplift and structural calculations.
4. Drawings shall be signed and sealed by a Professional Engineer registered in state corresponding to the project location.

B. Unless approved prior to submittal, submit all products from this Specification Section in one complete submittal package. Include all products and accessories together.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

1. Manhole rings, covers and frames:
    a. Neenah Foundry and Neenah Enterprises, Inc.
    b. Deeter Foundry.
2. Black mastic joint compound:

a. Kalktite 340.
b. Tufflex.
c. Plastico.

3. Premolded joint compound:
   a. RAM-NEK.
   b. Kent Seal.

2.2 SANITARY SEWER, STORM AND DRAIN MANHOLE STRUCTURE COMPONENTS

A. All completed structures shall be capable of withstanding HS-20 loading.

B. See Drawings for Standard Details.

C. See Drawings for inside diameter.

D. Manhole Components:

1. Reinforcement: ASTM C478.
2. Minimum wall thickness: 5 inches.
3. Minimum base thickness: 12 inches.
4. Provide the following components for each manhole structure:
   a. Base (precast) with integral bottom section or (cast-in-place).
   b. Precast bottom section(s).
   c. Precast barrel section(s).
   d. Precast eccentric transition section.
   e. Precast adjuster ring(s).
   f. Precast concrete transition section.
   g. Precast flat top.
   h. Access steps.
   i. Vent pipes.

E. Nonpressure Type Frames and Cover:

1. Cast iron frame and covers: ASTM A48/A48M, Class 35 (minimum).
2. Use only cast iron of best quality, free from imperfections and blow holes.
3. Furnish frame and cover of heavy-duty construction a minimum total weight of 450 pounds.
4. Machine all horizontal surfaces.
5. Furnish unit with lid per Standard Details.
6. Ensure minimum clear opening of 24 inches diameter.

F. Pressure Type Frame and Cover:

1. Provide covers meeting the requirements of the Nonpressure Type Frames and Cover paragraph above and as modified below.
2. Furnish unit with lid per Standard Details.

G. Special Coatings and Joint Treatment:

1. Joints of precast sections:
   a. Resilient O-ring gaskets manufactured from natural or synthetic materials complying with ASTM C923, of suitable cross section and size to meet specified infiltration or exfiltration requirements.
   b. 12-inch wide external seal wrap on all below grade joints.
2. Vertical wall surfaces:
   a. Install OBIC 1000 Polyurea on all interior walls, cones, and top section in all new manholes per manufacture's standard specifications and guidelines.

H. Sanitary Sewer Manhole Concrete:

1. Provide all sanitary manholes constructed with Portland ASTM C150/C150M, Type I or II cement with a tricalcium aluminate content not to exceed 8%.
2. Provide 3000 psi (min.) nonshrink grout.

I. Pipe to Manhole Connection:

1. Install flexible pipe connector meeting ASTM C923.

J. Access Steps:

1. All manhole steps shall conform to current OSHA Standards and ASTM C478.

K. Vent Pipes:

1. See Drawing Details.

PART 3 - EXECUTION

3.1 MANHOLE CONSTRUCTION

A. General:

1. Utilize precast concrete base with integral bottom section.
2. Ensure accurate vertical placement and leveling prior to placement of interior grout.
   a. Provide vertical alignment tolerance of maximum 1 inch horizontal to 10 feet vertical.
3. Make inverts with a semi-circular bottom conforming to the inside contour of the adjacent sewer sections.
   a. Shape inverts accurately and give them a steel trowel finish.
   b. For changes in direction of the sewer and entering branches into the manhole, make a circular curve in the manhole invert of as large a radius as manhole size will permit.

B. Build each manhole to dimensions shown on plans and at such elevation that pipe sections built into wall of manhole will be true extensions of line of pipe.

C. For all horizontal mating surfaces between concrete to concrete and concrete to metal, install resilient O-ring type gaskets.

D. For horizontal joints that fall below established high groundwater elevation shown, install a resilient O-ring type gasket or pre-molded joint compound.

E. Seal all pipe penetrations in manhole.

F. Set and adjust frame and cover to elevations shown on Drawings.

3.2 FIELD QUALITY CONTROL

A. Vacuum Testing:

1. See Section 40 05 00.

B. Special Coatings:

1. Test for continuity per ASTM D4787.
2. Repair holes and discontinuities per manufacture's recommendations.
3. Retest to verify repairs were successfully made.

END OF SECTION

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SECTION 33 05 19
DUCTILE-IRON UTILITY PIPE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Ductile iron piping, fittings, specials, and appurtenances.

B. Related Sections include but are not necessarily limited to:

1. Section 31 23 33 – Trenching, Backfilling, and Compaction for Utilities.
2. Section 33 31 11 - Gravity Sewer Pipeline and Manhole Construction.
3. Section 40 05 00 - Pipe and Pipe Fittings Basic Requirements.

1.2 REFERENCES

A. Definitions:

1. Mechanical Couplings: Fittings intended to join grooved and/or shouldered pipe.
2. Pipe Diameter: Pipe diameter specified or shown on the Drawings is the nominal pipe diameter for ductile iron pipe.

B. Referenced Standards:

1. American Society of Mechanical Engineers (ASME):
   a. B1.1 - Unified Inch Screw Threads (UN and UNR Thread Form).
   b. B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
   c. B16.21 - Nonmetallic Flat Gaskets for Pipe Flanges.
2. ASTM International (ASTM):
   a. A47 - Standard Specification for Ferritic Malleable Iron Castings.
   b. A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
   c. A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
   d. A194 - Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
   e. A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
   f. A536 - Standard Specification for Ductile Iron Castings.
3. American Water Works Association/American National Standards Institute (AWWA/ANSI):
   a. C104/A21.4 - Standard for Cement–Mortar Lining for Ductile-Iron Pipe and Fittings.
   b. C110/A21.10 - Standard for Ductile-Iron and Gray-Iron Fittings.
   c. C111/A21.11 - Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
   d. C150/A21.50 - Standard for Thickness Design of Ductile-Iron Pipe.
   e. C151/A21.51 - Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
   f. C153/A21.53 - Standard for Ductile-Iron Compact Fittings for Water Service.
   g. C219 - Bolted Sleeve-Type Couplings for Plain-End Pipe.
   h. C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.

1.3 SUBMITTALS

A. Action Submittals:

1. Submit shop drawings for ductile iron pipe, fittings and appurtenances as one package.
2. Submit the class and wall thickness for all pipe and pressure rating and wall thickness of all fittings.
3. Submit standard and restrained joints details indicating all pertinent dimensions and manufacturing tolerances.
4. Submit separate shop drawing for fittings only if manufactured by a separate supplier.
5. Manufacturing Information.
    a. Pipe and fitting details for temporary and permanent facilities indicating:
        1) Manufacturing tolerances.
        2) Maximum angular deflection limitations of field joints.
        3) Closure sections and cutoffs for field length adjustment.
        4) Bulkheads, including details for removal of test bulkheads and repair of linings.
        5) All other pertinent information required for the manufacture and installation of the product.
    b. Joint Details:
        1) Push-on joints.
        2) Restrained joints.
        3) Mechanical Joints.
6. Product data for the following:
    a. Pipe and fittings:
        1) Material data.
        2) Chemical and physical test reports.
        3) Manufacturer's recommendation for maximum allowable joint deflection.
    b. Coatings and Linings:
        1) Technical data sheets itemizing chemical composition, technical and performance information that indicates compliance with this Specification.
        2) Color chart, if applicable.
        3) Surface preparation requirements.
        4) Curing requirements.
        5) Manufacturer's name, product number or name.
        6) Coating or lining thickness.
    c. Gaskets and Bolting: Technical data sheets itemizing chemical composition, technical and performance information that indicates compliance with this Specification.
7. If mechanical coupling system is used, submit piping, fittings, and appurtenant items which will be utilized to meet system requirements.

B. Informational Submittals:

1. Certificates.
    a. Manufacturer's Certificate of Compliance that products furnished meet requirements of this Specification.
2. Reports:
    a. Factory Hydrostatic Test Reports.
    b. Field Hydrostatic Test Reports.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

1. Pipe and Fittings:
    a. American Ductile Iron Pipe.
    b. McWane Ductile.
    c. US Pipe.
2. Ceramic Epoxy Lining:
    a. "PROTECTO 401" by Induron.
    b. "CERAMAPURE PL-90" by Induron.
    c. "Permox-CTF" by Permite.
3. Restrained joints:
    a. American (Flex-Ring) - 4 inches to 54 inches.
    b. American (Lok-Ring) - 54 inches to 64 inches.
    c. U.S. Pipe (TR-Flex) - 4 inches to 36 inches.
    d. U.S. Pipe (HP Lok) - 30 inches to 64 inches.
    e. McWane (TR Flex) - 4 inches to 36 inches.
4. Wedge Restraint for Mechanical Pipe
    a. Star Pipe Products: Star Grip Series 3000.
    b. EBAA Iron: Series 1100.
    c. Romac: Romagrip.

2.2 MATERIALS

A. Ductile Iron Pipe:
    1. AWWA/ANSI C150/A21.50.
    2. AWWA/ANSI C151/A21.51.
    3. Wall Thickness:
        a. See Drawings.
        b. Pressure Class: 150 psi minimum, unless noted otherwise.

B. Fittings and Flanges:
    1. AWWA/ANSI C110/A21.10.
    2. AWWA/ANSI C153/A21.53.

C. Nuts and Bolts:
    1. Buried:
        a. 304 stainless steel: ASTM A193/A194 Grade B8 Class 1.
    2. Heads and dimensions per ASME B1.1.
    3. Threaded per ASME B1.1.
    4. Project ends 1/4 to 1/2 inches beyond nuts.

D. Gaskets:
    1. Mechanical and push-on joints: in accordance with AWWA C-111.
        a. Maximum pressure: 350 psi.

E. See Piping Schedules in Section 40 05 00.

2.3 LININGS AND COATINGS

A. Lining: Ceramic epoxy.
    1. Minimum dry film thickness: 40 mil.

B. Coating: Zinc.
    1. Provide in accordance with ISO 8179-1.

2. Minimum mean mass: 400 g/m^2.
    a. Measured in accordance with Section 7.1 of ISO 8179-1.
3. Material: 99.99 percent zinc.
4. Topcoat: Bituminous.
    a. Minimum average dry film thickness: 3 mils.
    b. Maximum dry film thickness: 10 mils.
    c. Local minimum dry film thickness: 2 mils.

2.4 SOURCE QUALITY CONTROL

A. Factory Test:

1. Subject pipe to hydrostatic test of not less than 500 psi with the pipe under the full test pressure for at least 10 seconds.

PART 3 - EXECUTION

3.1 GENERAL

A. Install piping complete with jointing materials and accessories, anchors, and other appurtenances.

B. Prepare trench as specified in Specification Section 31 23 33.

C. Handling and Storage:

1. Stack pipe no higher than the maximum height given in AWWA C600.
    a. Alternate bell ends with spigot ends.

3.2 LAYING PIPE

A. Trenching, embedment, and backfilling of buried piping: conform to Specification Section 31 23 33, and to the details indicated on the Drawings.

1. Do not install pipe when water is in the trench.

B. Before placement of pipe in the trench, ensure each pipe or fitting is clean of any foreign substance, keep clean thereafter.

1. Cover openings of pipes and fittings in the trench during non-working hours.

C. Handle pipe with proper equipment in a manner to prevent distortion or damage.

1. Use of hooks, chains, wire ropes, or clamps that could damage pipe, damage coating or lining is not permitted.
2. Use heavy canvas, or nylon slings of suitable strength for lifting and supporting materials.

D. Lift pipe during unloading or lifting into trench using one or more slings as required to prevent uncontrolled swinging, damage to pipe, or harm to workers.

1. Design slings to bear uniformly against pipe.

E. Form bell holes at the ends of pipe to prevent point loading at the bells or couplings.

1. Make excavation outside normal trench section at field joints for field connections, welding, and application of coatings.

F. Lay each section of pipe to the set line and grade.

1. Installation tolerances as hereinafter specified.

G. Locate horizontal deflections on alignment as shown on the Drawings.

H. Locate vertical deflections on alignment, and match pipe angle point locations indicated on Drawings.

I. Where necessary to raise or lower the pipe due to unforeseen obstructions or other causes, the Engineer may change the alignment and/or the grades.

1. Make changes by the deflection of joints or by using fittings.
2. Do not install misfit joints that will be detrimental to the strength and water tightness of the finished joint, including the strength and water tightness of the protective lining at the finished joint.

J. Make minor field adjustments by pulling standard joints.

1. The allowable deflection of field joints is as follows:
   a. Maximum Allowable Angle: 50 percent of manufacturer's recommended, or angle that results from ¾ inch pull out from normal joint closure, whichever is less.

K. For grades exceeding 10 percent lay pipe in an uphill direction except for short runs that may be permitted by the Engineer.

1. Block pipe which is laid on a downhill grade and hold in place until sufficient support is furnished by the following pipe to prevent movement.

L. Whenever pipe laying is stopped at the end of the day, seal the open end of the line to prevent entry by animals, dirt, and debris.

1. Design seals to prevent drying out of the interior of the pipe.
2. Maintain continuous dewatering when necessary to prevent groundwater or surface water from entering the pipeline.
3. Maintain continuous dewatering until pipe trench is fully backfilled and any anti-floatation provisions shown on the drawings are installed.
4. Remove water from the trench to the level indicated in Specification Section 31 23 33 prior to resuming pipe laying operations.

M. Cold Weather Protection:

1. Do not install pipe upon a foundation into which frost has penetrated or at any time that there is a danger of the formation of ice or penetration of frost at the bottom of the excavation.
2. Do not lay pipe unless it can be established that the trench will be backfilled before the formation of ice and frost occurs.

N. Alignment and Grade:

1. Lay pipe to the lines and grades indicated on the Drawings.
   a. Pipelines or runs intended to be straight shall be laid straight.
   b. Curves in push on joint pipe may be formed by opening the joint.
      1) Maximum joint openings and deflections: 50 percent of that recommended by the pipe manufacturer.
2. Use survey equipment to indicate alignment and grade.
   a. Take at least one elevation reading on each segment of pipe.
   b. Make periodic elevation measurements with surveying instruments to verify accuracy of grades.
   c. Verify survey set up at least daily using an independent benchmark or temporary benchmark.

O. Tolerances:

1. Alignment and Grade Tolerances
   a. Plus or minus 0.05 foot in grade.
      1) High and low points will not be acceptable, except where indicated on the Drawings.

b. Plus or minus 0.20 foot in alignment, except where indicated differently on the Drawings.

2. Observe stricter tolerances than specified above as necessary to maintain minimum cover, to maintain required clearances, to place carrier pipe inside the casing pipe, to make pipe connections to existing piping, to maintain the correct slope in the run to prevent high or low points along the pipeline other than those locations indicated on the Drawings.

P. Protection of Pipe:

1. Take precautions to protect the pipe from damages at locations where the Contractor proposes to cross the installed pipeline with heavy equipment.
2. Acceptable precautions include:
   a. Backfilling the pipe trench as necessary to protect the pipe.
   b. Concrete encasing the pipe.
   c. Placing steel plating over the pipe above the final pipe zone or embedment.
3. Repair damage to the pipe caused by Contractor's operation.

3.3 JOINTING

A. Joining Method – Push-On Mechanical (Gland-Type) Joints:

1. Install in accordance with AWWA/ANSI C111/A21.11.
2. Assemble mechanical joints carefully according to manufacturer's recommendations.
3. If effective sealing is not obtained, disassemble, thoroughly clean, and reassemble the joint.
4. Do not overstress bolts.
5. Where piping utilizes mechanical joints with tie rods, align joint holes to permit installation of harness bolts.

B. Joining Method – Push-On Joints:

1. Install in accordance with AWWA/ANSI C151/A21.51.
2. Assemble push-on joints in accordance with manufacturer's directions.
3. Bevel and lubricate spigot end of pipe to facilitate assembly without damage to gasket.
   a. Use lubricant that is non-toxic, does not support the growth of bacteria, has no deteriorating effects on the gasket material, and imparts no taste or odor to water in pipe.
4. Assure the gasket groove is thoroughly clean.
5. Flex rubber gasket inward and insert in the gasket recess of the bell socket.
   a. For cold weather installation, warm gasket prior to placement in bell.
6. Enter spigot end of the pipe into the socket with care used to keep the joint from contacting the ground.
   a. Complete the joint by forcing the plain end to the bottom of the socket in a manner approved by the Engineer.
7. Check each joint with a feeler gauge to ensure proper installation of the gasket.
8. Mark pipe that is not furnished with a depth mark before assembly to assure that the spigot end is inserted to the full depth of the joint.
9. File or grind field cut pipe joints to resemble a spigot end as recommended by the manufacturer.
   a. Field cutting allowed only on gauged.
10. Field-cut end repairs are to be done in accordance with the pipe manufacturer's recommendations.
    a. Taper of bevel: approximately 30 degrees with centerline of pipe and approximately ¼ inches back.

C. Joining Method – Mechanical Joints:

1. Thoroughly clean the last 8 inches outside of the spigot and the inside of the bell to remove oil, grit, excess coating, and other foreign matter from the joint and then paint with a thin film of non-toxic, water soluble gasket lubricant.
2. After preparation of the spigot, slip gland onto the spigot end of the pipe with the lip extension of the gland toward the plain end.
3. Paint the rubber gasket with the gasket lubricant and place on the spigot end with the thick edge toward the gland.
4. Push the entire section of the pipe forward to seat the spigot end in the bell, then press the gasket into place within the bell.
    a. Locate the gasket evenly around the entire joint.
5. Move the gland toward the bell and center with the gland lip against the gasket.
    a. Insert all of the bolts and finger tighten nuts.
    b. Tighten all nuts with a torque limiting wrench following the range of torque given in AWWA C600.
        1) Tighten bolts spaced 180 degrees apart alternately in order to produce an equal pressure on all parts of the gland.
6. Deflect joints scheduled for deflection after joint assembly but before tightening the bolts.
    a. Maximum deflection for mechanical joints: 50-percent of the manufacturers maximum recommended deflection.

D. Cutting:

1. Do not damage interior lining material during cutting.
2. Use abrasive wheel cutters or saws.
3. Make square cuts.
4. Bevel and free cut ends of sharp edges after cutting.

E. Install restrained joint systems where shown on the drawings.

3.4 FIELD QUALITY CONTROL

A. Test piping systems in accordance with Section 40 05 00.

END OF SECTION

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SECTION 33 05 31.11
POLYVINYL CHLORIDE GRAVITY SEWER PIPE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. PVC gravity sewer pipe and fittings.

B. Related Specification Sections include but are not necessarily limited to:

1. Section 31 23 33 – Trenching, Backfilling, and Compacting for Utilities.
2. Section 33 31 11 - Gravity Sewer Pipeline and Manhole Construction.
3. Section 40 05 00 – Pipe and Pipe Fittings Basic Requirements.

1.2 QUALITY ASSURANCE

A. Referenced Standards:

1. ASTM International (ASTM):
   a. PVC (polyvinyl chloride) materials:
      1) D1784, Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
      2) D3139, Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
      3) D3212, Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
      4) F477, Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
      5) F679, Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
      6) D2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
2. American Water Works Association (AWWA):
   a. PVC (polyvinyl chloride) materials:
      1) C900, Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 IN Through 60 IN.

1.3 DEFINITIONS

A. DR: Dimension Ratio, Outside Diameter/Minimum Wall Thickness, both in inches.

B. Diametral Deflection: reduction in diameter caused by earth and surcharge loads acting on the installed pipe.

C. PS: Pipe Stiffness, PSI

D. SDR: Standard Dimension Ratio.

1.4 SUBMITTALS

A. Action Submittals:

1. Product technical data including:
   a. Acknowledgement that products submitted meet requirements of standards referenced.
   b. Copies of manufacturer's written directions regarding material handling, delivery, storage and installation.
   c. Schedule sheet showing compliance of all system components.

1) Attach technical product data on gaskets, pipe, fittings, and other components.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

1. Diamond Plastics Corporation.
2. Or equal.

2.2 PVC DRAINAGE AND SEWER PIPING

A. Materials:

1. PVC pipe and fittings: rigid, unplasticized polyvinyl chloride (PVC) made of PVC plastic having a cell classification of 12454-B or 12454-C per ASTM D1784.

B. Pipe:

1. ASTM F679
   a. Pipe Stiffness = 115 psi (min.) (DR 27.9).
   b. Ensure impact strengths and pipe stiffnesses are in full compliance to these Specifications.
   c. Joints:
      1) Elastomeric gasket joint meeting requirements of ASTM D3212.
      2) Gaskets (seals) per ASTM F477.
2. AWWA C900
   a. Pipe Stiffness = 129 psi (min.) (DR 25)
   b. Ensure impact strengths and pipe stiffnesses are in full compliance to these Specifications.
   c. Joints:
      1) Elastomeric gasket joint meeting requirements of ASTM D3139.
      2) Gaskets (seals) per ASTM F477.

PART 3 - EXECUTION

3.1 IDENTIFICATION

A. Identify each length of pipe clearly at intervals of 5 feet or less per governing ASTM Standard for each type of pipe used.

3.2 INSTALLATION

A. See Section 31 23 33.

B. See Section 33 31 11.

C. Install pipe and fittings in accordance with ASTM D2321, the above referenced Specification Sections and as recommended by the manufacturer.

3.3 FIELD QUALITY CONTROL

A. See Section 40 05 00.

END OF SECTION

SECTION 33 05 37

FIBERGLASS REINFORCED POLYMER MORTAR PIPE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fiberglass Reinforced Polymer Mortar Pipe (Gravity Service) allowable for pipe diameters 30-inch and greater.

B. Related Requirements: Include, but are not necessarily limited to:

1. Section 31 23 33. – Trenching, Backfilling, and Compacting for Utilities.
2. Section 33 31 11 – Gravity Sewer Pipeline and Manhole Construction.
3. Section 40 05 00 – Pipe and Pipe Fittings Basic Requirements.

C. Scope of Work:

1. Design calculations, detailing and fabrication of fiberglass gravity piping for the conveyance of raw sewage.
2. Design of pipe is to include the determination of design pressures, stresses, external loads, pressure class (PN), and pipe stiffness class (SN).
3. This specification covers the technical requirements for the installation of the fiberglass pipeline, fittings, and accessories.
    a. The Contractor's Work shall include, but not necessarily be limited to, providing all items of labor, material, and equipment necessary to handle, install, and test the pipe, fittings, and accessories shown on the Drawings.
4. Other work performed under this section includes: shop testing; fabrication of fittings and appurtenances; handling, storage and protection; and loading and transportation of completed fittings and appurtenances to the construction site.
5. Manufacture all pipes specifically for this project and furnish no pipe from stock unless approved by the Engineer.

1.2 REFERENCES

A. Definitions:

1. Diametral Deflection: reduction in diameter caused by earth and surcharge loads acting on the installed pipe.
2. SN: Pipe Stiffness, PSI.

B. Referenced Standards:

1. ASTM International (ASTM):
    a. C33 - Specification for Concrete Aggregates.
    b. D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
    c. D3262 - Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.
    d. D3567 - Standard Practice for Determining Dimensions of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings.
    e. D3681 - Test Method for Chemical Resistance of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe in a Deflected Condition.
    f. D3839 - Standard Practice for Underground Installation of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe.

g. D4161 - Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals.
h. F477 - Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

2. American Water Works Association (AWWA):
a. AWWA M45 - Fiberglass Pipe Design.

1.3 SUBMITTALS

A. Action Submittals: Submit the following:

1. Shop Drawings:
a. Fabrication drawings showing:
1) Wall thickness
2) Pipe joint and gasket details
3) Design of pipe and fittings.
2. Details of all piping system components confirming that the pipe and fittings conform to the specified requirements.
3. Product Data:
a. Catalog Data Sheets and source for all materials.
4. Design calculations using the assumption listed in Part 2.2 signed and sealed by a Professional Engineer registered in the State of North Carolina.
a. Structural calculations to meet all loadings: In-situ, service, and installation.
b. Buoyancy calculations.

B. Informational Submittals:

1. Quality control and quality analysis test methods, schedule and results.
2. Manufacturer's certificate of compliance to these specifications referencing project name and location.
3. Manufacturer's recommendations for embedment, manhole connection details, encasement details, and any field repair details.

1.4 TRANSPORTATION, HANDLING, AND STORAGE OF PRODUCTS

A. Comply with the requirements in Section 01 65 50 - Product Delivery, Storage and Handling Requirements.

B. Protect pipe during handling using methods recommended by manufacturer.

1. Use of bare cables, chains, hooks, metal bars or narrow skids in contact with pipe is not permitted.

C. Prevent damage to pipe during transit.

1. Repair abrasions, scars, and blemishes.
2. If repair of satisfactory quality cannot be achieved, replace damaged material immediately.

D. Store all products above the ground upon platforms, pallets, skids, or other supports supplied by the Contractor.

1. Keep products free from dirt and other foreign matter.

E. Store all products to permit ready access for identification and inspection by the Engineer.

F. Abide by the required handling techniques specified by the Manufacturer.

G. Provide suitable quantities of all lifting equipment to handle the pipe.

1. Do not utilize any equipment that is not rated to handle the intended loading or conditions of use to which it will be subjected, or which will damage or gouge the pipe.
2. Do not drag or drop the pipe.

H. Repair new pipe and fittings that become damaged before or during installation as recommended by the manufacturer or replace as required by the Owner's project representative at the Contractor's expense, before proceeding further.

1. Deliver, store, and handle other materials as required to prevent theft or damage.

I. Place pipe laid directly on the ground prior to installation on an area free of loose stones or sharp objects.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable and no substitutions will be allowed:

1. Fiberglass Reinforced Polymer Mortar Pipe (Gravity Service):
   a. Hobas Pipe USA, Inc. – Centrifugally Cast FRPM only.
2. No substitutions.

2.2 DESIGN CRITERIA

A. Final pipe structural design and pipe stiffness shall be determined by the pipe manufacturer in accordance with ASTM D2412, ASTM D3262, ASTM D3567, and AWWA M45 standards.

1. Minimum furnished pipe stiffness: SN72.
2. Size: Nominal diameter varies as shown on drawings.
3. Dead Load/Depth of cover: As indicated on the Drawings.
   a. Maximum short-term vertical deflection (less than 30 days): less than or equal to 3 percent of the pipe internal diameter.
      1) Use this value as the maximum deflection limit in deflection calculations.
   b. Maximum long-term vertical deflection (greater than 30 days) not to exceed 5 percent of the pipe internal diameter.
4. Live load: Equal to HS-20 (in accordance with AASHTO standards) with 3 feet of pipe cover or Flood Stage Water Depth at grade whichever is more stringent.
   a. Maximum short-term vertical deflection (less than 30 days): less than or equal to 3 percent of the pipe internal diameter.
      1) Use this value as the maximum deflection limit in deflection calculations.
   b. Maximum long-term vertical deflection (greater than 30 days): less than or equal to 5 percent of the pipe internal diameter.

B. Furnish pipe buoyancy calculations by the pipe manufacturer and determine protection measures based on the following Design Conditions:

1. Minimum Factor of Safety = 1.5.
2. Ground water elevation: Use worst case of equal to the finished grade of the buried pipe or the 100-year flood elevation shown on the drawings.
3. Empty pipeline.
4. Provide provisions for buoyancy protection (if required).

2.3 MATERIALS

A. Pipe and fittings:

1. Manufacture pipe and test in accordance with ASTM D3262.
2. Manufacture pipe to produce a dense, nonporous, corrosion-resistant, consistent composite structure.
   a. Utilize resins, reinforcements, colorants, fillers, and other materials, when combined as a composite structure, to produce a pipe that meets the performance requirements of this specification and all applicable ASTM and AWWA standards.

3. Pipe basic structural wall composition: thermosetting resin, glass-fiber reinforcement, and aggregate filler.
4. Reinforcing glass fibers: highest quality commercial grade E-glass filaments with binder and sizing compatible with impregnating resins.
5. Sand: minimum 98 percent silica with a maximum moisture content of 0.2 percent.
   a. Conform to ASTM C33, except that requirements for gradation shall not apply.
6. Utilize resin additives, such as curing agents, pigments, dyes, fillers, thixotropic agents, etc., that do not detrimentally affect the performance of the product.
7. Incorporate UV inhibitors in the outer resin layer to protect the pipe from degradation while stored outside if the pipe is not inherently resistant to UV degradation
8. Resin: STD Standard Thermosetting polyester
   a. Utilize only polyester resin systems with a proven history of performance in this particular application.

2.4 FABRICATION

A. Pipe and fittings:

1. Manufacture pipe by the centrifugal casting or filament wound process to result in a dense, nonporous, corrosion-resistant, consistent composite structure.
2. Pipe Interior:
   a. For centrifugal casting, provide interior surface liner with chemical, crack and abrasion resistance.
   b. Minimum 40 mils (0.040") nominal, of non-reinforced, or reinforced thermosetting polyester resin.
3. Pipe Exterior:
   a. For centrifugally cast pipe minimum exterior surface thickness: 20 mils of a silica sand resin mixture over any fiber reinforcement.
4. The outside diameter of the pipe: in accordance with ASTM D3262 (gravity service)
5. Supply pipe in nominal lengths of 20 feet with the exception of special sections.
   a. Furnish at least 90 percent of the total footage of each size and class of pipe, excluding special order lengths, in nominal length sections.
6. Mark each length of pipe in accordance with ASTM D3262 and ASTM D3754.
7. Provide pipe with minimum wall thickness sufficient for design conditions specified.
8. Squareness of pipe ends: All points around each end of pipe unit within $\pm$ 1/4 inch or $\pm$ 0.5% of the nominal diameter of the pipe, whichever is greater, to a plane perpendicular to the longitudinal axis of the pipe.
9. Pipe tolerances.
   a. Maximum internal diameter variance of any portion of each piece of pipe: plus or minus 1 percent.
   b. Maximum wall thickness variation: 5 percent less than that shown in the design, but in no case more than 3/16 inch less.
      1) A wall thickness greater than that required in the design will not be cause for rejection.
10. Provide pipe free from all defects including indentations, delaminations, bubbles, pinholes, cracks, pits, blisters, foreign inclusions, and resin-starved areas that due to their nature, degree, or extent, detrimentally affect the strength and serviceability of the pipe.
11. Furnish pipe as uniform as commercially practicable in color, opacity, density, and other physical properties.
12. The inside surface of each pipe: free of bulges, dents, ridges, or other defects that result in a variation of inside diameter of more than 1/8 IN from that obtained on adjacent unaffected portions of the surface.

a. Provide pipe with no glass fiber reinforcement penetrating the interior surface of the pipe wall.

13. Minimum pipe deflection when tested per ASTM D3681: per Table 4 of ASTM D3262 when exposed to 1.0 N sulfuric acid, at the 50-year strain level (t/d). Coordinate gasket materials for chemical resistance of atypical chemicals in conveyed fluid.
    a. Supply elastomeric gaskets from qualified gasket manufacturers and suitable for the service intended.
14. Unless otherwise specified, field connect pipe joints with fiberglass sleeve couplings that utilize elastomeric sealing gaskets made of EDPM rubber compound as the sole means to maintain joint water tightness.
    a. Joints: meet the performance requirements of ASTM D4161 and ASTM F477.
    b. Tie-ins, when needed, may utilize stainless steel gasket-sealed mechanical couplings.
    c. Coupling joints: meet the requirements of ASTM D4161 and ASTM F477.
15. Design and furnish tees, wyes, and other fittings of withstanding all operating conditions when installed.
    a. Manufacture from mitered sections of pipe joined by glass-fiber-reinforced overlays.
    b. Fully encase fiberglass tees, wyes, or other similar fittings in reinforced concrete designed to withstand the pressure forces.
    c. Pipe manufacturer shall determine reinforcement of increased stiffness required for fabricated fittings.

2.5 IDENTIFICATION

A. Clearly mark each length of pipe with its Pipe Stiffness (SN).

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Install in accordance with the requirements of applicable ASTM and AWWA standards, this Specification, Section 33 31 11 – Gravity Sewer Pipeline and Manhole Construction, and the Manufacturer's instructions.

B. Contractor shall be responsible for correct fitting of all pipeline members and components.

C. Furnish necessary or desirable miscellaneous items, appurtenances, and structures not mentioned or described in accordance with the intent of the Drawings and Specifications and as accepted by the Engineer, as necessary to complete the work.

D. Brace and protect pipe sections to prevent deformation during installation and backfill.

E. Install the pipeline complete, including bends, couplings, and other associated work and appurtenances, as shown on the Drawings or as herein specified.
    1. Make all necessary connections to the lines and grades shown on the Drawings and in accordance with the Specifications.
    2. Furnish all construction materials and equipment required for installation and backfill.

F. Restore all area disturbed by installation of the pipeline in accordance with these Specifications, and the Drawings.

3.2 PIPELINE INSTALLATION

A. As indicated in Section 33 31 11 – Gravity Sewer Pipeline and Manhole Construction.

B. Clean interior of the pipe of foreign matter before being lowered into the trench and keep clean during the laying, jointing, bedding, and backfilling operations by plugging or other approved method.

C. Rest full length of each pipe section and each bend solidly on the compacted bedding material.

D. Keep open pipe ends covered when pipe laying is not in progress.

E. Excavation for the trench: as specified in Section 31 23 33, and the minimum requirements set forth in this Section.

F. Lay pipe to line and grade as shown on the Drawings.

1. Calculate the required elevation and location of each pipe joint and survey the installed elevation of each joint prior to stabbing the next joint to verify line and grade.
2. Relay any joint deviating from the calculation by more than 0.01 feet to proper grade and alignment.

G. Lateral shoring of the trench walls or other similar construction methods may be required.

1. Design and implement all such methods.
2. When required, install shoring in accordance with all applicable local, State and OSHA regulations.
3. Remove shoring prior to backfilling.

H. Grade bottoms of trenches so that each section of pipe is placed to the specified depth or elevation with uniform support.

1. If the bottom of the trench has been excavated below the specified depth or elevation, bring to the specified depth or elevation by backfilling with compacted bedding material.

I. Remove unsuitable material at the bottom of the trench as determined to be unsuitable by the Engineer and backfill trench with approved subgrade material or bedding material to the specified depth or elevation.

J. The pipeline may be buried as it is installed, provided all inspection and testing requirements are met.

K. Maintain identifying markings (stamped or painted numberings, tags, etc.) on installed pieces throughout installation.

1. Place markings at top of pipe.

L. Pipe, fittings, and special pieces will be subject to inspection by the Engineer, prior to installation.

1. Report all damages not detected by the Engineer and discovered by the Contractor during installation to the Engineer for corrective action or replacement.

M. Conform to the manufacturer's repair procedures, with the concurrence of the Engineer, for repair of pipe damaged during installation

N. Jointing:

1. Clean ends of pipe and coupling components.
2. Apply joint lubricant to pipe ends and the elastomeric seals of coupling.
   a. Use only lubricants approved by the pipe manufacturer.
3. Use suitable equipment and end protection to push or pull the pipes together.
4. Do not exceed forces recommended by the manufacturer for coupling pipe.
5. Join pipes in straight alignment and grade.
   a. Where joint deflection is allowed by Engineer or shown on Drawings, do not allow the deflection angle to exceed 50 percent of the deflection permitted by the manufacturer.
   b. When installing joints to be deflected, join pipes in straight alignment then deflect to the required angle.

3.3 FIELD QUALITY CONTROL

A. As indicated in Section 33 31 11 – Gravity Sewer Pipeline and Manhole Construction and Section 40 05 00 – Pipe and Pipe Fittings Basic Requirements.

END OF SECTION

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SECTION 33 31 11

GRAVITY SEWER PIPELINE AND MANHOLE CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Installation and testing of sewer pipes, manholes, structures and appurtenances.
2. Coordination and interface with existing facilities and utilities.

B. Related Specification Sections include but are not necessarily limited to:

1. Section 31 23 33 – Trenching, Backfilling, and Compacting for Utilities.
2. Section 33 05 16 - Precast Concrete Manhole Structures.
3. Section 33 05 19 – Ductile Iron Utility Pipe
4. Section 33 05 31.11 – Polyvinyl Chloride Gravity Sewer Pipe
5. Section 33 05 37 - Fiberglass Reinforced Polymer Mortar Pipe.
6. Section 40 05 00 – Pipe and Pipe Fittings Basic Requirements

1.2 REFERENCES

1.3 DELIVERY, STORAGE, AND HANDLING OF PRODUCTS

A. In addition to the requirements specified in this section, see related paragraphs in individual pipe specifications.

B. Deliver, handle and store products in accordance with manufacturer's instructions.

C. Protect pipeline sections stored at the site from damage.

D. Store all products above the ground upon platforms, pallets, skids, or other supports supplied by the Contractor.

1. Store in a way to permit ready access for identification and inspection by the Engineer.

E. Keep products free from dirt and other foreign matter.

F. Provide suitable quantities of all lifting equipment to handle the pipe.

1. Do not utilize any equipment that is not rated to handle the intended loading or conditions of use to which it will be subjected, or which will damage or gouge the pipe.
2. Do not drag or drop pipe.

G. Place pipe lain directly on the ground prior to placement on an area free of loose stones or sharp objects.

H. Repair or replace any new pipe and fittings damaged before or during installation at Contractor’s expense, before proceeding further.

1. Utilize repairs methods as recommended by the manufacturer.
2. Replace damaged materials as directed by Owner’s project representative.

I. Protect PVC pipe from UV degradation if stored outside for more than 60 days.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipe:

1. See Section 40 05 00.
2. See individual pipe material specifications listed in Paragraph 1.1 B above.

B. Manholes: See Specification Section 33 05 16.

C. Fill and Backfill at manholes: See Specification Section 31 23 33.

D. Embedment and Bedding Materials for pipelines: See Section Specification 31 23 33.

E. Size mandrels to meet deflection requirements specified herein or in the individual pipe material specifications.

F. Pipe Joint Testing Equipment:

1. Utilize joint testing equipment capable of providing sufficient sealing pressure for air bladder to prevent leakage through bladder seals.
2. Include pressure gage to aid in verification of adequate applied pressure and joints ability to withstand the applied pressure without leaking.
3. Utilize joint testing equipment that encapsulates the full 360 degrees circumference of the joint and at least 6 inches each side of the joint.
4. Pipes furnished with an integral "testable" joint, consisting of two gaskets with fittings to pressure test between the two gaskets, will be tested using the test equipment and fittings recommended by the pipe manufacturer.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Furnish all construction materials and equipment required for installation and backfill.

B. Install the pipeline complete, including bends, stop logs, and other associated work and appurtenances, as shown on the Drawings or as herein specified.

C. Make all necessary connections to sewer lines shown on the Drawings and in accordance with the Specifications.

D. Construct all sewer piping, manholes, and structures to be free of visible ground water inflow.

1. Install sanitary sewer manholes and structures that are watertight.
   a. Repair or replace any manhole or structure showing infiltration of ground water through joined surfaces, pipe to manhole/structure connections or manhole/structure wall.
2. Install pipe with water tight pipe joints.
   a. Repair or replace any joint showing infiltration of ground water through pipe joints or pipe to manhole connections.

E. Alignment: Lay gravity sewer lines in straight alignment and uniform grade between manholes.

1. Install at grade as shown on drawings.

F. Brace and protect pipe sections to prevent deformation during installation and backfill.

G. Deflection: Pipe deflection after final backfill shall not exceed the specified limits detailed in the individual pipe specifications.

1. Remove and replace any pipe observed to be deflecting in excess of the specified limits.

H. Perform testing in accordance with requirements of this Section.

I. Provide Engineer with free access to work for inspection.

1. Such inspection shall not relieve the Contractor of his responsibility for performing Work in accordance with the Contract Documents.

3.2 PIPELINE INSTALLATION

A. Lateral shoring of the trench walls or other similar construction methods may be required.

1. Design and implement all such methods.

2. When required, install shoring in accordance with all applicable local, State and OSHA regulations.
3. Remove shoring prior to backfilling.

B. Grade bottoms of trenches such that when bedding is placed between the trench bottom and the pipe, each section of pipe is installed to the specified depth or elevation with uniform support.

C. Determine and fix alignment and grade or elevation of each pipeline from offset stakes or calibrated laser instruments.

D. Install pipelines on the line and grade shown on the drawings.

1. Calculate required elevation of each pipe joint and survey installed elevation at each joint prior to stabbing the next joint to verify grade.
2. Relay pipe to proper grade if any joint elevation deviates from the calculation by more than 0.01 feet.

E. Remove material at the bottom of the trench if determined to be unsuitable by the Engineer.

1. Backfill trench with approved subgrade material or bedding material to the specified depth or elevation as described in Specification Section 31 23 33.

F. Install only clean pipe and fittings.

1. Provide physical barriers to protect open ends of sections of pipe in place from the entrance of trench water, mud, dirt, or other foreign substances with when pipe installation is not in progress.

G. Begin pipe laying at the lowest elevation with bell ends facing the direction of laying, except when reverse laying is permitted by Engineer.

H. Where the drawings require concrete encasement or flowable fill embedment and backfill, anchor pipe as required to prevent floatation.

1. Alternatively, Contractor may place concrete or flow fill materials in staged lifts allowing each lift to reach initial set prior to placing the subsequent lift to limit buoyancy effects and prevent floatation of the pipeline.

I. Pipeline may be backfilled as it is installed, provided all inspection and testing requirements are met.

J. Pipe, fittings, and special pieces will be subject to inspection by Engineer, prior to installation.

1. Report all damages not detected by Engineer but discovered by Contractor during installation to Engineer for corrective action or replacement.

K. Repair of pipe damaged during installation shall conform to the manufacturer's repair procedures; with the concurrence of Engineer.

3.3 RESTORATION

A. Restore all existing structures or services damaged by Contractor's operations at no cost to Owner.

1. Repair or replace culverts that are damaged, removed or interfere with the work as part of restoration at no additional cost to Owner.

B. Restore all area disturbed by installation of the pipelined in accordance with the Specifications, the Drawings,

1. Provide slope protection, re-vegetation, and road restoration as necessary.

C. Trees:

1. Do not remove trees without written instructions from the Engineer unless tree removal is shown on drawings.

2. No separate payment will be made for tree removal and the cost shall be included in the bid unit price sewer pipe.

D. Fences, Signs, Mailboxes, etc.:

1. Restore all damaged fences, signs, mailboxes, etc., to their original conditions.
   a. No separate payment will be made for these items.

3.4 PROTECTION OF EXISTING UTILITIES

A. Verify the location of all underground utilities.

1. Omission from, or the inclusion of utility locations on the plans is not to be considered as the nonexistence of or a definite location of existing underground utilities.

B. Notify utility representative prior to construction to obtain available information on location of existing utilities.

1. Contractor shall be responsible for locating all utilities.

C. Notify representative of the underground utilities 24 hours in advance of crossings.

D. Existing water services and sewer services:

1. Repair damage to existing water service using copper pipe and union the same size as existing service.
2. Repair damage to existing sewer laterals with pipe of same size and material as damaged pipe.

3.5 FIELD QUALITY CONTROL

A. Testing Requirements:

1. See Section 40 05 00.

END OF SECTION

SECTION 40 05 00

PIPE AND PIPE FITTINGS: BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Utility piping systems, including
   a. Gravity sewer
   b. Force main sewer

B. Related Specification Sections include but are not necessarily limited to:

1. Division 00 - Procurement and Contracting Requirements.
2. Division 01 - General Requirements.
3. Section 31 23 33 - Trenching, Backfilling, and Compacting for Utilities.
4. Section 33 05 16 – Precast Concrete Manhole Structures
5. Section 33 05 19 – Ductile Iron Utility Pipe
6. Section 33 05 31.11 – Polyvinyl Chloride Gravity Sewer Pipe
7. Section 33 05 37 – Fiberglass Reinforced Polymer Mortar Pipe

1.2 QUALITY ASSURANCE

A. Referenced Standards:

1. ASTM International (ASTM):
   a. C1244, Standard Test Method for Concrete Sewer Manholds by the Negative Air Pressure (Vacuum) Test Prior to Backfill.
   b. F1417, Standard Practice for Installation Acceptance of Plastic Non-Pressure Sewer Lines Using Low-Pressure Air.
2. American Water Works Association/American National Standards Institute (AWWA/ANSI):
   a. C600, Installation of Ductile-Iron Mains and Their Appurtenances.

1.3 SUBMITTALS

A. Informational Submittals:

1. Test reports:
   a. Copies of test results on all piping systems.
   b. Notification of time and date of piping tests.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Protect pipe coating during handling using methods recommended by manufacturer.

1. Use of bare cables, chains, hooks, metal bars or narrow skids in contact with coated pipe is not permitted.

B. Prevent damage to pipe during transit.

1. Repair abrasions, scars, and blemishes.
2. If repair of satisfactory quality cannot be achieved, replace damaged material immediately.

C. Storage:

1. Each pipe should be redundantly chocked at each end to prevent movement.
2. Vehicular traffic shall not be inconvenienced in placement of material within rights-of-way.

3. Comply with North Carolina Department of Transportation and City of Asheville requirements for storage of pipe and equipment within road rights-of-way, and with Duke Energy within overhead power rights-of-way.

PART 2 - PRODUCTS

2.1 COMPONENTS AND ACCESSORIES

A. Underground Warning Tape:

1. Material: Polyethylene.
2. Size:
   a. 6-IN wide
   b. Thickness: 3.5 mils
   c. Letter height: 1 1/4 – IN (min)
3. Color:
   a. Potable Water – Blue
   b. Sanitary Sewer – Green
4. Continuous Message along tape:
   a. Potable Water – “Caution – Water Main Buried Below.”
   b. Sanitary Sewer – “Caution – Sewer Main Buried Below.”
5. Location: Half way between top of pipe and finished grade

B. Tracer Wire:

1. Provide 12-gauge insulated straded copper wire.
2. Insulated for buried application:
3. Color:
   a. Water Main: Blue
   b. Sanitary Sewer: Green

PART 3 - EXECUTION

3.1 EXTERIOR BURIED PIPING INSTALLATION

A. Install underground hazard warning tape above pipe.

B. Install tracer wire along top of pipe.

1. Secure to the top centerline of pipe.
2. Bring to grade at each appurtenance such as air release valves, gate valve boxes, etc.
3. Secure bare wire to bolt of valves.
4. Perform continuity test on tracer wire and make necessary repairs to ensure proper operation.

3.2 FIELD QUALITY CONTROL

A. Pipe Testing – General:

1. Utilize pressures, media and pressure test durations as specified.
2. Isolate equipment which may be damaged by the specified pressure test conditions.
3. Perform pressure test using calibrated pressure gages and calibrated volumetric measuring equipment to determine leakage rates.
   a. Select each gage so that the specified test pressure falls within the upper half of the gage’s range.
   b. Notify the Engineer 24 hrs prior to each test.

4. Completely assemble and test new piping systems prior to connection to existing pipe systems.
5. Acknowledge satisfactory performance of tests and inspections in writing to Engineer prior to final acceptance.
6. Bear the cost of all testing and inspecting, locating and remedying of leaks and any necessary retesting and re-examination.
7. Any visible leak in pipe or manhole regardless of size or test results shall be repaired.

B. Gravity Sewers: All pipe materials:

1. All gravity sewer pipe shall be tested for infiltration no sooner than 30 days after the completion of backfill or shutting off the dewatering system, whichever date is later.
2. Test requirements:
   a. All gravity sewer pipe shall be tested using one of the following methods:
      1) Low Pressure Air Test.
   b. In addition to the testing required above all pipe installed where the groundwater is above the top of pipe, the following test is required:
      1) Infiltration test.
3. Infiltration Test:
   a. Maximum infiltration allowance is 100 gpd/inch diameter/mile.
   b. Tests and allowances include service connections or stub lines extending from main or lateral sewer to curb or property line.
   c. Install suitable measuring device at lower end.
   d. Measure amount of water flowing through outlet over a specified period of time.
4. Low Pressure Air Test
   a. Comply with ASTM F1417.
   b. Check pneumatic plugs for proper sealing.
   c. Place plugs in line at each manhole and inflate 25 psig.
   d. Introduce low pressure air into sealed line until air pressure reaches 4 psig greater than average back pressure of any groundwater that may be around the pipe. Use test gauge conforming to ANSI B40.1 with 0 to 15 psi scale and an accuracy of 1 percent of full range.
   e. Allow two (2) minutes for air pressure to stabilize.
   f. After stabilization period (3.5 psig minimum pressure in pipe) discontinue air supply to line segment.
   g. Acceptable time for loss of one (1) psig of air pressure shall be:
      1) 60” South French Broad Relief Interceptor (347 LF) = 8 hours.

   h. Joint Testing: For pipes 30-inch in diameter or greater.
      1) Contractor may use this test method to replace the Low Pressure Air Test.
      2) Regardless of pipe material, perform testing in accordance with ASTM C1103 Standard Practice for Joint Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines.
      3) The center cavity shall be pressurized with air to a minimum of 3.5 psi greater than the pressure exerted by groundwater above the pipe.
      4) Allow the air pressure and temperature to stabilize, then turn off and disconnect air supply.
      5) Joint test passes if the pressure drop is less than 1.0 psig over a minimum time of 10.0 seconds.
      6) Repair and retest all joints that fail.

i. All air testing shall be witnessed by Engineer. The results of all air testing shall be recorded and signed by the Engineer.

C. Gravity Sewers: All flexible pipe, which includes DIP, PVC and Fiberglass Pipe:

1. All flexible pipe shall be tested for deflection. Testing shall meet one of the following requirements.
   a. For pipe that does not need to be placed into service within 30 days of installation. Deflection test shall be performed no sooner than 30 days after the compaction of backfill or shutting off the dewatering system, whichever date is later. Deflection of pipe shall be limited to no more than 4 percent deflection.
   b. For pipe that does need to be placed into service within 30 days of installation to reduce bypass pumping. Deflection test shall be performed no sooner than 48 hours after the compaction of backfill or shutting off the dewatering system, whichever date is later. Deflection of pipe shall be limited to no more than 3 percent deflection.
2. Pull an approved mandrel through each sewer section. Submit drawing on mandrel and size calculations supporting its size to properly test the deflection specified and the ID of the installed pipe.
3. The mandrel shall be constructed of metal or other rigid material and shall contain nine or more runners or legs.
4. Engineer and Owner's representative shall witness testing.

D. Sewer Manholes: All sewer manholes shall be tested:

1. Test Options:
   a. Vacuum test in accordance with ASTM C—1244.
2. Vacuum Test. Vacuum test the assembled manhole after completing pipe connections and sealing but before backfilling or placing frame and cover as follows:
   a. Plug pipes with suitably sized and rated pneumatic or mechanical pipeline plugs. Place plugs a minimum of 6 inches beyond the manhole wall and brace to prevent displacement of the plugs or pipes during testing.
   b. Position the vacuum tester head assembly to seal against the interior surface of the top of the cone section and inflate according to the manufacturer's recommendations.
   c. Draw a vacuum of 10 inches of mercury, close the valve on the vacuum line, and shut off the vacuum pump.
   d. Measure the time for the vacuum to drop to 9 inches of mercury. The manhole shall pass when the time to drop to 9 inches of ″mercury meets or exceeds the following:
      1) 120 seconds.
   e. The Engineer shall be present during the entire testing process. Any repairs to manholes which fail the vacuum test must be made on the inside and outside of each manhole. The cost of vacuum testing shall be included in the unit price for manholes.
   f. If the manhole fails the test, remove the head assembly, coat the manhole interior with a soap and water solution, and repeat the vacuum test for approximately 30 seconds. Leaking areas will have soapy bubbles. Make the necessary repairs and repeat the test until the manhole passes.

E. Hydrostatic Pressure Testing (Waterlines and Pressure Sewers):

1. Contractor shall provide the water required to pressure test the force mains and the water required for the other testing required for the other testing required at no cost. Contractor is responsible for transporting the water from the source to the site. Comply with all metering and backflow prevention requirements.
2. Tests shall be conducted in accordance with AWWA C600 and NC Regulations except where modified herein. The pipe shall be tested between each valved section. The pressure shall be measured at the point of testing.

3. After the pipe is laid, the joints completed, and all appurtenances permanently installed, the piping system or any valved sections of piping system shall be subjected for two hours to a hydrostatic pressure test equal to or greater than 1.5 times the working pressure.
   a. Each of the 36-inch force main pipes shall be tested to 75 psi.
4. Air removal. Before applying the specified test pressure, air shall be expelled completely from the pipe, valves, and hydrants. If permanent air vents are not located at all high points, the Contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged, or left in place at the discretion of the Owner.
5. Where any section of main is provided with concrete reaction blocking for fittings or hydrants, the hydrostatic pressure test shall not be made until at least five days after installation of the concrete reaction blocking, unless otherwise approved.
6. Test Pressures shall:
   a. Equal the test pressure specified at the hightest point in the section tested.
   b. Not exceed pipe or thrust restraint design pressures.
   c. Not vary by more than +/- 5.0 p.s.i.
   d. Not exceed twice the rated pressure of the valves if resilient – seated butterfly valves are used.
7. Do not paint or insulate exposed piping until successful performance of pressure tests.
8. Repair defective joints, welds, pieces of pipe, jointing material, valves or other defective areas, and repeat pressure testing until pipe system meets test criteria. Pay for any additional costs associated with retesting and repairs.
9. Engineer and Owner's representative shall witness hydrostatic pressure tests. The results will be signed by Engineer and Owner's representative.

F. Leakage Test (Waterlines and Pressure Sewers)

1. Leakage Defined. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain pressure within 5 psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water.
2. Allowable Leakage. No pipe installation will be acceptable if the leakage exceeds the following per AWWA C600:

   $L = [SD (P)^{1/2}] / 133,200$

   L = testing allowance, gph

   S = length of pipe tested, feet

   D = diameter of pipe, inches

   P = test pressure, psig

3. Acceptance of Installation. Acceptance shall be determined on the basis of allowable leakage. If any test of pipe laid discloses leakage greater than that specified, the Contractor shall, at his own expense, locate and repair the defective material until the leakage is with the specified allowance. All visible leaks are to be repaired regardless of the amount of leakage.
4. Repair defective joints or other defective areas and repeat pressure testing until pipe system meets test criteria.

G. Cleaning and Video Assessment:

1. All gravity sewers shall be cleaned and televised prior to acceptance by the Owner. The cleaning shall include the use of a high velocity water jet to remove any objects. During the

cleaning all material shall be captured and removed at the downstream manhole. Following cleaining the gravity sewers shall be televised to verfy proper installation. The camera shall be a color, pan and tilt camera with bright lighting that produce a picture quality sufficient to perform a 360-degree visual assessment of the complete system. The camera should be advanced at a slow and uniform rate throughout the full length of the pipe, measuring the length from manhole to manhole with no lapses in coverage. The upstream and downstream manhole identifications as listed on the design plans shall be captured on the video screen along with the length, diameter, date, and project title. Labeled CD's shall be provided for Owner's assessment. The Owner shall not be responsible for purchasing additional software to view the CD's.

H. Final Inspection:

1. The Contractor is instructed to request a final inspection only after the work has been checked by the Contractor or his appointed agent. Upon final inspection, the Contractor will be notified in writing from the Engineer that the Contract has been satisfied and that the Owner has accepted the new facilities for maintenance. All leaks and defects observed shall be repaired, using methods approved by Engineer at the Contractor's expense. The section of defective line will be reinspected, after repair. The Contractor shall pay all costs for reinspection.

3.3 LOCATION OF BURIED OBSTACLES

A. Furnish exact location and description of buried utilities encountered and thrust block placement.

B. Reference items to definitive reference point locations such as found property corners, entrances to buildings, existing structure lines, fire hydrants and related fixed structures.

C. Include such information as location, elevation, coverage, supports and additional pertinent information.

D. Incorporate information on "As-Recorded" Drawings.

3.4 RELATION OF WATER MAINS TO SEWERS

A. Crossings: Water mains crossing sewers shall be laid to provide a minimum vertical separation of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case whether the water main is either above or below the sewer line. Whenever possible, the water main shall be located above the sewer line. Where a new water main crosses a new sewer line, a full length of pipe shall be used for both the water main and sewer line and the crossing shall be arranged so that the joints of each line will be as far as possible from the point of crossing and each other. Where a new water main crosses an existing sewer line, one full length of a waterpipe shall be located so both joints will be as far from the sewer line as possible. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer line to prevent damage to the water main.

B. Special Conditions: When it is impossible to obtain the distances specified above:

1. Maximize the distances between the water main and sewer line and the joints of each.
2. Use ductile iron pipe for the sewer line.
3. Allow enough distance to make repairs to one of the lines without damaging the other.

C. Force Mains: There shall be a least a 10 foot horizontal separation between water mains and sanitary sewer force mains. There shall be an 18 inch vertical separation at crossing.

D. Sewer Manholes: No water pipe shall pass through or come in contact with any part of a sewer manhole. Water lines may come in contact with storm sewers or catch basins if there is no other practical alternative, provide that ductile iron is used, no joints of the water line are within the storm sewer or catch basin and the joints are located as far as possible from the storm sewer or catch basin.

3.5 SCHEDULES

A. 60-Inch Gravity Sewer Pipe:

1. PVC, AWWA C900, DR 25 (min.).
2. PVC, ASTM F679, 115 psi pipe stiffness (min.) (DR 27.9).
3. Fiberglass, ASTM D3262, SN72 (min.)

B. 36-inch Force Main Pipe and Fittings:

1. Ductile iron, Pressure Class 150 (min.).
   a. Lining: Ceramic epoxy.
   b. Coating:
      1) Zinc basecoat and asphaltic topcoat (buried).

END OF SECTION

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Carrier Bridge Pump Station (Pipeline River Crossings)

APPENDIX A

Geotechnical Report

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GEOTECHNICAL DATA REPORT

NEW FORCE MAIN SEWER PIPELINE
PROPOSED CARRIER BRIDGE PUMP STATION
REPLACEMENT PROJECT
ASHEVILLE, NORTH CAROLINA

Prepared for:

Metropolitan Sewerage District
Mr. Darin Prosser, P.E.
2028 Riverside Drive
Asheville, North Carolina 28804

Prepared by:

Wood Environment & Infrastructure Solutions, Inc.
1308 Patton Avenue
Asheville, North Carolina 28806
North Carolina Engineering Firm License No. F-1253

January 15, 2020

Wood Project No. 6252-13-0101.64

Wood Environment & Infrastructure Solutions, Inc.
1308-C Patton Avenue
Asheville, NC 28806
T: 828-252-8130
www.woodplc.com

January 15, 2020

Mr. Darin Prosser, P.E.
Project Manager
Metropolitan Sewerage District (MSD)
2028 Riverside Drive
Asheville, North Carolina 28804

Subject: **Geotechnical Data Report**
New Force Main Sewer Pipeline
Proposed Carrier Bridge Pump Station Replacement Project
Asheville, North Carolina
Wood Project No. 6252-13-0101.64

Dear Mr. Prosser:

Wood Environment & Infrastructure Solutions, Inc. (Wood) is pleased to provide this Geotechnical Data Report for the proposed new force main sewer pipeline to be constructed as a part of the proposed Carrier Bridge Pump Station Replacement Project to be located near the intersection of Amboy Road and Riverview Drive in Asheville, North Carolina (Figure 1). Our services were provided in general accordance with our Proposal for Geotechnical Exploration authorized by MSD through issuance of P.O. Number 61944 on November 8, 2019.

The purpose of our exploration was to determine general subsurface conditions and provide information for this requested geotechnical data report to be used by others in design of the proposed project.

PROJECT AND SITE INFORMATION

Project information was provided by you in emails and telephone conversations, a scope of work for geotechnical investigation and report requirements prepared by others, and site visits by Wood personnel. Based on the information provided, we understand that a replacement pump station and force main sewer pipeline are proposed for construction near the intersection of Riverview Drive and Amboy Road, adjacent to the French Broad River Park. The proposed pump station will be a cast-in-place concrete structure that is currently proposed to bear approximately 60 feet below the existing grade. The new pipeline is proposed to cross the French Broad River east of the pump station. We understand that there are two options for the pipeline to cross the French Broad River – it will be constructed utilizing a jack and bore tunnel beneath the river, south of the proposed pump station, or it will be suspended beneath a proposed pedestrian bridge to be located north of the French Broad River Park.

The provided project information included a boring location plan showing the requested locations for six soil test borings. Two borings for the proposed river crossing are within the French Broad River Park (B-2 and B-4) and two borings are located on the east side of the French Broad River, parallel to Lyman Street (B-1 and B-3). Two borings for the pump station were located northeast of the existing pump station (B-5 and B-6).

At the time of our field exploration, boring location B-1 was unable to be drilled due to access agreements between MSD and the current Owner. A separate geotechnical report will be provided at a later date for the proposed pump station, borings B-5 and B-6.

The areas containing borings B-2 and B-4, west of the French Broad River and within the French Broad River Park, is primarily grass covered and is relatively level. The existing ground surface in the area of Boring B-3 is primarily covered in root mat and is relatively flat with a slope to the west towards the French Broad River and Lyman Street to the east.

SITE GEOLOGY

The project site is located in the Blue Ridge Physiographic Province. The bedrock in this province is a complex mixture of igneous, sedimentary and metamorphic rock that has been repeatedly squeezed, fractured, faulted and distorted by past tectonic movements. The virgin soils encountered in this area are the residual product of in-place weathering of rock, which was similar to the rock presently underlying the site.

In areas not altered by erosion or disturbed by the activities of development, the typical residual soil profile consists of clayey soils near the surface, where soil weathering is more advanced, underlain by sandy silts and silty sands. The less weathered soils exhibit relict features of the parent rock, including foliation patterns and joints.

The boundary between soil and rock is not sharply defined. This transitional zone, termed "partially weathered rock" (PWR), is normally found overlying the parent bedrock. Partially weathered rock is defined, for engineering purposes, as residual material with standard penetration resistance values in excess of 100 blows per foot. Fractures, joints, and the presence of less resistant rock types facilitate weathering. Consequently, the profile of the partially weathered rock and hard rock is quite irregular and erratic, even over short horizontal distances. Also, it is not unusual to find lenses and boulders of hard rock and zones of partially weathered rock within the soil mantle, well above the general bedrock level.

The upper soils along drainage features and in floodplain areas (such as at this site) are often water-deposited (alluvial) materials that have been eroded and washed down from adjacent higher ground.

SUBSURFACE EXPLORATION

Three soil test borings (B-2 through B-4), were performed at the approximate locations shown on the attached Site and Boring Location Plan (Figure 1). The borings were extended to auger refusal. Additionally, rock coring was performed within borings B-2 and B-3 below the auger refusal depths. Photographs of the rock cores obtained from these two borings are included in this report. The boring locations were located by Wood personnel near locations designated on the provided proposed boring location plan and approved by MSD in the field prior to drilling. Therefore, boring locations shown on Figure 1 should be considered approximate.

Soil sampling and Standard Penetration Testing were performed in general accordance with ASTM D 1586. At assigned intervals, soil samples were obtained with a standard 1.4-inch I.D., 2-inch O.D. split-spoon sampler. The sampler was first seated 6 inches to penetrate any loose cuttings, and then driven an additional 12 inches with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final 12 inches was recorded and is designated the "N-Value" or "penetration resistance".

Once auger refusal was encountered in the borings B-2 and B-3, rock coring was performed in general accordance with ASTM D 2113 to penetrate refusal materials and determine the continuity and condition of the refusal material. A 2 3/8-inch I.D. "HQ3" size wireline core barrel system was utilized with rock coring performed within borings B-2 and B-3 to depths of approximately 10 feet below auger refusal material. Rock core runs were performed in shorter two foot lengths due to the limits of the coring equipment available at the time of our field exploration.

Representative portions of the split spoon soil samples were sealed in glass jars and returned to our laboratory where they were visually classified by a geotechnical professional. The rock core samples were placed in a box and the rock core was returned to our laboratory where the percent core recovery and Rock Quality Designation (RQD) was measured and the core described (logged) by a geotechnical professional. The RQD denotes the percentage of intact and sound rock retrieved during coring and is a measure of the degree of natural fracturing. To calculate the RQD, all pieces of intact and sound rock core equal to or greater than 4-inches long are summed and divided by the total length of the core run.

The boreholes were backfilled with bentonite and grout after groundwater level observations were made upon the completion of drilling and as noted on the attached Soil Test Boring Records.

SUBSURFACE CONDITIONS

The following descriptions provide a general summary of the subsurface conditions encountered in borings B-2 through B-4. The attached Soil Test Boring Records represent our interpretation of the field boring/coring logs based on engineering examination of the field samples. The lines designating the interfaces between soil strata represent approximate boundaries and the transition between soil strata may be gradual. It should be noted that subsurface soil and rock conditions may vary between the boring locations.

Fill Soils

Beneath the surficial layers of topsoil/rootmat in the borings, fill soils were encountered in borings B-2 and B-3. Fill soil was encountered in boring B-2 to a depth of approximately 13 feet and to 17.5 feet in boring B-3. This fill was generally sampled as very loose to medium dense silty sand and medium dense sandy gravel. Within this sampled fill material, coal fragments, plastic debris, wood fragments asphaltic felt paper, asphalt fragments, concrete fragments and gravel were sampled.

Alluvial Soils

Beneath the layers of fill soil in borings B-2 and B-3, and the surficial ground surface layer in B-4, alluvial soils were encountered to the auger refusal depths of between 16.6 to 18 feet. This alluvial soil was sampled as very loose silty sand to very dense silty sand. The higher SPT N-value blow counts recorded were likely magnified by the gravel fragments and rounded cobbles contained in the alluvial soils. Thus, these higher N-values are not indicative of the consistency or relative density of the overall soil portions of the alluvium.

Approximately 7 inches of alluvial cobbles and boulders were encountered beneath the auger refusal depths in B-2 and B-3 during rock coring until competent, continuous bedrock was encountered.

Rock

Beneath the alluvial layers encountered during rock coring in borings B-2 and B-3, hard, slightly weathered, gneiss bedrock was first encountered at depths of 19.7 and 18.1 feet in respective borings B-2 and B-3 to coring termination depths of 29.3 and 27.5 feet, respectively. Fracturing within the rock cores was observed to be minimal, with most fractures observed being the result of mechanical breaks during coring. The attached Soil Test Boring Records provides a summary of the rock core runs, percent core recovery, and RQD measured. Photographs of these rock cores are also attached to this report.

Groundwater

Groundwater was encountered in each of the boreholes during our field exploration at depths of between 11 and 13.5 feet, approximately. However, groundwater levels may fluctuate seasonally or be locally perched just above the bedrock elevations. Levels will also vary with water levels within the adjacent French Broad River.

LABORATORY TESTING

Two jar samples, one each from borings B-3 and B-4, were tested for natural moisture content (ASTM D2216) and percent finer than #200 sieve (ASTM D1140). Selected pieces of rock core were tested in unconfined uniaxial compression in general accordance with ASTM D 7012 Method C. Two samples, one each from borings B-2 and B-3, representative of the different types of intact rock core samples observed within the rock cores obtained without readily visible fractures recovered, were initially selected for laboratory testing (designated as UC-1 and UC-2). The selected samples were then cut and trimmed to test sections of approximately 5.5 inches in length prior to compressive strength testing.

The laboratory tests were completed in general accordance with the applicable ASTMs. The results of the soil and rock laboratory tests are summarized in an attachment to this report.

GROUNDWATER CONTROL

Groundwater was encountered within our boreholes at the time of our field exploration between depths of approximately 10.3 to 13.5 feet. The contractor should be prepared to promptly remove any surface water or groundwater from the construction area. This has been done effectively on past jobs by means of gravity ditches and pumping from filtered sumps. Deeper excavations that may remain open for relatively longer periods of time, such as jack and bore pits to install larger underground sewer lines, may require additional measures to be installed by a specialty dewatering contractor to effectively remove and control groundwater in order to provide safe working conditions.

ESTIMATED SOIL PROPERTIES

Based on our experience and previously developed correlations for sandy silts and silty sands encountered within our soil test borings, the total unit weight, cohesion, effective internal friction angle and shear modulus values are recommended in the following table:

Table 1. Summary Table of Estimated Soil Properties

Material Description	Total Unit Weight (pcf)	Cohesion (psf)	Internal Angle of Friction (degrees)	Shear Modulus (tons/sf)*
Sandy Silt (ML)	120	100	24	100*
Silty Sand (SM)	120	0	28	100*
* Conservatively estimated based on published values shown in NAVFAC Design Manual 7.01 assuming a SPT N-value of 5 blows per foot, with a range of estimated values shown to be between approximately 100 to 2,000 tons/sf.				

The shear modulus values were conservatively estimated based on published correlations shown in NAVFAC DM 7.01 (Soil Mechanics) Chapter 2, Figure 5 which provides a graph to correlate SPT N-Values to shear modulus at very small strains.

Due to the soil overburden above the auger refusal depths encountered within our soil test borings consisting of fill and alluvial soils, which were highly variable with respect to debris (coal, concrete, asphalt, wood, plastic etc.) and gravel/cobble fragments sampled within them, it should be anticipated that the variation in the actual soil properties compared to the estimated ones provided will be greater than if they were undisturbed, weathered in-place residual soils.

QUALIFICATION OF REPORT

The recommendations provided in this report are based in part on project information provided to us and they only apply to the specific project and site discussed in this report. If the project information section in this report contains incorrect information or if additional information is available, you should convey the correct or additional information to us and retain us to review our recommendations. We can then modify our recommendations, as necessary, for the proposed project.

Regardless of the thoroughness of a geotechnical exploration, there is always a possibility that conditions between borings will be different from those at specific locations and that conditions will not be as anticipated by the designers or contractors. In addition, the construction process may itself alter subsurface conditions. Therefore, experienced geotechnical personnel should observe and document the construction procedures used and the conditions encountered. Unanticipated conditions and inadequate procedures should be reported to the design team along with timely recommendations for addressing the observed conditions/procedures. We recommend that Wood be retained to provide this service based upon our familiarity with the project, the subsurface conditions, and the intent of the recommendations and design.

The assessment of site environmental conditions for the presence of pollutants in the soil, rock, or ground water of the site was beyond the scope of this exploration.

CLOSING

We thank you for the opportunity to provide our professional geotechnical services during this phase of your project and would be pleased to discuss our recommendations with you.

Sincerely,
Wood Environment & Infrastructure Solutions, Inc.

Timothy P. Quigley, P.E.
Senior Engineer
Registered, North Carolina 034969

Mel Y. Browning, P.E.
Principal Engineer
Registered, North Carolina 8696

Attachments:
Figure 1 – Site and Boring Location Plan
Key to Symbols and Descriptions
Soil Test Boring Records (3)
Photographs
Summary of Soil Laboratory Laboratory Test Results
Summary of Rock Core Compressive Strength Laboratory Test Results

ATTACHMENTS

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Legend

- Geotechnical Boring Location
- Parcel Boundary

wood.

Site and Boring Location Plan
Carrier Bridge Pump Station Replacement
New Force Main Sewer Pipeline
Asheville, North Carolina

1:3,600 | 0 | 300 | 600 Feet

Figure 1 | Drawn: GLH
Project 6252130101.64 | Approved: TPQ

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravels, gravel - sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel - sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amount of fines)	GM	Silty gravels, gravel - sand - silt mixtures.
			GC	Clayey gravels, gravel - sand - clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 Sieve Size)	CLEAN SANDS (Little or no fines)	SW	Well graded sands, well graded sands with gravel.
			SP	Poorly graded sands, poorly graded sands with gravel.
		SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands.
			SC	Clayey sands.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)		ML	Inorganic silts, sandy or clayey silts with low plasticity.
			CL	Inorganic clays of low plasticity.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)		MH	Inorganic silts, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of high plasticity, organic silts.
CORED ROCK			RK	Rock

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

SILT OR CLAY	SAND			GRAVEL		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

No.200 No.40 No.10 No.4 3/4" 3" 12"

U.S. STANDARD SIEVE SIZE

Reference: "Classification of Soils for Engineering Purposes" (Unified Soil Classification System) ASTM D 2487, and/or "Description and Identification of Soils" (Visual-Manual Procedure), ASTM D 2488.

	Undisturbed Sample		Auger Cuttings
	Split Spoon Sample		Bulk Sample
	Rock Core		Crandall Sampler
	Dilatometer		Pressure Meter
	Packer		No Recovery
	Water Table at time of drilling		Water Table after 24 hours
	Caved Depth		WOH = Weight of Hammer

Monitoring Well Explanation

Cement Bentonite Sand Filter Screen

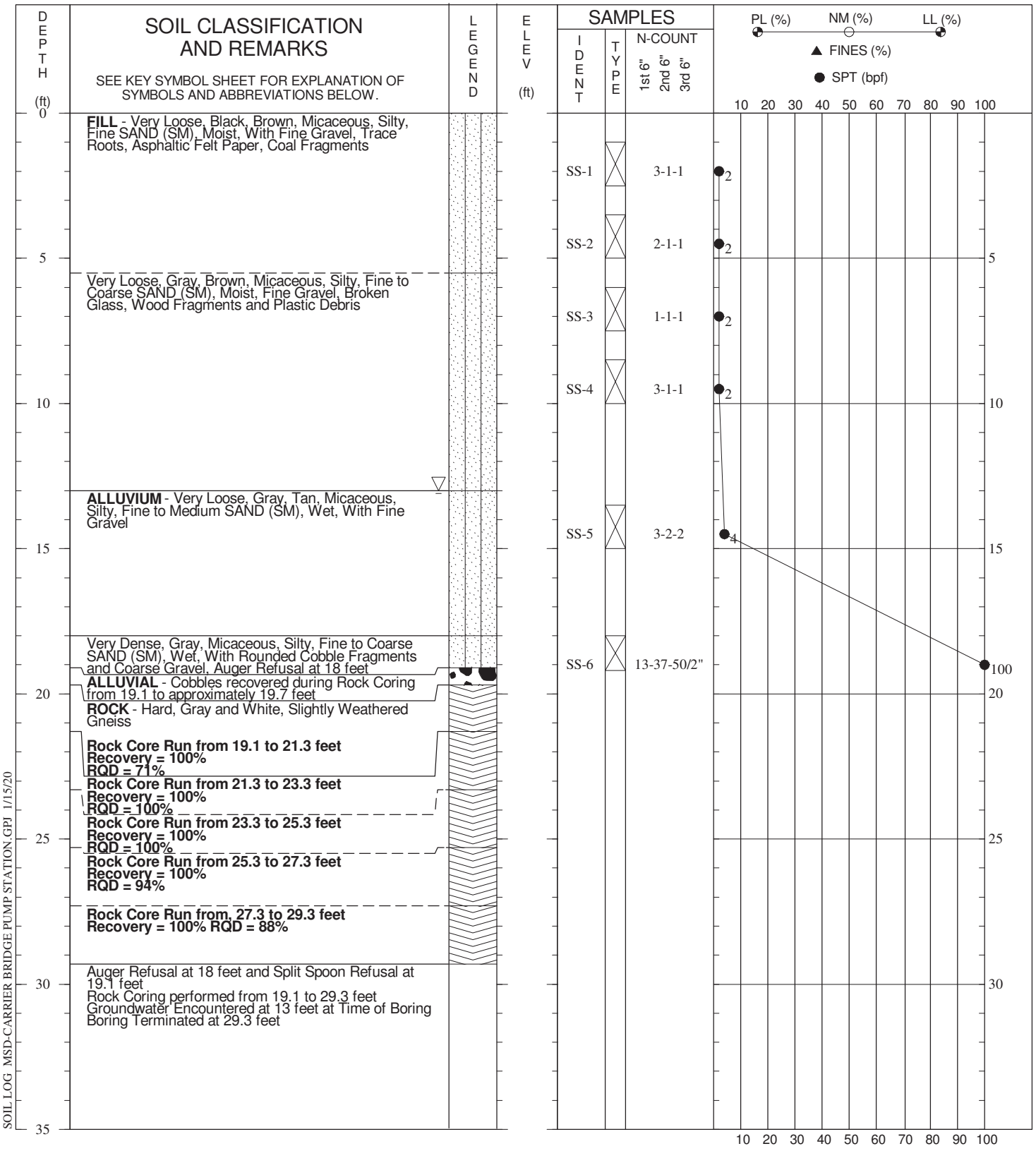
Correlation of Penetration Resistance with Relative Density and Consistency

SAND & GRAVEL		SILT & CLAY	
No. of Blows	Relative Density	No. of Blows	Consistency
0 - 4	Very Loose	0 - 1	Very Soft
5 - 10	Loose	2 - 4	Soft
11 - 30	Medium Dense	5 - 8	Firm
31 - 50	Dense	9 - 15	Stiff
Over 50	Very Dense	16 - 30	Very Stiff
		Over 30	Hard

wood.

KEY TO SYMBOLS AND DESCRIPTIONS

Wood Environment & Infrastructure Solutions, Inc.



SOIL LOG MSD-CARRIER BRIDGE PUMP STATION.GPJ 1/15/20

DRILLER:	Tri-State
EQUIPMENT:	CME 550X Autohammer
METHOD:	3.25 inch HSA
HOLE DIA.:	0.5' Nominal
REMARKS:	
PREPARED BY:	MNQ
CHECKED BY:	TPQ

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL TEST BORING RECORD

PROJECT: MSD-Carrier Bridge Pump Station **BORING NO.:** B-2

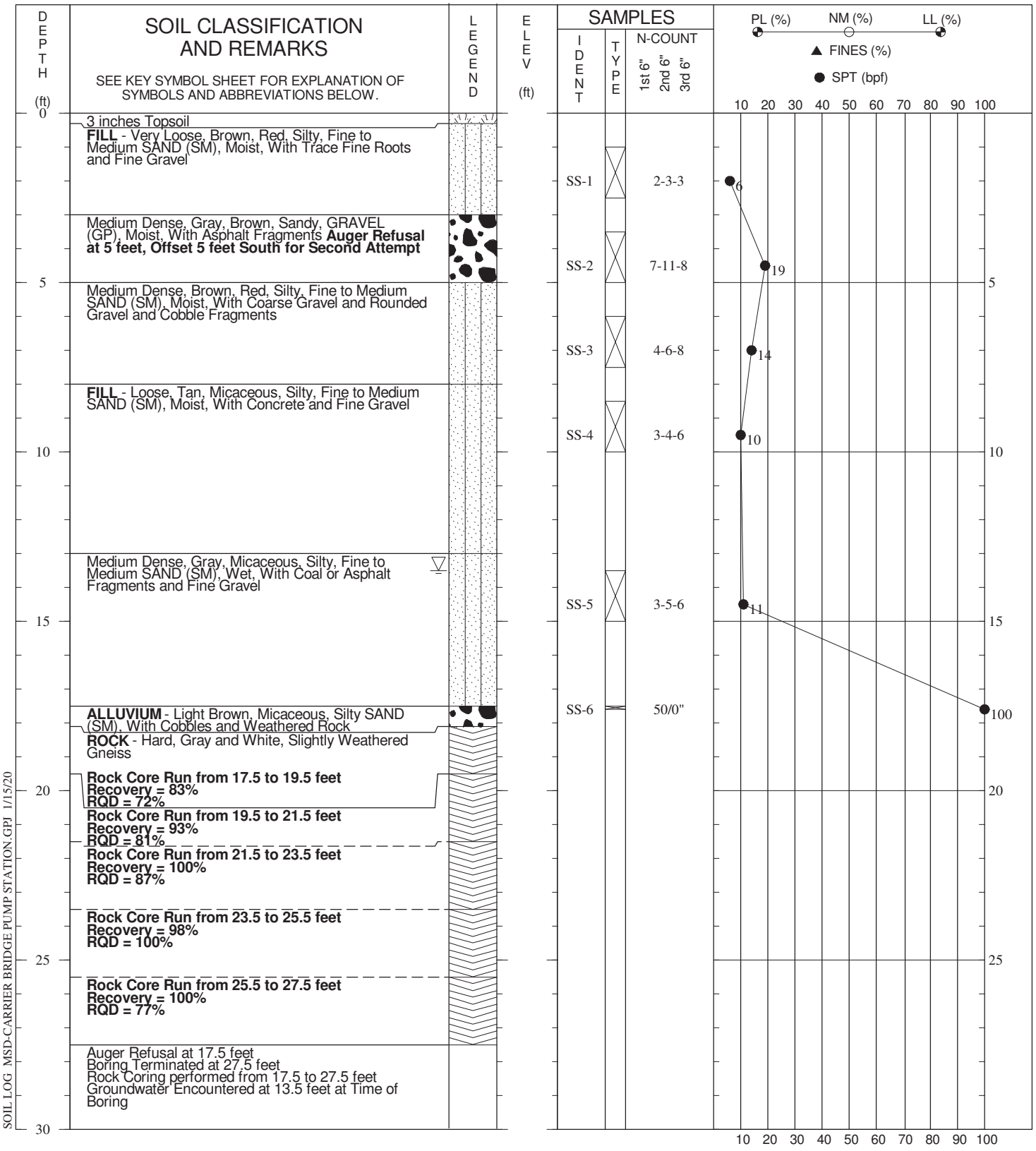
LATITUDE:

LONGITUDE:

DRILLED: November 20, 2019

PROJ. NO.: 6252-13-0101.64 **PAGE** 1 **OF** 1

wood.



SOIL LOG MSD-CARRIER BRIDGE PUMP STATION.GPJ 1/15/20

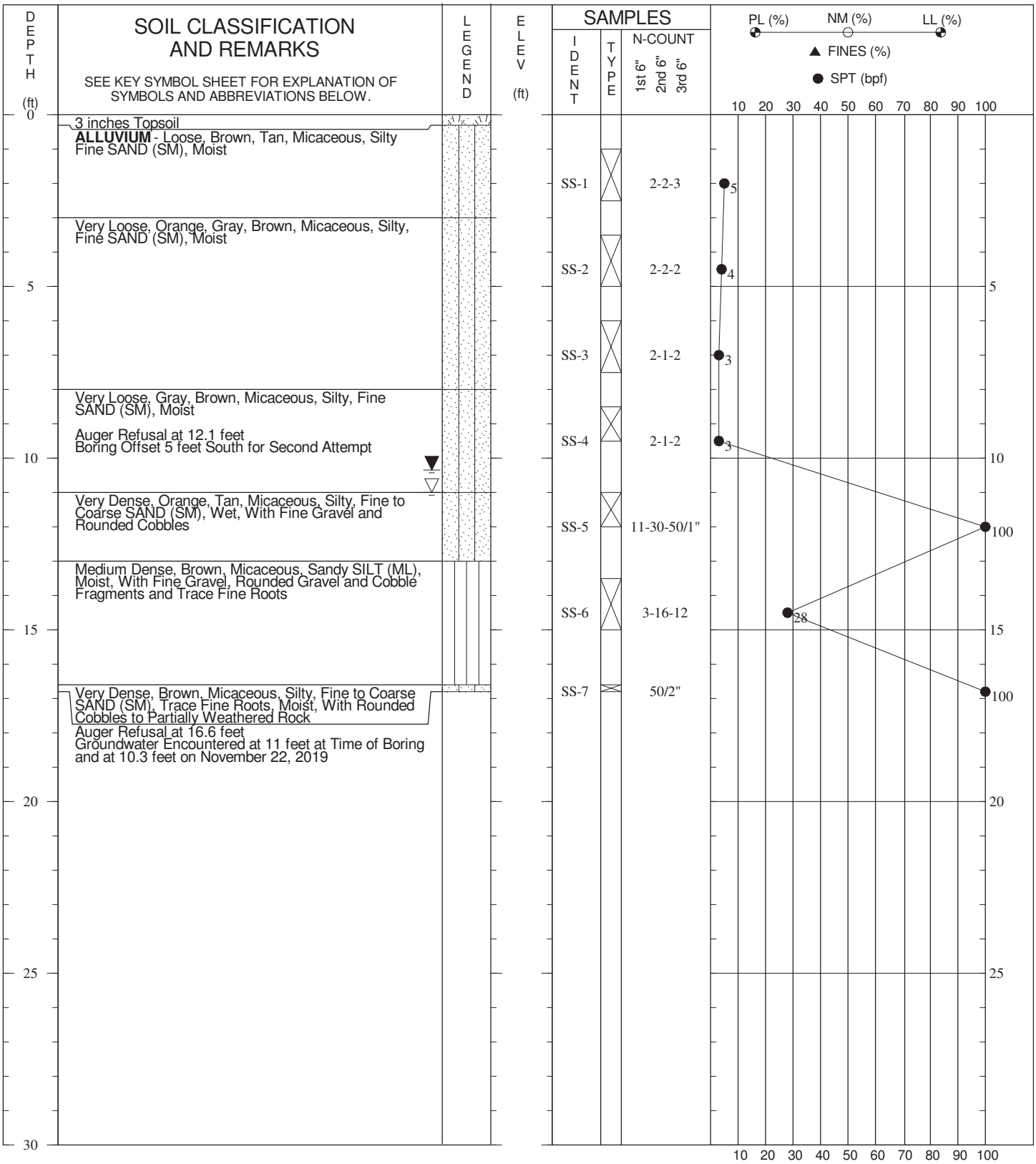
DRILLER:	Tri-State
EQUIPMENT:	CME 550X Autohammer
METHOD:	3.25 inch HSA
HOLE DIA.:	0.5' Nominal
REMARKS:	
PREPARED BY:	MNQ
CHECKED BY:	TPQ

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL TEST BORING RECORD

PROJECT: MSD-Carrier Bridge Pump Station **BORING NO.:** B-3
LATITUDE:
LONGITUDE:
DRILLED: November 21, 2019
PROJ. NO.: 6252-13-0101.64 **PAGE** 1 **OF** 1

wood.



SOIL LOG MSD-CARRIER BRIDGE PUMP STATION.GPJ 1/15/20

DRILLER:	Tri-State
EQUIPMENT:	CME 550X Autohammer
METHOD:	3.25 inch HSA
HOLE DIA.:	0.5' Nominal
REMARKS:	
PREPARED BY:	MNQ
CHECKED BY:	TPQ

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL TEST BORING RECORD

PROJECT: MSD-Carrier Bridge Pump Station **BORING NO.:** B-4
LATITUDE:
LONGITUDE:
DRILLED: November 20, 2019
PROJ. NO.: 6252-13-0101.64 **PAGE** 1 **OF** 1

wood.

Rock Core Photographs

Rock core from 19.1 to 29.3 feet (going left to right and top to bottom) boring B-2

Rock core from 17.5 to 27.5 feet (going left to right and top to bottom) boring B-3

Wood Environment & Infrastructure Solutions, Inc.
1308 Patton Avenue
Asheville, North Carolina 28806

MSD Carrier Bridge Pump Station Replacement Project - New Force Main Sewer Pipeline
Wood Project No. 6252-13-0101.64

SUMMARY OF SOIL LABORATORY TEST RESULTS

Sample Location	Sample Depth, ft	Sample Type	Sample Description	USCS Classification	Natural Moisture Content (%)	Percent Passing No. 200 Sieve
B-3	8.5-10	Split Spoon	Fill: Tan, Micaceous, Silty, Fine to Medium Sand, with Concrete and Fine Gravel	SM	12.2	20.3
B-4	13.5-15	Split Spoon	Alluvium: Medium Dense, Brown, Micaceous, Sandy, Silt, with Fine Gravel and Rounded Cobble Fragments	ML	27.0	63.6

Laboratory testing was performed in general accordance with the following test methods:
Percent Passing No. 200 Sieve - ASTM D1140
Natural Moisture Content - ASTM D2216

Prepared By: Matt Land 1/3/2020
Reviewed By: Tim Quigley 1/10/2020

Wood Environment & Infrastructure Solutions, Inc.
1308 Patton Avenue
Asheville, North Carolina 28806

MSD Carrier Bridge Pump Station Replacement Project
New Force Main Sewer Pipeline
Wood Project No. 6252-13-0101.64

SUMMARY OF ROCK CORE COMPRESSIVE STRENGTH LABORATORY TEST RESULTS

Sample Location	Sample Depth, ft	Sample Type	Sample Description	Uniaxial Compressive Strength (psi)
B-2	21.3-21.9	Rock Core	Hard, Gray and White, Slightly Weathered Gneiss	9,960
B-3	25.8-26.5	Rock Core	Hard, Gray and White, Slightly Weathered Gneiss	6,510

Laboratory testing was performed in general accordance with ASTM D 7012
Rock core samples trimmed and approximately 5.5 inch long section of rock core tested within sample depth interval shown.

Prepared By: M. Land 1/14/2020
Reviewed By: T. Quigley 1/14/2020

REPORT OF ADDITIONAL SUBSURFACE EXPLORATION AND GEOTECHNICAL EVALUATION

CARRIER BRIDGE PUMP STATION REPLACEMENT

ASHEVILLE, NC

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

PROJECT NO.: US-EI-6252130101.102
DATE: JUNE 13, 2024

WSP USA ENVIRONMENT & INFRASTRUCTURE, INC.
1308-C PATTON AVENUE
ASHEVILLE, NORTH CAROLINA 28806
NORTH CAROLINA ENGINEERING FIRM LICENSE NO. F-1253

WSP.COM

June 13, 2024

Metropolitan Sewerage District of Buncombe County
2028 Riverside Drive
Asheville, North Carolina 28804

Attention: Mr. Darin A. Prosser, PE
Project Manager

Subject: Report of Additional Exploration and Geotechnical Evaluation
Carrier Bridge Pump Station Replacement
Amboy Road
Asheville, North Carolina
WSP Project No. US-EI-6252130101.102

Dear Mr. Prosser,

WSP USA Environment & Infrastructure Inc. (WSP) is pleased to provide this Report of Additional Subsurface Exploration and Geotechnical Evaluation for the planned Carrier Bridge Pump Station Replacement project located near Amboy Road in Asheville, North Carolina. Our services were provided in accordance with our Proposal No. 2024US211682 for the additional geotechnical evaluation dated March 18, 2024 and authorized by you.

WSP previously performed two separate subsurface investigations for the eastern portion of this project and previously issued geotechnical reports for them. This additional geotechnical evaluation was requested by the designer, HDR, to provide additional geotechnical information for the open cut design and construction of the underground sewer line under French Board River. This report presents the results of our additional evaluation.

Thank you for the opportunity to provide our professional geotechnical services for this project. We would be pleased to discuss our evaluation with you and welcome the opportunity to continue to provide geotechnical consulting and construction materials testing services as this project progresses.

Sincerely,
WSP USA Environment & Infrastructure Inc.

F.A. KAYSER

Mohammad Kayser, P.E.
Senior Engineer
Registered, North Carolina 046209

Timothy P. Quigley

NORTH CAROLINA PROFESSIONAL SEAL 034969 ENGINEER TIMOTHY P. QUIGLEY 6/13/24

Timothy P. Quigley, P.E
Senior Engineer
Registered, North Carolina 034969

TABLE OF CONTENTS

ATTACHMENTS

TABLES

APPENDICES

1 PROJECT AND SITE INFORMATION

1.1 INTRODUCTION

In accordance with our Proposal No. 2024US dated March 18, 2024, and authorized by Metropolitan Sewerage District (MSD) of Buncombe County, we have performed a geotechnical evaluation for the Carrier Bridge Pump Station Replacement located near Amboy Road in Asheville, North Carolina.

The additional geotechnical evaluation was requested by the designer, HDR, to provide additional geotechnical information for the open cut design of the sewer line under French Board River. This report presents the results of our evaluation.

1.2 SITE DESCRIPTION AND PROPOSED CONSTRUCTION

WSP previously performed two separate subsurface investigations for the eastern portion of this project and previously issued geotechnical reports for them. This additional geotechnical evaluation was requested by the designer, HDR, to provide additional geotechnical information for the open cut design and construction of the underground sewer line under French Board River.

Project information was provided by you in emails and telephone conversations, a scope of work for geotechnical investigation and report requirements prepared by others, our previous subsurface exploration for the project and site visits by WSP personnel. Based on the information provided, we understand that the previously proposed force main sewer pipeline proposed for construction near the intersection of Riverview Drive and Amboy Road, adjacent to the French Broad River Park, will be re-aligned to cross the French Broad River further upstream. The new pipeline is proposed to cross the French Broad River at Carrier Park to the south of the existing baseball field on the north side and within the Biltmore Estate property on the south side of the river. The pipe is currently proposed to be constructed with an open cut trench.

2 FIELD EVALUATION

2.1 SUBSURFACE EXPLORATION

Two soil test borings (designated as B-10 and B-11), were performed at the approximate locations shown on the attached Site and Boring Location Plan (Figure 1). The borings were extended to requested termination depths of 40 feet. Additionally, rock coring was performed within boring B-11 below the auger refusal depths. Photographs of the rock cores obtained from these borings are included in this report. The boring locations were located by WSP personnel in the field utilizing site features near the locations designated on the provided proposed boring location plan provided to us and approved by MSD in the field prior to drilling. Ground surface elevations were estimated based on the contour lines shown on the topographic survey provided to us in the area of the boreholes. Therefore, boring locations shown on Figure 1 and ground surface elevations shown on the boring logs should be considered approximate.

Soil test borings were drilled by a track mounted drill rig with mechanically twisting 3 ¼ inch diameter hollow-stem augers into the soil. Soil sampling and penetration testing were performed in general accordance with ASTM D1586 using an automatic hammer system. At assigned intervals, soil samples were obtained with a standard 1.4-inch I.D., 2-inch O.D. split-spoon sampler. The sampler was first seated 6 inches to penetrate any loose cuttings, and then driven an additional 12 inches with blows from a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final 12 inches was recorded and is designated the "N-Value" or "penetration resistance". The N-Value, when properly evaluated, is an index to soil strength and foundation support capability.

Portions of split spoon samples were sealed in containers and returned to our laboratory where they were visually classified by a geotechnical engineer. Selected samples were assigned for subsequent index laboratory testing. The depth to water was measured in the boreholes at the time of drilling and prior to backfilling. Borehole B-10 was then backfilled with soil cuttings, with boring B-11 backfilled with grout due to rock coring being performed within it.

Auger refusal was encountered in boring B-11, rock coring was performed in the boring to penetrate refusal materials and determine the continuity and condition. Rock coring was performed in general accordance with ASTM D 2113 and utilized a 2-3/8-inch I.D. "HQ3" size wireline core barrel system. The rock cores extended below the auger refusal depth of about 20.4 feet to boring termination depth of about 39.9 feet. Rock core runs were generally performed in about five-foot lengths during our exploration.

The rock core samples were placed in a box and the rock core was returned to our laboratory where the percent core recovery and Rock Quality Designation (RQD) was measured and the core described (logged) by a geologist. The RQD denotes the percentage of intact and sound rock retrieved during coring and is a measure of the degree of natural fracturing. To calculate the RQD, all pieces of intact and sound rock core equal to or greater than 4-inches long are summed and divided by the total length of the core run.

2.2 SOIL BORING LOGS

The attached Soil Boring Logs represent our interpretation of the field drilling logs based on engineering examination of the field samples. Therefore, these boring logs contain both factual and interpretive information. Lines delineating subsurface strata on the boring logs are intended to group soils having similar engineering properties and characteristics. They should be considered approximate as the actual transition between soil types (strata) may be gradual. A Key to the Soil Symbols and Descriptions used on the boring logs is also included.

3 AREA GEOLOGY AND SUBSURFACE CONDITIONS

3.1 GEOLOGIC SETTING

The project site is located in the Blue Ridge Physiographic Province of North Carolina. The bedrock in this province is a complex mixture of igneous, sedimentary, and metamorphic rock that has been repeatedly squeezed, fractured, faulted, and distorted by past tectonic movements. The virgin soils encountered in this area are the residual product of in-place weathering of rock, which was similar to the rock presently underlying the site. In areas not altered by erosion or disturbed by the activities of development, the typical residual soil profile consists of clayey soils near the surface, where soil weathering is more advanced, underlain by sandy silts and silty sands. The less weathered soils exhibit relict features of the parent rock, including foliation patterns and joints.

The boundary between soil and rock is not sharply defined. This transitional zone, termed "partially weathered rock" (PWR), is normally found overlying the parent bedrock. Partially weathered rock is defined, for engineering purposes, as residual material with standard penetration resistance values in excess of 100 blows per foot. Fractures, joints, and the presence of less resistant rock types facilitate weathering. Consequently, the profile of the partially weathered rock and hard rock is quite irregular and erratic, even over short horizontal distances. Also, it is not unusual to find lenses and boulders of hard rock and zones of partially weathered rock within the soil mantle, well above the general bedrock level.

The upper soils along drainage features and in floodplain areas are often water-deposited (alluvial) materials that have been eroded and washed down from adjacent higher ground.

3.2 GENERALIZED SUBSURFACE STRATIGRAPHY

General subsurface conditions observed during our geotechnical evaluation are described in this section. For more detailed soil descriptions and stratifications at a particular boring location, the respective “Soil Boring Log”, and Subsurface Profile (Figure 2) attached to this report should be reviewed.

3.2.1 TOPSOIL

Approximately 4 inches of topsoil was noted at the surface of Boring-10. Topsoil is typically a dark-colored soil material containing roots, fibrous matter, and/or other organic components, and is generally unsuitable for engineering purposes. It should be noted that WSP has not performed any laboratory testing to determine the organic content or other horticultural properties of the observed surficial materials. Furthermore, the transition from topsoil to underlying material may be gradual, and therefore, the observation and measurement of these thicknesses is somewhat subjective. Actual topsoil depths should be expected to vary across the project site and will generally increase as the amount of vegetation present over the site increases.

3.2.2 EXISTING FILL

Existing fill soils were encountered in boring B-10 to a depth of approximately about 5 feet. These soils were generally sampled as loose to medium dense silty sand (SM) with SPT N-values ranging from 5 to 11 blows per foot (bpf). The higher N-value blow counts were likely magnified by the gravel or rock fragments contained in these soils. Thus, these higher N-values are not indicative of the consistency or relative density of the overall soil portions of the fill.

3.2.3 ALLUVIUM

Alluvial soils were encountered in borings B-10 and B-11 to depths of about 5 to 27 feet and from the ground surface to a depth of about 14 feet, respectively. These soils were generally sampled as very loose to medium dense silty sand (SM) with SPT N-values ranging from 1 to 13 bpf. The higher N-value blow counts were likely magnified by the gravel or rock fragments contained in these soils.

3.2.4 RESIDUAL SOILS / PARTIALLY WEATHERED ROCK

Residual soils were encountered in borings B-10 and B-11 below the alluvial soils and extended to above PWR layer at depths of 32 and 17 feet, respectively. When sampled, the residual soils generally consisted of loose silty sands (SM) and very stiff to hard sandy silt (ML). SPT N-values for the sampled residuum ranged from 6 to 70 bpf.

Partially weathered rock (PWR) was encountered at borings B-10 and B-11 from depths of about 32 to 37 feet and 17 to the auger refusal depth of 20.4 feet, respectively. Refusal of drilling equipment was encountered at boring B-11 at a depth of about 20.4 feet.

It should be noted that refusal of drilling equipment may be a result of hard rock, or a hard rock lens or a boulder underlain by additional partially weathered rock or residual soil. Auger refusal may not indicate the top of the parent rock formation.

3.2.5 ROCK

Rock coring was performed within boring B-11 since it encountered auger refusal and was unable to be advanced to the requested termination depth of 40 feet. Generally, hard gneiss bedrock was encountered in the boring with generally greater degrees of fracturing and more weathered rock and partially weathered rock within the upper portions of rock core sampled just beneath the auger refusal depths from approximately 20.4 to 23.5 feet.

Fracturing within the rock cores was generally observed to be minimal, with most fractures observed being the result of mechanical breaks during coring. The attached Soil Test Boring Records provides a summary of the rock core runs, percent core recovery, and RQD measured. Photographs of these rock cores are also attached to this report.

3.2.6 DEPTH-TO-WATER

Groundwater was encountered during drilling within the two soil test borings. The approximate depths and elevations are shown on the attached Soil Test Boring Records and

are summarized in Table 1 below. Groundwater levels were measured at the time of drilling. The boreholes were backfilled after the completion of drilling due to safety concerns so additional groundwater measurements were unable to be obtained.

Table 1. Approximate Groundwater Depths

Boring Number	**Depth to Groundwater at Time of Boring, feet**	**Elevation to Groundwater at Time of Boring, feet**
B-10	16	1968
B-11	7.5	1970.5

The groundwater level at the project site is anticipated to fluctuate seasonally depending on the amount of rainfall, prevailing weather conditions, subsurface drainage characteristics, and the influence of nearby construction. Groundwater elevations will vary seasonally, with higher levels typically occurring during late winter and early spring. Fluctuations in the water level of the French Broad River, which can vary greatly after heavy rainfall events or dry periods, will also cause variations in groundwater levels in adjacent areas. Additionally, the construction process itself can alter groundwater elevations.

3.3 LABORATORY TESTING

WSP completed laboratory tests (natural moisture content and percent finer than a No. 200 sieve) on split spoon samples obtained during our field exploration to assist in classification of on-site soils. Additionally unconfined compressive strength tests were performed on selected rock samples collected from boring B-11.

The laboratory tests were conducted in general accordance with ASTM standards. A description of our laboratory test methods and the laboratory test results is included as an attachment to this report.

Table 2. Summary of Laboratory Testing Results

Sample Location	Sample Depth, ft	Sample Type	Percent Passing No. 200 Sieve	Natural Moisture Content (%)	Unconfined Compressive Strength, psi
B-10	8.5-10.0	Soil	44.0	28.1	--
B-11	14.4-15	Soil	25.9	32.3	--
B-11	24.4-25.5	Rock	--	--	10,650
B-11*	33.5-34	Rock	--	--	1,770*

*Note that rock core sample contained some thin, diagonal layers of quartz that likely caused a weakened plane in which rock core failed during compressive strength testing.

3.4 EXCAVATION CONDITIONS

Partially weathered rock and material sufficiently hard enough to cause auger refusal was encountered within the two borings as shown on our attached Soil Test Boring Records.

In general, very dense residual soil and partially weathered rock with N-values ranging from 50 blows per 6 inches to 50 blows per 3 inches can often be excavated with bulldozers (Caterpillar D-8 with a single tooth-ripper, or equivalent) or powerful tractor-drawn rippers without blasting, although often with difficulty. Much can depend on the quality of the equipment and the experience of the operators, as well as the nature of the material being excavated (i.e., presence and direction of more weathered seams, bedding planes, etc.). Our experience indicates that partially weathered rock that has a standard penetration resistance of 50/3 inches or fewer, as indicated on the boring records, will require an extreme amount of effort to be removed by ripping and can most effectively be removed by blasting.

Confined excavations, such as utility trenches, in partially weathered rock may require pneumatic hammers or blasting. Blasting may be necessary to efficiently remove more resistant rock and large boulders that could be present within the partially weathered rock. The ease of excavation of partially weathered rock cannot be specifically quantified and depends on the quality of grading equipment, skill of the equipment operators and geologic structure of the material itself, such as the direction of bedding, planes of weakness and spacing between discontinuities.

Auger refusal material, confirmed to be continuous based on the rock coring performed, will require blasting to excavate. Alternatively, non-explosive methods such as pneumatic hammers and expansive grout poured into drilled holes in the rock could be utilized for rock excavation. We recommend that the requirement for blasting be defined in terms of equipment performance. For general excavation, typical recommendations would be that rock

be defined as material that cannot be excavated with a single tooth-ripper drawn by a Caterpillar D-8 or equivalent bulldozer. For trench excavation, typical recommendations would be that rock be defined as material that cannot be excavated by a Caterpillar 225 or equivalent backhoe equipped with rock teeth.

Prior to blasting, pre-blast surveys of nearby structures should be performed to document existing damage to these structures. Vibration monitoring should also be performed near the closest structures to the site during blasting.

In a larger, open excavation site, a particularly resistant area could be approached from any direction with the ripper and thus align with a plane of weakness. Partially weathered rock that is excavated by ripping may be removed in large slabs or boulders which are difficult to move and/or break into smaller pieces for use in the fill. Given the anticipated relatively small widths of the excavations on this project, this may prove difficult.

4 LIMITATIONS

The information provided are based in part on project information provided to us, and they only apply to the specific project and site discussed in this report. If the project information referenced in this report contains incorrect information or if additional information is available, you should convey the correct or additional information to us and retain us to review our information.

Regardless of the thoroughness of a geotechnical exploration, there is always a possibility that conditions between borings will be different from those at specific boring locations, and that conditions will not be as anticipated by the designers or contractors. In addition, the construction process may itself alter soil conditions. Therefore, experienced geotechnical personnel should observe and document the construction procedures used and the conditions encountered. Unanticipated conditions and inadequate procedures should be reported to the design team along with timely recommendations to solve the problems created. We are available to assist the design and construction team in providing this service based upon our familiarity with the project, the subsurface conditions, and the intent of the recommendations.

WSP prepared this report solely for the use of the intended recipient, MSD of Buncombe County, in accordance with our Proposal dated March 18, 2024. The intended recipient is solely responsible for the disclosure of any information contained in this report. The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance, or decisions. WSP does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report. This limitations statement is considered an integral part of this report.

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APPENDIX

A FIGURES

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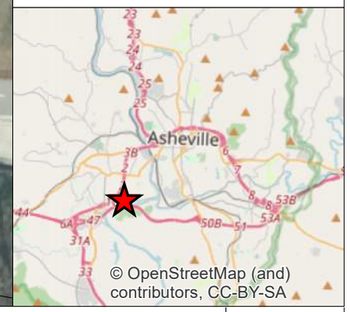
Legend

- Parcel Boundary
- Geotechnical Boring Location

N
W E
S

0 40 80 Feet



WSP USA Environment & Infrastructure Inc.
1308 Patton Ave Suite C
Asheville, NC 28806

Note: This map is for reference only.

TITLE:
SITE AND BORING LOCATION PLAN
CARRIER BRIDGE PUMP STATION REPLACEMENT
ASHEVILLE, NORTH CAROLINA

PREPARED BY: G. HUTCHINS 6/10/2024
CHECKED BY: T. QUIGLEY 6/10/2024
PROJECT NUMBER: 6252.13.0101.102
REFERENCE: NC ONEMAP
Figure No. 1

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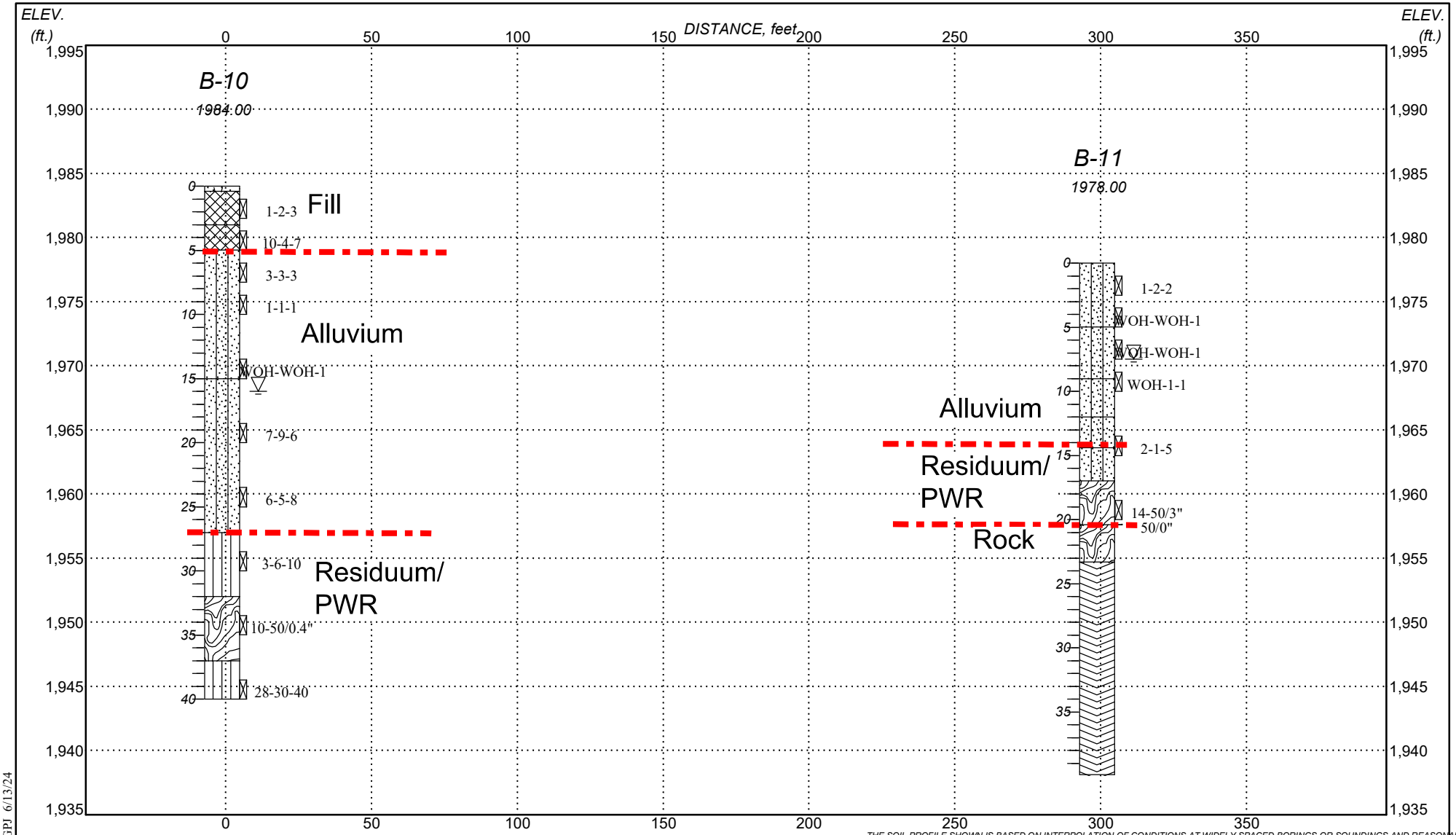
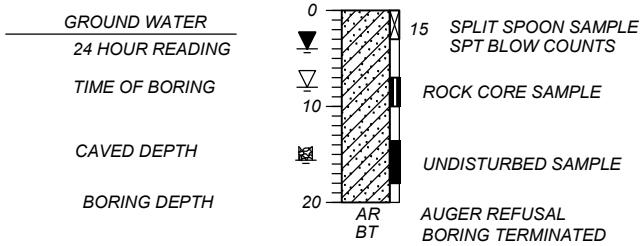


THE SOIL PROFILE SHOWN IS BASED ON INTERPOLATION OF CONDITIONS AT WIDELY SPACED BORINGS OR SOUNDINGS AND REASONABLE ENGINEERING JUDGEMENT AND IS NOT WARRANTED.

SEE KEY SHEET IN APPENDIX FOR KEY TO SYMBOLS AND DESCRIPTIONS



SUBSURFACE PROFILE

FIGURE 2

PROJECT MSD Carrier Bridge Pump Replacement

PROJECT NO. US-EI-6252130101

WSP USA Environment & Infrastructure Inc.

FENCE1 MSD BILTMORE ASHEVILLE.GPJ 6/13/24

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APPENDIX

B SOIL BORING LOGS

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MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravels, gravel - sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel - sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amount of fines)	GM	Silty gravels, gravel - sand - silt mixtures.
			GC	Clayey gravels, gravel - sand - clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 Sieve Size)	CLEAN SANDS (Little or no fines)	SW	Well graded sands, well graded sands with gravel.
			SP	Poorly graded sands, poorly graded sands with gravel.
		SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands.
			SC	Clayey sands.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)		ML	Inorganic silts, sandy or clayey silts with low plasticity.
			CL	Inorganic clays of low plasticity.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)		MH	Inorganic silts, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of high plasticity, organic silts.
CORED ROCK			RK	Rock

	Undisturbed Sample		Auger Cuttings
	Split Spoon Sample		Bulk Sample
	Rock Core		Crandall Sampler
	Dilatometer		Pressure Meter
	Packer		No Recovery
	Water Table at time of drilling		Water Table after 24 hours
	Caved Depth		WOH = Weight of Hammer

Monitoring Well Explanation

Cement | Bentonite | Sand Filter | Screen

Correlation of Penetration Resistance with Relative Density and Consistency

NON-COHESIVE		COHESIVE	
No. of Blows	Relative Density	No. of Blows	Consistency
0 - 4	Very Loose	0 - 1	Very Soft
5 - 10	Loose	2 - 4	Soft
11 - 30	Medium Dense	5 - 8	Firm
31 - 50	Dense	9 - 15	Stiff
Over 50	Very Dense	16 - 30	Very Stiff
		Over 30	Hard

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

SILT OR CLAY	SAND			GRAVEL		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

No.200 No.40 No.10 No.4 3/4" 3" 12"

U.S. STANDARD SIEVE SIZE

Reference: "Classification of Soils for Engineering Purposes" (Unified Soil Classification System) ASTM D 2487, and/or "Description and Identification of Soils" (Visual-Manual Procedure), ASTM D 2488.

KEY TO SYMBOLS AND DESCRIPTIONS

WSP USA Environment & Infrastructure Inc.

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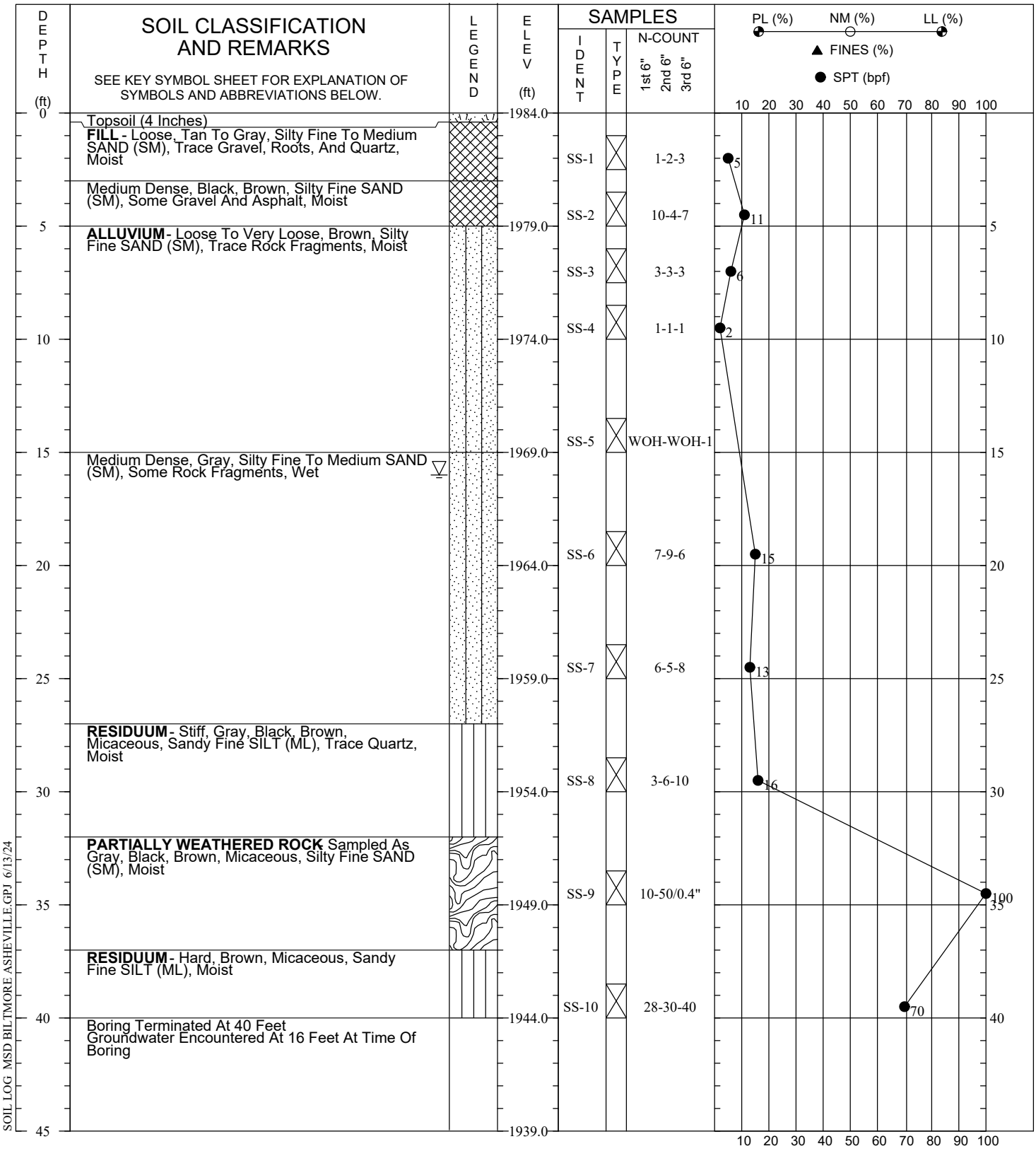


SOIL LOG MSD BILTMORE ASHEVILLE.GPJ 6/13/24

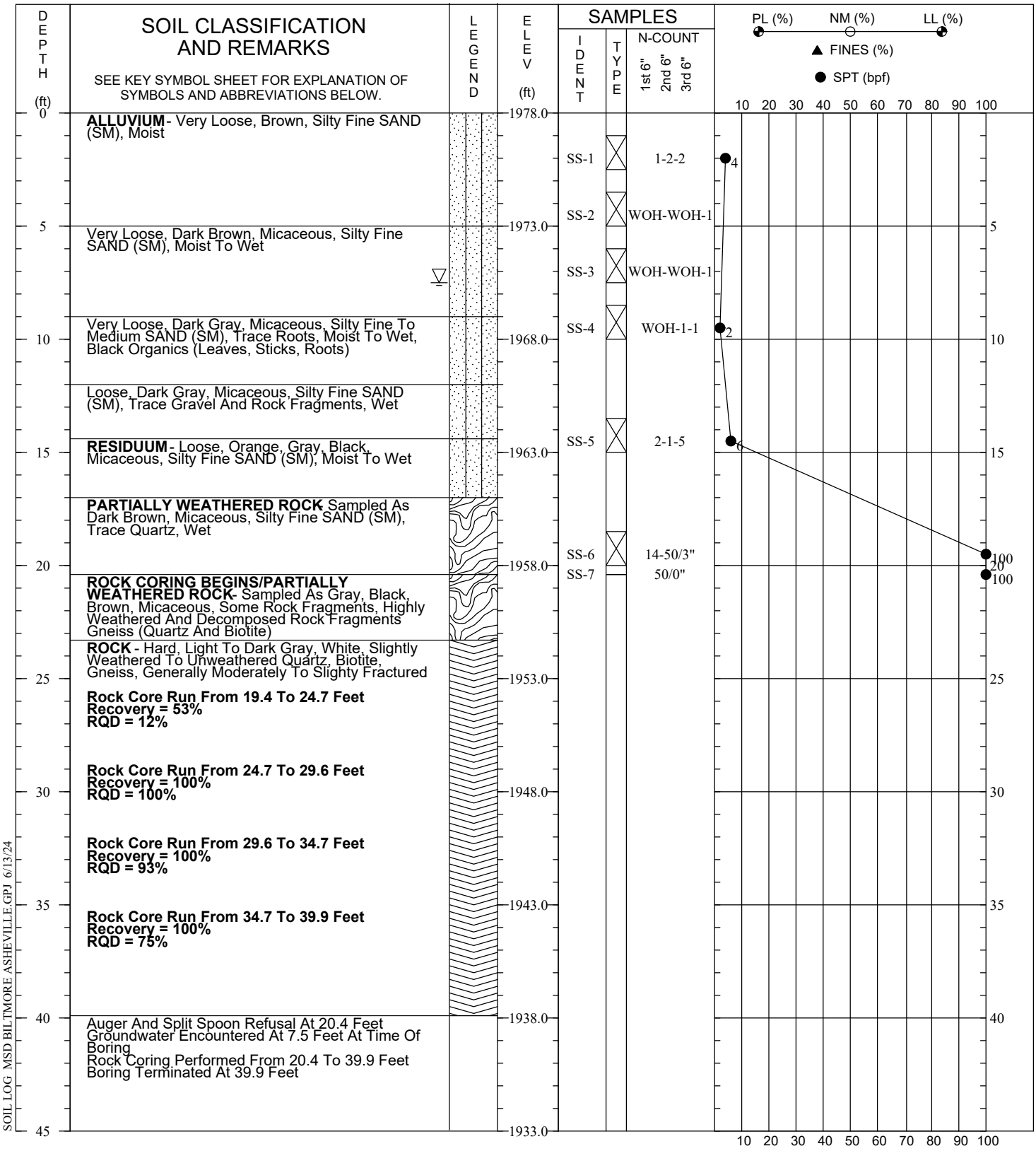
DRILLER:	IET Drilling
EQUIPMENT:	Mobile B-57
METHOD:	3.25" HSA
HOLE DIA.:	
REMARKS:	
PREPARED BY:	MNQ
CHECKED BY:	TPQ

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL TEST BORING RECORD

PROJECT: MSD Biltmore Asheville **BORING NO.:** B-10
LATITUDE:
LONGITUDE:
DRILLED: May 3, 2024
PROJ. NO.: US-EI-6252130101 **PAGE** 1 **OF** 1

wsp



SOIL LOG MSD BILTMORE ASHEVILLE.GPJ 6/13/24

DRILLER:	IET Drilling
EQUIPMENT:	Mobile B-57
METHOD:	3.25" HSA
HOLE DIA.:	
REMARKS:	
PREPARED BY:	MNQ
CHECKED BY:	TPQ

THIS RECORD IS A REASONABLE INTERPRETATION OF SUBSURFACE CONDITIONS AT THE EXPLORATION LOCATION. SUBSURFACE CONDITIONS AT OTHER LOCATIONS AND AT OTHER TIMES MAY DIFFER. INTERFACES BETWEEN STRATA ARE APPROXIMATE. TRANSITIONS BETWEEN STRATA MAY BE GRADUAL.

SOIL TEST BORING RECORD

PROJECT: MSD Biltmore Asheville **BORING NO.:** B-11
LATITUDE:
LONGITUDE:
DRILLED: May 6, 2024
PROJ. NO.: US-EI-6252130101 **PAGE** 1 **OF** 1

wsp

Boring Number: B-11. Core Depth: 19.4 to 29.6 Feet **(going left to right and top to bottom)**

Boring Number: B-11. Core Depth: 29.6 to 34.7 Feet **(going left to right and top to bottom)**

Boring Number: B-11. Core Depth: 34.7 to 39.9 feet **(going left to right and top to bottom)**

APPENDIX

C LABORATORY TEST RESULTS

WSP USA Environment & Infrastructure, Inc.
2801 Yorkmont Road, Suite 100
Charlotte, North Carolina 28208
United States
T: +704 357 8600

Report For ASTM D7012

Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying States of Stress and Temperatures
Method C

Sample ID

Project Name: MSD Carrier Bridge Pump Station
Boring ID: B-11 Sample Depth: 24.4-25.5 ft Project Number: 6252-13-0101.102
Core Run #: RC-1 Sample No: CHLT-03720
Lithologic Description: Refer to Boring Logs
Formation Name: Refer to Boring Logs
Load direction with respect to lithology? [X] vertical [ ] horizontal

Physical Attributes

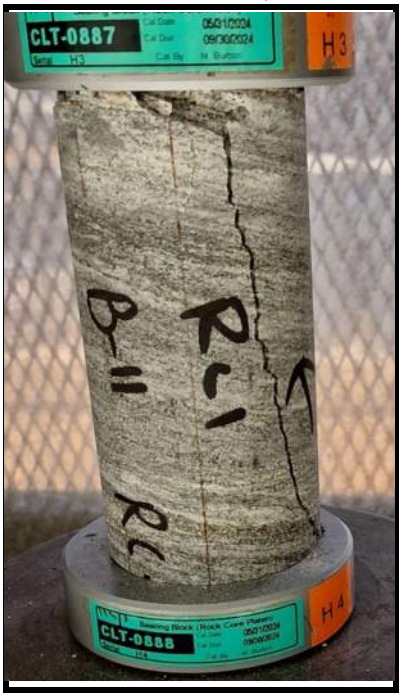
Moisture condition of specimen at the start of shear? [X] Air Dry [ ] Oven Dried [ ] Wet or Saturated
Average diameter from Dimension Log: 2.50 in Average length from Dimension Log: 5.91 in
Mass at start of shear: 1293.24 g

Conformance with Dimensional Requirements:

Side Straightness? 0.0050 in, max gap PASS
Perpendicularity? 0.0102 Max Gap / L_{avg} FAIL

	Diam-1	Diam-2	Diam-3
Maximum departure from best-fit straight line (in)	0.002	0.001	0.002
	FAIL	PASS	FAIL
	Diam-1	Diam-2	Diam-3
Maximum angular diff. between opposing best-fit lines (deg)	0.01	0.03	0.00
	PASS	PASS	PASS

Photo of Fractured Specimen



Test Apparatus & Results

Temperature: 23.7 °C Max Load: 52,285 lbs
Time to Failure: 304 sec Compressive Strength: 10,650 psi
Strain Rate: 172 lbs/sec Uniaxial Compr. Str.: 73.4 Mpa

Equipment Used	Equip ID	Calibration Date
Loading Device	CLT-0004	2/8/2025
Thermometer	CLT-1476	9/5/2024
Platens (upper)	CLT-0887	9/30/2024
Platens (lower)	CLT-0888	9/30/2024

Test Performed by: Checked by:

Name: G. Williams Name: M. Reppucci
Date: 6/6/2024 Date: 6/7/2024

Discuss any non-conformances

The maximum gap measured/Lavg is greater than 1/230 = 0.0043 in.
Flatness departs from best-fit straight line by more than 0.001 in.

WSP USA Environment & Infrastructure, Inc.
2801 Yorkmont Road, Suite 100
Charlotte, North Carolina 28208
United States
T: +704 357 8600

Report For ASTM D7012

Compressive Strength and Elastic Moduli of Intact Rock Core Specimens under Varying States of Stress and Temperatures
Method C

Sample ID

Project Name: MSD Carrier Bridge Pump Station
Boring ID: B-11 Sample Depth: 33.5-34.0 ft Project Number: 6252-13-0101.102
Core Run #: RC-2 Sample No: CHLT-03721
Lithologic Description: Refer to Boring Logs
Formation Name: Refer to Boring Logs
Load direction with respect to lithology? [X] vertical [ ] horizontal

Physical Attributes

Moisture condition of specimen at the start of shear? [X] Air Dry [ ] Oven Dried [ ] Wet or Saturated
Average diameter from Dimension Log: 2.49 in Average length from Dimension Log: 6.03 in
Mass at start of shear: 1394.27 g

Conformance with Dimensional Requirements:

Side Straightness? 0.0090 in, max gap PASS
Perpendicularity? 0.0109 Max Gap / L_{avg} FAIL

	Diam-1	Diam-2	Diam-3
Maximum departure from best-fit straight line (in)	0.007	0.005	0.007
	FAIL	FAIL	FAIL
Maximum angular diff. between opposing best-fit lines (deg)	0.19	0.00	0.03
	PASS	PASS	PASS

Photo of Fractured Specimen

Test Apparatus & Results

Temperature: 23.7 °C Max Load: 8,600 lbs
Time to Failure: 50 sec Compressive Strength: 1,770 psi
Strain Rate: 172 lbs/sec Uniaxial Compr. Str.: 12.2 Mpa

Equipment Used	Equip ID	Calibration Date
Loading Device	CLT-0004	2/8/2025
Thermometer	CLT-1476	9/5/2024
Platens (upper)	CLT-0887	9/30/2024
Platens (lower)	CLT-0888	9/30/2024

Test Performed by: Checked by:

Name: G. Williams Name: M. Reppucci
Date: 6/6/2024 Date: 6/7/2024

Discuss any non-conformances

The maximum gap measured/Lavg is greater than 1/230 = 0.0043 in.
Flatness departs from best-fit straight line by more than 0.001 in.

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Carrier Bridge Pump Station (Pipeline River Crossings)

APPENDIX B

Approved Permits

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Nationwide Permit 58
Utility Line Activities for Water and Other Substances

Effective Date: March 15, 2021 / Expiration Date: March 15, 2026

Authorities: Sections 10 and 404

Activities required for the construction, maintenance, repair, and removal of utility lines for water and other substances, excluding oil, natural gas, products derived from oil or natural gas, and electricity. Oil or natural gas pipeline activities or electric utility line and telecommunications activities may be authorized by NWPs 12 or 57, respectively. This NWP also authorizes associated utility line facilities in waters of the United States, provided the activity does not result in the loss of greater than 1/2-acre of waters of the United States for each single and complete project.

Utility lines: This NWP authorizes discharges of dredged or fill material into waters of the United States and structures or work in navigable waters for crossings of those waters associated with the construction, maintenance, or repair of utility lines for water and other substances, including outfall and intake structures. There must be no change in pre-construction contours of waters of the United States. A "utility line" is defined as any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose that is not oil, natural gas, or petrochemicals. Examples of activities authorized by this NWP include utility lines that convey water, sewage, stormwater, wastewater, brine, irrigation water, and industrial products that are not petrochemicals. The term "utility line" does not include activities that drain a water of the United States, such as drainage tile or french drains, but it does apply to pipes conveying drainage from another area.

Material resulting from trench excavation may be temporarily sidecast into waters of the United States for no more than three months, provided the material is not placed in such a manner that it is dispersed by currents or other forces. The district engineer may extend the period of temporary side casting for no more than a total of 180 days, where appropriate. In wetlands, the top 6 to 12 inches of the trench should normally be backfilled with topsoil from the trench. The trench cannot be constructed or backfilled in such a manner as to drain waters of the United States (e.g., backfilling with extensive gravel layers, creating a french drain effect). Any exposed slopes and stream banks must be stabilized immediately upon completion of the utility line crossing of each waterbody.

Utility line substations: This NWP authorizes the construction, maintenance, or expansion of substation facilities associated with a utility line in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not result in the loss of greater than 1/2-acre of waters of the United States. This NWP does not authorize discharges of dredged or fill material into non-tidal wetlands adjacent to tidal waters of the United States to construct, maintain, or expand substation facilities.

Foundations for above-ground utility lines: This NWP authorizes the construction or maintenance of foundations for above-ground utility lines in all waters of the United States, provided the foundations are the minimum size necessary.

Access roads: This NWP authorizes the construction of access roads for the construction and maintenance of utility lines, including utility line substations, in non-tidal waters of the United States, provided the activity, in combination with all other activities included in one single and complete project, does not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges of dredged or fill material into non-tidal wetlands adjacent to tidal waters for access roads. Access roads must be the minimum width necessary (see Note 2, below). Access roads must be constructed so that the length of the road minimizes any adverse effects on waters of the United States and must be as near as possible to pre-construction contours and elevations (e.g., at grade corduroy roads or geotextile/gravel roads). Access roads constructed above pre-construction contours and elevations in waters of the United States must be properly bridged or culverted to maintain surface flows.

This NWP may authorize utility lines in or affecting navigable waters of the United States even if there is no associated discharge of dredged or fill material (see 33 CFR part 322). Overhead utility lines constructed over section 10 waters and utility lines that are routed in or under section 10 waters without a discharge of dredged or fill material require a section 10 permit.

This NWP authorizes, to the extent that Department of the Army authorization is required, temporary structures, fills, and work necessary for the remediation of inadvertent returns of drilling fluids to waters of the United States through sub-soil fissures or fractures that might occur during horizontal directional drilling activities conducted for the purpose of installing or replacing utility lines. These remediation activities must be done as soon as practicable, to restore the affected waterbody. District engineers may add special conditions to this NWP to require a remediation plan for addressing inadvertent returns of drilling fluids to waters of the United States during horizontal directional drilling activities conducted for the purpose of installing or replacing utility lines.

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

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) a section 10 permit is required; or (2) the discharge will result in the loss of greater than 1/10-acre of waters of the United States. (See general condition 32.) (Authorities: Sections 10 and 404)

Note 1: Where the utility line is constructed, installed, or maintained in navigable waters of the United States (i.e., section 10 waters) within the coastal United States, the Great Lakes, and United States territories, a copy of the NWP verification will be sent by the Corps to the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), for charting the utility line to protect navigation.

Note 2: For utility line activities crossing a single waterbody more than one time at separate and distant locations, or multiple waterbodies at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. Utility line activities must comply with 33 CFR 330.6(d).

Note 3: Access roads used for both construction and maintenance may be authorized, provided they meet the terms and conditions of this NWP. Access roads used solely for construction of the utility line must be removed upon completion of the work, in accordance with the requirements for temporary fills.

Note 4: Pipes or pipelines used to transport gaseous, liquid, liquescent, or slurry substances over navigable waters of the United States are considered to be bridges, not utility lines, and may require a permit from the U.S. Coast Guard pursuant to the General Bridge Act of 1946. However, any discharges of dredged or fill material into waters of the United States associated with such pipelines will require a section 404 permit (see NWP 15).

Note 5: This NWP authorizes utility line maintenance and repair activities that do not qualify for the Clean Water Act section 404(f) exemption for maintenance of currently serviceable fills or fill structures.

Note 6: For activities that require pre-construction notification, the PCN must include any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings that require Department of the Army authorization but do not require pre-construction notification (see paragraph (b)(4) of general condition 32). The district engineer will evaluate the PCN in accordance with Section D, "District Engineer's Decision." The district engineer may require mitigation to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see general condition 23).

GENERAL CONDITIONS

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific

conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. **Navigation.** (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his or her authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. **Aquatic Life Movements.** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. **Spawning Areas.** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. **Migratory Bird Breeding Areas.** Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. **Shellfish Beds.** No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. **Suitable Material.** No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. **Water Supply Intakes.** No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

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

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

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

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

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

13. **Removal of Temporary Structures and Fills.** Temporary structures must be removed, to the maximum extent practicable, after their use has been discontinued. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

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

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

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

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

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

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

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

section 7 regarding "activities that are reasonably certain to occur" and "consequences caused by the proposed action."

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

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

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

(e) Authorization of an activity by an NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where

"take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

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

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

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

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

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)(1)). If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate

documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

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

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

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

21. **Discovery of Previously Unknown Remains and Artifacts.** Permittees that discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by an NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

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

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

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

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

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

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

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

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

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. If restoring riparian areas involves planting vegetation, only native species should be planted. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address

documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

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

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

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

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

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)). If permittee-responsible mitigation is the proposed option, and the proposed compensatory mitigation site is located on land in which another federal agency holds an easement, the district engineer will coordinate with that federal agency to determine if proposed compensatory mitigation project is compatible with the terms of the easement.

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

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

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

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

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

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

25. **Water Quality.** (a) Where the certifying authority (state, authorized tribe, or EPA, as appropriate) has not previously certified compliance of an NWP with CWA section 401,

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

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

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

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

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

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

(a) If only one of the NWPs used to authorize the single and complete project has a specified acreage limit, the acreage loss of waters of the United States cannot exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.

(b) If one or more of the NWPs used to authorize the single and complete project has specified acreage limits, the acreage loss of waters of the United States authorized by those NWPs cannot exceed their respective specified acreage limits. For example, if a commercial development is constructed under NWP 39, and the single and complete project includes the filling of an upland ditch authorized by NWP 46, the maximum acreage loss of waters of the United States for the commercial development under NWP 39 cannot exceed 1/2-acre, and the total acreage loss of waters of United States due to the NWP 39 and 46 activities cannot exceed 1 acre.

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

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

_____
(Transferee)

_____
(Date)

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

(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the

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

(c) The signature of the permittee certifying the completion of the activity and mitigation.

The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

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

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

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33

CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

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

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity;

(3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4) (i) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures.

(ii) For linear projects where one or more single and complete crossings require pre-construction notification, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters (including those single and complete crossings authorized by an NWP but do not require PCNs). This information will be used by the district engineer to evaluate the cumulative adverse environmental effects of the proposed linear project, and does not change those non-PCN NWP activities into NWP PCNs.

(iii) Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided

results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial and intermittent streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45-day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-federal permittees, if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat (or critical habitat proposed for such designation), the PCN must include the name(s) of those endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the “study river” (see general condition 16); and

(10) For an NWP activity that requires permission from, or review by, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from, or review by, the Corps office having jurisdiction over that USACE project.

(c) *Form of Pre-Construction Notification*: The nationwide permit pre-construction notification form (Form ENG 6082) should be used for NWP PCNs. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) *Agency Coordination*: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iii) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or e-mail that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure that the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will

consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

District Engineer's Decision

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the single and complete crossings of waters of the United States that require PCNs to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings of waters of the United States authorized by an NWP. If an applicant requests a waiver of an applicable limit, as provided for in NWPs 13, 36, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by an NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district

engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters. The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure that the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) that the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant

submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation.

Further Information

1. District engineers have authority to determine if an activity complies with the terms and conditions of an NWP.

2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.

3. NWPs do not grant any property rights or exclusive privileges.

4. NWPs do not authorize any injury to the property or rights of others.

5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects: Effects that are caused by the activity and occur at the same time and place.

Discharge: The term “discharge” means any discharge of dredged or fill material into waters of the United States.

Ecological reference: A model used to plan and design an aquatic habitat and riparian area restoration, enhancement, or establishment activity under NWP 27. An ecological reference may be based on the structure, functions, and dynamics of an aquatic habitat

type or a riparian area type that currently exists in the region where the proposed NWP 27 activity is located. Alternatively, an ecological reference may be based on a conceptual model for the aquatic habitat type or riparian area type to be restored, enhanced, or established as a result of the proposed NWP 27 activity. An ecological reference takes into account the range of variation of the aquatic habitat type or riparian area type in the region.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

High Tide Line: The line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete non-linear project in the Corps Regulatory Program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Indirect effects: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. The loss of stream bed includes the acres of stream bed that are permanently adversely affected by filling or excavation because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters or wetlands for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities that do not require Department of the Army authorization, such as activities eligible for exemptions under section 404(f) of the Clean Water Act, are not considered when calculating the loss of waters of the United States.

Navigable waters: Waters subject to section 10 of the Rivers and Harbors Act of 1899. These waters are defined at 33 CFR part 329.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of flowing or standing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of “open waters” include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Perennial stream: A perennial stream has surface water flowing continuously year-round during a typical year.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request

may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands next to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate

may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term "single and complete project" is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of "independent utility"). Single and complete non-linear projects may not be "piecemealed" to avoid the limits in an NWP authorization.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized jurisdictional stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef,

permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line.

Tribal lands: Any lands title to which is either: 1) held in trust by the United States for the benefit of any Indian tribe or individual; or 2) held by any Indian tribe or individual subject to restrictions by the United States against alienation.

Tribal rights: Those rights legally accruing to a tribe or tribes by virtue of inherent sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, executive order or agreement, and that give rise to legally enforceable remedies.

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWPs, a waterbody is a "water of the United States." If a wetland is adjacent to a waterbody determined to be a water of the United States, that waterbody and any adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)).

REGIONAL CONDITIONS:

The following Regional Conditions have been approved by the Wilmington District for the Nationwide Permits (NWPs) published in the January 13, 2021, *Federal Register* (86 FR 2744) announcing the reissuance of 12 existing (NWPs) and four new NWPs, as well as the reissuance of NWP general conditions and definitions with some modifications.

A. EXCLUDED WATERS AND/OR AREAS

The Corps has identified waters that will be excluded from the use of all NWP's during certain timeframes. These waters are:

1. **Anadromous Fish Spawning Areas.** Work in waters of the U.S. designated by either the North Carolina Division of Marine Fisheries (NCDMF) or the North Carolina Wildlife Resources Commission (NCWRC) as anadromous fish spawning areas are prohibited from February 15th through June 30th, without prior written approval from the Corps and the appropriate wildlife agencies (NCDMF, NCWRC and/or the National

Marine Fisheries Service (NMFS)). Work in waters of the U.S. designated by NCWRC as primary nursery areas in inland waters are prohibited from February 15th through September 30th, without prior written approval from the Corps and the appropriate wildlife agencies. Work in waters of the U.S. designated by NCDMF as primary nursery areas shall be coordinated with NCDMF prior to being authorized by this NWP. Coordination with NCDMF may result in a required construction moratorium during periods of significant biological productivity or critical life stages.

2. **Trout Waters Moratorium.** Work in waters of the U.S. in the designated trout watersheds of North Carolina are prohibited from October 15th through April 15th without prior written approval from the NCWRC, or from the Eastern Band of Cherokee Indians (EBCI) Fisheries and Wildlife Management (FWM) office if the project is located on EBCI trust land. (See Section C.3. above for information on the designated trout watersheds).

3. **Sturgeon Spawning Areas.** No in-water work shall be conducted in waters of the U.S. designated by the National Marine Fisheries Service as Atlantic sturgeon critical habitat from February 1st through June 30th. No in-water work shall be conducted in waters of the U.S. in the Roanoke River designated as Atlantic sturgeon critical habitat from February 1st through June 30th, and August 1st through October 31st, without prior written approval from NMFS.

4. **Submerged Aquatic Vegetation.** Impacts to Submerged Aquatic Vegetation (SAV) are not authorized by any NWP, except NWP 48, NWP 55 and NWP 56, unless Essential Fish Habitat (EFH) consultation has been completed pursuant to the Magnuson-Stevens Fisheries Conservation and Management Act (Magnuson-Stevens Act). Permittees shall submit a PCN (See NWP General Condition 32) to the District Engineer prior to commencing the activity if the project would affect SAV. The permittee may not begin work until notified by the Corps that the requirements of the Magnuson-Stevens Act have been satisfied and that the activity is verified.

B. REGIONAL CONDITIONS APPLICABLE TO ALL NWP's

1. **Critical Habitat in Western NC.** For proposed activities within waters of the U.S. that require a Pre-Construction Notification (PCN) and are located in the thirteen counties listed below, permittees must provide a copy of the PCN to the U.S. Fish and Wildlife Service (USFWS), 160 Zillicoa Street, Asheville, North Carolina 28801 and the Corps Asheville Regulatory Field Office. Please see General Condition 18 for specific PCN requirements related to the Endangered Species Act and the below website for information on the location of designated critical habitat.

Counties with tributaries that drain to designated critical habitat that require notification to the Asheville U.S. Fish and Wildlife Service: Avery, Cherokee, Graham, Haywood, Henderson, Jackson, Macon, Mecklenburg, Mitchell, Swain, Transylvania, Union and Yancey.

Website and office addresses for Endangered Species Act Information:

The Wilmington District has developed the following website for permittees which provides guidelines on how to review linked websites and maps in order to fulfill NWP General Condition 18 (Endangered Species) requirements: http://www.saw.usace.army.mil/Missions/RegulatoryPermitProgram/AgencyCoordination/ESA.aspx.

Permittees who do not have internet access may contact the appropriate U.S. Fish and Wildlife Service offices listed below or Corps at (910) 251-4850.

Below is a map of the USFWS Field Office Boundaries:

Asheville U.S. Fish and Wildlife Service Office counties: All counties west of and including Anson, Stanly, Davidson, Forsythe and Stokes Counties.

U.S. Fish and Wildlife Service
Asheville Field Office
160 Zillicoa Street
Asheville, NC 28801
Telephone: (828) 258-3939

Raleigh U.S. Fish and Wildlife Service Office counties: All counties east of and including Richmond, Montgomery, Randolph, Guilford, and Rockingham Counties.

U.S. Fish and Wildlife Service
Raleigh Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
Telephone: (919) 856-4520

2. **Special Designation Waters.** Prior to the use of any NWP that involves a discharge of dredged or fill material in any of the following identified waters and/or adjacent wetlands in North Carolina, permittees shall submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32). The North Carolina waters and wetlands that require additional PCN requirements are:

"Primary Nursery Areas" (PNA), including inland PNA, as designated by the North Carolina Marine Fisheries Commission and/or the North Carolina Wildlife Resources Commission. The definition of and designated PNA waters can be found in the North Carolina State Administrative Code at Title 15A, Subchapters 3R and 10C (15A NCAC 03R .0103; 15A NCAC 10C .0502; and 15A NCAC 10C .0503) and at the following web pages:

- http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2003%20-%20marine%20fisheries/subchapter%20r/15a%20ncac%2003r%20.0103.pdf

- http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2010%20-%20wildlife%20resources%20and%20water%20safety/subchapter%20c/15a%20ncac%2010c%20.0502.pdf

- http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2010%20-%20wildlife%20resources%20and%20water%20safety/subchapter%20c/15a%20ncac%2010c%20.0503.pdf

3. **Trout Waters.** Prior to any discharge of dredge or fill material into streams, waterbodies or wetlands within the 294 designated trout watersheds of North Carolina, the permittee shall submit a PCN (see General Condition 32) to the District Engineer prior to commencing the activity. The permittee shall also provide a copy of the PCN to the appropriate NCWRC office, or to the EBCI FWM Office (if the project is located on EBCI trust land), to facilitate the determination of any potential impacts to designated Trout Waters.

NCWRC and NC Trout Watersheds:

NCWRC Contact**	**Counties that are entirely within Trout Watersheds***		**Counties that are partially within Trout Watersheds***	
Mountain Coordinator 645 Fish Hatchery Rd., Building B Marion, NC 28752 828-803-6054 For NCDOT Projects: NCDOT Coordinator 12275 Swift Rd. Oakboro, NC 28129 704-984-1070	Alleghany Ashe Avery Graham Haywood	Jackson Macon Swain Transylvania Watauga	Burke Buncombe Caldwell Cherokee Clay Henderson Madison	McDowell Mitchell Polk Rutherford Surry Wilkes Yancey
EBCI Contact**	**Counties that are within Trout Watersheds***			
Office of Natural Resources P.O. Box 1747, Cherokee, NC 28719 (828) 359-6113	Qualla Boundary and non-contiguous tracts of trust land located in portions of Swain, Jackson, Haywood, Graham and Cherokee Counties.			

*NOTE: To determine PCN requirements, contact the Corps Asheville Regulatory Field Office at (828) 271-7980 or view maps showing trout watersheds in each County at the following webpage: http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Trout/.

**If a project is located on EBCI trust land, submit the PCN in accordance with Regional Condition C.16. Contact the Corps Asheville Regulatory Field Office at (828) 271-7980 with questions.

4. **Western NC Waters and Corridors.** The permittee shall submit a PCN (see General Condition 32) to the District Engineer prior to commencing the activity in waters of the U.S. if the activity will occur within any of the following identified waters in western North Carolina, within 0.5 mile on either side of these waters, or within 0.75 mile of the Little Tennessee River, as measured from the top of the bank of the respective water (i.e., river, stream, or creek):

Brasstown Creek
Burningtown Creek
Cane River
Caney Fork
Cartoogechaye Creek
Chattooga River
Cheoah River
Cowee Creek
Cullasaja River
Deep Creek
Ellijay Creek
French Broad River
Garden Creek
Hiwassee River
Hominy Creek
Iotla Creek
Little Tennessee River (within the river or within 0.75 mile on either side of this river)
Nantahala River
Nolichucky River
North Fork French Broad River
North Toe River
Nottley River
Oconaluftee River (portion not located on trust/EBCI land)
Peachtree Creek
Shooting Creek
Snowbird Creek
South Toe River
Stecoah Creek
Swannanoa River
Sweetwater Creek
Tuckasegee River (also spelled Tuckaseegee or Tuckaseigee)
Valley River
Watauga Creek
Watauga River
Wayah Creek

West Fork French Broad River

To determine PCN requirements, contact the Corps Asheville Regulatory Field Office at (828) 271-7980 or view maps for all corridors at the following webpage: http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Designated-Special-Waters.aspx .

5. **Limitation of Loss of Stream Bed.** NWPs may not be used for activities that may result in the loss of more than 0.05 acres of stream bed, except for NWP 32.

6. **Pre-Construction Notification for Loss of Stream Bed Exceeding 0.02 acres.** The permittee shall submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32) prior to the use of any NWP for any activity that results in the loss of more than 0.02 acres of stream bed. This applies to NWPs that do not have PCN requirements as well as those NWPs that require a PCN.

7. **Mitigation for Loss of Stream Bed.** For any NWP that results in a loss of more than 0.02 acres of stream bed, the permittee shall provide a mitigation proposal to compensate for more than minimal individual and cumulative adverse impacts to the aquatic environment, unless the District Engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal. For stream bed losses of 0.02 acres or less that require a PCN, the District Engineer may determine, on a case-by-case basis, that compensatory mitigation is required to ensure that the activity results in minimal adverse effect on the aquatic environment.

8**. Riprap.** For all NWPs that allow for the use of riprap material for bank stabilization, the following conditions shall be applied:

a. Filter cloth must be placed underneath the riprap as an additional requirement of its use in North Carolina waters. The placement of filter fabric is not required if the riprap will be pushed or “keyed” into the bank of the waterbody. A waiver from the specifications in this Regional Condition must be requested in writing.

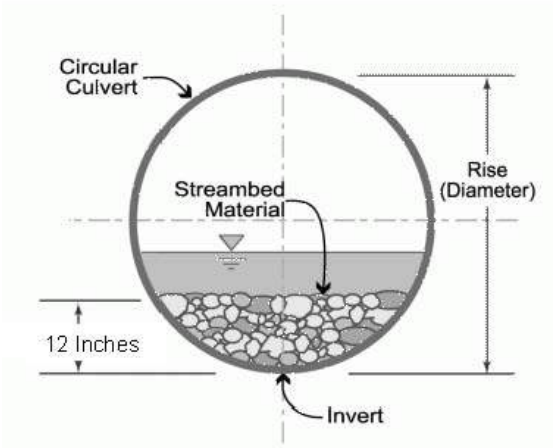
b. Riprap shall be placed only on the stream banks, or, if it is necessary to be placed in the stream bed, the finished top elevation of the riprap should not exceed that of the original stream bed.

9**. Culvert Placement.** For all NWPs that allow for culvert placement, the following conditions shall be applied:

a. For all NWPs that involve the construction/installation of culverts, measures shall be included in the construction/installation that will promote the safe passage of fish and other aquatic organisms

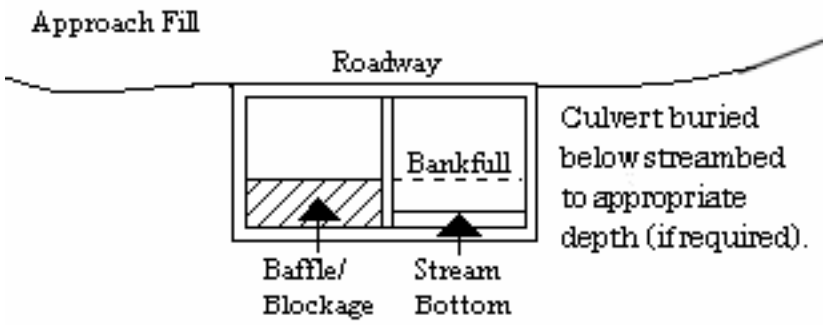
Placement of culverts and other structures in streams shall be below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20% of the culvert diameter for culverts having a diameter less than or equal to 48 inches. If the culvert outlet is submerged within a pool or scour hole and designed to provide for aquatic passage, then culvert burial into the streambed is not required.
Culvert burial is not required for structures less than 72 inch diameter/width, where the slope of the culvert will be greater than 2.5%, provided that all alternative options for flattening the slope have been investigated and aquatic life movement/connectivity has been provided when possible (e.g., rock ladders, cross vanes, sills, baffles etc.). Culvert burial is not required when bedrock is present in culvert locations.

Installation of culverts in wetlands shall ensure continuity of water movement and be designed to adequately accommodate high water or flood conditions. When roadways, causeways, or other fill projects are constructed across FEMA-designated floodways or wetlands, openings such as culverts or bridges shall be provided to maintain the natural hydrology of the system as well as prevent constriction of the floodway that may result in destabilization of streams or wetlands.



A waiver from the depth specifications in this condition may be requested, in writing, by the permittee and issued by the Corp. This waiver request must be specific as to the reasons(s) for the request. The waiver will be issued if it can be demonstrated that the proposed design would result in less impacts to the aquatic environment. Culverts placed across wetland fills purely for the purposes of equalizing surface water do not have to be buried, but the culverts must be of adequate size and/or number to ensure unrestricted transmission of water.

b. Bank-full flows (or less) shall be accommodated through maintenance of the existing bank-full channel cross sectional area. Additional culverts or culvert barrels at such crossings shall be allowed only to receive bank-full flows.



c. Culverts shall be designed and installed in such a manner that the original stream profiles are not altered and allow for aquatic life movement during low flows. The dimension, pattern, and profile of the stream above and below a pipe or culvert shall not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed culvert shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. If the width of the culvert is wider than the stream channel, the culvert shall include multiple boxes/pipes, baffles, benches and/or sills to maintain the natural width of the stream channel. If multiple culverts/pipes/barrels are used, low flows shall be accommodated in one culvert/pipe and additional culverts/pipes shall be installed such that they receive only flows above bankfull.

10. **Utility Lines.** For all NWPs that allow for the construction and installation of utility lines, the following conditions shall be applied:

a. Utility lines consisting of aerial electric power transmission lines crossing navigable waters of the U.S. (which are defined at 33 CFR part 329) must comply with the applicable minimum clearances specified in 33 CFR 322.5(i).

b. The work area authorized by this permit, including temporary and/or permanent fills, will be minimized to the greatest extent practicable. Justification for work corridors exceeding forty (40) feet in width is required and will be based on pipeline diameter and length, size of equipment required to construct the utility line, and other construction information deemed necessary to support the request. The permittee is required to provide this information to the Corps with the initial PCN package.

c. A plan to restore and re-vegetate wetland areas cleared for construction must be submitted with the required PCN. Cleared wetland areas shall be re-vegetated, as appropriate, with species of canopy, shrub, and herbaceous species. The permittee shall not use fescue grass or any other species identified as invasive or exotic species by the NC Native Plant Society (NCNPS): https://ncwildflower.org/invasive-exotic-species-list/.

d. Any permanently maintained corridor along the utility right of way within forested wetlands shall be considered a loss of aquatic function. A compensatory mitigation plan will be required for all such impacts associated with the requested activity if the activity requires a PCN and the cumulative total of permanent conversion of forested wetlands

exceeds 0.1 acres, unless the District Engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal.

Where permanently maintained corridor within forested wetlands is 0.1 acres or less, the District Engineer may determine, on a case-by-case basis, that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment.

e. When directional boring or horizontal directional drilling (HDD) under waters of the U.S., including wetlands, permittees shall closely monitor the project for hydraulic fracturing or "fracking." Any discharge from hydraulic fracturing or "fracking" into waters of the U.S., including wetlands, shall be reported to the appropriate Corps Regulatory Field Office within 48 hours. Restoration and/or compensatory mitigation may be required as a result of any unintended discharges.

11. **Temporary Access Fills.** The permittee shall submit a PCN to the District Engineer prior to commencing the activity if the activity will involve the discharge of dredged or fill material into more than 0.1 acres of wetlands or 0.02 acres of stream channel for the construction of temporary access fills and/or temporary road crossings. The PCN must include a restoration plan that thoroughly describes how all temporary fills will be removed, how pre-project conditions will be restored, and include a timetable for all restoration activities.

12. **Federal Navigation Channel Setbacks.** Authorized structures and fills located in or adjacent to Federally authorized waterways must be constructed in accordance with the latest setback criteria established by the Wilmington District Engineer. You may review the setback policy at http://www.saw.usace.army.mil/Missions/Navigation/Setbacks.aspx. This general permit does not authorize the construction of hardened or permanently fixed structures within the Federally Authorized Channel Setback, unless the activity is approved by the Corps. The permittee shall submit a PCN (see General Condition 32) to the District Engineer to obtain a written verification prior to the construction of any structures or fills within the Federally Authorized Channel Setback.

13. **Northern Long-eared Bat – Endangered Species Act Compliance**

The Wilmington District, U.S. Army Corps of Engineers has consulted with the United States Fish and Wildlife Service (USFWS) in regard to the threatened Northern long-eared bat (NLEB) (*Myotis septentrionalis*) and Standard Local Operating Procedures for Endangered Species (SLOPES) have been approved by the Corps and the USFWS. This condition concerns effects to the NLEB only and does not address effects to other federally listed species and/or federally designated critical habitat.

A. Procedures when the Corps is the lead federal* agency for a project:

The permittee must comply with (1) and (2) below when:

• the project is located in the western 41 counties of North Carolina, to include non-federal aid North Carolina Department of Transportation (NCDOT) projects, OR;
• the project is located in the 59 eastern counties of North Carolina and is a non-NCDOT project.

*Generally, if a project is located on private property or on non-federal land, and the project is not being funded by a federal entity, the Corps will be the lead federal agency due to the requirement to obtain Department of the Army authorization to impact waters of the U.S. If the project is located on federal land, contact the Corps to determine the lead federal agency.

(1) A permittee using an NWP must check to see if their project is located in the range of the NLEB by using the following website: http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf. If the project is within the range of the NLEB, or if the project includes percussive activities (e.g., blasting, pile driving, etc.), the permittee is then required to check the appropriate website in the paragraph below to discover if their project:

• is located in a 12-digit Hydrologic Unit Code area ("red HUC" - shown as red areas on the map), AND/OR;
• involves percussive activities within 0.25 mile of a red HUC.

Red HUC maps - for the western 41 counties in NC (covered by the Asheville Ecological Services Field Office), check the project location against the electronic maps found at: http://www.fws.gov/asheville/htmls/project_review/NLEB_in_WNC.html. For the eastern 59 counties in NC (covered by the Raleigh Ecological Services Field Office), check the project location against the electronic maps found at: https://www.fws.gov/raleigh/NLEB_RFO.html.

(2) A permittee must submit a PCN to the District Engineer, and receive written verification from the District Engineer, prior to commencing the activity, if the activity will involve any of the following:

• tree clearing/removal and/or, construction/installation of wind turbines in a red HUC, AND/OR;
• bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, (applies anywhere in the range of the NLEB), AND/OR:
• percussive activities in a red HUC, or within 0.25 mile of a red HUC.

The permittee may proceed with the activity without submitting a PCN to either the Corps or the USFWS, provided the activity complies with all applicable NWP terms and

general and regional conditions, if the permittee's review under A.(1) and A.(2) above shows that the project is:

- located outside of a red HUC (and there are no percussive activities), and the activity will NOT include bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, OR;
- located outside of a red HUC and there are percussive activities, but the percussive activities will not occur within 0.25-mile of a red HUC boundary, and the activity will NOT include bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, OR;
- located in a red HUC, but the activity will NOT include tree clearing/removal; construction/installation of wind turbines; bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, and/or; any percussive activities.

B. Procedures when the USACE is not the lead federal agency:

For projects where another federal agency is the lead federal agency - if that other federal agency has completed project-specific ESA Section 7(a)(2) consultation for the NLEB, and has (1) determined that the project would not cause prohibited incidental take of the NLEB, and (2) completed coordination/consultation that is required by the USFWS (per the directions on the respective USFWS office's website), that project may proceed without PCN to either the USACE or the USFWS, provided all General and Regional Permit Conditions are met.

The NLEB SLOPES can be viewed on the USACE website at: http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/ESA/. Permittees who do not have internet access may contact the USACE at (910) 251- 4633.

14. **West Indian Manatee Protection.** In order to protect the endangered West Indian manatee (*Trichechus manatus*) the Permittee shall implement the USFWS' Manatee Guidelines, and strictly adhere to all requirements therein. The guidelines can be found at https://www.fws.gov/raleigh/pdfs/ManateeGuidelines2017.pdf.

15. **ESA Programmatic Biological Opinions.** The Wilmington District, USFWS, NCDOT, and the FHWA have conducted programmatic Section 7(a)(2) consultation for a number of federally listed species and designated critical habitat (DCH), and programmatic consultation concerning other federally listed species and/or DCH may occur in the future. The result of completed programmatic consultation is a Programmatic Biological Opinion (PBO) issued by the USFWS. These PBOs contain mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" of whichever species or critical habitat is covered by a specific PBO. Authorization under NWPs is conditional upon the permittee's compliance with all the mandatory terms and conditions associated with incidental take of the applicable PBO (or PBOs), which are incorporated by reference in

the NWPs. Failure to comply with the terms and conditions associated with incidental take of an applicable PBO, where a take of the federally listed species occurs, would constitute an unauthorized take by the permittee, and would also constitute permittee non-compliance with the authorization under the NWPs. If the terms and conditions of a specific PBO (or PBOs) apply to a project, the Corps will include this/these requirements in any NWP verification that may be issued for a project. For an activity/project that does not require a PCN, the terms and conditions of the applicable PBO(s) also apply to that non-notifying activity/project. The USFWS is the appropriate authority to determine compliance with the terms and conditions of its PBO and the ESA. All PBOs can be found on our website at: https://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/ESA/.

16. **Work on Eastern Band of Cherokee Land.**

Notifying NWPs - All PCNs submitted for activities in waters of the U.S. on Eastern Band of Cherokee Indians (EBCI) trust land (i.e., Qualla Boundary and non-contiguous tracts of trust land located in portions of Swain, Jackson, Haywood, Graham and Cherokee Counties), must comply with the requirements of the latest MOU between the Wilmington District and the EBCI.

Non-notifying NWPs - Prior to the use of any non-notifying NWP for activities in waters of the U.S. on EBCI trust land (i.e., Qualla Boundary and non-contiguous tracts of trust land located in portions of Swain, Jackson, Haywood, Graham and Cherokee Counties), all prospective permittees must comply with the requirements of the latest MOU between the Wilmington District and the EBCI; this includes coordinating the proposed project with the EBCI Natural Resources Program and obtaining a Tribal Approval Letter from the Tribe.

The EBCI MOU can be found at the following URL: http://saw-reg.usace.army.mil/FO/Final-MOU-EBCI-USACE.pdf

17. **Sedimentation and Erosion Control Structures and Measures**
All PCNs will identify and describe sedimentation and erosion control structures and measures proposed for placement in waters of the U.S. The structures and measures should be depicted on maps, surveys or drawings showing location and impacts to jurisdictional wetlands and streams.

C. SECTION 401 WATER QUALITY CERTIFICATION (WQC) AND/OR COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION SUMMARY AND APPLICABLE CONDITIONS

The CZMA Consistency Determination and all Water Quality Certifications for the NWPs can be found at: https://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Permits/2017-Nationwide-Permits/

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
RICHARD E. ROGERS, JR.
Director

NORTH CAROLINA
Environmental Quality

SENT VIA ELECTRONIC MAIL ONLY: NO HARD COPY WILL BE MAILED.

July 24, 2023

DWR #20230477
Buncombe County

Metropolitan Sewerage District of Buncombe County
Attn: Darin Prosser
510 Riverview Drive
Asheville, NC 28806
Email: dprosser@msdbc.org

Subject: Approval of Individual 401 Water Quality Certification
Carrier Bridge Pump Station Replacement Project
USACE Action ID No. SAW-2021-01395

Dear Mr. Prosser:

Attached hereto is a copy of Certification No. 6121 issued to Darin Prosser and Metropolitan Sewerage District of Buncombe County dated July 24, 2023. This approval is for the purpose and design described in your application. The plans and specifications for this project are incorporated by reference as part of this Water Quality Certification. If you change your project, you must notify the Division and you may be required to submit a new application package with the appropriate fee. If the property is sold, the new owner must be given a copy of this Certification and is responsible for complying with all conditions. [15A NCAC 02H .0507(d)(2)].

This Water Quality Certification does not relieve the permittee of the responsibility to obtain all other required Federal, State, or Local approvals before proceeding with the project, including those required by, but not limited to, Sediment and Erosion Control, Non-Discharge, Water Supply Watershed, and Trout Buffer regulations.

This Water Quality Certification neither grants nor affirms any property right, license, or privilege in any lands or waters, or any right of use in any waters. This Water Quality Certification does not authorize any person to interfere with the riparian rights, littoral rights, or water use rights of any other person and does not create any prescriptive right or any right of priority regarding any usage of water. This Water Quality Certification shall not be interposed as a defense in any action respecting the determination of riparian or littoral rights or other rights to water use. No consumptive user is deemed by virtue of this Water Quality Certification to possess any prescriptive or other right of priority with respect to any other consumptive user.

Upon the presentation of proper credentials, the Division may inspect the property.

This Water Quality Certification shall expire on the same day as the expiration date of the corresponding Section 404 Permit. The conditions shall remain in effect for the life of the project, regardless of the expiration date of this Water Quality Certification.

Non-compliance with or violation of the conditions herein set forth may result in revocation of this Water Quality Certification for the project and may also result in criminal and/or civil penalties.

If you are unable to comply with any of the conditions of this Water Quality Certification you must notify the Asheville Regional Office within 24 hours (or the next business day if a weekend or holiday) from the time the permittee becomes aware of the circumstances.

The permittee shall report to the Asheville Regional Office any noncompliance with, and/or any violation of, stream or wetland standards [15A NCAC 02B .0200] including but not limited to sediment impacts to streams or wetlands. Information shall be provided orally within 24 hours (or the next business day if a weekend or holiday) from the time the permittee became aware of the non-compliance circumstances.

This approval and its conditions are final and binding unless contested [G.S. 143-215.5].

This Certification can be contested as provided in Chapter 150B of the North Carolina General Statutes by filing a Petition for a Contested Case Hearing (Petition) with the North Carolina Office of Administrative Hearings (OAH) **within sixty (60) calendar days**. Requirements for filing a Petition are set forth in Chapter 150B of the North Carolina General Statutes and Title 26 of the North Carolina Administrative Code. Additional information regarding requirements for filing a Petition and Petition forms may be accessed at http://www.ncoah.com/ or by calling the OAH Clerk's Office at (919) 431-3000.

One (1) copy of the Petition must also be served to the North Carolina Department of Environmental Quality:

William F. Lane, General Counsel
Department of Environmental Quality
1601 Mail Service Center
Raleigh, NC 27699-1601

If the party filing the Petition is not the permittee, then the party must also serve the recipient of the Certification in accordance with N.C.G.S 150B-23(a).

This letter completes the Division's review under section 401 of the Clean Water Act and 15A NCAC 02H .0500. Please contact Andrew Moore at 828-296-4684 or Andrew.W.Moore@deq.nc.gov if you have any questions or concerns.

Sincerely,

DocuSigned by:
7E617A38285848C...

G. Landon Davidson, P.G.
Regional Supervisor
Water Quality Regional Operations Section
Division of Water Resources, NCDEQ-ARO

cc: Eric Mularski, HDR Engineering, Inc. of the Carolinas (via email)
Amanda Jones, USACE Asheville Regulatory Field Office (via email)
Andrea Leslie, North Carolina Wildlife Resources Commission (via email)
Byron Hamstead, US Fish and Wildlife Service (via email)
Todd Bowers, EPA (via email)
DWR 401 & Buffer Permitting Branch Electronic file

NORTH CAROLINA 401 WATER QUALITY CERTIFICATION

CERTIFICATION #6121 is issued in conformity with the requirements of Section 401, Public Laws 92-500 and 95-217 of the United States and subject to North Carolina's Regulations in 15 NCAC 02H .0500 and 15A NCAC 02B .0200, to Darin Prosser and Metropolitan Sewerage District of Buncombe County who have authorization for the impacts listed below, as described within your application received by the N.C. Division of Water Resources (Division) on March 29, 2023; with subsequent information on June 2, 2023, and July 7, 2023; and by Public Notice issued by the Division on April 3, 2023.

The State of North Carolina certifies that this activity will comply with water quality requirements and the applicable portions of Sections 301, 302, 303, 306, 307 of the Public Laws 92-500 and PL 95-217 if conducted in accordance with the application, the supporting documentation, and conditions hereinafter set forth.

The following impacts are hereby approved. No other impacts are approved, including incidental impacts. [15A NCAC 02H .0506(b)]

Type of Impact	Amount Approved Permanent	Amount Approved Temporary	Mitigation Amount Required
Perennial Streams			
S1 / Cofferdam	0 linear feet	100 linear feet	0 credits
S2 / Pipe Installation and Open Cut Excavation	0 linear feet	50 linear feet	0 credits
S3 / Cofferdam	0 linear feet	100 linear feet	0 credits
S4 / Pipe Installation and Open Cut Excavation	0 linear feet	50 linear feet	0 credits
Intermittent Streams			
S5 / Temporary Culvert	0 linear feet	25 linear feet	0 credits
S6 / Temporary Culvert	0 linear feet	68 linear feet	0 credits
Riparian Wetlands			
W1 / Temporary matting	0 acres	0.080 acres	0 credits

This approval requires you to follow the conditions listed in the certification below.

CONDITIONS OF CERTIFICATION [15A NCAC 02H .0507(c)]:

1. The permittee and/or authorized agent shall conduct a pre-construction meeting with the Division Asheville Regional Office, the US Army Corps of Engineers, the selected contractor, and

representatives from any other interested permitting or resource agency prior to construction to discuss the conditions of this Certification and final plans, specifically with regard to the selected cofferdam design.

Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

Justification: A project that affects waters shall not be permitted unless the existing uses, and the water quality to protect such uses, are protected. In determining that the proposed activity will comply with state water quality standards (including designated uses, numeric criteria, narrative criteria and the state's antidegradation policy), the Division must evaluate if the activity has avoided and minimized impacts to waters, would cause or contribute to a violation of standards or would result in secondary or cumulative impacts.

2. Prior to initiation of construction, the Permittee shall provide the Division Asheville Regional Office a riverbank monitoring and contingency bank stabilization plan. The plan should include a qualitative evaluation of the conditions of the riverbanks immediately upstream and downstream of the north and south river crossings and a plan to visually monitor the riverbanks during and after construction for evidence of active erosion as well as an anticipated course of action should active erosion be detected.

   Citation: 15A NCAC 02H .0506; 15A NCAC 02H .0507(c)

   Justification: Surface water quality standards require that conditions of waters be suitable for all best uses provided for in state rule (including, at minimum: aquatic life propagation, survival, and maintenance of biological integrity; wildlife; secondary contact recreation; agriculture); and that activities must not cause water pollution that precludes any best use on a short-term or long-term basis.

3. Water removed from within the cofferdam shall be adequately treated prior to discharge to preclude violation of water quality standards.

   Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC02B .0200; 15A NCAC 02B .0231

   Justification: A project that affects waters shall not be permitted unless the existing uses, and the water quality to protect such uses, are protected. Activities must not cause water pollution that precludes any best use on a short-term or long-term basis. As cited in Stream Standards: (12) Oils, deleterious substances, or colored or other wastes: only such amounts as shall not render the waters injurious to public health, secondary recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated uses; and (21) turbidity in the receiving water shall not exceed 50 Nephelometric Turbidity Units (NTU) in streams not designated as trout waters and 10 NTU in streams, lakes, or reservoirs designated as trout waters; for lakes and reservoirs not designated as trout waters, the turbidity shall not exceed 25 NTU; if turbidity exceeds these levels due to natural background conditions, the existing turbidity level shall not be increased. As cited in Wetland Standards: (c)(1) Liquids, fill or other solids, or dissolved gases shall not be present in amounts that may cause adverse impacts on existing wetland uses; and (3)

Materials producing color or odor shall not be present in amounts that may cause adverse impacts on existing wetland uses.

4. All sewer lines shall be designed, constructed, and maintained in accordance with Title 15A NCAC Chapter 02T, applicable Minimum Design Criteria (MDC), and/or Alternative Design Criteria.

   Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

   Justification: The referenced Minimum Design criteria and 02T rules were adopted to ensure that conditions of waters be suitable for all best uses provided for in state rule (including, at minimum: aquatic life propagation, survival, and maintenance of biological integrity; wildlife; secondary contact recreation; agriculture); and that activities must not cause water pollution that precludes any best us on a short-term or long-term basis.

5. Any utility construction corridor that is parallel to a stream or open water shall not be closer than 10 feet to the top of bank or ordinary high-water mark.

   Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

   Justification: A project that affects waters shall not be permitted unless the existing uses, and the water quality to protect such uses, are protected. In determining that the proposed activity will comply with state water quality standards (including designated uses, numeric criteria, narrative criteria and the state's antidegradation policy), the Division must evaluate if the activity has avoided and minimized impacts to waters, would cause or contribute to a violation of standards or would result in secondary or cumulative impacts.

6. Where there are temporary or permanent impacts from stream crossings, utility lines shall cross the stream channel at a near-perpendicular direction (i.e., between 75 degrees and 105 degrees to the stream bank).

   Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

   Justification: A project that affects waters shall not be permitted unless the existing uses, and the water quality to protect such uses, are protected. In determining that the proposed activity will comply with state water quality standards (including designated uses, numeric criteria, narrative criteria and the state's antidegradation policy), the Division must evaluate if the activity has avoided and minimized impacts to waters, would cause or contribute to a violation of standards or would result in secondary or cumulative impacts.

7. The permittee shall restore wetland contours to pre-construction conditions. Any excess material will be removed to a high ground disposal area.

   The mixing of topsoil and subsoils within the wetlands along utility corridors shall be minimized to the greatest extent practical. During excavation, he soils shall be placed on fabric to minimize impacts whenever possible. Topsoil excavated from utility trenches will be piled separately from subsoils and will be backfilled into the trench only after the subsoils have been placed and compacted.

Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

Justification: A project that affects waters shall not be permitted unless the existing uses, and the water quality to protect such uses, are protected. In determining that the proposed activity will comply with state water quality standards (including designated uses, numeric criteria, narrative criteria and the state's antidegradation policy), the Division must evaluate if the activity has avoided and minimized impacts to waters, would cause or contribute to a violation of standards or would result in secondary or cumulative impacts.

8. The permittee shall report to the DWR Asheville Regional Office any noncompliance with, and/or any violation of, stream or wetland standards [15A NCAC 02B .0200], including but not limited to sediment impacts to streams or wetlands. Information shall be provided orally within 24 hours (or the next business day if a weekend or holiday) from the time the permittee became aware of the non-compliance circumstances.

   Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

   Justification: Timely reporting of non-compliance is important in identifying and minimizing detrimental impacts to water quality and avoiding impacts due to water pollution that precludes any best use on a short-term or long-term basis.

9. No waste, spoil, solids, or fill of any kind shall occur in wetlands or waters beyond the footprint of the approved impacts (including temporary impacts).

   Citation: 15A NCAC 02H .0506; 15A NCAC 02H .0507(c)

   Justification: Surface water quality standards require that conditions of waters be suitable for all best uses provided for in state rule (including, at minimum: aquatic life propagation, survival, and maintenance of biological integrity; wildlife; secondary contact recreation; agriculture); and that activities must not cause water pollution that precludes any best use on a short-term or long-term basis.

10. When applicable, all construction activities shall be performed and maintained in full compliance with G.S. Chapter 113A Article 4 (Sediment and Pollution Control Act of 1973). Regardless of applicability of the Sediment and Pollution Control Act, all projects shall incorporate appropriate Best Management Practices for the control of sediment and erosion so that no violations of state water quality standards, statutes, or rules occur.

    Design, installation, operation, and maintenance of all sediment and erosion control measures shall be equal to or exceed the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*, or for linear transportation projects, the *North Caroline Department of Transportation Sediment and Erosion Control Manual*.

    All devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) sites, including contractor-owned or leased borrow pits associated with the project. Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times.

For borrow pit sites, the erosion and sediment control measures shall be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*. Reclamation measures and implementation shall comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act and the Mining Act of 1971.

Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC02B .0200; 15A NCAC 02B .0231

Justification: A project that affects waters shall not be permitted unless the existing uses, and the water quality to protect such uses, are protected. Activities must not cause water pollution that precludes any best use on a short-term or long-term basis. As cited in Stream Standards: (12) Oils, deleterious substances, or colored or other wastes: only such amounts as shall not render the waters injurious to public health, secondary recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated uses; and (21) turbidity in the receiving water shall not exceed 50 Nephelometric Turbidity Units (NTU) in streams not designated as trout waters and 10 NTU in streams, lakes, or reservoirs designated as trout waters; for lakes and reservoirs not designated as trout waters, the turbidity shall not exceed 25 NTU; if turbidity exceeds these levels due to natural background conditions, the existing turbidity level shall not be increased. As cited in Wetland Standards: (c)(1) Liquids, fill or other solids, or dissolved gases shall not be present in amounts that may cause adverse impacts on existing wetland uses; and (3) Materials producing color or odor shall not be present in amounts that may cause adverse impacts on existing wetland uses.

11. Sediment and erosion control measures shall not be installed in wetland or waters except within the footprint of temporary or permanent impacts otherwise authorized by this Certification. If placed within authorized impact areas, then placement of such measures shall not be conducted in a manner that results in dis-equilibrium of any wetlands, streambeds, or streambanks. Any silt fence installed within wetlands shall be removed from wetlands and the natural grade restored within two (2) months of the date that DEMLR or locally delegated program has released the specific area within the project to ensure wetland standards are maintained upon completion of the project.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0200; 15A NCAC 02B .0231

    Justification: A project that affects waters shall not be permitted unless the existing uses, and the water quality to protect such uses, are protected. Activities must not cause water pollution that precludes any best use on a short-term or long-term basis. As cited in Stream Standards: (12) Oils, deleterious substances, or colored or other wastes: only such amounts as shall not render the waters injurious to public health, secondary recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated uses; and (21) turbidity in the receiving water shall not exceed 50 Nephelometric Turbidity Units (NTU) in streams not designated as trout waters and 10 NTU in streams, lakes, or reservoirs designated as trout waters; for lakes and reservoirs not designated as trout waters, the turbidity shall not exceed 25 NTU; if turbidity exceeds these levels due to natural background conditions, the existing turbidity level shall not be increased. As cited in Wetland Standards: (c)(1) Liquids, fill or other solids, or dissolved gases shall not be present in amounts that may cause adverse impacts on existing wetland uses; and (3)

Materials producing color or odor shall not be present in amounts that may cause adverse impacts on existing wetland uses.

12. Erosion control matting that incorporates plastic mesh and/or plastic twine shall not be used along streambanks or within wetlands.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

    Justification: A project that affects waters shall not be permitted unless the existing uses (including aquatic life propagation and biological integrity), and the water quality to protect such uses, are protected. Protections are necessary to ensure any remaining surface waters or wetlands, and any surface waters or wetlands downstream, continue to support existing uses during and after project completion. The Division must evaluate if the activity has avoided and minimized impacts to waters, would cause or contribute to a violation of standards, or would result in secondary or cumulative impacts.

13. If the project is covered by NPDES Construction Stormwater Permit Number NCG010000 or NPDES Construction Stormwater Permit Number NCG250000, full compliance with permit conditions including the erosion & sedimentation control plan, inspections and maintenance, self-monitoring, record keeping and reporting requirements is required.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0200; 15A NCAC 02B .0231

    Justification: A project that affects waters shall not be permitted unless the existing uses, and the water quality to protect such uses, are protected. Activities must not cause water pollution that precludes any best use on a short-term or long-term basis. As cited in Stream Standards: (12) Oils, deleterious substances, or colored or other wastes: only such amounts as shall not render the waters injurious to public health, secondary recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated uses; and (21) turbidity in the receiving water shall not exceed 50 Nephelometric Turbidity Units (NTU) in streams not designated as trout waters and 10 NTU in streams, lakes, or reservoirs designated as trout waters; for lakes and reservoirs not designated as trout waters, the turbidity shall not exceed 25 NTU; if turbidity exceeds these levels due to natural background conditions, the existing turbidity level shall not be increased. As cited in Wetland Standards: (c)(1) Liquids, fill or other solids, or dissolved gases shall not be present in amounts that may cause adverse impacts on existing wetland uses; and (3) Materials producing color or odor shall not be present in amounts that may cause adverse impacts on existing wetland uses.

14. All work in or adjacent to streams shall be conducted so that the flowing stream does not come in contact with the disturbed area. Approved best management practices from the most current version of the *NC Sediment and Erosion Control Manual*, or the *NC Department of Transportation Construction and Maintenance Activities Manual*, such as sandbags, rock berms, cofferdams, and other diversion structures shall be used to minimize excavation in flowing water.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0200

Justification: Surface water quality standards require that conditions of waters be suitable for all best uses provided for in state rule, and that activities must not cause water pollution that precludes any best use on a short-term or long-term basis. As cited in Stream Standards: (12) Oils, deleterious substances, or colored or other wastes: only such amounts as shall not render the waters injurious to public health, secondary recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated uses; and (21) turbidity in the receiving water shall not exceed 50 Nephelometric Turbidity Units (NTU) in streams not designated as trout waters and 10 NTU in streams, lakes, or reservoirs designated as trout waters; for lakes and reservoirs not designated as trout waters, the turbidity shall not exceed 25 NTU; if turbidity exceeds these levels due to natural background conditions, the existing turbidity level shall not be increased.

15. Culverts shall be designed and installed in such a manner that the original stream profiles are not altered and allow for aquatic life movement during low flows. The dimension, pattern, and profile of the stream above and below a pipe or culvert shall not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed culvert shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. If the width of the culvert is wider than the stream channel, the culvert shall include multiple boxes/pipes, baffles, benches and/or sills to maintain the natural width of the stream channel. If multiple culverts/pipes/barrels are used, low flows shall be accommodated in one culvert/pipe and additional culverts/pipes shall be installed such that they receive only flows above bankfull.

    Placement of culverts and other structures in streams shall be below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20% of the culvert diameter for culverts having a diameter less than or equal to 48 inches, to allow low flow passage of water and aquatic life. If the culvert outlet is submerged within a pool or scour hole and designed to provide for aquatic passage, then culvert burial into the streambed is not required.

    For structures less than 72” in diameter/width, and topographic constraints indicate culvert slopes of greater than 2.5% culvert burial is not required, provided that all alternative options for flattening the slope have been investigated and aquatic life movement/connectivity has been provided when possible (e.g. rock ladders, cross-vanes, sills, baffles etc.). Notification, including supporting documentation to include a location map of the culvert, culvert profile drawings, and slope calculations, shall be provided to DWR 30 calendar days prior to the installation of the culvert.

    When bedrock is present in culvert locations, culvert burial is not required, provided that there is sufficient documentation of the presence of bedrock. Notification, including supporting documentation such as a location map of the culvert, geotechnical reports, photographs, etc. shall be provided to DWR a minimum of 30 calendar days prior to the installation of the culvert. If bedrock is discovered during construction, then DWR shall be notified by phone or email within 24 hours of discovery.

    Installation of culverts in wetlands shall ensure continuity of water movement and be designed to adequately accommodate high water or flood conditions. When roadways, causeways, or other fill projects are constructed across FEMA-designated floodways or wetlands, openings such as culverts or bridges shall be provided to maintain the natural hydrology of the system as well as prevent constriction of the floodway that may result in destabilization of streams or wetlands.

The establishment of native woody vegetation and other soft stream bank stabilization techniques shall be used where practicable instead of rip-rap or other bank hardening methods.

Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

Justification: Surface water quality standards require that conditions of waters be suitable for all best uses provided for in state rule, and that activities must not cause water pollution that precludes any best use on a short-term or long-term basis. Ensuring that in-stream structures are installed properly will ensure that surface water quality standards are met and conditions of waters are suitable for all best uses.

16. Bridge deck drains shall not discharge directly into streams or wetlands. Stormwater shall be directed across the bridge and pre-treated through site-appropriate means to the maximum extent practicable (e.g. grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering streams or wetlands.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

    Justification: Surface water quality standards require that conditions of waters be suitable for all best uses provided for in state rule and that activities must not cause water pollution that precludes any best use on a short-term or long-term basis. Ensuring that in-stream structures are installed properly will ensure that surface water quality standards are met and conditions of waters are suitable for all best uses.

17. Application of fertilizer to establish planted/seeded vegetation within disturbed riparian areas and/or wetlands shall be conducted at agronomic rates and shall comply with all other Federal, State and Local regulations. Fertilizer application shall be accomplished in a manner that minimizes the risk of contact between the fertilizer and surface waters.

    Citation: 15A 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0200; 15A NCAC 02B .0231

    Justification: A project that affects waters shall not be permitted unless the existing uses, and the water quality to protect such uses, are protected. Activities must not cause water pollution that precludes any best use on a short-term or long-term basis. As cited in Stream Standards: (12) Oils, deleterious substances, or colored or other wastes: only such amounts as shall not render the waters injurious to public health, secondary recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated uses. As cited in Wetland Standards: (c)(1) Liquids, fill or other solids, or dissolved gases shall not be present in amounts that may cause adverse impacts on existing wetland uses; and (3) Materials producing color or odor shall not be present in amounts that may cause adverse impacts on existing wetland uses.

18. If concrete is used during construction, then all necessary measures shall be taken to prevent direct contact between uncured or curing concrete and waters of the state. Water that inadvertently contacts uncured concrete shall not be discharged to waters of the state.

    Citation: 15A 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0200; 15A NCAC 02B .0231

Justification: A project that affects waters shall not be permitted unless the existing uses, and the water quality to protect such uses, are protected. Activities must not cause water pollution that precludes any best use on a short-term or long-term basis. As cited in Stream Standards: (12) Oils, deleterious substances, or colored or other wastes: only such amounts as shall not render the waters injurious to public health, secondary recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated uses. As cited in Wetland Standards: (c)(1) Liquids, fill or other solids, or dissolved gases shall not be present in amounts that may cause adverse impacts on existing wetland uses; and (3) Materials producing color or odor shall not be present in amounts that may cause adverse impacts on existing wetland uses.

19. All proposed and approved temporary fill and culverts shall be removed and the impacted area shall be returned to natural conditions within 60 calendar days after the temporary impact is no longer necessary. The impacted areas shall be restored to original grade, including each stream's original cross-sectional dimensions, planform pattern, and longitudinal bed profile. All temporarily impacted sites shall be restored and stabilized with native vegetation.

    Citation: 15A NCAC 02H.0506(b); 15A NCAC 02H .0507(c)

    Justification: A project that affects waters shall not be permitted unless the existing uses, and the water quality to protect such uses, are protected. Protections are necessary to ensure any remaining surface waters or wetlands, and any surface waters or wetlands downstream, continue to support existing uses after project completion.

20. All proposed and approved temporary pipes/culverts/rip-rap pads etc. in streams or wetlands shall be installed as outlined in the most recent edition of the *North Carolina Sediment and Erosion Control Planning and Design Manual* or the *North Carolina Surface Mining Manual* or the *North Carolina Department of Transportation Best Management Practices for Construction and Maintenance Activities* so as not to restrict stream flow or cause dis-equilibrium during use of this Certification.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

    Justification: A project that affects waters shall not be permitted unless the existing uses, and the water quality to protect such uses, are protected. Protections are necessary to ensure any remaining surface waters or wetlands, and any surface waters or wetlands downstream, continue to support existing uses after project completion.

21. Any rip-rap required for proper culvert placement, stream stabilization, or restoration of temporarily disturbed areas shall be restricted to the area directly impacted by the approved construction activity. All rip-rap shall be placed such that the original streambed elevation and streambank contours are restored and maintained and shall consist of clean rock or masonry material free of debris or toxic pollutants. Placement of rip-rap or other approved materials shall not result in de-stabilization of the stream bed or banks upstream or downstream of the area or be installed in a manner that precludes aquatic life passage.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

Justification: Surface water quality standards require that conditions of waters be suitable for all best uses provided for in state rule, and that activities must not cause water pollution that precludes any best use on a short-term or long-term basis. The Division must evaluate if the activity has avoided and minimized impacts to waters, would cause or contribute to a violation of standards, or would result in secondary or cumulative impacts.

22. Any rip-rap used for stream or shoreline stabilization shall be of a size and density to prevent movement by wave, current action, or stream flows, and shall consist of clean rock or masonry material free of debris or toxic pollutants. Rip-rap shall not be installed in the streambed except in specific areas required for velocity control and to ensure structural integrity of bank stabilization measures.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0201

    Justification: Surface water quality standards require that conditions of waters be suitable for all best uses provided for in state rule, and that activities must not cause water pollution that precludes any best use on a short-term or long-term basis. The Division must evaluate if the activity has avoided and minimized impacts to waters, would cause or contribute to a violation of standards, or would result in secondary or cumulative impacts.

23. All mechanized equipment operated near surface waters shall be inspected and maintained regularly to prevent contamination of surface waters from fuels, lubricants, hydraulic fluids, or other toxic materials. Construction shall be staged in order to minimize the exposure of equipment to surface waters to the maximum extent practicable. Fueling, lubrication, and general equipment maintenance shall be performed in a manner to prevent, to the maximum extent practicable, contamination of surface waters by fuels and oils.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0200; 15A NCAC 02B .0231

    Justification: A project that affects waters shall not be permitted unless the existing uses, and the water quality to protect such uses, are protected. Activities must not cause water pollution that precludes any best use on a short-term or long-term basis. As cited in Stream Standards: (12) Oils, deleterious substances, or colored or other wastes: only such amounts as shall not render the waters injurious to public health, secondary recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated uses. As cited in Wetland Standards: (c)(1) Liquids, fill or other solids, or dissolved gases shall not be present in amounts that may cause adverse impacts on existing wetland uses; and (3) Materials producing color or odor shall not be present in amounts that may cause adverse impacts on existing wetland uses.

24. Heavy equipment working in wetlands shall be placed on mats or other measures shall be taken to minimize soil disturbance and compaction.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c); 15A NCAC 02B .0231

    Justification: Wetland standards require maintenance or enhancement of existing uses of wetlands such that hydrologic conditions necessary to support natural biological and physical characteristics

are protected; populations of wetland flora and fauna are maintained to protect biological integrity of the wetland; and materials or substances are not present in amounts that may cause adverse impact on existing wetland uses.

25. In accordance with 143-215.85(b), the permittee shall report any petroleum spill of 25 gallons or more; any spill regardless of amount that causes a sheen on surface waters; any petroleum spill regardless of amount occurring within 100 feet of surface waters; and any petroleum spill less than 25 gallons that cannot be cleaned up within 24 hours.

    Citation: 15A NCAC 02H .0507(c); N.C.G.S 143-215.85(b)

    Justification: Person(s) owning or having control over oil or other substances upon notice of discharge must immediately notify the Department, or any of its agents or employees, of the nature, location, and time of the discharge and of the measures which are being taken or are proposed to be taken to contain and remove the discharge. This action is required in order to contain or divert the substances to prevent entry into the surface waters. Surface water quality standards require that conditions of waters be suitable for all best uses provided for in state rule (including, at minimum: aquatic life propagation, survival, and maintenance of biological integrity; wildlife; secondary contact recreation; agriculture); and that activities must not cause water pollution that precludes any best use on a short-term or long-term basis.

26. The permittee and their authorized agents shall conduct all activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act), and any other appropriate requirements of State and Federal Law.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

    Justification: Surface water quality standards require that conditions of waters be suitable for all best uses provided for in state rule, and that activities must not cause water pollution that precludes any best use on a short-term or long-term basis. The Division must evaluate if the activity has avoided and minimized impacts to waters, would cause or contribute to a violation of standards, or would result in secondary or cumulative impacts.

27. The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this Water Quality Certification. A copy of this Water Quality Certification shall be available at the project site during the construction and maintenance of this project.

    Citation: 15A NCAC 02H .0506(b); 15A NCAC 02H .0507(c)

    Justification: Those actually performing the work should be aware of the requirements of this 401 Water Quality Certification to minimize water quality impacts.

This approval to proceed with your proposed impacts or to conduct impacts to waters as depicted in your application shall expire upon expiration of the 404 or CAMA Permit. The conditions in effect on the date of issuance shall remain in effect for the life of the project, regardless of the expiration date of this Certification. [15A NCAC 02H .0507(c)]

This, the 24th day of July 2023

DocuSigned by:
7E617A38285848C...

G. Landon Davidson, P.G.
Regional Supervisor
Water Quality Regional Operations Section
Division of Water Resources, NCDEQ-ARO

GLD/am

6121

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, WILMINGTON DISTRICT
ASHEVILLE REGULATORY FIELD OFFICE
151 PATTON AVENUE ROOM 208
ASHEVILLE NC 28801

December 18, 2023

Regulatory Program/Division

Darin Prosser
Metropolitan Sewerage District of Buncombe County
510 Riverview Drive
Asheville, NC 28806
Via Email: dprosser@msdbc.org

Dear Mr./Ms. Prosser:

This letter is in response to the Pre-Construction Notification (PCN) you submitted to the Wilmington District, Asheville Regulatory Field Office on March 29, 2023, for a Department of the Army Nationwide permit (NWP) verification. This project has been assigned the file number 2021-01395 and is known as Carrier Bridge Pump Station Replacement Project. This file number should be referenced in all correspondence concerning this project.

A review of the information provided indicates that the proposed work would include the construction of new pump station, replacement of the existing influent gravity sewer and replacement of existing force main. The project area for this determination includes approximately 300 acres area which is illustrated on the enclosed site plans/maps. The project/review area is located generally along and crossing the French Broad River near Amboy Road and Lyman Street intersection and along Amboy Road at Carrier Park, at Latitude 35.573049 and Longitude -82.565282; in Asheville, Buncombe County, North Carolina.

We have determined that the proposed work is authorized by **Nationwide Permit #58** pursuant to authorities under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403), and Section 404 of the Clean Water Act (33 U.S.C. § 1344). This permit authorizes the temporary dewatering of the French Broad River associated with installation a 36-inch force main (North Crossing) and a 60-inch force main (South Crossing). This authorization also includes two temporary culvert crossings of unnamed tributaries that total 93 linear feet (68 linear feet and 25 linear feet respectively) depending on the cofferdam construction design chosen.

The proposed work must be accomplished in strict accordance with the general permit conditions, any regional conditions, the special conditions listed in this letter, the application materials, and the enclosed plans. If the extent of the project area and/or nature of the authorized impacts to waters are modified, a revised PCN must be

submitted to this office for written approval before work is initiated. Any violation of permit conditions or deviation from your submitted plans may subject the permittee to enforcement action.

This verification is valid until March 15, 2026, unless prior to this date the subject NWP(s) is suspended, revoked, or is modified such that the activity no longer complies with the terms and conditions of this NWP. If you commence or are under contract to commence this activity before the date that the relevant NWP is modified or revoked, you will have 12 months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this NWP.

Special Conditions:

1. In order to mitigate adverse effects to federally listed endangered species with this project, the permittee will implement the Terms and Conditions and Reasonable and Prudent Measures of the enclosed *Biological Opinion* (dated December 14, 2023).

2. The permittee shall implement the enclosed *River Safety Plan* (dated March 28, 2023) prior to any work occurring in and/or above the French Broad River.

3. Prior to any precipitation events, the permittee shall determine if high water levels are expected and remove any equipment that is on the cofferdams prior to expected high water, or at the end of the work-day if high water is expected prior to the next work-day. Following all storm events equal to or greater than a bankfull event, the permittee shall inspect the cofferdams and riverbanks for signs of erosion or unstable conditions. Any debris caught on the temporary cofferdams shall be immediately removed and any areas of erosion shall be immediately stabilized.

4. Any bank erosion/instability surrounding the construction footprint at the North and South French Broad River Crossings will be assessed and coordinated with the Corps prior to developing a plan to remediate any project induced bank erosion. A separate/additional Section 10/404 authorization may be required for future bank stabilization activities.

5. Riverbank areas cleared of vegetation for installation of sewer line which will not be part of permanently maintained easement, shall be stabilized utilizing native vegetation and bio-engineering methods versus hard stabilization where practicable.

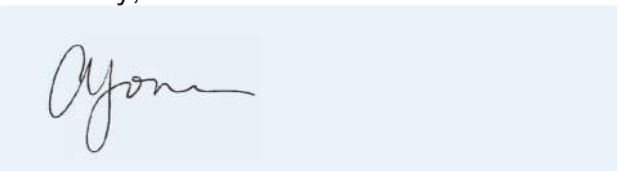
6. Prior to authorized impacts occurring, the permittee will provide plans detailing the chosen cofferdam construction method to the Corps for review within 30 days before planned construction/de-watering begins.

7. Prior to impacts occurring, a pre-construction meeting will be held between the permittee's contractors and the Corps' Asheville Regulatory Field Office staff.

This NWP verification does not preclude the necessity to obtain any other Federal, State, or local permits, licenses, and/or certifications, which may be required.

If you have any questions related to this verification or have issues accessing documents referenced in this letter, please contact Amanda Fuemmeler, Project Manager of the Asheville Regulatory Field Office at 828-271-7980 ext. 4225, by mail at the above address, or by email at amanda.jones@usace.army.mil. Please take a moment to complete our customer satisfaction survey located at https://regulatory.ops.usace.army.mil/customer-service-survey/.

Sincerely,



Amanda Fuemmeler
Project Manager

Enclosures

Cc (w/enclosures)
Eric Mularski, HDR Engineering, Inc. of the Carolinas (via eric.mularski@hdrinc.com)

Compliance Certification Form

Action ID Number: 2021-01395 **County: Buncombe**

Permittee: Metropolitan Sewerage District of Buncombe County, Darin Prosser

Project Name: Carrier Bridge Pump Station Replacement Project

Date Verification Issued: 12/18/2023

Project Manager: Amanda Fuemmeler

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following email address:

amanda.jones@usace.army.mil

Please note that your permitted activity is subject to a compliance inspection by a U. S. Army Corps of Engineers representative. Failure to comply with any terms or conditions of this authorization may result in the Corps suspending, modifying or revoking the authorization and/or issuing a Class I administrative penalty, or initiating other appropriate legal action.

I hereby certify that the work, and mitigation (if applicable), authorized by the above referenced permit has been completed in accordance with the terms and conditions of the said permit including any general or specific conditions.

Date Authorized Work Started: _____ **Completed: _____**

Describe any deviations from permit (attach drawing(s) depicting the deviations):

_____

_____

***Note: The description of any deviations on this form does not constitute approval by the Corps.**

_____ _____

Signature of Permittee **Date**

AID: SAW: 2021-01395

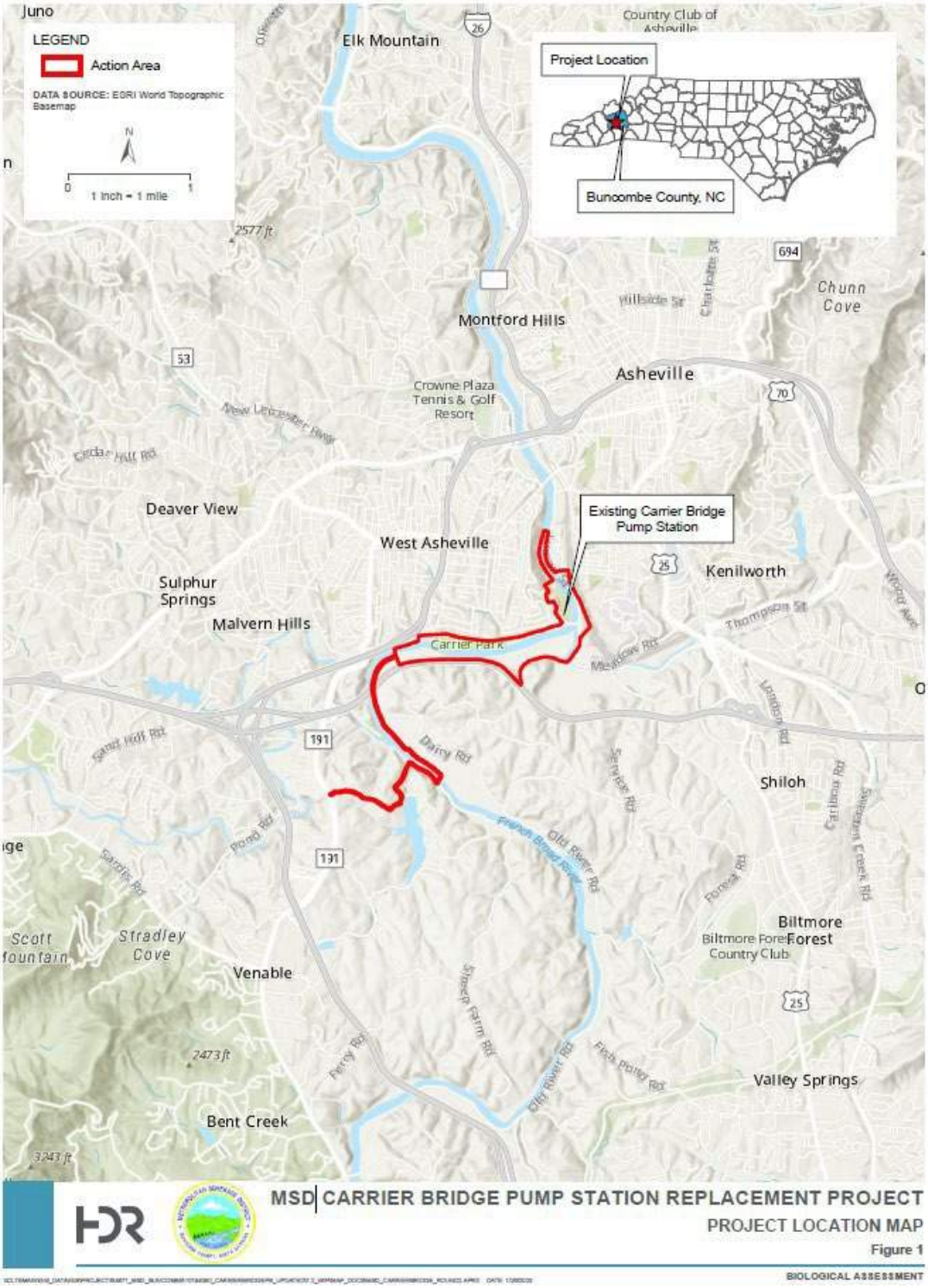


Figure 1. Proposed action area within the greater West Asheville area.

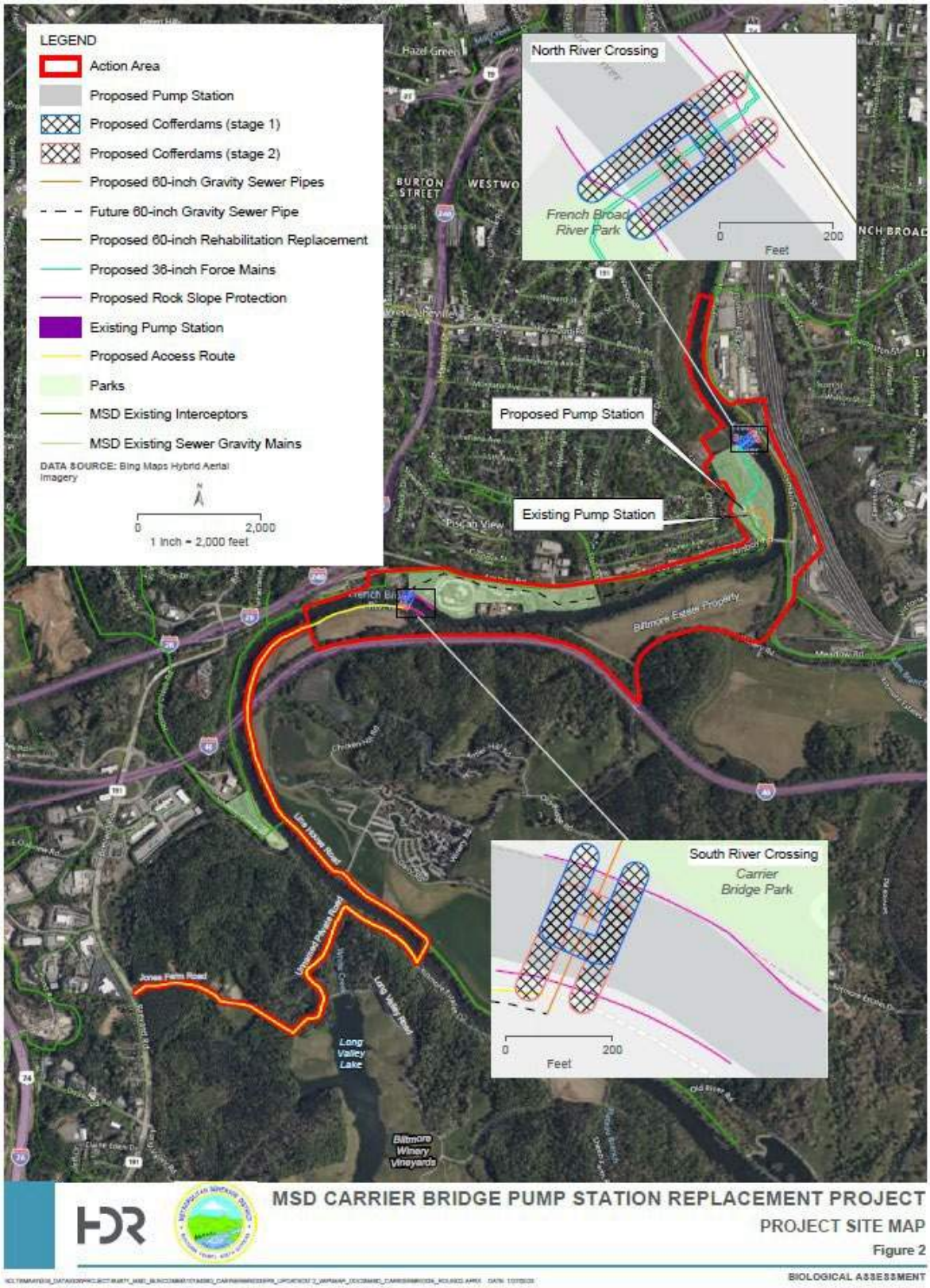


Figure 2. North and South River Crossing areas.

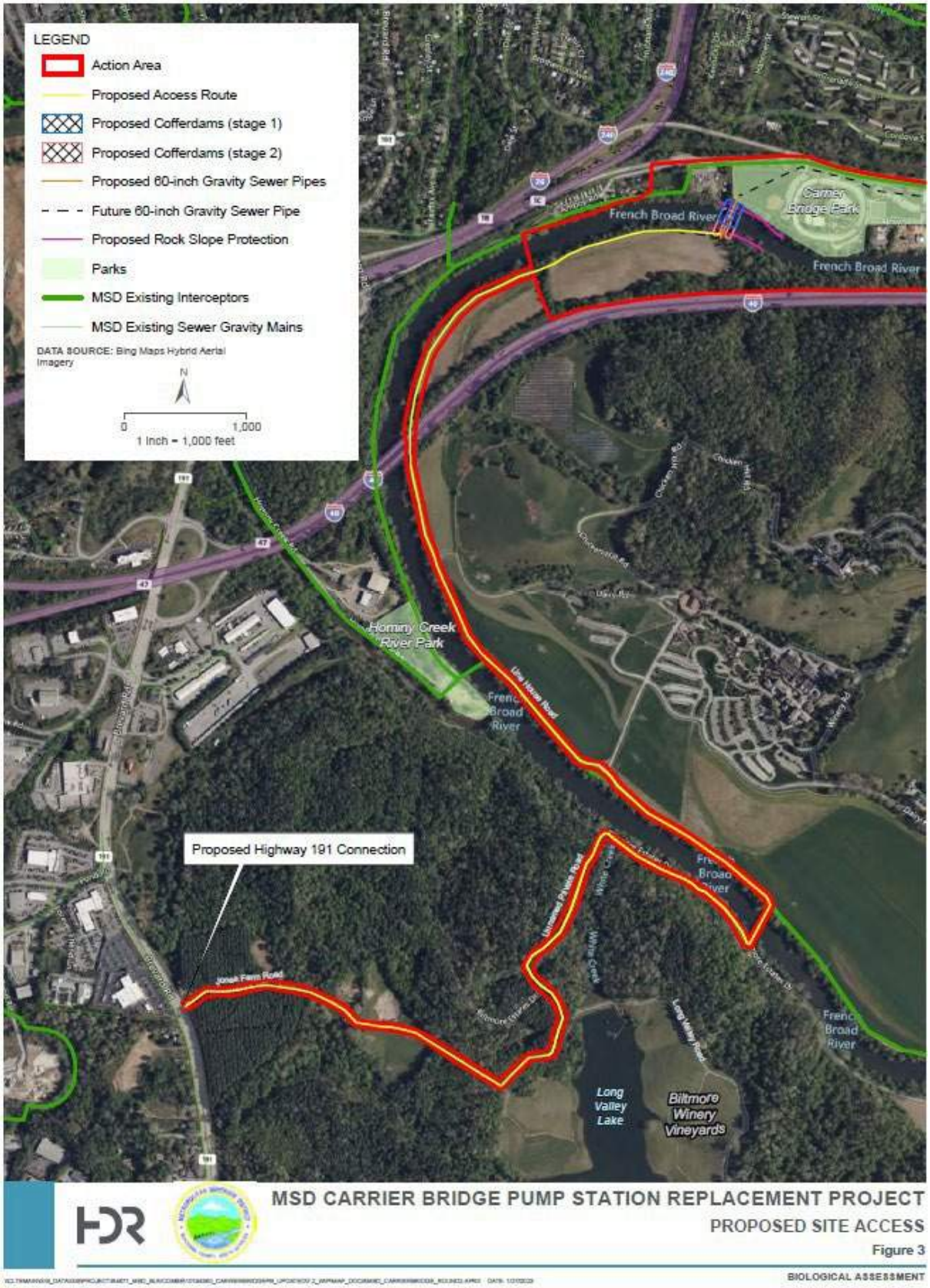


Figure 3. Proposed site access route.

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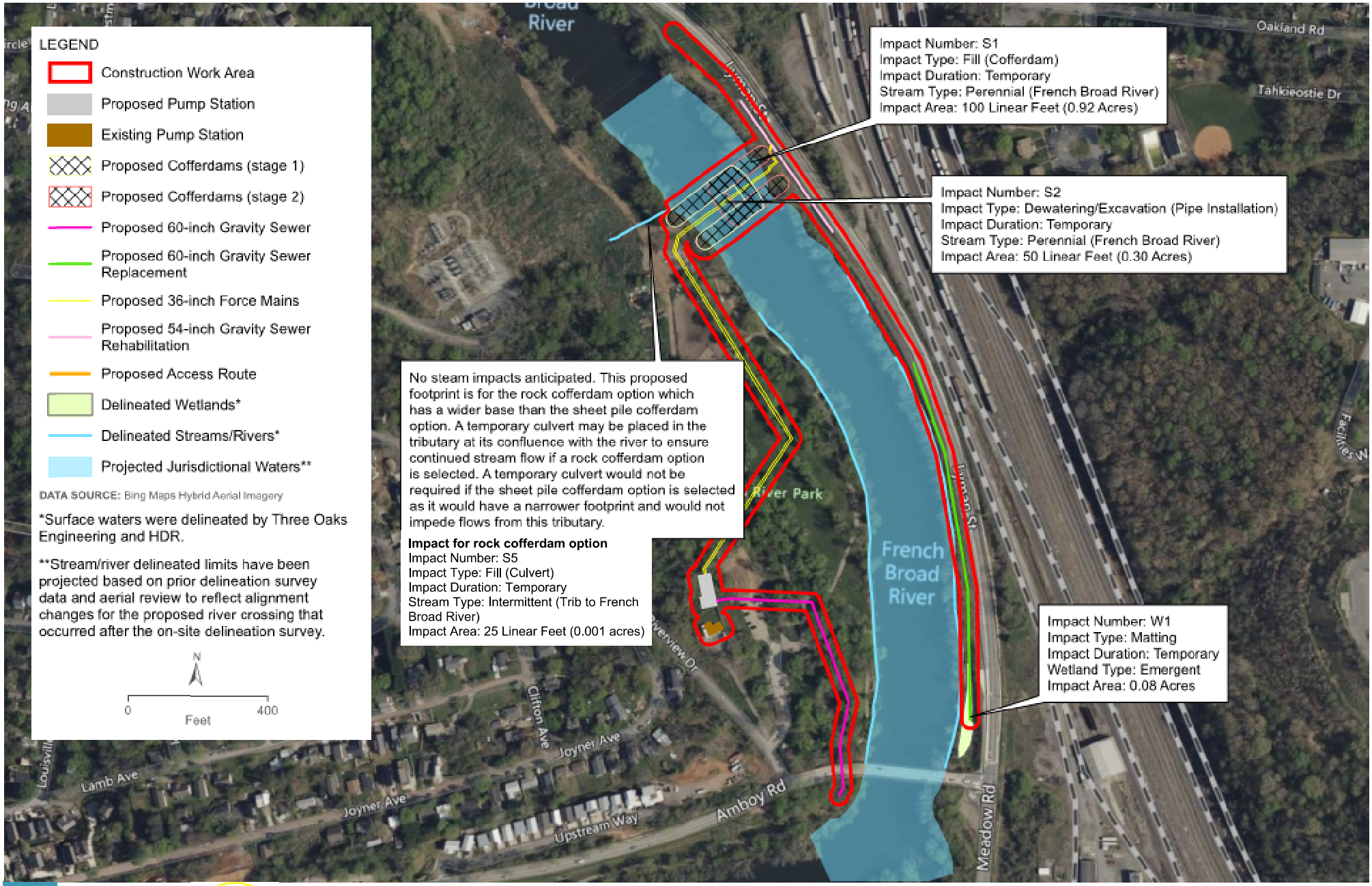
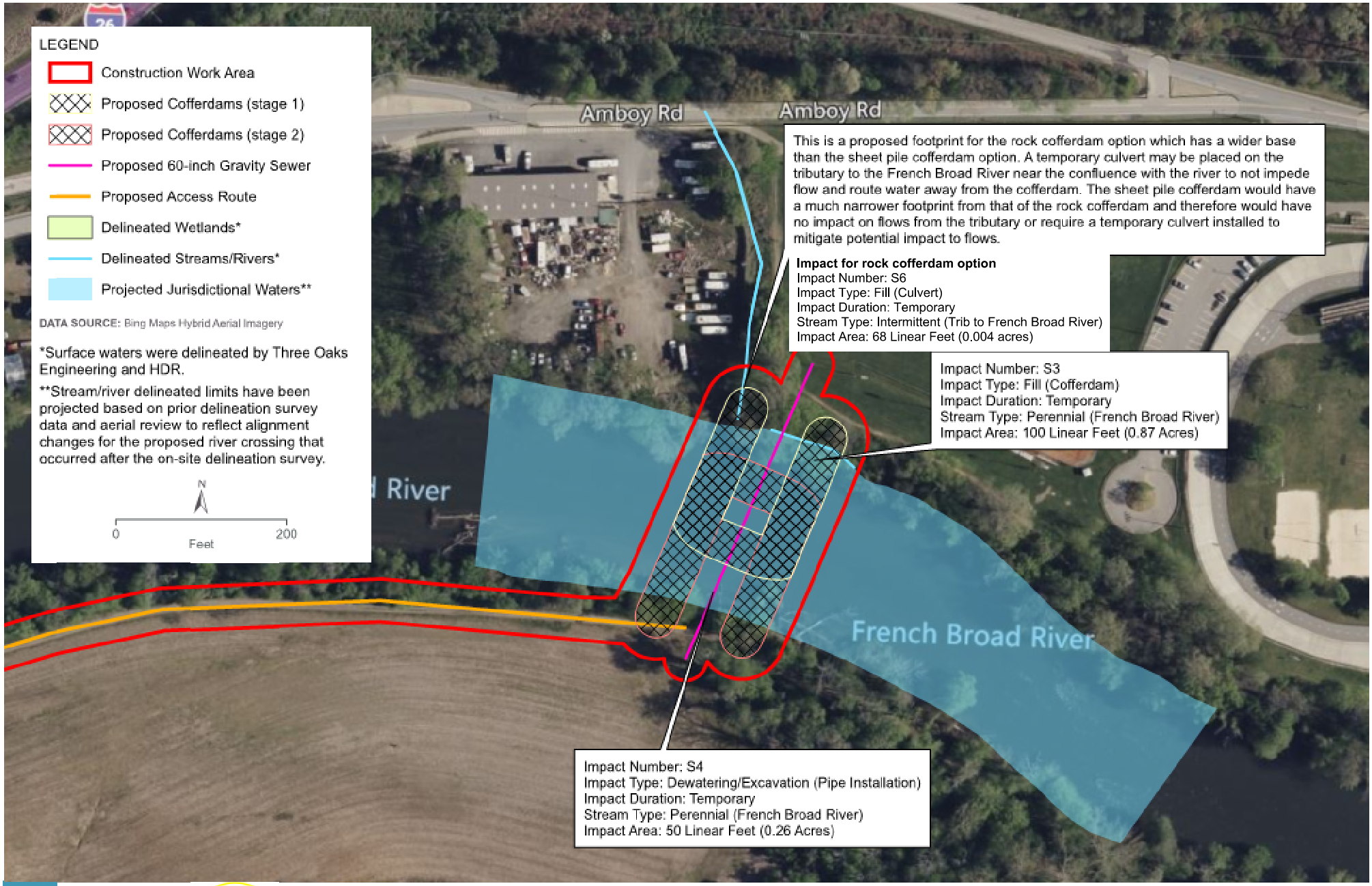


MSD CARRIER BRIDGE PUMP STATION REPLACEMENT PROJECT

POTENTIAL IMPACTS TO WATERS OF THE U.S.

Figure 8A



MSD CARRIER BRIDGE PUMP STATION REPLACEMENT PROJECT

POTENTIAL IMPACTS TO WATERS OF THE U.S.

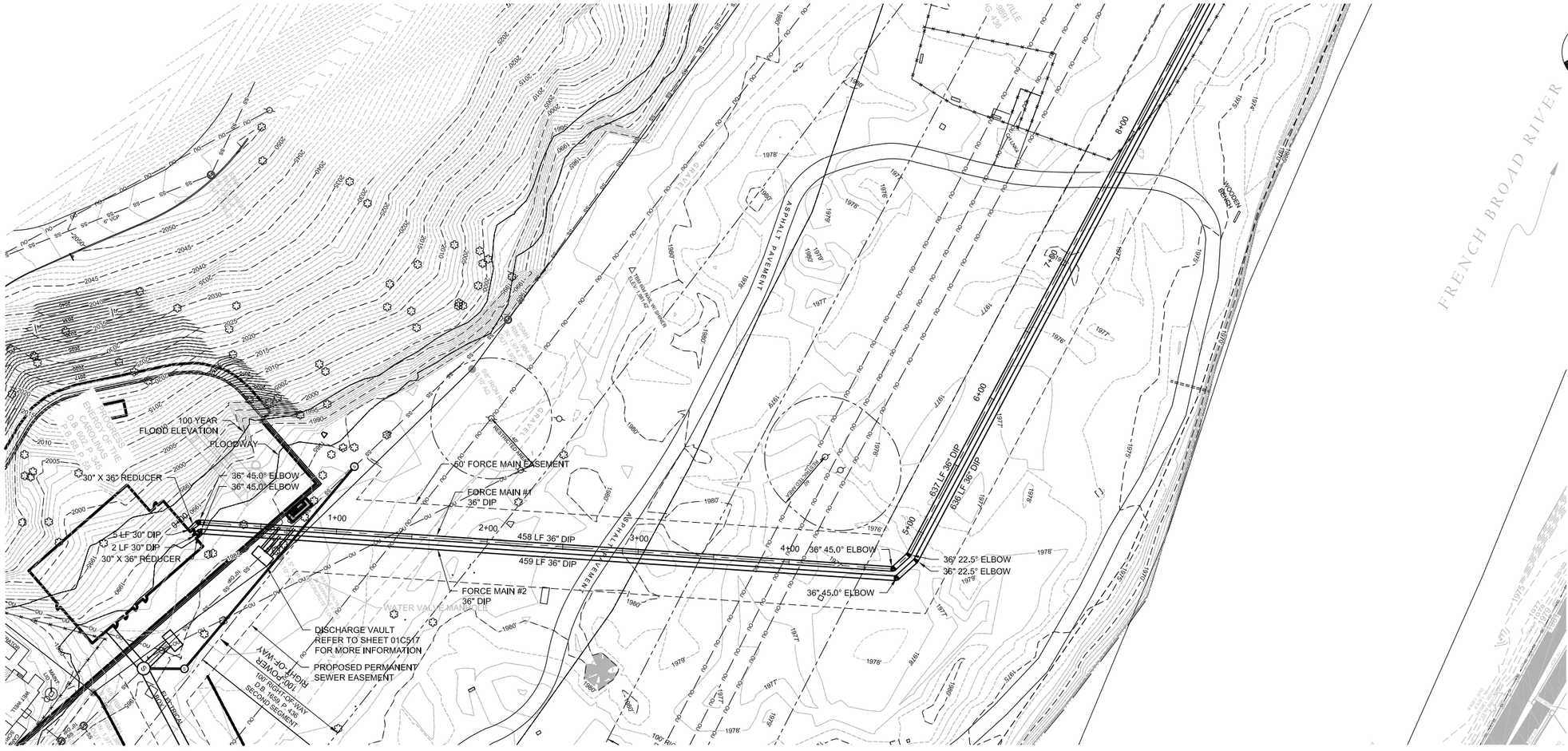
Figure 8B

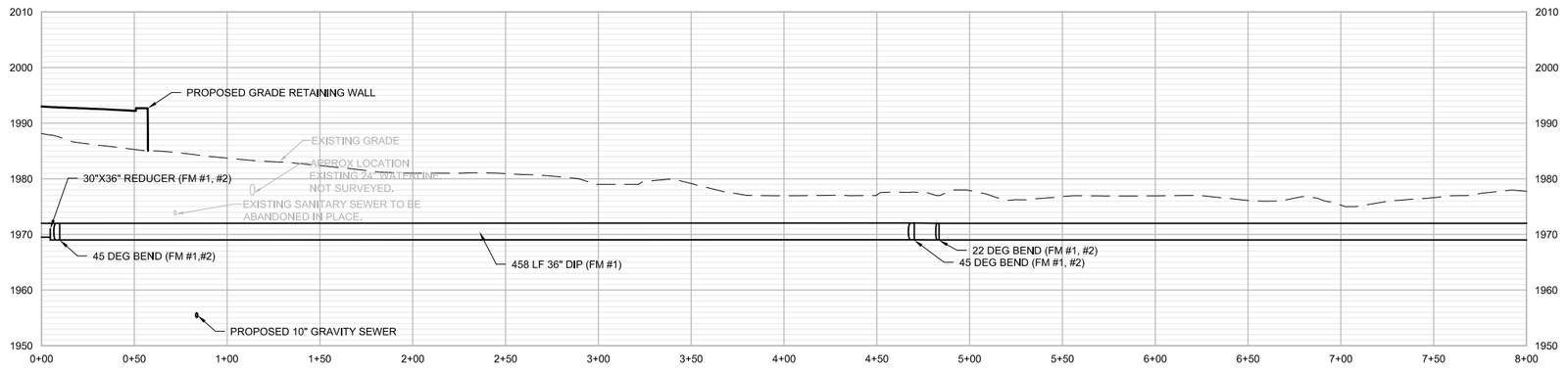
GENERAL NOTES:

1.

KEY NOTES:

1.





HDR Engineering Inc.
of the Carolinas

440 S. Church Street, Suite 1000
Charlotte, NC 28202
704.338.6700

N.C.B.E.L.S. License Number: F-0116

PRELIMINARY

ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	MATTHEW A. SHULTZ
DESIGNED BY	K. QUATTLEBAUM, PE
CHECKED BY	M. SHULTZ, PE
DRAWN BY	C.GIGLIOTTI
PROJECT NUMBER	10194380

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

CARRIER BRIDGE PUMP STATION

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

36" PARALLEL FORCE MAINS PLAN & PROFILE 1

0 1" 2"

FILENAME 01C303.DWG

SCALE 1" = 40'

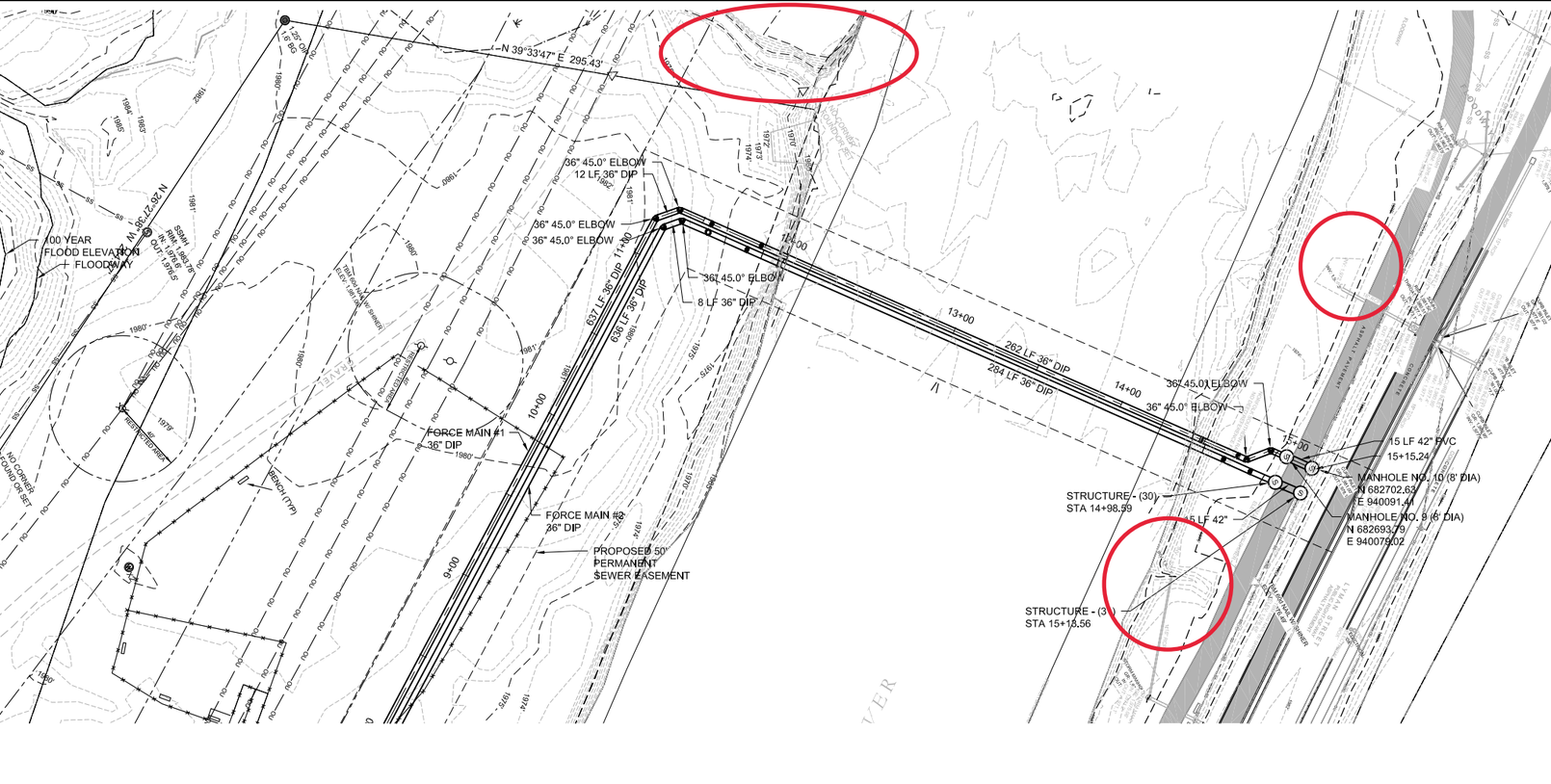
SHEET 01C303

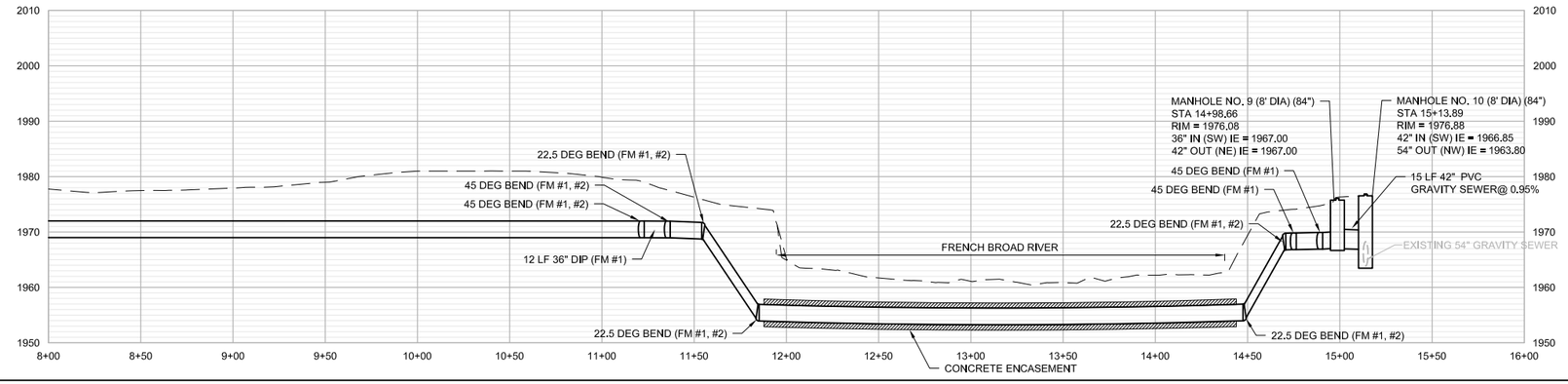
GENERAL NOTES:

1.

KEY NOTES:

1.





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PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

CARRIER BRIDGE PUMP STATION

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

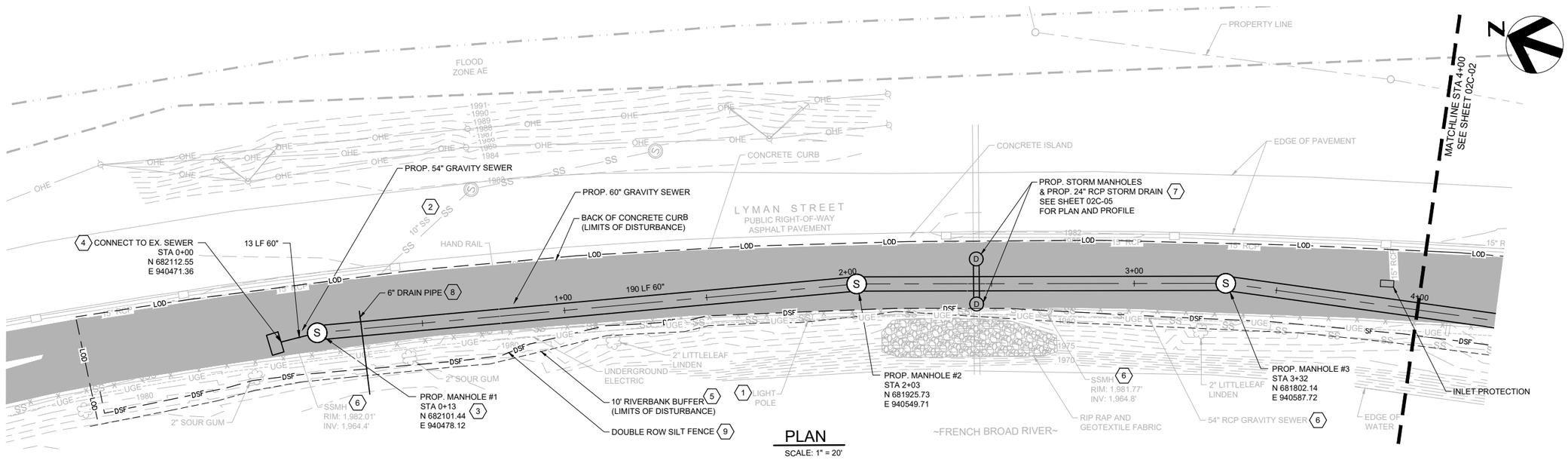
36" PARALLEL FORCE MAIN PLAN & PROFILE 2

0 1" 2"

FILENAME 01C304.DWG

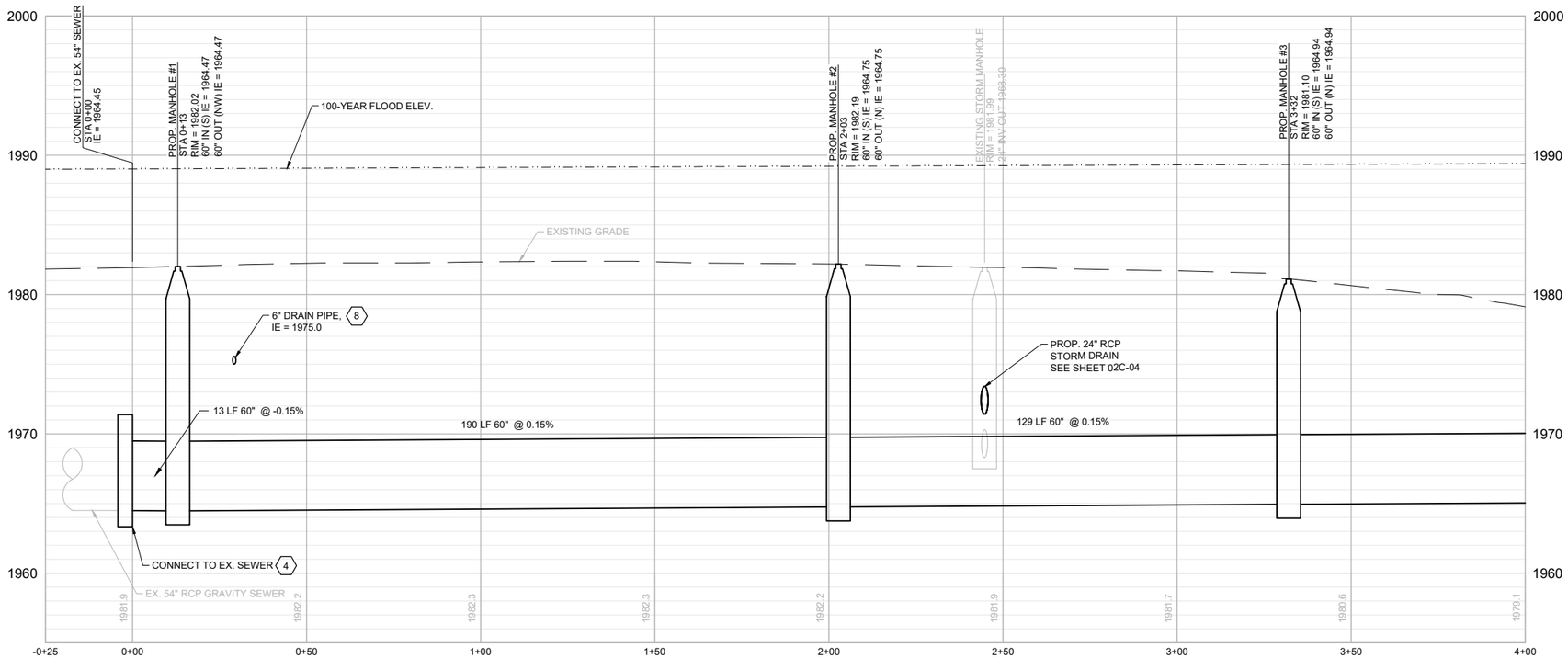
SCALE 1" = 40'

SHEET **01C304**



PLAN

SCALE: 1" = 20'



60" GRAVITY SEWER PROFILE

SCALE: 1" = 20' HORZ.
1" = 5' VERT.

GENERAL NOTES:

1. DRAWING SHEETS 04C-01 AND 04C-02 PROVIDE DRAWING DETAILS FOR SOME OF THE EXISTING FEATURES. ALL FEATURES DISTURBED, DAMAGED, REMOVED, ETC. SHALL BE FURNISHED AND RECONSTRUCTED PER THE DETAILS AND EXISTING SITE LAYOUT INCLUDING SIZE, LOCATION AND ELEVATION.
2. ONLY THE NEWLY PLANTED LANDSCAPE TREES ARE SHOWN AND LABELED. ALL TREES LABELED NEED TO BE REPLACED 10-FEET FROM SEWER. ADDITIONAL TREES AND VEGETATION EXIST BETWEEN ASPHALT PATH AND RIVER THAT WILL NEED TO BE CLEARED AND REMOVED WITHIN THE LIMITS OF DISTURBANCE.
3. WITH THE EXCEPTION OF MANHOLE #1 (SEE KEY NOTE), FOR ALL OTHER MANHOLES CONTRACTOR MAY USE CIRCULAR PRECAST CONCRETE, T-SERIES PRECAST CONCRETE OR FIBERGLASS TEE, IN LOCATIONS THAT ALLOW FOR EACH OPTION.
4. ALL PROPOSED SANITARY SEWER MANHOLES SHALL HAVE SEALED WATERTIGHT FRAME AND LID.
5. ALL CONCRETE MANHOLES SHALL INCLUDE CONCRETE PROTECTIVE LINER.
6. FOR ANY TEMPORARY LANE CLOSURE OF NORTHBOUND LANE, INSTALL ALL TRAFFIC CONTROL DEVICES AND PERFORM FLAGGING PER NCDOT REQUIREMENTS.

KEY NOTES:

1. UNDERGROUND ELECTRIC RUNS ALONG ENTIRE LENGTH OF WEST SIDE OF MULTI-USE PATH CONNECTING LIGHT POLES. REMOVE AND REPLACE AS REQUIRED AS PART OF PIPE INSTALLATION.
2. VERIFY EXISTING GRAVITY SEWER SIZE, LOCATION AND MATERIAL TYPE. CONNECT INTO PROPOSED MANHOLE #1.
3. MANHOLE #1 SHALL HAVE A MINIMUM INSIDE DIAMETER OF 120", INCREASE IF NEEDED TO ACCEPT 10" SEWER, AND 60" RISER UP TO THE CONE SECTION. PRIOR TO CONSTRUCTION, VERIFY LOCATION OF 10" SEWER AND ADJUST PROPOSED MANHOLE LOCATION AS REQUIRED.
4. CONNECT EXISTING 54" PIPE TO PROPOSED 60" PIPE USING BURIED PRECAST JUNCTION STRUCTURE WITH FLEXIBLE BOOT CONNECTION. MEET ALL REQUIREMENTS OF PRECAST MANHOLES AND PROVIDE PROTECTIVE LINING ON WALLS AND SOLID TOP. PER MANUFACTURE'S SPECIFICATIONS. PRECAST CONCRETE STRUCTURE CAN BE ROUND, RECTANGULAR OR T-STYLE MANHOLE BASE.
5. 10' BUFFER FROM TOP OF RIVER BANK. NO TREE CLEARING OR EXCAVATIONS ALLOWED WITHIN BUFFER. TEMPORARY BYPASS PIPING CAN BE INSTALLED WITHIN BUFFER.
6. ALL EXISTING MANHOLES AND GRAVITY SEWER PIPE SHALL BE REMOVED OR ABANDONED. ANY PIPE SECTIONS NOT REMOVED SHALL HAVE ALL OPEN ENDS PLUGGED WITH CONCRETE. ANY MANHOLES NOT REMOVED SHALL HAVE TOP 3-FEET REMOVED, ALL PIPE PLUGGED WITH CONCRETE AND REMAINING PORTION FILLED WITH COMPACTED SOIL.
7. REMOVE EXISTING STORM MANHOLE AND PIPE AS REQUIRED TO INSTALL NEW GRAVITY SEWER AND NEW STORM SYSTEM.
8. INSTALL PERFORATED 6" PLASTIC PIPE WITH SOCK TO SERVE AS A FRENCH DRAIN. DAYLIGHT IN RIVER BANK.
9. REDUCE TO SINGLE ROW WHERE ASPHALT PATH DOES NOT ALLOW INSTALLATION OF SECOND ROW.

HDR Engineering Inc.
of the Carolinas

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PRELIMINARY

ISSUE	DATE	DESCRIPTION
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PROJECT MANAGER	MATTHEW A. SHULTZ
DESIGNED BY	M. SHULTZ, PE
CHECKED BY	S. BEROSET, PE
DRAWN BY	J. KROOSWYK
PROJECT NUMBER	10194380

FRENCH BROAD INTERCEPTOR REPLACEMENT

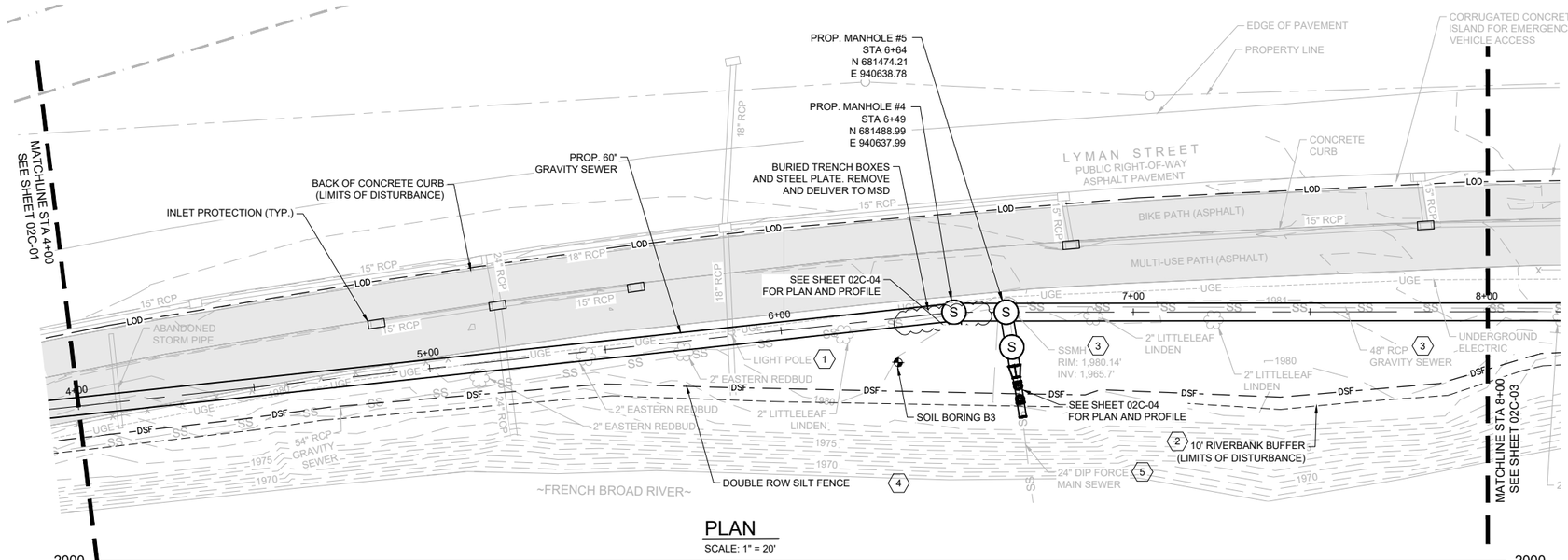
METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

GRAVITY SEWER PLAN AND PROFILE STA 0+00 TO STA 4+00

0 1" 2"

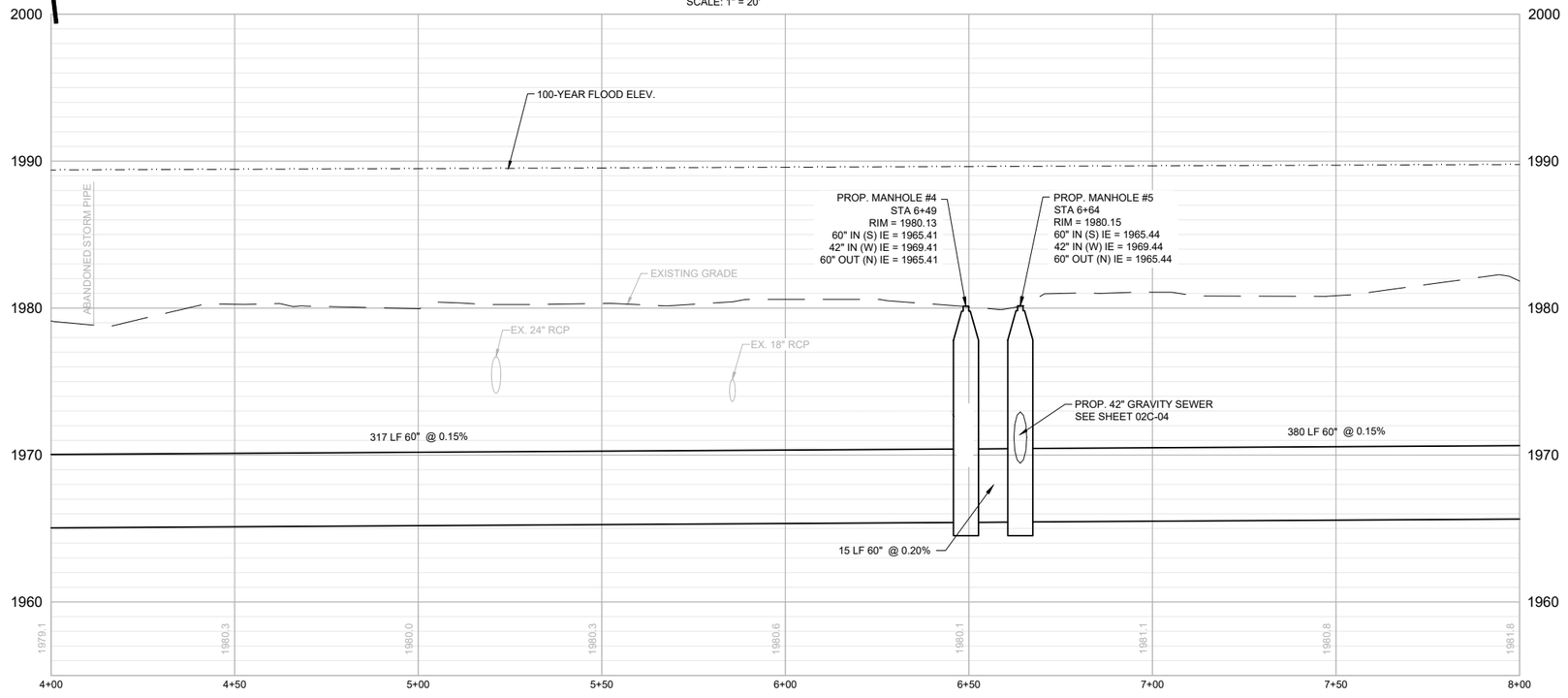
FILENAME 00C-UT02-20 ER.dwg
SCALE 1" = 20'

SHEET 02C-01



PLAN

SCALE: 1" = 20'



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3. ALL PROPOSED SANITARY SEWER MANHOLES SHALL HAVE A MINIMUM INSIDE DIAMETER OF 96-INCHES, HAVE SEALED WATERTIGHT FRAME AND LID, AND INCLUDE CONCRETE PROTECTIVE LINER.
4. FOR ANY TEMPORARY LANE CLOSURE OF NORTHBOUND LANE, INSTALL ALL TRAFFIC CONTROL DEVICES AND PERFORM FLAGGING PER NCDOT REQUIREMENTS.

KEY NOTES:

1. UNDERGROUND ELECTRIC RUNS ALONG ENTIRE LENGTH OF WEST SIDE OF MULTI-USE PATH CONNECTING LIGHT POLES.
2. 10' BUFFER FROM TOP OF RIVER BANK. NO TREE CLEARING OR EXCAVATIONS ALLOWED WITHIN BUFFER. TEMPORARY BYPASS PIPING CAN BE INSTALLED WITHIN BUFFER.
3. ALL EXISTING MANHOLES AND GRAVITY SEWER PIPE SHALL BE REMOVED OR ABANDONED. ANY PIPE SECTIONS NOT REMOVED SHALL HAVE ALL OPEN ENDS PLUGGED WITH CONCRETE. ANY MANHOLES NOT REMOVED SHALL HAVE TOP 3-FEET REMOVED, ALL PIPES PLUGGED WITH CONCRETE AND REMAINING PORTION FILLED WITH COMPACTED SOIL.
4. REDUCE TO SINGLE ROW WHERE ASPHALT PATH DOES NOT ALLOW INSTALLATION OF SECOND ROW.
5. CONNECT EXISTING FORCE MAIN INTO PROPOSED MANHOLE #8 USING FLEXIBLE CONNECTION, 36" PIPE SECTION AND REDUCER. CUT EXISTING 24" PIPE AS REQUIRED. INSTALL SOLID SLEEVE AND FITTINGS AS REQUIRED TO MAKE CONNECTIONS. ALL FORCE MAIN PIPE AND FITTINGS SHALL BE RESTRAINED JOINT, PROTECTO 401 LINED DUCTILE IRON. SEE SHEET 02C-04.

HDR Engineering Inc.
of the Carolinas

440 S. Church Street, Suite 1000
Charlotte, NC 28202
704.338.6700

N.C.B.E.L.S. License Number: F-0116

PRELIMINARY

ISSUE	DATE	DESCRIPTION
A		

PROJECT MANAGER	MATTHEW A. SHULTZ
DESIGNED BY	M. SHULTZ, PE
CHECKED BY	S. BEROSET, PE
DRAWN BY	J. KROOSYWK
PROJECT NUMBER	10194380

FRENCH BROAD INTERCEPTOR REPLACEMENT

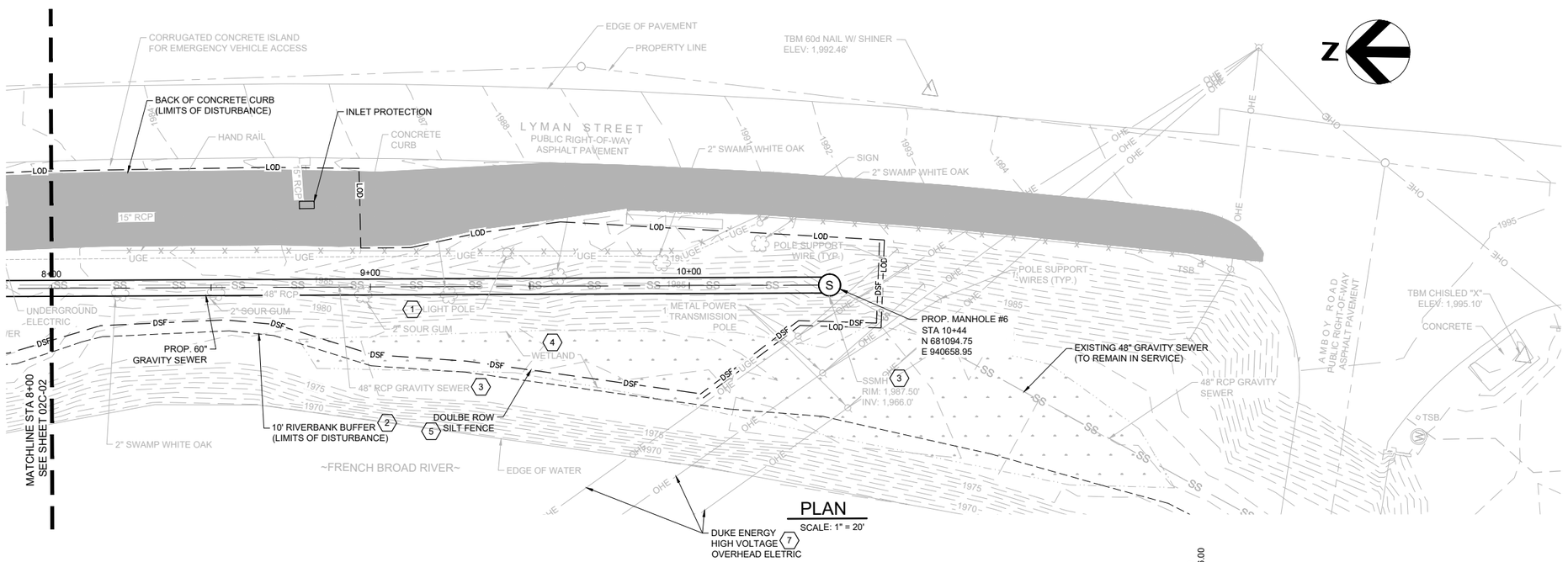
METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

GRAVITY SEWER PLAN AND PROFILE STA 4+00 TO STA 8+00

0 1" 2"

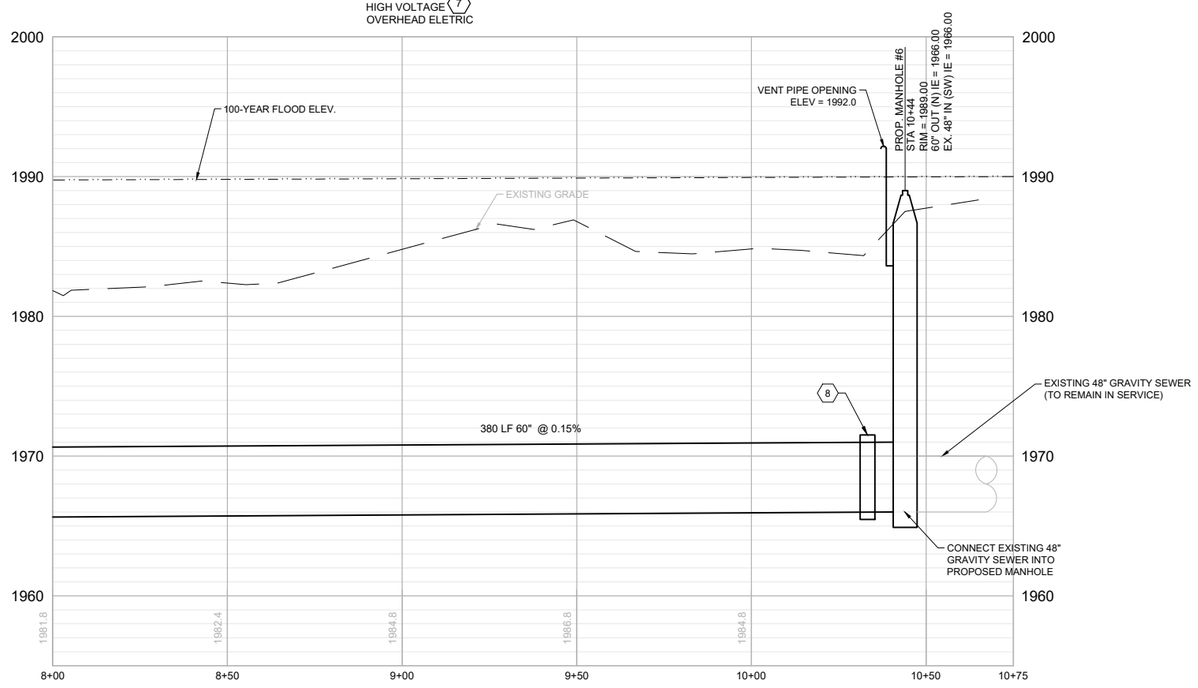
FILENAME 00C-UT02-20 ER.dwg
SCALE 1" = 20'

SHEET 02C-02



PLAN

SCALE: 1" = 20'



60" GRAVITY SEWER PROFILE

SCALE: 1" = 20' HORZ.
1" = 5' VERT.

GENERAL NOTES:

1. DRAWING SHEETS 04C-01 AND 04C-02 PROVIDE DRAWING DETAILS FOR SOME OF THE EXISTING FEATURES. ALL FEATURES DISTURBED, DAMAGED, REMOVED, ETC. SHALL BE FURNISHED AND RECONSTRUCTED PER THE DETAILS AND EXISTING SITE LAYOUT INCLUDING SIZE, LOCATION AND ELEVATION.
2. ONLY THE NEWLY PLANTED LANDSCAPE TREES ARE SHOWN AND LABELED. ALL TREES LABELED NEED TO BE REPLACED 10-FEET FROM SEWER. ADDITIONAL TREES AND VEGETATION EXIST BETWEEN ASPHALT PATH AND RIVER THAT WILL NEED TO BE CLEARED AND REMOVED WITHIN THE LIMITS OF DISTURBANCE.
3. ALL PROPOSED SANITARY SEWER MANHOLES SHALL HAVE A MINIMUM INSIDE DIAMETER OF 96-INCHES, HAVE SEALED WATERTIGHT FRAME AND LID, AND INCLUDE CONCRETE PROTECTIVE LINER.
4. FOR ANY TEMPORARY LANE CLOSURE OF NORTHBOUND LANE, INSTALL ALL TRAFFIC CONTROL DEVICES AND PERFORM FLAGGING PER NCDOT REQUIREMENTS.

KEY NOTES:

1. UNDERGROUND ELECTRIC RUNS ALONG ENTIRE LENGTH OF WEST SIDE OF MULTI-USE PATH CONNECTING LIGHT POLES.
2. 10' BUFFER FROM TOP OF RIVER BANK. NO TREE CLEARING OR EXCAVATIONS ALLOWED WITHIN BUFFER. TEMPORARY BYPASS PIPING CAN BE INSTALLED WITHIN BUFFER.
3. ALL EXISTING MANHOLES AND GRAVITY SEWER PIPE SHALL BE REMOVED OR ABANDONED. ANY PIPE SECTIONS NOT REMOVED SHALL HAVE ALL OPEN ENDS PLUGGED WITH CONCRETE. ANY MANHOLES NOT REMOVED NOT REMOVED SHALL HAVE TOP 3-THREE REMOVED, ALL PIPES PLUGGED WITH CONCRETE AND REMAINING PORTION WITH COMPACTED SOIL.
4. LIMIT DISTURBANCE TO WETLAND AREA TO THE EXTENT POSSIBLE. INSTALL TEMPORARY GEOTEXTILE FABRIC BEFORE PLACING ANY TEMPORARY FILL. FOLLOWING CONSTRUCTION RESTORE TO PRE-CONSTRUCTION ELEVATIONS AND PLAN SPECIAL WETLAND SEED MIX.
5. REDUCE TO SINGLE ROW WHERE ASPHALT PATH DOES NOT ALLOW INSTALLATION OF SECOND ROW.
6. RESTORE ALL SLOPE DISTURBED BETWEEN STA 8+50 AND MANHOLE #5 WITH EROSION CONTROL MATTING, SEE DETAIL 7/03C-04.
7. COMPLY WITH ALL OSHA, DUKE ENERGY AND OTHER APPLICABLE GUIDELINES AND SAFETY STANDARDS FOR WORKING NEAR AND UNDER HIGH VOLTAGE ELECTRICAL LINES. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORK WITH DUKE ENERGY.
8. FURNISH AND INSTALL HOBAS CLOSURE COUPLING OR APPROVED STAINLESS STEEL REPAIR SLEEVE TO JOIN PIPE ENDS. INCLUDE COST AS PART OF THE 60" PIPE INSTALLATION.

HDR Engineering Inc.
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704.338.6700

N.C.B.E.L.S. License Number: F-0116

ISSUE	DATE	DESCRIPTION
A		PRELIMINARY

PROJECT MANAGER	MATTHEW A. SHULTZ
DESIGNED BY	M. SHULTZ, PE
CHECKED BY	S. BEROSET, PE
DRAWN BY	J. KROOSWYK
PROJECT NUMBER	10194380

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY, NORTH CAROLINA

FRENCH BROAD INTERCEPTOR REPLACEMENT

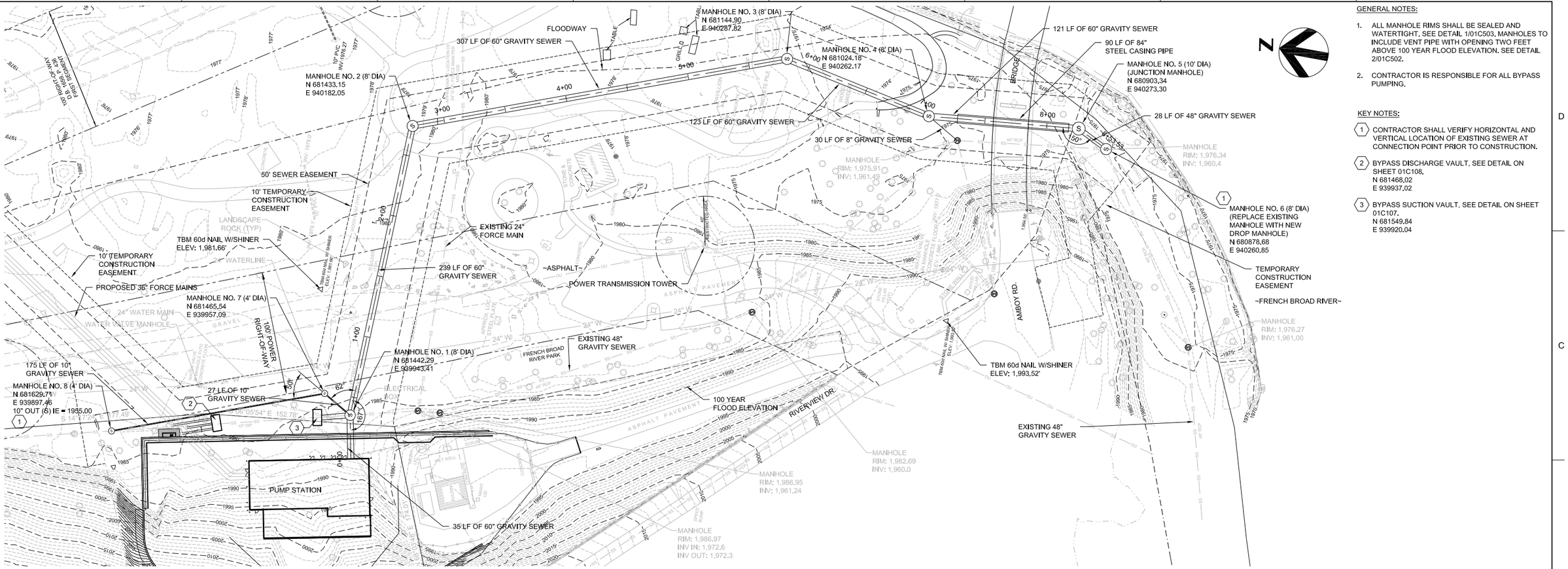
METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

GRAVITY SEWER PLAN AND PROFILE STA 8+00 TO STA 10+39

0 1" 2"

FILENAME	00C-UT02-20 ER.dwg
SCALE	1" = 20'

SHEET 02C-03

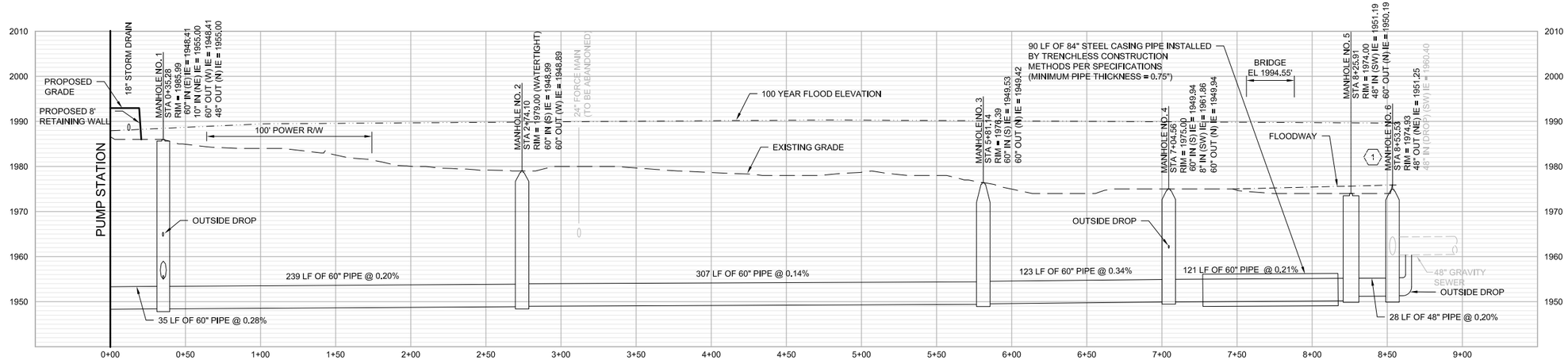


GENERAL NOTES:

1. ALL MANHOLE RIMS SHALL BE SEALED AND WATERTIGHT. SEE DETAIL 1/01C503. MANHOLES TO INCLUDE VENT PIPE WITH OPENING TWO FEET ABOVE 100 YEAR FLOOD ELEVATION. SEE DETAIL 2/01C502.
2. CONTRACTOR IS RESPONSIBLE FOR ALL BYPASS PUMPING.

KEY NOTES:

1. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING SEWER AT CONNECTION POINT PRIOR TO CONSTRUCTION.
2. BYPASS DISCHARGE VAULT, SEE DETAIL ON SHEET 01C108.
   N 681468.02
   E 939937.02
3. BYPASS SUCTION VAULT, SEE DETAIL ON SHEET 01C107.
   N 681549.84
   E 939920.04



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PRELIMINARY

ISSUE	DATE	DESCRIPTION
-		

PROJECT MANAGER	MATTHEW A. SHULTZ
DESIGNED BY	K. QUATTLEBAUM, PE
CHECKED BY	M. SHULTZ, PE
DRAWN BY	K. QUATTLEBAUM, PE
PROJECT NUMBER	10194380

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

CARRIER BRIDGE PUMP STATION

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

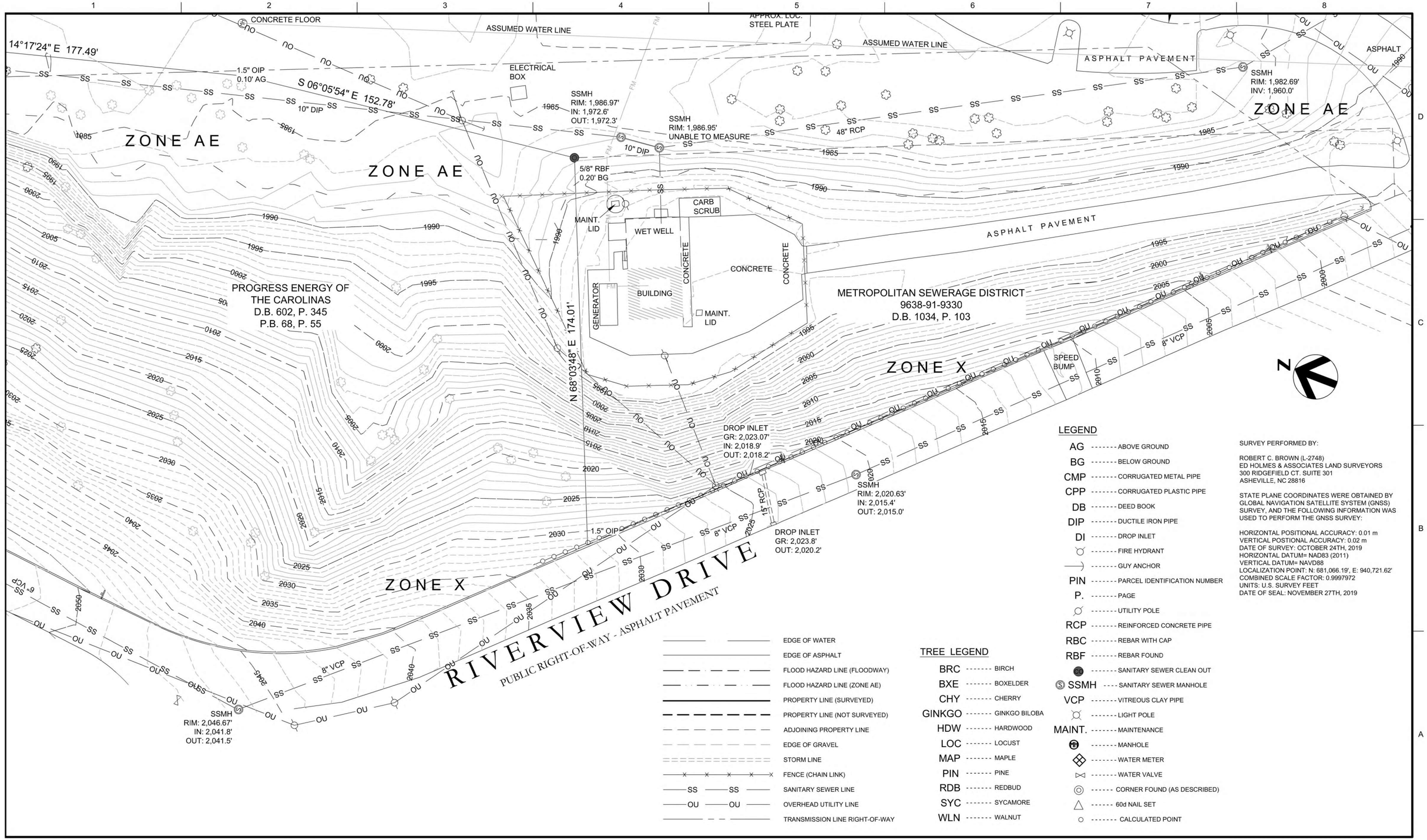
60" INFLUENT GRAVITY SEWER PLAN & PROFILE

0 1" 2"

FILENAME 01C302.DWG

SCALE 1" = 40'

SHEET 01C302



LEGEND

AG	ABOVE GROUND
BG	BELOW GROUND
CMP	CORRUGATED METAL PIPE
CPP	CORRUGATED PLASTIC PIPE
DB	DEED BOOK
DIP	DUCTILE IRON PIPE
DI	DROP INLET
	FIRE HYDRANT
	GUY ANCHOR
PIN	PARCEL IDENTIFICATION NUMBER
P.	PAGE
	UTILITY POLE
RCP	REINFORCED CONCRETE PIPE
RBC	REBAR WITH CAP
RBF	REBAR FOUND
	SANITARY SEWER CLEAN OUT
SSMH	SANITARY SEWER MANHOLE
VCP	VITREOUS CLAY PIPE
	LIGHT POLE
MAINT.	MAINTENANCE
	MANHOLE
	WATER METER
	WATER VALVE
	CORNER FOUND (AS DESCRIBED)
	60d NAIL SET
	CALCULATED POINT

TREE LEGEND

BRC	BIRCH
BXE	BOXELDER
CHY	CHERRY
GINKGO	GINKGO BILOBA
HDW	HARDWOOD
LOC	LOCUST
MAP	MAPLE
PIN	PINE
RDB	REDBUD
SYC	SYCAMORE
WLN	WALNUT

SURVEY PERFORMED BY:

ROBERT C. BROWN (L-2748)
ED HOLMES & ASSOCIATES LAND SURVEYORS
300 RIDGEFIELD CT. SUITE 301
ASHEVILLE, NC 28816

STATE PLANE COORDINATES WERE OBTAINED BY GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) SURVEY, AND THE FOLLOWING INFORMATION WAS USED TO PERFORM THE GNSS SURVEY:

HORIZONTAL POSITIONAL ACCURACY: 0.01 m
VERTICAL POSTIONAL ACCURACY: 0.02 m
DATE OF SURVEY: OCTOBER 24TH, 2019
HORIZONTAL DATUM= NAD83 (2011)
VERTICAL DATUM= NAVD88
LOCALIZATION POINT: N: 681,066.19', E: 940,721.62'
COMBINED SCALE FACTOR: 0.9997972
UNITS: U.S. SURVEY FEET
DATE OF SEAL: NOVEMBER 27TH, 2019

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PRELIMINARY

ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	MATTHEW A. SHULTZ
DESIGNED BY	C.GIGLIOTTI,J.CAUSEY
CHECKED BY	J. CAUSEY
DRAWN BY	C. GIGLIOTTI
PROJECT NUMBER	10194380

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

CARRIER BRIDGE PUMP STATION

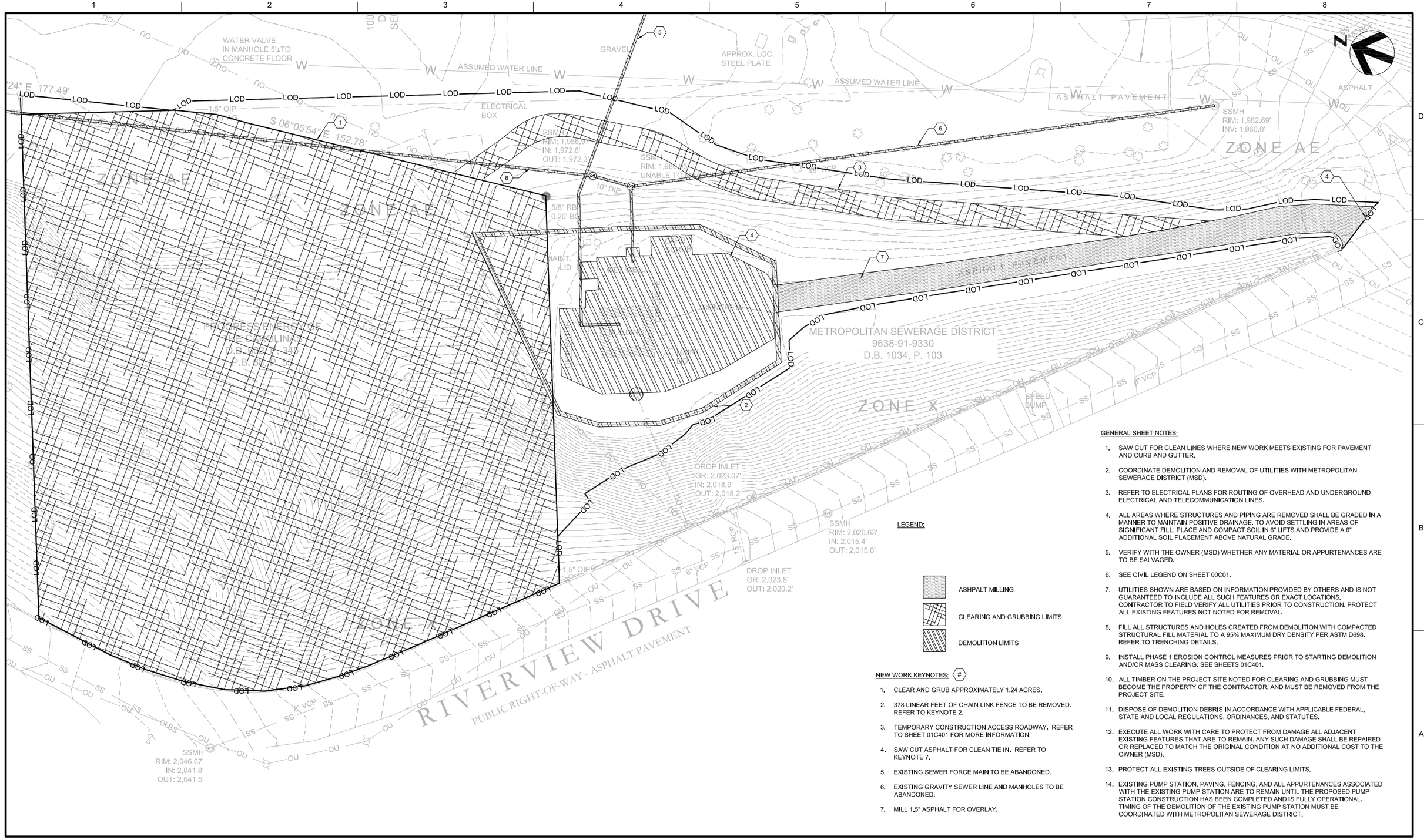
METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

EXISTING SITE PLAN

0 1" 2"

FILENAME 01C101.dwg
SCALE 1"=20'

SHEET 01C101



LEGEND:

- ASHPALT MILLING
- CLEARING AND GRUBBING LIMITS
- DEMOLITION LIMITS

NEW WORK KEYNOTES: (#)

1. CLEAR AND GRUB APPROXIMATELY 1.24 ACRES.
2. 378 LINEAR FEET OF CHAIN LINK FENCE TO BE REMOVED. REFER TO KEYNOTE 2.
3. TEMPORARY CONSTRUCTION ACCESS ROADWAY. REFER TO SHEET 01C401 FOR MORE INFORMATION.
4. SAW CUT ASPHALT FOR CLEAN TIE IN. REFER TO KEYNOTE 7.
5. EXISTING SEWER FORCE MAIN TO BE ABANDONED.
6. EXISTING GRAVITY SEWER LINE AND MANHOLES TO BE ABANDONED.
7. MILL 1.5" ASPHALT FOR OVERLAY.

GENERAL SHEET NOTES:

1. SAW CUT FOR CLEAN LINES WHERE NEW WORK MEETS EXISTING FOR PAVEMENT AND CURB AND GUTTER.
2. COORDINATE DEMOLITION AND REMOVAL OF UTILITIES WITH METROPOLITAN SEWERAGE DISTRICT (MSD).
3. REFER TO ELECTRICAL PLANS FOR ROUTING OF OVERHEAD AND UNDERGROUND ELECTRICAL AND TELECOMMUNICATION LINES.
4. ALL AREAS WHERE STRUCTURES AND PIPING ARE REMOVED SHALL BE GRADED IN A MANNER TO MAINTAIN POSITIVE DRAINAGE. TO AVOID SETTLING IN AREAS OF SIGNIFICANT FILL, PLACE AND COMPACT SOIL IN 6" LIFTS AND PROVIDE A 6" ADDITIONAL SOIL PLACEMENT ABOVE NATURAL GRADE.
5. VERIFY WITH THE OWNER (MSD) WHETHER ANY MATERIAL OR APPURTENANCES ARE TO BE SALVAGED.
6. SEE CIVIL LEGEND ON SHEET 00C01.
7. UTILITIES SHOWN ARE BASED ON INFORMATION PROVIDED BY OTHERS AND IS NOT GUARANTEED TO INCLUDE ALL SUCH FEATURES OR EXACT LOCATIONS. CONTRACTOR TO FIELD VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION. PROTECT ALL EXISTING FEATURES NOT NOTED FOR REMOVAL.
8. FILL ALL STRUCTURES AND HOLES CREATED FROM DEMOLITION WITH COMPACTED STRUCTURAL FILL MATERIAL TO A 95% MAXIMUM DRY DENSITY PER ASTM D698. REFER TO TRENCHING DETAILS.
9. INSTALL PHASE 1 EROSION CONTROL MEASURES PRIOR TO STARTING DEMOLITION AND/OR MASS CLEARING. SEE SHEETS 01C401.
10. ALL TIMBER ON THE PROJECT SITE NOTED FOR CLEARING AND GRUBBING MUST BECOME THE PROPERTY OF THE CONTRACTOR, AND MUST BE REMOVED FROM THE PROJECT SITE.
11. DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES, AND STATUTES.
12. EXECUTE ALL WORK WITH CARE TO PROTECT FROM DAMAGE ALL ADJACENT EXISTING FEATURES THAT ARE TO REMAIN. ANY SUCH DAMAGE SHALL BE REPAIRED OR REPLACED TO MATCH THE ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER (MSD).
13. PROTECT ALL EXISTING TREES OUTSIDE OF CLEARING LIMITS.
14. EXISTING PUMP STATION, PAVING, FENCING, AND ALL APPURTENANCES ASSOCIATED WITH THE EXISTING PUMP STATION ARE TO REMAIN UNTIL THE PROPOSED PUMP STATION CONSTRUCTION HAS BEEN COMPLETED AND IS FULLY OPERATIONAL. TIMING OF THE DEMOLITION OF THE EXISTING PUMP STATION MUST BE COORDINATED WITH METROPOLITAN SEWERAGE DISTRICT.

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PRELIMINARY

ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	MATTHEW A. SHULTZ
DESIGNED BY	C.GIGLIOTTI,J.CAUSEY
CHECKED BY	J. CAUSEY
DRAWN BY	C. GIGLIOTTI
PROJECT NUMBER	10194380

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

CARRIER BRIDGE PUMP STATION

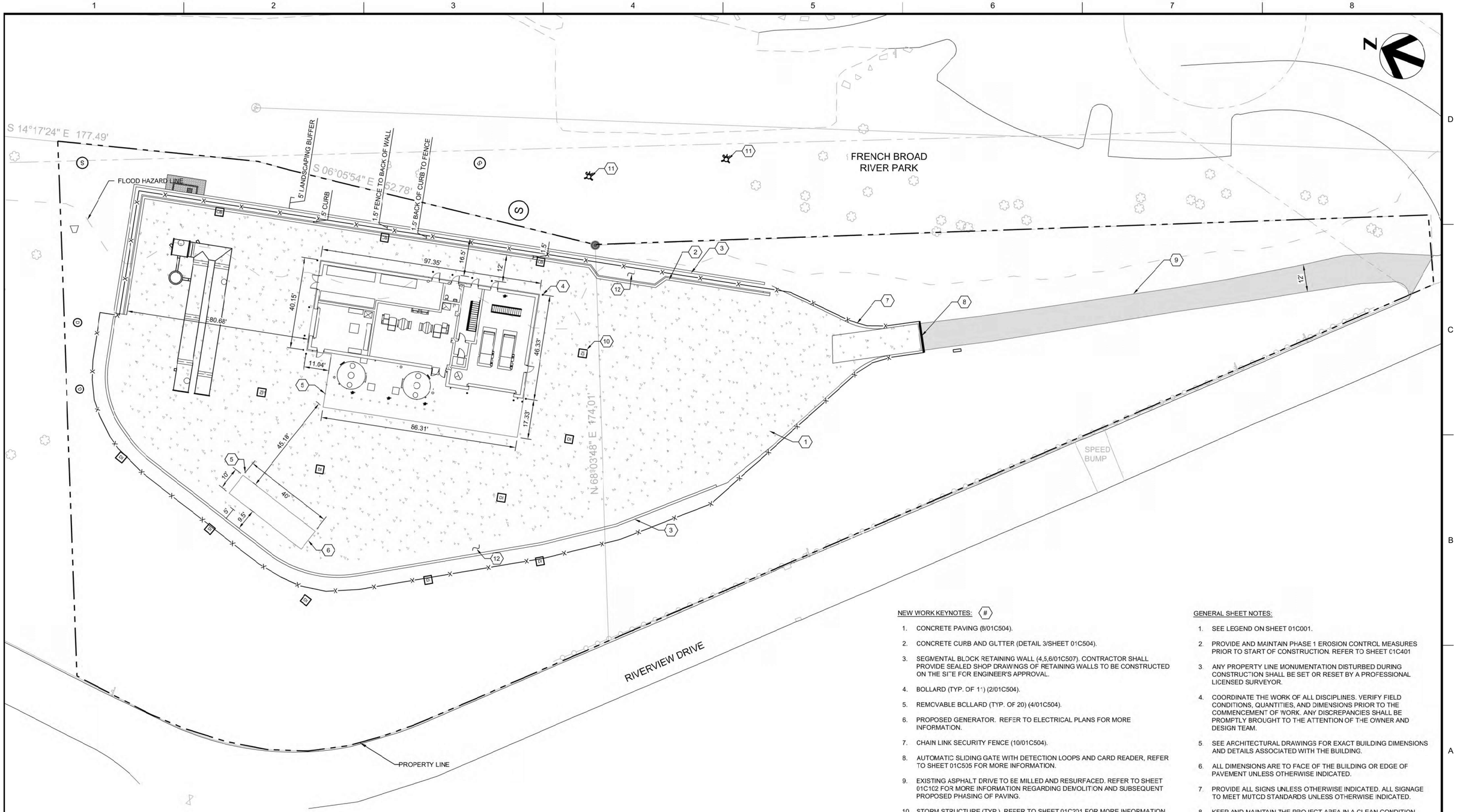
METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

PUMP STATION SITE CLEARING AND DEMOLITION PLAN

0 1" 2"

FILENAME 01C102.dwg
SCALE 1"=20'

SHEET 01C102



NEW WORK KEYNOTES: (#)

1. CONCRETE PAVING (8/01C504).
2. CONCRETE CURB AND GUTTER (DETAIL 3/SHEET 01C504).
3. SEGMENTAL BLOCK RETAINING WALL (4,5,6/01C507). CONTRACTOR SHALL PROVIDE SEALED SHOP DRAWINGS OF RETAINING WALLS TO BE CONSTRUCTED ON THE SITE FOR ENGINEER'S APPROVAL.
4. BOLLARD (TYP. OF 11) (2/01C504).
5. REMOVABLE BOLLARD (TYP. OF 20) (4/01C504).
6. PROPOSED GENERATOR. REFER TO ELECTRICAL PLANS FOR MORE INFORMATION.
7. CHAIN LINK SECURITY FENCE (10/01C504).
8. AUTOMATIC SLIDING GATE WITH DETECTION LOOPS AND CARD READER, REFER TO SHEET 01C505 FOR MORE INFORMATION.
9. EXISTING ASPHALT DRIVE TO BE MILLED AND RESURFACED. REFER TO SHEET 01C102 FOR MORE INFORMATION REGARDING DEMOLITION AND SUBSEQUENT PROPOSED PHASING OF PAVING.
10. STORM STRUCTURE (TYP.), REFER TO SHEET 01C201 FOR MORE INFORMATION.
11. FIRE HYDRANT, REFER TO SHEET 01C301 FOR MORE INFORMATION.
12. REFER TO SHEET 01C104 FOR MORE LANDSCAPING INFORMATION

GENERAL SHEET NOTES:

1. SEE LEGEND ON SHEET 01C001.
2. PROVIDE AND MAINTAIN PHASE 1 EROSION CONTROL MEASURES PRIOR TO START OF CONSTRUCTION. REFER TO SHEET 01C401
3. ANY PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LICENSED SURVEYOR.
4. COORDINATE THE WORK OF ALL DISCIPLINES. VERIFY FIELD CONDITIONS, QUANTITIES, AND DIMENSIONS PRIOR TO THE COMMENCEMENT OF WORK. ANY DISCREPANCIES SHALL BE PROMPTLY BROUGHT TO THE ATTENTION OF THE OWNER AND DESIGN TEAM.
5. SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND DETAILS ASSOCIATED WITH THE BUILDING.
6. ALL DIMENSIONS ARE TO FACE OF THE BUILDING OR EDGE OF PAVEMENT UNLESS OTHERWISE INDICATED.
7. PROVIDE ALL SIGNS UNLESS OTHERWISE INDICATED. ALL SIGNAGE TO MEET MUTCD STANDARDS UNLESS OTHERWISE INDICATED.
8. KEEP AND MAINTAIN THE PROJECT AREA IN A CLEAN CONDITION, FREE OF DEBRIS AND TRASH.
9. CURBING SHALL BE CAST-IN-PLACE ON-SITE.

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PRELIMINARY

ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	MATTHEW A. SHULTZ
DESIGNED BY	C.GIGLIOTTI,J.CAUSEY
CHECKED BY	J. CAUSEY
DRAWN BY	C. GIGLIOTTI
PROJECT NUMBER	10194380

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

CARRIER BRIDGE PUMP STATION

METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

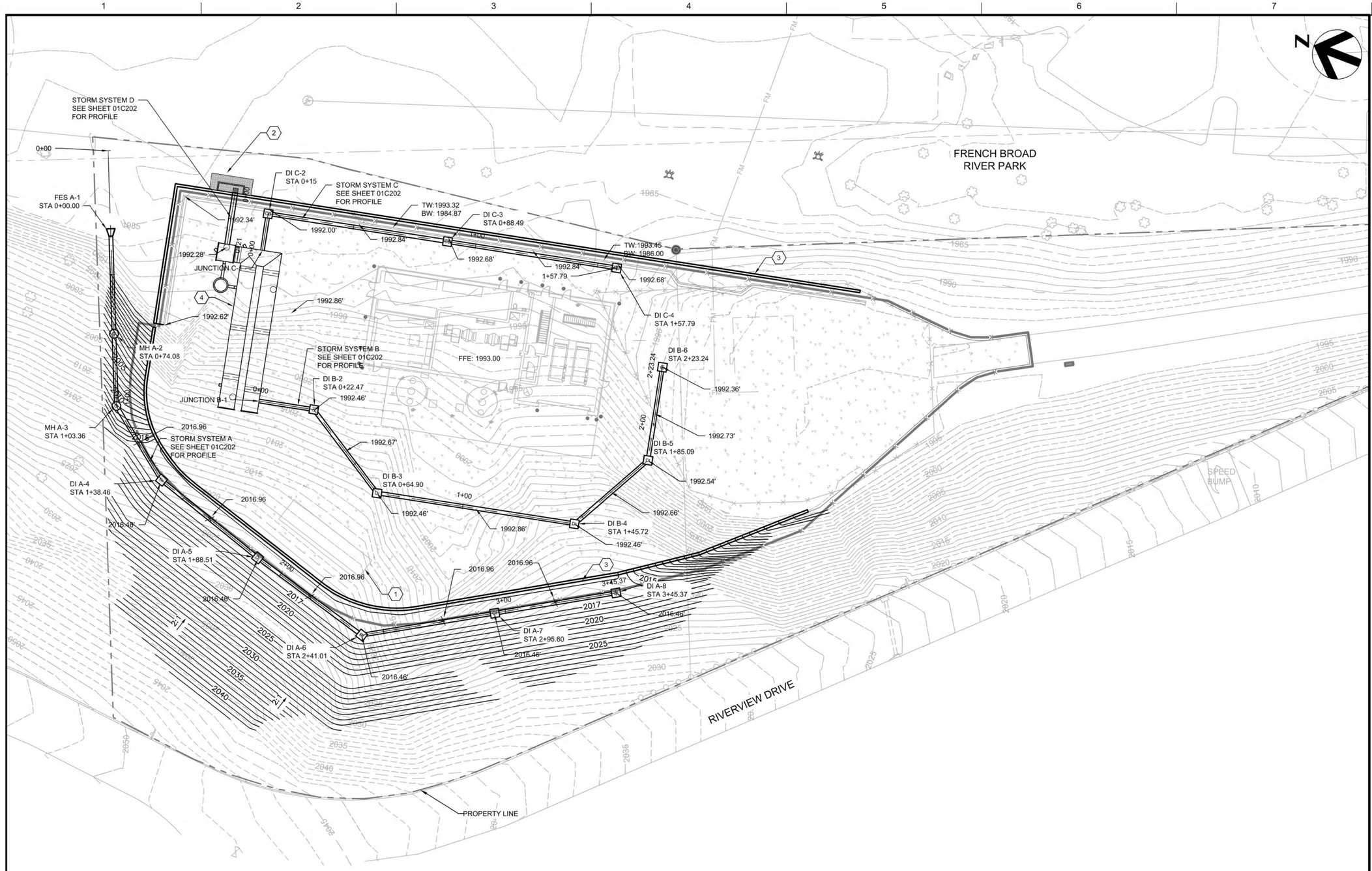
SITE LAYOUT AND CONTROLS PLAN

0 1" 2'

FILENAME 00C103.dwg

SCALE 1"=20'

SHEET 01C103



GENERAL SHEET NOTES:

1. SEE LEGEND ON SHEET 00C001.
2. PROVIDE AND MAINTAIN EROSION CONTROL MEASURES. SEE EROSION CONTROL SHEETS 01C401 AND 01C402.
3. FOR DROP INLET (DI) STORM STRUCTURE SEE DETAIL 1/01C506.
4. FOR CATCH BASIN (CB) STORM STRUCTURE SEE DETAILS 2,4/01C506.
5. FOR MANHOLE STORM STRUCTURE SEE DETAIL 3/01C506 AND 1/01C507.
6. FOR TRENCHING ASSOCIATED WITH STORM PIPE SEE DETAIL 1/01C501.
7. RCP MUST BE CLASS III UNLESS OTHERWISE SPECIFIED.
8. ALL GRADE TRANSITIONS MUST BE SMOOTH AND GRADUAL WITH NO ABRUPT OR SHARP CHANGES.
9. FINISHED GRADE MUST BE ½ INCH TO 1 INCH BELOW TOP OF ABUTTING PAVEMENTS, SIDEWALKS, AND CURBING.
10. SEE SHEET 01C202 FOR STORM SYSTEM PROFILES.

NEW WORK KEYNOTES: (#)

1. CONCRETE GENERATOR PAD, REFER TO ELECTRICAL DRAWINGS FOR MORE INFORMATION. TOP OF CONCRETE PAD ELEVATION = 1993.50.
2. LEVEL SPREADER (6/01C504).
3. SEGMENTAL BLOCK RETAINING WALL (4,5,8/01C507). CONTRACTOR SHALL PROVIDE SEALED SHOP DRAWINGS OF RETAINING WALLS TO BE CONSTRUCTED ON THE SITE FOR ENGINEER'S APPROVAL.
4. UNDERGROUND DETENTION SYSTEM (1,2,3,4/01C510 AND 1,2/01C511).

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CHECKED BY	J. CAUSEY
DRAWN BY	C. GIGLIOTTI
PROJECT NUMBER	10194380

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

CARRIER BRIDGE PUMP STATION

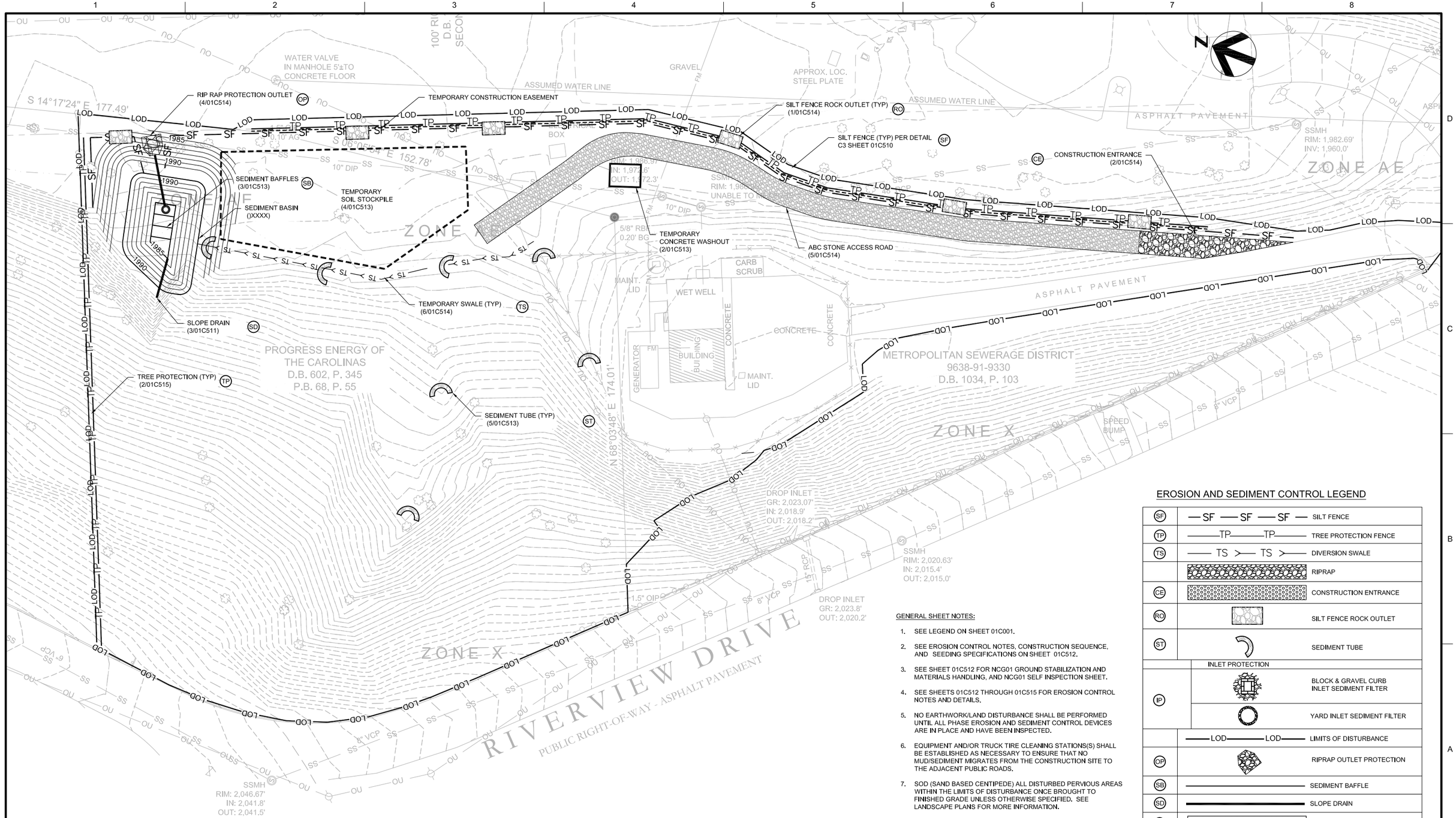
METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

GRADING AND DRAINAGE PLAN

0 1" 2"

FILENAME 01C201.dwg
SCALE 1"=20'

SHEET 01C201



EROSION AND SEDIMENT CONTROL LEGEND

SF	— SF — SF — SF —	SILT FENCE
TP	— TP — TP —	TREE PROTECTION FENCE
TS	— TS > — TS > —	DIVERSION SWALE
		RIPRAP
CE		CONSTRUCTION ENTRANCE
RO		SILT FENCE ROCK OUTLET
ST		SEDIMENT TUBE
	INLET PROTECTION	
IP		BLOCK & GRAVEL CURB INLET SEDIMENT FILTER
IP		YARD INLET SEDIMENT FILTER
	— LOD — LOD —	LIMITS OF DISTURBANCE
OP		RIPRAP OUTLET PROTECTION
SB		SEDIMENT BAFFLE
SD		SLOPE DRAIN
EM		EROSION CONTROL MATTING

GENERAL SHEET NOTES:

1. SEE LEGEND ON SHEET 01C001.
2. SEE EROSION CONTROL NOTES, CONSTRUCTION SEQUENCE, AND SEEDING SPECIFICATIONS ON SHEET 01C512.
3. SEE SHEET 01C512 FOR NCG01 GROUND STABILIZATION AND MATERIALS HANDLING, AND NCG01 SELF INSPECTION SHEET.
4. SEE SHEETS 01C512 THROUGH 01C515 FOR EROSION CONTROL NOTES AND DETAILS.
5. NO EARTHWORK/LAND DISTURBANCE SHALL BE PERFORMED UNTIL ALL PHASE EROSION AND SEDIMENT CONTROL DEVICES ARE IN PLACE AND HAVE BEEN INSPECTED.
6. EQUIPMENT AND/OR TRUCK TIRE CLEANING STATIONS(S) SHALL BE ESTABLISHED AS NECESSARY TO ENSURE THAT NO MUD/SEDIMENT MIGRATES FROM THE CONSTRUCTION SITE TO THE ADJACENT PUBLIC ROADS.
7. SOD (SAND BASED CENTIPEDE) ALL DISTURBED PERVIOUS AREAS WITHIN THE LIMITS OF DISTURBANCE ONCE BROUGHT TO FINISHED GRADE UNLESS OTHERWISE SPECIFIED. SEE LANDSCAPE PLANS FOR MORE INFORMATION.
8. TOTAL LAND DISTURBANCE = 1.91 ACRES
9. CONTRACTOR MUST ENSURE REQUIRED MAINTENANCE OF EROSION CONTROL MEASURES.

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ISSUE	DATE	DESCRIPTION

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DESIGNED BY	C.GIGLIOTTI,J.CAUSEY
CHECKED BY	J. CAUSEY
DRAWN BY	C. GIGLIOTTI
PROJECT NUMBER	10194380

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

CARRIER BRIDGE PUMP STATION

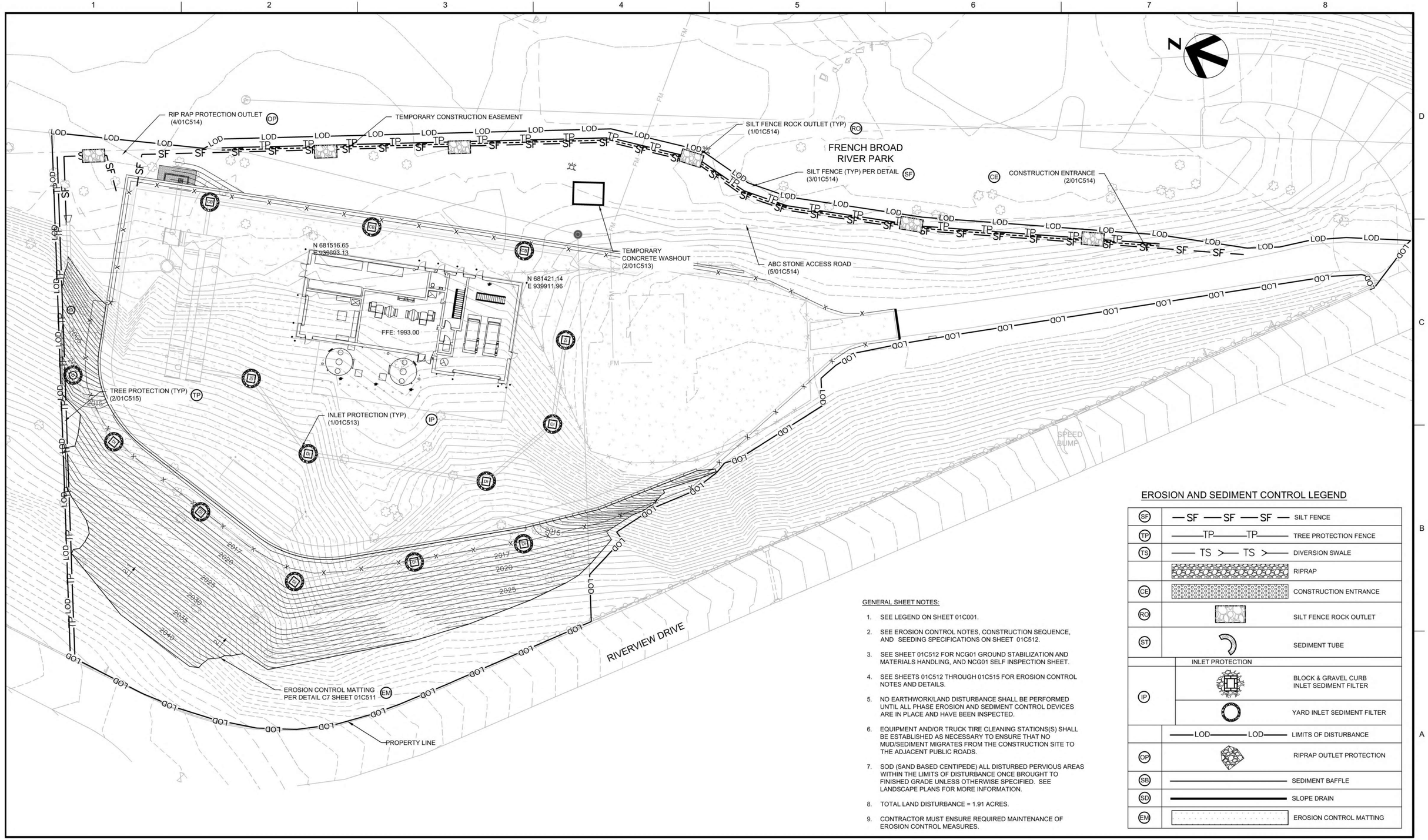
METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

EROSION CONTROL PLAN PHASE 1

0 1" 2"

FILENAME 01C401.dwg
SCALE 1"=20'

SHEET 01C401



EROSION AND SEDIMENT CONTROL LEGEND

SF	SILT FENCE
TP	TREE PROTECTION FENCE
TS	DIVERSION SWALE
	RIPRAP
CE	CONSTRUCTION ENTRANCE
RO	SILT FENCE ROCK OUTLET
ST	SEDIMENT TUBE
	INLET PROTECTION
IP	BLOCK & GRAVEL CURB INLET SEDIMENT FILTER
IP	YARD INLET SEDIMENT FILTER
	LIMITS OF DISTURBANCE
OP	RIPRAP OUTLET PROTECTION
SB	SEDIMENT BAFFLE
SD	SLOPE DRAIN
EM	EROSION CONTROL MATTING

GENERAL SHEET NOTES:

1. SEE LEGEND ON SHEET 01C001.
2. SEE EROSION CONTROL NOTES, CONSTRUCTION SEQUENCE, AND SEEDING SPECIFICATIONS ON SHEET 01C512.
3. SEE SHEET 01C512 FOR NCG01 GROUND STABILIZATION AND MATERIALS HANDLING, AND NCG01 SELF INSPECTION SHEET.
4. SEE SHEETS 01C512 THROUGH 01C515 FOR EROSION CONTROL NOTES AND DETAILS.
5. NO EARTHWORK/LAND DISTURBANCE SHALL BE PERFORMED UNTIL ALL PHASE EROSION AND SEDIMENT CONTROL DEVICES ARE IN PLACE AND HAVE BEEN INSPECTED.
6. EQUIPMENT AND/OR TRUCK TIRE CLEANING STATIONS(S) SHALL BE ESTABLISHED AS NECESSARY TO ENSURE THAT NO MUD/SEDIMENT MIGRATES FROM THE CONSTRUCTION SITE TO THE ADJACENT PUBLIC ROADS.
7. SOD (SAND BASED CENTIPEDE) ALL DISTURBED PERVIOUS AREAS WITHIN THE LIMITS OF DISTURBANCE ONCE BROUGHT TO FINISHED GRADE UNLESS OTHERWISE SPECIFIED. SEE LANDSCAPE PLANS FOR MORE INFORMATION.
8. TOTAL LAND DISTURBANCE = 1.91 ACRES.
9. CONTRACTOR MUST ENSURE REQUIRED MAINTENANCE OF EROSION CONTROL MEASURES.

HDR Engineering Inc.
of the Carolinas

440 S. Church Street, Suite 1000
Charlotte, NC 28202
704.338.6700

N.C.B.E.L.S. License Number: F-0116

PRELIMINARY

ISSUE	DATE	DESCRIPTION

PROJECT MANAGER	MATTHEW A. SHULTZ
DESIGNED BY	C.GIGLIOTTI,J.CAUSEY
CHECKED BY	J. CAUSEY
DRAWN BY	C. GIGLIOTTI
PROJECT NUMBER	10194380

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

CARRIER BRIDGE PUMP STATION

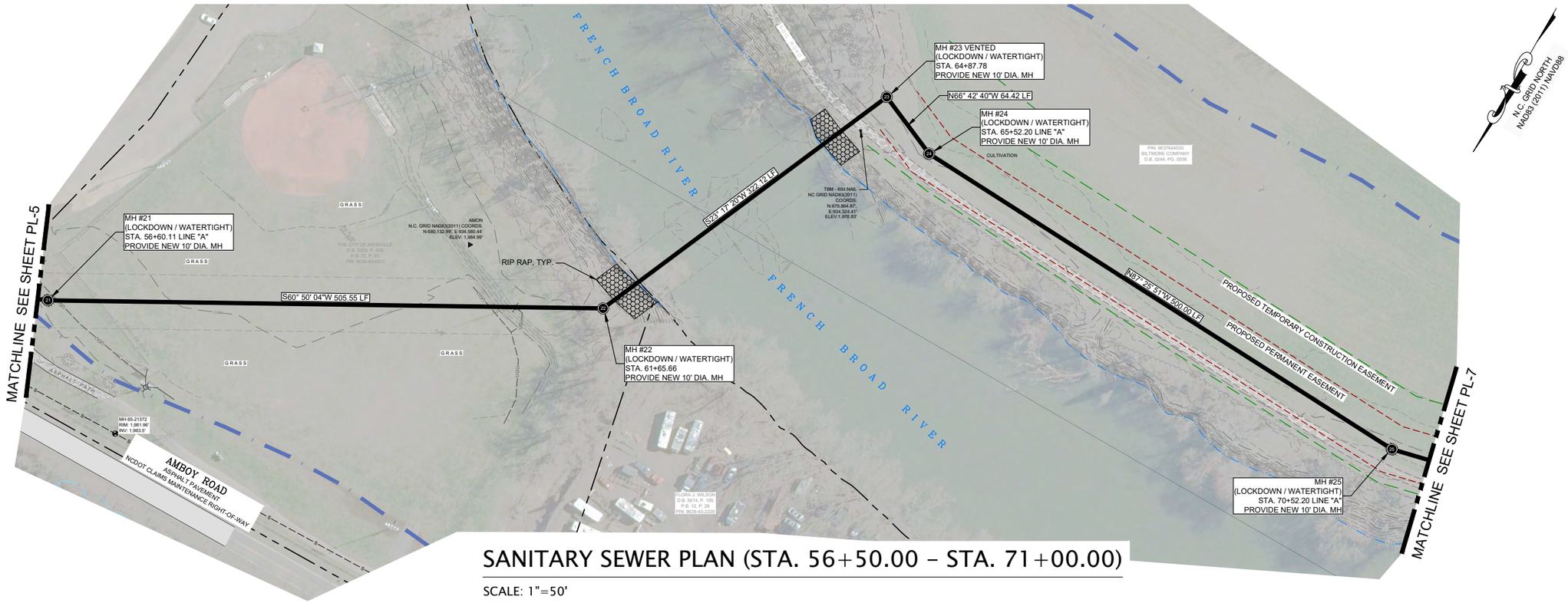
METROPOLITAN SEWERAGE DISTRICT OF BUNCOMBE COUNTY

EROSION CONTROL PLAN PHASE 2

0 1" 2"

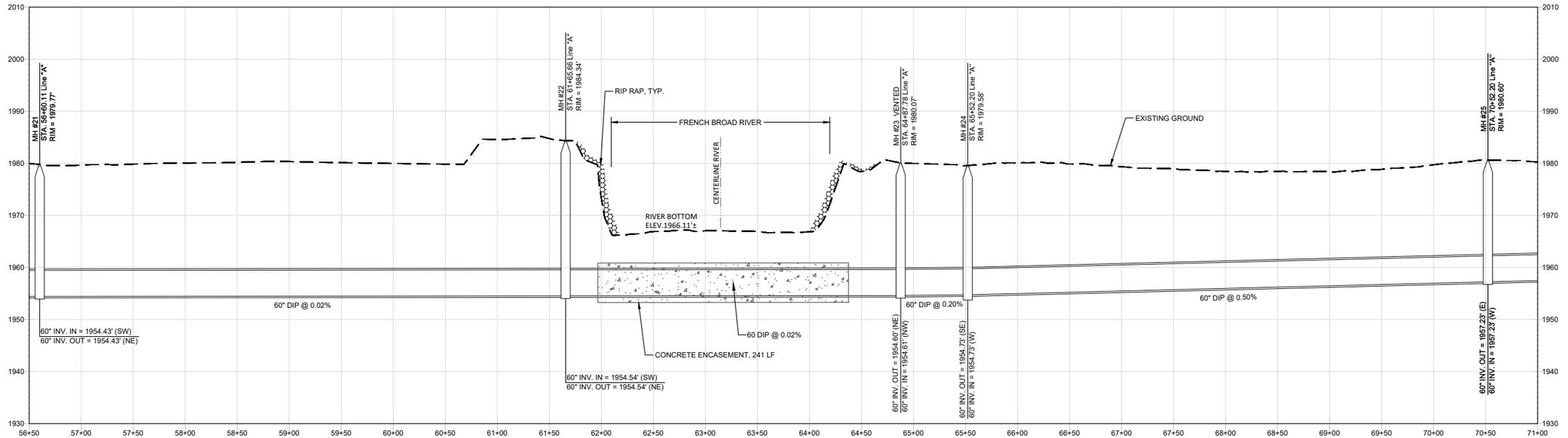
FILENAME 01C402.dwg
SCALE 1"=20'

SHEET 01C402



SANITARY SEWER PLAN (STA. 56+50.00 – STA. 71+00.00)

SCALE: 1"=50'



SANITARY SEWER PROFILE (STA. 56+50.00 – STA. 71+00.00)

SCALE. HORIZ: 1"=50' ; VERT. 1"=10'

50 0 25 50 100 150
GRAPHIC SCALE 1 INCH = 50 FEET

P:\MSD_MSD\South French Broad Relief Interceptor\DWG\DES\SR Relief Interceptor-60 WOrkway 2/9/2023 7:47 AM wsmith

Metropolitan Sewerage District of Buncombe County

SOUTH FRENCH BROAD RELIEF INTERCEPTOR
(STA. 56+50.00 – STA. 71+00.00)

PL-6

DRAWN: KMK | DATE: 11/02/2021
CHECKED BY: KMK | SCALE: 1" = 50'
APPROVED: WHC

PRELIMINARY-
DO NOT USE FOR
CONSTRUCTION

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 049141 WILLIAM H. CHESTER

No.	DESCRIPTION	DATE
1.	60% DESIGN	2/9/2023

REVISIONS

MSD
Engineering Division

METROPOLITAN SEWERAGE DISTRICT • BUNCOMBE COUNTY, NORTH CAROLINA

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Biological Opinion

Carrier Bridge Pump Station in Asheville, Buncombe County, North Carolina

Service Log #23-561
Service ECOSphere Project Codes 2023-0036082 & 2023-0088477

Prepared by:

U.S. Fish and Wildlife Service
Asheville Ecological Services Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

Janet Mizzi
Field Supervisor
Asheville Ecological Services Field Office
Asheville, North Carolina

Table of Contents

Consultation History

March 1, 2021:	The HDR Engineering Inc. (HDR) introduces proposed project and requests technical assistance related to listed species surveys.
July 12, 2021:	Project proponents submit preliminary project description and locations of proposed river crossings.
July 14, 2021:	HDR provides preliminary project description, including an alternatives analysis, cost analysis, and potential impact avoidance and minimization measures in interagency pre-application meeting.
July 15, 2021:	The U.S. Fish and Wildlife Service (Service) provides technical assistance for developing a complete biological assessment (BA) and referencing definitions of key regulatory terms.
July 23, 2021:	Telephone and email exchanges wherein the Service provides examples of a relevant BA and Biological Opinion (BO) to project proponents.
September 22, 2022:	The Service conducts freshwater mussel surveys with project proponents.
November 18, 2022:	HDR submits a Preliminary Jurisdictional Determination Package to the U.S. Army Corps of Engineers (USACE).
May 1, 2023:	HDR and USACE submits Preconstruction Notification (PCN) and BA to the Service via DOD SAFE link.
May 3, 2023:	Telephone exchange between the USACE and the Service regarding appropriate effect determinations for listed bat species and Appalachian elktoe considering reclassification of northern long-eared bat and mussel survey results.
May 15, 2023:	Meeting with USACE, Service, and HDR to discuss outstanding information needs in the BA.
June 1, 2023:	HDR provides meeting notes summarizing May 15, 2023, meeting and indicates that they are preparing responses to the Services information requests.
June 16, 2023:	HDR provides additional information to the Service in support of the USACE's BA.
June 27, 2023:	Telephone exchange between the USACE and Service with brief discussion about cumulative effects and additional information provided by HDR.
August 22, 2023:	The Service notifies the USACE that we consider the BA to be complete.
October 4, 2023:	Email exchange from Service to USACE and project proponents providing progress update on draft BO.
October 30, 2023:	The Service provides the USACE a signed BO for the proposed project.
December 8, 2023:	The USACE requests amendments to Conservation Measure #8.

1. Introduction

A biological opinion is the document that states the opinion of the Service in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act), as to whether a federal action is likely to jeopardize the continued existence of species listed as endangered or threatened; or result in the destruction or adverse modification of designated critical habitat.

Formal consultation was requested by the USACE, who is the lead federal action agency for this project for section 7 purposes. This document transmits the Service's biological opinion (Opinion) based on our review of the proposed Carrier Bridge Pump Station project (CBPS) in Asheville, Buncombe County, North Carolina (NC), and its effects on the federally endangered Appalachian elktoe (*Alasmidonta raveneliana*).

In addition to Appalachian elktoe, suitable roosting, foraging, and/or commuting habitats occur within the proposed action area for the federally endangered gray bat (*Myotis grisescens*), northern long-eared bat (*Myotis septentrionalis*), and the proposed endangered tricolored bat (*Perimyotis subflavus*). The USACE has determined that the proposed action may affect but is not likely to adversely affect these species and

has requested our concurrence. Informal consultation for these bat species is provided by separate correspondence.

This Opinion is based on information provided in the May 1, 2023, PCN, the BA dated March 28, 2023 (embedded within the PCN), additional information from HDR provided June 16, 2023, communications with the USACE and project proponents since March 1, 2021, communications with experts on the affected species, and other sources of information. A complete administrative record of this consultation is on file at the Asheville Ecological Services Field Office.

2. Proposed Action

As defined in the Service's section 7 regulations (50 CFR 402.02), "*action*" means "*all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas*." The "*action area*" is defined as "*all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action*." The effects of the action must be considered in conjunction with the effects of other past and present federal, state, or private activities, as well as the cumulative effects of reasonably certain future state or private activities within the action area.

The Metropolitan Sewerage District of Buncombe County, NC (MSD, Applicant) is seeking authorization from the USACE to impact jurisdictional waters of the United States associated with improvements to existing wastewater infrastructure. The proposed action would entail the construction of a new pump station, replacement of existing influent gravity sewer lines and the replacement of existing force main pipelines to accommodate growing demand. The USACE's BA indicates that the CBPS project would address service demands for the next 50 years.

According to the BA and materials provided by the Applicant, the CBPS project would be completed in approximately 47 months beginning November 15, 2024, and would be complete by October 12, 2028 (Table 2). Detailed project descriptions are provided in the sections below and in the USACE's BA.

2.1 Action Area

The action area for this project is approximately 300 acres in extent and is located within or near the French Broad River (FBR) in Asheville, NC. The action area includes the proposed project footprint, the French Broad Study Area, and areas that would be used for staging, site access, and all other work areas (Figures 1 – 3). The action area also includes those areas which may be subject to effects from lighting, noise, and vibration.

Specifically, the USACE describes the action area to include the following:

- A 40,000 –square-foot (ft) (0.91-acre) construction footprint for a new pump station,
- two parallel 36-inch (in) diameter force main pipes each measuring approximately 1,546 linear feet (ft) (including a 250-linear-ft crossing of the FBR, Figure 4),
- A 60-in diameter gravity sewer pipe connecting to the new CBPS measuring approximately 850 linear ft (Figure 4),
- A 60-in diameter gravity sewer pipe crossing the FBR measuring approximately 300 linear ft (Figure 5),
- 450 linear ft of an existing 54-in diameter pipe along Lyman Street to be repaired with an interceptor lining (Figure 4),
- Approximately 1,044 linear ft of existing 48-in diameter/54-in diameter pipe along Lyman Street to be replaced with a larger 60-in diameter pipe (Figure 4),

- A reach of the FBR that is 0.25 river mile (1,320 ft) upstream and 0.5 river mile (2,640 ft) downstream of the proposed cofferdams required for the open-cut installation of the 60-in diameter gravity sewer pipe and 36-in diameter force main pipes (Figures 2, 4, and 5)
- Approximately 320 linear ft of bank stabilization on the west bank and approximately 330 linear ft of bank stabilization on the east bank of the FBR for the proposed 36-in diameter force mains crossing (North River Crossing, Figure 4).
- Approximately 600 linear ft of bank stabilization on the north bank and approximately 400 linear ft of bank stabilization on the south bank of the FBR for the proposed 60-in diameter gravity sewer pipe crossing (South River Crossing, Figure 5).
- Potential construction laydown areas located within a pre-cleared park and/or agricultural crop areas near the proposed construction areas (exact locations to be determined by the contractor and coordination efforts with the appropriate landowners).
- A proposed access route located on Biltmore Estate property (approximately 3 miles in total length) to be used for construction access to the proposed work area for the South River Crossing (Figure 3).

2.2 Project Description

The CBPS project is composed of several components which are summarized below. Detailed descriptions of these components are also provided in the USACE's BA.

2.2.1 Carrier Bridge Pump Station Replacement

The new 4,200-square-ft, two-level CBPS replacement facility will be constructed north of the existing pump station (Figure 2). The new facility would contain two influent screens with a 1.5-in screen opening size, each rated for 50 million gallons per day peak inflow. The total area of the facility including appurtenances for vehicle access is 0.1 acres. The total work area required to construct this component is approximately 0.3 acre and 0.21 acre of woody vegetation (i.e., trees and shrubs) would be removed between November 15, 2024, and April 1, 2025 (Table 1 and Table 2).

The existing CBPS will remain in operation while the new CBPS is being constructed. Once construction of the new CBPS is completed and in service, the original station will be out of service, demolished, and its former site will be incorporated into the new station's paved driveway and concrete pavement. Disturbed areas not paved for parking would be revegetated with native plant species.

2.2.2 36-inch-diameter Force Mains

Two parallel 36-in diameter force mains, one duty and one backup, would replace the existing 24-in diameter ductile iron pipe (DIP) force main. These force mains would be installed between a proposed CBPS site on the west side of the FBR and the existing 54-in diameter interceptor located on the east side of the FBR (Figure 4). Construction of the new force mains will be conducted by open-cut dry-ditch (trenching) methods. The two parallel 36-in diameter force mains will measure approximately 1,546 linear ft in total, including an approximately 250 linear ft crossing under the FBR (referred to as the North River Crossing).

The existing 24-in diameter force main that crosses FBR will be abandoned in place by cutting and capping the existing pipe. Project proponents indicate that this line will not be kept in service because it is considered a "high risk force main" due to its age and submergence in the riverbed and would present an environmental hazard under the increased demand for the new CBPS.

The upland areas adjacent to the proposed parallel 36-in diameter force main alignments consist of upland woodland and open grassland areas (i.e., French Broad River Park and overhead transmission line right-of-way). The total upland construction areas are approximately 1.48 acres in extent. Within this proposed

right-of-way area, approximately 0.98 acre of woody vegetation would be removed between November 15, 2025, and April 1, 2026 (Table 1 and Table 2).

2.2.3 60-inch diameter Influent Gravity Sewer Interceptor

Approximately 850 linear ft of a single 60-in diameter gravity sewer interceptor pipeline would be installed to convey wastewater flows into the new CBPS. The new 60-in diameter gravity sewer interceptor pipe would connect to the existing 48-in diameter South French Broad interceptor pipe just south of Amboy Road near the Amboy Road bridge over the FBR (Figure 4). This project component also includes construction of an approximately 300-linearft river crossing segment consisting of a 60-in diameter pipe under the FBR just west of the Carrier Park Sports Facility (Figure 5). The new pipeline would be installed by open-cut dry-ditch (trenching) methods described in detail in the sections below and in the USACE's BA.

This project component would require disturbance to approximately 0.95 acre of which, 0.86 acre of woody vegetation would be removed. Tree removal associated with the Amboy Road crossing would occur between November 15, 2024, and April 1, 2025, and tree removal associated with the FBR crossing would occur between November 15, 2025, and January 1, 2026 (Table 1 and Table 2).

The purpose of this pipe crossing (referred to as the South River Crossing) is to accommodate projected needs for future system upgrades slated for construction in approximately 2035. As such, the proposed 60-in diameter pipe installed under the river as part of this project will be capped at both ends until MSD is ready to proceed with pipeline system upgrades, which would connect to this crossing point. This consultation does not address impacts or cover take of listed species associated with system upgrades which are projected for construction in approximately 2035.

Since the South River Crossing consists of a gravity pipeline, its final placement would dictate the depth of the pump station. Although the sewer line at the South River Crossing will not be operational once the CBPS project is complete, its installation and final elevation is essential for constructing the new pump station and other components of this project.

2.2.4 French Broad River Pipeline Crossings

The North and South River Crossings of the FBR referenced in the two sections above would be installed using trenching methods (open-cut dry-ditch) at the respective sites (Figures 2, 4, and 5). Project proponents first considered the use of micro-tunneling methods to accomplish crossings of the FBR. However, the extent of solid bedrock material under this area of the FBR and required tunnel depth under the streambed (minimum 18 ft) would expand the action area much further into upland areas and rendered these methods infeasible.

For each of the two sites, a trench would be mechanically excavated under dry operating conditions with the aid of U-shaped coffer dams. Coffer dam and pipeline installation would occur in two stages at each of the two crossings. Each of the four stages would entail the placement of a temporary cofferdam that spans approximately 130 linear ft from the riverbank into the FBR and would be approximately 50 ft wide. The area within the cofferdam would then be dewatered, excavated, the pipeline segment would be installed, the excavated area would be backfilled to pre-existing riverbed elevations. The cofferdam would then be reinstalled adjacent to the first stage and the construction sequence described above would be repeated.

Staged cofferdam placement would ensure that FBR streamflow is not completely obstructed at any time. The Applicant modeled streamflow hydraulics (via HEC-RAS) for 2-year, 5-year, 10-year, and 25-year storm events and determined that either sheet pile (with king piles) or braced box sheet pile cofferdam

types would be used. Cofferdams would need to extend at least 12 ft above the riverbed to withstand a 2-year storm event. The USACE's BA (Section 2.2.8) indicates that cofferdams at the North and South River Crossings would remain in the FBR for six months at each crossing.

Cofferdam installation would constrict streamflow volume into a smaller cross-sectional area which will increase flow velocity and shearing forces on adjacent streambanks. Riparian habitats adjacent to the FBR pipeline crossings are composed of erodible sand and silt substrates structured by root systems of herbaceous and large woody vegetation. To prevent the potential for project-mediated streambank erosion and sedimentation of aquatic habitats, the Applicant proposes to install temporary bank stabilization measures which may include the use of riprap, articulated concrete blocks, and/or gabion mattress. The North and South River Crossings would entail approximately 0.87 acre and 1.43 acres of temporary bank stabilization, respectively (Figures 4 and 5). Once the pipeline crossing is completed, the temporary bank stabilization measures would be removed and replaced with permanent natural bank stabilization using bioengineering techniques to strengthen and return the bank slopes to vegetated riparian habitats.

This project component would entail approximately 0.45 acre and 0.5 acre of woody vegetation removal at the North and South River Crossings, respectively. Associated tree clearing would be accomplished between November 15, 2025, and April 1, 2026 (Table 1 and Table 2).

2.2.5 48-inch diameter and 54-inch diameter Gravity Sewer Rehabilitation

Approximately 1,044 linear ft of deteriorated 48-in diameter and 54-in diameter pipe will be replaced with 60-in diameter pipeline between Lyman Street and the FBR (Figure 4). This area is dominated by maintained open grassy areas and would require up to 0.1 acre of tree clearing (Table 1). Any tree clearing associated with the rehabilitation of the existing 54-in diameter sewer line would be accomplished between November 15, 2025, and March 1, 2026 (Table 1 and Table 2). Any tree clearing associated with the rehabilitation of the 48-in diameter sewer line would be accomplished between November 15, 2027, and January 1, 2028 (Table 1 and Table 2).

2.2.6 Site Access

The CBPS project would utilize existing roads within the action area for site access and would not create new access roads. Construction activities near the North River Crossing would utilize Amboy Road, existing park roads within Carrier Park and Lyman Street. Construction activities near the South River Crossing would utilize existing private roads within the Biltmore Estate and Highway 191. Portions of private roadways may require widening but would not exceed 25 ft from the existing centerline. Proposed site access would not require modification or extension of any existing culvert or bridge crossings.

This component of the project would require no more than 2.60 acres of tree clearing (Table 1). However, this estimate represents a "worst-case" scenario. Vegetative removal would be limited to what is necessary and is likely to be restricted to tree-trimming in most areas and would occur between November 15, 2025 and January 1, 2026 (Table 2).

2.2.7 Staging and Laydown Areas

Staging and laydown areas have not been finalized at this time. However, the Applicant has committed to ensure that any required staging or laydown areas would occur in areas void of tree and shrub vegetation and will be adjacent to or within the immediate construction work areas.

2.2.8 Construction Timing

Construction activities would be limited to the hours between 7:00AM and 7:00PM, Monday through Saturday in compliance with the City of Asheville Noise Ordinance. The Applicant has also committed to

ensure that all construction equipment would be operated in accordance with the manufacturer's specification and that all standard noise-reducing equipment is properly employed.

2.2.9 Facility Operation and Maintenance

Operation and maintenance of the CBPS project would entail mowing and landscaping around facilities and utility rights-of-way. Utility corridor easements would be maintained with native herbaceous vegetation only since deep rooting woody vegetation may threaten pipeline infrastructure.

2.3 Conservation Measures

Conservation measures (CM) represent actions, pledged in the project description, that the action agency will implement to minimize the effects of the proposed action and further the recovery of the species under review. Such measures should be closely related to the action and should be achievable within the authority of the action agency. We consider the beneficial effects of conservation measures in making our determination of whether the project will jeopardize the species.

We appreciate the Applicant's commitment to the CMs described in the USACE's BA which are summarized below. Some of the USACE's proposed CMs summarized below (CM 3, 5, 6, 7, and 8) are also intended to avoid or minimize project-mediated impacts to federally listed bat species which are addressed under separate informal consultation:

CM 1. Ensure all operators, employees, and contractors working in the proposed action area are aware of environmental commitments associated with the CBPS project including all applicable impact avoidance and minimization measures.

CM 2. Minimize project-mediated disturbance to the greatest extent feasible to safely implement the CBPS project.

CM 3. Accomplish all tree clearing activities in the winter/spring from November 15 – April 1 to avoid the active season for tree-roosting bat species.

CM 4. Prohibit construction activities which generate noise and vibration from occurring at night (between dusk and dawn). Impulsive noise and vibration shall be reduced with the use of noise-absorption padding or matting to dampen those effects. If blasting is required for excavation within the riverbed, blasting mats shall be used to reduce the effects of noise and vibration.

CM 5. Any construction lighting shall be shielded and directed away from suitable habitat for listed bat species. Nightwork is not anticipated but would not exceed 14 consecutive days per 12-month period and would not exceed a duration of 4 hours after dusk per day.

CM 6. Permanent exterior lighting associated with the CBPS project shall be shielded, down-facing and of a low intensity to reduce impacts to federally listed bat species which are averse to light.

CM 7. Following construction, re-establish disturbed areas with native vegetation to prevent erosion and sedimentation, and protect water quality of aquatic habitats within receiving waters. This measure would also help maintain or improve suitable roosting, forage, and/or commuting habitats for federally listed bat species.

CM 8. Establish a 50-ft wide forested riparian buffer along each streambank adjacent to the FBR, Swannanoa River, Moore Branch, unnamed tributaries, and delineated wetlands within the action area to prevent erosion and sedimentation and protect water quality of aquatic habitats within receiving waters. This measure would also help maintain suitable roosting, forage, and/or commuting habitats for federally listed bat species. This conservation measure is exempted from each bank of the FBR where the re-establishment of riparian forest (and associated root systems) within the 100-foot-wide utility right of way would damage the pipeline.

CM 9. Conduct a pre-construction mussel survey of the FBR at the North and South River Crossing areas within 14 days of instream disturbance to detect and relocate any Appalachian elktoe to a safe location within the FBR. Survey schedule should be coordinated with this office at least 30 days prior to so that we may be available to participate and help identify suitable sites for animal

relocation. Only qualified biologists covered by requisite federal collection permits should conduct surveys for Appalachian elktoe.

CM 10. A contracted biologist shall be on site during cofferdam dewatering activities to detect trapped animals (including live mussels and fish which may serve as hosts for Appalachian elktoe) and if found, relocate them to an appropriate safe location.

CM 11. Cofferdams shall remain in the FBR for the shortest feasible duration and removed as soon as new pipe segments are installed to prevent unnecessary erosive forces and shear stresses to streambed and streambank habitats.

CM 12. Cofferdams shall be properly anchored and consider realistic streamflow scenarios to prevent dislodging, downstream movement, or failure which may exacerbate impacts to aquatic habitats.

CM 13. Cofferdam dewatering inlet hoses shall be screened and equipped with a float to prevent inadvertent aquatic life entrainment or unnecessary removal of streambed substrates. Water removed from within the cofferdam shall be filtered before discharged. Discharge sites shall be chosen to prevent unnecessary secondary erosion and sedimentation.

CM 14. Substrates excavated from the FBR shall be retained in upland areas and returned to match pre-existing streambed elevations and habitat conditions.

CM 15. Any necessary vegetation removal along streambanks including the FBR, shall be cleared by hand with vegetation cut at the base to retain bank stabilizing root masses.

CM 16. Implement an approved Stormwater and Pollution Protection Plan to ensure that all erosion and sedimentation controls are maintained throughout construction at all river and stream crossings and dewatering discharge locations.

CM 17. All hazardous materials necessary for construction shall be properly stored under cover in upland areas at least 100 ft from water bodies. Fueling, lubrication, and general equipment maintenance shall be performed in upland areas or otherwise in a manner that prevents contamination of surface waters by fuel and oils.

CM 18. Temporary bank stabilization materials used during construction (e.g. rip rap, concrete blocks, or gabions), shall be removed after construction and replaced using permanent natural bank stabilization techniques that employ bioengineering and natural channel design methods. Permanent bank stabilization design shall be developed and approved in coordination with the Service and applicable state agencies.

3. Range-Wide Status of the Species

3.1 Appalachian Elktoe

Scientific Name: *Alasmidonta raveneliana*
Status: Endangered
Date Listed: September 3, 1993
Critical Habitat: None designated within the proposed action area

This section summarizes best available data about the life history, population size, distribution, and threats to the Appalachian elktoe throughout its range that are relevant to formulating an opinion about the action.

3.1.1 Species Description and Life History

Lea (1834) described the Appalachian elktoe from the FBR system in NC. Its shell is thin but not fragile, oblong, and somewhat kidney-shaped, with a sharply rounded anterior margin and a broadly rounded posterior margin. Parmalee and Bogan (1998) cite a maximum length of 8 centimeter (cm). However, individuals from the Little River (FBR Basin) in Transylvania County and West Fork Pigeon River (FBR Basin) in Haywood County measured more than 9.9 cm in length (USFWS 2009). The periostracum (outer shell) of the Appalachian elktoe varies in color from dark brown to yellowish-brown in color. Rays

may be prominent in some individuals, usually on the posterior slope, and nearly obscure in other specimens. The nacre (inside shell surface) is a shiny bluish white, changing to salmon color in the beak cavity portion of the shell. A detailed description of the shell characteristics is contained in Clarke (1981). Ortmann (1921) provides descriptions of the soft anatomy.

The reproductive cycle of the Appalachian elktoe is similar to that of other native freshwater mussels. Males release sperm into the water column, which is then taken in by the female through their siphons during feeding and respiratory processes. The females retain fertilized eggs in their gills until larvae (glochidia) fully develop. Gravid female mussels release glochidia into the water and within a few days they must attach to the appropriate fish host, which they parasitize for a short time while they develop into juvenile mussels. Juveniles then detach from their fish host and sink to the stream bottom where they may continue to develop, provided that suitable substrate and water conditions are present (USFWS 2002). The Appalachian elktoe is a bradytictic (long-term) brooder, with the females retaining glochidia in their gills from late August to mid-June (USFWS 2009). Glochidia are released in mid-June, attaching to either the gills or fins of a suitable fish host species. Transformation time for Appalachian elktoe occurs within 18 to 22 days where mean temperatures are 18°C. Appalachian elktoe mussels use a variety of common fish hosts but appear to specialize on darters and sculpins, which are common in the action area.

3.1.2 Species Status and Distribution

The Appalachian elktoe is known only from the mountain streams of western NC and eastern Tennessee (TN). It is found in gravelly substrates often mixed with cobble and boulders, in cracks of bedrock, and in relatively silt-free, coarse sandy substrates (USFWS 1996).

Although the complete historic range of the Appalachian elktoe is unknown, available information suggests that the species once lived in most rivers and larger creeks of the upper Tennessee River system in NC, with the possible exception of the Hiwassee and Watauga River systems. In TN, the species is known only from its present range in the main stem of the Nolichucky River. At the time of listing, two known populations of the Appalachian elktoe existed: the Nolichucky River, including its tributaries (the Cane River and the North Toe River); and the Little Tennessee River and its tributaries. The record in the Cane River was represented by one specimen found just above its confluence with the North Toe River (USFWS 1996). Since listing, the Appalachian elktoe has been found in additional areas. These occurrences include extensions of the known ranges in the Nolichucky River (North Toe River, South Toe River, and Cane River) and the Little Tennessee River (Tuckasegee River and Cheoah River) as well as a rediscovery in the FBR Basin (Pigeon River, Little River, Mills River, and the main stem of the FBR). Many of these newly discovered populations are relatively small in numbers and range.

The Appalachian elktoe has experienced declines in two populations across its range. A sudden die-off in the Little Tennessee River, (once considered the largest and most secure population of this animal), occurred from 2005 – 2015. During that time, periodic monitoring efforts failed to find any live individuals. Surveys during 2016 also failed to produce any observations of Appalachian elktoe, but surveys in 2017, 2018 and 2019 produced very low numbers, indicating a remnant population persists.

Appalachian elktoe also have declined in the lower portion of the Nolichucky River. This animal was once common in all three tributaries of the Nolichucky River: North Toe, South Toe, and Cane Rivers. In 2008, a fish kill linked to a wastewater plant failure also resulted in the death of most known occurrences Appalachian elktoe in the Cane River. Beginning in 2013, the Appalachian elktoe population in the lower South Toe River declined steeply. This decline coincided with a major highway construction project and only occurred downstream of receiving streams in that project footprint. Appalachian elktoe are still present in the South Toe River, but at reduced densities. Appalachian elktoe also remain in low densities within the North Toe River. It appears that the North Toe River population expansion is limited by urban runoff and mining effects to the river.

The other populations of Appalachian elktoe appear to be stable (Tuckasegee, Cheoah, and Pigeon Rivers) or expanding (FBR). A remnant population known in the Cheoah River since the early 2000's is undergoing augmented by the NC Wildlife Resources Commission with hatchery-propagated individuals sourced from the Tuckasegee River. This effort appears to be successful in bringing this population back to a viable state.

Prior to 2004, the FBR population appeared to be confined to two tributary streams (Little River, Mills River), but over the last decade the known range of Appalachian elktoe in the main stem of the FBR has expanded and it now appears to be well established, albeit at low density, over a broad area extending from the Craggy Dam in Asheville, NC to Rosman, NC.

3.1.3 Threats to the Species

Throughout its historic range Appalachian elktoe declines have been attributed to a variety of factors, including sedimentation, point and nonpoint-source pollution, and habitat modification (impoundments, channelization etc.). Low abundance and restricted range of most of the surviving populations make this species extremely vulnerable to extirpation from a single catastrophic event or activity. Catastrophic events may consist of natural events, such as flooding or drought, as well as human influenced events, such as toxic spills associated with highways, railroads, or improperly treated effluent discharges.

Flood disturbances exacerbated by anthropogenic watershed and climatic alterations may be responsible for large fluctuations in Appalachian elktoe population abundance. Portions of the FBR Basin and most of western NC experienced catastrophic flooding in late summer 2004 during Tropical Storms Francis, Ivan, and Jeanne. Numerous dead mussels, including the Appalachian elktoe, were observed in over-wash areas along the Little Tennessee River after the flood events. Additionally, surveys conducted in the Little Tennessee River after the flooding yielded noticeably lower catch per unit effort of live mussels, including the Appalachian elktoe, compared to past survey efforts in this section of the river (USFWS 2009).

Siltation and sedimentation resulting from insufficient erosion controls associated with agriculture, forestry, transportation, and various developed land uses, are recognized as a major contributing factor to the degradation of mussel populations (USFWS 1996). Siltation has been documented to be extremely detrimental to mussel populations by degrading physical habitats and water quality, increasing potential exposure to other pollutants, smothering and/or suffocating animals (Ellis 1936, Marking and Bills 1979). Sediment accumulations of less than an inch have been shown to cause high mortality in most mussel species (Ellis 1936). The abrasive action of sediment on mussel shells has been shown to cause erosion of the outer shell, which allows acids to reach and corrode underlying layers (Harman 1974).

Sewage treatment effluent has been documented to significantly affect the diversity and abundance of mussel fauna (Goudreau *et al*. 1988). Goudreau *et al*. (1988) found that recovery of mussel populations might not occur for up to 2 river miles (3.22 kilometers) below points of chlorinated sewage effluent. Most water bodies where Appalachian elktoe still exist have relatively few point source discharges within the watershed and are rated as having "good" to "excellent" water quality (USFWS 1996).

Introductions of exotic species, such as the Asian clam (*Corbicula fluminea*) and zebra mussel (*Dreissena polymorpha*), also pose significant threats to native freshwater mussels. The Asian clam is now established in most of the major river systems in the United States (Fuller and Powell 1973). At the time the Appalachian elktoe was listed, the Asian clam was not known from the stretch of the Little Tennessee River that it occupies; however, it has been observed in the Little Tennessee River in recent years and, as mentioned earlier, may be a contributing factor to the decline of that population. Concern has been raised over competitive interactions for space, food, and oxygen between this species and native mussels,

possibly at the juvenile stages (Neves and Widlak 1987). When the Appalachian elktoe was listed, it was speculated that, due to its restricted distribution, it "may not be able to withstand vigorous competition" (USFWS 1996).

The exotic Japanese knotweed (*Fallopia japonica*) may also threaten populations of Appalachian elktoe. This riparian plant is an invasive species within the known range of Appalachian elktoe and can reproduce from seed or long, stout rhizomes. It can tolerate a variety of conditions, such as full shade, high temperatures, high salinity, and drought. It can be spread by wind, water, and soil movement to an area where it quickly forms dense thickets that exclude native vegetation and greatly alter the natural ecosystem. This species has become established in riparian habitats throughout western NC. The species has a very shallow root system; because of this shallow root system and its preclusion of other vegetation, areas where this species has been established may be susceptible to erosion during flood events.

4. Environmental Baseline in the Action Area

In accordance with 50 CFR 402.02, the environmental baseline "*refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline*."

4.1 Appalachian Elktoe in the Action Area

The proposed action area occurs within a reach of the FBR which is occupied by a population of Appalachian elktoe that exists in low abundance. Prior to 2017, Element Occurrence Number (EO No.) 21150 of this species within the FBR was considered historic (first observed in 1840). In 2017, occurrences of this animal were found in the FBR which expanded the previously known range of this species by approximately 32 river miles (EO No. 69). Mussel surveys in 2019 detected Appalachian elktoe in low abundance near the Bent Creek confluence with the FBR upstream of the CBPS action area.

Suitable habitat for this animal occurs within the proposed action area located within the FBR. The Applicant and Service staff conducted mussel surveys of the action area on September 22, 2022. Survey efforts evaluated reaches of the FBR extending approximately 400 meters downstream and 100 meters upstream from each of the two proposed crossings areas (i.e. North and South River Crossings). Six surveyors conducted visual surveys using mask and snorkel and weight belts (22 person-hours). Water clarity was high and flow conditions were close to median levels according to U.S. Geological Survey gage # 03451500. No Appalachian elktoe were detected and a single live animal representing the introduced mussel species eastern elliptio (*Elliptio complanata*) was found.

Even under ideal survey conditions, detectability of Appalachian elktoe using visual and tactile survey methods is low, due to the animal's burrowing habit, camouflage in substrates, and inherently low abundance. We assume that this animal occurs in low abundances within the portion of the action area which overlaps the FBR based on the survey information provided by the Applicant, known occurrences in the project vicinity, low detection probability, and availability of suitable habitats within this reach of the FBR.

5. Effects of the Action

In accordance with 50 CFR 402.02, the definition of "effects of the action" is "*all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action*." This section analyzes the effects or consequences of the action on the Appalachian elktoe. The effects of the action are added to the environmental baseline and, after taking into consideration the status of the species, serve as the basis for the determination in this Opinion (50 CFR 402.14(g)(4)).

The CBPS project is expected to affect Appalachian elktoe during construction and after construction is complete. Potential stressors and beneficial effects mediated by the proposed action are summarized below:

5.1 Stressor – Direct Impacts

Construction activities within the FBR, especially those requiring the use of heavy machinery associated with the pipeline crossings and bank stabilization, may directly impact (kill, crush, injure, bury, excavate, dewater, strand aground, etc.) any undetected mussels occurring within the action area. Given the apparently low abundance of Appalachian elktoe in this reach of the FBR, and the USACE's commitment to conduct mussel surveys before and during construction (see Section 2.3 of this Opinion) the potential for such direct impacts is unlikely but not completely discountable. Direct impacts would be restricted to approximately 2.6 acres of aquatic habitat within the FBR for all stages of both crossing areas (1.1 acres for each crossing) and all proposed bank stabilization (0.4 acre).

5.2 Stressor – Pipeline Crossings and Cofferdams

Pipeline crossings would be accomplished by open-cut dry-ditch (trenching methods) which entail the construction of temporary cofferdams, dewatering within cofferdams, substrate excavation, temporary storage of excavated substrates in upland areas, and replacement of riverbed substrates to pre-existing riverbed elevations (see Section 2.2 of this Opinion). These activities may affect physical habitats and water quality conditions that support Appalachian elktoe. The installation and removal of cofferdams is expected to temporarily suspend fine substrates and increase sedimentation into downstream aquatic habitats. Cofferdam installation/removal would be accomplished in less than two days for each stage at both crossings. The USACE's BA (Section 6.4.8) indicates that impacts to instream habitats associated with the installation and removal of all cofferdams would not exceed eight days total for both stream crossings.

Cofferdam construction and maintenance would also reduce the amount of available suitable habitat for Appalachian elktoe within the FBR by temporarily dewatering portions of the river and constricting river flow into a confined area. Temporary placement of cofferdams would increase surrounding flow velocities in streambed and streambank habitats, which may disturb host fish behavior and the feeding and reproduction behaviors of any undetected mussels. Cofferdams would also increase adjacent shearing forces which increase erosion, sedimentation, and temporarily degrade suitable habitat conditions for mussels. The duration of these stressors would coincide with construction duration of each crossing. Section 2.2.8 of the USACE's BA indicates that the North and South River Crossings would each be completed in six months.

According to the USACE's BA, cofferdams would be dewatered (via screened intake), filtered, and discharged into the FBR. Cofferdam dewatering may entrain, impinge, injure, or kill, undetected mussels or host fish which are smaller than the screened intake. Cofferdam dewatering may also mobilize, entrain, and/or transport fine sediments and any water contaminations into downstream habitats. Stressors to

Appalachian elktoe associated with cofferdam dewatering are minimized by several proposed conservation measures summarized in Section 2.3 of this Opinion.

Section 2.2.4.1 of the USACE's BA indicates that cofferdams will be designed to withstand at least a 2-year storm event. Given the proposed six-month duration of cofferdam placement for each of the two FBR crossings and uncertainty of weather events, it is possible that instream construction sites coincide with one or more flow events that result in cofferdam failure. Cofferdam failure would likely expand the action area, require additional instream work to recover equipment, and extend construction/impact durations. Stressors to Appalachian elktoe resulting from cofferdam failure would depend on specifics of the event and are beyond the scope of analysis in this consultation (see Reinitiation Notice in Section 9 of this Opinion).

5.3 Stressor – Temporary and Permanent Streambank Stabilization

Riparian areas adjacent to the North and South Crossings would require the temporary placement of lithic materials to minimize bank scour and mass wasting associated with river flow constriction from cofferdam placements (see Section 2.2.4 of this Opinion). Temporary bank stabilization would likely entail placement of materials in some areas that contain suitable aquatic habitats for Appalachian elktoe. Any undetected Appalachian elktoe occurring in these areas may be crushed, injured, or disturbed during material placement and removal. This activity may mobilize sediments resulting in localized and temporary erosion and sedimentation which could reduce fitness of any Appalachian elktoe present or degrade their habitats. This stressor would be approximately 2.3 acres in extent (primarily in riparian, not aquatic habitats) and its duration would coincide with construction activities associated with the North and South River Crossings (Table 2).

Temporary bank stabilization measures would be removed after pipe installation is complete and replaced with permanent natural stabilization using bioengineering techniques and native vegetation. Permanent bank stabilization would likely entail placement of materials in some areas that may contain suitable aquatic habitats for Appalachian elktoe. Any undetected Appalachian elktoe occurring in these areas may be crushed, injured, or disturbed during material placement. The installation of permanent bank stabilization may also mobilize sediments resulting in localized and temporary erosion and sedimentation which could reduce fitness of any Appalachian elktoe present or degrade their habitats. This stressor would be approximately 2.3 acres in extent (primarily in riparian, not aquatic habitats) and its duration would be less than 46 days for the North Crossing and less than 45 days for the South Crossing (Table 2).

In the long-term, permanent streambank stabilization could improve baseline habitat conditions for Appalachian elktoe within the small, localized areas in FBR where this work would occur. A bioengineered, natural channel bank stabilization design may improve pre-existing levels of bank stabilization and reduce potential for erosion and sedimentation of downstream habitats. An appropriate permanent bank stabilization design may also improve the near bank substrates and flow conditions that support freshwater mussels and their fish symbionts.

5.4 Stressor – Light, Noise, and Vibration

Freshwater mussels can detect and respond to changes in light. Studies suggest that mussels may react more to rapid changes in ambient light levels (e.g. passing shadows from adjacent activity) than to gradual changes in light levels (Braun and Faust 1954, Imlay 1968). Some mussels may release glochidia (possibly prematurely) in response to changes in ambient light, noise, and/or vibration.

Lighting, noise, and vibration disturbances may cause mussels to retract siphons and close valves which could disrupt feeding, respiration, and reproductive behaviors, (including those associated with their fish symbionts), and could reduce fitness of individuals. Prolonged exposure to these disturbances exceeding

baseline conditions may influence animals to expend additional resources to relocate or prematurely abort glochidia which could reduce reproductive success and increase susceptibility to predation or otherwise reduce fitness.

The USACE indicates that nighttime work requiring artificial lighting is not anticipated for the CBPS project but that on occasion, work may extend up to four hours beyond daylight hours. Any artificial lighting used for nightwork within or near the FBR would not exceed 14 consecutive days per 12-month period. Project-mediated construction lighting impacts to Appalachian elktoe is unlikely to significantly exceed existing artificial light sources from adjacent roadways, parks, residences, and commercial developments.

Project-mediated vibration stressors to Appalachian elktoe are difficult to quantify but are likely to result from various proposed construction activities within and adjacent to the FBR. The extent of those stressors would depend on the magnitude of impact/vibration source, duration of source, and dissipation rates through water and various substrates. Vibration impacts are expected to occur outside the immediate project footprint and possibly outside of the mussel survey area described in the USACE's BA. Vibration from cofferdam installation and removal, substrate excavation, substrate replacement, streambank stabilization, and various other construction activities is anticipated to coincide with the duration of instream and riparian activities associated with the North and South River Crossings (Table 2).

5.5 Stressor – Inadvertent Spills

Inadvertent spills or discharges of toxic pollutants, such as diesel fuel, lubricants, and hydraulic fluid into the FBR could result in mortality of Appalachian elktoe. Spills of construction fluids are not uncommon, and the duration of heavy equipment use adjacent to waterways increases the possibility that a spill or discharge could occur. However, the Applicant has committed to conservation measures that reduce the likelihood of a spill or discharge reaching the river (see Section 2.3 of this Opinion). Spills could also take place near any other waterway within the action area and subsequently have an effect further downstream.

The type, timing, amount, and proximity to a water source of any accidental spills would determine the magnitude of effect to Appalachian elktoe, but may result in death, disrupt feeding or reproductive behaviors, influence animals to expend energy to relocate to more favorable habitats, or otherwise reduce fitness. Significant spills resulting from negligent operation are possible, but unlikely to occur.

5.2 Cumulative Effects

Cumulative effects include the "*effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation*" (50 CFR 402.02). Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Federal projects such as the I-26 Connector (I-2513, Service Log# 02-252), I-26 Widening (I-4400/4700, Service Log #01-206), Project Ranger (Service Log #19-328), and I-26 Proposed Exit 35 (HE-0001, Service Log #21-330) are included in the environmental baseline as section 7 consultation is already completed for these actions.

While the project area continues to maintain positive growth and a growing population, we are unaware of any specific future State or private actions that are reasonably certain to occur within the action area.

6. Conclusion

After reviewing the present status of the Appalachian elktoe, the environmental baseline for the action area, the effects of the proposed CBPS project and the cumulative effects, it is the Service's biological opinion that the project as proposed, is not likely to jeopardize the continued existence of the Appalachian elktoe.

Low abundances of Appalachian elktoe are assumed to be present within the action area which contains suitable habitat in the FBR. The Service anticipates that incidental take of the Appalachian elktoe is likely to occur due to project-mediated activities within the FBR. During construction, individual mussels may be crushed, harmed by siltation or other water quality degradation, or relocated due to physical changes in their habitat.

The survey data is not sufficient to populate a robust population model, but according to recent nearby surveys in the FBR that detected Appalachian elktoe, the Service estimates a species density of 0.0005 mussels per square meter in the CBPS action area that contains suitable habitat. The CBPS project proposes to directly affect up to 2.6 acres (10,522 square meters) of suitable aquatic habitat associated with the installation of the North and South River Crossings and all bank stabilization. Based on estimated mussel density, approximately six animals could be crushed, excavated, stranded aground, or buried in association with proposed pipeline crossings and bank stabilization work (if undetected during preconstruction and dewatering surveys).

Due to the extent and duration of this project, it is possible Appalachian elktoe in the action area will be affected by habitat degradation from sediment eroded or mobilized by construction activities. The reach of the FBR within the proposed action area is approximately 3,500 meters long and has an average river width of 80 meters (i.e. 280,000 square meters or 69.2 acres). Riparian and instream development activities in this reach of the FBR (including sand and gravel mining, residential, commercial, industrial, and recreational activities) significantly reduce streambank and streambed stability, riparian buffers, natural stormwater controls, and ultimately reduce available habitats which support Appalachian elktoe. We estimate that approximately 50-75% of available aquatic habitats in this reach of the FBR are suitable for Appalachian elktoe. According to our model density and estimated proportion of suitable habitat, approximately 70-105 Appalachian elktoe occur within the proposed action area.

Due to the extent and duration of this project, it is possible Appalachian elktoe in the action area will be affected by habitat degradation from sediment eroded or mobilized by the project. Conservation measures outlined in the USACE's BA are intended to minimize adverse effects from sedimentation. However, even under standard construction conditions, we expect that up to 105 Appalachian elktoe within the action area may be harmed by the presence of turbidity or settling of sediment in depositional portions of its habitat. We expect this effect to be non-lethal harm that could temporarily reduce fitness and reproductive success throughout the duration of the project. We do not anticipate that the effects of sediment pollution within the action area will reach a level that prevents recolonization after construction.

Therefore, in this Opinion, the Service has determined that this level of take is not likely to result in jeopardy to the Appalachian elktoe. In addition to the measures listed in the Reasonable and Prudent Measures and Terms and Conditions sections of this Opinion, the measures listed in the Conservation Measures section of this opinion must be implemented for this determination to remain valid.

The proposed action area does not contain designated critical habitat for Appalachian elktoe or any other federally listed species; therefore, none would be affected.

7. Incidental Take Statement

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take "*means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct*" (16 U.S.C §1532). Harm is further defined by the Service as "*an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering*" (50 CFR 17.3). Incidental taking "*means any taking otherwise prohibited, if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity*" (50 CFR 17.3). Harass is defined by the Service as "*an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering*" (50 CFR 17.3). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered to be prohibited under the Act, provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary and must be undertaken by the USACE so that they become binding conditions of any grant or permit issued to the construction contractor, as appropriate, for the exemption in section 7(o)(2) to apply. The USACE has a continuing duty to regulate the activity covered by this incidental take statement. If the USACE (1) fails to assume and implement the terms and conditions or (2) fails to require the construction contractor to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the USACE must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

7.1 Amount or Extent of Take

The Service anticipates that up to 106 Appalachian elktoe could be taken (killed, wounded, harmed or harassed) as a result of the proposed action, with most take occuring in the form of non-lethal harassment or harm via habitat alteration to approximately 64-99 Appalachian elktoe. In this Opinion, the Service determines that this level of anticipated take is not likely to result in jeopardy to Appalachian elktoe.

7.2 Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure(s) are necessary and appropriate to minimize take of Appalachian elktoe. These non-discretionary measures reduce the level of take associated with project activities, include only actions that occur within the action area, and involve only minor changes to the project.

1. Ensure that project proponents and contractors understand and follow the measures listed in the "Conservation Measures," "Reasonable and Prudent Measures," and "Terms and Conditions" sections of this Opinion.
2. Reduce take, mortality, and injury of Appalachian elktoe to the maximum extent practicable.
3. Monitor and document instances of observed take and report it to the Service.

7.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the Act for Appalachian elktoe**,** the USACE must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting and monitoring requirements. When incidental take is

anticipated, the terms and conditions must include provisions for monitoring project activities to determine the actual project effects on listed fish or wildlife species (50 CFR §402.14(i)(3)). These terms and conditions are nondiscretionary.

1. Ensure that the procedures listed in the "Conservation Measures," "Reasonable and Prudent Measures", and "Terms and Conditions" sections of this Opinion are being implemented.
2. Construction Progress Reporting. Provide brief email notifications to this office when project construction begins and is completed, and when construction phases within the FBR begin and are completed. Specifically, notify this office when:
    a. project construction begins.
    b. cofferdam installation begins and when cofferdam relocation/removal is complete for each of the four cofferdam stages.
    c. pipeline installation begins and is completed for the North and South River Crossings.
    d. temporary bank stabilization is installed and removed.
    e. permanent bank stabilization begins and is complete.
    f. project construction is complete and operational.
3. Construction Changes or Delays. Notify this office as soon as deviations to the proposed project description or construction timeline described in the BA are anticipated or occur.
4. Listed Species Encounters. Notify this office as soon as possible and within 24 hours upon detecting live, dead (including shell material), injured, or sick federally endangered or threatened species.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The USACE must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

8. Conservation Recommendations

Section 7(a)(l) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Consider permanent bank stabilization design and methods which improve habitat conditions for Appalachian elktoe, its fish symbionts, and other aquatic natural resources. The Service appreciates the opportunity to review the proposed permanent bank stabilization design when it becomes available.
2. Consider the use of native flowering plant species for landscaped areas and utility rights-of-way which may reduce maintenance costs and provide habitat for listed or candidate pollinator species.
3. Consider a bat-friendly lighting design plan for all outdoor permanent lighting fixtures associated with the pump station (see separate informal consultation associated with this project for listed bat species).

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

9. Reinitiation Notice

This concludes formal consultation for the CBPS project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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11. Figures and Tables

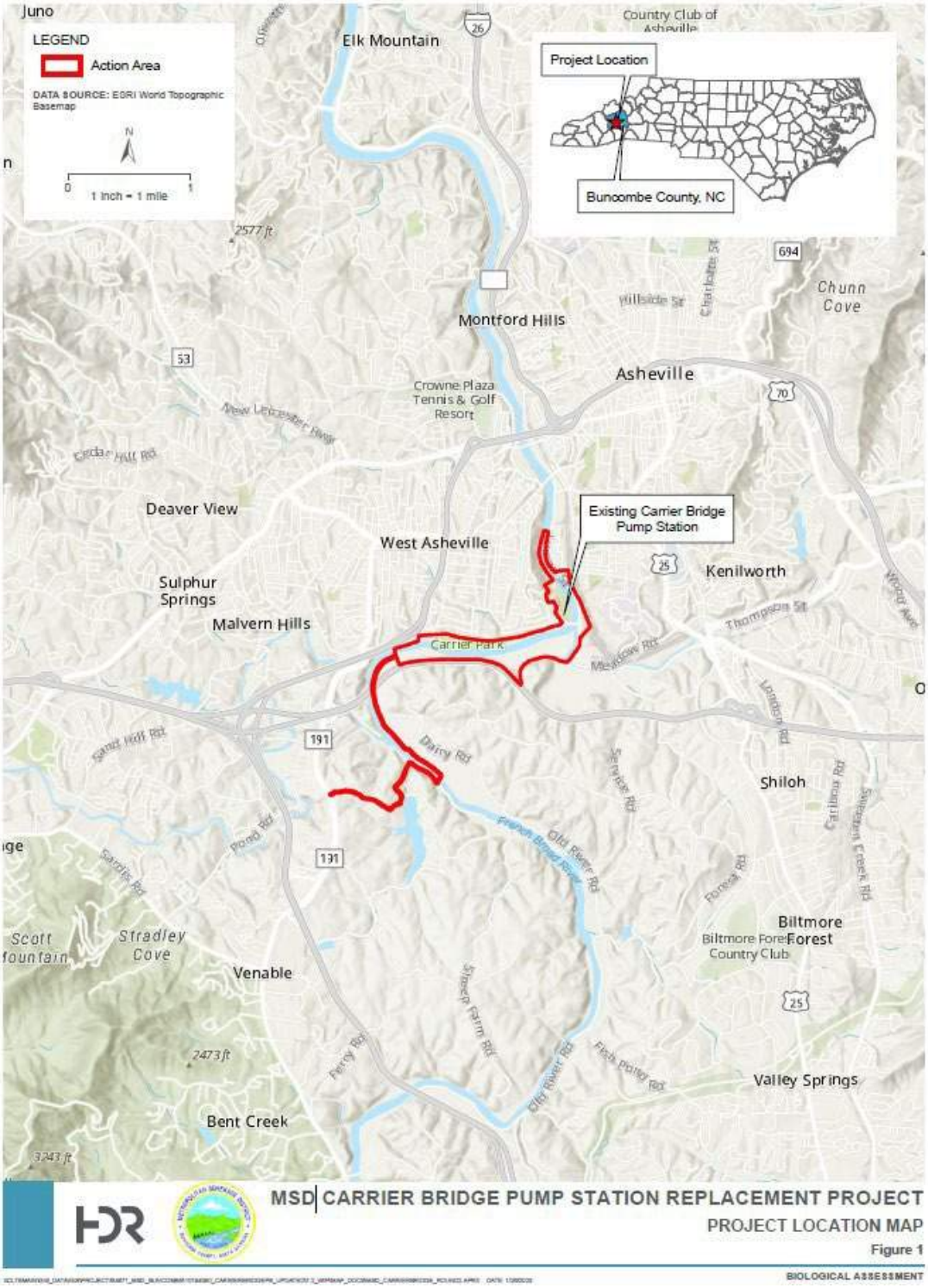


Figure 1. Proposed action area within the greater West Asheville area.

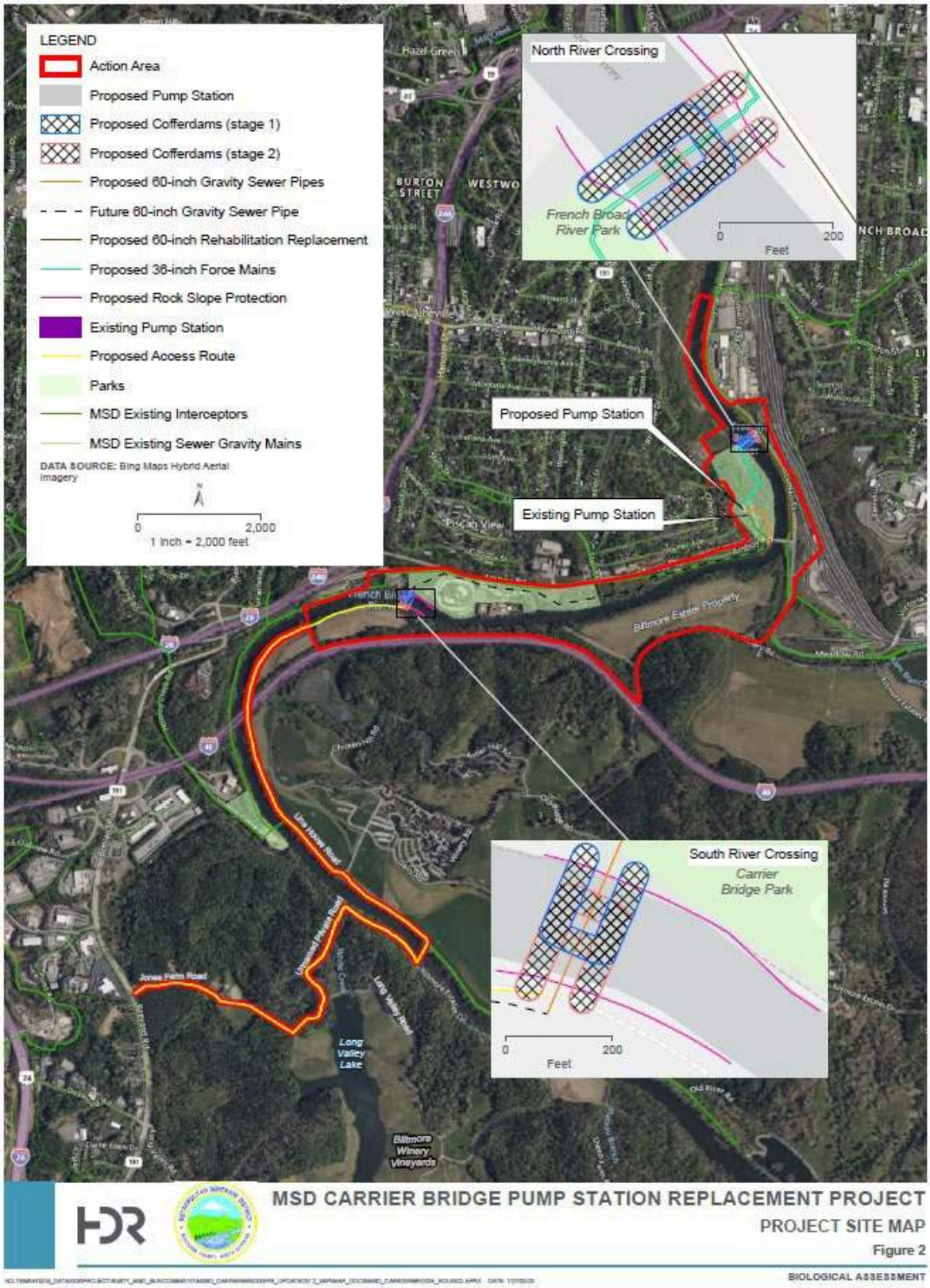


Figure 2. North and South River Crossing areas.

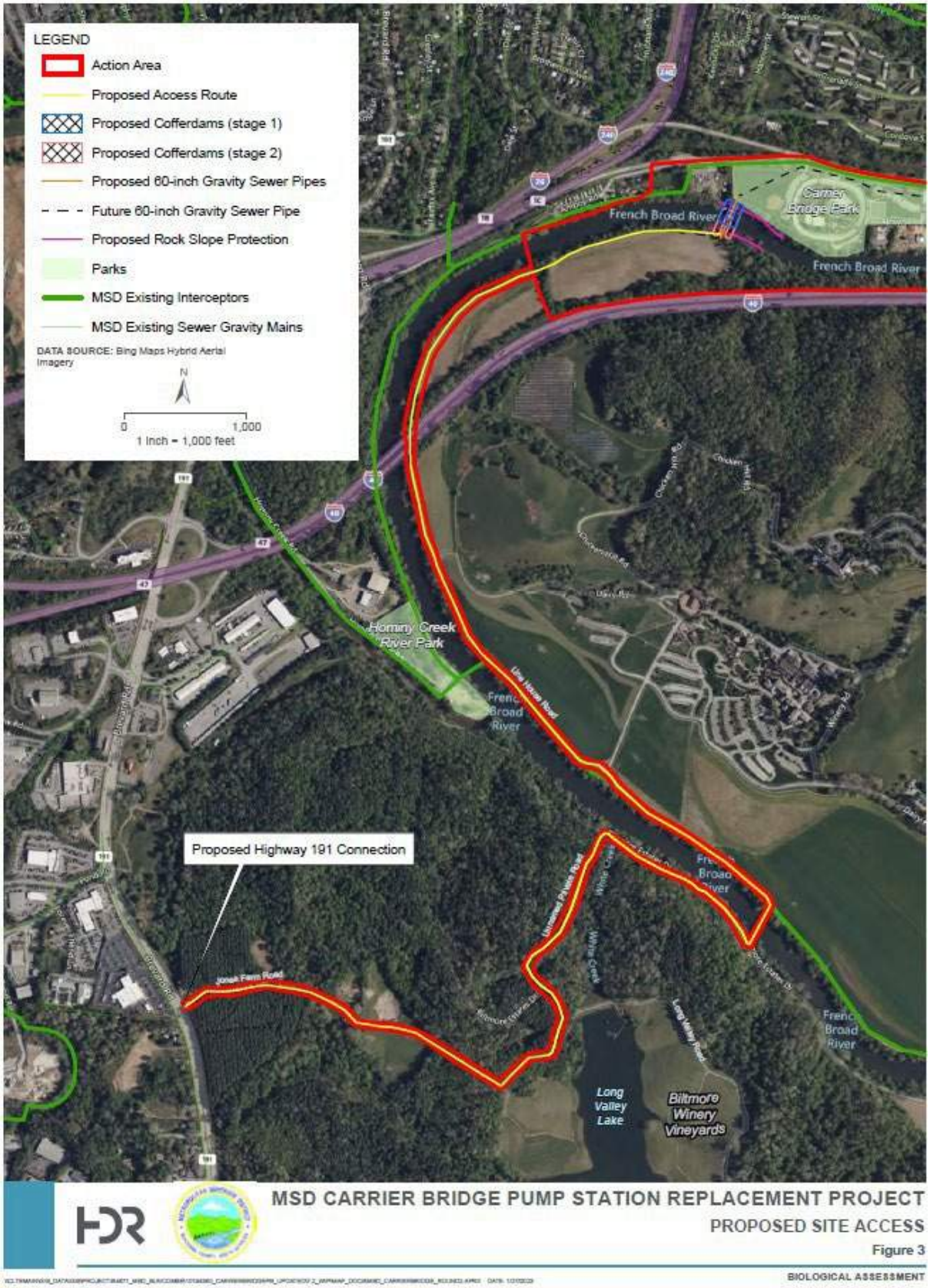


Figure 3. Proposed site access route.

Figure 4. North River Crossing detail.

Figure 5. South River Crossing detail.

Table 1. Proposed tree clearing/trimming limits.

Construction Area	Tree Clearing or Trimming	Square or Linear Feet	Acres
New Carrier Bridge Pump Station	Clearing	9,087 sq ft	0.21
New 36-inch Force Main Pipeline	Clearing	825 LF	0.98
New 60-inch Gravity Sewer Interceptor Pipeline	Clearing	700 LF	0.86
48-inch/54-inch Gravity Sewer Rehabilitation	Clearing	300 LF	0.10
North River Crossing (36-inch force mains)	Clearing	100 LF	0.45
South River Crossing (60-inch gravity sewer line)	Clearing	100 LF	0.50
Biltmore Estate Access Route (passing lane, turn radius)	Clearing	8,000 LF	2.60*
Staging and Laydown Areas	Clearing	n/a	0
		Total Tree Clearing Area	**5.70**
48-inch/54-inch Gravity Sewer Rehabilitation	Trimming	850 LF	0.88
South River Crossing (60-inch gravity sewer line)	Trimming	30 LF	0.08
Biltmore Estate Access Route	Trimming	n/a	0*
Staging and Laydown Areas	Trimming	n/a	0
		Total Tree Trimming Area	**0.96**

*This provides a worst-case scenario for potential tree clearing along the Biltmore Estate Access Road west of the French Broad River assuming a 15-ft wide clearing for the entire length to allow passing vehicles and increases to existing turning radius at three locations along the route to facilitate turns for larger supply trucks/construction equipment. Where feasible clearing will be limited to just tree trimming and will be determined at a later date.

MSD Carrier Bridge Pump Station Project
Construction Schedule

ID	Task Mode	Task Name	Duration	Start	Finish
1		**Construction Contract Notice of Award**			**Thu 8/1/24**
2		**Notice to Proceed with Construction**			**Tue 10/1/24**
3		**Pump Station Construction**	**1021 days**	**Fri 11/15/24**	**Thu 10/12/28**
4		Clearing, Erosion Control, Rough Grading	98 days	Fri 11/15/24	Tue 4/1/25
5		Install Dewatering System	66 days	Wed 4/2/25	Wed 7/2/25
6		Pump Station Excavation	110 days	Thu 7/3/25	Tue 12/2/25
7		Concrete Substructure	262 days	Wed 12/3/25	Thu 12/3/26
8		Pump Station Building	131 days	Fri 12/4/26	Fri 6/4/27
9		Piping, Electrical, Mechanical, Plumbing	110 days	Mon 6/7/27	Fri 11/5/27
10		Final Site Work and Restoration	89 days	Mon 11/8/27	Thu 3/9/28
11		Testing and Start Up	66 days	Fri 3/10/28	Fri 6/9/28
12		Decommission Existing Pump Station and Piping	89 days	Mon 6/12/28	Thu 10/12/28
13		**60-Inch Influent Gravity Sewer**	**520 days**	**Fri 11/15/24**	**Wed 11/11/26**
14		AMBOY ROAD CROSSING	269 days	Fri 11/15/24	Tue 11/25/25
15		Clearing, Erosion Control, Rough Grading	98 days	Fri 11/15/24	Tue 4/1/25
16		Trenchless Crossing	89 days	Wed 4/2/25	Mon 8/4/25
17		60-Inch Pipeline Installation	87 days	Tue 8/5/25	Tue 12/2/25
18		RIVER CROSSING	169 days	Sat 11/15/25	Wed 7/8/26
19		Clearing, Erosion Control, Rough Grading	35 days	Sat 11/15/25	Thu 1/1/26
20		Cofferdam and Pipeline Installation (North Side)	65 days	Fri 1/2/26	Thu 4/2/26
21		Cofferdam and Pipeline Installation (South Side)	69 days	Fri 4/3/26	Wed 7/8/26
22		Testing	44 days	Thu 7/9/26	Tue 9/8/26
23		Final Site Work and Restoration	46 days	Wed 9/9/26	Wed 11/11/26
24		**36-Inch Effluent Force Main Sewers**	**316 days**	**Sat 11/15/25**	**Fri 1/29/27**
25		Clearing and Erosion Control	99 days	Sat 11/15/25	Wed 4/1/26
26		RIVER CROSSING	230 days	Sat 11/15/25	Thu 10/1/26
27		Cofferdam and Pipeline Installation (West Side)	66 days	Wed 4/1/26	Wed 7/1/26
28		Cofferdam and Pipeline Installation (East Side)	67 days	Wed 7/1/26	Thu 10/1/26
29		Testing	44 days	Thu 10/1/26	Tue 12/1/26
30		Final Site Work and Restoration	44 days	Tue 12/1/26	Fri 1/29/27
31		**Existing 54-Inch Gravity Sewer Rehabilitation**	**255 days**	**Sat 11/15/25**	**Thu 11/5/26**
32		Clearing and Erosion Control	77 days	Sat 11/15/25	Sun 3/1/26
33		54-Inch Pipe Rehabilitation	89 days	Mon 3/2/26	Thu 7/2/26
34		Testing	45 days	Fri 7/3/26	Thu 9/3/26
35		Final Site Work and Restoration	45 days	Fri 9/4/26	Thu 11/5/26
36		**Existing 48-Inch Gravity Sewer Replacement**	**121 days**	**Mon 11/15/27**	**Mon 5/1/28**
37		Clearing and Erosion Control	36 days	Mon 11/15/27	Sat 1/1/28
38		48-Inch Pipe Replacement	45 days	Sun 1/2/28	Thu 3/2/28
39		Testing	22 days	Fri 3/3/28	Mon 4/3/28
40		Final Site Work and Restoration	46 days	Mon 4/3/28	Mon 6/5/28

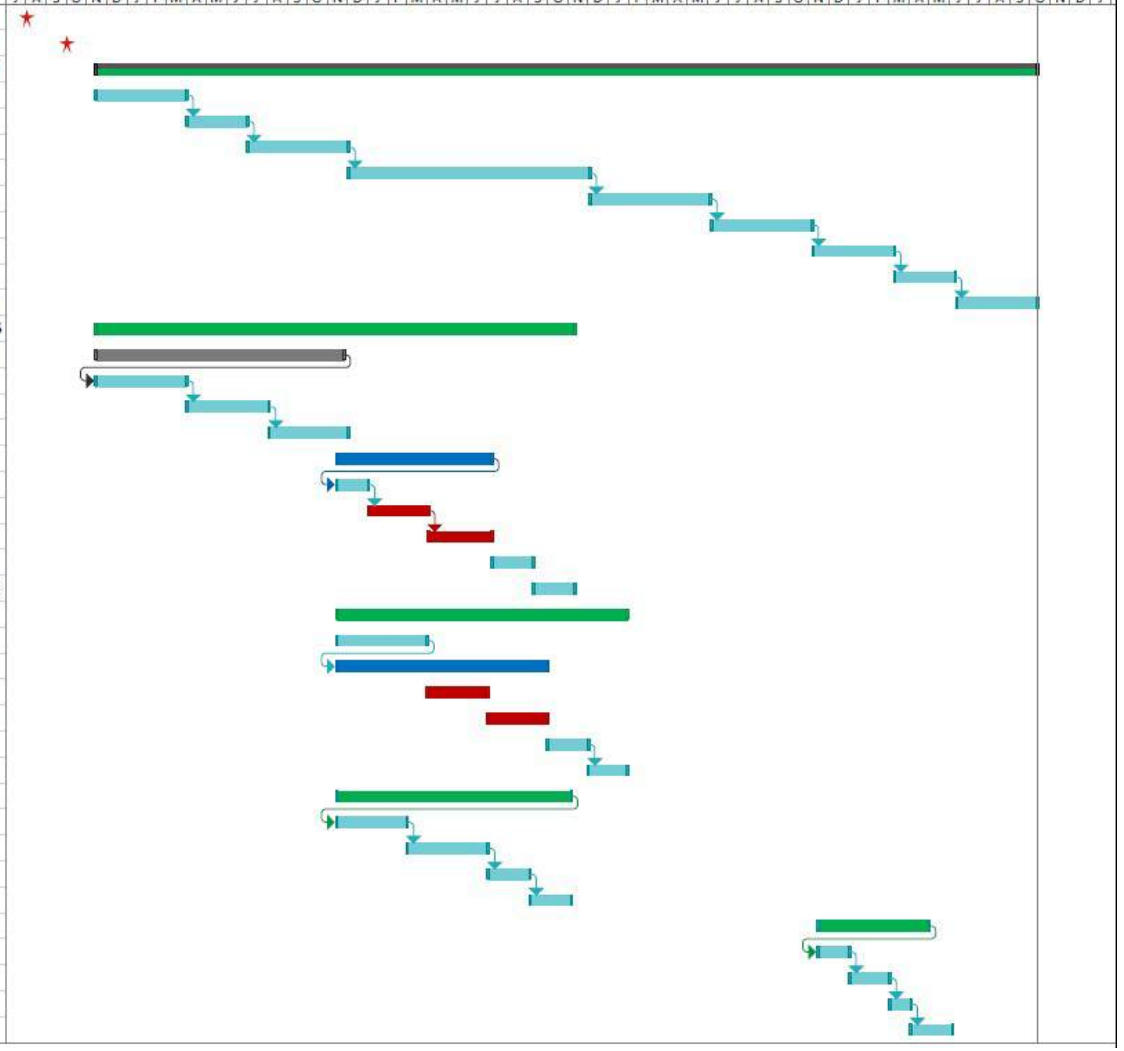


Table 2. Gantt chart description of construction timeline.

Appendix F

River Safety Plan

RIVER SAFETY PLAN

for the
CONSTRUCTION OF THE 36-INCH FORCE MAIN PIPELINE CROSSING (NORTH) AND THE 60-INCH GRAVITY SEWER PIPELINE CROSSING (SOUTH) OF THE FRENCH BROAD RIVER

Proposed for the
Metropolitan Sewerage District of Buncombe County
Carrier Bridge Pump Station Project

To facilitate and assure safe passage of river users during the construction of the Carrier Bridge Pump Station Project proposed pipeline north and south crossings of the French Broad River, the Metropolitan Sewerage District of Buncombe County has developed this River Safety Plan (RSP) for implementation during project construction. The following measures are to be conducted and implemented prior to initiating construction activities along or across the French Broad River:

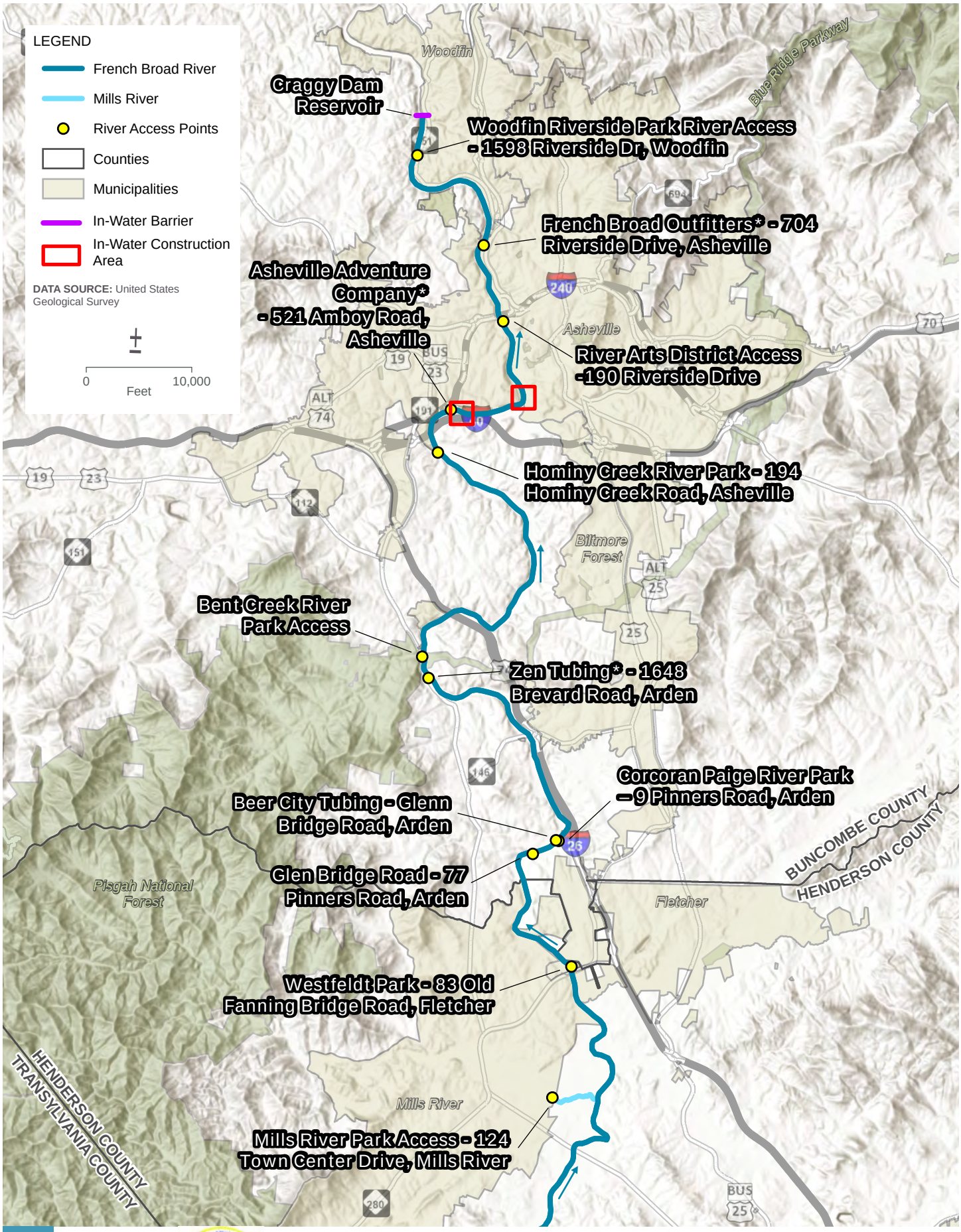
- Initial coordination efforts:
  - Coordinate with the North Carolina Department of Transportation (NCDOT):
    - Identify river safety measures implemented by NCDOT for the I-26 bridge demolition and construction project.
    - Identify any lessons learned or issues that occurred to consider further as part of this River Safety Plan.
    - Revise and/or add measures to this River Safety Plan based on information learned from NCDOT.
  - Coordinate with the Biltmore Farms, LLC:
    - Identify river safety measures implemented for their Ranger Bridge construction project.
    - Identify any lessons learned or issues that occurred to consider further as part of this River Safety Plan.
    - Revise and/or add measures to this River Safety Plan based on information learned from Biltmore Farms, LLC.
  - Coordinate with the local recreational boating outfitters in the area:
    - Ensure project signage and river safety measures outlined in this plan are adequate for recreational users.
    - Identify suitable locations for posting signage along the river visible for recreational users.
    - Request permission to post a project/construction announcement alerting recreational users of appropriate river safety during construction activities and recommended put in/pull out locations.
  - Verify privately owned launches are open for access use; update coordination and sign posting lists accordingly.

  - Coordinate with public and privately owned launches for permission of sign posting:
    - Public agencies/department – Transylvania County Parks and Recreation Department, Brevard Parks and Recreation Department, North Carolina Wildlife Resources Commission, Henderson County Parks and Recreation Department, Town of Mills River, Buncombe County Parks and Recreation Department, and Woodfin Parks and Recreation Department.
    - Private entities – Headwaters Outfitters, Headwaters Outfitters Campground, Beer City Tubing, Zen Tubing, Asheville Adventure Company, and French Broad Outfitters.
- Develop appropriate project/construction announcement and signage for alerting recreational users of river safety during construction and recommended put in/pull out areas.
- Identify appropriate locations for posting construction notification and river safety signage along the river and at river entry points (see proposed upstream and downstream locations shown on the attached Figures 1A and 1B, and outlined under the following bullet).
- Posting of construction notification and river safety signage:
  - Provide signage upstream and downstream of the pipeline crossing locations (north and south) to alert recreational users of construction activities in the area. Signs shall be posted in a publicly viewable location near river access parking areas and at the top slope of river launch ramps.
  - Signs posted upstream of the project construction areas will note that the last public pull out is at Hominy Creek River Park, approximately 1-mile upstream of the project south crossing construction area. Last emergency pull out on private property is at the Asheville Adventure Company access ramp located approximate 900 feet upstream of the project south crossing construction area.
  - Signage shall be posted along the river edge or at a suitable upstream bridge crossing alerting in-water users of the upcoming public pull out and emergency pull out locations and shall be placed no less than 1,000 feet from the exit point. Additionally, this signage should indicate which side of the bank (left or right) the exit point is on.
  - Notification signage will be placed at the following **upstream** locations (listed starting with the furthest upstream location and moving in order downstream to the project site); all are public with the exception of the privately owned launches marked with an asterisk (*):
    - Headwaters Outfitters* – 25 Parkway Road, Rosman
    - Champion Park River Access (Transylvania County Parks and Recreation Department) – Old Turnpike Road, Rosman (1st public access from the headwaters)
    - Headwaters Outfitters Campground * - Green Road (SR 1127), Rosman
    - Island Ford River Access (Transylvania County Parks and Recreation Department) – Island Ford Road, Brevard
    - Hap Simpson Park (Brevard Parks and Recreation Department) – 968 Greenville Hwy, Brevard
    - Wilson Road River Access (Transylvania County Parks and Recreation Department) – Wilson Road, Pisgah Forest

        - Penrose Boat Ramp (North Carolina Wildlife Resources Commission) – 170 Apac Drive, Penrose
        - Blantyre Park (Henderson County Parks and Recreation Department) – Grove Bridge, Etowah
        - Horse Shoe River Bend Access (Henderson County Parks and Recreation Department) – 5437 Brevard, Horse Shoe
        - Mills River Park (Town of Mills River) – 124 Town Center Drive, Mills River (This access point is located along Mills River approximately 0.9 river miles upstream of the confluence of Mills River and French Broad River and is a common starting point for paddlers along the French Broad River).
        - Westfeldt Park (Henderson County Parks and Recreation Department) – 83 Old Fanning Bridge Road, Fletcher
        - Glen Bridge River Park (Buncombe County Parks and Recreation) – 77 Pinners Road, Arden
        - Beer City Tubing* - Geen Bridge Road, Arden
        - Corcoran Paige River Park (Buncombe County Parks and Recreation Department) – 9 Pinners Road, Arden
        - Bent Creek River Park (Buncombe County Parks and Recreation Department) – 1592 Brevard Road, Asheville
        - Zen Tubing* - 1648 Brevard Road, Arden
        - Hominy Creek River Park (Buncombe County Parks and Recreation Department) – 194 Hominy Creek Road, Asheville (**last public pull out exit point moving downstream**)
        - Asheville Adventure Company* - 521 Amboy Road, Asheville (**last emergency private pull out exit point moving downstream**)
    - Notification signage will be placed at the following **downstream** locations (listed starting with the first downstream location and moving in order downstream to the Craggy Dam; Figure 1A); all are public with the exception of the privately owned launches marked with an asterisk (*):
        - River Arts District Access (North Carolina Wildlife Resources Commission) – 190 Riverside Drive (**last public pull out exit point moving upstream**)
        - French Broad Outfitters* - 704 Riverside Drive, Asheville
        - Woodfin Riverside Park River Access (Woodfin Parks & Recreation Department) - 1598 Riverside Dr, Woodfin
    - Signage on the cofferdam structures to warn river users away and prevent river users from using the cofferdam structures as a stopping/resting point.
- Physical restrictions:
    - Use of a floating navigational aide to mark the safe passage lane around the cofferdam structures.
    - Steady-state red lights that are solar-powered will be placed on the cofferdam to alert river user to its location. Generators will not be used to provide power. These lights will be set atop the cofferdam bladder for the duration the cofferdam is in use. The contractor

will be responsible for maintaining these lights at all times during construction, replacing them as necessary.

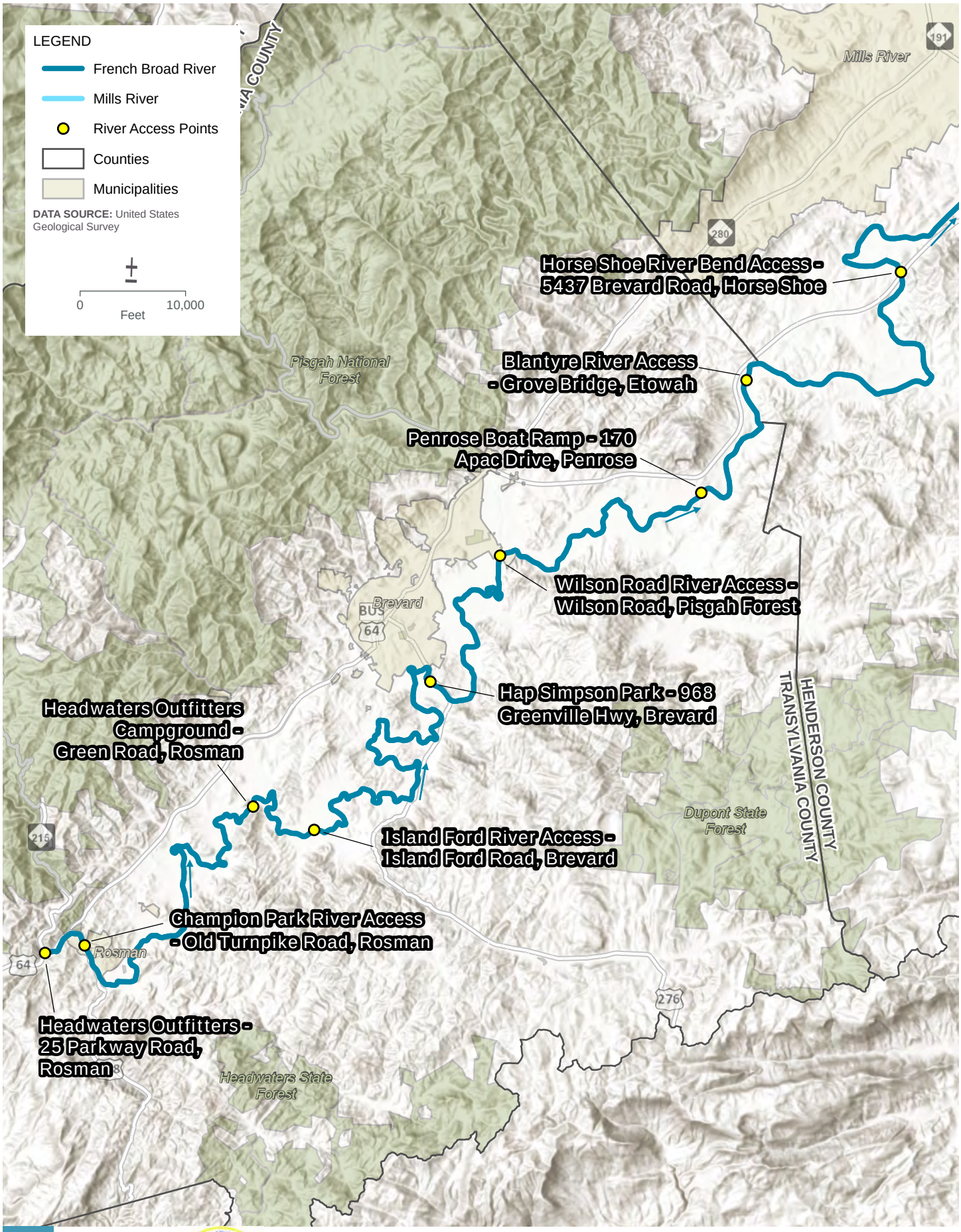
- Contractor requirements:
  - Develop a river traffic plan to include below items:
    - Provide one or more flaggers upstream as needed to stop river use at limited times when working in the river (e.g., cofferdam installation/removal, blasting).
    - Training of construction staff to teach skills in aiding a distressed boater – This is meant as an extra precaution for both staff and river users. It does NOT imply that the contractor will provide "lifeguard" type services.
    - Crews working in or near the water must wear a life vest.
    - Crews working in the water and cofferdam area must have a boat on site.



MSD CARRIER BRIDGE

SIGNAGE POSTING AT RIVER ACCESS/EXIT POINTS

Figure 1A



MSD CARRIER BRIDGE

SIGNAGE POSTING AT RIVER ACCESS/EXIT POINTS

Figure 1B

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