SECTION 00 01 01 PROJECT TITLE PAGE

PROJECT MANUAL

FOR



THE UNIVERSITY OF NORTH CAROLINA AT PEMBROKE 111 UNIVERSITY DRIVE PEMBROKE, NORTH CAROLINA 28372

WEST HALL PARKING (LOT 21) PAVEMENT IMPROVEMENT 111 UNIVERSITY ROAD PEMBROKE, NORTH CAROLINA 28372 REI PROJECT NO. 022CLT-296

SCO ID# 22-24689-01A

02-03-2023

PREPARED BY:

1927 J.N. PEASE PLACE, SUITE 201, CHARLOTTE, NC 28262 NORTH CAROLINA FIRM LICENSE C-1520

SECTION 00 01 07

SEALS PAGE

PART 1 GENERAL

1.1 SUMMARY

- A. Design Firm for West Hall Parking (Lot 21) Pavement Improvement with Project Manual dated 02-03-2023:
 - 1. REI Engineers, Inc., 1927 J.N. Pease Place, Suite 201, Charlotte, NC 28262.
 - 2. North Carolina Firm License C-1520



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- A. The following drawings dated 02-03-2023 are included as part of the Contract Documents:
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 - 3. G-003 Building Code Summary
 - 4. V-101 Survey
 - 5. C-101 Demolition Plan
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 - 17. C-501 Details
 - 18. C-502 Details
 - 19. C-503 Structural Details

SECTION 00 11 13

ADVERTISEMENT FOR BIDS

PART 1 GENERAL

1.1 **PROJECT INFORMATION**

- A. Project Name: West Hall Parking (Lot 21) Pavement Improvement
- B. Project Address: 111 University Road, Pembroke, North Carolina 28372
- C. Owner: The University of North Carolina at Pembroke

1.2 BIDS

A. Sealed bids for the project will be received from bidders by the Owner at 111 University Drive, Pembroke, North Carolina 28372 until 10:30 AM on 04-03-2024, at which time they will be publicly opened and read.

1.3 **PROJECT DOCUMENTS**

A. Electronic project documents may be obtained from the Engineer, REI Engineers, Inc., 1927 J.N. Pease Place, Charlotte, NC 28262, Marcos Quesada, mquesada@reiengineers.com at no cost.

1.4 BIDDING REQUIREMENTS

- A. All bidders are hereby notified that they shall be properly licensed under the state laws governing their trades.
- B. Bid security in the amount equal to not less than 5% of the gross amount of the bid is required.
- C. A Performance Bond and Payment Bond in the amount of the contract is required.
- D. Submit questions to REI Engineers, Inc. in writing to the Project Manager's email address listed above no later than 5:00 PM at least 7 days prior to the bid due date.

1.5 PRE-BID MEETING

- A. A Pre-Bid Meeting is scheduled for 11:00 AM on 03-21-2024 at the project address listed above.
- B. Attendance is recommended.

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.1 **DEFINITIONS**

- A. The Bidding Documents consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Bid Form, and other sample bidding and contract forms.
- B. The proposed Contract Documents consist of the Form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and Addenda issued prior to execution of the Contract.
- C. Definitions set forth in Section 00 72 13 General Conditions of the Contract for Construction or in other Contract Documents are applicable to the Bidding Documents.
- D. Addenda are written or graphic instruments issued by the Engineer prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.
- E. A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.
- F. The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.
- G. An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.
- H. A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.
- I. A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.
- J. A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

1.2 BIDS

- A. Submit Bid Form along with required enclosures in a sealed envelope, with the Bidder's name, license number, and project name written on the outside; place this sealed envelope in another envelope and deliver to the Owner at the address specified.
- B. Bids will be received until the date and time specified at which time they will be publicly opened and read.

- C. Fill in and sign the bid form correctly. Bids that show any omission, alterations of form, additions not called for, conditional Bids, or any irregularities of any kind may be rejected. If erasures are necessary and appear on the forms, each such erasure must be initialed by the person signing the proposal.
- D. Bids that are non-responsive or fail to follow the Instructions to Bidders may be rejected.
- E. No bid may be withdrawn after receipt of Bids for a period of 60 days.

1.3 ACCEPTANCE OF BID (AWARD)

- A. It is the intention of the Owner to award a contract for work under this project to the lowest responsible Bidder; however, in the interest of suitability to the need of the Owner and/or economy, equipment, materials and furnishings other than the lowest in price may be selected.
- B. The Owner reserves the right to reject any or all Bids, to accept any bid submitted, to waive any formalities, and to negotiate with the low Bidder or Bidders any changes considered necessary or desirable. The Owner reserves the right to reject any Bid when such rejection is in the interest of the Owner to reject the bid of the bidder who has previously failed to perform or to complete on time Contracts of a similar nature; and to reject the bid of a bidder who is not, in the opinion of the Engineer, in a position to perform the Contract.
- C. The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted. Alternates may be accepted at any time during the bid holding period.

1.4 PRE-BID MEETING

- A. Refer to the invitaiton or adveristement for bids for the date, time and location of the Pre-Bid Meeting.
- B. A Pre-Bid Meeting will be held for purposes of considering questions posed by Bidders. All interpretations and corrections to Contract Documents deriving from this meeting will be documented via Addendum.
- C. If the Bidder does not attend the Pre-Bid Meeting, it is the Bidder's responsibility to obtain the Pre-Bid Meeting Minutes and all Addenda.

1.5 DISQUALIFICATION

A. The Owner reserves the right to disqualify Bids, before or after opening, upon evidence of collusion with intent to defraud or commit other illegal practices upon the part of the Bidder.

1.6 CONTRACTOR'S LICENSE

A. All Bidders must have proper licenses for contractors as required by State Law. The Bidder's license number shall be listed on the bid form and on the outside of the inner sealed envelope in which the bid is submitted.

1.7 CONFLICT OF INTEREST

A. Bidders must disclose in writing with their bid the name of any owner, officer, director, or agent who is also an employee of the Owner.

- B. Bidders must disclose in writing with their bid the name of any employee of the Owner who owns, directly or indirectly, an interest of 5 percent or more in the Bidder's firm or any of its branches or subsidiaries.
- C. By submitting a bid, the Bidder certifies that there is no relationship between the Bidder and any person or entity which is, or gives the appearance of, a conflict of interest related to this project.

1.8 NON-DISCRIMINATION

A. The Bidder shall not discriminate against any individuals and will take proactive measures to assure compliance with all Federal and State requirements concerning fair employment, employment of people with disabilities, and concerning the treatment of all employees without regard to discrimination based upon age, race, color, religion, sex, national origin, or disability.

1.9 INTERPRETATION OF DRAWINGS AND SPECIFICATIONS

- A. Examine Drawings and Specifications and all Addenda or other revisions thereto and thoroughly familiarize himself with the detailed requirements thereof prior to submitting a proposal.
- B. Should a Bidder find discrepancies or ambiguities in, or omissions from the Specifications and Drawings bound herein, or should be in doubt as to their meaning, notify the Engineer in writing immediately. Engineer will issue an interpretation in the form of an addendum. This addendum will be forwarded to all Bidders of record.
- C. Addenda will be issued no later than four days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.
- D. Act promptly and allow sufficient time for a reply to be provided before the date established for submission of Bids.
- E. Acknowledge receipt of all addenda on the Bid Form.
- F. No oral interpretations will be made to any Bidder as to the meaning or intent of the Contract Documents or be effective to modify any of the provisions of the Contract Documents.

1.10 SUBSTITUTIONS

- A. References are made to certain specific products solely to denote the quality standard of the desired product and are not intended to restrict Bidders to a specific brand, make, manufacturer, or name. These products have been noted to assist in establishing material types and acceptable products. Equivalent products will be considered acceptable provided that the approval of the specific product has been given in writing by the Engineer.
- B. Written requests for substitution of equivalent products from prime bidders will be considered if received by the Engineer 7 calendar days prior to the bid opening.
- C. Identify the product or the fabrication or installation method to be replaced in each request. Include related specification sections and drawing number.
- D. Provide complete documentation on both the product specified and the proposed substitution including the following information as appropriate:

- 1. Comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.
- 2. Samples where applicable or requested.
- 3. Detailed comparison of significant qualities of the proposed substitution with those of the work specified.
- 4. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors that will become necessary to accommodate the proposed substitution.
- E. Certification by the Bidder or manufacturer that the substitution proposed is equal to or better in every respect to that required by the Contract Documents, and that it will perform equal or superior to product specified in the application indicated. The Bidder waives any right to additional payment or time, which may subsequently become necessary because of the failure of the substitution to perform adequately.
- F. Engineer's Action: The Engineer may request additional information or documentation necessary for evaluation of the request. The Engineer will notify the Bidders of acceptance of the proposed substitution by means of an addendum to the bid documents. If the proposed substitute is accepted through an addendum use the product specified by name. Engineer's Substitution Approval during bidding and subsequent addendums does not void the Bidder's responsibility to submit the required shop drawings and comply with the other contract documents and requirements.

1.11 SITE INVESTIGATION

- A. Examine the site to determine the extent of work involved, size of work, etc., and the conditions under which the work must be staged and performed. Examine the grounds and buildings, utilities and roads and ascertain by any reasonable means conditions that will in any manner affect its work. Ask the Engineer for any additional information that he deems necessary to be fully informed as to exactly what is to be expected prior to submitting a proposal. The drawings have been prepared on the basis of surveys and inspections of the site and physical conditions at the site. This, however, does not relieve the Bidder of the necessity for fully informing itself as to the existing physical conditions. Secure field measurements for quantities upon which proposal is based. Carefully examine the existing conditions as compared to the Contract Documents.
- B. The submission of a bid will be construed as evidence that such an investigation has been made, and no subsequent allowance will be made in this connection on behalf of the bidder for any error or negligence.
- C. Upon arrival at the Project Site, immediately proceed to the main entrance/office and advise the administrative personnel of its presence and purpose. Sign the visitor's log, giving his name, his company and the time and date of the visit.
- D. Inspection of the work areas shall occur between the hours of 8:00 AM and 5:00 PM. No inspections will be conducted on Saturdays, Sundays, or holidays.

1.12 BID SECURITY

A. Bid bond, deposit of cash or a certified check drawn on a bank or trust company insured by the FDIC in an amount equal to not less than 5% of the gross amount of the bid is required.

1.13 PERFORMANCE BOND AND LABOR AND MATERIALS PAYMENT BOND

A. A Performance Bond and Payment Bond in the amount of the contract is required. Include the cost of providing Performance Bond and Payment Bond in the Base Bid.

1.14 PRIME CONTRACT

A. Perform all work under a single prime contract.

1.15 PERMITS, FEES AND TAXES

A. Secure and pay the costs of licenses, permits and fees for inspections required by City, County and/or State authorities; Social Security and other applicable Local, State and Federal Government taxes, and sales taxes. Include such costs in its bid.

1.16 SUBCONTRACTORS

- A. List names of subcontractors on the Bid Form. Identify work by the general, subcontractor or not applicable for each trade; utilize blank lines to list trades not provided in the table. Do not list suppliers. All blanks must be filled in. Failure to do so may result in bid being declared non-responsive. If there is more than one subcontractor per trade identified below, list all. If no subcontractors are to be utilized, indicate by signing at the appropriate place at the bottom of the table.
- B. A Bidder whose bid is accepted shall not substitute any person as subcontractor in the place of the subcontractor listed in the original bid, except if the listed subcontractor's bid is later determined by the successful Bidder to be nonresponsible or nonresponsive or the listed subcontractor refuses to enter into a contract for the complete performance of the bid work, or with the approval of the awarding authority, the Owner, for good cause shown by the successful Bidder.
- C. The terms, conditions, and requirements of each contract between the successful Bidder and a subcontractor performing work under a subdivision or branch of work listed in this subsection shall incorporate by reference the terms, conditions, and requirements of the contract between the contractor and the Owner.

1.17 FORM OF AGREEMENT

A. The form of agreement between the Owner and Contractor to be entered into shall be the sample contained in Section 00 52 13 - Standard Form of Agreement.

1.18 BIDDER QUALIFICATIONS

A. Bids will be accepted from Bidders who are regularly engaged in, and licensed to perform, the work they are bidding, which represents a significant portion of their total volume and who perform this work with workers regularly employed on their direct payrolls. Before a bid is considered for award, the Bidder may be requested by the Engineer to submit a statement of facts in detail as to its previous experience in performing similar or comparable work and of its business and technical organization and financial resources available to be used in contemplated work. The Bidder may also be required to submit a statement of facts in detail on his proposed subcontractors as to their previous experience and past performance in performing similar work or comparable work.

SECTION 00 41 13

BID FORM

PART 1 GENERAL

1.1 PROJECT AND ITS PARTIES

- A. TO:
 - 1. Kevin Witmore
 - 2. The University of North Carolina at Pembroke
 - 3. 111 University Drive
 - 4. Pembroke, North Carolina 28372
- B. PROJECT:
 - 1. West Hall Parking (Lot 21) Pavement Improvement
 - 2. REI Project No. 022CLT-296
- C. FROM:

1.	Date:			
2.	Bidder:			_
3.	Address:			
4.	Phone:	Email:		
5.	GC License #:	Classification:	Limitation:	

1.2 BASE BID

- A. The undersigned, as bidder, hereby declares that the only person or persons interested in this bid as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this bid or in the contract to be entered into; that this proposal is made without connection with any other person, company or parties making a bid or proposal; and that it is in all respects fair and in good faith without collusion or fraud. The Bidder further declares that he has examined the site of the work and the contract documents relative thereto dated 02-03-2023 as prepared by REI Engineers, Inc., and has read all special provisions furnished prior to the opening of bids; that he has satisfied himself relative to the work to be performed. The Bidder proposes and agrees if this bid is accepted to contract with the Owner in the form of contract specified, to furnish all necessary materials, equipment, machinery, tools apparatus, means of transportation and labor necessary to complete the construction of the project with a definite understanding that no money will be allowed for extra work except as set forth in the General Conditions and the Contract Documents, for the sum of:
 - 1. Words: _____
 - 2. Figures: \$_____.

1.3 ASPHALT INDEX

- A. Adjustments will be made to the Contract Amount for each grade of asphalt binder when it has been determined that the monthly average terminal F.O.B. Selling Price of asphalt binder, Grade PG 64-22, has fluctuated from the Base Price Index for Asphalt Binder included in the Base Bid. A change order will be issued at construction commencement for the difference of the average price of Grade PG 64-22 asphalt binder as published by the NCDOT on the first of each month based upon the following formula:
 - 1. $A = (B \times C) \times (D E)$
 - 2. A = Change order amount (positive or negative)
 - 3. B = Tonnage listed on Bid Form
 - 4. C = % of binder listed in the Job Mix Formula
 - 5. D = PG 64-22 price at construction commencement
 - 6. E = PG 64-22 price at bid due date
- B. The following tons of asphalt are included in the base bid:
 - 1. S9.5B: _____ TONS
 - 2. I19.0C: _____ TONS

1.4 ALTERNATES:

- A. The undersigned agrees to perform alternative work as described in Section 01 23 00 -Alternates for the sums stated below resulting in additions to or deductions from the base bid stated above. Additions and deductions shall include any modifications of the Work or additional work that may be reasonably included as part of the alternative work. All alternative work is to be completed within the same timeframe as the base bid work. All alternates must be filled out. A zero or no entry after any alternate indicates no cost change to include that Alternate. Alternates may be accepted at any time during the bid holding period. The undersigned acknowledges that failure to complete all information requested in this section may result in the rejection of this bid.
 - 1. Alternate No. 1: Concrete Sidewalk
 - a. Words:_____
 - b. Figures: \$_____.
 - c. Select One: ____ Add or ____ Deduct

1.5 ALLOWANCES:

A. Include in the Base Bid the \$45,000.00 Contingency Allowance.

1.6 UNIT PRICES:

A. Unit prices quoted and accepted shall apply throughout the life of the contract, except as otherwise specifically noted. Unit prices shall be applied, as appropriate, to compute the total value of changes in the scope of the work all in accordance with the contract documents.

- 1. Place and Grade ABC Stone. Furnishing, mobilizing, placing, and grading of material is included: \$_____ per TON.
- 2. Place and Grade Washed #57 Stone. Furnishing, mobilizing, placing, and grading of material is included: \$_____ per TON.
- 3. Undercut/Mill and Provide Asphalt Pavement. The undercut is the removal of stone, subgrade, concrete, and/or asphalt. Include the related cost for hauling and disposal of all undercut material. Exclude the cost for testing, disposal and excess hauling of contaminated material: \$_____ per TON
- 4. Spread Blotting Sand: \$_____ per LB
- 5. Provide 4-inch wide Striping: \$_____ per LF
- 6. Provide 4-inch Sidewalk. Include the related cost for furnishing, mobilizing, forming, and pouring of material. Include the related cost for hauling and disposal of all existing material: \$_____ per SF
- 7. Provide Curb and Gutter. Include the related cost for furnishing, mobilizing, forming, and pouring of material. Include the related cost for hauling and disposal of all existing material: \$_____ per LF
- 8. Provide Concrete Wheel Stop. Include the related cost for furnishing, mobilizing, and installing of the wheel stop: \$_____ per EA

1.7 BID HOLDING TIME AND ACCEPTANCE:

A. The undersigned hereby agrees that this bid may not be revoked or withdrawn after the time set for the opening of bids but shall remain open during the bid holding period as specified in Section 00 21 13 - Instructions to Bidders.

1.8 SCHEDULE OF COMPLETION:

A. The undersigned understands that time is of the essence and agrees to the Contract Time and liquidated damages as indicated in General Conditions of the Contract for Construction and Supplementary Conditions apply to this Work. The undersigned hereby agrees to commence work on this project within 30 days following receipt of an Executed Agreement between the Owner and Contractor. Date of commencement will be established in a Notice to Proceed issued to Contractor. Complete work under the Base Bid and all alternates accepted within 75 calendar days from the date of commencement. Applicable liquidated damages shall be as stated in the Supplementary Conditions.

1.9 ADDENDUM:

- A. Addendum received and used in computing bid:
 - 1. Addendum No. 1: _____
 - 2. Addendum No. 2: _____
 - 3. Addendum No. 3: _____
 - 4. Addendum No. 4: _____

1.10 SUBCONTRACTORS:

A. If subcontractors are to be utilized, the Bidder shall fill out all blanks on the list below. All subcontractors shall be listed. The Bidder shall identify work by the general, subcontractor or not applicable for each trade; utilize parenthesis (_) to list trades not provided. Do not list suppliers. All blanks must be filled in. Failure to do so may result in bid being declared non-responsive. If there is more than one subcontractor per trade identified below, list all. If no subcontractors are to be utilized, indicate by signing at the appropriate place at the bottom of the table.

	1.	Trade: <u>General</u>	Contractor:			
	2.	Trade: <u>Paving</u>	Contractor:			
	3.	Trade: <u>Mechanical</u>	_ Contractor:			
	4.	Trade: <u>Electrical</u>	Contractor:			
	5.	Trade: <u>Concrete</u>	Contractor:			
	6.	Trade: <u>Utility Locate</u>	Contractor:			
	7.	Trade: <u>Waste Disposal</u>	Contractor:			
	8.	Trade: <u>Grading</u>	Contractor:			
	9.	Trade: <u>Milling</u>	_ Contractor:			
	10.	Trade: <u>Trucking</u>	_ Contractor:			
	11.	Trade: <u>Striping</u>	_ Contractor:			
	12.	Trade:	_ Contractor:			
	13.	Trade:	_ Contractor:			
	14.	We do not plan to use subco	ontractors:	(Signed)		
ENCL	OSURE	S:				
A.	Provid	Provide the following enclosures with submitted bid:				
	1.	Bid Bond				
SUBN	SUBMITTED BY:					
A.	Contra	actor Name:				
B.	Autho	rized Signing Officer Name:				
C.	Autho	rized Signing Office Title:				
D.	Signat	ure:				
E.	Respe	ectfully submitted this	day of	, 20		

1.11

1.12

1.13 NOTARIZED BY:

I,	(print name), a	a Notary Public for
do hereby certify that	(o	fficer listed above)
personally appeared be	efore me this day and acknowledged the due	e execution of the
foregoing instrument.	Withness my hand and official seal, this	day of
, 20	. My commission expires of	, 20 .

B. Signed: _____

(OFFICIAL SEAL)

SECTION 00 43 13

BID BOND FORM

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Utilize AIA Document A310 2010 Bid Bond Form. Document is incorporated by reference, Contractor is responsible to obtain a properly licensed form for use on the project.

1.2 RELATED DOCUMENTS

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

1.3 BID SECURITY

- A. File a bid bond in the amount equal to not less than 5% of the gross amount of the bid executed in accordance with and conditioned as prescribed by GS 143-129, as amended by Chapter 1104 of the North Carolina Public Laws of 1951.
- B. Bid Bond shall be signed by the Bidder and notarized.
- C. If the successful Bidder fails to execute the contract within 10 days after award, the above deposit will be retained by the Owner on the bid bond executed on liquidated damages.

SECTION 00 52 13

STANDARD FORM OF AGREEMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Owner's Standard Form of Agreement

1.2 RELATED DOCUMENTS

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

FORM OF CONSTRUCTION CONTRACT

(ALL PRIME CONTRACTS)

	THIS AGREEMENT, made the	day of	in	the year of 20_	_ by
and	between				
				hereinafter ca	alled

the Party of the First Part and the State of North Carolina, through the [insert name of UNC Institution] hereinafter called the Party of the Second Part.

WITNESSETH:

That the Party of the First Part and the Party of the Second Part for the consideration herein named agree as follows:

1. Scope of Work: The Party of the First Part shall furnish and deliver all of the materials, and perform all of the work in the manner and form as provided by the following enumerated plans, specifications and documents, which are attached hereto and made a part thereof as if fully contained herein: advertisement; Instructions to Bidders; General Conditions; Supplementary General Conditions; specifications; accepted proposal; contract; performance bond; payment bond; power of attorney; workmen's compensation; public liability; property damage and builder's risk insurance certificates; and drawings, titled:

Consisting of the following sheets:					
Dated:	and the followi	ng addenda:			
Addendum No	Dated:	Addendum No Dated:			
Addendum No	Dated:	Addendum No Dated:			
Addendum No	Dated:	Addendum No Dated:			
Addendum No	Dated:	Addendum No Dated:			

2. That the Party of the First Part shall commence work to be performed under this agreement on a date to be specified in a written order of the Party of the Second Part and shall fully complete all work hereunder within ______ consecutive calendar days from said date. For each day in excess thereof, liquidated damages shall be as stated in Supplementary General Conditions. The Party of the First Part, as one of the considerations for the awarding of this contract, shall furnish to the Party of the Second Part a construction schedule setting forth planned progress of the project broken down by the various divisions or part of the work and by calendar days as outlined in Article 14 of the General Conditions of the Contract.

3. The Party of the Second Part hereby agrees to pay to the Party of the First Part for the faithful performance of this agreement, subject to additions and deductions as provided in the specifications or proposal, in lawful money of the United States as follows:

(\$).

Summary of Contract Award:

4. In accordance with Article 31 and Article 32 of the General Conditions of the Contract, the Party of the Second Part shall review, and if approved, process the Party of the First Party's pay request within 30 days upon receipt from the Designer. The Party of the Second Part, after reviewing and approving said pay request, shall make payments to the Party of the First Part on the basis of a duly certified and approved estimate of work performed during the preceding calendar month by the First Party, less five percent (5%) of the amount of such estimate which is to be retained by the Second Party until all work has been performed strictly in accordance with this agreement and until such work has been accepted by the Second Party. The Second Party may elect to waive retainage requirements after 50 percent of the work has been satisfactorily completed on schedule as referred to in Article 31 of the General Conditions.

5. Upon submission by the First Party of evidence satisfactory to the Second Party that all payrolls, material bills and other costs incurred by the First Party in connection with the construction of the work have been paid in full, final payment on account of this agreement shall be made within thirty (30) days after the completion by the First Party of all work covered by this agreement and the acceptance of such work by the Second Party.

6. It is further mutually agreed between the parties hereto that if at any time after the execution of this agreement and the surety bonds hereto attached for its faithful performance, the Second Party shall deem the surety or sureties upon such bonds to be unsatisfactory, or if, for any reason, such bonds cease to be adequate to cover the performance of the work, the First Party shall, at its expense, within five (5) days after the receipt of notice from the Second Party so to do, furnish an additional bond or bonds in such form and amount, and with such surety or sureties as shall be satisfactory to the Second Party. In such event no further payment to the First Party shall be deemed to be due under this agreement until such new or additional security for the faithful performance of the work shall be furnished in manner and form satisfactory to the Second Party.

7. The Party of the First Part attest that it and all of its subcontractors have fully complied with all requirements of NCGS 64 Article 2 in regards to E-Verification as required by Section 2.(c) of Session Law 2013-418, codified as N.C. Gen. Stat. § 143-129(j).

IN WITNESS WHEREOF, the Parties hereto have executed this agreement on the day and date first above written in ______ counterparts, each of which shall without proof or accounting for other counterparts, be deemed an original contract.

Witness:

	Contractor: (Trade or Corporate Name)
(Proprietorship or Partnership)	By: Title: (Owner, Partner, or Corp. Pres. or Vice Pres. only)
Attest: (Corporation)	
Ву:	_
Title: (Corp. Sec. or Asst. Sec. only)	 The State of North Carolina through
(CORPORATE SEAL)	[insert name of UNC institution]
	(Agency, Department or Institution)
Witness:	
	Ву:

Title:_____

SECTION 00 60 00

PROJECT FORMS

PART 1 GENERAL

1.1 SUMMARY

- A. The following documents are hereby incorporated into the Contract Documents by reference:
 - 1. AIA Documents: Properly licensed forms are available for purchase from the American Institute of Architects at www.aia.org/documents. Utilize current version of each document.
 - a. G701 Change Order Form
 - b. G702 Application and Certificate for Payment
 - c. G703 Continuation Sheet
 - d. G704 Certificate of Substantial Completion
 - e. G706 Contractor's Affidavit of Payment of Debts and Claims
 - f. G706A Contractor's Affidavit of Payment of Release of Liens
 - g. G707 Consent of Surety to Final Payment
 - h. G710 Architect's Supplemental Instruction Form
 - i. G714 Construction Change Directive
- B. The following documents are included in the Project Manual:
 - 1. Section 00 61 13.13 Performance Bond Form
 - 2. Section 00 61 13.16 Payment Bond Form
 - 3. Section 00 62 76.13 Sales Tax Report
 - 4. Section 00 65 36 Contractor's Warranty

SECTION 00 61 13.13

PERFORMANCE BOND FORM

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Utilize Owner's required Performance Bond Form attached to this section.

1.2 RELATED DOCUMENTS

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

1.3 GENERAL

- A. A Performance Bond in the amount of the contract is required.
- B. Include the cost of providing bonds in the Base Bid.
- C. Deliver the required bonds to the Owner no later than three days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section.
- D. Write bonds on the forms contained or referenced herein.
- E. Write bond in the amount of the Contract Sum.
- F. Date bonds on the date of the Contract.
- G. Issue bonds by sureties and execute by an attorney-in-fact, on behalf of the surety, who is authorized to do business in the State of North Carolina.
- H. Affix thereto a certified and current copy of the power of attorney.

FORM OF PERFORMANCE BOND

Date of Contract:			
Date of Execution: Name of Principal (Contractor)			
Name of Surety:			
Name of Contracting Body:			
Amount of Bond:			
Project			

KNOW ALL MEN BY THESE PRESENTS, that we, the principal and surety above named, are held and firmly bound unto the above named contracting body, hereinafter called the contracting body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind, ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the contracting body, identified as shown above and hereto attached:

NOW, THEREFORE, if the principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the contracting body, with or without notice to the surety, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Witness:

	_	Contractor: (Trade or Corporate Name)
(Proprietorship or Partnership)	Ву:	
Attest: (Corporation)	litle:	(Owner, Partner, or Corp. Pres. or Vice Pres. only)
Ву:		
Title:		
(Corp. Sec. or Asst. Sec. only)	-	
(Corporate Seal)		
		(Surety Company)
Witness:		Ву:
		Title:
		(Attorney in Fact)
Countersigned:		
		(Surety Corporate Seal)
(N.C. Licensed Resident Agent)		
Name and Address-Surety Agency		

Surety Company Name and N.C. Regional or Branch Office Address

SECTION 00 61 13.16

PAYMENT BOND FORM

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Utilize Owner's required Payment Bond Form attached to this section.

1.2 RELATED DOCUMENTS

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

1.3 GENERAL

- A. A Labor and Material Payment Bond in the amount of the contract is required.
- B. Include the cost of providing bonds in the Base Bid.
- C. Deliver the required bonds to the Owner no later than three days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section.
- D. Write bonds on the forms contained or referenced herein.
- E. Write bond in the amount of the Contract Sum.
- F. Date bonds on the date of the Contract.
- G. Issue bonds by sureties and execute by an attorney-in-fact, on behalf of the surety, who is authorized to do business in the State of North Carolina.
- H. Affix thereto a certified and current copy of the power of attorney.

FORM OF PAYMENT BOND

Date of Contract:	
Date of Execution: Name of Principal (Contractor)	
Name of Surety:	
Name of Contracting Body:	
Amount of Bond:	
Project	

KNOW ALL MEN BY THESE PRESENTS, that we, the principal and surety above named, are held and firmly bound unto the above named contracting body, hereinafter called the contracting body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the contracting body identified as shown above and hereto attached:

NOW, THEREFORE, if the principal shall promptly make payment to all persons supplying labor/material in the prosecution of the work provided for in said contract, and any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Executed in	 counterparts.

Witness:

	Contractor: (Trade or Corporate Name)
(Proprietorship or Partnership)	Ву:
Attest: (Corporation)	Title: (Owner, Partner, or Corp. Pres. or Vice Pres. only)
Ву:	
Title: (Corp. Sec. or Asst. Sec. only)	
(Corporate Seal)	
	(Surety Company)
Witness:	Ву:
	Title:
	(Attorney in Fact)
Countersigned:	
	(Surety Corporate Seal)
(N.C. Licensed Resident Agent)	
Name and Address-Surety Agency	

Surety Company Name and N.C. Regional or Branch Office Address Sheet for Attaching Power of Attorney

Sheet for Attaching Insurance Certificates

Approval of the University Attorney as to Form

SECTION 00 62 76.13

SALES TAX REPORT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Submit the attached State and County Salex/Use Tax Statement and Certification with each application for payment.

1.2 RELATED DOCUMENTS

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

Page ____ of ____

STATE AND COUNTY SALES/USE TAX STATEMENT AND CERTIFICATION

Project Name:	Application/Invoice #:	
Contractor's Name:	 Date:	

Subcontractor's Name:

Invoice Number	Invoice Date	Vendor's Name	Materials Purchased	Amount of Invoice Before Sales Tax	Sales Tax	Total Invoice	Name of County to Which Sales Tax Paid
TOTALS							

CERTIFICATION

This will certify that the above-listed amounts include only Sales or Use Taxes paid on purchases of tangible personal property for use in performing the contract for construction of the above-mentioned project which have become annexed to, affixed to, or have become a part of the building or structure.

SWORN AND SUBSCRIBED BEFORE ME THIS DAY OF

NOTARY PUBLIC

My Commission Expires:

Contractor: _____ Title: Date:

Revised 12/01/06

Signed By:

SECTION 00 65 36

CONTRACTOR'S WARRANTY

PART 1 GENERAL

1.1 WARRANTY

- B. We agree that for the period specified below, we will make repairs at no expense to the Owner to defects which may develop in the work in a manner compatible to the system and acceptable under industry standards and general practice as established by the Engineer.
- C. We agree to attend one post construction field inspection no earlier than one month prior to the Contractor's Warranty expiration date and to complete corrective actions requested by Owner, Engineer, or Manufacturer at no additional cost to the Owner.
- D. Warranty Period: 2 years from date of substantial completion of ______, 20____.

1.2 EXECUTED BY

1.3

A.	Contractor:
В.	Authorized Signing Officer Name:
C.	Authorized Signing Office Title:
D.	Signature: Date:
NOT	ARIZED BY:
A.	I,(print_name), a Notary Public for County of(State), do hereby certify that(officer listed above) personally appeared before me this day and acknowledged the due execution of the foregoing instrument. Withness my hand and official seal, this day of, 20 My commission expires of, 20
В.	Signed:

(OFFICIAL SEAL)

SECTION 00 72 13

GENERAL CONDITIONS OF THE CONTRACT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. AIA Document A201 2017 General Conditions of the Contract for Construction.

1.2 RELATED DOCUMENTS

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

SUPPLEMENTARY GENERAL CONDITIONS

TIME OF COMPLETION

The Contractor shall commence work to be performed under this Contract on a date to be specified in written order from the Designer/Owner and shall fully complete all work hereunder within 75 consecutive calendar days from the <u>Notice to Proceed Date</u>. For each day in excess of the above number of days, the Contractor shall pay the Owner the amount of \$500.00 Dollars as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the Owner should the Contractor fail to complete the Work within the time specified.

If the Contractor is delayed at any time in the progress of his work by any act or negligence of the Owner, his employees or his separate contractor, by changes ordered in the work; by abnormal weather conditions; by any causes beyond the Contractor's control or by other causes deemed justifiable by Owner, then the contract time may be reasonably extended in a written order from the Owner upon written request from the contractor within ten days following the cause for delay. Time extensions for weather delays, acts of God, labor disputes, fire, delays in transportation, unavoidable casualties or other delays which are beyond the control of the Owner do not entitle the Contractor to compensable damages for delays. Any contractor claim for compensable damages for delays is limited to delays caused solely by the owner or its agents.

CONTRUCTION SCHEDULE:

Seventy-five calendar days from Notice to Proceed Date to complete project to Owner's satisfaction. Note: State Electrical Inspector inspects projects on UNCP campus once per week on Tuesdays, to be requested a week in advance by the project licensed electrical subcontractor through Owner's Electrical Shop Supervisor: David McQueen, 910.521.6678 or 910.734.3277 or <u>David.mcqueen@uncp.edu</u> who needs to be contacted for a pre-inspection before requesting the State Electrical Inspector's site visit. Do not request the state inspection until receipt of a passing pre-inspection from David.

PAYMENTS

Final payment to be submitted at project completion, all pay applications to include HUB/MBE Appendix E Form and sales tax total report(s).

UTILITIES

Owner may provide certain utilities such as power or water with connections and extensions by the Contractor, but must be approved and coordinated in advance. Contractor to provide sanitary temporary toilet facilities for employees and subcontractors.

SECURITY

Owner is not liable for contractor or resources.

USE OF SITE

Available as needed Coordinate in advance with Owner for access. NOTE: all contractor vehicles coming onto campus must be registered with Facilities Management and Campus Police and obtain a free contractor's temporary parking pass/permit, for more information contact Facilities at 910.521.6233. Do not drive on or park on grass/turf or sidewalks. Do not block access to building entrances, sidewalks or any handicap access. Obey campus speed limits. If any building keys are needed, see and complete key request form for contractors (attached). Contractor to ensure employees maintain professional conduct and decorum on campus (no weapons, alcohol, drugs, etc. allowed on campus) and do not interact with students; any interaction with campus staff should be limited to pertinent project-specific conversations with the campus Project Manager. Refer to section 21 above regarding cleaning the project site, but ensure dust control measures are used to prevent dust from entering non-construction spaces, to include through the HVAC system ductwork. Ensure the work areas are left in the same condition or better than
when work starts, meaning Contractor is responsible for cleaning up behind themselves using Contractor provided cleaning equipment. Contractor responsible for protecting walls, elevators, floors, outdoor areas, etc. that are accessed by project. If project requires any digging, trenching, boring or other underground work, Contractor responsible for utilities locating and submitting required request form to Owner (Facilities), which requires a minimum of 48 hours' notice to complete utility markings of Owner's utilities. Form located online at: https://www.uncp.edu/sites/default/files/2017-12/diaging.com

12/digging and excavation procedure.pdf.

If work involves potentially setting off the building's fire alarm system, Contractor responsible for protecting smoke detector heads and coordinating placement of building's fire alarm system in test mode through Owner's Project Manager and Electrical Shop Supervisor with 72 hour advance notice. If work requires a utilities shut down or temporary outage, Contractor responsible for coordinating with Owner's Project Manager at least one week in advance in writing, form attached.

NO SMOKING POLICY

No smoking within 100 ft. of facilities.

SUSTAINABILITY

Follow all environmental sustainability rules and regulations and recycle waste materials and other items as applicable. Track and record this data (C&D debris and recyclables) and provide to Owner with closeout.

MINORITY BUSINESS PARTICIPATION

See and use attached forms.

<u>TECHNICAL SPECIFICATIONS</u> SHOULD FOLLOW THE SUPPLEMENTARY GENERAL CONDITIONS.

SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Name: West Hall Parking (Lot 21) Pavement Improvement
- B. Project Address: 111 University RoadPembroke, North Carolina 28372
- C. Owner: The University of North Carolina at Pembroke
- D. Engineer: The Contract Documents, dated 02-03-2023, were prepared by REI Engineers, Inc.
- E. This work includes the provision of labor, material, equipment, supervision and administration to integrate the work outlined in these specifications and Contract Drawings. In general, the scope of work in the Base Bid includes:
 - 1. Locate public and private utilities prior to work occurring.
 - 2. Provide barricades and signage for traffic control and designating work zones as indicated in the Contract Drawings. Fencing requirements are described in the specifications.
 - 3. Proof roll substrate to confirm suitability for paving. Report deflections to the Engineer and Owner.
 - 4. Provide striping as-is, unless otherwise stated in the Contract Drawings or by the Owner and approved by the Engineer.
 - 5. Provide erosion controls to protect contamination from leaving the work area and protect storm structures from sediment contamination.
 - 6. Provide signage inside adjacent buildings alerting patrons of the Work Area.
 - 7. Provide a Portable Toilet and hand washing station. Access inside the facility is not available.
 - 8. Pavement striping is for illustration only. Existing striping layouts should be noted prior to demolition.
 - 9. Existing trees and landscape are to remain in place unless otherwise noted.
 - 10. Backfill and compact landscaped and disturbed areas with like material. Grade areas level to surrounding existing and new surfaces. Slope surfaces to allow desired surface drainage. Seed and straw planted surfaces with surrounding like grass.
 - 11. Defined slopes have a tolerance of +/-0.5%.
 - 12. Defined lengths have a tolerance of +/- 6 inches.

- F. General requirements and specific recommendations of the material manufacturers are included as part of these specifications. The manufacturers' specifications are the minimum standards required for the completed systems. Where specific items listed herein improve the standards required by the manufacturers, they take precedence where their compliance does not affect the manufacturers' guarantee or warranty provisions.
- G. Prior to excavation, coordinate with designated Owner personnel all known utility locations. Provide utility locate and mark location of utilities on the ground. The Contractor remains responsible for protecting existing utilities from damage.
- H. The contractor is responsible for labor and materials needed for backfilling and fine grading necessary to comply with the requirements of these documents and conform to the requirements of the current Building Code approved in the State of the project location.
- I. Serve as the Project Expeditor and coordinate work and schedules of others hired.

1.2 **REFERENCE STANDARDS**

A. CSI/CSC MF - Masterformat; 2016.

1.3 CONTRACT

A. Project constructed under a single prime general construction contract between Owner and Contractor.

1.4 WORK UNDER OTHER CONTRACTS

- A. Separate Contract: Owner may award a separate contract for performance of certain construction operations at Project site.
- B. Cooperate with separate contractors so work on those contracts are carried out smoothly without interfering with or delaying Work under this Contract.

1.5 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the CSI/CSC MF 49-division format and numbering system.
 - 1. Section Identification: The Specifications use section numbers and titles to cross-reference Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Interpret words and meanings as appropriate. Infer words implied, but not stated, as the sense requires. Interpret singular words as plural and plural words as singular where applicable as the context of the Contract Documents indicates.

- 2. Imperative mood and streamlined language are generally used in the Specifications. Perform requirements expressed in the imperative mood. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. The words "shall", "shall be", or "shall comply with" depending on the context, are implied where a colon (:) is used within a sentence or phrase.

SECTION 01 14 00

WORK RESTRICTIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Administrative and procedural requirements for work sequence, work restrictions, occupancy requirements and use of premises.

1.2 RELATED DOCUMENTS

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

1.3 WORK SEQUENCE

- A. Construct Work in phases to accommodate the Owner's use; if applicable, of the premises during the construction period; coordinate the construction schedule and operations with the Owner and Engineer.
- B. Construct the Work in phases to provide for public convenience. Do not close off public use of facility until completion of one phase of construction provides alternative usage.
- C. Schedule construction in such a manner that once work has commenced on site, the work force will remain at that site continuously each workday through final completion at that facility.

1.4 WORK RESTRICTIONS

- A. Work hours generally performed during normal business hours. Provide notification to the Owner and Engineer 48 hours in advance of work outside of normal business hours. No work allowed without prior notification and authorization.
- B. University Work Restrictions:
 - 1. Coordinate work schedule with University's testing and events schedule and may not be allowed on-site during certain days/events.
 - Complete deliveries to the construction site before 8:00 AM or start after 6:00 PM Monday through Friday when classes are in session. Coordinate with Owner for special deliveries or weekend deliveries.

1.5 OCCUPANCY REQUIREMENTS

- A. Owner Occupancy:
 - 1. Owner occupies the premises during construction to conduct his normal operations. Cooperate with Owner in construction operations to minimize conflict, and to facilitate Owner usage.

2. Conduct operations as to ensure the least inconvenience and the greatest amount of safety and security for the Owner, building occupants, and the general public.

1.6 SECURITY

- A. Restrict the access of persons entering upon the Owner's property in connection with the work to the Contractor's Entrance and to the site of the work.
- B. Maintain an accurate record of the names and identification of visitors entering upon the Owner's property in connection with the work of this contract, including times of entering and times of leaving, and submit a copy of the record to the Owner weekly.

1.7 USE OF SITE

- A. Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.
- B. Confine its apparatus, the storage of materials, and operations of its workmen to limits required by law, ordinances, permits or directions of the Owner, and do not unnecessarily encumber the site. Prepare grounds for storage of materials, equipment set-up, foot and vehicular traffic.
 - 1. Driveways and Entrances: For areas where no construction is taking place keep driveways, entrances and/or access points serving premises clear and available to Owner, Owner's employees, and emergency vehicles. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
 - c. Schedule deliveries to avoid student pick up and drop off times.
 - 2. Do not allow equipment or operators to come within ten feet of power lines on the site. Adjust methods of demolition and construction accordingly to stay a safe distance from low or high voltage power lines.
 - 3. Move stored materials and equipment that interfere with operations of the Owner.
 - 4. Protect surface improvements not included in scope of work including pavements, curbs, sidewalks, lawn and landscaped areas, utilities, etc.
 - 5. Clean up daily refuse, rubbish, scrap materials, and debris caused by its operations. Pesent a neat, orderly, and controlled appearance of the site.
 - 6. No access to the facility unless authorized. Do not utilize restrooms inside the facility. Provide a portable toilet and remain for the duration of the project.
 - 7. Keep areas at the facility, except areas under construction, safely accessible to vehicles.
 - 8. Perform Work in a way that does not restrict the site outtside of the work area.
- C. Transportation Facilities

- 1. Truck and equipment access:
 - a. Avoid traffic conflict with vehicles of the Owner's employees and customers and avoid over-loading of street and driveways elsewhere on the Owner's property, limit the access of trucks and equipment to the designated areas.
 - b. Provide adequate protection for curbs and sidewalks over which trucks and equipment pass to reach the job site.
- 2. Contractor's vehicles:
 - a. Require contractor's vehicles, vehicles belonging to employees of the contractor, and other vehicles entering the Owner's property in performance of the work the contract, to use only the designated access route.
 - b. Do not permit such vehicles to park on street or other area of the Owner's property except in the designated area.
- D. Repair to the Owner and Engineer's satisfaction, or to restore to condition at the time of award of Contract, or to make restitution acceptable to the Owner, damages to surface improvements resulting from, or attributable to, the work operation.
 - 1. Repair damaged concrete by replacing full sections of concrete between control/expansion joints.
 - 2. Fill ruts in grass areas and grade to original conditions. Provide grass seed and straw.
 - 3. Replace disturbed landscaping in mulched or natural areas.

SECTION 01 21 00

ALLOWANCES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Administrative and procedural requirements governing allowances.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections apply to this Section, including but not limited to:
 - 1. Section 32 12 16 Asphalt Paving
 - 2. Section 32 17 23 Pavement Markings

1.3 ABBREVIATIONS

- A. Abbreviations for typical units of measurement:
 - 1. Square Foot (SF)
 - 2. Square Yard (SY)
 - 3. Cubic Foot (CF)
 - 4. Linear Foot (LF)
 - 5. Each (EA)
 - 6. Tonnage (TON)

1.4 CONTINGENCY ALLOWANCE

- A. Include the specified contingency allowance in the base bid.
- B. Credit unused portion remaining at the completion of the contract back to the Owner.
- C. The Owner reserves the right to modify the contingency allowance prior to award of Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 SCHEDULE OF ALLOWANCES

A. Contingency Allowance: Include a \$45,000.00 contingency allowance in the base bid.

SECTION 01 22 00

UNIT PRICES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Administrative and procedural requirements for unit prices.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections apply to this Section, including but not limited to:
 - 1. Section 31 00 00 Earthwork
 - 2. Section 32 12 16 Asphalt Paving
 - 3. Section 32 17 23 Pavement Markings

1.3 DEFINITION

A. Unit price is an amount proposed by Bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 ABBREVIATIONS

- A. Abbreviations for typical units of measurement:
 - 1. Square Foot (SF)
 - 2. Square Yard (SY)
 - 3. Cubic Foot (CF)
 - 4. Linear Foot (LF)
 - 5. Each (EA)
 - 6. Tonnage (TON)

1.5 UNIT PRICE MEASUREMENT

- A. Prior to performing work under a unit price as specified herein, notify the Engineer to allow for measurement of the actual quantities of work. Work performed under these items without prior approval and measurement is at the Contractor's expense.
- B. Maintain a daily log including visual documentation (i.e. digital photographs) showing dates, location and exact quantities of unit price work.

C. Owner and Engineer reserve the right to reject Contractor's measurement of work-inplace that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent party.

1.6 UNIT PRICE PAYMENT

A. Include in unit prices costs associated with performing the unit price work including but not limited to labor, material, equipment, insurance, applicable taxes, overhead and profit, bonds, etc.

1.7 UNIT PRICE PERFORMANCE

A. Install unit price work in accordance with the applicable specification sections and Contract Drawings.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 SCHEDULE OF UNIT PRICES

- A. Provide a unit price for:
 - 1. Place and Grade ABC Stone. Furnishing, mobilizing, placing, and grading of material is included. Unit of Measurement: TON.
 - 2. Place and Grade Washed #57 Stone. Furnishing, mobilizing, placing, and grading of material is included. Unit of Measurement: TON.
 - 3. Undercut/Mill and Provide Asphalt Pavement. The undercut is the removal of stone, subgrade, concrete, and/or asphalt. Include the related cost for hauling and disposal of all undercut material. Exclude the cost for testing, disposal and excess hauling of contaminated material. Unit of Measurement: TON
 - 4. Spread Blotting Sand. Unit of Measurement: LB
 - 5. Provide 4-inch wide Striping. Unit of Measurement: LF
 - 6. Provide 4-inch Sidewalk. Include the related cost for furnishing, mobilizing, forming, and pouring of material. Include the related cost for hauling and disposal of all existing material. Unit of Measurement: SF
 - 7. Provide Curb and Gutter. Include the related cost for furnishing, mobilizing, forming, and pouring of material. Include the related cost for hauling and disposal of all existing material. Unit of Measurement: LF
 - 8. Provide Concrete Wheel Stop. Include the related cost for furnishing, mobilizing, and installing of the wheel stop:. Unit of Measurement: EA

SECTION 01 23 00

ALTERNATES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Administrative and procedural requirements for alternates.

1.2 RELATED DOCUMENTS

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

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction or in the products, materials, equipment, systems or installation methods described in the Contract Documents.

1.4 ALTERNATES

- A. Indicate on the Bid Form whether the alternate bid amount is to added to or deducted from the base bid in the event the alternate bid is accepted.
- B. The Owner reserves the right to accept or reject any or all of the alternate bids.
- C. Responsible for determining to his own satisfaction and for his own purposes the limits and extent of the work affected by the alternate bids and to make proper allowance therefore in the submission of alternate bid.
- D. Include the cost of each alternate bid as specified in the technical specification sections and as described on the drawings. Perform work required by the alternate bids in accordance with applicable specifications and drawings of the trade section affected.
- E. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate selected alternates into the Work. No other adjustments are made to the Contract Sum.
- F. The Owner reserves the right to delay the acceptance of the alternate bids during the bid holding period prior to accepting the contract without a change in the dollar amount of the alternate bids.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1: Concrete Sidewalk

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - a. Project Schedule
 - b. General project coordination procedures.
 - c. Coordination.
 - d. Administrative and supervisory personnel
 - e. Project meetings

1.2 RELATED DOCUMENTS

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

1.3 SUBMITTALS

- A. Work schedule:
 - 1. Indicate start date, crew size, production rate, completion date, etc.
 - 2. Provide illustrated schedule on an aerial map.

1.4 COORDINATION

- A. Coordinate construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Coordinate its operations with those included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Contact Progress Reporting: Coordinate the scheduling and sequence of operations with the Owner and Engineer.

- C. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Construction Schedule.
 - 2. Preparation of the Schedule of Values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Pre-Construction conference.
 - 7. Pre-installation conferences.
 - 8. Project closeout activities.

1.5 **PROJECT MEETINGS**

- A. Pre-Construction Meeting
 - 1. A Pre-Construction Meeting will be scheduled as soon as possible after the award of the contract. The Engineer's Representative will compile minutes of the meeting and will furnish a copy of the minutes to each person present.
 - 2. Attendance: Project Manager, Job Superintendent and Job Foreman, Owner, Engineer's Representative, manufacturer's representatives, installers of related work and other persons concerned with the installation and performance.
 - a. Provide 3 telephone numbers to contact the Contractor or his authorized representative in the event of an emergency after normal business hours.
 - 3. Minimum Agenda: Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, and the Project Manager; channels and procedures for communication; construction schedule, including sequence of critical work; contract documents, including distribution of required copies of Drawings and revisions; processing of Shop Drawings and other data submitted to the Project Manager for review; rules and regulations governing performance of the work and procedures for safety, first aid, security, quality control, housekeeping and related matters.
- B. Progress Meetings:

- 1. Attend bi-weekly progress meetings for the purpose of informing the Owner and the Engineer regarding the status of the project. The Engineer will compile minutes of the meeting and will furnish a copy of the minutes to each person present.
- 2. Attendance: Owner, Engineer, Contractor, Job Superintendent, material Supplier, and Subcontractors, as appropriate. Provide an updated job progress schedule at each weekly meeting. Be thoroughly familiar with the status of the project and be prepared to discuss and act upon situations that arise. The time, date and location of these meetings will be established during pre-construction conference.
- 3. Minimum Agenda: Review of work progress; field observations, problems, and decisions; identification of problems which impede planned progress; maintenance of progress schedule; corrective measures to regain projected schedules; planned progress during succeeding work period; coordination of projected progress; maintenance of quality and work standards; processing of field decisions and Change Orders; effect of proposed changes on progress, schedule, and coordination; other business relating to work.
- C. Substantial Completion Inspection Meeting
 - 1. Scheduled by Owner and Engineer upon written notification of substantial completion of work from the Contractor.
 - 2. Attendance: Owner, Engineer, Contractor, material manufacturer.
 - 3. Minimum Agenda: Walkover inspection, verification of substantial completion, identification of punch list items and identification of problems potentially impeding issuance of warranties.
- D. Final Inspection Meeting
 - 1. Scheduled by Owner and Engineer upon written notification of final completion of work from the Contractor.
 - 2. Attendance: Owner, Engineer, Contractor.
 - 3. Minimum Agenda: Verification of final completion including the completion of the punch list items.

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

1.2 RELATED DOCUMENTS

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

1.3 SUBMITTAL PROCEDURE

- A. General: The Contractor is responsible for providing the submittals to the Engineer. Each submittal is required to be accepted in writing prior to commencement of work.
- B. Submission Requirements:
 - 1. Submit required submittals electronically in pdf format to the Engineer for review. The submittals will then be returned electronically to the Contractor with comments. Final submittals require written responses to submittal comments.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as specified below, commencing on Engineers receipt of submittal.
 - 1. Initial Review: Allow 7 work days for initial review of submittals.
 - 2. Allow 7 work days for processing each resubmittal.
 - 3. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
- D. Identification:
 - 1. Submit as one pdf file with bookmarks for each scheduled item.
- E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals and provide letter describing in detail proposed changes, substitutions, or deviations from the project or manufacturers specifications. Include a written explanation of why substitutions should be considered under the appropriate tab.
- F. Transmittal: Package submittals appropriately for transmittal. Engineer will discard submittals received from sources other than Contractor. Include Contractors certification stating that information submitted complies with requirements of the Contract Documents.
- G. Use for Construction: Use only final submittals with mark indicating action taken by Engineer in connection with construction.

1.4 SCHEDULE OF SUBMITTALS

- A. Refer to the applicable specification section for list of submittal requirements for each section.
- B. Submit the following submittal items electronically with a title page and/or pdf bookmark for each submittal item to meet the requirements specified herein:
 - 1. Owner/Contractor Agreement:
 - a. Copy of Executed Owner/Contractor Agreement
 - b. Copy of Contractors Certificate of Insurance
 - c. Copy of Performance Bond Form
 - d. Copy of Payment Bond Form
 - 2. Section 01 31 00 Project Management and Coordination
 - 3. Section 01 40 00 Quality Requirements
 - 4. Section 01 77 00 Closeout Procedures
 - 5. Section 31 00 00 Earthwork
 - 6. Section 31 01 16.71 Cold Milling Asphalt Pavement
 - 7. Section 32 05 23 Cement and Concrete for Exterior Improvements
 - 8. Section 32 12 16 Asphalt Paving
 - 9. Section 32 17 23 Pavement Markings
 - 10. Section 32 93 43 Tree Planting
 - 11. Shop Drawings: Shop drawings or letter stating installation of materials as detailed in the Contract Drawings unless properly authorized by the Engineer.
 - 12. Existing Damage Documentation: Existing damaged/dysfunctional components documentation (videotape, photos, etc.) including but not limited to asphalt spills, windows, walls, sidewalks, paving, ceilings, etc. Lack of submission prior to commencement of work indicates no existing damaged components and Contractor takes responsibility for damages caused by operations.

PART 2 PRODUCTS

2.1 SUBMITTALS

- A. General: Prepare and submit Submittals required herein and by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information is specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.

- 2. Mark each copy of each submittal to show which products and options are applicable.
- 3. Include the following information, as applicable:
 - a. Manufacturers written recommendations.
 - b. Manufacturers product specifications.
 - c. Manufacturers installation instructions.
 - d. Manufacturers catalog cuts.
 - e. Wiring diagrams showing factory-installed wiring.
 - f. Printed performance curves.
 - g. Operational range diagrams.
 - h. Compliance with recognized trade association standards.
 - i. Compliance with recognized testing agency standards.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Include the following information, as applicable: dimensions, identification of products, fabrication and installation drawings, schedules, coordination requirements and notation of dimensions established by field measurements.
 - 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches.
- D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of engineers and owners, and other information specified.
- E. Product Certificates: Prepare written statements on manufacturers letterhead certifying that product complies with requirements.
- F. Installer Certificates: Prepare written statements on manufacturers letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
- G. Manufacturer Certificates: Prepare written statements on manufacturers letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.
- H. Material Certificates: Prepare written statements on manufacturers letterhead certifying that material complies with requirements.

- I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agencys standard form, indicating and interpreting test results of material for compliance with requirements.
- J. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- K. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software used for calculations. Include page numbers.
- L. Manufacturer's Instructions: Prepare written or published information that documents manufacturers recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.
- M. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, and term of the coverage.

PART 3 EXECUTION

3.1 CONTRACTORS REVIEW

A. Review each submittal, check for compliance with the Contract Documents and note corrections and field dimensions prior to submitting to Engineer.

3.2 ENGINEERS ACTION

- A. Submittals: Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal item with an action stamp and will mark stamp appropriately to indicate action taken.
- B. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. This Section includes administrative and procedural requirements for quality assurance and quality control.
 - 2. Secure and pay costs of licenses and permits required by City, County and/or State authorities.
 - a. Permits and approvals may include but are not limited to grading, demolition, zoning, building, driveway, detention, subdivision, special use, sewer, and water.

1.2 RELATED DOCUMENTS

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

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.
- C. Authority Having Jurisdiction: AHJ

1.4 DELEGATED DESIGN

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

1.5 SUBMITTALS

A. Permit: Provide copy of construction permits and approvals along with required licenses or certifications required by the AHJ.

1.6 QUALITY ASSURANCE

A. Perform quality assurance in accordance with governing Codes, referenced standards, established standards, or industry standards.

- B. Solely responsible for supervising and directing the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise necessary to perform the Work in accordance with the Contract. Solely responsible for the means, methods, techniques, sequences and procedures of construction and for coordinating portions of the Work under the Contract, except where otherwise specified in the Contract Documents. Solely responsible to the Owner that the finished Work complies with the Contract Documents.
- C. It is the intent under this contract that workmanship be of the best quality consistent with the materials and construction methods specified. The presence or absence of the Owner's or Engineer's representative in no way relieves the Contractor of his responsibility to furnish materials and construction in compliance with the drawings and specifications. The Owner and Engineer have the authority to judge the quality and require replacement of unacceptable work or personnel.
- D. Materials or methods described by words which, when applied, have a well-known technical or trade meaning are held to refer to such recognized standard. Standard specifications or manufacturer's literature, when referenced, are of the latest revision or printing unless otherwise stated, and are intended to establish the minimum requirements acceptable.
- E. Maintain one set of the contract documents and accepted submittals at the job site.
- F. Correct deficiencies identified by Engineer and non-conforming work within 24 hours of receipt of notification, either verbally or written, and submit a plan of action for addressing the deficiencies and non-conforming work. Do not proceed with further tear-off or commencement of other work until deficiencies and non-conforming work are properly addressed.
- G. Control of Installation
 - 1. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
 - 2. Comply with manufacturers' instructions, including each step in the sequence
 - 3. Request clarification from Engineer before proceeding in the event manufacturers' instructions conflict with Contract Documents.
 - 4. Comply with specified standards as the minimum quality for the Work, except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
 - 5. Only allow Work performed by person qualified to produce workmanship of specified quality.
 - 6. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
- H. Tolerances:
 - 1. Monitor tolerance control of installed products to produce acceptable work. Do not permit tolerances to accumulate.
 - 2. Comply with manufacturers' tolerances. Request clarification from Engineer in the event manufacturers' tolerances conflict with Contract Documents.

- 3. Adjust products to appropriate dimensions; position before securing products in place.
- I. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
 - 1. Maintain applicable federal, state and municipal licenses.
 - 2. Have a minimum of 5 years' experience in installing the same or similar materials specified under the same firm name as that submitting the bid. If requested, submit a copy of firm's Articles of Incorporation to verify years in business. Crew workers on site are experienced and have a working knowledge of the system being installed.
 - 3. Principals of the firm to have a minimum of 10 years' experience in the estimating, supervision, management and administration of a contracting firm engaged in work similar to work as specified.
 - 4. Licensed by state work is occurring in for the type and dollar amount of work contemplated by these Contract Documents.
 - 5. Never filed bankruptcy or filed for protection from creditors.
 - 6. During the construction and completion of work covered by these Specifications, if the conduct of workers of the various crafts is determined unsuitable or a nuisance to the Owner or Engineer, or if the workman is considered incompetent or detrimental to the work, order such party removed from the grounds with the person not returning during the course of work on the project.
 - 7. Superintendent: During the performance of work by the Contractor or subcontractors, provide an on site superintendent/representative meeting the following requirements:
 - a. For the purpose of these Specifications the designation "superintendent" is hereby defined as the individual present on the job site while work is being performed, and whose primary responsibility is to supervise and direct the performance of the Work.
 - b. Be in attendance at the project site during the progress of the work and duties as superintendent limited to this project only. Supervise and instruct workmen without engaging in the work process. If superintendent is absent temporarily from the project, designate a competent foreman to assume duties. During the superintendent's absence, foreman cannot engage in the work process; supervise and instruct only. Likewise, communications given to the foreman are binding as if given to the Contractor.
 - c. Communicate matters pertaining to the Work with the Owner and Engineer. Do not make decisions regarding changes in the Work without the Owner and Engineer's knowledge.
 - d. Decision making authority and ability.
 - e. Able to demonstrate knowledge of work being installed.

- f. Fluent in the English language (reading, writing and speaking).
- g. In possession of mobile telephone.
- h. Employed by the Contractor at least six months prior to project commencement.
- i. Owner approval and Engineer acceptance.
- j. Once approved, do not change the superintendent except with the consent of the Owner unless he proves unsatisfactory to the Owner or Contractor or is no longer employed.
- k. Minimum of five 5 years continuous experience as a job superintendent.
- 8. No later than ten days prior to the pre-construction conference, provide the Owner, in writing, the names of the proposed project manager, superintendent, and foreman for approval. If he so determines, the Owner, without giving cause, may request an additional name, or names, be submitted for approval. The Owner will notify the Contractor of his acceptance at least 48 hours prior to the pre-construction conference.
- J. Specialists: Certain sections of the Specifications require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists satisfy qualification requirements indicated and be engaged for the activities indicated.
- K. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- L. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.7 QUALITY CONTROL

- A. The authorized representatives and agents of Owner permitted to inspect work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.
- B. Owner Responsibilities:
 - 1. Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - a. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
 - b. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- C. Contractor Responsibilities:

- 1. Repair and protection of work and materials.
- 2. Replace work or materials not conforming with requirements of the Specifications or damaged during the progress of the work before completion and acceptance of the project.
- 3. Coordinate documents with manufacturer and perform such testing, reporting, and communication incidental to provisions of the warranty procedures.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

SECTION 01 42 00

REFERENCE STANDARDS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Requirements relating to referenced standards.

1.2 RELATED DOCUMENTS

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

1.3 REFERENCE STANDARDS

- A. Reference standards are specified in Part 1 of the applicable specification section.
- B. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- C. Comply with the reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- D. Should specified reference standards conflict with Contract Documents, request clarification from the Engineer before proceeding.
- E. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Engineer shall be altered by Contract Documents by mention or inference otherwise in any reference document.

1.4 BUILDING CODE

- A. Comply with the building code and energy conservation code/standard in effect in North Carolina and current on date of Contract Documents.
 - 1. 2018 North Carolina Building Code
 - 2. 2018 North Carolina Energy Conservation Code

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

1.2 RELATED DOCUMENTS

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

1.3 **REFERENCE STANDARDS**

- A. NFPA 70 National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. NFPA 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.4 USE CHARGES

A. Include in Contract, cost or use charges for temporary facilities which are not chargeable to Owner. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, occupants of testing and inspecting agencies and personnel of authorities having jurisdiction.

1.5 QUALITY ASSURANCE

- A. Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
- B. Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- C. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- D. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures. Instruct personnel in methods and procedures. Post warnings and information.

PART 2 PRODUCTS

2.1 MATERIALS

A. General: Provide new materials or utilize undamaged, previously used materials in serviceable condition if accepted by Engineer. Provide materials suitable for use intended.

- B. Fencing:
 - 1. Safety Fence: Safety orange high density polyethylene fabric with a minimum of 4 feet in height, 15 lbs. per 100 linear feet. Painted steel fence posts with ground anchors and metal tabs stationed often enough to hold the fabric at a minimum height of 3 feet 8 inches tall.
- C. Water: Potable.
- D. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material with a self-contained or standalone exterior handwashing station.
- E. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110 to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.
- F. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure and the requirements of the local Governing agency.
- G. Ground Protection Mats: 4 foot by 8 foot, HDPE infused with rubber for traction mats designed to protect landscaping from construction equipment.

PART 3 EXECUTION

3.1 TEMPORARY UTILITIES

- A. Water Service: Obtain water from an appropriately metered public water hydrant.
- B. Electrical Power Service: Provide portable generators for electrical power requirements.
 - 1. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths do reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

3.2 CONSTRUCTION FACILITIES

- A. Temporary construction facilities include the following:
 - 1. Field Office: prefabricated, mobile units or job-built construction with lockable entrances and serviceable finishes including lights and utilities.
 - 2. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities. Located facilities at sites approved by Owner. Access inside the facility is not available.
 - a. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
 - b. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.

- c. Wash Facilities: Provide adequate hand washing stations.
- d. Drinking-Water Facilities: Provide bottled-water, drinking-water units.
- 3. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations at a location approved by the Owner. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Use of Owner's waste disposal facilities is not acceptable.
 - a. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material.

3.3 TEMPORARY BARRIERS AND ENCLOSURES

- A. Provide temporary barriers and enclosures for protection from exposure, foul weather, construction operations and other activities. Protect buildings and grounds from damages during construction.
- B. Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.
- C. Provide security controls to protect work and materials at the project site.
- D. Provide and maintain suitable temporary sidewalks, closed passageways, fences, or other structures required by law so as not to obstruct or interfere with traffic in public streets, alley ways, or private right-of-way. Leave an unobstructed way along public and private places for pedestrians and vehicles.
- E. Provide walks over and around all obstructions in public places. Maintain sufficient light and guards to protect persons from injury.
- F. Provide emergency egress from existing occupied areas at all times as required by AHJ. Maintain egress path in compliance with requirements of the applicable building code.

3.4 PROTECTION FACILITIES INSTALLATION

- A. Provide environmental protection by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- B. Provide Erosion Control Measures:
 - 1. Provide silt fence in landscaped areas and gravel areas downstream from disturbed subgrade.
 - 2. Provide wattles along pavement surfaces downstream from disturbed subgrade.
 - 3. Provide silt sacks under storm grates collecting runoff from areas with disturbed subgrade.
- C. Provide premanufactured concrete washout apparatus or provide approved designated washout area.
- D. Provide premanufactured pop-up containment apparatus.

3.5 TREE AND PLANT PROTECTION:

- A. Contractors are hereby reminded and cautioned that care shall be exercised to protect trees and plants which are to remain during the progress of the Project. Suitable barriers shall be provided around all trees and plants that are to remain and which are in the construction area and product handling area. All damage to such trees and plants shall be repaired; broken limbs properly and neatly pruned and painted with pruning paint; all trunk damage neatly dressed and painted with pruning paint. Any trees and plants which are excessively damaged shall be replaced in like, kind, size, and species by The Contractor at no additional cost. All work shall be by a recognized and approved nursery.
 - 1. All grading around trees and plants to remain shall be such that the root system shall not be disturbed. Earth shall not be temporarily piled around trees and plants, nor shall earth be graded to the trees and plants above the natural root depth for that particular species.
 - 2. Established trees and plants, which are in the way of construction and which are in the material handling areas, shall be removed and stored for future replanting. The services of a recognized and approved nursery shall be employed to remove the trees and plants and prepare them for storage. Removed trees and plants shall be properly balled and burlapped in accordance with their size. During the time of storage, they shall be properly watered and cared for in accordance with the instructions from the nursery. After the construction work is completed, the stored trees and plants shall be replanted, and those trees and plants not replanted shall be disposed of as directed by the Owner.Provide storm water controls sufficient to prevent flooding from heavy rain.

3.6 PROJECT SIGNAGE

- A. Provide temporary signs to provide information to building occupants directing them away from construction operations.
- B. Provide signage inside adjacent buildings alerting occupants of the Work Area.

3.7 VEHICULAR ACCESS AND PARKING

- A. Parking for vehicles available only in the approved Set-up and Staging area. No other vehicle parking on site is allowed.
- B. Owner Personnel vehicles will be removed from the construction area prior to the start of construction.

3.8 TRAFFIC CONTROLS

- A. Obtain and erect street/parking lot signage as necessary to divert traffic away from staging areas, work area, etc. Coordinate signage requirements with the Owner and Engineer.
- B. Provide temporary traffic controls at junction of temporary roads with public roads. Include warning signs for public traffic and "STOP" signs for entrance onto public roads. Comply with requirements of authorities having jurisdiction.
- C. Obey speed limit of 5 mph for construction vehicles.

SECTION 01 73 00

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. General procedural requirements governing execution of the Work.

1.2 RELATED DOCUMENTS

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

1.3 SUBMITTALS

- A. List of Materials on the project site including manufacturer name and product name.
- B. Safety Data Sheets (SDS):
 - 1. Safety Data Sheets (SDS) for materials/products anticipated for use and stored or brought to the site for completion of this project.
 - 2. Maintain on site with the Superintendent a set of SDS for products/materials on site.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Material storage area designated by the Owner at the Pre-Bid and Pre-Construction Meetings and/or indicated in Contract Drawings.
 - 1. Store materials as required by their respective specification section.
 - 2. Properly secure materials to resist wind events.
- B. Deliver and transport materials to project in accordance with the Owner's requirements and coordinate material deliveries with Owner.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Existing Conditions:
 - 1. The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of construction affecting the Work.
- B. Existing Utilities:

- 1. The existence and location of utilities and construction indicated as existing are not guaranteed.
- 2. Before construction, verify the location and points of connection of utility services.
- 3. Before beginning work, investigate and verify the existence and location of utilities and other construction affecting the Work.
- C. Acceptance of Conditions:
 - 1. Examine areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 2. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include a description of the work, a list of detrimental conditions, list of unacceptable installation tolerances and recommended corrections.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each material. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Upon discovery of the need for clarification of the Contract Documents, submit a request for information to Engineer. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
- B. Install products at the time and under conditions that ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- C. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

3.4 STARTING AND ADJUSTING

A. Test equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

3.6 CORRECTION OF THE WORK

- A. Restore permanent facilities used during construction to their specified condition.
- B. Replace components that are not up to specification standards.

SECTION 01 74 00

CLEANING AND WASTE MANAGEMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Administrative and Procedural requirements for progress cleaning and construction waste management.

1.2 RELATED DOCUMENTS

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

1.3 **REFERENCE STANDARDS**

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.4 **DEFINITIONS**

- A. Waste: Material that has reached the end of its intended use. Waste includes salvageable, returnable, recyclable and reusable material.
- B. Construction waste: Solid wastes including, but not limited to, building materials, packaging materials, debris and trash resulting from construction operations.
- C. Salvage: To remove a waste material from the Project site to another site for resale or reuse by others.
- D. Hazardous waste: Material or byproduct of construction that is regulated by the Environmental Protection Agency and cannot be disposed in a landfill or other waste endsource without adherence to applicable laws.
- E. Trash: Product or material unable to be returned, reused, recycled or salvaged.
- F. Landfill: Public or private business involved in the practice of trash disposal.

PART 2 PRODUCTS

2.1 MATERIALS

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

PART 3 EXECUTION

3.1 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials in a legal manner.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust impairs proper execution of the Work, broom-clean or vacuum the work area, as appropriate.
 - 3. If necessary, have a heavy-duty vacuum on site to remove small, loose debris from work area.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and do not damage exposed surfaces.
- E. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Final Acceptance.
- F. Waste Disposal: Burying or burning waste materials on-site is not permitted. Washing waste materials down sewers or into waterways is not permitted.
- G. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Final Acceptance.
- H. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- I. Limiting Exposures: Supervise construction operations to ensure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.2 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials to accumulate onsite.
 - 2. Remove and transport debris in a manner that prevents spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them.
- D. Separate, store and dispose of hazardous wastes in accordance with local and EPA regulations and additional criteria listed below:
 - 1. Do not incinerate building products manufactured with PVC or containing chlorinated compounds.
 - 2. Disposal of fluorescent tubes to open containers is not permitted.
 - 3. Do not co-mingle unused fertilizers with construction waste.

3.3 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting Substantial Completion.
 - 2. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including, waste material, litter, and other foreign substances.
 - 3. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - 4. Remove tools, construction equipment, machinery, and surplus material from Project site. Properly dispose of unwanted surplus material.
 - 5. Clean exposed exterior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - 6. Remove labels that are not permanent.
 - 7. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess foreign substances.
- 8. Replace parts subject to unusual operating conditions.
- 9. Leave Project clean and ready for occupancy.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - a. Inspection Procedures
 - b. Project Record Documents
 - c. Warranties

1.2 RELATED DOCUMENTS

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

1.3 SUBMITTALS

A. Warranties: Submit copy of warranties to meet the requirements of their respective specification section.

1.4 SUBSTANTIAL COMPLETION

- A. Submit written certification to the Engineer that the Project is substantially complete along with the following:
 - 1. Prepare a list of items to be completed and corrected (Contractor's punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Notify Owner of pending insurance changeover requirements.
 - 3. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 4. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 5. Notify Owner of changeover in heat and other utilities.
 - 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 - 7. Complete final cleaning requirements, including touchup painting.
 - 8. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

- B. Substantial Completion Inspection: On receipt of written substantial completion certification, the Engineer will make a substantial completion inspection within 7 days after receipt of certification.
 - 1. Should the Engineer consider the Work not substantially complete, he will notify the Contractor, in writing, stating the reasons. Complete the Work and send a second written notice to the Engineer, certifying the Project is substantially complete, at which time the Engineer will re-inspect the work.
 - 2. Should the Engineer consider the Work substantially complete, he will prepare and issue a Certificate of Substantial Completion accompanied by the list of items to be completed or corrected (Punch List).
 - 3. A punch list of items will be prepared for correction and completion before the Final Inspection. Complete the punch list items within 15 days of the punch list inspection. If the Contractor fails to complete the punch list within this period, the Owner has the right to impose liquidated damages in the amount of \$500.00 for each consecutive day until the items are completed.

1.5 PROJECT RECORD DOCUMENTS

- A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Engineer's reference during normal working hours.
 - 1. Submit required record documents and warranties within 30 days of the punch list inspection. If the Contractor fails to properly submit required items within this period, the Owner has the right to impose liquidated damages in the amount of \$500.00 for each consecutive day until the items are properly submitted.
- B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.
 - 1. Mark Record Prints to show where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
 - b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - 2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 - 3. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 - 4. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

- C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Note related Change Orders and Record Drawings, where applicable.
- D. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
 - 1. Completed and signed Engineer's Punch List
 - 2. Certificate of Occupancy from AHJ

1.6 WARRANTIES

- A. Warranties to commence on the date of Substantial Completion of the project.
- B. Two Year Warranty: Manufacturer's Representative and Contractor's Representative will attend post construction field inspection no earlier than one month prior to the expiration date of the Contractor's Warranty. Submit a written report within 7 days of the site visit to the Engineer listing observations, conditions and recommended repairs or remedial action.

END OF SECTION

SECTION 04 05 00

MORTAR AND GROUT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Provide mortar and grout for replacement masonry.
 - 2. Provide mortar for repointing.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and the following Specification Sections apply to this Section:
 - 1. Section 04 20 00 Unit Masonry

1.3 REFERENCE STANDARDS

- A. ASTM C91/C91M Standard Specification for Masonry Cement; 2023.
- B. ASTM C144 Standard Specification for Aggregate for Masonry Mortar; 2018.
- C. ASTM C150/C150M Standard Specification for Portland Cement; 2022.
- D. ASTM C207 Standard Specification for Hydrated Lime for Masonry Purposes; 2018.
- E. ASTM C270 Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.
- F. ASTM C404 Standard Specification for Aggregates for Masonry Grout; 2018.
- G. ASTM C476 Standard Specification for Grout for Masonry; 2023.
- H. ASTM C595/C595M Standard Specification for Blended Hydraulic Cements; 2021.
- I. ASTM C979/C979M Standard Specification for Pigments for Integrally Colored Concrete; 2016.

1.4 SUBMITTALS

- A. Product Data: Manufacturer's Product Data Sheets for materials specified certifying material complies with specified requirements.
- B. Manufacturer's Instructions: Latest edition of the Manufacturer's current material specifications and installation instructions.
- C. Samples: Furnish mortar color samples to match existing mortar for acceptance by Engineer and Owner.

1.5 **PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Deliver masonry materials in original sealed containers marked with name of manufacturer and identification of contents.
- B. Store masonry materials under waterproof covers on planking clear of ground, and protect damage from handling, dirt, stain, water and wind.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I
- B. Hydrated Lime: ASTM C207 S
- C. Masonry Cements: ASTM C91/C91M, Type S
- D. Sand: ASTM C144
 - 1. Light colored sand for mortar for laying face brick.
 - 2. White plastering sand meeting sieve analysis for mortar joints for pointing and laying of structural facing tile units except that 100 percent passes No. 8 sieve and not more than 5 percent retained on No. 16 sieve.
 - 3. Test sand for color value in accordance with ASTM C40. Sand producing color darker than specified standard is unacceptable.
- E. Grout Aggregate: ASTM C404, Size 8
- F. Admixtures:
 - 1. No air-entraining admixtures or material containing air-entraining admixtures.
 - 2. No antifreeze compounds added.
 - 3. No admixtures containing added.
- G. Water: Clean and potable.
- H. Mortar Pigment:
 - 1. ASTM C979/C979M: Not to exceed ten percent of the weight of Portland cement.
 - 2. Carbon black not to exceed two percent of the weight of Portland cement.
 - 3. Color of mortar to match existing mortar.
- I. Liquid Acrylic Resin: A formulation of acrylic polymers and modifiers in liquid form designed for use as an additive for mortar to improve physical properties.
- J. Blended Hydraulic Cement: ASTM C595/C595M, Type IS, IP, I (PM).
- K. Mortar Cement: ASTM C1329, Type S.

2.2 MORTAR AND GROUT MIXES

- A. Masonry Mortar: ASTM C270.
- B. Grout:
 - 1. Conform to ASTM C476 except as specified.
 - 2. Fine Grout:
 - a. Portland cement or blended hydraulic cement: one part.
 - b. Hydrated lime: 0 to 1/10 part.
 - c. Fine aggregate: 2-1/4 to three times sum of volumes of cement and lime used.
 - 3. Coarse Grout:
 - a. Portland cement or blended hydraulic cement: one part.
 - b. Hydrated lime: 0 to 1/10 part.
 - c. Fine aggregate: 2-1/4 to three times sum of volumes of cement and lime used.
 - d. Coarse aggregate: one to two times sum of volumes of cement and lime used.
 - 4. Sum of volumes of fine and coarse aggregates: Do not exceed four times sum of volumes of cement and lime used.

PART 3 EXECUTION

3.1 MIXING

- A. Mix in a mechanically operated mortar mixer for at least three minutes but not more than five minutes.
- B. Measure ingredients by volume using a container with a known capacity.
- C. Mix water with dry mortar ingredients in sufficient amount to provide a workable mixture which adheres to vertical surfaces of masonry units.
- D. Mix water with grout dry ingredients in sufficient amount to bring grout mixture to a pouring consistency.
- E. Mortar that has stiffened because of loss of water through evaporations:
 - 1. Re-tempered by adding water to restore to proper consistency and workability.
 - 2. Discard mortar that has reached its initial set or has not been used within two hours.

3.2 MORTAR USE LOCATION

A. Use Type S mortar for masonry containing vertical reinforcing bars (non-engineered), masonry below grade, masonry solar screens and setting cast stone.

3.3 GROUT USE LOCATIONS

- A. Use fine grout for filling wall cavities and cells of concrete masonry units where the smallest dimension is 2 inches (50 mm) or less.
- B. Use coarse grout for filling wall cavities and cells of concrete masonry units where the smallest dimension is greater than 2 inches (50 mm).
- C. Do not use grout for filling bond beam or lintel units.

END OF SECTION

SECTION 04 20 00

UNIT MASONRY

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Provide brick masonry for the following:
 - a. School Gateway

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and the following Specification Sections apply to this Section:
 - 1. Section 04 05 00 Mortar and Grout

1.3 **REFERENCE STANDARDS**

- A. ASTM A951/A951M Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2022.
- B. ASTM C67/C67M Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2023.
- C. ASTM C90 Standard Specification for Loadbearing Concrete Masonry Units; 2023.
- D. ASTM C216 Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale); 2023.

1.4 SUBMITTALS

- A. Product Data: Manufacturer's Product Data Sheets for materials specified certifying material complies with specified requirements.
- B. Samples: Review Owners existing veneer and match new veneer to existing for Owner approval.

PART 2 PRODUCTS

2.1 CONCRETE MASONRY UNITS

- A. General: Provide shapes indicated and as follows:
 - 1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
 - 2. Provide square edged units for outside corners, except where indicated as bullnose.
- B. Masonry Unit Types:

- 1. Hollow Load Bearing Concrete Masonry Units: ASTM C90, Type 1 or 2 as specified above, Grade N-I or N-II, made with lightweight aggregate. Provide load bearing units for exterior walls, foundation walls, load-bearing walls and shear walls.
- 2. Solid Load Bearing Concrete Masonry Units: ASTM C 145, Type 1 or 2 as specified above, Grade S-1 or S-II. Where units are exposed to weather, utilize Grade N-1 or N-II and made with lightweight aggregates. Provide solid units for masonry bearing under structural framing members and as indicated.
- 3. Special Shapes: Provide special shapes, lintels, corners, control joints, closures, header units, jamb units and other special units to complete the work. Provide special shapes conforming to the requirements for the units with which they are used.
- 4. Size: Manufactured to the dimensions listed below (within tolerances specified in the applicable referenced ASTM specification) for the corresponding nominal sizes indicated on Drawings.
 - a. 4-inch nominal: 3-5/8
 - b. 6-inch nominal: 5-5/8
 - c. 8-inch nominal: 7-5/8
 - d. 10-inch nominal: 9-5/8
 - e. 12-inch nominal: 11-5/8
- C. Subject to compliance with the requirements, provide units from a single source.
 - 1. Johnson Concrete
 - 2. Adams
 - 3. Metromont
 - 4. Engineers accepted equivalent

2.2 BRICK

- A. General: Provide shapes indicated and as follows for each form of brick.
 - 1. Provide units without cores or frogs and with exposed surfaces finished for ends of sills and caps and for similar applications that otherwise expose unfinished brick surfaces.
- B. Provide special shapes for applications requiring brick of size, form, color and texture on exposed surfaces that cannot be produced by sawing.
 - 1. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes and lintels.
 - 2. Provide special shapes for applications where shapes produced by sawing result in sawed surfaces being exposed to view.

- C. Face Brick: ASTM C216 and as follows:
 - 1. Grade: SW
 - 2. Initial Rate of Absorption: Between 5 and 20 g/30 sq in per minute when tested per ASTM C67/C67M.
 - 3. Surface Coloring: Brick with surface coloring, other than flashing or sand-finished brick, withstand 50 cycles of freezing and thawing per ASTM C67/C67M with no observable difference in the applied finish when viewed from 10 feet.
 - 4. Type: FBS
 - 5. Size: Bricks manufactured to the following dimensions within tolerances specified in ASTM C216.
 - a. Modular: 3-1/2 to 3-5/8 inches thick by 2-1/4 inches high by 7-1/2 to 7-5/8 inches long. Provide solid uncored brick to avoid exposed holes.
 - b. Utility: 3-1/2 to 3-5/8 inches thick by 3-1/2 to 3-5/8 inches high by 11-1/2 to 11-5/8 inches long.
 - 6. Where shown to "match existing", provide face brick matching color, texture, and size of existing adjacent brickwork.
- D. Subject to compliance with the requirements, provide units from a single source.
 - 1. General Shale Brick
 - 2. Statesville Brick
 - 3. Boral Brick Co.
 - 4. Taylor Clay Products
 - 5. Triangle Brick
 - 6. Lee Brick
 - 7. Engineers accepted equivalent

2.3 MORTAR AND GROUT MATERIALS

A. Refer to Section 04 05 00 - Mortar and Grout.

2.4 JOINT REINFORCEMENT

- A. General: ASTM A951/A951M and as follows:
 - 1. Hot-dip galvanized, carbon-steel wire for both interior and exterior walls.
 - 2. Wire Size for Side Rods: W1.7 or 0.148-inch diameter.
 - 3. Wire Size for Cross Rods: W1.7 or 0.148-inch diameter.
 - 4. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.

2.5 MASONRY ANCHORS

- A. Bent Wire Ties: Rectangular units with closed ends and not less than 4 inches wide. Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches long.
 - 1. Fabricate wire from 1/4 inch diameter, hot-dip galvanized steel wire.
 - 2. Where coursing between wythes does not align, use adjustable ties composed of 2 parts; 1 with pintles, the other with eyes; with maximum misalignment of 1-1/4 inches.
- B. Corrugated Buck Anchor: Minimum 16-gauge hot dipped galvanized steel with corrugations, minimum width of 1-1/4 inch and length sufficient to extend no less than 3/4 inch from outside face of masonry veneer.
- C. Adjustable Masonry Veneer Anchors: Provide two-piece assemblies that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs or CMU, and as follows:
 - 1. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.

2.6 MASONRY CLEANER

A. Submit brick and mortar manufacturer's written acceptance of proposed cleaner.

2.7 MASONRY ACCESSORIES

- A. Cavity Drainage Material: Provide trapezoidal shaped drainage material to suspend mortar droppings at unequal heights allowing moisture to drain from the cavity and maintain airflow within the cavity wall. The trapezoidal shaped Mortar Net is a 90% open nylon mesh with thickness of 1 inch to fully fill cavity.
- B. Weep Vent: One-piece, flexible extrusion manufactured from ultraviolet-resistant polypropylene copolymer, designed to weep moisture in masonry cavity to exterior, sized to fill head joints with outside face held back 1/8 inch from exterior face of masonry, in color selected from manufacturer's standard.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Prepare written report the listing conditions detrimental to performance.
- C. Verify that foundations are within tolerances specified.
- D. Verify that reinforcing dowels are properly placed.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Build cavity and composite walls and other masonry construction to the thickness shown.

- B. Build single-wythe walls to the widths of masonry units, using units of widths indicated.
- C. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Install cut units with cut surfaces and, where possible, cut edges concealed.
- D. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- E. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- F. Wetting of Brick: Wet brick before laying if the initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C67/C67M. Allow units to absorb water so they are damp but not wet at the time of laying.

3.3 REPLACEMENT OF MASONRY UNITS

- A. Cut out mortar joints surrounding masonry units being replaced.
 - 1. Units can be broken and removed provided surrounding units to remain are not damaged.
 - 2. Once the units are removed, carefully chisel out the old mortar and remove dust and debris.
 - 3. If units are located in exterior wythe of a cavity or veneer wall, exercise care to prevent debris falling into cavity.
- B. Dampen surfaces of the surrounding units before units are placed.
 - 1. Allow masonry to absorb surface moisture prior to starting installation of the replacement units.
 - 2. Butter contact surfaces of existing masonry and replacement masonry units with mortar.
 - 3. Center replacement masonry units in opening and press into position.
 - 4. Remove excess mortar with a trowel.
 - 5. Point around replacement masonry units to ensure full head and bed joints.
 - 6. When mortar becomes "thumbprint hard", tool joints.

3.4 CONSTRUCTION TOLERANCES

- A. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:
- B. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, nor 1/2 inch maximum.
- C. For exposed bed and head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow masonry units as follows:
 - 1. With full mortar coverage on horizontal and vertical face shells.
 - 2. Bed webs in mortar in starting course on footings and in courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
 - 3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
- B. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint).

3.6 CAVITIES

- A. Keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavities flush.
- B. Cavity-Wall Insulation:
 - 1. Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards.
 - 2. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways.
 - 3. Press units firmly against inside wythe of masonry or other construction.
 - 4. Fill cracks and open gaps in insulation with additional insulation or minimalexpanding spray foam with a low-pressure build.

3.7 MASONRY JOINT REINFORCEMENT

- A. General: Provide continuous masonry joint reinforcement as indicated. Install length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
 - 1. Space reinforcement not more than 16 inches on center vertically.
 - 2. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings. Reinforcement is in addition to continuous reinforcement.
- B. Cut or interrupt joint reinforcement at control and expansion joints.
- C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcing units as recommended by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.8 ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to wall framing with masonry-veneer anchors to comply with the following requirements:

- 1. Fasten each anchor through sheathing to wall framing/to CMU back-up wall with fasteners provided by anchor manufacturer suitable for back-up wall substrate.
- 2. Embed tie sections in masonry joints.
- 3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
- 4. Space anchors no more than 18 inches on center vertically and 24 inches on center horizontally, with not less than 1 anchor for each 2 sq. ft. of wall area. Install additional anchors within 8 inches of openings and at intervals, not exceeding 8 inches, around the perimeter.
- 5. Provide corrugted buck anchors anchored to the back-up wall spaced at 24 inches on center maximum along the top course of the replacement masonry for the through wall flashing system replacement.

3.9 REPAIR

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application.

3.10 CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Engineer's acceptance of sample cleaning before proceeding with cleaning of masonry.
 - 3. Clean brick by the bucket-and-brush hand-cleaning method described in BIA Technical Notes No. 20, using job-mixed detergent solution.
 - 4. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain on exposed surfaces.

3.11 DISPOSAL

A. Remove masonry waste and legally dispose.

END OF SECTION

SECTION 31 00 00

EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Excavate and/or backfill to accommodate the installation of flexible or rigid pavement system.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and the following Specification Sections apply to this Section:
 - 1. Section 32 05 23 Cement and Concrete for Exterior Improvements
 - 2. Section 32 12 16 Asphalt Paving

1.3 **REFERENCE STANDARDS**

- A. ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2012 (Reapproved 2021).
- B. ASTM D1556/D1556M Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method; 2015, with Editorial Revision (2016).
- C. ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)); 2012 (Reapproved 2021).
- D. ASTM D2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 2015.
- E. ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017, with Editorial Revision (2020).
- F. ASTM D2940/D2940M Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports; 2020.
- G. ASTM D4491/D4491M Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 2022.
- H. ASTM D4533/D4533M Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2015 (Reapproved 2023).
- I. ASTM D4632/D4632M Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a (Reapproved 2023).
- J. ASTM D4751 Standard Test Methods for Determining Apparent Opening Size of a Geotextile; 2021a.

K. ASTM D4833/D4833M - Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products; 2007 (Reapproved 2020).

1.4 DEFINITIONS

- A. Backfill: Soil materials used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Aggregate Base Course (ABC Stone): Well graded stone measuring up to 1 ¹/₂" in size.
- C. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Drainage Course: Layer supporting slab-on-grade used to minimize capillary flow of pore water.
- F. Excavation: Removal of material encountered above subgrade elevations.
 - 1. Additional Excavation: Excavation below subgrade elevations as directed by Engineer. Additional excavation and replacement material paid for according to Contract provisions for changes in the Work.
 - 2. Bulk Excavation: Excavations more than 10 feet in width and pits more than 30 feet in either length or width.
 - 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, without additional compensation.
- G. Fill: Soil materials used to raise existing grades.
- H. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
 - 1. Rock Excavation, Trench: Late-model, track-mounted hydraulic excavator; equivalent to Caterpillar Model N, 235D LC; measured according to SAE J-1179.
 - 2. Rock Excavation, Mass: Late-model, track-mounted loader with a hydraulically operated power ripper; equivalent to Caterpillar Model No. D-8N, Heavy Duty; measured according to SAE J-732.
 - 3. This classification does not include loose rock, concrete, or other materials that can be removed by means other than drilling and blasting, but which is chosen to remove by drilling and blasting.
- I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

- J. Subbase Course: Layer of standardized ABC Stone installed over the subgrade and prior to flexible or ridged pavement system.
- K. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill below subbase, drainage fill, or topsoil materials.
- L. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of weeds, roots, and other deleterious materials.
- M. Unsatisfactory Soils: ASTM D2487 soil classification groups MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- N. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.
- O. Uncontaminated Stone: Rock material that has not been combined with a significant amount of foreign soils.

1.5 MATERIALS OWNERSHIP

- A. Materials indicated to be stockpiled are the Owner's property.
- B. Store on site.

1.6 SUBMITTALS

- A. Product Data: Manufacturer's Product Data Sheets for materials specified certifying material complies with specified requirements.
- B. Test Reports: Submit test reports indicating suitability of materials supplied from offsite.

1.7 **PROJECT CONDITIONS**

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Owner and Engineer and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Engineer not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Engineer's written permission.
 - 3. Contact utility-locator service for area where Project is located before excavating.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

- B. Satisfactory Soils: ASTM D2487 soil classification groups GC, SC, CL, ML, GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Backfill and Fill: Satisfactory soil materials.
- D. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2- inch sieve and not more than 12 percent passing a No. 200 sieve.
- E. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- G. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- H. Structural Fill and Backfill: Inorganic soil with a maximum particle size of no more than 3 inches, plasticity index of 20 or less, and maximum dry density of at least 90 pounds per cubic foot when tested by the Standard Proctor Method in accordance with ASTM D698.
- I. Rip Rap: Consist of quarry run stone, field stone or granite stone and classified by size into Class 1. Vary in weight from 5 to 200 pounds. At least 30% of the total weight of the rip rap in individual pieces weighing a minimum of 60 pounds. Not more than 10% of the total weight of the rip rap in individual pieces weighing less than 50 pounds.

2.2 ACCESSORIES

- A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
 - 1. Red: Electric.
 - 2. Yellow: Gas, oil, steam, and dangerous materials.
 - 3. Orange: Telephone and other communications.
 - 4. Blue: Water systems.
 - 5. Green: Sewer systems.
 - 6. Use warning tape type and color as directed by Utility Agencies having jurisdiction where applicable.

- B. Drainage Fabric: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:
 - 1. Grab Tensile Strength: 110 lbf; ASTM D4632/D4632M.
 - 2. Tear Strength: 40 lbf; ASTM D4533/D4533M.
 - 3. Puncture Resistance: 50 lbf; ASTM D4833/D4833M.
 - 4. Water Flow Rate: 150 gpm per sq. ft.; ASTM D4491/D4491M.
 - 5. Apparent Opening Size: No. 50; ASTM D4751.

2.3 SOURCE QUALITY CONTROL

A. Test off-site materials used for suitability under requirements of this section.

PART 3 EXECUTION

3.1 **PREPARATION**

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- D. Provide one public and one private utility locate prior to the start of work. De-energize lines within 10 feet of the work and pothole for gauging proper depth.
 - 1. A vacuum truck is required for potholing within 10 feet of all utility lines.
 - 2. Potholed utilities to remain open and protected until demolition/grading is complete.
 - 3. Locate utilities within 10 days of work and refresh every 30 days.
 - 4. Inspect markings daily for signs of wear.
 - 5. Make markings clearly visible for the duration of the project.
 - 6. Stake whiskers in gravel areas to maintain visibility.
 - 7. Submit illustration of marked utilities prior to the start of construction.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
 - 2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Strip surface soil of unsuitable topsoil, including trash, debris, weeds, roots, and other waste materials.
 - 2. Stockpile surplus topsoil and allow for re-spreading deeper topsoil.

3.5 EXCAVATION

- A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
- B. Classified Excavation: Excavation to subgrade elevations classified as earth and rock. Rock excavation paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.
 - 1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
 - a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.
 - 2. Rock excavation includes removal and disposal of rock.
 - a. Do not excavate rock until it has been classified and cross-sectioned by Owner's Geotechnical Representative.
- C. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

- 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
- 2. Excavation for Underground Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended for bearing surface.

3.6 SUBGRADE

- A. Notify Engineer and Testing Agency when excavations have reached required subgrade.
- B. If Engineer or Testing Agency determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
 - 1. Additional excavation and replacement material paid for according to Contract provisions for changes in the Work.
- C. Proof roll subgrade and/or subbase with a 10 wheel loaded dump truck weighing a minimum 20 tons. Identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated or frozen subgrades. Limit vehical speed to three miles per hour.
- D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities and retest, as directed by Engineer.

3.7 STORAGE OF SOIL MATERIALS

- A. Stockpile fill and other satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.8 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for record documents.
 - 3. Inspecting and testing underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring and bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

- 3.9 FILL
 - A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.
 - B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material bonds with existing material.
 - C. Place and compact fill material in layers to required elevations as follows:
 - 1. Use satisfactory soil material except where otherwise indicated.

3.10 MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content or as accepted by Engineer.
 - 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.11 COMPACTION OF BACKFILLS AND FILLS

- A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly around structures to required elevations, and uniformly along the length of the structure.
- C. Compact soil to not less than the following percentages of maximum dry density according to ASTM D698:
 - 1. Under structures, building slabs and steps scarify and re-compact top 12 inches of existing subgrade and each layer of backfill or fill material at 98 percent. Compact other fill to 95 percent unless otherwise indicated.
 - 2. Under pavements, compact material to a depth of 8 inches below the finished surface of the subgrade to a density of at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T 99 as modified by the referenced DOT.
 - 3. Under walkways, scarify and re-compact top 6 inches below subgrade and compact each layer of backfill or fill material at 95 percent.
 - 4. Under lawn or unpaved areas, scarify and re-compact top 12 inches below subgrade and compact each layer of backfill or fill material at 90 percent.
 - 5. Compact utility trenches to 95 percent.

3.12 GRADING

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - 1. Lawn or Unpaved Areas: Plus or minus 1 inch when tested with a 10-foot straightedge.
 - 2. Walks: Plus 1/2 inch or minus 1 inch when tested with a 10-foot straightedge.
 - 3. Pavements: Plus 1/4 inch or minus 1/2 inch when tested with a 10-foot straightedge.
- C. Grading inside Building Lines: Finish subgrade to a tolerance of plus 1/4 inch or minus 1/2 inch when tested with a 10-foot straightedge.

3.13 SUBBASE AND BASE COURSES

- A. Under pavements and walks, place subbase course on prepared subgrade and as follows:
 - 1. Place base course material over subbase.
 - 2. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 98 percent of maximum dry density according to ASTM D698.
 - 3. Shape subbase and base to required crown elevations and cross-slope grades.
 - 4. When thickness of compacted subbase or base course is 6 inches or less, place materials in a single layer.
 - 5. When thickness of compacted subbase or base course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.
- B. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry density according to ASTM D1557.

3.14 DRAINAGE COURSE

- A. Under slabs-on-grade, place drainage course on prepared subgrade and as follows:
 - 1. Compact drainage course to required cross sections and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D698.

- 2. When compacted thickness of drainage course is 6 inches or less, place materials in a single layer.
- 3. When compacted thickness of drainage course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

3.15 RESPREADING TOPSOIL

- A. Re-spread stockpiled topsoil in planted areas. Distribute stockpiled material in a uniform thickness as follows.
 - 1. Lawn Areas: 4 inches minimum.
 - 2. Athletic Fields: 12 inches minimum.
 - 3. Planting Areas: 12 inches minimum.
- B. Adjust topsoil as required by Engineer following topsoil depth testing by Owner's testing representative.

3.16 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will employ a qualified independent geotechnical engineering testing agency to perform field quality-control testing.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design-bearing capacities. Subsequent verification and approval of other footing subgrades based on a visual comparison of subgrade with tested subgrade when accepted by Engineer.
- D. Testing agency will test compaction of soils in place according to ASTM D1556/D1556M, ASTM D2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test per 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
 - 2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for each 100 feet or less of wall length, but no fewer than two tests.
 - 3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench length, but no fewer than two tests.
- E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.

3.17 PROTECTION

A. Protecting Graded Areas: Protect graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and re-compact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION

SECTION 32 01 16.71

COLD MILLING ASPHALT PAVEMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Cold mill asphalt pavement by way of a milling machine to depths as specified on the drawings.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and the following Specification Sections, apply to this Section:
 - 1. Section 31 00 00 Earthwork
 - 2. Section 32 12 16 Asphalt Paving

1.3 DEFINITIONS

A. Reclaimed Asphalt Pavement (RAP): The material produced as a result of cold milling asphalt pavement.

1.4 SUBMITTALS

A. Documentation designating a tonnage and signed by the recipient of RAP to be recycled.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EQUIPMENT

- A. Use equipment with automatic grade and slope controls, capable of cold milling existing asphalt pavement to an accurate depth of cut, profile and cross slope and capable of loading the milled material directly into trucks.
- B. The cutting head of the cold milling machine minimum width of four feet.

3.2 PROCEDURE

- A. Cold milling asphalt pavement performed in a manner which prevents the tearing and breaking of underlying and adjacent pavement and the contamination of the RAP with granular, subgrade or deleterious materials.
- B. RAP loaded directly to trucks from the milling machine and hauled to stockpile or directly recycled.
- C. Sweep clean prior to opening to traffic. Sweep the surface in a manner which minimizes dust.

- D. Repair localized areas of distress in the milled surface that present a hazard to traffic.
- E. At the point of daily termination of cold milling operations, changes in surface profile or cross section limited to 1-1/2 inch and longitudinal transitions maximum of 1 inch vertically per 3 feet.
- F. In the event of rain or other inclement weather, suspend cold milling operations. Make necessary allowances for drainage of water that pond in areas where the milled sections have not been paved.

3.3 DISPOSAL

- A. Except for material indicated to be recycled, remove excavated materials from project site and legally dispose of them in an EPA approved landfill.
- B. A minimum of 80% of the milled pavement documented as stockpiled or directly recycled; see Submittals for required documentation.

END OF SECTION

SECTION 32 05 23

CEMENT AND CONCRETE FOR EXTERIOR IMPROVEMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Provide exterior concrete system.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and the following Specification Sections, apply to this Section:
 - 1. Section 31 00 00 Earthwork

1.3 DESCRIPTION

- A. Exterior concrete constructed upon the prepared subgrade or substrate and in conformance with the lines, grades, thickness, and cross sections shown on the Drawings meeting the following requirements:
 - 1. Type I concrete
 - 2. Do not exceed a water cement ratio of 0.35
 - 3. Minimum system thickness of 4 inches
 - 4. Minimum slope of 1/8 inch per foot, where the substrate elevation allows for clearance of stationary structures.
 - 5. Slump between 1 and 3 inches
 - 6. Minimum 28-day compressive strength of 4,000 psi

1.4 **REFERENCE STANDARDS**

- A. ACI PRC-211.1 Selecting Proportions for Normal-Density and High Density-Concrete Guide; 2022.
- B. ACI PRC-305 Guide to Hot Weather Concreting; 2020.
- C. ACI PRC-306 Guide to Cold Weather Concreting; 2016.
- D. ACI PRC-347 Guide to Formwork for Concrete; 2014 (Reapproved 2021).
- E. ASTM C31/C31M Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2023.
- F. ASTM C33/C33M Standard Specification for Concrete Aggregates; 2023.
- G. ASTM C94/C94M Standard Specification for Ready-Mixed Concrete; 2023.

- H. ASTM C143/C143M Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
- I. ASTM C150/C150M Standard Specification for Portland Cement; 2022.
- J. ASTM C171 Standard Specification for Sheet Materials for Curing Concrete; 2020.
- K. ASTM C192/C192M Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory; 2019.
- L. ASTM C231 Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method; 2009.
- M. ASTM C260/C260M Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).
- N. ASTM C494/C494M Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).
- O. ASTM C615/C615M Standard Specification for Granite Dimension Stone; 2018, with Editorial Revision.
- P. ASTM C618 Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2023, with Editorial Revision.
- Q. ASTM C1064/C1064M Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete; 2017.
- R. ASTM C1116/C1116M Standard Specification for Fiber-Reinforced Concrete; 2023.
- S. ASTM D1751 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2018.

1.5 SUBMITTALS

- A. Product Data: Manufacturer's Product Data Sheets for materials specified certifying material complies with specified requirements.
- B. Manufacturer's Instructions: Latest edition of the Manufacturer's current material specifications and installation instructions.
- C. Product Test Reports:
 - 1. Concrete Mix Design.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver ready-mixed concrete in accordance with ASTM C94/C94M.
 - 1. Agitating drum required for transportation.

1.7 PROJECT CONDITIONS

A. When air temperatures of 40°F or above are predicted to occur within the first 24 hours after placement, utilize normal application procedures.

- B. When air temperatures of 32°F 40°F are predicted to occur within the first 24 hours after placement, with acceptance from the Engineer, heat mixing water to a maximum of 120°F.
- C. Avoid cold weather placement, 35°F and falling, of concrete due to the possibility of the concrete freezing prior to final set. If cold weather installations are required, provide special considerations in accordance with manufacturer's guidelines.

PART 2 PRODUCTS

2.1 ADMIXTURE MANUFACTURER

- A. Manufacturers:
 - 1. Sika

2.2 MATERIALS

- A. Portland Cement: ASTM C150/C150M, type I unless otherwise accepted.
- B. Fly Ash: ASTM C618, Class C or F if accepted.
- C. Aggregate: ASTM C33/C33M
- D. Air-Entraining Admixtures: ASTM C260/C260M
- E. Reinforcing Steel: ASTM C615/C615M, when required by drawings.
- F. Expansion Joint Filler: ASTM D1751
- G. Sheet Materials for Curing Concrete: ASTM C171
- H. Water: Potable water as defined by US Department of Health, containing no more than 250 ppm of free chloride ions or other substances that affect the set of Portland cement. Clean, fresh, and free from injurious quantities of acid, alkali, salt, oil, organic matter, or other impurities. Provide water with sufficient pressure and volume to meet the insulation application schedule.
- I. Admixtures: High Range Water Reducing Sika ViscoCrete 2100 meeting ASTM C494/C494M, Type F.
- J. Fiber Reinforcement: Sika Fiber MS 20 meeting ASTM C1116/C1116M.
- K. Concrete Forms: Wood, plywood or metal with a high strength and low pliability that can withstand the loads applied.

2.3 MIX DESIGN

- A. Mix materials in accordance with recommendations of manufacturer to yield the specified physical properties while following ASTM C94/C94M.
- B. Strength of the concrete tested prior to installment. Report the average of three-cylinder tests in accordance with ASTM C39, and made and cured in accordance with ASTM C192/C192M.
- C. Follow the guidelines set forth in ACI PRC-211.1 to determine suitable air content based on the nominal maximum aggregate size and the environmental exposure.

D. Maintain a consistency suitable to provide a plastic mix capable of being screeded to a desirable finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify surfaces to receive concrete have been properly prepared for installation free of grease and oil.

3.2 PREPARATION

- A. Cover drains, clean outs, etc. before installing Portland cement concrete.
- B. Remove substances that interfere with bonding of the concrete system.
- C. Set screeds to ensure concrete is applied to the required depth and height.
- D. Protect elements surrounding the work of this Section from damage or disfiguration.

3.3 APPLICATION

- A. Provide equipment and application procedures conforming to the material manufacturer's application instructions and referenced ASTM and ACI published guidelines.
- B. Follow AACI PRC-347 requirements for the installation of formwork.
 - 1. Wet forms in hot weather applications just prior to the pour.
 - 2. Clean and coat metal forms prior to reinforcement installation with light form oil.
- C. Remove debris or hardened concrete on the inside the perimeter of the pour.
- D. Distribute concrete in a fashion that does not allow segregation inside the mix.
- E. Work concrete that has not attained its initial set or has not reached its desirable water to cement ratio for longer than one and half hours.
- F. Discharge concrete no more than 3 feet horizontally above the placement position.
- G. Place in lifts not to exceed 12 inches in depth.
- H. Consolidate concrete by spading rodding and vibrating. Avoid applying the vibration to the form work.
- I. Install warm weather concrete in accordance with ACI PRC-305.
- J. Install cold weather concrete in accordance with ACI PRC-306.
- K. Calcium Chloride is not permitted as a set accelerating agent.
- L. Remove drain sump forms as soon as the concrete supports foot traffic. Mix and install drain sump material. Hand form drain sump transition from roof drain to surrounding concrete height.

- M. Do not use water alone to improve the workability of fresh concrete. Avoid using water to assist in finishing operations or working bleed water back into the top surface of the concrete as these practices increase the water-to-cement ratio of the top layer of concrete, which leads to future durability problems.
- N. Slab Finishes:
 - 1. Broom finish an exterior slab, ramp and stair treads with a damp bristle brush
- O. Perform saw cutting as soon as the concrete has cured enough to handle the weight of the saw and cleanly cut a 1/8 inch wide joint 1/4 of the way in to the slab.
- P. Apply curing membrane over concrete deck surface as early as practical for protection against rapid evaporation or dry out. The preferred application method is spraying.
- Q. Remove forms only after the concrete has achieved sufficient strength to carry its own weight and loads. It's recommended to leave forms in place as long as possible. Form removal time frame is the responsibility of the Contractor.
- R. Prevent traffic for 28 days or until the concrete has reached the intended design strength according to the test samples. An early release can be considered based on the samples and the Engineers acceptance.

3.4 FIELD QUALITY CONTROL

- A. A third-party field-testing agency will be hired to perform the tests below:
 - 1. Test Specimens/Cylinders: One set of cylinders per each placement operation per 100 cubic yards in accorandance with ASTM C31/C31M.
 - 2. Temperature: Performed on the first load and when test specimens are made in accordance with ASTM C1064/C1064M.
 - 3. Air Content -Pressure Air Meter: Performed on the first load, and a random load per 30 cubic yards in accordance with ASTM C231.
 - 4. Slump: Performed on the first load, and a random load per 30 cubic yards in accordance with ASTM C143/C143M.

3.5 CLEAN-UP

A. Clean the site free of Portland cement stains, spills, aggregate, trash and other debris.

END OF SECTION

SECTION 32 12 16

ASPHALT PAVING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Provide hot-mix asphalt paving over conditioned and repaired rigid or flexible pavement.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and the following Specification Sections, apply to this Section:
 - 1. Section 31 00 00 Earthwork
 - 2. Section 32 01 16.71 Cold Milling Asphalt Pavement
 - 3. Section 32 17 23 Pavement Markings

1.3 **REFERENCE STANDARDS**

A. Division 6 Asphalt Pavements and Division 10 Materials of the NCDOT Specifications

1.4 SUBMITTALS

- A. Product Test Reports:
 - 1. Provide copies of job mix formula sheets indicating mix temperature and compaction specification.
 - 2. Upon request, provide documentation of field verification of compaction, thickness and application temperatures.
 - 3. Documentation stating the tonnage and location of RAP removed from the site.

1.5 QUALITY ASSURANCE

- A. A third party may be required at the discretion of the Owner or the Engineer to inspect the stability of the subgrade and/or density of the asphalt as deemed necessary during the duration of the project.
- B. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the above referenced DOT for asphalt paving work.

1.6 **PROJECT CONDITIONS**

A. Follow the weather and Seasonal Limitations of the above referenced DOT Standard Specifications. Exceptions may be accepted by the Engineer and Owner.

- B. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate tack cure, or if the following conditions are not met.
 - 1. Tack Coat: Minimum surface temperature of 50 deg F.
 - 2. Asphalt Base Course: Minimum surface temperature of 35 deg F and ambient temperature of 35 deg F and rising at time of placement. Ensure the paving surface is not wet or frozen.
 - 3. Asphalt Surface Course: Minimum surface temperature of 50 deg F and ambient temperature of 40 deg F and rising at time of placement. Ensure the paving surface is not wet or frozen.

PART 2 PRODUCTS

2.1 AGGREGATES

- A. Asphalt Plant Mix Materials: Conform to the above referenced DOT Standard Specifications.
- B. Tack Coat: Conform to the above referenced DOT Standard Specifications.
- C. Reclaimed Asphalt Pavement (RAP): Processed material obtained by milling or full depth removal of existing asphalt concrete pavements. Conform to the above referenced DOT Standard Specifications.

2.2 ASPHALT PAVING MIX

- A. General: Use mix design conforming to the above referenced Standard Specifications.
- B. Wedging or Leveling Mix: Use intermediate mix type conforming to the above referenced DOT Standard Specifications.
- C. Standard Allowable Reclaimed Asphalt Pavement (RAP) Content: Use a maximum of 45 percent for a base and intermediate course and a maximum of 30 percent for a surface course. Conform to the above referenced DOT Standard Specifications.
- D. High Performance Allowable Reclaimed Asphalt Pavement (RAP) Content: Use a maximum of 45 percent for a base and intermediate course and a maximum of 20 percent for a surface course, unless otherwise accepted by the Engineer.

2.3 SOURCE QUALITY CONTROL AND TESTS

- A. Obtain materials from a plant approved by the above referenced DOT.
- B. Upon request, show density reports on Pavement Areas and individual lifts.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify subgrade is dry and in suitable condition to begin paving.
- B. Proof-roll prepared subbase surface below pavements with heavy pneumatic tired equipment to identify soft pockets and areas of excess yielding.

- 1. Proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.
- 2. Proof-roll with a loaded 10-wheel tandem axle dump truck or equivalent weighing not less than 15 tons.
- 3. At a minimum, subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch require correction.
- 4. Notify Engineer of subbase with movement in order for Engineer to review prior to paving.
- C. Verify gradients and elevations of base are correct.
- D. Verify utility structure frames and lids are installed in correct position and elevation.
- E. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 TACK COAT

- A. Clean the surface of debris, dust, dirt, oil or other foreign material.
- B. Apply tack coat at uniform rate of 0.04 gallons/square yard for new asphalt, 0.06 for milled or aged asphalt and 0.08 gallons/square yard for cement concrete.
- C. Apply tack coat to contact surfaces of curbs and gutters.
- D. Grease the surface of utility structures to prevent bond with asphalt pavement. Do not tack-coat these surfaces.
- E. Ensure tack coat breaks prior to beginning the paving operation. The tack has broken once the surface has turned sticky to the touch.

3.3 HOT-MIX ASPHALT PLACING

- A. Install Work in accordance with the above referenced DOT Standard Specifications.
- B. Place asphalt within 24 hours of applying tack coat.
- C. Place asphalt in courses to the thicknesses and dimensions shown on the Drawings.
- D. Place base and intermediate courses.
- E. Place surface course within 2 hours of placing and compacting intermediate course. When intermediate course is placed more than 24 hours before placing surface course, clean surface and apply tack coat before placing surface course.
- F. Compact each course by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- G. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.4 BLOTTING SAND

A. Apply blotting sand upon completion of the asphalt surface lift, when directed. Spread uniformly on the same day as installation of the final surface lift.
- B. Apply at the rate of 0.1 lb./SY of surface area, unless otherwise directed.
- C. Blotting sand to be black in color and consist of natural sand, commercial sand, manufactured sand, coarse screenings, or other inert material having similar characteristics.
- D. Blotting sand to be relatively dry and free from sticks, roots, visible lumps of clay, and other unsatisfactory materials before use.
- E. Ensure the application of blotting sand is uniform and sufficient.

3.5 JOINTS

- A. Transverse Joints:
 - 1. When Work is suspended long enough to allow mixture to chill, construct transverse joint.
 - 2. Use butt joint where traffic does not pass over pavement.
 - 3. Use sloped wedge ahead of the end of pavement where traffic passes over pavement. Place paper parting strip to aid the removal of a wedge.
 - 4. Tack coat edge of pavement prior to placing adjoining pavement.
- B. Longitudinal Joints:
 - 1. Tack the edge of longitudinal joints prior to placing adjoining pavement.
 - 2. Pinch joint by rolling behind the paver.
 - 3. Offset longitudinal joints in each layer by approximately 6 inches.

3.6 TOLERANCES

- A. Density Compaction: average minimum of 92 percent of Theoretical Maximum Specific Gravity (Gmm) as determined on a moving average by the producer.
- B. Flatness: Maximum variation of 1/8 inch measured with 10-foot straight edge.
- C. Compacted Thickness: Within 1/4 inch.
- D. Variation from Indicated Elevation: Within 1/2 inch.

3.7 PAVEMENT MARKING

A. Do not apply pavement marking paint until layout, colors, and placement have been verified with the Engineer and the Owner.

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Engineer or Owner may engage a qualified testing agency to perform tests and inspections.
- B. If nuclear test methods are specified, take one test per 2,000 linear feet or fraction thereof per day on pavement placed at the paver lay down width. Take a minimum of five tests per production day.

- C. If core tests are specified, take one 6-inch diameter full depth pavement core per 2,000 linear feet or fraction thereof per day on pavement placed at the paver lay down width. Take a minimum of three core samples per production day unless directed by the engineer.
- D. Do not core asphalt above 120° F. Cool asphalt with ice as necessary at no additional cost to the owner. Patch core locations with hot mix asphalt of the same type within 24 hours of sampling. Dry and tack core holes before patching.
- E. When tests indicate Work does not meet specified requirements, remove Work, replace, and retest.

3.9 PONDING WATER

A. The ponding of water on the surface after installation of the pavement system is not acceptable and is grounds for rejection of the system. Ponding is herein defined as precipitation remaining in an area, 1/8 inch or deeper for a period of 2 hours from the termination of precipitation. Provide modifications to the pavement to ensure proper drainage.

3.10 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from project site and legally dispose of them in an EPA approved landfill.

END OF SECTION

SECTION 32 17 23

PAVEMENT MARKINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Provide contractor grade acrylic, striping paint for asphalt or coated asphalt.
 - 2. Provide contractor grade acrylic, latex, alkyd, or chlorinated rubber striping paint for asphalt and concrete pavements or restriping.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and the following Specification Sections, apply to this Section:
 - 1. Section 32 12 16 Asphalt Paving

1.3 SUBMITTALS

A. Product Data: Manufacturer's Product Data Sheets for materials specified certifying material complies with specified requirements.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver pavement-marking materials to the Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of materials, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.5 **PROJECT CONDITIONS**

- A. Environmental Requirements:
 - 1. Apply marking paint on a clean surface and in dry weather when pavement and atmospheric temperatures are 55 degrees F or above or in accordance with manufacturer's specification and not exceeding 95 degrees F and are anticipated to remain above 50 degrees F for 4 hours after completing application.
- B. For asphalt wait a minimum of 4 days before marking unless otherwise instructed by the Engineer.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Commercial compressed air spray striping machine capable of applying an even coating at the manufacturer's recommended thickness in an even width across the stripe.

B. Commercial airless spray striping machine capable of applying an even coating at the manufacturer's recommended thickness in an even width across the stripe.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Inspect pavement surfaces for conditions and defects that adversely affect quality of work, and which cannot be put into an acceptable condition through normal preparatory work as specified.
- B. Do not place markings over unsound pavements. If these conditions exist, notify the Engineer.
- C. Starting installation constitutes acceptance of surface as suitable for installation.

3.2 PREPARATION

- A. Provide qualified technician to supervise equipment and application of marking. Layout markings using guidelines, templates and forms. Stencils and templates professionally made to industry standards. "Free hand" painting of arrows, symbols, or wording are not allowed.
- B. Thoroughly clean surfaces free of dirt, sand, gravel, oil and other foreign matter.
- C. Protect adjacent curbs, walks, fences, and other items from receiving paint.

3.3 APPLICATION

- A. Parking Lots Markings Spacing: All parking layout designs shall utilize dimensional requirements.
- B. Apply marking paint at a rate of 1 gallon per 300-400 lineal feet of 4 inch wide stripes or to manufacturer's specifications.
- C. Apply stripes straight and even in accordance with schedules.
- D. Apply stripes and other markings in widths and colors previously existing or as otherwise detailed in schedule.

3.4 PROTECTION

A. Barricade marked areas during installation and until the marking paint is dried and ready for traffic.

END OF SECTION

SECTION 32 93 43

TREE PLANTING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Provide trees where indicated in Contract Drawings.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections and the following Specification Sections, apply to this Section:
 - 1. Section 31 00 00 Earthwork

1.3 SUBMITTALS

A. Product Data: Manufacturer's Product Data Sheets for materials specified certifying material complies with specified requirements.

1.4 DEFINITIONS

- A. Anti-desiccant: Material applied to plant surfaces for retarding excessive loss of plant moisture and inhibiting wilt. It shall be an approved emulsion, which will provide a film over plant surfaces permeable enough to permit transpiration.
- B. Caliper: Diameter of a tree six inches (6") above the ground for trees less than 4 inches and 12 inches above the ground for trees greater than four 4 inches in diameter.
- C. Cambium Layer: Growing point between the bark and sapwood.
- D. Critical Root Zone (CRZ): Area of undisturbed ground, which contains sufficient roots to preserve a tree's health. Determined by calculating the area with a radius in feet equal to one foot in length for each one inch of DBH. When an area of ground cannot be protected in a circle of this radius, the CRZ area may be defined as an asymmetrical shape of the same size.
- E. DBH: Diameter of a tree 4.5 ft above the average ground line.
- F. Dormant: A condition of non-active growth. Deciduous trees are considered dormant from the time the leaves fall until new foliage begins to appear.
- G. Existing Soils: A naturally occurring soil that has not been relocated or was present on site before construction. Shall be natural, fertile, agricultural topsoil, capable of sustaining vigorous plant growth.
- H. Parent Stem: The main trunk system of the tree.
- I. Scars or Injuries: Natural or man-made lesions of the bark in which wood is exposed.

- J. Small Tree: May be a small maturing (less than 35 ft at maturity) or large maturing tree (more than 35 ft at maturity). This can be either a single trunk or multiple trunk specimen.
- K. Water Breaker: A hose end device used to diffuse a stream of water.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. When shipment is made by open truck, pack plants material to provide adequate protection against climate and breakage during transit. Tie to prevent whipping. The tops shall be covered with tarpaulin to minimize wind-whipping and drying.
- B. Exercise care to prevent damage to bark, branches, and root system. Employ a suitable method of handling to preclude loose or crushed plant balls. Balled and burlap plants shall have wire baskets.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Plant Materials:
 - 1. Substitutions:
 - a. The species or varieties, materials, products or sizes specified herein by botanical and common name, shall be provided as specified. Only upon written application by the Contractor to the Owner will substitutions be permitted.
 - b. If proof is submitted, substantiated in writing, that any plant specified is not obtainable, a proposal will be considered for use of the nearest available size or similar variety with a corresponding adjustment of the contract price.
 - 2. Plants shall be typical of their species and variety, have normal growth habits, have well-developed branches, be densely foliated, be vigorous, and have fibrous root systems.
 - 3. Labeled with correct plant name and size.
 - 4. Nursery grown and freshly dug.
 - 5. Burlap shall be untreated and biodegradable.
 - 6. Nursery grown plants shall have been transplanted or root pruned at least once in the past 3 years. No plants showing evidence of "made" root balls will be accepted.
 - 7. Containerized plants shall have a root system sufficient enough in development to hold the soil intact when removed from the container. The root system shall not be root bound.
 - 8. Trees must have straight trunks with a single leader intact, unless multi-stem trees are specified. Bark shall be free of abrasions, and all cuts shall be completely callused over. Trees will not be accepted which have had their branches shortened, leaders cut, or which have leaders damaged so that cutting is necessary.

- 9. Large maturing trees shall be free of branches up to 6 feet from top of ball, well branched, and have straight stems.
- B. Topsoil: Native soil on site or natural soil harvested from another site that is free of noxious weeds.
- C. Planting Mix:
 - 1. Shall be developed by amending the existing soil or by removing the existing soil and replacing it with new planting mix.
 - 2. Free of stones, lumps, live plants and their roots, sticks, and other extraneous matter.
 - 3. Not frozen or muddy.
 - 4. Composition:
 - a. Clay: Minimum 10%, maximum 40%.
 - b. Sand: Minimum 20%, maximum 50%.
 - c. Silt: Minimum 20%, maximum 50%.
 - d. Organic matter: Minimum 15%, maximum 20%.
 - 5. Acidity range: 6.5 to 7.0 pH.
 - 6. The top 8 to 10 inches shall contain soil conditioner described below thoroughly mixed and tilled:
 - a. Composition: Composted and aged pine bark.
 - b. Color: Black.
 - c. Acidity range: 5.8 to 6.0 pH.

END OF SECTION

APPENDIX A

PAVEMENT CORES – DCP FORM

Project: UNCP West Hall Parkin Pavement Improvement	g Lot 21	Date: December 13, 2022	
Location: Core #1		Notes: Tested in drive lane.	
Stone Thickness: 5"	Pavement Thickness: N/A		Soil Type: Dark Sand

Project: UNCP West Hall Parking Lot 21 Pavement Improvement		Date: December 13, 2022	
Location: Core #2		Notes: Tested in drive lane.	
Stone Thickness: 6 1/2"	Pavement Thickness: N/A		Soil Type: Dark Sand

Project: UNCP West Hall Parkin Pavement Improvement	g Lot 21	Date: December 13, 2022	
Location: Core #3		Notes: Tested in parking stall.	
Stone Thickness: 7 1/4"	Pavement Thickness: N/A		Soil Type: Dark Sand

Project: UNCP West Hall Parking Lot 21 Pavement Improvement		Date: December 13, 2022	
Location: Core #4		Notes: Tested in drive lane.	
Stone Thickness: 6 3/4"	Pavement Thickness: N/A		Soil Type: Dark Sand

Project: UNCP West Hall Parking Lot 21 Pavement Improvement		Date: December 13, 2022	
Location: Core #5		Notes: Tested in parking stall.	
Stone Thickness: 6 1/2"	Pavement Thickness: N/A		Soil Type: Dark Sand

Project: UNCP West Hall Parking Lot 21 Pavement Improvement		Date: December 13, 2022	
Location: Core #6		Notes: Tested in drive lane.	
Stone Thickness: 7 1/2"	Pavement Thickness: N/A		Soil Type: Sand



Pavement Cores – DCP Form