



## HEAD START - Child Care Facility Replacement

REQUEST FOR PROPOSAL

### OWNER/CLIENT

**Action Pathways Inc.**

Fayetteville, NC

### DESIGNER



**Landscape Architecture ♦ Civil Engineering ♦ Planning**

116 North Cool Spring Street, Fayetteville, NC 28301

P: 910-221-0033 F: 910-221-0035

DATE \_\_\_\_\_

Project # 21026

<b>Item</b>	<b>Pages</b>
INVITATION TO BID.....	1
INFORMATION TO BIDDERS.....	2
MBE Instructions.....	2
MBE Guidelines.....	8
MBE Forms.....	6
BID FORM.....	2
FORMAL CONTRACT FOR CONSTRUCTION.....	33
SUPPLEMENTARY GERNERAL CONDITIONS.....	4

**TECHNICAL SPECIFICATIONS**

**Division 1 - General Requirements**

SECTION 01010 – SUMMARY OF WORK.....	1
SECTION 01027 – APPLICATIONS FOR PAYMENT.....	3
SECTION 01035 – MODIFICATION PROCEDURES.....	1
SECTION 01040 – COORDINATION.....	2
SECTION 01050 – FIELD ENGINEERING.....	1
SECTION 01200 – PROJECT MEETINGS.....	2
SECTION 01300 – SUBMITTALS.....	4
SECTION 01400 – QUALITY CONTROL.....	2
SECTION 01421 – REFERENCE STANDARDS AND DEFINITIONS.....	2
SECTION 01500 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS.....	5
SECTION 01631 – SUBSTITUTIONS.....	2
SECTION 01700 – CONTRACT CLOSEOUT.....	3
SECTION 01740 – WARRANTIES.....	2

**Division 2 – Site Construction**

SECTION 02110 – SITE CLEARING.....	2
SECTION 02300 – EARTHWORK.....	8
SECTION 02511 – HOT-MIX ASPHALT PAVING.....	5
SECTION 02700 – DRAINAGE.....	6
SECTION 02823 – CHAIN LINK FENCES AND GATES.....	2
SECTION 02900 – LANDSCAPING.....	3

**Division 3 – Site Construction**

SECTION 03300 – CAST IN PLACE CONCRETE.....	4
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**PWC Specifications – Site Work**

SECTION 02211 – GRADING FOR ROADS AND DRAINAGE.....	3
SECTION 02222 – EXCAVATION AND BACKFILLING FOR UTILITY SYSTEMS.....	5
SECTION 02660 – WATER DISTRIBUTION.....	13
SECTION 02730 – SANITARY SEWER SYSTEMS.....	14

## INVITATION TO BID

Sealed proposals will be received until **10:00 am May 14, 2024** at Action Pathways Inc. 4525 Campground Road PO Box 25759 Fayetteville, NC 28314. Attention Syreeta Morrissey. The work will consist of **demolition, constructing sidewalks, parking facilities, and drives; installing utilities and landscaping; grading and erosion control; and other associated items. Coordination with the Modular Building Supplier shall also be required.**

**A Pre-Bid Conference** will be held **2:00 pm April 22, 2024** on-site hosted by Action Pathways Inc. **The address is 328 Deep Creek Road, Fayetteville, NC 28312.** (Attendance is highly encouraged.)

- Certain MBE guidelines must be followed.
- Federal Davis Bacon procedures and rates shall apply to all insulation/construction activities.

Requirements for bidding this project are as follows:

1. **Furnish NC License Numbers as appropriate and required** (G.S. Chapter 87 establishes licensing requirements for general, utility, site, plumbing, heating, electrical, and refrigeration contractors for construction projects.)
2. Insurance - The Contractor shall provide, as required by law, insurance for his employees. Action Pathways Inc., their affiliated agencies and entities assumes no liability for injuries or accidents related to the Contractual Agreement. The Contractor shall furnish a certificate to the Owner (Action Pathways Inc.) as a Proof of Coverage. The Contractor shall maintain and pay the Insurance Coverage, which shall not be less than the following:
3. 

A.	Workman's Compensation	Statutory
	Employers Liability	\$1,000,000
	Owner/Officer must be included in coverage	
B.	General Liability (per person/per occurrence):	
	1. Bodily and Personal Liability	\$1,000,000/\$2,000,000
	2. Property Damage	\$1,000,000/\$2,000,000 Aggregate
C.	Automobile Liability (per person/per occurrence)	
	1. Bodily Injury	\$1,000,000
	2. Property Damage:	\$1,000,000 Aggregate
D.	Builder's Risk or Installation Floater	Contract Amount*
E.	Excess Liability Coverage of	\$5,000,000
4. Recruitment of minority business participation in accordance with NC G.S. 143-128 is required.

All questions related to this proposal shall be directed to Crawford Design Company, Attention Del Crawford. Email: [admin@crowforddsn.com](mailto:admin@crowforddsn.com). They shall be in written form by way of the email address provided. Contacting Action Pathways Inc. staff is prohibited. Questions shall be received until (provide date). Responses to questions in the form of an addendum shall be sent to all bidders by (provide date)

The Owner reserves the right to reject any and all proposals.

**ACTION PATHWAYS Inc.**

## INFORMATION TO BIDDERS

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FORMAL BIDS will be received by Action Pathways, Inc. (herein called the "OWNER") April 16, 2024 until May 14, 2024. A mandatory PRE-BID conference will be held on April 22, 2024 at 328 Deep Creek Road, Fayetteville.

The project consists of demolition, constructing sidewalks, parking facilities, and drives; installing utilities and landscaping; grading and erosion control; and other associated items. Coordination with the Modular Building Supplier shall also be required. Project will be awarded to one Contractor and under a single contract.

Each BID must be submitted in a sealed envelope, addressed to 4525 Campground Road, Fayetteville. Each sealed envelope containing a BID must be plainly marked on the outside as "**BID for Head Start Childcare Facility Replacement,**" and the envelope should bear on the outside the name of the BIDDER, his address, his license number if applicable and the name of the project for which the BID is submitted. If forwarded by mail, the sealed envelope containing the BID must be enclosed in a second envelope addressed to the OWNER at 4525 Campground Road, Fayetteville. All BIDS must be made on the required BID form. All blank spaces for BID prices must be filled in, in ink or typewritten, and the BID form must be fully completed and executed when submitted. Only one copy of the BID form is required.

The OWNER may waive any informalities or minor defects or reject any and all BIDS. Any BID may be withdrawn prior to the above scheduled time for the opening of BIDS or authorized postponement thereof. ANY BID RECEIVED AFTER THE TIME AND DATE SPECIFIED SHALL NOT BE CONSIDERED. No BIDDER may withdraw a BID within 60 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the OWNER and the BIDDER.

BIDDERS must satisfy themselves of the accuracy of the estimated quantities in the Bid Schedule by examination of the site and a review of the drawings and specifications including ADDENDA. After BIDS have been submitted, the BIDDER shall not assert that there was a misunderstanding concerning the quantities of WORK or of the nature of the WORK to be done.

The CONTRACT DOCUMENTS contain the provisions required for the construction of the PROJECT. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve him from fulfilling any of the conditions of the contract.

A performance bond and a payment bond is required.

The party to whom the contract is awarded will be required to execute the AGREEMENT within ten

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(10) calendar days from the date when NOTICE OF AWARD is delivered to the bidder. The NOTICE OF AWARD shall be accompanied by the necessary AGREEMENT. In case of failure of the BIDDER to execute the AGREEMENT, the OWNER may at his option consider the BIDDER in default.

The OWNER within ten (10) days of receipt of acceptable AGREEMENT signed by the party to whom the AGREEMENT was awarded shall sign the AGREEMENT and return to such party an executed duplicate of the AGREEMENT. Should the OWNER not execute the AGREEMENT within such period, the BIDDER may by written notice withdraw his signed AGREEMENT. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

The NOTICE TO PROCEED shall be issued within ten (10) days of the execution of the AGREEMENT by the OWNER. Should there be reasons why the NOTICE TO PROCEED cannot be issued

within such period, the time may be extended by mutual agreement between the OWNER and CONTRACTOR. If the NOTICE TO PROCEED has not been issued within the ten (10) day period or within the period mutually agreed upon, the CONTRACTOR may terminate the AGREEMENT without further liability on the part of either party.

The OWNER may make such investigations as he deems necessary to determine the ability of the BIDDER to perform the WORK, and the BIDDER shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly qualified to carry out the obligations of the AGREEMENT and to complete the WORK contemplated therein.

A conditional or qualified BID will not be accepted.

Award will be made to the lowest, responsible BIDDER.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction

over construction of the project shall apply to the contract throughout.

Each BIDDER is responsible for inspecting the site and for reading and being thoroughly familiar with the CONTRACT DOCUMENTS. The failure of omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to the BID.

The low BIDDER must supply the names and addresses of major material suppliers and subcontractors when requested to do so by the OWNER.

Inspection trips for prospective BIDDERS will be the responsibility of the Bidder.

The DESIGNER is CRAWFORD DESIGN COMPANY. Their address is 116 N. Cool Spring Street, Fayetteville, North Carolina 28301. Electronic copies of the plans and specifications will be available after the pre-bid meeting and obtained from the Designer.

## **MINORITY BUSINESS CONTRACT PROVISIONS (CONSTRUCTION AND/OR MANUFACTURING)**

### **APPLICATION:**

The Guidelines for Recruitment and Selection of Minority Businesses for Participation are hereby made a part of these contract documents. These guidelines shall apply to all contractors regardless of ownership.

### **MINORITY BUSINESS SUBCONTRACT GOALS:**

The Goals for participation by minority firms as subcontractors on this project have been set at 15%.

The bidder must identify on its bid, the minority businesses that will be utilized on the project with corresponding total dollar value of the bid and affidavit (Affidavit A) listing good faith efforts **or** affidavit (Affidavit B) of self-performance of work, if the bidder will perform work under contract by its own workforce.

The lowest responsible, responsive bidder must provide Affidavit C, that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the applicable goal.

### **OR**

Provide Affidavit D, that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, with documentation of Good Faith Effort, if the percentage is not equal to the applicable goal.

**The above information must be provided as required. Failure to submit these documents is grounds for rejection of the bid.**

## **MINIMUM COMPLIANCE REQUIREMENTS:**

All written statements, affidavits or intentions made by the bidder shall become a part of the agreement between the Contractor/manufacture for performance of this contract. Failure to comply with any of these statements, affidavits or intentions, or with the minority business Guidelines shall constitute a breach of contract. A finding by the Owner that any information submitted either prior to award of the contract or during the performance of the contract is inaccurate, false or incomplete, shall also constitute a breach of the contract. Any such breach may result in termination of the contract in accordance with the termination provisions contained in the contract. It shall be solely at the option of the Owner whether to terminate the contract for breach.

In determining whether a contractor/manufacture has made Good Faith Efforts, the Owner will evaluate all efforts made by the Contractor/manufacture and will determine compliance in regard to quantity, intensity, and results of these efforts. Good Faith Efforts include:

- (1) Contacting minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor/manufacture or available on the State of North Carolina or local government-maintained lists at least 10 days before the bid or proposal date and notifying them of the nature and scope of the work to be performed.
- (2) Making the construction plans, specification and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bid or proposals are due.
- (3) Breaking down or combining elements of work into economically feasible units to facilitate minority participation.
- (4) Working with minority trade, community, or contractor organizations identified by the Office for Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.
- (5) Providing assistance in getting required bonding or insurance or providing alternatives to bonding or insurance for subcontractors.
- (6) Negotiating in good faith with interested minority businesses and not rejecting them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.
- (7) Providing assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisting minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.
- (8) Negotiating joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.
- (9) Provide quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

# GUIDELINES FOR RECRUITMENT AND SELECTION OF MINORITY BUSINESSES FOR PARTICIPATION

These guidelines establish goals for minority participation in single-prime bidding, separate-prime bidding, construction manager at risk, and alternative contracting methods.

## **SECTION A: INTENT**

It is the intent of these guidelines that Action Pathways Inc., as awarding authority for construction projects, and the contractors and subcontractors performing the construction contracts awarded shall cooperate and in good faith do all things legal, proper and reasonable to achieve the statutory goal of fifteen percent (15%) for participation by minority businesses in each construction project. Nothing in these guidelines shall be construed to require contractors or awarding authorities to award contracts or subcontracts to or to make purchases of materials or equipment from minority-business contractors or minority-business subcontractors who do not submit the lowest responsible, responsive bid or bids.

## **SECTION B: DEFINITIONS**

1. **Minority** - a person who is a citizen or lawful permanent resident of the United States and who is:
  - a. Black, that is, a person having origins in any of the black racial groups in Africa;
  - b. Hispanic, that is, a person of Spanish or Portuguese culture with origins in Mexico, South or Central America, or the Caribbean Islands, regardless of race;
  - c. Asian American, that is, a person having origins in any of the original peoples of the Far East, Southeast Asia and Asia, the Indian subcontinent, the Pacific Islands;
  - d. American Indian, that is, a person having origins in any of the original peoples of North America; or
  - e. Female
2. **Minority Business** - means a business:
  - a. In which at least fifty-one percent (51%) is owned by one or more minority persons, or in the case of a corporation, in which at least fifty-one percent (51%) of the stock is owned by one or more minority persons or socially and economically disadvantaged individuals; and
  - b. Of which the management and daily business operations are controlled by one or more of the minority persons or socially and economically disadvantaged individuals who own it.
3. **Socially and economically disadvantaged individual** - means the same as defined in 15 U.S.C. 637. "Socially disadvantaged individuals are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as a member of a group without regard to their individual qualities". "Economically disadvantaged individuals are those socially disadvantaged individuals whose ability to compete in the free enterprise system has been impaired due to diminished capital and credit opportunities as compared to others in the same business area who are not socially disadvantaged".
4. **Public Entity** - means State and all public subdivisions and local governmental units.
5. **Owner** – Action Pathways Inc., through the Agency/Institution named in the contract.
6. **Designer** – Any person, firm, partnership, or corporation, which has contracted with the State of North Carolina to perform architectural or engineering, work.
7. **Bidder** - Any person, firm, partnership, corporation, association, or joint venture seeking to be awarded a public contract or subcontract.
8. **Contract** - A mutually binding legal relationship or any modification thereof obligating the seller to furnish equipment, materials or services, including construction, and obligating the buyer to pay for them.



9. Contractor - Any person, firm, partnership, corporation, association, or joint venture which has contracted with Action Pathways Inc. to perform construction work or repair or the manufacture of structures and associated components.
10. Subcontractor - A firm under contract with the prime contractor/manufacture or construction manager at risk for supplying materials or labor and materials and/or installation. The subcontractor may or may not provide materials in his subcontract.

### **SECTION C: RESPONSIBILITIES**

1. Office for Historically Underutilized Businesses, Department of Administration (hereinafter referred to as HUB Office).

The HUB Office has established a program, which allows interested persons or businesses qualifying as a minority business under G.S. 143-128.2, to obtain certification in the State of North Carolina procurement system. The information provided by the minority businesses will be used by the HUB Office to:

- a. Identify those areas of work for which there are minority businesses, as requested.
- b. Make available to interested parties a list of prospective minority business contractors and subcontractors.
- c. Assist in the determination of technical assistance needed by minority business contractors.

In addition to being responsible for the certification/verification of minority businesses that want to participate in the State construction program, the HUB Office will:

- (1) Maintain a current list of minority businesses. The list shall include the areas of work in which each minority business is interested.
- (2) Inform minority businesses on how to identify and obtain contracting and subcontracting opportunities through the State Construction Office and other public entities.
- (3) Inform minority businesses of the contracting and subcontracting process for public construction building projects.
- (4) Work with the North Carolina trade and professional organizations to improve the ability of minority businesses to compete in the State construction projects.
- (5) The HUB Office also oversees the minority business program by:
  - a. Monitoring compliance with the program requirements.
  - b. Assisting in the implementation of training and technical assistance programs.
  - c. Identifying and implementing outreach efforts to increase the utilization of minority businesses.
  - d. Reporting the results of minority business utilization to the Secretary of the Department of Administration, the Governor, and the General Assembly.

2. Owner

Before awarding a contract, owner shall do the following:

- a. Develop and implement a minority business participation outreach plan to identify minority businesses that can perform building projects and to implement outreach efforts to encourage minority business participation in these projects to include education, recruitment, and interaction between minority businesses and non-minority businesses.
- b. Attend the scheduled prebid conference.
- c. At least 10 days prior to the scheduled day of bid opening, notify minority businesses that have requested notices related to the project and minority businesses that otherwise indicated to the Office for Historically Underutilized Businesses an interest in the type of work being bid or the potential contracting opportunities listed in the proposal. The notification shall include the following:
  1. A description of the work for which the bid is being solicited.
  2. The date, time, and location where bids are to be submitted.
  3. The name of the individual within the owner's organization who will be available to answer questions about the project.

4. Where bid documents may be reviewed.
  5. Any special requirements that may exist.
- d. Utilize other media, as appropriate, likely to inform potential minority businesses of the bid being sought.
  - e. Maintain documentation of any contacts, correspondence, or conversation with minority business firms made in an attempt to meet the goals.
  - f. Evaluate documentation to determine good faith effort has been achieved for minority business utilization prior to recommendation of award.
  - g. Review prime contractors' pay applications for compliance with minority business utilization commitments prior to payment.

Under the single-prime bidding, the separate-prime bidding, construction manager at risk and alternative contracting methods, contractor(s) will:

- a. Identify or determine those work areas of a subcontract where minority businesses may have an interest in performing subcontract work.
- b. At least ten (10) days prior to the scheduled day of bid opening, notify minority businesses of potential subcontracting opportunities listed in the proposal. The notification will include the following:
  - (1) A description of the work for which the subbid is being solicited.
  - (2) The date, time and location where subbids are to be submitted.
  - (3) The name of the individual within the company who will be available to answer questions about the project.
  - (4) Where bid documents may be reviewed.
  - (5) Any special requirements that may exist, such as insurance, licenses, bonds and financial arrangements.

If there are more than three (3) minority businesses in the general locality of the project who offer similar contracting or subcontracting services in the specific trade, the contractor(s) shall notify three (3), but may contact more, if the contractor(s) so desires.

- c. During the bidding process, comply with the contractor(s) requirements listed in the proposal for minority participation.
- d. Identify on the bid, the minority businesses that will be utilized on the project with corresponding total dollar value of the bid and affidavit listing good faith efforts.
- e. Upon being named the apparent low bidder, the Bidder shall provide one of the following: (1) an affidavit (Affidavit C) that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the applicable goal; (2) if the percentage is not equal to the applicable goal, then documentation of all good faith efforts taken to meet the goal. Failure to comply with these requirements is grounds for rejection of the bid and award to the next lowest responsible and responsive bidder.
- f. The contractor(s) shall identify the name(s) of minority business subcontractor(s) and corresponding dollar amount of work on the schedule of values. The schedule of values shall be provided as required in Article 31 of the General Conditions of the Contract to facilitate payments to the subcontractors.
- g. The contractor(s) shall submit with each monthly pay request(s) and final payment(s), "MBE Documentation for Contract Payment" – (Appendix E), for designer's review.
- h. During the construction of a project, at any time, if it becomes necessary to replace a minority business subcontractor, immediately advise the owner in writing, of the circumstances involved. The prime contractor shall make a good faith effort to replace a minority business subcontractor with another minority business subcontractor.
- i. If during the construction of a project additional subcontracting opportunities become available, make a good faith effort to solicit subbids from minority businesses.
- j. It is the intent of these requirements apply to all contractors performing as prime contractor and first tier subcontractor under construction manager at risk on state projects.

### 3. Minority Business Responsibilities

While minority businesses are not required to become certified with the State, it is recommended that they become certified and should take advantage of the appropriate technical assistance that is made available. In addition, minority businesses who are contacted by owners or bidders must respond promptly whether or not they wish to submit a bid.

#### **SECTION 4: DISPUTE PROCEDURES**

It is the policy of this state that disputes that involves a person's rights, duties or privileges, should be settled through informal procedures. To that end, minority business disputes arising under these guidelines should be resolved as governed under G.S. 143-128(g).

#### **MINORITY BUSINESS CONTRACT PROVISIONS (CONSTRUCTION)**

#### **APPLICATION:**

The **Guidelines for Recruitment and Selection of Minority Businesses for Participation in State Construction Contracts** are hereby made a part of these contract documents. These guidelines shall apply to all contractors regardless of ownership. Copies of these guidelines may be obtained from the Department of Administration, State Construction Office, (physical address) 301 North Wilmington Street, Suite 450, NC Education Building, Raleigh, North Carolina, 27601-2827, (mail address) 1307 Mail Service Center, Raleigh, North Carolina, 27699-1307, phone (919) 733-7962, Website: <http://interscope2.doa.state.nc.us/main.htm>.

#### **MINORITY BUSINESS SUBCONTRACT GOALS:**

The goals for participation by minority firms as subcontractors on this project have been set at 15%.

The bidder must identify on its bid, the minority businesses that will be utilized on the project with corresponding total dollar value of the bid and affidavit (Affidavit A) listing good faith efforts **or** affidavit (Affidavit B) of self-performance of work, if the bidder will perform work under contract by its own workforce.

The anticipated awarding contractor/manufacture must provide Affidavit C, that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the applicable goal.

**OR**

Provide Affidavit C, that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, **with documentation of Good Faith Effort, if the percentage is not equal to the applicable goal.**

**OR**

Provide Affidavit B, which includes sufficient information for the Owner to determine that the bidder does not customarily subcontract work on this type project.

**The above information must be provided as required. Failure to submit these documents is grounds for rejection of the bid.**

## **MINIMUM COMPLIANCE REQUIREMENTS:**

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

In determining whether a contractor has made Good Faith Efforts, the Owner will evaluate all efforts made by the Contractor and will determine compliance in regard to quantity, intensity, and results of these efforts. Good Faith Efforts include:

- (1) Contacting minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor or available on State or local government-maintained lists at least 10 days before the bid or proposal date and notifying them of the nature and scope of the work to be performed.
- (2) Making the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bid or proposals are due.
- (3) Breaking down or combining elements of work into economically feasible units to facilitate minority participation.
- (4) Working with minority trade, community, or contractor organizations identified by the Office for Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.
- (5) Providing assistance in getting required bonding or insurance or providing alternatives to bonding or insurance for subcontractors.
- (6) Negotiating in good faith with interested minority businesses and not rejecting them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.
- (7) Providing assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisting minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.
- (8) Negotiating joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.
- (9) Providing quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

# APPENDIX E

## MBE DOCUMENTATION FOR CONTRACT PAYMENTS

Prime Contractor/Architect: \_\_\_\_\_

Address & Phone: \_\_\_\_\_

Project Name: \_\_\_\_\_

Pay Application #: \_\_\_\_\_ Period: \_\_\_\_\_

The following is a list of payments to be made to minority business contractors on this project for the above-mentioned period.

Firm Name	*Minority Category	Payment Amount	Owner Use Only

\*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

Date: \_\_\_\_\_

Approved/Certified By: \_\_\_\_\_

Name

\_\_\_\_\_

Title

\_\_\_\_\_

Signature

**\*\*THIS DOCUMENT MUST BE SUBMITTED WITH EACH PAY REQUEST & FINAL PAYMENT\*\***

## Identification of HUB Certified/ Minority Business Participation

I, \_\_\_\_\_,  
(Name of Bidder)

do hereby certify that on this project, we will use the following HUB Certified/ minority business as construction subcontractors, vendors, suppliers or providers of professional services.

Firm Name, Address and Phone #	Work Type	*Minority Category	**HUB Certified (Y/N)

\*Minority categories: Black (**B**), Hispanic (**H**), Asian American (**AA**), American Indian (**AI**), White Female (**F**), Socially and Economically Disadvantaged (**SED**), Disabled (**D**)

**\*\* HUB Certification with the state HUB Office required to be counted toward participation goals.**

**The total value of minority business contracting will be (\$)**\_\_\_\_\_.

# AFFIDAVIT A – Listing of Good Faith Efforts

County of \_\_\_\_\_

(Name of Bidder)

Affidavit of \_\_\_\_\_

I have made a good faith effort to comply under the following areas checked:

**Bidders must earn at least 50 points from the good faith efforts listed for their bid to be considered responsive.** (1 NC Administrative Code 30 I.0101)

- 1 – (10 pts)** Contacted minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor, or available on State or local government maintained lists, at least 10 days before the bid date and notified them of the nature and scope of the work to be performed.
- 2 --(10 pts)** Made the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bids are due.
- 3 – (15 pts)** Broken down or combined elements of work into economically feasible units to facilitate minority participation.
- 4 – (10 pts)** Worked with minority trade, community, or contractor organizations identified by the Office of Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.
- 5 – (10 pts)** Attended prebid meetings scheduled by the public owner.
- 6 – (20 pts)** Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors.
- 7 – (15 pts)** Negotiated in good faith with interested minority businesses and did not reject them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.
- 8 – (25 pts)** Provided assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisted minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.
- 9 – (20 pts)** Negotiated joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.
- 10 - (20 pts)** Provided quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

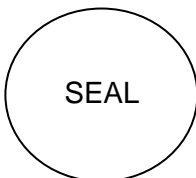
The undersigned, if apparent low bidder, will enter into a formal agreement with the firms listed in the Identification of Minority Business Participation schedule conditional upon scope of contract to be executed with the Owner. Substitution of contractors must be in accordance with GS143-128.2(d) Failure to abide by this statutory provision will constitute a breach of the contract.

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

Date: \_\_\_\_\_ Name of Authorized Officer: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_



State of \_\_\_\_\_, County of \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

Notary Public \_\_\_\_\_

My commission expires \_\_\_\_\_

# AFFIDAVIT B-- Intent to Perform Contract with Own Workforce.

County of \_\_\_\_\_

Affidavit of \_\_\_\_\_

(Name of Bidder)

I hereby certify that it is our intent to perform 100% of the work required for the \_\_\_\_\_

\_\_\_\_\_ contract.

(Name of Project)

In making this certification, the Bidder states that the Bidder does not customarily subcontract elements of this type project, and normally performs and has the capability to perform and will perform all elements of the work on this project with his/her own current work forces; and

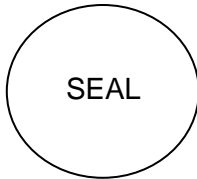
The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement. The Bidder agrees to make a Good Faith Effort to utilize minority suppliers where possible.

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

Date: \_\_\_\_\_ Name of Authorized Officer: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_



State of \_\_\_\_\_, County of \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_

Notary Public \_\_\_\_\_

My commission expires \_\_\_\_\_



# AFFIDAVIT C - Portion of the Work to be Performed by HUB Certified/Minority Businesses

County of \_\_\_\_\_

(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)

If the portion of the work to be executed by HUB certified/minority businesses as defined in GS143-128.2(g) and 128.4(a),(b),(e) is equal to or greater than 10% of the bidders total contract price, then the bidder must complete this affidavit.  
This affidavit shall be provided by the apparent lowest responsible, responsive bidder within **72 hours** after notification of being low bidder.

Affidavit of \_\_\_\_\_ I do hereby certify that on the \_\_\_\_\_  
(Name of Bidder)

\_\_\_\_\_ (Project Name)  
Project ID# \_\_\_\_\_ Amount of Bid \$ \_\_\_\_\_

I will expend a minimum of \_\_\_\_\_% of the total dollar amount of the contract with minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below. Attach additional sheets if required

Name and Phone Number	*Minority Category	**HUB Certified Y/N	Work Description	Dollar Value

\*Minority categories: Black (B), Hispanic (H), Asian American (AA), American Indian (AI), White Female (F), Socially and Economically Disadvantaged (SED), Disabled (D)

\*\* HUB Certification with the state HUB Office required to be counted toward participation goals.

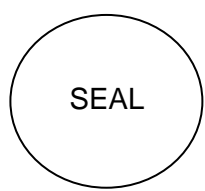
Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

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

Date: \_\_\_\_\_ Name of Authorized Officer: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_



State of \_\_\_\_\_, County of \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

Notary Public \_\_\_\_\_

My commission expires \_\_\_\_\_

## AFFIDAVIT D – Good Faith Efforts

County of \_\_\_\_\_

**(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)**

If the goal of 15% participation by HUB Certified/ minority business **is not** achieved, the Bidder shall provide the following documentation to the Owner of his good faith efforts:

Affidavit of \_\_\_\_\_ I do hereby certify that on the \_\_\_\_\_  
 (Name of Bidder)

Project ID# \_\_\_\_\_ (Project Name) Amount of Bid \$ \_\_\_\_\_

I will expend a minimum of \_\_\_\_\_% of the total dollar amount of the contract with HUB certified/ minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below. (Attach additional sheets if required)

Name and Phone Number	*Minority Category	**HUB Certified Y/N	Work Description	Dollar Value

\*Minority categories: Black (**B**), Hispanic (**H**), Asian American (**AA**), American Indian (**AI**), White Female (**F**), Socially and Economically Disadvantaged (**SED**), Disabled (**D**)

\*\* **HUB Certification with the state HUB Office required to be counted toward participation goals.**

**Examples** of documentation that may be required to demonstrate the Bidder's good faith efforts to meet the goals set forth in these provisions include, but are not necessarily limited to, the following:

- A. Copies of solicitations for quotes to at least three (3) minority business firms from the source list provided by the State for each subcontract to be let under this contract (if 3 or more firms are shown on the source list). Each solicitation shall contain a specific description of the work to be subcontracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when quotes must be received.
- B. Copies of quotes or responses received from each firm responding to the solicitation.
- C. A telephone log of follow-up calls to each firm sent a solicitation.
- D. For subcontracts where a minority business firm is not considered the lowest responsible sub-bidder, copies of quotes received from all firms submitting quotes for that particular subcontract.
- E. Documentation of any contacts or correspondence to minority business, community, or contractor organizations in an attempt to meet the goal.
- F. Copy of pre-bid roster
- G. Letter documenting efforts to provide assistance in obtaining required bonding or insurance for minority business.
- H. Letter detailing reasons for rejection of minority business due to lack of qualification.
- I. Letter documenting proposed assistance offered to minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letter of credit, including waiving credit that is ordinarily required.

Failure to provide the documentation as listed in these provisions may result in rejection of the bid and award to the next lowest responsible and responsive bidder.

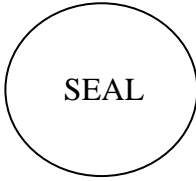
Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

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

Date: \_\_\_\_\_ Name of Authorized Officer: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_



State of \_\_\_\_\_, County of \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

Notary Public \_\_\_\_\_

My commission expires \_\_\_\_\_

**BID FORM**

**Head Start – Child Care Facility Replacement**

**ACTION PATHWAYS INC.  
Fayetteville, NC**

The undersigned, as Bidder, hereby declares 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 they examined the site of the Work and the Documents as a part of the request; has read and understands all provisions furnished prior to the opening of bids and satisfied themselves relative to the work to be performed. The Bidder proposes and agrees if this Proposal is accepted to contract with Action Pathways Inc., Fayetteville, North Carolina, in the form of contract specified, to furnish all necessary designs, materials, equipment, machinery, tools, apparatus, means of transportation, labor, permits and associated items necessary for **demolition, constructing sidewalks, parking facilities, and drives; installing utilities and landscaping; grading and erosion control; and other required items associated with a child care facility replacement. Coordination with the modular building supplier is also a part of the work.**

In accordance with the documents herein and to the full satisfaction of Action Pathways Inc., Fayetteville, North Carolina with an understanding that no additional funds will be allowed for extra work except as set forth in the attached Documents, for the sum of:

**As defined in the work scope above.**

\$ \_\_\_\_\_ Lump Sum                      Sub-Total \$ \_\_\_\_\_

**TOTAL Base Bid \$ \_\_\_\_\_**

**General Contingency:**

For miscellaneous additional items as specifically designated and approved by the Owner beyond the base bid work and materials.

\_\_\_\_\_ Dollars (\$ 35,000.00 )

**TOTAL Bid to include Contingency (\$ \_\_\_\_\_ )**

**BID FORM**  
**Head Start – Child Care Facility Replacement**

**ACTION PATHWAYS INC.**  
**Fayetteville, NC**

Minority Status *:	Form of Minority Certification**:
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\*Non-minority, Black, Hispanic, Asian/American, White Female, Socially and Economically Disadvantaged  
\*\*Not Applicable, Local Agency, Self-Identified, State of NC HUB, Federal Agency, State of NC DOT, Out of State Agency, Unknown (Note: In July 2009, businesses will be required to be certified through the State of NC HUB)

The Bidder further proposes and agrees to commence work under this contract, complete all items as specified in the attached documents and per any permit or regulatory requirements and approvals. Applicable liquidated damages shall be as stated in this document.

Respectfully submitted this \_\_\_\_\_ day of \_\_\_\_\_, 2024.

\_\_\_\_\_

*(Name of firm or corporation making bid)*

Witness: \_\_\_\_\_ By: \_\_\_\_\_  
Title: \_\_\_\_\_

\_\_\_\_\_

*(Proprietorship or Partnership)*

(Owner/Partner/Corp. President or Vice President only)

Address: \_\_\_\_\_

License No.: \_\_\_\_\_

Federal ID No.: \_\_\_\_\_

**(CORPORATE SEAL)**

ATTEST:

By: \_\_\_\_\_

Title: \_\_\_\_\_

*(Corp. Sec. or Ass't Sec. only)*

ADDENDA USED IN COMPUTING THIS BID

ADDENDUM NO. 1 \_\_\_\_\_ ADDENDUM NO. 2 \_\_\_\_\_

**CONTRACT  
FOR  
ACTION PATHWAYS INC.**

4525 Campground Road  
PO Box 25759  
Fayetteville, NC 28314

**GENERAL SCOPE OF WORK**

The work shall consist of demolition, constructing sidewalks, parking facilities, and drives; installing utilities and landscaping; grading and erosion control; and other associated items.

Coordination with the modular building provider shall also be required.

**NOTICE TO BIDDERS**

Sealed proposals for this work will be received by:

**ACTION PATHWAYS INC.**

Syreeta Shaw  
4525 Campground Road  
PO Box 25759  
Fayetteville, NC 28314  
on or before May 14, 2024 at 10:00 am

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**A Pre-Bid Conference will be held April 22, 2024 on-site hosted by Action Pathways Inc. The address is 328 Deep Creek Road, Fayetteville, NC 28312.**

Contractors are hereby notified that they must have a proper North Carolina license under the State laws governing their respective trades and that North Carolina General Statutes and Action Pathway provisions will be observed in receiving and awarding this contract.

The Owner reserves the right to reject any or all bids and waive informalities.

Proposals shall be made only on the form provided with all blank spaces for bids properly filled in and all signatures properly executed.

Designation on the envelope:

**Bid Proposal:**

Project Name: Action Pathways Inc. Head Start – Child Care Facility Replacement  
Attention: Syreeta Shaw  
Entity submitting Bid: Bidder's Name  
Bid Date: (date)

Bids submitted by electronic means shall be rejected.

## CONTRACT FOR CONSTRUCTION

THIS CONTRACT, made the \_\_\_\_ day of \_\_\_\_\_ in the year of 2024 by and between \_\_\_\_\_ (“Contractor”) and the **Action Pathways Inc.** (“Owner”).

### WITNESSETH:

That the Contractor and the Owner for the consideration herein named agree as follows:

1. **Scope of Work:** The Contractor shall furnish and deliver all of the design, structures, materials, permits and perform all of the work in the manner and form as provided by the attached specifications and documents, which are attached and made a part of the contract.

**The work shall consist of demolition, constructing sidewalks, parking facilities, and drives; installing utilities and landscaping; grading and erosion control; and other associated items.**

Addendum No. 1 Dated \_\_\_\_\_, Addendum No. 2 Dated \_\_\_\_\_

2. That the Contractor shall commence work to be performed under this Contract on a date to be specified in a written Notice to Proceed issued by the Owner and shall fully complete all work hereunder within: **180** consecutive calendar days from said start date. For each day in excess of the start date, liquidated damages shall be assessed in the amount of **Two Hundred Fifty Dollars (\$250.00)** per day until the work is satisfactorily completed. If the Contractor fails to begin the Work as described under Paragraph 1 above within ten days after the date specified in the Notice to Proceed, or the progress of the Work is not maintained on schedule and completed within the time specified, or shall perform the Work unsuitably, or in violation of safety requirements then the Owner shall declare this Contract in default and may terminate the performance of the Contract and assume possession of the Project site and of all materials and equipment at the site and may complete the work. In such case, the Contractor shall not be paid until the Work is complete.

After Final Completion has been achieved, if any portion of the contract price, as it may be modified thereafter, remains after the cost to the Owner of completing the work, including all costs and expenses of every nature incurred, such remainder shall belong to the Contractor. Otherwise, the Contractor shall pay and make whole the Owner for such cost. This obligation for payment shall survive the termination of the Contract. Failure of a Contractor to meet the requirements of a Contract and/or insufficient performance may disqualify the Contractor from being awarded future Projects.

3. It is understood that the contractor depends on the site being accessible in a manner to begin their work. If delays occur in the site work through no fault of the awarded contractor, they shall not be default of the contract to include the schedule if they comply with all other provisions.

4. The Owner hereby agrees to pay to the Contractor for the faithful performance of this Contract, subject to additions and deductions as provided in the Specifications or the accepted Proposal, in lawful money of the United States as follows:

Base Bid: \_\_\_\_\_

\$ \_\_\_\_\_

Contingency: \_\_\_\_\_

\$35,000 \_\_\_\_\_

Total Bid: \$ \_\_\_\_\_

Based upon an Application for Payment, submitted to the Owner by the Contractor, the Owner shall make payment to the Contractor upon inspection and acceptance by the Owner within 20 days.

5. This contract consists of the Contract for Construction, the Contractor's bid, the General Conditions, the Supplementary General Conditions, the Standard Addendum for Contract Services and any other written documents, specifications, plans, drawings, exhibits, or addenda specifically referenced herein or executed by the parties. This Contract contains all of the parties' terms, agreements, and understandings regarding the Work, and it supersedes and replaces any prior discussions or communications of any kind, and this Contract may only be amended or changed in writing, executed by the parties. If any term of this Contract is subsequently judicially determined to be unenforceable or invalid, the remaining terms shall remain in full force and effect. This Contract is governed by North Carolina law.

IN WITNESS WHEREOF, the Owner and Contractor have executed this Contract on the day and date first above written in two counterparts, each of which shall without proof or accounting for other counterparts, be deemed an original.

**ACTION PATHWAYS INC.**

\_\_\_\_\_  
Name Date

**CONTRACTOR**

\_\_\_\_\_  
Name Date

ATTEST \_\_\_\_\_

**NORTH CAROLINA LICENSE HOLDERS**

**General Contractor License** \_\_\_\_\_



## **GENERAL CONDITIONS**

It is understood and agreed that by submitting a bid, the Contractor has examined these contract documents, drawings and specifications and has visited the site of the Work, and has satisfied himself relative to the providing the Structures and the Work to be performed.

## **MATERIALS, EQUIPMENT AND EMPLOYEES**

The Contractor shall, unless otherwise specified, supply and pay for all labor, transportation, materials, tools, apparatus, lights, power, fuel, sanitary facilities and incidentals necessary for the completion of his work, and shall install, maintain and remove all equipment of the construction, and be responsible for the safe, proper and lawful construction, maintenance and use of same, and shall manufacture, construct, and furnish in the best and most workmanlike manner, a complete job and everything incidental thereto, as provided in the specifications, or reasonably implied there from, all in accordance with the contract documents.

All materials shall be new and of quality specified, except where reclaimed material is authorized herein and approved for use. Workmanship shall at all times be of a grade accepted as the best practice of the particular trade involved, and as stipulated in written standards of recognized organizations or institutes of the respective trades except as exceeded or qualified by the specifications. Used products, sub-standard products or leftover materials from a previous job will not be acceptable and shall not be allowed on the job site.

If particular products are specified by ASTM or other referenced standard and/or by manufacturer's name and model number or trade name, the Contractor may select any product meeting this standard, by any manufacturer unless a specific product is specified as a part of the bid document. When several products or manufacturers are specified as being equally acceptable, the Contractor has the option of using any product and manufacturer combination listed. However, the contractor shall be aware that the cited examples are used only to denote the quality standard of product desired and that they do not restrict bidders to a specific brand, make, manufacturer or specific name; that they are used only to set forth and convey to bidders the general style, type, character and quality of product desired; and that equivalent products will be acceptable. Substitution of materials, items or equipment of equal or equivalent design shall be submitted to the Owner for approval or disapproval; such approval or disapproval shall be made to the Owner prior to the opening of bids. Preference shall be given to 'Buy America' products and materials.

If any time during the construction and completion of the work covered by these contract documents, the conduct of any workman of the various crafts be adjudged a nuisance to the Owner or if any workman be considered detrimental to the work, the Contractor shall order such parties removed immediately from the grounds. This includes bringing firearms on site, drug use, profanity, and detrimental behavior.

The Contractor shall designate a knowledgeable project manager responsible to provide information during manufacturing the units and a foreman/superintendent who shall direct the work and shall be on-site at all times while work is being performed.

## **PROTECTION OF PERSONS AND PROPERTY**

The Contractor shall be responsible for the entire demolition, installation and construction of the same and provide all the necessary protections as required by laws or ordinances governing such conditions and as required by the Owner or their representative. The Contractor shall adhere to the rules, regulations and interpretations of the North Carolina Department of Labor relating to Occupational Safety and Health Standards for the Construction Industry, and revisions thereto as adopted by General Statutes of North Carolina 95-126 through 155. The Contractor shall provide all necessary safety measures for the protection of all persons on the job, including the requirements of the A.G.C. Accident Prevention Manual in Construction, as amended, and shall fully comply with all state laws or regulations and North Carolina State Building Code requirements to prevent accident or injury to persons on or about the location of the work. The Contractor shall protect against damage or injury resulting from falling materials and shall maintain all protective devices and signs throughout the progress of the work.

The Contractor shall perform any demolition in such a manner as to eliminate hazards to property and personnel. They shall take precautions to minimize interference with the use of adjacent areas, utilities, and other structures and provide free passage to and from the areas or structures. Whenever any equipment is used that may cause a fire or if any flammable material is used, the Contractor shall provide and maintain a fully charged fire extinguisher in the area and instruct all personnel in its proper use.

The Contractor shall be responsible for any damage to the Owner's property, or of that of others on the job, by them, their personnel, or their subcontractors, and shall make good such damages.

At no time shall the Contractor block any fire hydrants or emergency exits with any material, equipment or debris. All equipment locations, storage, etc. shall be approved by the Owner. Outside storage areas shall be roped and/or barricaded and posted as restricted areas. The Contractor shall clearly mark or post signs warning of existing hazards and shall barricade work area, if possible, to prevent entry by students or other persons.

The Contractor shall wear appropriate clothing, shirts and long pants, while on the job. The Contractor is restricted from wearing clothing that displays offensive language or material. Smoking is prohibited and will be restricted to a designated site outside the project area.

## **CONTRACTOR-SUBCONTRACTOR RELATIONSHIPS**

The Contractor agrees that the terms of these contract documents shall apply equally to a subcontractor as to the Contractor and that the subcontractor is bound by those terms as an employee of the Contractor.

## **INSURANCE**

The Contractor shall not commence work until they have obtained all insurance required, and the Owner has approved such insurance, nor shall the Contractor allow any subcontractor to commence work on his subcontract until all similar insurance required of the subcontractor has been obtained.

The Contractor shall provide and maintain during the life of this contract Workman's Compensation

- A. Workman's Compensation Statutory  
Employers Liability \$1,000,000  
Owner/Officer must be included in coverage
- B. General Liability (per person/per occurrence):
  - 1. Bodily and Personal Liability \$1,000,000/\$2,000,000
  - 2. Property Damage \$1,000,000/\$2,000,000 Aggregate
- C. Automobile Liability (per person/per occurrence)
  - 1. Bodily Injury \$1,000,000
  - 2. Property Damage: \$1,000,000 Aggregate
- D. Builder's Risk or Installation Floater Contract Amount\*
- E. Owner shall be listed on the General Liability and Auto Liability insurance policies as an additional insured (an additional insured endorsement similar to the one attached to this contract must be included/attached with the certificate of insurance. If blanket additional insured is provided by the policy, a copy of the blanket additional insured wording form must be included/attached to the certificate.)
- F. Owner reserves the right to reject any carrier of insurance shown in the certificate of insurance by the Carrier(s) on the grounds of poor claim service or financial responsibility.

The Builders' Risk Coverage shall be written on a Special Covered Cause of Loss form and shall include theft, vandalism, malicious mischief, collapse, false-work, temporary buildings, transit, debris removal including demolition, increased cost of construction, designer's fees and expenses, soft cost, flood (including water damage), earthquake, and if applicable, all below and above ground structures, piping, foundations including underground water and sewer mains, piling including the ground on which the structure rests and excavation, backfilling, filling, and grading.

Insured property shall include portions of the work located away from the site but intended for use at the site, and shall also cover portions of the work in transit. The policy shall cover the cost of removing debris, including demolition as may be made legally necessary by the operation of any law, ordinance or regulation.

Equipment Breakdown Coverage (a.k.a. Boiler & Machinery) shall be included as required by the Contract Documents or by law, which shall specifically covers insured equipment during installation and testing (including cold and hot testing).

Certificates of Insurance shall be filed with the Owner. During construction of the work, the Contractor shall provide updated records prior to any of these coverages become outdated.

Each Certificate of Insurance shall bear the provision that the policy cannot be canceled, or coverage reduced or eliminated in less than thirty (30) days after mailing notice to the insured and/or the Owner of such alteration or cancellation.

**The certificate holder shall be named:** Action Pathways Inc. 4525 Campground Road  
PO Box 25759 Fayetteville, NC 28314

## **CONSTRUCTION/INSTALLATION CONFERENCES**

During demolition, the contractor is required to attend conferences called by the Owner. It shall be the principal purpose of these conferences to effect coordination, cooperation and assistance in every practical way toward the end of maintaining progress of the Project on schedule and toward completing the Project within the specified Contract time.

## **SHOP DRAWINGS, SUBMITTALS, SAMPLES, DATE**

The Contractor shall submit to the Owner all shop drawings, descriptive data, samples, color charts, etc., required for the work. All materials shall be submitted in duplicate. These shall be promptly reviewed by the Owner, noting desired corrections, if any, and one approved copy shall be returned to the Contractor. Once materials have been approved, no substitutions will be permitted except per approval by the Owner. If a proposed substitution is not approved by the Owner in writing, the Contractor shall supply materials as specified.

## **PERFORMANCE**

The Contractor shall commence work to be performed under the Contract on a date(s) to be specified in a Notice to Proceed issued by the Owner and shall substantially complete all work in accordance with the project Time Table.

## **REFERENCES**

Contractor shall furnish to the Owner a list of at least three references with names and phone numbers where demolition was provided similar to the ones proposed in this cost proposal.

## **PREREQUISITES FOR SUBSTANTIAL COMPLETION**

The Owner will not delay Substantial Completion inspection pending receipt of the following items. Conversely, these are items which should be addressed at that time, and must be completed to achieve Final Completion.

- A. Submission of Final Payment Request.
- B. Submission of all Allowances/Change Orders and accounting for all adjustments to the Contract Sum.

## **CHANGE ORDER**

No change shall be made in the Work except upon written approval and change order of the Owner.

Changes in the work within the general scope of this Contract, consisting of additions, deletions, revisions, or any combination thereof, may be ordered without invalidating this Contract, by Change Order. Changes in the work shall be performed under applicable provisions of this Contract and the Contractor shall proceed promptly with such changes.

All Change Orders are to be submitted on the attached form. The Contractor shall not proceed with such work without written authority. THE CONTRACTOR SHALL NOT ACT ON INSTRUCTIONS RECEIVED BY THEM FROM PERSONS OTHER THAN THE PROJECT MANAGER, OR THE INDIVIDUAL

REPRESENTING THE OWNER. ANY CLAIMS FOR EXTRA COMPENSATION OR EXTENSION OF TIME ON ACCOUNT OF SUCH INSTRUCTIONS WILL NOT BE HONORED. In preparing figures for Change Orders for consideration, the percentage allowed for overhead and profit combined shall not exceed fifteen (15%) of net cost.

### **INSPECTION, PERMITS**

The Contractor shall obtain the required permits, give all notice and comply with all laws, ordinances, codes, rules and regulations bearing on the conduct of the work under this contract. If the Contractor observes that the drawings and specifications are at variance therewith, he shall promptly notify the Owner Representative in writing. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, codes, rules and regulations, and without such notice to the Owner, they shall bear all cost arising there from.

All permits must be posted or delivered to the Owner prior to the start of work. A copy of the permit invoice shall be conveyed to the Owner with the application for payment.

It is a condition of this Contract that the work shall be subject to inspection during normal working hours by designated representatives of the Owner, the Owners Representatives, and those persons required by state law to test special work for official approval. The Contractor shall therefore provide safe access to the work at all times for such inspections.

All work under this Contract shall conform to the North Carolina State Building Code and all other state, local and national codes as are applicable. The cost of all required inspections and permits shall be the responsibility of the Contractor.

### **TAXES**

All taxes of any kind shall be paid by the Contractor as a part of the bid.

### **EQUAL OPPORTUNITY**

The non-discrimination clause contained in Section 202 (Federal Executive Order 11246, as amended by Executive Order 11375, relative to Equal Employment Opportunity for all persons without regard to race, color, religion, sex or national origin, and the implementing rules and regulations prescribed by the Secretary of Labor, are incorporated herein.

The Contractor agrees not to discriminate against any employees or applicant for employment because of physical or mental handicap in regard to any position for which the employees or applicant is qualified. The Contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices.

### **MINORITY PARTICIPATION**

Contractor shall solicit minority participation in accordance with a minimum goal of 15%. Reporting requirements for solicitation and participation shall follow these guidelines. (Guidelines and documents are attached)

## **DAVIS BACON**

This project will be paid, in part, by Federal funds. As such, the work associated with the installation of the units will be subject to the provisions of Davis Bacon including complying with wage rates.

## **CONTRACT PAYMENTS**

Payment Request shall be submitted on an Application and Certificate for Payment AIA G702 Form to Action Pathways Inc., Syreeta Shaw, 4525 Campground Road PO Box 25759 Fayetteville, NC 28314

The Invoice will be processed and paid within twenty (25) consecutive days after acceptance of the work.

Certificate of Sales Tax Usage must be included with **each** request for payment. This Certificate shall include the date, the type of property and the cost of the property purchased from each vendor, the county in which the vendor made the sale and the amount of local sales and use taxes paid thereon.

If the property was purchased out-of-state, the county in which the property was delivered should be listed. Contractors are not to include any tax paid on supplies, tools and equipment which they use to perform their contracts and should include only those building materials, supplies, fixtures and equipment which actually become a part of or annexed to the building or structure.

## **CLEANING UP**

The Contractor shall keep the structures and surrounding area reasonably free from rubbish at all times, and shall remove debris from the site from time to time or when directed to do so by the Owner. Before final inspection and acceptance, the Contractor shall clean its portion of the work, with no cleaning required by the Owner.

In the event the Contractor creates additional cleaning work for the Owner, the Contractor shall compensate the Owner for such cleaning. Any expense the Owner incurs to clean the structures and associated site area will be deducted from final payment to the Contractor.

## **WARRANTY**

The contractor shall unconditionally guarantee against patent defects arising from faulty materials, faulty workmanship for a period of 12 months from the project completion date.

Additionally, the Owner may bring an action of latent defects caused by the negligence of the Contractor, which is hidden or not readily apparent to the Owner at the time of final acceptance, whichever occurred first, in accordance with applicable law.

**Lunsford Act.** Contractor acknowledges that N.C.G.S. 14-208.18 prohibits anyone required to register as a sex offender from knowingly being present upon the premises of any school, and Contractor shall insure that neither Contractor, its subcontractors, nor its suppliers shall allow any person registered as a sex offender to come on or about the premises of any subject school in any manner or for any reason related to the Work or the Contract.

**Sex Offender Registries; Ban on Direct Interaction with Children.** Contractor shall conduct annual checks of the State Sex Offender and Public Protection Registration Program, the State Sexually Violent Predator Registration Program, and the National Sex Offender Registry for all employees or contracted personnel whose work requires or may result in direct interaction with students, including but not limited to any employee or contracted worker whose job duties include: (1) delivering services directly to students; or (2) performing tasks on or delivering products to school property. No employee or contracted personnel of Contractor registered with the State Sex Offender and Public Protection Registration Program, the State Sexually Violent Predator Registration Program, or the National Sex Offender Registry may have direct interaction with children. See Board Policy 5022, "Registered Sex Offenders."

## **SUPPLEMENTARY GENERAL CONDITIONS**

### **TIME OF COMPLETION**

The Contractor shall develop a Project Construction Schedule, which shall be approved by and submitted to the Owner.

Substantial Completion shall be achieved by ( ) Final Completion shall be no later than ( ).

The Owner will occupy the nearby buildings and grounds and conduct business on a daily basis while work is in progress. It is essential that the Contractor cooperate closely with the Owner in working to keep disruptions to a minimum. Anticipated disruptions/delays in projected work schedules must be reviewed and cleared in advance with the Owner.

### **USE OF SITE**

Normal working hours are from 6 am to 6 pm Monday – Friday. The Contractor may not work outside these hours without prior authorization from the Owner's representative. If necessary, additional hours on the weekend or in the evenings may be considered. Extended hours maybe allowed at the discretion of the Owner with.

### **LIQUIDATED DAMAGES**

The Contractor shall commence work to be performed under this agreement as defined in the contract. For each day in excess of the final completion date, the Contractor shall pay to the Owner **Two Hundred Fifty Dollars (\$250.00)** 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 any other causes deemed justifiable by Owner, then the contract time may be reasonable extended in a written order from the Owner upon written request from the Contractor within ten days following the cause for delay.

## **UTILITIES**

- a. Use of electric power, fuel oil, water, heating and cooling, and toilet facilities shall be coordinated with Action Pathways staff prior to start of construction.
- b. Any interruption of utilities (electricity, fuel oil, water, heating, cooling, etc.) shall be minimized and undertaken through coordination with the Owner with at least 72 hours advance notice.
- c. The contractor is responsible for locating all underground services prior to construction through the use of owner accounting information or through a utility locator service.

## **SECURITY**

The Contractor shall take all necessary precautions to avoid jeopardizing the security of the site to include:

- A. No entry shall be made into the site without the authorization and approval of the Owner.
- B. Workers shall be identified at all times with either badges or company logo.
- C. Contractor shall be responsible for securing area within which they working.

## **MISCELLANEOUS**

The Contractor shall include a miscellaneous contingency of **\$25,000** in the base bid.



## SUPPLEMENTARY GENERAL CONDITIONS OF THE CONTRACT HEAD START DAYCARE REPLACEMENT

The GENERAL CONDITIONS and the SUPPLEMENTARY GENERAL CONDITIONS are intended to govern the work.

### SGC.00 GENERAL

The following items supplement the "General Conditions of the Contract for Construction". Where any Article of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these supplements, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

### SGC.01 DEFINITIONS

A. OWNING AGENCY ACTION PATHWAYS, INC.  
(4525 Campground Rd Fayetteville NC 28314)  
(910) 485-6131

### SGC.02 SUMMARY OF THE WORK

It is the intent of this Contract that the Contractor performs all works included in these Specifications and indicated on the Drawings. All materials shall be new and without defects. Used products, sub-standard products or leftover materials from a previous job will not be acceptable and shall not be allowed on the job site.

The Owner will occupy the existing buildings and grounds and conduct business on a daily basis while constructions are in progress. It is essential that the Contractor cooperate closely with the Owner in working to keep disruptions to a minimum. Anticipated disruptions/delays in projected work schedules must be reviewed and cleared in advance with the Owner.

### SGC.03 TIMETABLE FOR THE PROJECT

Contracts will be conveyed to the Contractor along with Notice to Proceed. The Notice to Proceed will set \_\_\_\_\_ as the Construction Start Date. The Contractor shall commence the performance of this Contract on \_\_\_\_\_ and shall diligently continue its performance to and until final completion of the Project. The construction period will be **180** consecutive calendar days.

Schedules and access to the site shall be coordinated and agreed upon during the **Pre-Construction Conference**, which shall be attended by representatives from Contractor, Owner and Designer. The Contractor shall take all necessary precautions to avoid jeopardizing the security of the site and **shall not interfere with the normal operations.**

The Contractor shall develop a Project Construction Schedule, which shall be basis for the completion of the work.

### SGC.04 INSURANCE

Certificates of Insurance shall be filed with the Owner prior to start of the work. During construction of the work, the Contractor shall provide updated records whenever any of these coverages become outdated.

The Contractor shall either:

- (1) Require each of his subcontractors to procure and maintain during the life of their subcontract, Subcontractor's General Liability and Property Damage of the type and in the same amounts as specified in the preceding paragraph. OR
- Insure the activities of his subcontractors in the Contractor's own policies.

## **SUPPLEMENTARY GENERAL CONDITIONS OF THE CONTRACT HEAD START DAYCARE REPLACEMENT**

### **SGC.05 CONSTRUCTION CONFERENCES**

The Contractor is required to attend progress conferences as called by the Designer and Owner. It shall be the principal purpose of these conferences to effect coordination, cooperation and assistance in every practical way toward the end of maintaining progress of the Project on schedule and toward completing the Project within the specified Contract time.

### **SGC.06 SHOP DRAWINGS, SUBMITTALS, SAMPLES, DATA**

The Contractor shall submit to the Designer all shop drawings, descriptive data, samples, color charts, etc., required for the work. All materials shall be submitted electronically. The Designer and Owner, noting desired corrections, if any, and a electronic copy shall be returned to the Contractor, shall promptly review these. Once materials have been approved, no substitutions will be permitted except in unusual extenuating circumstances. If the Owner in writing does not approve a proposed substitution, the Contractor shall supply materials as specified.

### **SGC.07 PERFORMANCE**

The Contractor shall commence work to be performed under the Contract on a date issued by the Owner and shall substantially complete all work in accordance with the project Time Table. If the Contractor fails to begin the work within ten days after the date specified in the Notice to Proceed, or progress of the work is not maintained on schedule, or the Contractor fails to perform the work with sufficient workmen and equipment or with sufficient materials to ensure prompt completion of the work, or shall perform the work unsuitably, or not in accordance with plans and specifications, or in violation of safety requirements or for any cause whatsoever shall not carry on the work in an acceptable manner, then the Owner shall declare this Contract in default and Owner may terminate the performance of the Contract and assume possession of the Project site and of all materials and equipment at the site and may complete the work. In such case, the Contractor shall not be paid until the work is complete. After Final Completion has been achieved, if any portion of the contract price, as it may be modified thereunder, remains after the cost to the Owner of completing the work, the Owner has deducted including all costs and expenses of every nature incurred, such remainder shall belong to the Contractor. Otherwise, the Contractor shall pay and make whole the Owner for such cost. This obligation for payment shall survive the termination of the Contract. Failure of a Contractor to meet the requirements of a Contract and/or insufficient performance may disqualify Contractor from bidding future Projects.

### **SGC.08 REFERENCES**

Contractor shall furnish to the Owner a list of at least three commercial references with names and phone numbers.

### **SGC.09 CONTRACT PAYMENTS**

Payment Request shall be in submitted on an Application and Certificate for Payment AIA G702 Form to Designer. The Invoice will be processed and paid within fifteen (15) consecutive days after acceptance of the work.

Certificate of Sales Tax Usage must be included with the request for payment.

### **SGC.10 PREREQUISITES FOR SUBSTANTIAL COMPLETION**

- A. Up-to-date Payment Request.
- B. Submit statements rectifying all Allowances/Change Orders and accounting for all adjustments to the Contract Sum.
- C. Review pending insurance changeover requirements with the Owner.

## **SUPPLEMENTARY GENERAL CONDITIONS OF THE CONTRACT HEAD START DAYCARE REPLACEMENT**

### **SGC.11 PROTECTION OF PERSONS AND PROPERTY**

The Contractor shall perform demolition in such a manner as to eliminate hazards to property and personnel. He shall take precautions to minimize interference with the use of adjacent areas, utilities, other structures and to provide free passage to and from the areas or structures. Whenever any equipment is used that may cause a fire or if any flammable material is used, the Contractor shall provide and maintain a fully charged fire extinguisher in the area and instruct all personnel in its proper use. The Contractor shall be responsible for any damage to the Owner's property, or of that of others on the job, by them, their personnel, or their subcontractors, and shall make good such damages.

At no time shall the Contractor block any fire hydrants or emergency exits with any material, equipment or debris. The Owner shall approve all equipment locations, storage, etc. Outside storage areas shall be roped and/or barricaded and posted as restricted areas. The Contractor shall clearly mark the project area that may include the posting of signs and fencing.

The Contractor shall adhere to the rules, regulations and interpretations of the North Carolina Department of Labor relating to Occupational Safety and Health Standards for the Construction Industry, and revisions thereto as adopted by General Statutes of North Carolina 95-126 through 155. The Contractor shall provide all necessary safety measures for the protection of all persons on the job, including the requirements of the A.G.C. Accident Prevention Manual in Construction, as amended, and shall fully comply with all state laws or regulations and North Carolina State Building Code requirements to prevent accident or injury to persons on or about the location of the work. The Contractor shall protect against damage or injury resulting from falling materials and shall maintain all protective devices and signs throughout the progress of the work.

The Contractor shall wear appropriate clothing, shirts and long pants, while on the job. The Contractor is restricted from wearing clothing that displays offensive language or material. Smoking is prohibited while in the act of performing the work and will be restricted to a designated site outside the facility.

### **SGC.12 CHANGE ORDER**

Changes in the work within the general scope of this Contract, consisting of additions, deletions, revisions, or any combination thereof, may be ordered without invalidating this Contract, by Change Order. Changes in the work shall be performed under applicable provisions of this Contract and the Contractor shall proceed promptly with such changes.

**All Change Orders are to be submitted on FORM C/O99-00.** The Contractor shall not proceed with such work without written authority. **THE CONTRACTOR SHALL NOT ACT ON INSTRUCTIONS RECEIVED BY HIM FROM PERSONS OTHER THAN THE PROJECT MANAGER, OR THE DESIGNER REPRESENTING THE OWNER. ANY CLAIMS FOR EXTRA COMPENSATION OR EXTENSION OF TIME ON ACCOUNT OF SUCH INSTRUCTIONS WILL NOT BE HONORED.** In preparing figures for Change Orders for consideration, the percentage allowed for overhead and profit combined shall not exceed fifteen (15%) of net cost.

### **SGC.13 INSPECTION, PERMITS**

It is a condition of this Contract that the work shall be subject to review during normal working hours by designated representatives of the Owner, the Designer, and those persons required by state law to test special work for official approval. The Contractor shall therefore provide safe access to the work at all times for such inspections.

All work under this Contract shall conform to the North Carolina State Building Code and all other state, local and national codes as are applicable. The cost of all required inspections and permits shall be the responsibility of the Contractor.

### **SGC.14 CLEANING UP**

The Contractor shall keep the project site and surrounding area reasonably free from rubbish at all times, and shall remove debris from the site from time to time or when directed to do so by the Owner. Before

## **SUPPLEMENTARY GENERAL CONDITIONS OF THE CONTRACT HEAD START DAYCARE REPLACEMENT**

final inspection and acceptance of the building, the Contractor shall clean its portion of the work, including glass, hardware, fixtures, masonry, and tile, clean all floors and completely prepare the building for use by the Owner, with no cleaning required by the Owner.

### **SGC.14 CLEANING UP (Con't)**

**In the event the Contractor creates additional cleaning work for the Owner, the Contractor shall compensate the Owner for such cleaning.** Any expense the Owner incurs to clean the building will be deducted from final payment to the Contractor.

### **SGC.15 WARRANTY**

The Warranty for work and materials by the Contractor shall be for a period of one-year from date of acceptance (not the completion date) of the Project by the Owner.

### **SGC.17 UTILITIES**

- a. Use of electric power, fuel oil, water, heating and cooling, and toilet facilities shall be coordinated with the Owner prior to start of construction.
- b. Any interruption of utilities (electricity, fuel oil, water, heating, cooling, etc.) shall be minimized and undertaken through coordination with the Owner with at least 72 hours advance notice.

### **SGC.18 ON SITE TESTING**

The Owner will pay for all required testing for this project. The Contractor is to make the Owner and Designer aware of any concerns they have with the existing conditions; at which time the Owner and the Designer shall review the Contractor's concerns. All testing shall be performed based on the Designer's recommendations.

# SECTION 01010

## SUMMARY OF WORK

### 1.1 GENERAL

A. The project consists of demolition, constructing sidewalks, parking facilities, and, constructing sidewalks, parking facilities, and drives; installing utilities and landscaping;

Project Locations: 328 Deep Creek Rd  
Fayetteville NC 28312

For: Action Pathways Inc.  
4525 Campground Rd  
Fayetteville, NC 28314

B. Contract Documents dated XXX were prepared for the Project by:



116 N. Cool Spring Street  
Fayetteville, NC 28301  
Ph.: 910-221-0033

- C. The Work will be constructed under a single prime contract.
- D. Cooperate with separate contractors so that work under those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Use of the Site: Limit use of premises to areas indicated. Do not disturb portions of the site beyond the areas indicated.
- E. The 'limits of Construction' or 'LOC' indicated is a general representation of the work boundaries. Specific construction limits shall be defined by the Owner's representative prior to the project start and interpreted during the course of the project.
- F. The Contractor shall bid all work as referenced in the Contract Documents unless expressly designated as 'Not in Contract' or 'NIC'.
1. Allow for Owner occupancy.
  2. Keep driveways and entrances clear. Do not use these areas for parking or material storage. Schedule deliveries to minimize on-site storage of materials and equipment.
- G. Existing site improvements: Repair damage caused by construction. Protect new improvements and the public during construction.

### 1.2 PRODUCTS (Not Applicable)

### 1.3 EXECUTION (Not Applicable)

END OF SECTION 01010

# SECTION 01027

## APPLICATIONS FOR PAYMENT

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### 1.1 GENERAL

- A. Coordinate the Schedule of Values and Applications for Payment with the Contractor's Construction Schedule, Submittal Schedule, and List of Subcontracts.
- B. Schedule of Values: Coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule.
  - 1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
    - a. Contractor's Construction Schedule.
    - b. Application for Payment forms, including Continuation Sheets.
    - c. List of subcontractors.
    - d. List of products.
    - e. List of principal suppliers and fabricators.
    - f. Schedule of submittals.
    - g. Sales and Use Tax Report
  - 2. Submit the Schedule of Values at the earliest possible date but no later than 7 days before the date scheduled for submittal of the initial Applications for Payment.
- C. Format and Content: Use the Project Manual table of contents as a guide to establish the format for the Schedule of Values. Provide at least one line item for each Specification Section. If the project is a unit price project the bid schedule information may be used to establish the Schedule of Values.
  - 1. Include the following Project identification:
    - a. Project name and location.
    - b. Name of Engineer.
    - c. Project number.
    - d. Contractor's name and address.
    - e. Date of submittal.
  - 2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
    - a. Related Specification Section or Division.
    - b. Description of Work.
    - c. Name of subcontractor.
    - d. Name of manufacturer or fabricator.
    - e. Name of supplier.
    - f. Change Orders (numbers) that affect value.
    - g. Dollar value.
    - h. Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent or in the case of unit prices the actual quantity installed.
  - 3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate evaluation of Applications for Payment. Break subcontract amounts down into several line items. Round amounts to nearest whole dollar; the total shall equal the Contract Sum.
  - 4. Provide a separate line item for each part of the Work where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.
  - 5. Provide separate line items for initial cost of the materials, for each subsequent stage of completion, and for total installed value.
  - 6. Show line items for indirect costs and margins on costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin for each item.

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- a. Temporary facilities and items that are not direct cost of work-in-place may be shown as separate line items or distributed as general overhead expense if they were not bid as a separate item in the bid schedule.
7. Update and resubmit the Schedule of Values when Change Orders or Construction Change Directives change the Contract Sum.
- D. Applications for Payment shall be consistent with previous applications and payments as certified by the Engineer and paid for by the Owner.
  - E. Payment-Application Times: Payment dates are indicated in the General Conditions.
  - F. Payment-Application Forms: Use AIA Document G702 and Continuation Sheets G703 as the form for Applications for Payment or other form approved by Engineer.
  - G. Application Preparation: Complete every entry, including notarization and execution by a person authorized to sign on behalf of the Contractor. The Engineer will return incomplete applications without action.
    1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions were made.
    2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.
  - H. Transmittal: Submit 3 executed original copies of each Application for Payment to the Engineer within 24 hours. One copy shall be complete, including waivers of lien and similar attachments.
    1. Transmit each copy with a transmittal listing attachments and recording appropriate information related to the application.
  - I. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of lien from every entity who may file a lien arising out of the Contract and related to the Work covered by the payment.
    1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.
    2. When an application shows completion of an item, submit final or full waivers.
    3. Submit each Application for Payment with Contractor's waiver of lien for the period of construction covered by the application.
      - a. Submit final Applications for Payment with final waivers from every entity involved with performance of the Work covered by the application who may file a lien.
    4. Waiver Forms: Submit waivers of lien on forms, and executed in a manner, acceptable to the Owner.
  - J. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
    1. List of subcontractors.
    2. List of principal suppliers and fabricators.
    3. Schedule of Values.
    4. Contractor's Construction Schedule (preliminary if not final).
    5. Submittal Schedule (preliminary if not final).
    6. List of Contractor's staff assignments.
    7. Copies of building permits.
    8. Copies of licenses from governing authorities.
    9. Certificates of insurance and insurance policies.
    10. Performance and payment bonds.
  - K. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

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1. Administrative actions and submittals that shall precede or coincide with this application include the following:

- a. Occupancy permits.
- b. Warranties and maintenance agreements.
- c. Test/adjust/balance records.
- d. Maintenance instructions.
- e. Meter readings.
- f. Changeover information related to Owner's occupancy.
- g. Final cleaning.
- h. Application for reduction of retainage and consent of surety.

L. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:

- 1. Completion of Project closeout requirements.
- 2. Completion of items specified for completion after Substantial Completion.
- 3. Transmittal of Project construction records to the Owner.
- 4. Proof that taxes, fees, and similar obligations were paid.
- 5. Removal of temporary facilities and services.
- 6. Change of door locks to Owner's access (if project warrants).

**1.2 PRODUCTS (Not Applicable)**

**1.3 EXECUTION (Not Applicable)**

**END OF SECTION 01027**



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## SECTION 01035

### MODIFICATION PROCEDURES

#### 1.1 GENERAL

- A. Minor Changes in the Work: The Engineer will issue instructions authorizing minor changes in the work.
- B. Owner-Initiated Change Order Proposal Requests: The Engineer will issue a description of proposed changes in the Work that require adjustment to the Contract Sum or Time. The description may include supplemental or revised Drawings and Specifications.
  - 1. Proposal requests are for information only. Do not consider them an instruction to stop work or to execute the proposed change.
  - 2. Within 15 days of receipt, submit an estimate of cost necessary to execute the change for the Owner's review.
    - a. Indicate a list of work or product items required with an associated cost of each. Each item shall include overhead, profit, taxes, delivery charges and other incidental work.
    - b. Indicate the effect the change will have on the Contract Time.
- C. Contractor-Initiated Proposals: When unforeseen conditions require modifications, the Contractor may submit a request for a change to the Engineer.
  - 1. Indicate a list of work or product items required with an associated cost of each. Each item shall include overhead, profit, taxes, delivery charges and other incidental work.
  - 2. Indicate the effect the change will have on the Contract Time.
- D. Proposal: All proposals must be in written form.
- E. Allowance Adjustment: Base Change Order Proposals on the difference between the purchase amount and the allowance, multiplied by the measurement of work-in-place. Allow for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
  - 1. Include installation costs only where indicated as part of the allowance.
  - 2. Prepare explanations and documentation to substantiate margins claimed.
  - 3. Submit substantiation of a change in work claimed in the Change Orders related to unit-cost allowances.
- F. Submit claims for increased costs because of a change in the allowance, whether for purchase order amount or handling, labor, installation, overhead, and profit. Submit claims within 21 days of receipt of authorization to proceed. The Owner will reject claims submitted later than 21 days.
  - 1. Do not include indirect expense in cost amount unless the Work has changed from that described in Contract Documents.
  - 2. No change to indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.
- G. Construction Change Directive: When Owner and Contractor disagree on the terms of a Proposal Request, the Engineer may issue a written Construction Change Directive instructing the Contractor to proceed with a change.
  - 1. The Construction Change Directive contains a description of the change and designates the method to be followed to determine change in the Contract Sum or Time.
- H. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
  - 1. After completing the change, submit an itemized account and supporting data to substantiate Contract adjustments.
- I. Change Order Procedures: Upon the Owner's approval of a Proposal Request, the Engineer will issue a change order for signage by the Contractor, Owner and Engineer.

#### 1.2 PRODUCTS (Not Applicable)

#### 1.3 EXECUTION (Not Applicable)

**END OF SECTION 01035**

**1.1 GENERAL**

- A. This Section includes requirements for coordinating construction operations including, but not necessarily limited to, the following:
1. Coordination drawings.
  2. Administrative and supervisory personnel.
  3. Cleaning and protection.

**1.2 COORDINATION**

- A. Coordinate construction to assure efficient and orderly installation of each part of the Work. Coordinate operations that depend on each other for proper installation, connection, and operation.
1. Schedule operations in the sequence required to obtain the best results where installation of one part depends on installation of other components, before or after its own installation.
  2. Coordinate installation of different components to assure maximum accessibility for maintenance, service, and repair.
  3. Make provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved, outlining procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required procedures with other activities to avoid conflicts and assure orderly progress. Such activities include, but are not limited to, the following:
1. Preparation of schedules.
  2. Delivery and processing of submittals.
  3. Progress meetings.
  4. Project closeout activities.
- D. Conservation: Coordinate construction to assure that operations are carried out with consideration for conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not incorporated in, the Work.
- E. Coordination Drawings: Prepare coordination drawings if needed for installation of products and materials fabricated by separate entities. Prepare coordination drawings where limited space necessitates maximum utilization of space for efficient installation of different components.
1. Show the relationship of components shown on separate shop drawings.
  2. Indicate required installation sequences.
  3. Comply with requirements contained in Section "Submittals."
- F. Staff Names: Within 15 days of commencement of construction, submit a list of the Contractor's and sub-contractor's construction managers, superintendents and other responsible personnel at the Project Site. Identify individuals and their responsibilities. List their addresses and telephone numbers.
1. Submit one copy to the Engineer and Post copies in the Project meeting room, the temporary field office, and each temporary telephone.

**1.3 PRODUCTS (Not Applicable)**

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#### **1.4 EXECUTION**

- A. Inspection of Conditions: Require Installers of major components to inspect substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected.
- B. Coordinate temporary enclosures with inspections and tests to minimize the need to uncover completed construction.
- C. Clean and protect construction in progress and adjoining materials, during handling and installation. Apply protective covering to assure protection from damage.
- D. Clean and maintain completed construction as necessary through the construction period. Adjust and lubricate operable components to assure operability without damaging effects.
- E. Limiting Exposures: Supervise construction to assure that no part is subject to harmful, dangerous, or damaging exposure. Such exposures include, but are not limited to, the following:
  - 1. Excessive static or dynamic loading.
  - 2. Excessive internal or external pressures.
  - 3. Excessively high or low temperatures.
  - 4. Water or ice.
  - 5. Solvents and chemicals.
  - 6. Abrasion.
  - 7. Soiling, staining, and corrosion.
  - 8. Combustion.

**END OF SECTION 01040**

**1.1 GENERAL**

- A. This Section specifies requirements for field-engineering services including, but not limited to, the following:
  - 1. Land survey work.
  - 2. Civil/landscape services.
  - 3. Damage surveys.
  - 4. Geotechnical monitoring.
- B. Submit a certificate certifying location and elevation of improvements.
- C. Project Record Documents: Submit a record of Work performed and record survey data.
- D. Surveyor Qualifications: Engage a land surveyor registered in the state where the Project is located.

**1.2 PRODUCTS (Not Applicable)**

**1.3 EXECUTION**

- A. Identification: The Owner will identify existing control points.
- B. Verify layout information, in relation to property survey and existing benchmarks, before proceeding to lay out the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.
  - 1. Do not change or relocate benchmarks or control points without written approval. Report destroyed reference points or requirements to relocate reference points because of changes in grades.
  - 2. Contractor shall Replace destroyed Project control points at their expense. Base replacements on the original survey control points.
- C. Establish and maintain a minimum of 2 permanent benchmarks.
  - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
- D. Existing Utilities: The existence of underground utilities and construction is not guaranteed. Verify location of underground utilities and other construction before beginning sitework.
  - 1. Prior to construction, verify location and invert elevation at points of connection of sanitary and storm sewers, and water-service piping.
- E. Work from lines and levels established by the construction documents. Establish benchmarks and markers to set lines and levels at each story of construction and to locate each element. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.
  - 1. Advise entities engaged in construction activities of marked lines and levels provided for their use.
  - 2. As construction proceeds, check every element for line, level, and plumb.
  - 3. Construction Staking: The contractor will provide construction staking.
- F. Surveyor's Log: Maintain a surveyor's log of control and other survey work. Make this log available for reference.
  - 1. Record deviations from lines and levels. Advise the engineer when deviations exceed tolerances. On Project Record Drawings, record deviations that are accepted and not corrected.
  - 2. On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- G. Site Improvements: Locate and layout site improvements, general location of poles, panel boxes housing, etc.
- H. Record Drawings: Prepare 'red line' drawings of the project after completion of all construction activities. Drawing shall include all significant changes completed during the course of the project.

**END OF SECTION 01050**

**1.1 GENERAL**

- A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:
  - 1. Preconstruction conferences.
  - 2. Preinstallation conferences.
  - 3. Progress meetings.
- B. Preconstruction Conference: Schedule a preconstruction conference before starting construction. Review responsibilities and personnel assignments.
- C. Attendees: Authorized representatives of the Owner, Engineer, and their consultants; the Contractor and its superintendent; major subcontractors; utility providers, regulatory agency representatives and other concerned parties shall attend.
  - 1. Participants shall be familiar with the Project and authorized to conclude matters relating to the Work.
- D. Agenda: Discuss items that could affect progress, including the following:
  - 1. Tentative construction schedule.
  - 2. Critical work sequencing.
  - 3. Designation of responsible personnel.
  - 4. Procedures for processing field decisions and Change Orders.
  - 5. Procedures for processing Applications for Payment.
  - 6. Distribution of Contract Documents.
  - 3. Submittal of Shop Drawings, Product Data, and Samples.
  - 4. Preparation of record documents.
  - 5. Use of the project area.
  - 6. Parking availability.
  - 7. Office, work, and storage areas.
  - 8. Safety procedures.
  - 9. First Aid.
  - 10. Security.
  - 11. Housekeeping.
  - 12. Working hours.
- E. Preinstallation Conferences: Conduct a conference before each activity that requires coordination with other operations.
- F. Attendees: The Installer and representatives of manufacturers and fabricators involved in or affected by the installation shall attend. Advise the Engineer of scheduled meeting dates.
  - 1. Review the progress of other operations and preparations for the activity under consideration at each preinstallation conference, including requirements for the following:
    - a. Compatibility problems and acceptability of substrates.
    - b. Time schedules and deliveries.
    - c. Manufacturer's recommendations.
    - d. Warranty requirements.
    - e. Inspecting and testing requirements.
  - 2. Record significant discussions and agreements and disagreements, and the approved schedule. Promptly distribute the record of the meeting to everyone concerned, including the Owner and the Engineer.
  - 3. Do not proceed with the installation if the conference cannot be successfully concluded. Initiate actions necessary to resolve problems and reconvene the conference.

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- G. Progress Meetings: Conduct progress meetings at the Project Site at regular intervals. Notify the Owner and the Engineer of scheduled dates. Coordinate meeting dates with preparation of the payment request. Meetings must be held a minimum of once a month during the duration of the project.
  - H. Attendees: The Owner, Engineer, and other entities concerned with current progress or involved in planning, coordination, or future activities shall be represented. Participants shall be authorized to conclude matters relating to the Work.
  - I. Agenda: Review and correct or approve minutes of the previous meeting. Review items of significance that could affect progress. Include topics for discussion appropriate to Project status.
    - 1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule. Determine how to expedite construction behind schedule; secure commitments from parties involved to do so. Discuss revisions required to insure subsequent activities will be completed within the Contract Time.
    - 2. Review the present and future needs of each entity present, including the following:
      - a. Time.
      - b. Sequences.
      - c. Status of submittals.
      - d. Deliveries and off-site fabrication problems.
      - e. Temporary facilities and services.
      - f. Quality and work standards.
      - g. Change Orders.
    - 3. Reporting: Distribute meeting minutes to each party present and to parties who should have been present. Include a summary of progress since the previous meeting and report. Minutes shall be on an approved form obtained from the OWNER'S REPRESENTATIVE.
    - 4. Schedule Updating: Revise the Contractor's Construction Schedule after each meeting where revisions have been made. Issue the revised schedule concurrently with the report of each meeting.

**1.2 PRODUCTS (Not Applicable)**

**1.3 EXECUTION (Not Applicable)**

**END OF SECTION 01200**

**1.1 GENERAL**

- A. Submittal Procedures: Coordinate submittal preparation with construction, fabrication, other submittals, and activities that require sequential operations. Transmit in advance of construction operations to avoid delay.
1. Coordinate submittals for related operations to avoid delay because of the need to review submittals concurrently for coordination. The Designer reserves the right to withhold action on a submittal requiring coordination until related submittals are received.
  2. Processing: Allow 2 weeks for initial review. Allow more time if the Designer must delay processing to permit coordination. Allow 2 weeks for reprocessing.
    - a. No extension of Contract Time will be authorized because of failure to transmit submittals sufficiently in advance of the Work to permit processing.
  3. Submittal Preparation: Place a permanent label on each submittal for identification. Provide a 4-by 5-inch space on the label or beside title block to record review and approval markings and action taken. Include the following information on the label for processing and recording action taken.
    - a. Project name.
    - b. Date.
    - c. Name and address of the Designer.
    - d. Name and address of the Contractor.
    - e. Name and address of the subcontractor.
    - f. Name and address of the supplier.
    - g. Name of the manufacturer.
    - h. Number and title of appropriate Specification Section.
    - i. Drawing number and detail references, as appropriate.
  5. Transmittal Form: Use a cover page to transmit the submittals. On the form, record items submitted, requests for data and deviations from requirements. Include Contractor's certification that information complies with requirements.
- B. Contractor's Construction Schedule: Prepare a horizontal bar-chart-type, contractor's construction schedule. Provide a separate time bar for each activity and a vertical line to identify the first working day of each week. Use the same breakdown of Work indicated in the "Schedule of Values." Indicate estimated completion in 10 percent increments. As Work progresses, mark each bar to indicate actual completion.
1. Submit within 10 days of the date established for "Notice to Proceed."
  2. Prepare the schedule on stable transparency, or other reproducible media, of width to show data for the entire construction period.
  3. Secure performance commitments from parties involved. Coordinate each element with other activities; include minor elements involved in the Work. Show each activity in proper sequence. Indicate sequences necessary for completion of related Work.
  4. Coordinate with the Schedule of Values, list of subcontracts, Submittal Schedule, payment requests, and other schedules.
  5. Indicate completion in advance of Substantial Completion. Indicate Substantial Completion to allow time for the Engineer's procedures necessary for certification of Substantial Completion.
  6. Phasing: Show how phased completion affects the Work.
  7. Work Stages: Indicate important stages for each portion of the Work.
- C. Submittal Schedule: After developing the Contractor's Construction Schedule, prepare a schedule of submittals. Submit within 10 days of submittal of the Construction Schedule.
1. Coordinate with list of subcontracts, Schedule of Values, list of products, and the Contractor's Construction Schedule.
  2. Prepare the schedule in chronological order. Provide the following information:
    - a. Date for first submittal.
    - b. Related Section number.

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- c. Submittal category (Shop Drawings, Product Data, or Samples).
  - d. Name of the subcontractor.
  - e. Description of the Work covered.
  - f. Date for the Engineer's final approval.
3. Schedule Distribution: Distribute copies of the Contractor's Construction Schedule and the Submittal Schedule to the Designer subcontractors, and parties required to comply with submittal dates. Post copies in the field office.
- a. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their Work and are no longer involved in construction activities.
  - b. Updating: Revise the schedule after each meeting or activity where revisions have been made. Issue the updated schedule concurrently with the report of each meeting.
- D. Daily Construction Reports: Prepare a daily report recording events at the site. Submit duplicate copies to the Designer at weekly intervals. Include the following information:
- 1. List of subcontractors at the site.
  - 2. High and low temperatures, general weather conditions.
  - 3. Accidents and unusual events.
  - 4. Stoppages, delays, shortages, and losses.
  - 6. Emergency procedures.
  - 7. Orders and requests of governing authorities.
  - 8. Services connected, disconnected.
  - 9. Equipment or system tests and startups.
  - 10. Substantial Completions authorized.
- E. Shop Drawings: Submit newly prepared information drawn to scale. Indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information. Include the following information:
- 1. Dimensions.
  - 2. Identification of products and materials included by sheet and detail number.
  - 3. Compliance with standards.
  - 4. Notation of coordination requirements.
  - 5. Notation of dimensions established by field measurement.
  - 6. Sheet Size: Except for templates and full-size Drawings, submit one correctable, reproducible print and one blue- or black-line print on sheets at least 8-1/2 by 11 inches but no larger than 36 by 48 inches. The Engineer will return the reproducible print.
- a. Do not use Shop Drawings without an appropriate final stamp indicating action taken.
- F. Product Data: Collect Product Data into a single submittal for each element of construction. Mark each copy to show applicable choices and options. Where Product Data includes information on several products, mark copies to indicate applicable information.
- 1. Include the following information:
    - a. Manufacturer's printed recommendations.
    - b. Compliance with trade association standards.
    - c. Compliance with recognized testing agency standards.
    - d. Application of testing agency labels and seals.
    - e. Notation of dimensions verified by field measurement.
    - f. Notation of coordination requirements.
  - 2. Preliminary Submittal: Submit a preliminary single copy of Product Data where selection of options is required.
  - 3. Submittals: Submit 3 copies. The Engineer will retain one, send on to the Owner and return the other marked with action taken.



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- a. Unless noncompliance with Contract Documents is observed, the submittal serves as the final submittal.
    4. Distribution: Furnish copies to installers, subcontractors, suppliers, and others required for performance of construction activities. Show distribution on transmittal forms. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
      - a. Do not use unmarked Product Data for construction.
  - G. Samples: Submit full-size Samples cured and finished as specified and identical with the material proposed. Mount Samples to facilitate review of qualities.
    1. Include the following:
      - a. Specification Section number and reference.
      - b. Generic description of the Sample.
      - c. Sample source.
      - d. Product name or name of the manufacturer.
      - e. Compliance with recognized standards.
      - f. Availability and delivery time.
    2. Submit Samples for review of size, kind, color, pattern, and texture, for a check of these characteristics, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed. Where variations are inherent in the material, submit at least 3 units that show limits of the variations.
      - a. Refer to other Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar characteristics.
      - b. Refer to other Sections for Samples to be incorporated in the Work. Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.
      - c. Samples not incorporated into the Work, or designated as the Owner's property, are the Contractor's property and shall be removed from the site.
    3. Preliminary Submittals: Submit a full set of choices where Samples are submitted for selection of color, pattern, texture, or similar characteristics from standard choices. The Engineer will review and return submittals indicating selection and other action.
    4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit 3 sets. One set will be returned marked with the action taken. Maintain sets of Samples, at the Project Site, for quality comparison.
      - a. Unless noncompliance with Contract Documents is observed, the submittal may serve as the final submittal.
      - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
    5. Distribution of Samples: Distribute additional sets to subcontractors, manufacturers, and others as required for performance of the Work. Show distribution on transmittal forms.
  - H. Quality Assurance Submittals: Submit quality-control submittals, including design data, certifications, manufacturer's instructions, and manufacturer's field reports required under other Sections of the Specifications.
    1. Certifications: Where certification that a product or installation complies with specified requirements is required, submit a notarized certification from the manufacturer certifying compliance.
      - a. Signature: Certification shall be signed by an officer authorized to sign documents on behalf of the company.

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- I. Designer's Action: Except for submittals for the record or information, where action and return are required, the Designer will review each submittal, mark to indicate action taken, and return. Compliance with specified characteristics is the Contractor's responsibility.

1. Action Stamp: The Designer will stamp each submittal with an action stamp. The Designer will mark the stamp appropriately to indicate the action taken. The action taken on each submittal does not relieve the Contractor of his responsibilities of the Contract. It is used as one means of reviewing substantial compliance.

**1.2 PRODUCTS (Not Applicable)**

**1.3 EXECUTION (Not Applicable)**

**END OF SECTION 01300**

**1.1 GENERAL**

- A. Quality-control services include inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by the Designer.
  
- B. Contractor Responsibilities: Unless they are the responsibility of another entity, Contractor shall provide inspections and tests specified elsewhere and required by authorities having jurisdiction. Costs for these services are to be included in the Contract Sum.
  - 1. Where inspections and tests are the Contractor's responsibility, the Contractor shall employ and pay a qualified independent testing agency to perform these services. Costs for these services are included in the Contract Sum.
  - 2. Work Performance: The contractor shall complete all work under the provisions of the Contract Documents in a professional manner. It is not the intent of the testing results or inspections by the Designer to provide the basis for the quality of the project. The Contractor shall provide their own quality control measures during the course of the work.
  
- C. Retesting: The Contractor is responsible for retesting where results of inspections and tests prove unsatisfactory and indicate noncompliance with requirements.
  - 1. The cost of retesting is the Contractor's responsibility where tests performed indicated noncompliance with requirements.
  
- D. Auxiliary Services: Cooperate with agencies performing inspections and tests. Provide auxiliary services as requested. Notify the agency in advance of operations to permit assignment of personnel. Auxiliary services include the following:
  - 1. Providing access to the Work.
  - 2. Furnishing incidental labor and facilities to assist inspections and tests.
  - 3. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
  - 4. Providing facilities for storage and curing of test samples.
  - 5. Delivering samples to testing laboratories.
  - 6. Providing preliminary design mix proposed for use for materials mixes that require control by the testing agency.
  - 7. Providing security and protection of samples and test equipment.
  
- E. Duties of the Testing Agency: The testing agency shall cooperate with the Designer and the Contractor in performing its duties. The agency shall provide qualified personnel to perform inspections and tests.
  - 1. The agency shall notify the Designer and the Contractor of irregularities or deficiencies observed in the Work during performance of its services.
  - 2. The agency shall not release, revoke, alter, or enlarge requirements or approve or accept any portion of the Work.
  - 3. The agency shall not perform duties of the Contractor.
  
- F. Coordination: Coordinate activities to accommodate services with a minimum of delay. Avoid removing and replacing construction to accommodate inspections and tests.
  - 1. The Contractor is responsible for scheduling inspections, tests, taking samples, and similar activities.
  
- G. Submittals: The testing agency shall submit a certified written report, in duplicate, of each inspection and test to the Designer. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection or test through the Contractor.
  - 1. Submit additional copies of each report to the governing authority, when the authority so directs.
  - 2. Report Data: Reports of each inspection, test, or similar service include, but are not limited to, the following:

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- a. Date of issue.
  - b. Project title and number.
  - c. Name, address, and telephone number of testing agency.
  - d. Dates and locations of samples and tests or inspections.
  - e. Names of individuals making the inspection or test.
  - f. Designation of the Work and test method.
  - g. Identification of product and Specification Section.
  - h. Complete inspection or test data.
  - i. Test results and an interpretation of test results.
  - j. Ambient conditions at the time of sample taking and testing.
  - k. Comments or professional opinion on whether inspected or tested Work complies with requirements.
  - l. Name and signature of laboratory inspector.
  - m. Recommendations on retesting.

H. Qualifications for Service Agencies: Engage inspection and testing service agencies that are prequalified as complying with the American Council of Independent Laboratories' "Recommended Requirements for Independent Laboratory Qualification" and that specialize in the types of inspections and tests to be performed.

1. Each agency shall be authorized by authorities having jurisdiction to operate in the state where the Project is located.

## **1.2 PRODUCTS (Not Applicable)**

## **1.3 EXECUTION**

- A. Repair and Protection: Upon completion of inspection, testing, and sample taking, repair damaged construction. Restore substrates and finishes. Comply with Division 1 Section "Cutting and Patching."
- B. Protect construction exposed by or for quality-control service activities, and protect repaired construction.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for inspection and testing.

**END OF SECTION 01400**

**REFERENCE STANDARDS AND DEFINITIONS****1.1 GENERAL**

- A. Definitions: Basic contract definitions are included in the Conditions of the Contract.
- B. "Indicated" refers to graphic representations, notes, or schedules on the Drawings; or to other paragraphs or schedules in the Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference. Location is not limited.
- C. "Directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Engineer, requested by the Engineer, and similar phrases.
- D. "Approved," when used in conjunction with the Engineer's action on the Contractor's submittals, applications, and requests, is limited to the Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- E. "Regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish" means to supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install" describes operations at the Project site including the actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide" means to furnish and install, complete and ready for the intended use.
- I. "Installer" is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
1. The term "experienced," when used with the term "installer," means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.
  2. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter."
- J. "Project site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
- K. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.
- L. Specification Format: These Specifications are organized into Divisions and Sections based on the 16-division format and CSI/CSC's "MasterFormat" numbering system.
- M. Specification Content: These 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 is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the

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sense requires. Singular words shall be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Streamlined language is generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the 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.

- N. **Applicability of Standards:** Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- O. **Publication Dates:** Comply with the standards in effect as of the date of the Contract Documents.
- P. **Copies of Standards:** Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source and make them available on request.
- Q. **Abbreviations and Names:** Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-producing organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research's "Encyclopedia of Associations" or Columbia Books' "National Trade & Professional Associations of the U.S.," which are available in most libraries.
- R. **Permits, Licenses, and Certificates:** For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

**1.2 PRODUCTS (Not Applicable)**

**1.3 EXECUTION (Not Applicable)**

**END OF SECTION 01421**

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**CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS****1.1 GENERAL**

- A. Summary: This Section specifies construction facilities and temporary controls including temporary utilities, support facilities, and security and protection facilities.
- B. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
  - 1. Building code requirements.
  - 2. Health and safety regulations.
  - 3. Utility company regulations.
  - 4. Police, fire department, and rescue squad rules.
  - 5. Environmental protection regulations.
  - 6. Local, State and Federal jurisdictional regulations
- C. Standards: Comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations," ANSI A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."
  - 1. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code."
- D. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.
- E. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. Submit reports of tests, inspections, meter readings, and procedures performed on temporary utilities. At the earliest time, change over from use of temporary service to use of permanent service.

**1.2 PRODUCTS**

- A. Materials: Provide new materials. If acceptable to the Designer, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.
  - 1. Lumber and Plywood: Comply with Division 6 Section "Rough Carpentry." Provide UL-labeled, fire-treated lumber and plywood for temporary offices and sheds. Provide exterior, Grade B-B high-density concrete form overlay plywood for signs. Provide 5/8-inch-thick exterior plywood for other uses.
  - 4. Tarpaulins: Waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.
  - 5. Water: Potable water approved by local health authorities.
- B. Equipment: Provide new equipment. If acceptable to the Designer, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.
  - 1. Water Hoses: 3/4-inch, heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet long. Provide adjustable shutoff nozzles at hose discharge.
  - 2. Electrical Outlets: Properly configured, NEMA-polarized outlets. Provide outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.
  - 3. Electrical Power Cords: Grounded extension cords. Use hard-service cords where exposed to abrasion and traffic.
  - 4. Lamps and Light Fixtures: General service incandescent lamps. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.
  - 5. Heating Units: Temporary heating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.

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6. Fire Extinguishers: Hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.
    - a. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
  7. Contractor shall place adequate refuse containers on the site for construction materials and personal use by their employees, sub-Contractors and others. The site must stay clean of debris at all times. Paper, bottles, cans, and other trash shall be disposed of properly. The Owner reserves the right to reject payment to the Contractor if the project site is not kept in a clean orderly manner until the deficiencies are corrected.

### 1.3 EXECUTION

- A. Installation, General: Use qualified personnel to install temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
  1. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.
  2. Conditions of Use: Keep temporary facilities clean and neat in appearance. Operate safely and efficiently. Relocate as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.
- B. Temporary Utility Installation: Engage the local utility company to install temporary service or connect to existing service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.
  1. Arrange with company and existing users for a time when service can be interrupted to make connections for temporary services.
  2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
  3. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.
  4. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Engineer. Neither the Owner nor Engineer will accept cost or use charges as a basis of claims for Change Orders.
  5. Temporary Water Service: Install temporary water service and distribution piping of sizes and pressures adequate for construction. Maintain service until permanent water service is in use. Sterilize piping prior to use.
  6. Temporary Electric Power: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics. Include meters, transformers, overload-protected disconnects, automatic ground-fault interrupters, and main distribution switchgear. Install service underground.
    - a. Power Distribution: Install wiring overhead and rise vertically where least exposed to damage.
    - b. Temporary Lighting: Provide temporary lighting with local switching to fulfill security requirements and illumination for construction operations and traffic conditions.
  7. Temporary Heat: Provide temporary heat for curing or drying of completed installations or for protection of installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations. Coordinate ventilation requirements to produce ambient condition required and minimize consumption of energy.
    - a. Heating Facilities: Except where the Owner authorizes use of the permanent system, provide vented, self-contained, LP-gas or fuel-oil heaters with individual space thermostatic



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control. Use of gasoline-burning space heaters, open flame, or salamander heating units is prohibited.

8. Temporary Telephones: Provide temporary telephone service for personnel engaged in construction. Install a separate line for each temporary office and first-aid station. Provide a dedicated telephone line for a fax machine in the field office. At each telephone, post a list of important telephone numbers.
  9. Sanitary Facilities: Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers.
    - a. Toilets: Install self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.
  10. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.
    - a. Filter out soil, construction debris, chemicals, and similar contaminants that might clog sewers or pollute waterways.
    - b. Connect temporary sewers to the municipal system, as directed by sewer department officials. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.
    - c. Provide earthen embankments and similar barriers in and around excavations and subgrade construction to prevent flooding by runoff of storm water from heavy rains.
- C. Support Facilities Installation: (A field office is not required for this project). Locate field offices, storage sheds, and other construction and support facilities for easy access. Maintain facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
1. Provide incombustible construction for offices, shops, and sheds located within the construction area or within 30 feet of building lines. Comply with requirements of NFPA 241.
  2. Field Offices: Provide heated and air-conditioned, insulated, weathertight temporary offices of size to accommodate personnel at the Project Site. Provide offices on foundations adequate for normal loading. Provide units with lockable entrances, operable windows, and serviceable finishes. Keep the office clean and orderly for use for small progress meetings. Furnish and equip offices as follows:
    - a. Furnish field offices with a desk and chairs, a 4-drawer file cabinet, plan table, plan rack, and a 6-shelf bookcase. Equip with a water cooler and toilet complete with water closet, lavatory, and medicine cabinet unit with a mirror.
  3. Storage and Fabrication Sheds: Install sheds equipped to accommodate materials and equipment involved. Sheds may be open shelters or fully enclosed spaces within the building.
  4. Temporary Paving: Construct temporary paving for roads, storage areas, and parking where the same permanent facilities will be located. Comply with Division 2 Section "Hot-Mixed Asphalt Paving."
    - a. Coordinate temporary paving development with subgrade grading, compaction, installation and stabilization of subbase, and installation of base and finish courses of permanent paving.
      - 1) Install temporary paving to minimize the need to rework the installations and to result in permanent roads and paved areas without damage or deterioration when occupied by the Owner.

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- b. Delay installation of the final course of permanent paving until immediately before Substantial Completion. Coordinate with weather conditions to avoid unsatisfactory results.
      - c. Extend temporary paving in and around the construction area as necessary to accommodate delivery and storage of materials, equipment usage, administration, and supervision.
    5. Dewatering Facilities and Drains: For temporary drainage and dewatering operations not directly associated with construction, comply with dewatering requirements of applicable Division 2 Sections. Where feasible, utilize the same facilities. Maintain excavations and construction free of water.
    6. Temporary Enclosures: Provide temporary enclosures for protection of construction from exposure, foul weather, other construction operations, and similar activities. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions.
      - a. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 sq. ft. or less with plywood or similar materials.
      - b. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
    9. Project Signs: Install project identification and other signs where indicated to inform the public and persons seeking entrance to the Project. Support on framing of preservative-treated wood or steel. Do not permit installation of unauthorized signs. Engage an experienced sign painter to apply graphics. Comply with details indicated.
    11. Waste Collection and Disposal: Collect waste daily. Comply with requirements of NFPA 241. Enforce requirements strictly. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.
      - a. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F.
  - D. Security and Protection Facilities Installation: Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion.
    1. Temporary Fire Protection: Until permanent facilities supply fire-protection needs, install and maintain temporary fire-protection facilities of types needed to protect against controllable fire losses. Comply with NFPA 10 and NFPA 241.
      - b. Store combustible materials in containers in fire-safe locations.
      - c. Prohibit smoking in hazardous fire-exposure areas.
      - d. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
    2. Permanent Fire Protection: At the earliest date, complete installation of the permanent fire-protection facility and place into operation and use. Instruct key personnel on use of facilities.
    3. Barricades, Warning Signs, and Lights: Comply with code requirements for erection of barricades. Paint with appropriate colors, graphics, and warning signs. Where appropriate and needed, provide lighting, including flashing red or amber lights.
    4. Enclosure Fence: Before excavation begins, install an enclosure fence with lockable entrance gates to enclose the entire site or the portion sufficient to accommodate construction.
      - a. Provide open-mesh, chainlink fencing with posts set in a compacted mixture of gravel and earth.
    7. Environmental Protection: Operate temporary facilities and conduct construction in ways that comply with environmental regulations and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise-making equipment to hours that will minimize complaints.

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- E. Operation: Enforce discipline in use of temporary facilities. Limit availability to intended uses to minimize waste and abuse.
  - F. Maintenance: Maintain facilities in operating condition until removal. Protect from damage by freezing temperatures and similar elements. Maintain temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid damage.
  - G. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect during excavation.
  - H. Termination and Removal: Remove each temporary facility when the need has ended, when replaced by a permanent facility, or no later than Substantial Completion. Complete or restore permanent construction delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
    - 1. Materials and temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.
    - 2. Remove temporary paving. Where the area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil in the area. Remove materials contaminated with oil, asphalt and other petrochemical compounds, and substances that might impair growth of plant materials or lawns. Repair or replace paving, curbs, and sidewalks at the temporary entrances, as required by the governing authority.
    - 3. At Substantial Completion, clean and renovate permanent facilities used during the construction period.
      - a. Replace air filters and clean inside of ductwork and housings.
      - b. Replace worn parts and parts subject to unusual operating conditions.
      - c. Replace burned out lamps.

**END OF SECTION 01500**

**1.1 GENERAL**

- A. Substitutions: Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed after award of the Contract are considered requests for substitutions. The following are not requests for substitutions:
1. Substitutions requested during the bidding period and accepted by Addendum prior to award of the Contract.
  2. Revisions to the Contract Documents requested by the Owner.
  3. Specified options included in the Contract Documents.
  4. Contractor's compliance with regulations issued by governing authorities.
- B. Substitution Request Submittal: The Designer will consider requests for substitution received within 60 days after commencement of the Work.
1. Submit 3 copies of each request for substitution. Submit requests according to procedures required for change-order proposals.
  2. Identify the product or method to be replaced in each request. Include related Specification Section and Drawing numbers.
  3. Provide documentation showing compliance with the requirements for substitutions and the following information:
    - a. Coordination information, including a list of changes needed to other Work that will be necessary to accommodate the substitution.
    - b. A comparison of the substitution with the Work specified, including performance, weight, size, durability, and visual effect.
    - c. Product Data, including Drawings and descriptions of products and installation procedures.
    - d. Samples, where applicable or requested.
    - e. A statement indicating the effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the substitution on Contract Time.
    - f. Cost information, including a proposal of the net change, if any in the Contract Sum.
    - g. Certification that the substitution conforms to the Contract Documents and is appropriate for the applications indicated.
    - h. The Contractor's waiver of rights to additional payment or time that may become necessary because of the failure of the substitution to perform adequately.
  4. Designer's Action: If necessary, the Designer will request additional information within one week of receipt of a request for substitution. The Designer will notify the Contractor of acceptance or rejection within 2 weeks of receipt of the request. Acceptance will be in the form of a change order or a work change directive if substituted item does not change the contract amount of project schedule.

**1.2 PRODUCTS**

- A. Conditions: The Designer will receive and consider a request for substitution when one or more of the following conditions are satisfied. Otherwise, the Engineer will return the requests without action except to record noncompliance with these requirements.
1. Extensive revisions to the Contract Documents are not required.
  2. Changes are in keeping with the intent of the Contract Documents.
  3. The specified product cannot be provided within the Contract Time. The Designer will not consider the request if the specified product cannot be provided as a result of failure to pursue the Work promptly.
  4. The request is related to an "or-equal" clause.
  5. The substitution offers the Owner a substantial advantage, in cost, time, or other considerations, after deducting compensation to the Engineer for redesign and increased cost of other construction.
  6. The specified product cannot receive approval by a governing authority, and the substitution can be approved.

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- B. The Contractor's submittal and the Designer's acceptance of Shop Drawings, Product Data, or Samples for construction not complying with the Contract Documents do not constitute an acceptable request for substitution, nor do they constitute approval.

**1.3 EXECUTION (Not Applicable)**

**END OF SECTION 01631**

## SECTION 01700

### CONTRACT CLOSEOUT

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#### 1.1 GENERAL

- A. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 3.
- B. Substantial Completion: Before requesting inspection for certification of Substantial Completion, complete the following:
  - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the Work claimed as substantially complete.
    - a. Include supporting documentation for completion and an accounting of changes to the Contract Sum.
  - 2. Advise the Owner of pending insurance changeover requirements.
  - 3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
  - 4. Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
  - 5. Deliver tools, spare parts, extra stock, and similar items.
  - 6. Complete startup testing of systems and instruction of operation and maintenance personnel. Remove temporary facilities, mockups, construction tools, and similar elements.
  - 7. Complete final cleanup requirements.
- C. Inspection Procedures: On receipt of a request for inspection, the Engineer will proceed or advise the Contractor of unfilled requirements. The Engineer will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued. Prior to inspection, the Contractor shall make their own evaluations of their completed work and correct any deficiencies prior to asking for an inspection.
  - 1. The Engineer will repeat inspection when requested and assured that the Work is substantially complete.
  - 2. Results of the completed inspection will form the basis of requirements for final acceptance.
- D. Final Acceptance: Before requesting inspection for certification of final acceptance and final payment, complete the following:
  - 1. Final payment request with releases and supporting documentation. Include insurance certificates where required.
  - 2. Submit a statement, accounting for changes to the Contract Sum.
  - 3. Submit a copy of the final inspection list stating that each item has been completed or otherwise resolved for acceptance.
  - 5. Submit consent of surety to final payment.
  - 6. Submit a final settlement statement.
  - 7. Submit evidence of continuing insurance coverage complying with insurance requirements.
- E. Reinspection Procedure: The Engineer will reinspect the Work upon receipt of notice that the Work has been completed, except for items whose completion is delayed under circumstances acceptable to the Engineer.
  - 1. Upon completion of reinspection, the Engineer will prepare a certificate of final acceptance. If the Work is incomplete, the Engineer will advise the Contractor of Work that is incomplete or obligations that have not been fulfilled but are required.
  - 2. If necessary, reinspection will be repeated.
- F. Record Document Submittals: Do not use record documents for construction. Protect from loss in a secure location. Provide access to record documents for the Engineer's reference.
- G. Record Drawings: Maintain a set of prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown.

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Mark the drawing most capable of showing conditions fully and accurately. Give attention to concealed elements.

1. Mark sets with red pencil. Use other colors to distinguish between variations in separate categories of the Work.
2. Organize record drawing sheets into manageable sets. Bind with durable-paper cover sheets; print titles, dates, and other identification on the cover of each set.

H. Record Specifications: Maintain one copy of the Project Manual, including addenda. Mark to show variations in Work performed in comparison with the text of the Specifications and modifications. Give attention to substitutions and selection of options and information on concealed construction. Note related record drawing information and Product Data.

1. Upon completion of the Work, submit record Specifications to the Engineer for the Owner's records.

I. Maintenance Manuals: Organize operation and maintenance data into sets of manageable size. Bind in individual, heavy-duty, 3-ring, binders, with pocket folders for folded sheet information. Mark identification on front and spine of each binder. Include the following information:

1. Emergency instructions.
2. Spare parts list.
3. Copies of warranties.
4. Wiring diagrams.
5. Shop Drawings and Product Data.

## **1.2 PRODUCTS (Not Applicable)**

### **1.3 EXECUTION**

A. Operation and Maintenance Instructions: Arrange for each Installer of equipment that requires maintenance to provide instruction in proper operation and maintenance. Include a detailed review of the following items:

1. Maintenance manuals.
2. Spare parts, tools, and materials.
3. Lubricants and fuels.
4. Identification systems.
5. Control sequences.
6. Hazards.
7. Warranties and bonds.
8. Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following:

1. Startup and shutdown.
2. Emergency operations and safety procedures.
3. Noise and vibration adjustments.

C. Final Cleaning: Employ experienced cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal cleaning and maintenance program. Complete the following operations before requesting inspection for certification of Substantial Completion.

1. Remove labels that are not permanent labels.
3. Clean exposed finishes, free of stains, films, and foreign substances. Leave concrete floors broom clean.
4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication. Clean plumbing fixtures. Clean light fixtures and lamps.
5. Clean the site of rubbish, litter, and foreign substances. Sweep paved areas; remove stains, spills, and foreign deposits. Rake grounds to a smooth, even-textured surface.

E. Removal of Protection: Remove temporary protection and facilities.

F. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Remove waste materials and dispose of lawfully.

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**END OF SECTION 01700**



**PART 1 – GENERAL**

**1.1 STANDARD PRODUCT WARRANTIES**

Preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

**1.2 SPECIAL WARRANTIES**

Written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

**1.3 CORRECTION OF WORK**

Refer to the General Conditions for terms of the Contractor's period for correction of the Work.

**1.4 DISCLAIMERS AND LIMITATIONS**

Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

**1.5 RELATED DAMAGES AND LOSSES**

When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

**1.6 REINSTATEMENT OF WARRANTY**

When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

**1.7 REPLACEMENT COST**

Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

**1.8 OWNER'S RECOURSE**

Expressed warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which the Owner can enforce such other duties, obligations, rights, or remedies.

- A. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
- B. Where the Contract Documents require a special warranty, or similar commitment, the Owner reserves the right to refuse to accept the Work, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

**PART 2 – PRODUCTS (Not Applicable)**

**PART 3 – EXECUTION**

**3.1 WARRANTY SUBMISSIONS**

Submit written warranties to the Designer prior to the date certified for Substantial Completion. If the Designer's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion, submit written warranties upon request of the Designer.

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- A. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Designer within 15 days of completion of that designated portion of the Work.
  - B. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner, through the Engineer, for approval prior to final execution.
    - 1. Refer to Divisions 2 and 3 Sections for specific content requirements and particular requirements for submitting special warranties.

### **3.2 BINDERS**

Bind warranties and bonds in heavy-duty, commercial-quality, durable 3-ring, vinyl-covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

- A. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address, and telephone number of the Installer.
- B. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project title or name, and name of the Contractor.
- C. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

**END OF SECTION 01740**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section. This section shall also apply to demolition items.

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Removal of trees and other vegetation.
  - 2. Clearing and grubbing.
  - 3. Removing above-grade improvements.
  - 4. Removing below-grade improvements.

**1.3 PROJECT CONDITIONS**

- A. Traffic: Conduct site-clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from Owner or authorities having jurisdiction.
- B. Protection of Existing Improvements: Provide protections necessary to prevent damage to existing improvements indicated to remain in place.
  - 1. Protect improvements on adjoining properties and on OWNER's property.
  - 2. Restore damaged improvements to their original condition, as acceptable to property owners.

**1.4 EXISTING SERVICES**

- A. General: Indicated locations are approximate; determine exact locations before commencing Work.
- B. Arrange and pay for disconnecting, removing, capping, and plugging utility services. Notify affected utility companies in advance and obtain approval before starting this Work.
- C. Place markers to indicate location of disconnected services. Identify service lines and capping locations on Project Record Documents.

**PART 2 - PRODUCTS (Not Applicable)**

**PART 3 - EXECUTION**

**3.1 SITE CLEARING**

- A. General: Thoroughly remove trees, shrubs, grass, and other vegetation, improvements, or obstructions, as required, to permit installation of new construction within project construction site. Remove similar items elsewhere on-site or premises as specifically indicated. Removal includes digging out and off-site disposal of stumps and roots.
  - 1. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
- B. Clearing and Grubbing: Clear site of trees, shrubs, and other vegetation, except for those indicated to be left standing.
  - 1. Completely remove stumps, roots, and other debris protruding through ground surface.
  - 2. Use only hand methods for grubbing inside drip line of trees indicated to remain.
- C. Removal of Improvements: Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction.
  - 1. Abandonment or removal of certain underground pipe or conduits is indicated on drawings.

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**3.2 DISPOSAL OF WASTE MATERIALS**

- A. Burning: Burning is not permitted on this project.
- B. Removal from Property: Remove waste materials and unsuitable or excess topsoil from Project area.

**END OF SECTION 02110**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Preparing and grading subgrades for slabs-on-grade, walks, pavements, and landscaping.
  - 2. Excavating and backfilling for buildings and structures.
  - 3. Subbase course for walks and pavements.
  - 4. Subsurface drainage backfill for walls and trenches.
  - 5. Excavating and backfilling for underground utilities and appurtenances.
- B. Related Sections: The following Sections contain requirements that relate to this Section.
  - 1. Division 2 Section 02110 "Site Clearing and Demolition" for site stripping, grubbing, topsoil removal, removal of above and below grade improvements, and tree protection.
  - 2. Division 2 Section 02520 "Portland Cement Concrete Paving" for concrete driveways, curbs and gutters, walkways and exterior slabs.
  - 3. Division 2 Section 02700 "Drainage" for storm drain pipes and drainage structures.
  - 4. Division 2 Section 02900 "Landscape Work" for finish grading, including placing and preparing topsoil for lawns and planting.

**1.3 DEFINITIONS**

- A. Excavation consists of the removal of material encountered to subgrade elevations and the reuse or disposal of materials removed.
- B. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- C. Select Materials: Select Material shall be any suitable material which is classified by gradation and performance characteristics as indicated in NCDOT Standard Specifications Section 1016.
- D. Borrow Materials: Borrow Materials shall be any suitable material as specified in NCDOT Standard Specifications Section 1018.
- E. Drainage Fill: Course of NCDOT Class VI Select Material supporting slab-on-grade placed to cut off upward capillary flow of pore water.
- F. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the THE OWNER'S REPRESENTATIVE. Unauthorized excavation, as well as remedial work directed by the THE OWNER'S REPRESENTATIVE, shall be at the Contractor's expense.
- G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.
- H. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within building lines.
- I. Class B Bedding: Class B Bedding shall consist of NCDOT Class VI Select Materials. Bedding shall have a minimum thickness beneath the pipe of 4 in., or one-eighth of the outside diameter of the pipe, whichever is greater, and shall extend up the mid-point of the outside diameter of the pipe. Backfill from the top of bedding material to a level not less than 12 in. above the top of the pipe shall be carefully placed NCDOT Class I soil material.

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- J. Class C Bedding: Class C Bedding shall consist of NCDOT Class VI Select Materials. Bedding shall have a minimum thickness beneath the pipe of 4 in., or one-eighth of the outside diameter of the pipe, whichever is greater, and shall extend up the sides of the pipe one-fourth of the outside diameter of the pipe. Backfill from the top of bedding material to a level not less than 12 in. above the top of the pipe shall be carefully placed NCDOT Class I soil material.
  - K. Class D Bedding: Class D Bedding shall consist of NCDOT Class II or III Select Materials. Bedding shall have a minimum thickness beneath the pipe of 4 in., or one-eighth of the outside diameter of the pipe, whichever is greater, and shall be carefully placed, shaped, and compacted to conform to the bottom pipe periphery and to uniformly and continuously support the pipe. Backfill from the top of bedding material to a level not less than 12 in. above the top of the pipe shall be carefully placed NCDOT Class I soil material.
  - L. Aggregate Base Course: Aggregate Base Course shall conform to NCDOT Standard Specifications Section 520.

#### **1.4 SUBMITTALS**

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for the following:
  - 1. Type of tracer wire.
  - 2. Filter fabric.
- C. Samples of the following:
  - 1. 20 lb samples, sealed in air-tight containers, of each proposed fill and backfill soil material from on-site or borrow sources.
  - 2. 12 x 12 inch sample of filter fabric.
- D. Test Reports: In addition to test reports required under field quality control, submit the following:
  - 1. Laboratory analysis of each soil material proposed for fill and backfill from on-site and borrow sources.
  - 2. One optimum moisture-maximum density curve for each soil material.
  - 3. Report of actual unconfined compressive strength and/or results of bearing tests of each stratum tested.
- E. Photographs of existing adjacent structures and site improvements.

#### **1.5 QUALITY ASSURANCE**

- A. Codes and Standards: Perform earthwork complying with requirements of North Carolina Department of Transportation.
- B. Testing and Inspection Service: OWNER will employ a qualified independent geotechnical engineering testing agency to classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing. The CONTRACTOR shall include the cost of all testing in the BID.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section 01200 "Project Meetings."
  - 1. Before commencing earthwork, meet with representatives of the governing authorities, OWNER, THE OWNER'S REPRESENTATIVE, consultants, Geotechnical Engineer, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

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## 1.6 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the OWNER or others except when permitted in writing by the THE OWNER'S REPRESENTATIVE and then only after acceptable temporary utility services have been provided.
  - 1. Provide a minimum 48-hours' notice to the THE OWNER'S REPRESENTATIVE and receive written notice to proceed before interrupting any utility.
- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shutoff services if lines are active.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.
- B. Satisfactory Soil Materials: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM; free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.
- C. Unsatisfactory Soil Materials: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.
- D. Select Materials: Select Materials shall conform to NCDOT Standard Specifications Section 1016.
- E. Borrow Materials: Borrow Materials shall conform to NCDOT Standard Specifications Section 1018.
- F. Aggregate Base Materials: Aggregate Base Materials shall conform to NCDOT Standard Specifications Section 1010, Type A or B.
- G. Aggregates for Asphalt Surface Treatment: Aggregates for Asphalt Surface Treatments shall conform to NCDOT Standard Specifications Section 1012-2.

### 2.2 ACCESSORIES

- A. Detectable Tracer Wire: A continuous "detectable" wire of minimum 12 gauge THHN shall be buried along the pipe. The wire shall be "stubbed" out into valve boxes and secured.
- B. Filter Fabric: Manufacturer's standard nonwoven pervious geotextile fabric of polypropylene, nylon or polyester fibers, or a combination.

## 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. Tree protection is specified in the Division 2 Section 02110 "Site Clearing."

### **3.2 DEWATERING**

- A. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

### **3.3 EXCAVATION**

- A. Explosives: Do not use explosives.
- B. Unclassified Excavation: Excavation is unclassified and includes excavation to required subgrade elevations regardless of the character of materials and obstructions encountered. All suitable material removed in the excavation shall be used as far as practiceable in the formation of embankments, subgrades, and shoulders and at such other places as may be indicated on the plans or directed by the THE OWNER'S REPRESENTATIVE. The wasting of suitable material removed as part of unclassified excavation prior to the completion of embankments will be permitted under the following conditions:
  - 1. The Contractor shall provide and incorporate into the project, at no additional cost to the OWNER, any material required to complete the project up to the volume wasted. All additional cost for providing and incorporating this material into the work shall be borne exclusively by the Contractor.
  - 2. Any replacement material shall be either suitable wasted material from the project or approved borrow material, at the contractor's option.
  - 3. The Contractor agrees that he shall present no claim for any time arising from the wasting of excess suitable unclassified material or for having to replace materials wasted from the project.
  - 4. Where work is so phased by the owner as to preclude utilizing suitable unclassified materials, the Contractor shall be exempt from the above requirements.

### **3.4 STABILITY OF EXCAVATIONS**

- A. Comply with local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.

### **3.5 EXCAVATION FOR STRUCTURES**

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1.2 inches. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, installing services and other construction, and for inspections.

### **3.6 EXCAVATION FOR WALKS AND PAVEMENTS**

- A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.

### **3.7 EXCAVATION FOR UTILITY TRENCHES**

- A. Excavate trenches to indicated slopes, lines, depths, and invert elevations.
- B. Pipe Bedding: Excavate trench bottoms. Unless otherwise indicated, provide bedding in accordance with the following:
 

1. Vitrified Clay Pipe (VCP)	Class D Bedding
2. PVC Pipe (Gravity Piping)	Crushed Stone Encasement
3. Ductile Iron Pipe	Class D Bedding
4. PVC Pipe (Water mains & Sewage Force Mains)	Class D Bedding
5. Reinforced Concrete Pipe	Class C Bedding
6. High Density Polyethylene (HDPE) pipe	Class B Bedding

### **3.8 APPROVAL OF SUBGRADE**

- A. Notify THE OWNER'S REPRESENTATIVE when excavations have reached required subgrade.



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- B. When THE OWNER'S REPRESENTATIVE determines that unforeseen unsatisfactory soil is present, continue excavation and replace with select material as directed.
    - 1. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.
  - C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the THE OWNER'S REPRESENTATIVE.

### **3.9 UNAUTHORIZED EXCAVATION**

- A. Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to the THE OWNER'S REPRESENTATIVE.
  - 1. Fill unauthorized excavations under other construction as directed by the THE OWNER'S REPRESENTATIVE.
- B. Where indicated widths of utility trenches are exceeded, provide stronger pipe, or special installation procedures, as required by the THE OWNER'S REPRESENTATIVE.

### **3.10 STORAGE OF SOIL MATERIALS**

- A. Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent wind-blown dust.
  - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### **3.11 BACKFILL**

- A. Backfill excavations promptly, but not before completing the following:
  - 1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
  - 2. Surveying locations of underground utilities for record documents.
  - 3. Testing, inspecting, and approval of underground utilities.
  - 4. Concrete formwork removal.
  - 5. Removal of trash and debris from excavation.
  - 6. Removal of temporary shoring and bracing, and sheeting.
  - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

### **3.12 UTILITY TRENCH BACKFILL**

- A. Place and compact bedding course in accordance with bedding class specified and to fill unauthorized excavations. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- B. Carefully place and compact initial backfill of NCDOT Class I soil material as specified, or subbase material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit, in layers not to exceed 6 inches loose unless otherwise approved by the THE OWNER'S REPRESENTATIVE.
  - 1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of utility system. The backfill shall be kept free from stones, frozen lumps, chunks of highly plastic clay or other objectionable material.
  - 2. All pipe backfill areas shall be graded and maintained in such a condition that erosion or saturation will not damage the pipe bed or backfill

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3. Heavy equipment shall not be operated over any pipe until it has been properly backfilled with a minimum 3 feet of cover. Where any part of the required cover is above the proposed finished grade, the Contractor shall place, maintain and finally remove such material at no cost to the Owner. Pipe which becomes misaligned, shows excessive settlement or has been otherwise damaged by the Contractor's operations shall be removed and replaced by the Contractor at no cost to the Owner.
- C. Backfill shall be conducted in accordance with NCDOT Standard Specifications SubSection 300-6.
  - D. Coordinate backfilling with utilities testing.
  - E. Place and compact final backfill of satisfactory soil material to final subgrade. In the event that native materials are found to be unsatisfactory for backfill, the THE OWNER'S REPRESENTATIVE may require that borrow material be placed in the trench.
  - F. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

### **3.13 FILL**

- A. Preparation: Remove vegetation, topsoil, debris, wet, and unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placing fills.
  1. Plow strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing surface.
- B. When subgrade or existing ground surface to receive fill has a density less than that required for fill, break up ground surface to depth required, pulverize, moisture-condition or aerate soil and recompact to required density.
- C. Place fill material in layers to required elevations for each occurrence listed below.
  1. Under grass, use satisfactory excavated or borrow soil material.
  2. Under walks and pavements, use NCDOT Class II material.
  3. Under steps and ramps, use NCDOT Class VI material.

### **3.14 MOISTURE CONTROL**

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.
  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 satisfactory soil material that is too wet to compact to specified density.
    - a. Stockpile or spread and dry removed wet satisfactory soil material.

### **3.15 COMPACTION**

- A. Place backfill and fill materials in layers not more than 6 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 on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.
- C. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density according to ASTM D 1557:
  1. Under structures, building slabs, steps, and pavements, compact the top 12 inches below subgrade at 100 percent maximum dry density and each layer of backfill or fill material below the top 12 inches at 98 percent maximum dry density.

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2. Under walkways, compact the top 6 inches below subgrade and each layer of backfill or fill material at 95 percent maximum dry density.
  3. Under lawn or unpaved areas, compact the top 6 inches below subgrade and each layer of backfill or fill material at 95 percent maximum dry density.

### **3.16 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 existing adjacent grades and new grades.
  2. Cut out soft spots, fill low spots, and trim high spots to conform to 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 1.2 inches.
  2. Walks: Plus or minus 1.2 inches.
  3. Pavements: Plus or minus 1/2 inch.

### **3.17 SUBGRADE, BASES, AND SHOULDERS**

- A. Subgrade, Bases, and Shoulders shall be placed in accordance with NCDOT Standard Specifications Sections 500 and 560.

### **3.18 FIELD QUALITY CONTROL**

- A. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.
  1. Perform field in-place density tests according to ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), or ASTM D 2937 (drive cylinder method), as applicable.
    - a. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.
    - b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the THE OWNER'S REPRESENTATIVE.
  2. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, perform at least one field in-place density test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
  3. Trench Backfill: In each compacted initial and final backfill layer, perform at least one field in-place density test for each 150 feet or less of trench, but no fewer than two tests.
- B. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact and retest until required density is obtained.

### **3.19 PROTECTION**

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions.

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1. Scarify or remove and replace material to depth directed by the THE OWNER'S REPRESENTATIVE; reshape and recompact at optimum moisture content to the required density.
- C. Settling: Where settling occurs during the Project correction period, remove finished surfacing, backfill with additional approved 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.

**3.20 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 the OWNER's property.

**END OF SECTION 02300**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Hot-mix asphalt surface course.
  - 2. Hot-mix asphalt binder course
  - 3. Aggregate base and subbase.
- B. Related Sections include the following:
  - 1. Division 2 Section 02200 "Earthwork" for aggregate subbase and base courses and aggregate pavement shoulders.

**1.3 SYSTEM DESCRIPTION**

- A. Provide hot-mix asphalt pavement according to the materials, workmanship, and other applicable requirements of the North Carolina Department of Transportation Standard Specifications for Roads and Structures, referred to hereinafter by "NCDOT Section..."
  - 1. Standard Specification: As indicated. The term, "Department", when used in the NCDOT Standard Specifications for Roads and Structures, shall be understood to mean the OWNER'S REPRESENTATIVE.
  - 2. Measurement and payment provisions and safety program submittals included in Standard Specifications do not apply to this Section.

**1.4 SUBMITTALS**

- A. Product Data: For each product specified. Include technical data and tested physical and performance properties.
- B. Job-Mix Designs: Certification, by THE OWNER'S REPRESENTATIVE, of approval of each job mix proposed for the Work.
- C. Asphalt load tickets with project name, date installed, supplier and quantity.

**1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experienced installer who has completed hot-mix asphalt paving similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Manufacturer Qualifications: Engage a firm experienced in manufacturing hot-mix asphalt similar to that indicated for this Project and with a record of successful in-service performance.
- C. Testing Agency: Sampling and testing shall be performed as directed by the THE OWNER'S REPRESENTATIVE by an independent testing laboratory selected by the OWNER'S REPRESENTATIVE and paid for by the CONTRACTOR. The CONTRACTOR shall include the cost of testing in the BID. In the event that sampling and testing reveal unsatisfactory work, the costs of additional sampling and testing shall be borne by the CONTRACTOR.
- D. Regulatory Requirements: Conform to applicable standards of the NCDOT and The County of Cumberland for asphalt paving work on public property.
- E. Asphalt-Paving Publication: Comply with AI's "The Asphalt Handbook," except where more stringent requirements are indicated.

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- F. Preinstallation Conference: No pavement shall be placed without prior inspection of the subgrade by the OWNER'S REPRESENTATIVE. The CONTRACTOR shall schedule and conduct a conference at the project site to review methods and procedures related to the contemplated asphalt paving including, but not limited to, the following:
    - 1. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
    - 2. Review condition of subgrade.
    - 3. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
    - 4. Review and finalize construction schedule for paving and related work. Verify availability of materials, paving Installer's personnel, and equipment required to execute the Work without delays.
    - 5. Review inspection and testing requirements, governing regulations, and proposed installation procedures.
    - 6. Review forecasted weather conditions and procedures for coping with unfavorable conditions.
  - G. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, 50 deg F for water-based materials, and not exceeding 95 deg F.

#### 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if substrate is wet or excessively damp or if the following conditions are not met:
  - 1. Tack Coats: Minimum surface temperature of 60 deg F.
  - 2. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

### PART 2 - PRODUCTS

#### 2.1 AGGREGATES

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Aggregate Subbase: Conform to Section 02200, "Earthwork."
- C. Aggregate Base: Conform to Section 02200, "Earthwork."

#### 2.2 ASPHALT MATERIALS

- A. Asphalt Tack Coat: Conform Material to NCDOT Section 605.
- B. Asphalt Surface Course: Conform Material to NCDOT Section 645, Type I-2.
- C. Water: Potable.

#### 2.4 AUXILIARY MATERIALS

- A. Herbicide: Commercial chemical for weed control, registered by Environmental Protection Agency (EPA). Provide granular, liquid, or wettable powder form.
- B. Sand: ASTM D 1073, Grade Nos. 2 or 3.

### PART 3 - EXECUTION

#### 3.1 SUBGRADE PREPARATION

- A. Construct subgrade in accordance with Section 02200, "Earthwork." At the completion of excavating and grading work, scarify subgrade to a depth of 6 inches for a minimum distance of 2 feet beyond the edges of pavement on both sides. Remove spongy soil, rock and other unsuitable material as defined in Section

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02200 and replace with suitable material as specified in Section 02200. Shape and compact subgrade to the section indicated and do not vary more than 0.04 foot from the indicated grades or elevations.

**B. AGGREGATE BASE**

1. Construct the aggregate base in accordance with Section 02200, "Earthwork."
2. Mix material used in the aggregate base on this project in an approved central mixing plant of the pugmill or other mechanical type or in place by means of a self-propelled or self-powered machine equipped with a mechanical rotor or other approved mixer that will thoroughly mix the material throughout the full depth of the layer placed as indicated.

**3.2 SURFACE PREPARATION**

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.
- B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
- C. Adjustment of Structures: Manhole frames and valve boxes shall be adjusted as required for paving in accordance with contract documents. Frames and covers shall be set to grade, flush with adjacent pavement. Temporary closures shall be provided over opening until completion of rolling operations, and then removed.

**3.3 HOT-MIX ASPHALT PLACING**

- A. Machine place hot-mix asphalt mix on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness, when compacted.
1. Place hot-mix asphalt base course in number of lifts and thickness indicated in accordance with NCDOT Section 630.
  2. Spread mix at minimum temperature of 250 deg F.
  3. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.
  4. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet wide, except where infill edge strips of a lesser width are required.
1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

**3.4 JOINTS**

- A. Construct joints to ensure continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.
1. Clean contact surfaces and apply tack coat.
  2. Offset longitudinal joints in successive courses a minimum of 6 inches.
  3. Offset transverse joints in successive courses a minimum of 24 inches.

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4. Construct transverse joints by bulkhead method or sawed vertical face method as described in AI's "The Asphalt Handbook."
  5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
  6. Compact asphalt at joints to a density within 2 percent of specified course density.

### **3.5 COMPACTION**

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.
  1. Complete compaction before mix temperature cools to 185 deg F.
- B. Breakdown Rolling: Accomplish breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Repair surfaces by loosening displaced material, filling with hot-mix asphalt, and rerolling to required elevations.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling, while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
  1. Average Density: 96 percent of reference laboratory density according to ASTM D 1559, but not less than 94 percent nor greater than 100 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while still hot, with back of rake or smooth iron. Compact thoroughly using tamper or other satisfactory method.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials. Remove paving course over area affected and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

### **3.6 INSTALLATION TOLERANCES**

- A. Thickness: Compact each course to produce the thickness indicated:
  1. Asphalt Paving – Light Duty: Compacted Subgrade, 6 inch Compacted ABC, 2 inch I-2 Surface Course. Asphalt Paving – Medium Duty: Compacted Subgrade, 8 inch Compacted ABC, 1½ inch H-Binder Course, 1½ inch I-2 Bituminous Surface Course.
  2. Asphalt Paving – Heavy Duty: Compacted Subgrade, 8 inch Compacted ABC, 2 inch H-Binder Course, 2 inch I-2 Bituminous Surface Course.
- B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
  1. Base Course: 1/4 inch.
  2. Surface Course: 1/8 inch.
  3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

### **3.7 INCIDENTAL STONE BASE**

- A. The incidental stone base shall be placed as directed and approved by the OWNER'S REPRESENTATIVE for use in driveways, maintenance of traffic, etc. The material shall be as specified for Aggregate Base



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Course material in Section 02200 "Earthwork," and shall be placed on approved backfill in the location and thickness indicated. The material shall be uniformly spread over the area required, shaped, dressed and compacted to the OWNER'S REPRESENTATIVE's satisfaction. The material shall be maintained by the CONTRACTOR until final acceptance or permanent access is provided.

- B. The incidental stone base may be used for part of the Aggregate Base Course for pavement. Incidental stone shall be removed and disposed of by the Contractor at no additional expense to the OWNER. The remaining material shall conform in all respects to the requirements for an aggregate base course in the location and thickness indicated.

### **3.8 FIELD QUALITY CONTROL**

Field testing, sampling, testing and inspection will be conducted in accordance with Section 01400. Payment and costs in connection with sampling and testing shall be in accordance with Section 01400.

- A. Testing Agency: OWNER will engage a qualified independent testing agency to perform field inspections and tests and to prepare test reports, paid for by the CONTRACTOR. The CONTRACTOR shall include the cost of testing in the BID.
  - 1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.
- B. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.
- C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.
- D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- E. In-Place Density: Samples of uncompacted paving mixtures and compacted pavement will be secured by testing agency according to ASTM D 979.
  - 1. Reference laboratory density will be determined by averaging results from 4 samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 1559, and compacted according to job-mix specifications.
- F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

**END OF SECTION 02511**

**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes drainage systems outside the building. Systems include the following:
  - 1. Storm Drainage.
  - 2. Subsurface Roof Drainage

**1.3 DEFINITIONS**

- A. Drainage Piping: System of drainage pipe, fittings, and appurtenances for gravity flow of storm drainage.

**1.4 PERFORMANCE REQUIREMENTS**

- A. Gravity-Flow, Nonpressure-Piping Pressure Ratings: At least equal to system test pressure.

**1.5 SUBMITTALS**

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Shop drawings for precast concrete manholes and other structures. Include frames, covers, and grates.
- C. Shop drawings for cast-in-place concrete or field-erected masonry manholes and other structures. Include frames, covers, and grates.
- D. Reports and calculations for design mixes for each class of cast-in-place concrete.
- E. Inspection and test reports specified in the "Field Quality Control" Article.

**1.6 QUALITY ASSURANCE**

- A. Environmental Agency Compliance: Comply with NCDOT regulations pertaining to storm drainage systems.
- B. Utility Compliance: Comply with NCDOT regulations pertaining to storm drainage systems. Include standards of water and other utilities where appropriate.

**1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Protect pipe, pipe fittings, and seals from dirt and damage.
- B. Handle precast concrete manholes and other structures according to manufacturer's rigging instructions.

**1.8 PROJECT CONDITIONS**

- A. Site Information: Perform site survey, research public utility records, and verify existing utility locations.
- B. Locate existing structures and piping to be closed and abandoned.

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- C. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the Owner or others except when permitted under the following conditions and then only after arranging to provide acceptable temporary utility services.
    - 1. Notify THE OWNER'S REPRESENTATIVE not less than 48 hours in advance of proposed utility interruptions.
    - 2. Do not proceed with utility interruptions without receiving written permission from THE OWNER'S REPRESENTATIVE.

## **1.9 SEQUENCING AND SCHEDULING**

- A. Coordinate storm drainage system connections with NCDOT where appropriate.
- B. Coordinate storm drainage system connections to existing on-site storm sewer.
- C. Coordinate with other utility work.

## **PART 2 - PRODUCTS**

### **2.1 PIPES AND FITTINGS**

- A. Reinforced-Concrete Culvert Pipe: NCDOT Section 1032-9(B), ASTM C 76, Class III Wall B.
  - 1. Shall have section joints designed for cold applied sealing compound conforming to the latest FED. SPEC. SS-S-00210-A. Sealing compound shall be RAM-NEK Flexible Plastic Gaskets as manufactured by K.T. Snyder Company, Inc. or approved equal.
  - 2. Minimum diameter is 15-inch unless specifically noted otherwise on plans.
- B. HDPE Pipe and Fittings:
  - 1. Use pipe manufactured by ADS, Hancore or approved equal.
  - 2. Connections shall be a gasketed integral bell type. Zip ties and collar connections shall not be allowed.
  - 3. Pipe must meet ASTM D 3350 'Standard Specification for Polyethylene Plastics Pipe and Fittings Materials'

### **2.2 MANHOLES**

- A. Storm Drainage Manholes: Conform to NCDOT Section 840.
- B. Precast Concrete Manholes: ASTM C 478, precast, reinforced concrete, of depth indicated.
  - 1. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent floatation.
  - 2. Base Section: 6-inch minimum thickness for floor slab and 5-inch minimum thickness for walls and base riser section, and having a separate base slab or base section with integral floor.
  - 3. Riser Sections:
    - a. 5-inch minimum thickness, 48-inch diameter, and lengths to provide depth indicated.
    - b. 6-inch minimum thickness, 60-inch diameter, and lengths to provide depth indicated
    - c. Minimum manhole diameter is 48-inch. Manhole diameters are determined by diameter of entering pipes and angles between all pipes connected.
  - 4. Top Section: Eccentric cone type, unless concentric cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
  - 5. Gaskets: AASHTO M-198, Type B, Flexible Plastic Gasket

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6. Grade Rings: Include 2 or 3 reinforced-concrete rings, of 6- to 9-inch total thickness, that match a 24-inch-diameter frame and cover.
  7. Steps: Individual steps of rubber- or plastic-encased steel reinforcing bar as manufactured by MA Industries (Model PSI-PF). Include a width that allows a worker to place both feet on one step and is designed to prevent lateral slippage off the step. Cast steps or anchor ladder into base, riser, and top sections sidewalls at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.
  8. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
  9. Preformed flow channels shall not be acceptable.
- C. Manhole Frames and Covers: ASTM A 48-83, Class 30, heavy-duty cast iron as manufactured by Vulcan Foundry, Inc. Model V-1284-3. Include indented top design with lettering, equivalent to the following, cast into cover:
1. Storm Drainage Piping Systems: STORM SEWER.

### **2.3 CATCH BASINS**

- A. Precast Concrete Catch Basins: Conform to NCDOT Section 840. Dimensions shall be as indicated on the Drawings.
1. Steps: Individual steps of rubber- or plastic-encased steel reinforcing bar as manufactured by MA Industries (Model PSI-PF). Include a width that allows a worker to place both feet on one step and is designed to prevent lateral slippage off the step. Cast steps or anchor ladder into base, riser, and top sections sidewalls at 12- to 16-inch intervals. Omit steps for catch basins less than 60 inches deep.
  2. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
- B. Brick Catch Basins: Brick and mortar, of depth, shape, and dimensions indicated.
1. Base, Channel, and Bench: Concrete.
  2. Wall: ASTM C 32, Grade MS, manhole brick; 8-inch minimum thickness with tapered top for a 24-inch frame and cover.
    - a. Option: ASTM C 139, concrete masonry units may be used instead of brick.
  3. Mortar: ASTM C 270, Type S, using ASTM C 150, Type II, portland cement.
  4. Steps: Individual steps of rubber- or plastic-encased steel reinforcing bar as manufactured by MA Industries (Model PSI-PF). Include a width that allows a worker to place both feet on one step and is designed to prevent lateral slippage off the step. Cast steps or anchor ladder into base, riser, and top sections sidewalls at 12- to 16-inch intervals. Omit steps for catch basins less than 60 inches deep.
- C. Cast-in-Place Concrete Catch Basins: Construct of reinforced-concrete, designed according to ASTM C 857 for structural loading. Include depth, shape, dimensions, and appurtenances indicated.
1. Bottom, Walls, and Top: Reinforced concrete.
  2. Channels and Benches: Concrete.
  3. Steps: Individual steps of rubber- or plastic-encased steel reinforcing bar as manufactured by MA Industries (Model PSI-PF). Include a width that allows a worker to place both feet on one step and is designed to prevent lateral slippage off the step. Cast steps or anchor ladder into base, riser, and top sections sidewalls at 12- to 16-inch intervals. Omit steps for catch basins less than 60 inches deep.
- D. Frames and Grates: ASTM A 536, Grade 60-40-18, heavy-duty ductile iron. Include 24-by-24-inch minimum flat grate with small square or short-slotted drainage openings.
- E. Frames and Grates: ASTM A 48, Class 30 iron. Include 24-by-24-inch minimum flat grate with small square or short-slotted drainage openings as indicated.

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## **2.4 STORM-WATER INLETS**

- A. Curb inlets: Made with vertical curb opening, of materials and dimensions according to NCDOT Roadway standards.
- B. Frames and Grates: Heavy-duty frames and grates according to NCDOT standards.

## **2.5 OUTFALLS**

- A. Construct headwall, apron, and tapered sides of cast-in-place, reinforced concrete.
- B. Riprap: Broken stone, irregular size and shape, of NCDOT Class indicated. Where no Class is indicated, use Class A.
- C. Energy Dissipators: Construction as indicated, from materials indicated.

## **PART 3 - EXECUTION**

### **3.1 EARTHWORK**

- A. Excavating, trenching, and backfilling are specified in Division 2 Section 02200 "Earthwork."

### **3.2 IDENTIFICATION**

- A. Materials and their installation are specified in Division 2 Section 02200 "Earthwork." Arrange for installation of green warning tapes directly over piping and at outside edges of underground structures.
  - 1. Use detectable warning tape over nonferrous piping and over edges of underground structures.

### **3.3 DRAINAGE PIPING APPLICATIONS**

- A. General: Include soiltight joints, except where watertight or silttight joints are indicated. Conform to NCDOT Section 1032. Material shall be as indicated on the Drawings.

### **3.4 INSTALLATION, GENERAL**

- A. Existing Conditions: Drawings indicate the general location and arrangement of existing underground utilities based upon best available data. Contractor shall be responsible for verifying all existing conditions, and shall notify the THE OWNER'S REPRESENTATIVE of any discrepancies between field conditions and those indicated on the drawings.
- B. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's recommendations for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed.
- C. Use manholes for changes in direction, except where fittings are indicated.
- D. Use proper size increasers, reducers, and couplings, where different sizes or materials of pipes and fittings are connected. Reduction of the size of piping in the direction of flow is prohibited.
- E. Install gravity-flow-systems piping at constant slope between points and elevations indicated.
- F. Extend drainage piping and connect to existing storm drainage as indicated. Terminate piping as indicated.
- G. Install drainage piping pitched down in direction of flow, at minimum slope of 1 percent and 36-inch minimum cover, except where otherwise indicated.

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### **3.5 PIPE JOINT CONSTRUCTION AND INSTALLATION**

- A. General: Join and install pipe and fittings according to the following:
- B. Polyvinyl Chloride (PVC) Plastic Pipe and Fittings: As follows:
  - 1. Join solvent-cement-joint pipe and fittings with solvent cement according to ASTM D 2855 and ASTM F 402.
  - 2. Join pipe and gasketed fittings with elastomeric seals according to ASTM D 2321.
- C. Concrete Pipe and Fittings: Install according to ACPA "Concrete Pipe Handbook."
- D. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and fit both systems' materials and dimensions and as approved by the ENGINEER..

### **3.6 MANHOLE INSTALLATION**

- A. General: Install manholes, complete with accessories, as indicated.
- B. Form continuous concrete channels and benches between inlets and outlet.
- C. Set tops of frames and covers in suitable mortar surrounded by a concrete collar to a grade one-fourth inch (1/4") above finished surface where manholes occur in pavements. Set tops 3 inches above finished surface elsewhere, except where otherwise indicated.
- D. Place precast concrete manhole sections as indicated.
  - 1. Provide rubber joint gasket complying with ASTM C 443, at joints of sections.
  - 2. Apply bituminous mastic coating at joints of sections.

### **3.7 CATCH BASIN INSTALLATION**

- A. Construct catch basins to sizes and shapes indicated.
- B. Set frames and grates to elevations indicated.

### **3.8 CONCRETE PLACEMENT**

- A. Place cast-in-place concrete according to ACI 318, ACI 350R, and as indicated.

### **3.9 CLOSING ABANDONED SEWERAGE AND DRAINAGE SYSTEMS**

- A. Abandoned Piping: Close open ends of abandoned underground piping that is indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either of the following procedures:
  - 1. Close open ends of piping with at least 8-inch-thick brick masonry bulkheads.
  - 2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.
- B. Abandoned Structures: Excavate around structure as required and use either of the following procedures:
  - 1. Remove structure and close open ends of remaining piping.
  - 2. Remove top of structure down to at least 36 inches below final grade. Fill to within 12 inches of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.

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3. Backfill to grade according to Division 2 Section 02200 "Earthwork."

### **3.10 FIELD QUALITY CONTROL**

- A. Clear interior of piping and structures of dirt and superfluous material as the work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.
  1. In large, accessible piping, brushes and brooms may be used for cleaning.
  2. Place plug in end of incomplete piping at end of day and whenever work stops.
  3. Flush piping between manholes and other structures, if required by authorities having jurisdiction, to remove collected debris.
- B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of the Project.
  1. Submit separate reports for each system inspection.
  2. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visual between structures.
    - b. Crushed, broken, cracked, or otherwise damaged piping.
    - c. Infiltration: Water leakage into piping.
    - d. Exfiltration: Water leakage from or around piping.
  3. Replace defective piping using new materials and repeat inspections until defects are within allowances specified.
  4. Reinspect and repeat procedure until results are satisfactory.
- C. Test new piping systems and parts of existing systems that have been altered, extended, or repaired for leaks and defects. The maximum length of a line tested shall not exceed 1,000 feet.
  1. Do not enclose, cover, or put into service before inspection and approval.
  2. Test completed piping systems according to the above referenced standards.
  3. Schedule tests, and their inspections by the Owner's Representative, with at least 24 hours' advance notice.
  4. Submit separate reports for each test.

**END OF SECTION 02700**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following items:
  - 1. Installing temporary and permanent landscape groundcover.
  - 2. Seeding Requirement.
  - 3. Placement of turfgrass sod.

**1.3 SUBMITTALS**

- A. Certification of grass seed from seed vendor for each seed mixture.
- B. Product certificates.
- C. Sod supplier and documented information certifying type.

**1.4 QUALITY ASSURANCE**

- A. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations to produce a uniformly smooth vigorous lawn for not less than the following:
  - 1. Permanent groundcover: 60 days after date of Substantial Completion. Thereafter, maintain at 3 month intervals minimum during the one year warranty period on or about the 15 of the month to maintain growth.
  - 2. Erosion Control Temporary Seeding – Install as required to minimize erosion. Minimum 15 days after a land disturbing activity in accordance with The North Carolina Department of Environment & Natural Resources (NCDENR).

**1.5 PROJECT CONDITIONS**

- A. Utilities: Determine location of above grade and underground utilities and perform work in a manner which will avoid damage. Hand excavate as required. Maintain grade stakes until removal is mutually agreed upon by concerned parties.
- B. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Engineer before planting.
- D. Contractor shall seed all areas disturbed by the construction phase.

**PART 2 - PRODUCTS**

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerances.
  - 1. Seed Mixture: Provide seed of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as indicated.
- B. Sod: Tifway 419 Bermuda Sod – Shall be free of weeds and weedy grasses. Must have dense growth with no void areas, no visible sign of disease or insect stress. Thickness of soil shall not exceed ¾ inch.
- C. Topsoil: ASTM D 5268, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 1 inch (25 mm) or larger in any dimension, and other extraneous materials harmful to plant growth.



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1. Topsoil Source: Reuse surface soil stockpiled on the site. Verify suitability of surface soil to produce topsoil meeting requirements and amend when necessary. Supplement with imported topsoil when quantities are insufficient. Clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
  - D. Lime: ASTM C 602, Class T, agricultural limestone, applied at the rate of 2 tons/acre.
  - E. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea-form, phosphorous, and potassium in the following composition:
    1. Composition: 1 lb per 1000 sq. ft. (0.5 kg per 100 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.

### **PART 3 - EXECUTION**

- A. Lawn Planting Preparation: Loosen subgrade to a minimum depth of 4 inches (100 mm). Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, rubbish, and other extraneous materials.
  1. Spread planting soil mixture to 4-inch depth to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen or overlie moist.
  2. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.
- B. Moisten prepared lawn areas before planting when soil is dry and allow surface to dry before planting.
- C. Seeding Lawns: Sow seed with a spreader or a seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h). Evenly distribute seed by sowing equal quantities in 2 directions at right angles to each other. Rake seed lightly into top 1/8 inch (3 mm) of topsoil, roll lightly, and water with fine spray.
  1. Seeding Rate: to 4 lb per 1000 sq. ft. (1.5 to 2 kg per 100 sq. m).
  2. Protect seeded areas with slopes less than 1:6 against erosion by spreading straw mulch after completion of seeding operations and anchor by crimping into topsoil. Spread uniformly at a minimum rate of 2 tons per acre (45 kg per 100 sq. m).
  3. Sow seed at the following rates:
    - a. Planting Date from Mar. 1 - Aug. 31: Mixture: 1/2 hulled Common Bermuda and 1/2 Fescue, Ky-31.
    - b. Planting Date from Sep. 1 - Feb. 28 : Mixture of 2/3 Common Bermuda and 1/3 Rye Grain.
- E. Turf Sod: The area to be sodded shall be constructed to the lines and grades indicated in the contract documents. The ground shall be kept moist prior to the installation of the sod. Prior to installation fertilizer shall be uniformly applied at the rate of 12 pounds of 10-10-10 equivalent per 1,000 square feet. Limestone shall be applied at the rate of 100 pounds per 1,000 square feet.
  1. No sod shall be placed on soil which has been chemically treated until sufficient time has elapsed to permit dissipation of all harmful materials (see manufacturers recommendations for re-entry date calculation). The general contractor shall assume full responsibility for any loss or damage to from improper use of chemicals or due to his failure to allow sufficient time to permit dissipation of chemical residues,
  2. The sod shall be placed on a prepared consistent graded surface in close contact with ground. The area shall be void of rocks, roots or other debris larger than two inches and concentrations of general gravel or construction trash. Sod strips should be laid across the slope. The sod shall be fitted tightly in the space placed and shall be pounded into place. The entire area should be thoroughly covered with sod without void areas.
  3. Sod shall be placed as soon as practical after removal from the point or origin, and shall be kept moist in the interim. Immediately after placing, it shall be thoroughly wetted and rolled with a satisfactory roller.

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4. On steep slopes and channels, sod shall be fastened to the ground with wire staples or other suitable means that allows for mowing and general maintenance. Where surface water cannot be diverted from flowing over the face of a slope, install a strip of heavy jute or plastic netting and fasten tight along the crown or top of the slope for extra protection against lifting and undercutting of sod.
  5. The sod shall be watered as needed to establish growth. Any dead areas shall be removed and new sod installed and established.
  6. Do not allow any equipment or material placed on any planted area that will damage sod or underling grade.
  7. Substantial completion of sod shall only be given once area is established, without void or dead areas and grade is consistant.
- F. Disposal: Remove trash, and debris, and legally dispose of it off the Owner's property. Remove surplus soil including excess subsoil and distribute within approved areas.

**END OF SECTION 02900**

**SECTION 03300**  
**CAST-IN-PLACE CONCRETE**

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**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawing and general provision for the Contract including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section.

**1.2 SUMMARY**

- A. This Section included the following:
  - 1. Installation of curb and gutter.
  - 2. Installation of sidewalks.
  - 3. Installation of slabs.

**1.3 SUBMITTALS**

- A.. Product data for reinforcement, forming accessories, admixtures, patching compounds, joint systems, curing compounds, dry-shake finish materials, and others as requested by OWNERS REPRESENTATIVE
- B. Shop drawings for fabricating, bending, and placing concrete reinforcement.
- C. Laboratory test reports or evaluation reports for concrete materials and concrete mix designs.
- D.. Written report to OWNERS REPRESENTATIVE for each proposed concrete mix at least 15 days prior to start of concreting. Do not begin concrete production until mixes have been reviewed by OWNERS REPRESENTATIVE.

**1.4 QUALITY ASSURANCE:**

- A. Comply with provisions of ACI 301, "Specifications for Structural Concrete for Buildings," ACI 318, "Building Code Requirements for Reinforced Concrete," and CRSI "Manual of Standard Practice," except where more stringent requirements are indicated.
  - 1. Concrete Testing Service: Engage a testing agency acceptable to OWNERS REPRESENTATIVE to perform materials evaluation testing and to design concrete mixes.
  - 2. Materials certificates signed by concrete producer and Contractor may be submitted in lieu of materials laboratory testing when acceptable to OWNERS REPRESENTATIVE.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

- A. Form Materials: Furnish form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection.
  - 1. Forms for Exposed Concrete Surfaces: Suitable panel-type material to provide continuous, straight, smooth, exposed surfaces.
- B. Reinforcing Materials: As follows:
  - 1. Deformed Reinforcing Bars: ASTM A 615, Grade 60, unless otherwise indicated.
  - 2. Welded Wire Fabric: ASTM A 185.
- C. Concrete Materials: As follows:
  - 1. Portland Cement: ASTM C 150, Type 1.
  - 2. Aggregates: ASTM C 33, except local aggregates of proven durability may be used when acceptable to OWNERS REPRESENTATIVE.
  - 3. Water: Potable.
- D. Admixtures: Provide admixtures that contain not more than 0.1 percent chloride ions.

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1. Air-Entraining Admixture: ASTM C 260.
  2. Water-Reducing, Retarding, and Accelerating Chemical Admixtures: ASTM C 494.
- E. Related Materials: Contractor's option as follows:
1. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
  2. Moisture-Retaining Cover: Waterproof paper, polyethylene film, or polyethylene-coated burlap, complying with ASTM C 171.
  3. Membrane-Forming Curing Compound: ASTM C 309, Type I. Moisture loss not more than 0.55 kg/sq. meter when applied at 200 sq. ft./gal.
  4. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.
- F. Mix Proportions and Design: Proportion mixes complying with mix design procedures specified in ACI 301.
1. Limit use of fly ash to not exceed 25 percent of cement content by weight.
  2. Design mixes to provide normal weight concrete with the following properties:
    - a. 3000-psi, 28-day compressive strength; water-cement ratio, 0.58 maximum (non-air-entrained), 0.46 maximum (air-entrained).
  3. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
    - a. Not more than 4 inches.
  4. Adjust mix designs when material characteristics, job conditions, weather, test results, or other circumstances warrant. Do not use revised concrete mixes until laboratory test data and strength results have been submitted to and reviewed by ENGINEER.
- G. Use air-entraining admixture in exterior exposed concrete, providing not less than 4.5 percent nor more than 7 percent entrained air for concrete exposed to freezing and thawing, and from 2 percent to 4 percent for other concrete.
- H. Use water-reducing, accelerating, and retarding admixtures that have been tested and accepted in mix designs in strict compliance with manufacturer's directions.
- I. Job-Site Mixing: Use drum-type batch machine mixer, mixing not less than 1-1/2 minutes for 1 cu. yd. or smaller capacity. Increase mixing time at least 15 seconds for each additional cu. yd.
- J. Ready-Mix Concrete: ASTM C 94.

### **PART 3 EXECUTION**

#### **3.1 PREPARATION**

- A. Formwork: Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation, and position. Select form materials to obtain required finishes.
1. Maintain formwork tolerances and surface irregularities within ACI 347 limits, Class A tolerances for concrete exposed to view and Class C tolerances for other concrete surfaces.
  2. Provide openings in formwork to accommodate work of other trades. Accurately place and securely support items built into forms.
  3. Clean and adjust forms prior to concrete placement. Apply form-release agents or wet forms as required. Retighten forms during concrete placement, if required, to eliminate mortar leaks.
- B. Reinforcement: Accurately position and support reinforcement, and secure against displacement. Locate and support reinforcement to maintain minimum cover with metal chairs, runners, bolsters, spacers, and

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hangers as required. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

1. Install welded wire fabric in lengths as long as practicable; lap at least one full mesh and lace splices with wire.
- B. Joints: Locate and install construction, isolation, and control joints as indicated or required. Locate construction joints so they do not impair strength and appearance of structure. Place isolation and control joints in slabs-on-ground to stabilize differential settlement and prevent random cracking.

### 3.2 INSTALLATION

- A.. Installation of Embedded Items: Set and build anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting diagrams, templates, and instructions provided by others for locating and setting.
- B.. Concrete Placement: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," for placing concrete in a continuous operation within planned joints or sections. Do not begin concrete placement until other affected work is completed.
  1. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping so that concrete is worked around reinforcement and other embedded items and into forms.
  2. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placing, and curing.
    - a. In cold weather comply with ACI 306.
    - b. In hot weather comply with ACI 305.
- C. Finish of Formed Surface: As follows:
  1. Smooth-Formed Finish: Provide a smooth finish for concrete surfaces exposed to view and surfaces to be covered with a coating or covering material applied directly to concrete. Repair and patch defective areas, with fins and other projections completely removed and smoothed.
- D.. Field Quality Control: Perform sampling and testing during concrete placement, as follows:
  1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
    - a. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
    - b. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
    - c. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4 deg C) and below, when 80 deg F (27 deg C) and above, and one test for each set of compressive-strength specimens.
    - d. Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
    - e. Compressive-Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yd. plus additional sets for each 50 cu. yd. more than the first 25 cu. yd. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
  2. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
  3. When total quantity of a given class of concrete is less than 50 cu. yd., ENGINEER may waive strength testing if adequate evidence of satisfactory strength is provided.

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4. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
  5. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.
  6. Test results will be reported in writing to ENGINEER, Structural Engineer, ready-mix producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.
  7. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
  8. Additional Tests: The testing agency will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by ENGINEER. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

**END OF SECTION 03300**

# PWC SPECIFICATIONS

***\*\*\*THESE SPECIFICATIONS SHALL BE USED FOR INSTALLING  
FAYETTEVILLE PWC RELATED UTILITIES\*\*\****

## DIVISION 2 SITE WORK

### 02211 GRADING FOR ROADS AND DRAINAGE

#### GENERAL

This section covers grading for the roadways and drives including all excavations, formation of embankments, preparation of subgrade for pavements and finishing and dressing of graded earth areas, shoulders, and ditches.

#### MATERIALS

Topsoil, material obtained from excavation suitable for topsoils, is defined as natural, friable soil, characteristics of representative soils in the vicinity that produce heavy growth of crops, grass, or other vegetation. Topsoil shall be free from roots, stones, and other materials that hinder grading, planting, and maintenance operations, and free from objectionable weed seeds.

Satisfactory soil materials are defined as those in accordance with AASHTO Soil Classification Groups, A-1, A-2-4, A-2-5 and A-3 (or in accordance with ASTM D2487 soil classification groups GW, GP, GM, SM, SW, SP, SC.) as determined by the Engineer. Satisfactory material shall be free from roots, organic matter, trash, debris, frozen material or stones larger than three (3) inches in any dimension.

Unsatisfactory soil materials are defined as those in accordance with AASHTO Soil Classification Groups A-2-6, A-2-7, A-4, A-5, A-6, A-7 (or in accordance with ASTM D2487 soil classification groups GC, ML, MH, CL, CH, OL, OH, and PT) as determined by the Engineer.

Materials determined by the Engineer as too wet or too soft to provide a stable subgrade, foundation, or fill will be classified as unsatisfactory regardless of soil classification. The Engineer may require the Contractor to condition the wet and/or soft soils to provide a stable subgrade, foundation, or fill. The Contractor shall recondition the materials at no additional cost to the Owner.

#### CONSERVATION OF TOPSOIL

Areas designated for operations that contain a blanket of soil, which is more satisfactory for the growth of grass than the embankment material to be placed, shall be stripped to a depth of approximately four (4) to six (6) inches and placed in convenient stockpiles as directed in the field, for later use as a topsoil blanket on the new graded areas specified herein, or as designated. The stripping of material for use as topsoil shall be carefully determined and only the quantity required shall be stripped and stockpiled. Material ordered stockpiled shall be placed in a satisfactory manner to afford drainage. When grading operations permit, instead of stockpiling, the topsoil shall be hauled and spread directly on the areas to receive topsoil.



Topsoil shall be placed on all shoulders, slopes, ditches, and other earth areas graded under this contract, excluding borrow areas, unless otherwise specified on the plans. Topsoil shall be uniformly placed on these areas to a compacted depth of not less than three (3) inches or more than four (4) inches. The material shall be free from clods of soil, matted roots greater than ½ inch in diameter, and any other objectionable material which might hinder subsequent grass and mowing operations. The material shall be placed, leveled, and lightly compacted with at least one pass of a cultipacker, or other approved equipment weighing 100 to 160 pounds per linear foot of roller, to required cross sections, but shall be left one-tenth of a foot below the finished earth grade as specified in the paragraph FINISHED EXCAVATION.

#### BORROW EXCAVATION (Select Backfill)

Where satisfactory materials are not available in sufficient quantities from the required excavation, approved materials shall be obtained from borrow areas. Borrow excavation material shall be supplied by the Contractor from borrow areas located off-site. The work covered by this section shall consist of the excavation of approved material from borrow sources and the hauling and utilization of such material as required on the plans or directed by the Engineer. The borrow material shall be approved by the Engineer and shall not contain roots, root mats, stumps, highly plastic clay or other unsatisfactory materials. The material shall be a soil material which meets requirements of AASHTO M1 45 for soil classification A-i-a, A-i-b, A-2-A, A-3 acceptable for select backfill. All borrow material shall be in accordance with the NCDOT Standard Specification for Roads and Structures, most recent edition. Borrow excavation shall be in accordance with the NCDOT Standard Specification for Roads and Structures, most recent edition. Excess material removed within the work limits, suitable for borrow excavation, during “Unclassified Excavation” operations shall not be considered or paid for as borrow excavation.

#### UNDERCUT EXCAVATION

When the Owner determines that the natural soil materials in areas where fill is to be placed, or in the finished graded subgrade roadway cross section, or in areas supporting structures or pipes, are determined to have a poor supporting value, the Engineer may require the Contractor to remove the materials and backfill with approved properly compacted material to the finished graded section. The Contractor shall conduct undercut operations in such a way that the Engineer can take the necessary measurements before any backfill is placed. Any material removed and backfilled without the approval of the Engineer, and/or all necessary measurements taken, and/or to a depth, length or width exceeding the dimensions shall not be considered undercut excavation and will not be paid for such. All undercut excavation shall be in accordance with the NCDOT Standard Specification for Roads and Structures, most recent edition. Undercut excavations suitable for backfill on toes of slopes and other approved areas will not be paid for as borrow excavation.

#### FINISHED EXCAVATION

All areas covered by the project, including excavated and filled sections and adjacent transition areas, shall be uniformly smooth-graded. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from blade-grader operations, except as otherwise specified. Ditches shall be finished to permit adequate drainage. The surface of areas to be turfed shall be finished to a smoothness suitable for the application of turfing materials. Surfaces shall be finished not more than 0.15 foot above or below the established grade and approved cross section. In areas where the bulking of soil as a result of grassing operations will tend to retard surface drainage along the edge of pavements, the finished grades shall be left 0.1 foot below grade prior to grassing.

Newly graded areas shall be protected from traffic and from erosion, and any settlement or washing away that may occur from any cause, prior to acceptance, shall be repaired and grades re-established to the required elevations and slopes. Embankments and excavations shall be kept shaped and drained. Ditches and drains along subgrade shall be maintained in such a manner as to drain effectively at all times. The finished subgrade shall not be disturbed by traffic of other operations and shall be protected and maintained by the Contractor in a satisfactory condition until subbase, base, or pavement is placed. The storage or stockpiling of materials on the finished subgrade shall not be permitted. No base course or pavement shall be laid until the subgrade has been checked and approved, and in no case shall base, surfacing, or pavement be placed on a muddy, spongy, or frozen subgrade. All work shall be conducted in accordance with the environmental protection requirements of the contract.

**DIVISION 2  
SITE WORK**

**02222 EXCAVATION AND BACKFILLING FOR UTILITY SYSTEMS**

GENERAL

Work described in this section consists of the excavation, backfill, compaction, and finish grading required to install the utility systems. The intent and purpose of these specifications is to require a complete and satisfactory installation in every respect and any defect in material or workmanship shall be cause for the replacement and correction of such defect as directed by the Public Works Commission.

RELATED SECTIONS

- A. 02305 – Pipe Bursting
- B. 02660 – Water Distribution
- C. 02730 – Sanitary Sewer Systems
- D. 02732 – Sewage Force Mains
- E. Chapter 24 of the City of Fayetteville Ordinance (most recent version)

MATERIALS

Suitable soil materials are defined as those in accordance with AASHTO Soil Classification Groups A-1, A-2-4, A-2-5 and A-3 (or in accordance with ASTM D2487 soil classification groups GW, GP, GM, SM, SW, SP, SC) as determined by the Public Works Commission. Suitable material shall be free from roots, organic matter, trash, debris, frozen material or stones larger than three (3) inches in any dimension.

Unsuitable soil materials are defined as those in accordance with AASHTO Soil Classification Groups A-2-6, A-2-7, A-4, A-5, A-6, A-7 (or in accordance with ASTM D2487 soil classification groups GC, ML, MH, CL, CH, OL, OH, and PT) as determined by the Public Works Commission. Unsuitable material as defined above shall be replaced with select material as determined by the Public Works Commission.

Suitable materials determined by the Public Works Commission as too wet or too soft to provide a stable subgrade, foundation, or fill will be deemed as unsuitable regardless of soil classification. Materials deemed unsuitable shall be conditioned or replaced, as directed by the Public Works Commission. The Contractor shall recondition and stockpile the materials at no additional cost to the Public Works Commission.

EXCAVATION

All excavation shall be to the lines and grades indicated. The work shall consist of the excavation, placement, and compaction of suitable material as outlined in this Specification and proper disposal of all unsuitable materials. During excavation, suitable material for backfilling shall be stockpiled. The stockpiles shall be protected from contamination by unsuitable excavated material or other material. If

any material becomes unsuitable, such material, if directed, shall be removed and replaced with suitable on-site or imported material from approved sources at no additional cost to the Public Works Commission.

Where the line parallels a creek and/or ditch the excavated material shall be stockpiled opposite the creek, with the trench separating the two. Adequate drainage shall be provided for the stockpiles and surrounding areas by means of ditches, dikes, or other approved methods. Grading shall be done to prevent surface water from entering the excavation. Any water within the trench shall be removed.

Suitable excavated material shall be stockpiled or placed in the excavation's backfill. Excavation and filling shall be performed in a manner and sequence that will provide drainage at all times. Unauthorized over excavation shall be backfilled with select bedding material at no additional cost to the Public Works Commission. The Contractor, at their expense, shall properly dispose of all excess excavated material unless directed to place it in another area of the project by the Public Works Commission. The Contractor's obligation to remove and dispose of excess materials shall in no manner convey to him any rights of property in any material taken from any excavation.

It shall be the Contractor's responsibility to investigate the site and existing conditions. No compensation will be allowed due to excavation and/or grading being different than anticipated.

### TRENCH EXCAVATION

The trench width shall be in accordance with the PWC standard details. All work shall be in accordance with the applicable OSHA regulations.

The subgrade beneath the centerline of the pipe shall provide uniform support for each section of the pipe. Stones three (3) inches or greater in any dimension, or as recommended by the pipe manufacturer, whichever is smaller, shall be removed.

Where unsuitable material is encountered at the elevation established for installation of pipe or structures, additional undercut excavation shall be done as directed by the Public Works Commission. The additional undercut excavated area shall be backfilled with stone bedding material. Unauthorized undercut excavation shall be backfilled with stone bedding material and compacted as directed by the Public Works Commission. The Contractor shall conduct undercut operations in such a way that the Public Works Commission can take the necessary measurements before any backfill is placed. Any material removed and backfilled without the approval of the Public Works Commission, and/or all necessary measurements taken, and/or to a depth, length or width exceeding the dimensions shall not be considered undercut excavation and will not be paid for such.

Where unsuitable material is encountered at the elevation established for installation of roads, parking lots, or other paved areas, additional undercut excavation shall be done as directed by the responsible agency (i.e., City of Fayetteville, Town of Hope Mills, NCDOT, etc.). The additional undercut excavated area shall be backfilled with stone bedding material. Unauthorized undercut excavation shall be backfilled with stone bedding material and compacted as directed by the responsible agency. The Contractor shall conduct undercut operations in such a way that the responsible agency can take the

necessary measurements before any backfill is placed. Any material removed and backfilled without the approval of the responsible agency, and/or all necessary measurements taken, and/or to a depth, length or width exceeding the dimensions shall not be considered undercut excavation. All undercut excavation shall be in accordance with the NCDOT Standard Specification for Roads and Structures (most recent edition), or the responsible agency's specifications.

Excavation for manholes, meter vaults, or similar structures shall leave a minimum of 12-inches clear space around the structure. Removal of unsuitable material shall be as specified above. Preparation of the subgrade shall be in accordance with the applicable detail and as directed by the Public Works Commission.

### PIPE LAYING

All pipe shall be installed in accordance with PWC Specification Section 02660 – Water Distribution, Specification Section 02730 – Sanitary Sewer Systems, and/or PWC Specification Section 02732 – Sewage Force Mains.

### TRENCH SAFETY

All excavations shall comply with all Federal, State, and local rules and regulations. The Contractor shall have a trenching and shoring "competent" person on the job at all times when there is an open excavation. Under no circumstance shall an employee of the Public Works Commission be considered the "competent" person for the operation.

### TRENCH STABILIZATION (SHORING)

The Contractor shall furnish, install, and maintain all necessary shoring to ensure a safe excavation. The method of shoring and excavation shall be in strict accordance with OSHA Regulations. The Contractor shall be responsible for installation, maintenance, and removal of all trench stabilization measures. The Contractor shall be responsible for any damage to adjacent structures resulting from the installation, maintenance, removal, or absence of trench stabilization measures.

### DEWATERING

Excavations shall be kept dry at all times. Any required dewatering shall be the Contractor's responsibility. The Contractor shall be responsible for any damage to the adjacent property resulting from the installation, maintenance, discharge, and removal of the dewatering system. All discharge from the dewatering system shall be in accordance with the applicable erosion control rules and regulations.

### BACKFILL

Backfill shall consist of suitable material free from debris, stone, etc. The backfill shall be brought up evenly on both sides of the pipe for the full length of the pipe. The backfill operation shall be conducted to prevent damage and/or movement of the pipe.

Backfill material in trenches shall be placed in layers not exceeding six (6) inches loose thickness to a point at least 12-inches above the pipe compacted to 90 percent maximum density. The remainder of the trench shall be backfilled in layers not exceeding six (6) inches in loose thickness compacted as specified in subparagraph COMPACTION. Each layer shall be thoroughly compacted by an approved mechanical tamping device.

Backfill material around structures shall be placed in a manner that the structure will not be damaged. No backfill shall be placed around manholes, thrust blocks, or similar structures until the concrete has been allowed to cure for three (3) days. The backfill material shall be compacted as specified in subparagraph COMPACTION.

No backfilling will be allowed when weather conditions prevent compliance with these Specifications.

BORROW EXCAVATION (Select Backfill)

Borrow excavation material shall be supplied by the Contractor when sufficient quantities of suitable materials are not available within the project limits. The borrow material shall be approved by the Public Works Commission and shall not contain roots, root mats, stumps, highly plastic clay or other unsatisfactory materials. All borrow material shall be in accordance with the NCDOT Standard Specification for Roads and Structures, most recent edition.

COMPACTION

Backfill shall be compacted in accordance with the following table as a percentage of the maximum density at optimum moisture content as determined by the Standard Proctor Test, ASTM D-698.

<u>Area</u>	<u>Percent ASTM D-698 Maximum Dry Density</u>
Around and 1' above top of pipe	95
Remaining trench (within 4' of subgrade)	95
Pavement subgrade and shoulders	
Last 1' of fill (below subgrade)	100
Last 3' of fill to 12" below subgrade	98
Base material	100
Adjacent to structures (Areas not paved)	95
Under structures	98
Utility Outfalls (Cross Country)	95

Compaction testing may be performed at the option of the PWC Project Coordinator, or as required by the responsible agency (i.e., City of Fayetteville, NCDOT, etc.). Compaction testing shall be done in

accordance with the responsible agency's requirements. Deficiencies shall be corrected by the Contractor without additional cost to PWC.

FINISHED EXCAVATION

All areas covered by the project shall be uniformly graded to the established elevations and approved cross sections. Ditches shall be graded to permit proper drainage. Newly graded areas shall be protected from traffic and/or from erosion, and any settlement or washing prior to acceptance shall be repaired and the required grades re-established. Ditches and drains along the subgrade shall be maintained to drain at all times. The finished subgrade shall be protected and maintained by the Contractor. The storage or stockpiling of materials on the finished subgrade shall not be permitted. No base course or pavement shall be laid until the subgrade has been checked and approved. All work shall be conducted in accordance with the environmental protection requirements of the Contract.

DIVISION 2  
SITE WORK

02660 WATER DISTRIBUTION

GENERAL

Water lines and all appurtenant items shall be constructed of materials specified and/or as indicated on the approved drawings. The intent and purpose of these specifications is to require a complete and satisfactory installation in every respect and any defects in material or workmanship shall be cause for the replacement and correction of such defect as directed by the Fayetteville Public Works Commission (PWC) at no expense to the Fayetteville Public Works Commission.

RELATED SECTIONS

- A. 02211 – Grading, Utilities
- B. 02222 – Excavation and Backfilling for Utility Systems
- C. 02301 – Boring And Jacking (Roadways And Railroads)

MATERIALS

MANUALLY OPERATED GATE VALVES

All manually operated gate valves four (4) inches and larger shall be ductile iron or cast iron body resilient wedge type rated for 250 psig working pressure gate valves and shall conform to American Water Works Association (AWWA) C-509/C-515 and NSF 61. All valves must open counter-clockwise equipped with a two (2) inch square operating nut. The operating nut shall have an arrow cut in the metal, indicating the direction of opening. All valves shall have a non-rising stem. All valves up to and including thirty-six (36) inch diameter shall have triple "O" ring stem seals. The design and machining of valves shall be such as to permit the replacement of the upper two (2) "O" rings without undue leakage while the valve is wide open and in service. The wedge shall be ductile iron encapsulated in nitrile rubber (for four (4) inch through 12 inch) and SBR rubber for 14-inch through 24-inch sizes.. All internal and external surfaces of the valve body and bonnet shall have a fusion bonded epoxy coating complying with ANSI/AWWA C550 applied electrostatically prior to assembly, conforming to AWWA C-550-90. All valves up to and including 36-inch diameter shall have a safe working pressure of 250 psi. Valve connections shall be as required for the piping in which they are installed. Valves shall have a clear waterway equal to the full nominal diameter of the valve. All valves shall be tested for leakage and distortion in strict accordance with the latest revision of AWWA Specification C-500.

Gate valves installed in meter vaults shall have a wheel in lieu of a square operating nut and shall also have a non-rising stem. The wheel shall have an arrow cut in the metal indicating the direction of opening. Flanges shall not be buried. An approved pit shall be provided for all flange connections.

Resilient seated tapping valves shall be furnished with the tapping flange having a raised face or lip designed to engage the corresponding recess in the tapping sleeve flange in accordance with MSS-SP60.



Tapping valves without the raised face on the tapping flange are not permitted since they do not assure the proper alignment required to prevent damage by a misaligned shell cutter. The interior of the waterway in the body shall be a full opening and capable of passing a full sized shell cutter equal to the nominal diameter of the valve.

All valves shall be manufactured in strict accordance with the latest specifications of the American Water Works Association (AWWA). Valves shall be manufactured by: Mueller Company, Clow Corporation, or American Darling Company. Certification shall be furnished to the Fayetteville Public Works Commission by the manufacturer that all valves are in accordance with PWC standards. Where specified on the plans and approved by the Fayetteville Public Works Commission, resilient wedge gate valves may be furnished with spur gearing for valves installed in a vertical position and bevel gearing for valves installed in a horizontal position. All gate valves shall be installed in accordance with PWC standard details.

### BALL VALVES

For all valves smaller than four (4) inches, ball valves shall be used. Ball valves shall be installed in accordance with PWC standard details.

Ball valves shall be all bronze construction, with tee head operator and having a removable disc. Ball valves shall have threaded connections, in accordance with PWC standard details. Ball valves shall be manufactured and tested in accordance with AWWA/ANSI C800. The valve shall be equipped with packing nut, gland, and packing material. Ball valves shall be of an approved type made from approved materials conforming to ASTM Specifications and shall also meet the approval of the Public Works Commission. The turn required to travel from fully closed to fully open on the ball valve shall be 90 degrees.

### VALVE BOXES

Valve boxes shall be "slip-type" made of close-grained, gray cast iron metal painted with a protective asphaltic coating. Construction shall be in three pieces as follows: The lower of base pieces, which shall be flanged at the bottom, the upper part which shall be flanged on the lower end, and of such size as to telescope over the lower part, the upper end being constructed in the form of a socket to receive the cap or cover; and the cover or cap shall have cast on the upper surface, in raised letters, the word "WATER". All valve boxes shall be equal in quality and workmanship to those manufactured by Sigma Corporation (VB-462), Tyler Union (6855 Series), Star Pipe Products (VB-0004), or an approved equal. The valve box shall be installed in accordance with PWC standard details. The valve box shall have a 3/8-inch hole drilled in the upper part four (4) to six (6) inches from the top of the box to accommodate a 1/4-inch x 1-1/2-inch galvanized bolt for securing tracer wire.

Valve box protector rings shall be installed to protect valve boxes located outside pavement. The ring shall be constructed and installed in accordance with PWC standard details.

## FIRE HYDRANTS

All fire hydrants shall be dry barrel, traffic type and conform to the latest revision of AWWA Specification C-502 except as listed below or as otherwise directed by the Public Works Commission. All working parts shall be bronzed. The size of the fire hydrants (designated by the nominal diameter of the valve opening) shall not be less than four and one-half (4 ½) inches. All hydrants shall be able to deliver a minimum of 1,000 gallons per minute with a friction loss of not more than five (5) pounds per square inch (psi) total head loss through the hydrant. Hydrants shall be of compression type (opening shall be of such design that when the barrel is broken off the hydrant valve will remain closed and reasonably tight against leakage). All hydrants shall be mechanical joint to accommodate the spigot end of six (6) inch Pressure Class 150, AWWA Standard, ductile iron pipe. The installation of the fire hydrant shall be in accordance with PWC standard details. Bosses (6") may be substituted for tees in pipe sizes exceeding 24 inches in diameter, with prior approval from PWC. The boss shall be welded to the bottom of the main to provide effective flushing of the system.

All hydrants shall be furnished with two (2) two and one-half (2 ½) inch nozzles and one (1) four and one-half (4 ½) inch pumper nozzle. Outlets shall have American National Standard fire hose coupling thread, in accordance with the City of Fayetteville standard, and shall be provided with nozzle caps securely chained to the body of the hydrant. The base of the hydrant shall have two (2) cast lugs suitable for use in strapping the hydrant to the connecting pipe. The operating nut shall be pentagonal in shape, finished with a slight taper to one and one-half (1 ½) inches from point to flat to conform to the standard wrench used by the Fayetteville Public Works Commission. All hydrants shall open left or counter-clockwise. Hydrants shall be suitable for working pressure of 150 psi and a test pressure of twice the working pressure. Fire hydrants shall be specific models manufactured by Mueller Company (Model Centurian 200), Clow Corporation (Medallion), American Darling (Model Mark 73-1) or approved equal. The interior of the hydrant shoe shall be coated with a four (4) mil thickness FDA approved epoxy coating.

## COMBINATION AIR VALVES ASSEMBLY

Combination air valves shall be of the single housing style that combines the operation features of both an air/vacuum and air release valve. The combination air valve shall have a two (2) inch inlet and one (1) inch outlet connections and an orifice diameter to be determined by the Design Engineer for each project for a maximum working pressure of 300 psi. The assembly shall be equipped with a two (2) inch cut-off valve as shown on the PWC standard detail. The combination air valve body shall be constructed of 316 stainless steel or reinforced nylon with the only exception being the Buna-N Rubber seat and gasket. Valves shall be as manufactured by Crispin (Model UX20), ARI (D-020), or approved equal. Combination air valves shall be installed in accordance with PWC standards.

## WATER DISTRIBUTION PIPE

### DUCTILE IRON PIPE

The raw material from all ductile iron pipe and fittings shall have an average minimum content consisting of 90% recycled iron and steel. Ductile iron pipe and fittings shall be manufactured in the United States of

America in accordance with ANSI/AWWA A21.51/C151. The manufacturer of the ductile iron pipe shall be a member of the Ductile Iron Pipe Research Association (DIPRA).

All ductile iron pipe shall be designated as “Pressure Class”, unless otherwise specified. The pipe furnished shall have a minimum thickness calculated in accordance with ANSI A 21.50 (AWWA C-150), with a factor of safety of two (2); a working pressure of 150 psi to 350 psi, plus 100 psi water hammer allowance; and AASHTO H-20 live truck load with 2.5 feet of cover. In no case shall “Pressure Class” pipe’s nominal thickness be less than the following:

<u>SIZE</u>	<u>PRESSURE CLASS</u>	<u>NOMINAL THICKNESS (In.)</u>
4"	350	0.25
6"	350	0.25
8"	350	0.25
10"	350	0.26
12"	350	0.28
16"	250	0.30
24"	250	0.37

PUSH-ON JOINTS

Push-on joints shall be as specified and installed in accordance with AWWA C-600 and shall conform to AWWA Standard C-111. Push on joints, rubber gaskets and lubricant shall conform to ANSI A21.11. Pressure rating shall not be less than 200 psi unless otherwise specified. All ductile iron pipe shall be lined with standard thickness cement mortar lining and asphaltic seal coat in accordance with ANSI A21.4 (AWWA C-104). The pipe shall have an outside asphaltic coating as specified in AWWA Standard C-151.

RESTRAINED JOINTS

Factory Restrained Joints

Factory restrained joint pipe shall be utilized for all pipe greater than 12-inches in diameter, unless otherwise approved by the Fayetteville Public Works Commission. Factory restrained joint pipe shall be furnished for the locations shown on the approved drawings. The pipe, joints, and gaskets shall be in accordance with ANSI/AWWA Standards as specified for ductile iron pipe. Factory restrained joints shall be rated for a working pressure of 350 psi for sizes up to 12-inches and 250 psi for larger sizes.

All factory restrained joint pipe shall have the restraints internal to the pipe (i.e., “boltless”). All restrained joint ductile iron pipe and fittings larger than 12-inches shall be as manufactured by U.S. Pipe’s TR-Flex, Griffin Pipe Products SNAP-LOK, American Cast Iron Pipe Company's Flex-Ring Joint, or approved equal. The method of restraining the valves to the factory restrained ductile iron pipe shall be reviewed and approved by PWC on a case by case basis. The valves shall have the same working pressure as the pipe.

### Flanged Joints

Flanges shall be specifically designed for each application. The flange pipe shall be in accordance with ANSI/AWWA C-115/A21.15. Threads for threaded flange pipe shall be in accordance with ANSI B2.1, shop fabricated as outlined by AWWA 115 with serrated faces furnished on the pipe, completely factory installed. Welding of flanges to the body of the pipe will not be acceptable.

Ductile iron fittings and flanges shall be in accordance with ANSI/AWWA C-110/A21.10 with a minimum working pressure of 250 psi. Gaskets shall be full faced SBR rubber per ANSI/AWWA C-111/A21.11 with a minimum 1/8 inch thickness. Linings and coatings shall be as previously outlined for all ductile iron pipe and fittings.

### Mechanical Joints

Mechanical joints shall be as specified and installed in accordance with AWWA C-600 and shall conform to AWWA Standard C-111. Mechanical joints shall be of the stuffing box type and shall conform to ANSI A21.11 for four (4) inch pipe through 12-inch pipe. Mechanical joints, rubber gaskets and lubricant shall conform to ANSI A21.11. Pressure rating shall not be less than 200 psi unless otherwise specified.

Special accessories such as mechanical joint retainer glands or mega-lugs are acceptable on pipe 12-inches and less in diameter, upon approval from the Fayetteville Public Works Commission. Mega-lug and/or grip-ring restraint mechanisms will not be an acceptable method of restraint for pipe, fitting and/or valves on sizes larger than 12-inches in diameter. For mains larger than 12-inches and at locations specified by the Fayetteville Public Works Commission, factory restrained joints shall be utilized, in accordance with these Specifications.

### Field Lok Gaskets

Special accessories such as US Pipe's Field-LOK gasket, Ford's Uni-Ring, or Romac's Grip-Ring are acceptable on pipe 12-inches and less in diameter, upon approval from the Fayetteville Public Works Commission. Mega-lug and/or grip-ring restraint mechanisms will not be an acceptable method of restraint for pipe, fitting and/or valves on sizes larger than 12-inches in diameter. For mains larger than 12-inches and at locations specified by the Fayetteville Public Works Commission, factory restrained joints shall be utilized, in accordance with these Specifications.

## FITTINGS

### Mechanical Joint

All fittings shall be ductile iron and shall be manufactured in accordance with AWWA Standard C-110 (ANSI A21.11). Compact fittings shall be mechanically restrained, ductile iron in accordance with ANSI A 21.53 (AWWA C-153) for four (4) inch through 12 inch sizes only. Where thrust blocking is utilized, fittings shall be full body ductile iron in accordance with ANSI A 21.53 (AWWA C110).

All ductile iron fittings shall be lined with standard thickness cement mortar lining and asphaltic seal coat in accordance with ANSI A21.4 (AWWA C-104). All fittings shall have an outside asphaltic coating as specified in AWWA Standard C-151 and C-110, respectively.

#### Factory Restrained

Factory restrained joint fittings shall be utilized for all pipe greater than 12-inches in diameter, unless otherwise approved by the Fayetteville Public Works Commission. Factory restrained joint fittings shall be furnished for the locations shown on the approved drawings. The fittings, joints, and gaskets shall be in accordance with ANSI/AWWA Standards as previously specified for ductile iron pipe. Factory restrained joints shall be rated for a working pressure of 350 psi for sizes up to 12-inches and 250 psi for larger sizes. All factory restrained joint fittings shall have the restraints internal to the fitting (i.e., “boltless”). All fittings shall be compatible with the factory restraint system. All restrained joint ductile iron fittings larger than 12-inches shall be as manufactured by U.S. Pipe’s TR-Flex, Griffin Pipe Products SNAP-LOK, American Cast Iron Pipe Company’s Flex-Ring Joint, or approved equal.

#### Bosses

Tangential welded on outlets (i.e., bosses) shall only be utilized on pipe 24-inches and larger, as approved by PWC. All bosses shall be factory welded; field fabrication is not allowed. The pipe shall be in accordance with these specifications. Bosses shall be of the size and location indicated on the approved drawings.

#### AERIAL CROSSINGS

For aerial crossings, the ductile iron pipe shall be thickness class, as specified on the plans and standard details. All thickness class pipe shall be in accordance with ANSI A21.51 and AWWA C-151, with a minimum working pressure of 200 psi.

For aerial crossings which are four (4) inches to 12 inches in diameter, Class 53 manufactured factory restrained joint or Class 53 flanged ductile iron pipe shall be used in accordance with the PWC standard details. No other means of restraint are allowed for aerial crossings. For aerial crossings larger than 12 inches, or as noted specifically on the plans, Class 53 flanged ductile iron pipe shall be used in accordance with the PWC standard details.

All aerial crossings shall be designed and installed in accordance with PWC standard details.

#### PIPE IN CASINGS

All ductile iron pipe (regardless of diameter) within casings shall be factory restrained, in accordance with these specifications and the applicable PWC standard details. The use of any other restraints (i.e., mega-lugs, grip-rings, etc.) shall not be utilized on pipe within casings.

All restrained joint ductile pipe in casings shall be in accordance with the PWC standard details.

## TRENCHLESS APPLICATIONS

All ductile iron pipe (regardless of diameter) utilized for trenchless installations (i.e., horizontal directional drilling, pipe-bursting, etc.) shall be factory restrained, in accordance with these specifications and the applicable specification section for the trenchless technology. The use of any other restraints (i.e., mega-lugs, grip-rings, etc.) shall not be utilized.

### PVC PIPE

Two (2) inch water main pipe shall be manufactured using Grade 1 PVC compound material as defined in ASTM D-1784 and shall be SDR21, pressure class 200 in accordance with ASTM D 2241. Fittings for two (2) PVC pipe shall be solvent weld Schedule 80 PVC. Brass FIP x pack joint for PVC fittings shall be used to transition from PVC to brass. The pipe shall be plainly marked with the manufacturer's name, size, material (PVC) type and grade or compound, NSF seal, date of manufacture, pressure rating and reference to appropriate product standards.

All PVC pipe (4-inches through 12-inches diameter) shall be manufactured using virgin compounds as defined in ASTM D-1784, with a 4,000 psi HDB rating and designated as PVC 1120 to be in strict accordance with AWWA C-900. The pipe shall be Class 150 and conform to the thickness requirements of DR18. The pipe shall be manufactured to withstand 755 psi quick burst pressure tested in accordance with ASTM D-1599 and withstand 500 psi for a minimum of 1,000 hours tested in accordance with ASTM D-1598. The pipe joints shall be of the integral bell type with rubber gaskets and shall conform to the requirements of ASTM D-3139 or ASTM F-477.

PVC fittings are not acceptable for water mains four (4) inches or greater. Fittings and specials shall be ductile iron, bell end in accordance with AWWA C-110, 150 psi pressure rating unless otherwise shown or specified. Ductile iron fittings to PVC pipe shall be adequately supported on a firm trench foundation. Ductile iron fittings and specials shall be cement mortar lined (standard thickness) in accordance with ANSI A21.4.

**Mechanical restraining systems (i.e. mega-lug, grip-ring) shall not be used on PVC pipe.**

### TRACING WIRE

For the purpose of locating non-metallic pipes, a continuous "detectable" tracing wire shall be installed. The wire shall be a minimum 12 gauge, single strand, coated copper or copper clad steel wire that is suitable for underground use. Splices shall be accomplished utilizing a corrosion proof wire connector. The connectors shall "lock" the wires in place and contain a dielectric sealant to prevent corrosion. The connector shall be the "Snake Bite" connector manufactured by Copperhead Industries, LLC, or approved equal. The wire shall be buried continuously along the pipe. The wire shall be secured into valve boxes such that a direct/conductive metal detector may be used to trace the pipe location. Bolts shall be used to secure the wire and the attachment location shall be readily available from finished grade without special equipment.

## POLYETHYLENE PLASTIC WATER TUBING

Polyethylene (PE) plastic water tubing shall be installed in accordance with PWC standard details. All services installed in new construction shall be one continuous run of pipe with no splices from the corporation stop to the meter. The PE water tubing shall meet the requirements of ASTM D2737, AWWA C901, and NSF Standards 14 and 61. Pipe dimensions shall meet Iron Pipe Size (IPS) standards.

The PE tubing material shall be high density polyethylene conforming to the minimum requirements of cell classification 445574E, as defined and described in ASTM D3350. The resin shall have a material designation code of PE4710 by the Plastic Pipe Institute.

The PE water tubing shall be SDR 7, with a minimum pressure rating of 250 psi. Fittings for the PE water pipe shall be cast brass compression fittings, made to the PE water pipe dimension. All brass fittings shall have a 300 psi minimum pressure rating.

For the purpose of locating plastic water services during trenching, a continuous tracing wire shall be installed. The wire shall be a minimum 12 gauge, single strand, coated copper or copper clad steel wire that is suitable for underground use. The wire shall be buried along the water service lateral from the main to the meter box. The wire shall extend a minimum of 12 inches into the meter boxes.

## COPPER WATER TUBING

Copper water tubing shall be installed in accordance with PWC standards. All services installed shall be one continuous run of pipe with no splices from the corporation stop to the meter.

Copper water tubing shall be Type K, soft copper manufactured in accordance with ASTM B88. The minimum pressure rating for the copper water pipe shall be 655 psi. Fittings for the copper water pipe shall be brass compression fittings, made to the copper water pipe dimensions. All brass fittings shall have a 300 psi minimum pressure rating.

## TAPPING SLEEVES

Tapping sleeves shall be ductile iron mechanical joint or stainless steel and have a minimum working pressure of 150 psi for all tapping of mains up to and including 24-inch diameter with a branch less than or equal to 12-inches diameter. Branch diameter greater than 12-inches on a 16-inch diameter pipe and larger shall require full body ductile iron mechanical joint tapping sleeve.

Ductile iron mechanical joint tapping sleeves shall be as manufactured by Clow, M&H, Mueller, American, or an approved equal and shall be furnished with complete joint accessories. The mechanical joint sleeve shall be compatible with type and class of pipe being tapped. The outlet flange shall be class 125 per ANSI B16.1 compatible with approved tapping valves.

Stainless steel tapping sleeves shall be as manufactured by Romac, Smith-Blair, or approved equal, and shall be furnished with all accessories. The sleeve, lugs, bolts and nuts shall be 18-8 type 304 stainless steel, as provided by the manufacturer. The outlet flange shall be ductile iron or stainless steel. The gasket shall be a grid pattern design and shall provide full circumferential sealing around pipe to be

tapped. The sleeve shall include a 3/4 NPT test plug. All welds shall be passivated. The outlet flange shall be class D per AWWA C-207-ANSI 150 lb. drilling compatible with approved tapping sleeves.

The tapping sleeve and valve shall be in accordance with PWC standard details.

All tapping sleeves shall be hydrostatically pressure tested prior to the tap being accomplished. **Use of air to complete the pressure test is not acceptable.** The tapping sleeve shall be tested to 150 psi. The PWC Project Coordinator shall witness and approve the testing.

#### WATER SERVICE SADDLES

All water service saddles for use on two (2) inch PVC shall be one (1) inch brass saddles as manufactured by Ford, McDonald, or Mueller.

Water service saddles for one (1) and two (2) inch taps on four (4), six (6), eight (8), 12-inch and larger size PVC and asbestos-cement (AC) and also four (4) inch and larger size iron pipe shall be ductile iron with stainless steel strap(s), bolts, nuts and washers. Ford Models FS 101, FS 202; Romac Models 101S, 202S; or Smith-Blair Model 315.317 shall be used. Stainless steel straps must be pre-formed at the factory to the specified outside diameters of the pipe.

Water service saddles with a two (2) inch outlet shall be double strap.

Water service saddles for pipe sizes 12-inch through 24-inch shall be double strap.

Water service saddles for pipe sizes exceeding 24-inches shall be as specified by the PWC Water Resources Engineering Department.

#### INSTALLATION

##### GENERAL

Pipe installation shall be in strict accordance with Specification Section 02222 – Excavation and Backfilling for Utility Systems and as outlined herein.

##### PIPE INSTALLATION

Pipe installation shall be in accordance with the manufacturer's instructions. All pipes and fittings shall be handled to prevent damage to the protective coatings and linings.

All dust, dirt, oil, tar, or other foreign matter shall be cleaned from the jointing surfaces, and shall be lubricated with lubricant recommended by the manufacturer.

All pipe shall be installed in accordance with the approved drawings and cut sheets, unless otherwise directed by PWC.



All dead ends on new mains shall have a two (2) inch blow-off assembly as indicated on the approved drawings. The blow-off assembly shall be in accordance with PWC standard details.

For pipe sizes up to 12-inches, mechanical equipment should not be utilized to assemble the pipe. For pipe sizes over 12-inches, mechanical equipment may be utilized, in accordance with the pipe manufacturer's instructions. Any damage resulting from the use of mechanical equipment shall be replaced as directed by PWC.

Adjustments in grade by exerting force on the barrel of the pipe with excavating equipment shall not be allowed. The Contractor shall verify line and grade after assembling each joint.

When pipe installation is not in progress, the open ends of the pipe shall be closed by a water tight plug or other means approved by the PWC Project Coordinator. If water is present, the plug shall remain in place until the water is lowered to a level that allows for proper installation. No pipe shall be laid in water or where in the PWC Project Engineer's and/or PWC Project Coordinator's opinion trench conditions are unsuitable. Every precaution shall be taken to prevent material from entering the pipe while it is being installed.

#### ALIGNMENT AND GRADE

The Contractor shall be responsible for installing the pipe and appurtenances to proper line and grade.

All ductile iron pipe and fittings shall be installed in accordance with ANSI/AWWA C-110/A21.10. All C-900 pipe shall be installed in accordance with ASTM D-2774. The amount of deflection in the PVC or ductile iron pipe shall not exceed the applicable AWWA standards and the manufacturer's recommendations. If the required deflection exceeds the specified limitations or as determined by the Public Works Commission, mechanical joint bends shall be utilized.

Pipe passing through walls of NCDOT bridges, retaining walls, and other concrete structures shall be factory restrained joint ductile iron and be installed in casings/sleeves in accordance with NCDOT specifications. Annular space between walls and sleeves shall be filled with an approved cement mortar that meets NCDOT specifications. The annular space between the sleeve and the pipe shall be filled with an approved mastic.

Pipe passing through the walls of meter vaults, valve pits, and storm drainage structures shall be restrained joint ductile iron, as specified by PWC. Pipe shall be installed in a casing/sleeve if determined to be necessary. Annular space between walls and sleeves shall be filled with an approved cement mortar. Annular space between pipe and sleeves shall be filled with an approved mastic. Proposed conflict boxes with storm and water shall be reviewed by the PWC Water Resources Engineer and approved on a case by case basis.

All ductile iron pipe (regardless of diameter) within casings shall be factory restrained, in accordance with these specifications and the applicable PWC standard details. The use of mechanical restraints (i.e., mega-lugs, grip-rings, etc.) shall not be utilized on pipe within casings.

When pipe is field cut, the cut end shall be smooth and at right angles to the axis of the pipe. All sharp edges shall be removed. All field cut pipe shall be beveled. The beveled end of PVC pipe shall be removed, when installing into mechanical joint ductile iron fittings.

When connecting unlike (class, material, etc.) pipe, an approved PWC fitting shall be used. All pipe shall be installed in accordance with AWWA C-600 or C-605 as applicable, for buried lines and the manufacturer's recommendations. For mechanical joint pipe and fittings, all nuts shall be torqued to the manufacturer's recommendations.

Concrete thrust blocking shall be utilized on all PVC water mains. The concrete thrust blocking shall be in accordance with PWC standard details. When thrust blocking is to be utilized, backfilling shall not occur until the concrete has time to set. No hydrostatic pressure testing shall occur until the concrete thrust blocking has cured for a minimum of five (5) calendar days.

### FIRE HYDRANTS

Fire hydrants shall be installed as shown on the approved drawings. Each fire hydrant shall be connected to the main with a six (6) inch branch line and shall have a minimum of 42-inches of cover. Fittings between the valve and fire hydrant may be utilized, with prior approval from PWC. The valve shall be located at the main unless otherwise approved by PWC. Hydrants shall be set plumb with pumper nozzle facing the roadway. The hydrant branch shall not be backfilled until inspected and approved by the PWC Project Coordinator. Fire hydrants shall be installed in accordance with PWC standard details.

### HYDROSTATIC TESTS

All mains and laterals shall be subjected to a hydrostatic pressure test. Each valved section may be tested individually.

The Contractor shall furnish all labor and material, including test pumps, taps, and corporations, necessary to complete the work. Any taps which are not to be utilized shall be killed out at the main. If any taps are to be used for irrigation laterals they shall be installed in accordance with PWC standard details. A PWC Project Coordinator shall be present and observe all valve operation by the Contractor. Under no circumstances shall a Contractor operate any PWC-owned valves unless it is an emergency.

The duration of the pressure test shall be at least one hour or longer, as directed by the PWC Project Coordinator. The hydrostatic pressure shall be 200 psi. The pipe to be tested shall be slowly filled with water and the specified test pressure shall be applied. Before applying the specified test pressure, all air shall be expelled from the pipe. If hydrants or blow offs are not located to properly expel the air, taps shall be made as approved by PWC.

Damaged or defective materials discovered as a result of the pressure test shall be removed and replaced with new material, and the test shall be repeated until the test results are satisfactory to the Public Works Commission.

All replacement, repair or retesting shall be accomplished by the Contractor at no additional cost to the Public Works Commission. All repairs shall be reviewed and approved by PWC prior to backfill. The use of couplings, fittings, sleeves, etc. shall be reviewed and approved by PWC prior to use. The main must successfully pass the hydrostatic test prior to sterilization.

### STERILIZATION

Sterilization shall be in accordance with the requirements of NCDEQ, the North Carolina Rules Governing Public Water Supply, AWWA C651, and AWWA C655 (most recent editions). The Contractor shall furnish all chlorinating equipment, sterilization solution, materials, excavation, barricades, backfilling, and any taps and corporations necessary to complete the work. The Contractor shall fully cooperate with the PWC Project Coordinator, furnish any needed assistance, and schedule the testing.

Prior to performing the hydrostatic test, water mains, laterals, and appurtenances shall be flushed to remove air, sediment, contaminants, and/or foreign matter. After completion of a successful hydrostatic test, the water system shall be disinfected by the thorough dispersion of a chlorine solution. The chlorine level shall be between 50 parts per million (ppm) and 100 ppm throughout the water system. In no case shall the chlorine level exceed 300 ppm. If the chlorine level is over 300 ppm, the system shall be completely flushed and re-chlorinated. **In no case shall chlorine be introduced into the water system in a dry solid state.**

The chlorine solution shall remain in contact with the interior surfaces of the water system for a minimum period of 24 hours and shall result in not less than 10 ppm of chlorine throughout the system. Then the water system shall be flushed with water from the existing PWC water system until the chlorine solution is dispelled. The Contractor shall take all necessary measures to prevent downstream erosion caused by flushing the lines. All erosion/damages shall be repaired at no additional expense to the Public Works Commission. All environmental regulations governing the release and/or disposal of chlorinated testing water shall be met by the Contractor. AWWA C655 defines "highly chlorinated" water as water having more than four (4) ppm. Any water with a chlorine level greater than four (4) ppm shall be de-chlorinated by the Contractor prior to being released to the environment.

If any disruption to the disinfection process occurs, or if any repair procedure is necessary then the disinfection process shall start over.

After disinfection, the water supply shall not be accepted or placed into service until bacteriological tests results or representative water samples analyzed in the Public Works Commission's laboratory are found to be satisfactory. The disinfection shall be repeated until tests indicate the absence of pollution for at least two (2) full days. The PWC Project Coordinator shall be responsible for taking the sample(s) and transporting them to the PWC laboratory.

If the initial sample taken after disinfection and flushing does not indicate that the water main is sterilized, the Contractor shall, in conjunction with the PWC Project Coordinator, flush the lines. Once flushing is complete, another sample will be taken to the Public Works Commission's laboratory for analysis. Should this second sample also fail to indicate that the main is sterilized; the Contractor shall repeat the disinfection process. This process shall be repeated until the samples are satisfactory. The Contractor

**Revised January 2021**

shall fully cooperate with the PWC Project Coordinator, furnish any needed assistance, and schedule the testing.

## **DIVISION 2 SITE WORK**

### **02730 SANITARY SEWER SYSTEMS**

#### GENERAL

Sanitary sewer lines and all appurtenant items shall be constructed of materials specified or indicated on the drawings. The intent and purpose of these specifications is to require a complete and satisfactory installation in every respect and any defect in material or workmanship shall be cause for the replacement and correction of such defect as directed by the Public Works Commission.

#### RELATED SECTIONS

- A. 02211 – Grading, Utilities
- B. 02222 – Excavation and Backfilling for Utility Systems
- C. 02732 – Sewage Force Mains

#### MATERIALS

##### **SEWER MAINS**

Prior to shipment each joint of pipe shall be stamped by an independent testing laboratory, certifying compliance with the specifications stated therein. Pipe sizes indicated shall be understood to be nominal inside diameter of the pipe. All sewer pipe materials shall be either PVC (as specified herein) or ductile iron (as specified herein), unless otherwise approved in writing by the Public Works Commission. Written approval shall be obtained prior to installation.

##### **DUCTILE IRON PIPE**

The raw material from all ductile iron pipe and fittings shall have an average minimum content consisting of 90% recycled iron and steel. Ductile iron pipe and fittings shall be manufactured in the United States of America in accordance with ANSI/AWWA A21.51/C151. The manufacturer of the ductile iron pipe shall be a member of the Ductile Iron Pipe Research Association (DIPRA).

All ductile iron pipe and fittings shall be in strict accordance with ANSI A21.51 and AWWA C151, Class 50 or Class 51, as applicable, in every respect. The working pressure shall be a minimum of 200 psi. Pipe shall be furnished in 18 or 20-foot lengths. All pipe joints used in open trench construction shall be furnished with "push-on" joints, unless otherwise indicated on the drawings or specified. All joints and fittings shall be in accordance with ANSI A21.11 and AWWA C111. All ductile iron interior surfaces shall be lined with two (2) coats of ceramic epoxy to produce a total minimum dry film thickness of 40 mils (Protecto401 or approved equal). The exterior pipe surfaces shall be protected with asphaltic coating as specified in AWWA C151 and C110. Specifications for the ceramic epoxy can be found in Specification Section 09802.

For aerial crossings which are 4 inches through 12 inches in diameter, manufactured restrained joint ductile iron pipe Class 53, or Class 53 flanged ductile iron pipe shall be utilized in accordance with the standard Public Works Commission detail for aerial crossings. Mega-lugs, field-lok, and gripper rings are not an allowable means of restraint for aerial crossings. For aerial crossings larger than 12 inches, or as noted specifically on the plans, flange joint ductile iron pipe, Class 53, shall be utilized in accordance with the standard Public Works Commission details. The location of flanges shall be specifically designed for each application. The flange pipe shall be in accordance with ANSI/AWWA C-115/A21.15. Threads for threaded flange pipe shall be in accordance with ANSI B2.1, shop fabricated as outlined by AWWA 115 with serrated faces furnished on the pipe, completely factory installed. Welding of flanges to the body of the pipe will not be acceptable. Ductile iron fittings and flanges shall be in accordance with ANSI/AWWA C-110/A21.10 with a minimum working pressure of 250 psi. Gaskets shall be full faced SBR rubber per ANSI/AWWA C-111/A21.11 with a minimum 1/8" thickness. Linings and coatings shall be as outlined for ductile iron pipe.

If the Public Works Commission determines that an expansion coupling is required, it shall be installed as indicated on the drawings. The expansion coupling shall not be buried.

For subsurface water crossings (i.e., streams, wetlands), restrained joint ductile iron pipe shall be utilized. No mechanical restraint systems (e.g., mega-lugs, field-lok gaskets, etc.) shall be utilized. The pipe shall be installed in a casing, in accordance with the approved Public Works Commission detail, unless otherwise specifically approved by the Public Works Commission.

## PVC PIPE

PVC sewer pipe and fittings 4 inches thru 15 inches shall be in accordance with ASTM D-3034 with a standard dimension ratio (SDR) of 26 for sewer mains and laterals. Larger diameter pipe (18 inches through 27 inches) shall be in accordance with ASTM F-679, with a SDR of 26. Both pipe and fittings shall be made of PVC plastic having a cell classification of 12454 as specified in ASTM D-1784.

Pipe joining shall be push on elastomeric gasket joints only and the joints shall be manufactured and assembled in accordance with ASTM D-3212. Elastomeric seals shall meet the requirements of ASTM F-477. The pipe shall be furnished with integral bells and with gaskets that are permanently installed at the factory and in accordance with ASTM D-3212 and contain a steel reinforcing ring. PVC sewer pipe shall be made by continuous extrusion of prime green unplasticized PVC and contain identification markings as required by the applicable ASTM standard.

## SEWER FITTINGS

### Ductile Iron Push-on Fittings:

Ductile iron sewer fittings on PVC mains shall be deep bell, gasketed joint, and air test rated. Gasket grooves shall be machined in the factory. Material shall be ductile iron, in accordance with ASTM A536, Grade 65-45-12 and ASTM F1336. Wall thickness shall meet the requirements of AWWA C153. Gaskets shall have a minimum cross sectional area of 0.20 square inches, and conform to ASTM F477.

All ductile iron fittings shall have an interior coating of Protecto 401, or approved equal. All ductile iron fittings on PVC pipe shall provide a flow line that provides a smooth transition between the materials. Ductile iron fittings shall be as manufactured by the Harrington Corporation (Harco), or approved equal.

Mechanical Joint Fittings:

Joints shall be installed in accordance with AWWA C-600 and shall conform to AWWA Standard C-111. Mechanical joints shall be of the stuffing box type and shall conform to ANSI A21.11 for four inch (4") pipe and larger. Fittings and specials shall be ductile iron and shall be manufactured in accordance with AWWA Standard C-110 (ANSI A21.11). Compact fittings shall be ductile iron in accordance with ANSI A 21.53 (AWWA C-153) for 4" thru 24" sizes only. Note: mechanical joint wyes are not included in the AWWA C-153 specification. Pressure rating shall be not less than 200 psi unless otherwise specified. All ductile iron fittings shall have an interior coating of Protecto 401, or approved equal. Mechanical joint fittings shall be utilized on ductile iron mains and ductile iron laterals. Mechanical joint fittings shall not be utilized on PVC mains, unless otherwise approved by the Public Works Commission.

PVC Fittings:

PVC fittings shall be manufactured in accordance with ASTM D-3034, F-1336, and F-679. Molded fittings shall be utilized in sizes from 4" to 8" (or larger, if available). Fabricated fittings shall only be utilized with prior approval from the Public Works Commission. Fabricated fittings are defined as those fittings that are made from pipe or a combination of pipe and molded components. All PVC fittings shall contain identification markings as required by the applicable ASTM standard. All PVC fittings shall be gasketed joint, except as indicated for interior drop structures. Plastic fittings shall be as manufactured by GPK Products, Inc., Plasti-Trends, the Harrington Corporation (Harco), or approved equal.

Ductile Iron Pipe Size x SDR26 Transition Adapter:

All ductile iron x PVC transition adapters shall be one (1) piece, bell x bell (gasket x gasket). Transition adapters shall range in size from four (4) inches through 12 inches. Transition adapters for pipe larger than 12-inches shall be as specified by the Public Works Commission. All transition adapters shall have a flow way tapered to allow a smooth transition between the ductile iron and PVC. Transition adapters shall be either PVC or ductile iron, in accordance with the following:

PVC – All PVC transition fittings shall be made from DR 18 C900 pipe stock. The C900 pipe stock shall meet the requirements of AWWA C900/C905, and have a minimum cell classification of 12454 as defined in ASTM D1784. The wall thickness shall meet or exceed DR 18. PVC transition fittings shall have SBR gaskets in accordance with ASTM F477. All six (6) inch and eight (8) inch adapters shall be molded. Molded fitting joints shall be 235 psi rated, in accordance with ASTM D3139, and shall have SBR rubber gaskets. Four (4) inch, ten (10) inch and 12 inch transition adapters shall have SBR Rieber style gaskets meeting ASTM F477. Joints shall be 235 psi rated, in accordance with ASTM D3139 for the C900 (ductile iron) bell, and in accordance with ASTM D3212 for the sewer (SRD26) bell. Molded C900 bell depths shall comply with AWWA C907. Fabricated (4-inch, 10-inch and 12-inch) bell depths and molded sewer (SDR26) bell depths shall be in accordance with ASTM F1336. PVC transition adapters shall be manufactured by the Harrington Corporation (Harco), GPK Products, or approved equal.

Ductile iron – Ductile iron transition fittings shall be deep bell, push-on joint, and air test rated. The ductile iron material shall comply with ASTM A536, Grade 65-45-12 or 80-55-06. The bell depth shall be in accordance with ASTM F1336. Gaskets shall be of SBR rubber, in accordance with ASTM F477. Transition gaskets are not allowed. All ductile iron transition fittings shall have an interior coating of Protecto401 or approved equal. Ductile iron transition fittings shall be manufactured by the Harrington Corporation (Harco) or approved equal.

Saddles:

Sewer service saddles may be utilized for sewer lateral installations. All sewer service saddles shall be ductile iron with stainless steel straps, bolts, nuts, and washers. The nuts shall be coated to prevent galling. The saddle body shall be ductile iron, in accordance with ASTM A536, Grade 65-45-12. The gasket material shall be SBR, in accordance with ASTM D2000. Saddles for PVC or DI laterals shall have an alignment flange. Sewer service saddles shall be as manufactured by Geneco, or approved equal. All stainless steel straps shall be pre-formed at the factory, to the specified outside diameters of the pipe.

**SEWER LATERALS**

Ductile iron laterals – For ductile iron mains, utilize mechanical joint fittings or an approved saddle with an alignment flange (Geneco or approved equal). For PVC mains, utilize an approved saddle with an alignment flange (Geneco or approved equal) or ductile iron fittings as specified above.

PVC laterals – utilize a saddle with an alignment flange (Geneco or approved equal) on PVC or ductile iron mains; utilize a mechanical joint tee with SDR 35 transition gaskets on ductile iron mains; or utilize PVC fittings as specified above on PVC mains.

The following table summarizes the materials to be utilized for sewer main to lateral connections:

	PVC Main	DI Main
DI Lateral	DI fitting or approved saddle	MJ fitting or approved saddle
PVC Lateral	PVC fitting or approved saddle	MJ fitting with transition gasket or approved saddle

Sewer laterals shall be in accordance with these Specifications and PWC standard details S.10, S.11, and S.12.

**PRECAST CONCRETE MANHOLES**

Pre-cast circular reinforced concrete manhole units shall be in accordance with ASTM C-478. The tongue and groove ends of the manhole sections shall be manufactured for jointing with rubber gaskets (i.e., con-seal). An eccentric cone shall be utilized on all manholes, unless otherwise approved by the Public Works Commission.



Manhole steps shall be placed in all manholes and shall be steel reinforced (½" grade 60) copolymer polypropylene plastic steps in accordance with ASTM C-478 for material and design. The steps shall be spaced 16" on center with serrated treads and wide enough to stand on with both feet.

Manhole frames and covers shall be made of gray cast-iron, and the iron shall possess a tensile strength of not less than 18,000 psi. Cast iron shall conform to ASTM Specification A 48-83 Class 35. The frame and cover shall be manufactured by the same manufacturer. All castings shall be in accordance with Public Works Commission standard details. Any defective castings shall be removed and replaced.

Any special linings and coatings that are specified for a manhole and installed at the production facility, in the field, or during repairs, shall be applied in accordance with the applicable special coatings specification and the manufacturer's specifications for that material.

Camlock ring and covers shall be in accordance with Public Works Commission standard details. Camlock bolt head shall be compatible with PWC standard tool for turning camlock mechanism. Camlock ring and covers shall be installed as indicated on the drawings, in accordance with PWC standard details.

#### **SELECT BEDDING MATERIAL**

Select bedding material shall be crushed stone (No. 57 or No. 5), in accordance with Public Works Commission standard details. Bedding material shall be provided for all pipe materials.

#### **INSTALLATION**

Pipe installation shall be in strict accordance with Specification Section 02222 – Excavation and Backfilling for Utility Systems and as outlined herein.

#### **PIPE LAYING**

Pipe installation shall be in accordance with the manufacturer's instructions. Proper equipment shall be utilized to perform the work in a manner satisfactory to PWC. All pipes and fittings shall be carefully lowered into the trench in such a manner to prevent damage to the protective coatings and linings. Under no circumstances shall pipe materials be dropped or dumped into the trench. Pipe shall be carried into position and not dragged.

All dust, dirt, oil, tar (other than standard coating), or other foreign matter shall be cleaned from the jointing surfaces, and the gasket, bell, and spigot shall be lubricated with lubricant recommended by the manufacturer.

The pipe shall be laid upgrade, beginning at the lower end with the tongue or spigot ends pointing in the direction of the flow to the correct line and grade, unless otherwise approved by PWC. The pipe section to be installed shall be aligned by batter board or laser beam with the last installed pipe section. Mechanical equipment should not be used to assemble the pipe. Pipe shall be assembled in accordance

with the pipe manufacturer's instructions. Any damage resulting from the use of mechanical equipment shall be replaced as directed by PWC.

Adjustments in grade by exerting force on the barrel of the pipe with excavating equipment shall not be allowed. The Contractor shall verify line and grade after assembling each joint.

At any time when pipe laying is not in progress, the open ends of the pipe shall be closed by a water tight plug or other means approved by the PWC Project Coordinator. If water is in the trench, the plug shall remain in place until the trench is pumped completely dry. No pipe shall be laid in water or where in the PWC Project Engineer's and/or PWC Project Coordinator's opinion trench conditions are unsuitable. Every precaution shall be taken to prevent material from entering the pipe while it is being installed.

### ALIGNMENT AND GRADE

All pipe shall be installed to the required lines and grades. Structures shall be installed at the required locations. The lines and grades of the pipe will generally be indicated by stakes parallel to the line of the pipe. The Contractor shall be responsible for installing the pipe to proper line and grade.

Pipe shall be visually inspected by shining a light between structures and /or by closed circuit television inspection. Any defects discovered, including poor alignment, shall be corrected as directed by the Public Works Commission.

The bottom of the trench shall be excavated to a minimum of four inches (4") below the outside bottom of the pipe being installed to allow adequate placement and compaction of bedding material prior to installation.

Select bedding material shall be placed a minimum of four inches (4") and a maximum of six inches (6") under the pipe for full width of the trench and halfway up the pipe on the sides. Bedding material shall be placed in layers not exceeding six inches (6") loose thickness for compacting by vibratory mechanical tamps under the haunches and concurrently on each side of the pipe for the full width of the trench. The final result shall be "Class B" bedding for rigid pipe. If the existing material under the pipe bedding material is unsuitable, the unsuitable material shall be removed and replaced with select bedding material (No. 57 or No. 5 stone), as authorized and approved by the Public Works Commission Project Coordinator.

The same material pipe shall be utilized from manhole to manhole, unless otherwise approved by PWC. If the section of pipe between manholes is 250 feet or less, no transitions will be allowed (either all PVC or all ductile iron). Should the length between manholes exceed 250 feet, only one transition will be allowed. Use of a C900 x SDR 26 adaptor shall be used to accomplish the transition. A transition is defined as the use of one C900 x SDR26 adaptor. No more than one (1) adaptor shall be utilized in any given manhole to manhole segment.

All manholes shall be constructed to Public Works Commission's standards. Installation shall be in accordance with ASTM C-891 and PWC standards.

Manholes shall be constructed of precast reinforced concrete circular sections installed on a base riser section with integral floor and shall be cored to accommodate the various pipe connections, as indicated on the drawings. Pipe connections to a manhole shall be by gasketed flexible watertight connections (boot for small diameter and A Loc for larger diameter pipe) or as approved by the Public Works Commission. The manhole size shall be in accordance with the following table, unless otherwise specified:

<u>Pipe Size</u>	<u>Manhole Diameter</u> **
24" and less	48" *
27" - 36"	60"
42"	72"

\* Where interior drop structures are required, use 60" diameter as required in the Public Works Commission standard details.

\*\* Where multiple connections or acute angles are required, larger diameter manhole may be required as indicated on the plans.

The invert channel shall be constructed of brick and mortar, in accordance with Public Works Commission standard details. **Precast inverts are not allowed.** The invert channel shall be smooth and semicircular in shape conforming to the inside of the connecting sewer section. Changes in direction of flow shall be made with a smooth curve as large as a radius as the size of the manhole will permit without a decrease in flow velocity. Changes in size and grade of the channel shall be made gradually and evenly. The invert channel walls shall be constructed to three quarters (3/4) of the height of the crown of the outlet sewer and in such a manner not to obstruct maintenance, inspection or flow in the sewers. The inverts shall have a minimum slope of one (1) percent across the bottom of the manhole. A shelf shall be provided on each side of any manhole invert channel. Inverts in manholes with standing water will not be acceptable. The shelf shall be sloped not less than 1:12 (min) and no more than 2:12 (max). The bottom of the boot for the new sewer main or lateral shall be set one inch above existing shelf unless otherwise indicated.

When used in a paved street, the ring and cover shall be set in suitable mortar surrounded by a concrete collar in accordance with Public Works Commission standard details. When used in places other than in a paved street, the ring and cover shall be set to the grade shown on the plans or directed by the Public Works Commission. In unpaved areas cam-lock ring and cover shall be used. Camlock ring and cover shall be installed in accordance with Public Works Commission standard details.

The interior manhole riser joints, lift holes and grade adjustment rings shall be sealed with non-shrinking mortar to provide a watertight manhole. Lift holes sealed by the manufacturer with plastic caps do not require mortar seal. The hardened mortar shall be smooth to rub with no sharp edges. Use of grade rings with cam-lock ring and cover are not allowed, unless approved by the PWC Project Coordinator. **Use of grade rings is not allowed for above grade adjustments.**

All exterior manhole riser joints, including the joint at the cone, shall be sealed with an external rubber sleeve. The sleeve shall be made of stretchable, self-shrinking rubber, with a minimum thickness of 30

mils. The back side of each wrap shall be coated with a cross-linked reinforced butyl adhesive. The butyl adhesive shall be a non-hardening sealant, with a minimum thickness of 30 mils. The seal shall be designed to stretch around the manhole joint and then overlap to create a fused bond between the rubber and butyl adhesive. The application shall form a continuous rubber seal for the life of the application. The sealing system shall be as manufactured by Concrete Sealants, Inc. (Con-Seal), Sealing Systems, Inc., or approved equal. The wrap shall be a minimum of six (6) inches in width, and shall be centered on the joint. All manhole joints (including the cone section to the last riser) shall be wrapped and sealed. Care shall be taken to prevent damage to the wrap during backfill operations. The manhole surface shall be prepared in accordance with manufacturer's specifications, prior to installing the joint wrap.

Materials shall not enter the sewer line during construction of the manhole. The manhole shall be kept clean of any and all debris or materials. Any debris or material that entered the manhole shall be immediately removed. This condition shall be maintained until final acceptance of the work.

### CONNECTION TO EXISTING MANHOLES OR LIFT STATIONS

All connections to existing manholes and/or lift stations shall be approved by the Public Works Commission. Where new mains are to be connected to existing active sanitary sewers, the active sewers shall remain in service. Unless otherwise indicated, where new lines are connected into existing manholes, all or such portion of the manhole invert as is necessary shall be removed and a new invert shall be constructed to accommodate both new and existing flows. All work shall conform to the requirements specified for new manholes. The existing structure connection shall be cored and a flexible watertight connection (i.e., boot) installed. The boot shall be installed in accordance with Public Works Commission standard details and requirements. The Contractor shall coordinate and cooperate with the Public Works Commission's Project Coordinator.

### PIPE TO MANHOLE CONNECTOR (BOOT)

A watertight, flexible pipe-to-manhole connector shall be utilized on all pipe to manhole connections, for both new and existing manholes and pipes, unless otherwise specifically authorized in writing by the Public Works Commission.

The connector assembly shall be the sole element to provide a watertight seal of the pipe to the manhole or other structure. The connector shall consist of a rubber gasket, an internal compression sleeve, and one or more external take-up clamps. The connector shall consist of natural or synthetic rubber and Series 300 non-magnetic stainless steel. No plastic components shall be allowed.

The rubber gasket shall be constructed of synthetic or natural rubber, and shall meet or exceed the requirements of ASTM C-923. The connector shall have a minimum tensile strength of 1,600 psi. The minimum cross-sectional thickness shall be 0.275 inches.

The internal expansion sleeve shall be comprised of Series 300 non-magnetic stainless steel. No welds shall be utilized in its construction.

Installation of the connector shall be performed utilizing a calibrated installation tool furnished by the connector manufacturer. Installation shall require no re-tightening after the initial installation. Installation shall be done in accordance with the manufacturer's instructions.

The external compression take-up clamps shall be Series 300 non-magnetic stainless steel. No welds shall be utilized in its construction. The clamps shall be installed utilizing a torque-setting wrench furnished by the connector manufacturer. Installation shall be done in accordance with the manufacturer's instructions.

The Contractor shall utilize the proper size connector in accordance with the connector manufacturer's recommendations. All dead-end pipe stubs shall be restrained in accordance with ASTM C-923.

The finished connection shall provide a sealing to a minimum of 13 psi, and shall accommodate a minimum pipe deflection of seven (7) degrees without the loss of seal.

The pipe to manhole connector shall be PSX: Direct Drive as manufactured by Press-Seal, or approved equal.

#### INSIDE DROP MANHOLE STRUCTURE

Inside manhole drop structures shall be constructed and installed in accordance with Public Works Commission standard details.

#### CLEANING

Prior to final inspection, all sanitary sewer laterals, mains, and manholes newly installed on the collection system shall be flushed and cleaned. During the flushing operation, the downstream manhole shall be closed with a watertight plug to protect the existing sewer main. All water and debris shall be removed and properly disposed of by the Contractor. This condition shall be maintained until the Public Works Commission issues final acceptance for the project.

#### TESTING

Completed sewers shall be tested in accordance with the provisions outlined below. The Contractor shall furnish all equipment, labor, materials, and pay all costs associated with the tests performed. The Contractor shall schedule all testing with the Public Works Commission's Project Coordinator, a minimum of 48 hours in advance. The Contractor shall cooperate with the Public Works Commission's Project Coordinator and furnish any needed assistance necessary to complete the required testing.

For annexation and/or retrofit projects: No testing shall be conducted prior to successful completion of the compaction testing.

For all other projects: No testing shall be completed until all utilities are installed, prior to preparation of the road subgrade. The Contractor may elect to perform testing to satisfy them that the sewer utility is

installed properly prior to commencing installation of other utilities. However, such testing shall not be construed as acceptance by PWC.

The deflection/mandrel test shall not be performed until a minimum of thirty (30) calendar days after backfill operations are completed and the area graded to final contours. In lieu of waiting thirty (30) calendar days, the Contractor has the option to have an independent testing laboratory verify that compaction has been completed to achieve the maximum density as shown in the detail. The location and elevation of the compaction testing shall be determined reviewed and approved by the Public Works Commission’s Project Coordinator. The Contractor shall provide the Public Works Commission with a copy of the density testing results.

Compaction testing shall be done in accordance with Specification Section 02222 – Excavation and Backfilling for Utility Systems.

Vacuum Testing Manholes:

All precast sanitary sewer manholes installed by the Contractor shall be vacuum tested for leakage. This test shall be done in accordance with ASTM C-1244 and in the presence of a Public Works Commission Project Coordinator. The Contractor shall be responsible for providing all the necessary labor, materials, equipment, testing apparatus, and all other incidentals necessary to complete the vacuum test. All testing equipment utilized shall be approved for use in vacuum testing manholes.

Each manhole shall be tested after assembly. All lift holes shall be plugged with an approved non-shrink grout. All lines, including laterals, entering the manhole shall be temporarily plugged. The Contractor should take care to ensure that the pipes and plugs are secure in place to prevent them being drawn into the manhole. The test head shall be placed directly on top of the concrete surface of the manhole following the manufacturer’s recommendations, rather than to the cast iron seating ring.

Manholes may be tested either prior to backfill or post backfill at the contractor’s option. For pre-backfill testing, a vacuum of 10 inches of Mercury (inches Hg) shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 inches of Mercury (inches Hg). The manhole is acceptable if the time for the vacuum reading to drop from 10 inches of Mercury to 9 inches of Mercury meets or exceeds the values indicated below:

<u>Manhole Depth</u>	<u>Diameter of Manhole</u>		
	<u>4’ Diameter</u>	<u>5’ Diameter</u>	<u>6’ Diameter</u>
10’ or less	25 sec	33 sec	41 sec
11’ to 15’	38 sec	49 sec	62 sec
16’ to 20’	50 sec	65 sec	81 sec
21’ to 25’	62 sec	82 sec	101 sec

**25' to 30'**

**74 sec**

**98 sec**

**121 sec**

Vacuum testing backfilled manholes is not recommended in the presence of groundwater. Vacuum testing a backfilled manhole that is subjected to hydrostatic pressure may exceed the design limits of the flexible connectors and could lead to failure of the structure, joints, and/or connectors. Where groundwater is present a reduction in the vacuum pressure applied to the manhole will be required. The vacuum shall be reduced by 1 inch of Mercury for every 1 foot of hydrostatic head between 12 feet and 21 feet. A vacuum test should not be performed when the hydrostatic head exceeds 22 feet. See the chart below:

Hydrostatic Head (ft)*	12	13	14	15	16	17	18	19	20	21	22
Vacuum Pressure (in Hg)	10	9	8	7	6	5	4	3	2	1	**

\*Hydrostatic head above the critical connector (critical connector is bottom most flexible connector)

\*\*Do not perform vacuum test

If the manhole fails the initial test, the manhole shall be repaired by an approved method until a satisfactory test is obtained. All repair methods shall be approved by the Public Works Commission prior to being utilized. Retesting shall be performed until a satisfactory test is accomplished.

**Mandrel Testing:**

Deflection tests shall be performed on all PVC pipe installations. PVC pipe's maximum deflection after backfilling shall not exceed five (5) percent. The rigid ball or mandrel used for the deflection test shall have a diameter not less than 95 percent of the base inside diameter or average inside diameter of the pipe depending on the type of pipe manufactured and the applicable ASTM Standard. The PVC pipe shall be measured in compliance with ASTM D2122 "Standard Test Method of Determining Dimensions of Thermoplastic Pipe and Fittings". The Contractor shall supply all labor, equipment and materials necessary to perform the test in the presence of the Public Works Commission's Project Coordinator. The test shall be performed without mechanical pulling devices. The mandrel shall be constructed so as to preclude any yield in diameter, and with a pull line on each end to facilitate withdrawal. If the deflection exceeds the allowable, the Contractor shall remove and replace the pipe.

**Air Testing:**

Air testing shall be performed on all mains and laterals to determine acceptability. The length of sewer subject to an air test shall be the distance between two adjacent manholes. The tests shall be conducted in accordance with the appropriate ASTM standard. The air test shall be coordinated with the Public Works Commission. The Contractor is required to supply all equipment, labor, materials and pay all costs associated with the test performed.

**Air Test for PVC Pipe**

The low pressure air test on PVC pipe shall be performed with satisfactory results in accordance with ASTM F1417 "Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using

Low-Pressure Air". The pipe, including lateral assemblies, shall be plugged and air added slowly until the internal pressure of the line is raised to 4.0 psi. After the pressure of 4.0 psi is obtained, regulate the air-supply so that the pressure is maintained between 3.5 and 4.0 psi for at least two (2) minutes, depending on air/ground temperature conditions. The pressure will drop slightly until equilibrium is obtained; however, a minimum of 3.5 psi is required. Once the 3.5 psi is maintained, the test will begin. If the pressure drops 1.0 psi within the time indicated below, the test fails.

Pipe Dia (in)	Minimum time (minutes)	Length for Min Time (ft)	Time for Longer Length (sec)
4	3:46	597	0.380L
6	5:40	398	0.854L
8	7:34	298	1.520L
10	9:26	239	2.374L
12	11:20	199	3.418L
15	14:10	159	5.342L
18	17:00	133	7.692L
21	19:50	114	10.470L
24	22:40	99	13.674L
27	25:30	88	17.306L
30	28:20	80	21.366L
33	31:10	72	25.852L
36	34:00	66	30.768L

The Contractor shall observe all safety precautions to include allowing no one in the manholes during testing, securing all plugs and providing additional plug bracing. The Contractor shall be required to furnish, install and remove after testing at no additional cost, a temporary glue cap/plug to be airtight for all cleanout stacks to accomplish air testing. The air pressure shall never exceed 8 psi. All gauges shall be accessible outside of the manholes.

## HYDROSTATIC TESTS

After the ductile iron sewer pipe has been laid within the "protected" area and backfilled to finished grade, the pipe shall be subjected to a hydrostatic pressure test. All laterals within the "protected" area shall be ductile iron. All sewers subject to hydrostatic testing shall include (1) sewers entering or crossing streams, (2) sewers located less than 100 feet from any public or private water supply source including any WS-I waters or Class I or Class II impounded reservoirs, (3) where the minimum 18 inch vertical and 10 feet horizontal separation cannot be maintained between sewers and water mains (see NC DENR Regulations), or (4) as specified and/or indicated on the drawings. The Contractor will furnish all labor and material, including test pumps, plugs, and all other incidentals for making hydrostatic tests. Hydrostatic pressure testing shall be conducted on the completed main, including the laterals.

The duration of the pressure test shall be at least one hour or longer, as directed by the Public Works Commission. The hydrostatic pressure shall be 150 psi. Each section of pipe shall be slowly filled with water and the specified test pressure based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the



pipe in a manner satisfactory to the Public Works Commission. Before applying the specified test pressure, all air shall be expelled from the pipe.

All joints showing visible leaks shall be made tight. Cracked or defective pipe, joints, laterals, and fittings discovered in consequence of the pressure test shall be removed and replaced with sound material, and the test shall be repeated until the test results are satisfactory. The requirement for the joints to remain exposed for the hydrostatic test may be waived by the Public Works Commission in certain situations. The test shall be repeated until satisfactory to the Public Works Commission.

The results of the pressure tests shall be satisfactory as specified. All replacement, repair, or retesting shall be accomplished by the Contractor. All repairs shall be reviewed and approved by the Public Works Commission prior to backfill. The use of couplings, sleeves, etc. shall be reviewed and approved by the Public Works Commission prior to use.

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**PRELIMINARY**  
 NOT FOR SALE OR CONSTRUCTION

GENERAL SITE IMPROVEMENTS

REVISIONS	mm-dd-yy	Description
0		

**ACTION PATHWAYS**  
**HEADSTART CHILD CARE FACILITY**  
**REPLACEMENT**  
 DEEP CREEK RD, FAYETTEVILLE, NC

**SITE LAYOUT PLAN**

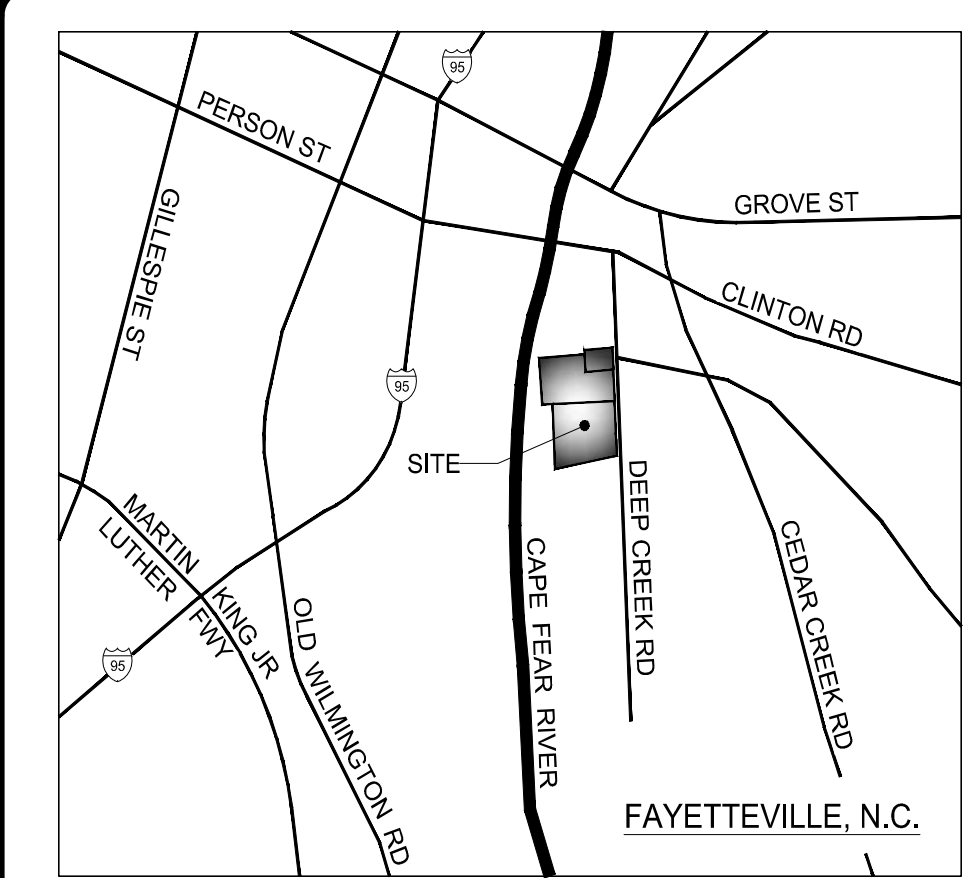
PROJECT DETAILS  
 Project Manager: FDC  
 CAD Technician: DJL  
 Reviewed / Approved By: FDC  
 Project Number: 21026

SCALE 0 30 60  
 Full Scale: 1" = 30'

ISSUE DATE: 4/3/2024

SHEET NUMBER

**C2.0**



VICINITY MAP (N.T.S.)

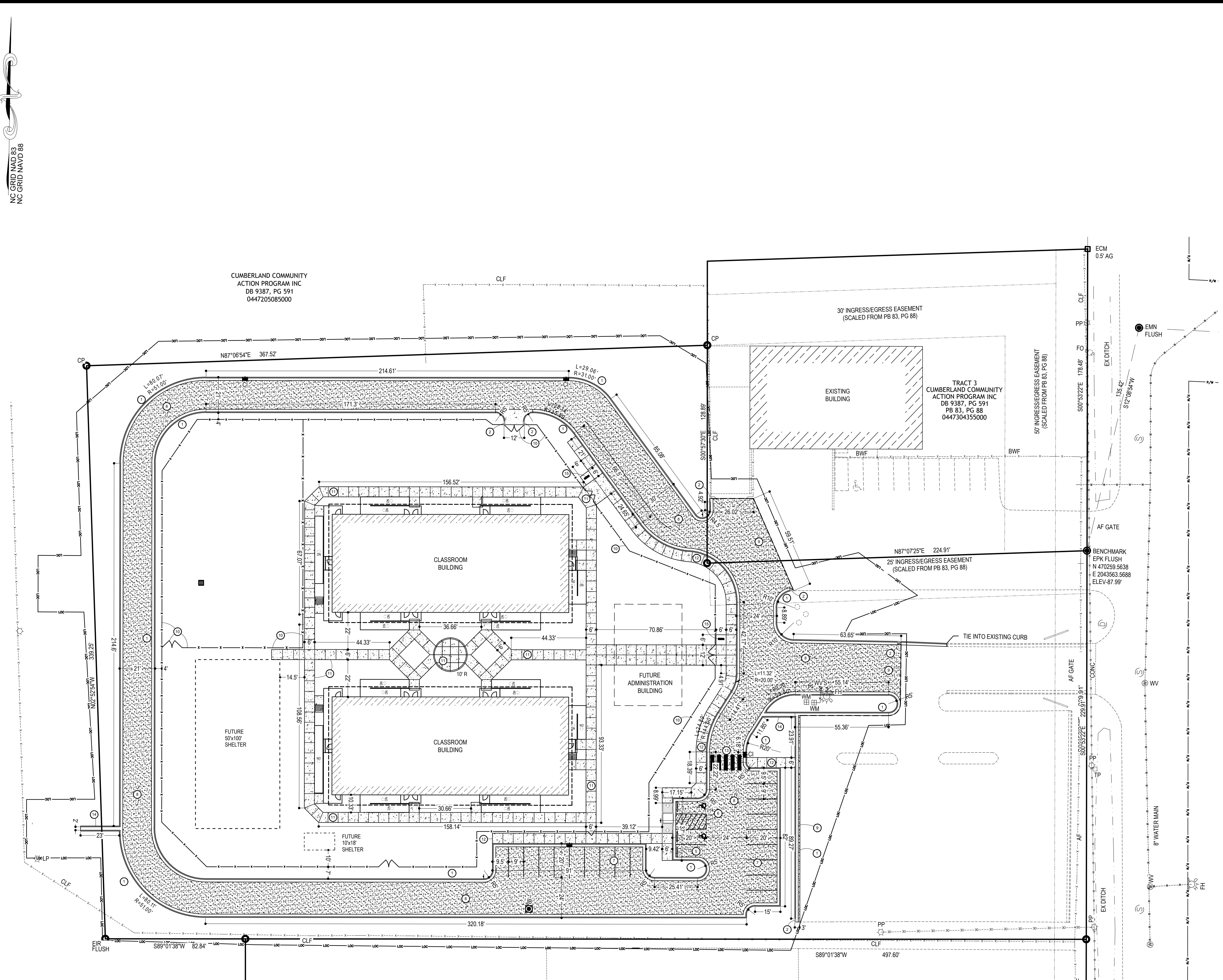
**SITE NOTES**

- 1 CONCRETE CURB & GUTTER: 24-INCH (SEE SHT C5.0, CDC-01.1207)
- 2 CONCRETE CURB TAPER. (SEE SHT. C5.0, CDC-01.1214)
- 3 ACCESSIBLE NON-WING IN LINE TYPE RAMP WITH TRUNCATED DOMES. (SEE SHT C5.0, CDC-01.1602)
- 4 WHEEL STOPS. (SEE SHT C5.1, CDC-01.1225)
- 5 PARKING SPACE STRIPING/ADA ACCESSIBILITY SIGNAGE. (SEE SHT C5.0, CDC-01.1813)
- 6 PAINT STRIPES.
- 7 LIGHT DUTY ASPHALT PAVEMENT. (SEE SHT C5.0, CDC-01.1910)
- 8 SAWCUT AND PATCH EXISTING ASPHALT. (SEE SHT C-5.0, CDC-01.1905.)
- 9 6' CHAIN LINK FENCE. (SEE SHT C5.0, CDC-01.2104)
- 10 STANDARD CONCRETE SIDEWALK. (SEE SHT C5.0, CDC-01.2509)
- 11 STANDARD CONCRETE SIDEWALK WITH CURB & GUTTER. (SEE SHT C5.0, CDC-01.2502)
- 12 HIGH VISIBILITY PED CROSSWALK. (SEE SHT C5.1, CDC-01.1802)
- 13 CONSTRUCT FLUME. (SEE SHT C5.1, CDC-01.1501)
- 14 SINGLE GRID TYPE BIKE RACK. (SEE SHT C5.1, CDC-01.2606)

**ADDITIONAL NOTES**

1. ALL GENERAL NOTES, ABBREVIATIONS, SYMBOLS, AND OTHER INFORMATION INDICATED ON SHEET C0 SHALL APPLY TO THIS PLAN
2. ALL ELEVATIONS SHOWN ARE IN REFERENCE TO THE BENCHMARK AND MUST BE VERIFIED BY THE GENERAL CONTRACTOR WITH THE SURVEYOR OF RECORD PRIOR TO BEGINNING CONSTRUCTION. BENCHMARK IS A CONTROL NAIL LOCATED SOUTH OF PROJECT SITE, WITH COORDINATES N 469587.0442, E 2043226.8944 AND HAVING AN ELEVATION OF 86.00'.

CLASSROOM STRUCTURES AND ADJOINING ADA RAMPS AND STAIRS SHALL BE PROVIDED AND INSTALLED BY MODULAR MANUFACTURE. THE CONTRACTOR SHALL COORDINATE WITH MODULAR MANUFACTURE DURING THE INSTALLATION OF THE STRUCTURES.



THE INTENT OF THIS PLAN IS TO REPRESENT THE GENERAL IMPROVEMENTS REQUIRED FOR THE SITE. THE BID PLANS SHALL BE PROVIDED AS A FULL SET TO INCLUDE SITE, GRADING, UTILITIES AND LANDSCAPING.