50168691

TECHNICAL SPECIFICATIONS

BAILEY ROAD PARK EXPANSION – PHASE 1

APRIL 24, 2024

Dewberry

SUBMITTED BY
Dewberry Engineers Inc.
9300 Harris Corner Parkway, Ste. 220
Charlotte, NC 28269
704-509-9918
NCBOLA #C-478
NCBELS – F-0929

PREPARED FOR
Town of Cornelius
21445 Catawba Ave
Cornelius, NC 28031
704-892-6031

Exceptional Parks, Greenways, and Community Experiences

00 00 00 Procurement and Contracting Requirements

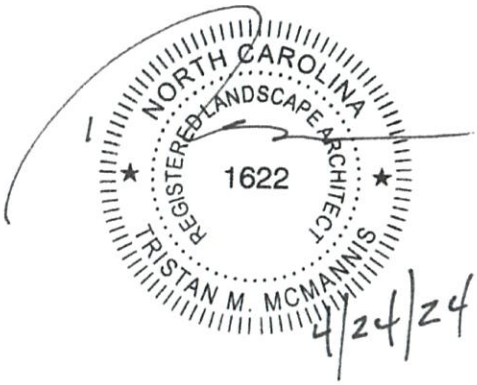
SECTION 00 01 07 – SEALS PAGE

1.1 DESIGN PROFESSIONALS OF RECORD

CIVIL ENGINEER **Daniel Jones**
North Carolina Professional Engineer License # 053058

For Utility Design

LANDSCAPE ARCHITECT **Tristan McMannis**
North Carolina Professional Landscape Architect #1622



For Site Design

END OF SECTION 00 01 07

TABLE OF CONTENTS

00 10 00 Solicitation

00 11 00 Advertisements and Invitations

00 11 00 Advertisements and Invitations

00 11 16 Invitation to Bid

00 11 16 – INVITATION TO BID

FOR THE CONSTRUCTION OF
Bailey Road Park Expansion – Phase 1
CORNELIUS, NORTH CAROLINA

SEALED BIDS for Bailey Road Park Expansion – Phase 1 will be received by the Town of Cornelius. The proposed work consists of converting three (3) existing tennis courts into ten (10) pickleball courts, the construction of six (6) new tennis courts, the expansion of an existing parking lot, the construction of a new parking lot, the expansion of an existing dry detention pond, construction of a new sand filter BMP, rough grading for tennis courts and parking to be constructed during Phase 2, and water/sewer service extensions to serve a restroom building to be constructed during Phase 2, with associated clearing, demolition, erosion control, grading, stormwater, landscaping, and concrete work.

Written, sealed bids should be delivered to Troy Fitzsimmons, Park and Recreation Director, PO Box 399, Cornelius, NC 28031, or express or hand delivered to the Cornelius Town Hall, 21445 Catawba Ave., Cornelius NC 20831, and clearly marked "Bailey Road Park Expansion – Phase 1". Bids are due by **3:00 pm on May 30th, 2024**. Bids will be publicly opened and read aloud at this time in room 204 of the Cornelius Town Hall. Please note that the terms of the bid documents and your response thereto will be incorporated into the terms of the final contract if your firm is the selected contractor.

A mandatory pre-bid meeting shall be held at **11:00 am on May 14th, 2024** at the project site located at 11536 Bailey Road, Cornelius, NC 28031. In the event of inclement weather, the pre-bid meeting shall be held in room 204 of Cornelius Town Hall. Any questions regarding this meeting should be directed to Adam Abernathy, Assistant Director of Parks and Recreation at (704) 892-6031 ext. 164.

The entire Bid Package may be obtained from TPM, 900 Pressley Road, Charlotte, NC, (704)-527-7881. All costs of printing bid documents shall be the responsibility of the Bidder and are non-refundable. There will be an additional charge for postage and handling for each set mailed to a prospective bidder.

Each Bid must be accompanied by cash, cashier's check, certified check on a bank or trust company insured by the Federal Deposit Insurance Corporation, or Bid Bond in the amount not less than five percent (5%) of the amount of the Bid in the form and subject to the conditions provided in the Information for Bidders.

The Bidding Documents are on file at the Town of Cornelius Parks and Recreation Department (704-892-6031) and in the following Plan Rooms:
Carolina Association of General Contractors (AGC) (704) 372-1450
McGraw-Hill Construction/F.W. Dodge http://dodgeprojects.construction.com
Metrolina Minority Contractors Association, and Mecklenburg County Minority, Women & Small Business Enterprise Program (M/W/SBE) (877) 526-6205

The laws of North Carolina and applicable regulations of various Licensing Boards and M/W/SBE provisions will be observed in receiving bids and awarding contracts.

The Town of Cornelius, North Carolina reserves the right to reject any or all bids, and to waive all informalities not involving price, time, or changes in the Work. Bidders must be licensed contractors in the State of North Carolina.

TOWN OF CORNELIUS PARKS AND RECREATION DEPARTMENT

00 20 00 Instructions to Procurement

00 21 00 Instructions

00 21 00 Instructions

00 21 13 Instructions to Bidders

00 21 13 – INSTRUCTIONS TO BIDDERS

1. **FAMILIARITY WITH WORK AND CONDITIONS:** Before preparing Bids, Bidders are urged to visit the site to inform and familiarize themselves with all conditions involved and under which the project is to be constructed or apparatus erected or installed. The Owner will not be responsible to the Contractor for payments other than as set out in the Construction Contract should construction conditions be different from those assumed or contemplated by the Contractor. The Contractor is required to satisfy himself, before bidding, as to the correctness of the site as indicated by the Contract Documents.

2. **FAMILIARITY WITH LAWS, ETC.:** The Bidder shall be familiar with all Federal, State and Local Laws, ordinances and regulations, which may in any manner affect those engaged or employed in Work, or the materials or equipment in or upon the Work, or in any way affect the conduct of the Work, and no pleas of misunderstanding will be considered on account of the ignorance thereof. If the Bidder or Contractor shall discover any provisions in the plans, specifications or Construction Contract (hereinafter sometimes referred to as "Contract") which are contrary to or inconsistent with any such law, ordinance, or regulation, he shall immediately report it to the Consultant in writing before the bid opening.

3. **INTERPRETATIONS OF PLANS AND SPECIFICATIONS:** If any prospective Bidder is in doubt as to the true meaning of any part of the Contract Documents, he shall submit to the Consultant no later than seven (7) calendar days prior to the bid opening, a written request for an interpretation thereof.

   Any interpretation of the proposed documents will be made only by Addenda to the Contract Documents, which will be sent to all persons to whom Contract Documents have been issued. Interpretations, corrections and changes in Contract Documents made in any other manner will not be binding.

   All such addenda shall become part of the Contract Documents. The Consultant and the Owner will not be responsible for any other explanations or interpretations.

   The Bid Proposal shall be based upon the materials and equipment described in the Contract Documents or on substitutions that have been approved for use on this project. The proposal shall include any fees associated with the Town of Cornelius, Mecklenburg County and City of Charlotte plan review & permits.

4. **INSURANCE, PERFORMANCE & PAYMENT AND MATERIAL BOND:** See the General Conditions for Insurance, Performance & Payment and Material Bond requirements.

5. **PROPOSAL FORM:** All forms included in the bidding documents shall be completed in ink or be typewritten. Both words and figures shall be indicated on the bid proposal form. If there is a discrepancy between the wording and the figures, the wording shall govern. With each bid, the Contractor shall include Certification of Non-Discrimination in Employment, Certification of Compliance with Americans with Disabilities Act, Bid Bond, M/W/SBE Good Faith Effort, and either M/W/SBE Forms I or II. If there are any omissions, lines left blank on the bid form, or alterations, qualifiers of the bid form; the bid proposal shall be deemed as non-responsive unless such omission, alteration or qualifier is waived by the Owner as an informality or technicality in the Owner's sole discretion. If an Alternate does not change the "Base Bid" then the Contractor shall enter "No Change" in the blank. A person that is legally authorized to bind the Contractor to a contract with the Owner shall sign the proposal. The signer of the bid proposal shall initial any

corrections.

The Contractor shall bid the number of calendar days, unless indicated otherwise within the Contract Documents, required to complete the Work.

6. **QUALIFICATIONS:** If applicable, bidders will find special information in the Supplementary Conditions for this project regarding the Contractor's Qualification Statement. The Owner reserves the right to disqualify a bid if the bidder does not possess the minimum stipulated qualifications for the Work, or has not provided the requested information.

7. **BID BOND OR BID DEPOSIT:** Each proposal must be accompanied by a Bid Bond executed by a corporate surety licensed under the laws of North Carolina to execute such bonds, conditioned that the surety will, upon demand forthwith make payment to the Owner if the bidder fails to execute the Contract. The Bid Bond shall be in the amount of five (5%) percent of the total bid plus all of the alternates. The Bid Bond shall be valid for a minimum of ninety (90) calendar days. In lieu of a Bid Bond, a deposit equal to five (5%) percent of the total bid plus all of the alternates in the form of a Cashier's Check or Certified Check on some bank or trust company insured by the Federal Deposit Insurance Corporation and payable to The Town of Cornelius. The purpose of the Bid Deposit or Bid Bond is to ensure that the bidder will enter into a Contract with the Owner with the terms stipulated in the Bid Proposal and the bidder guarantees that a Performance, Labor & Material Bond will be executed. If the Contractor fails to execute a Contract, the Bid Bond or Bid Deposit shall be seized. Bid security shall be submitted separately for each project and bid.

8. **DIRECTING PROPOSALS:** Each proposal must be complete and independent including bid proposal forms, bid security, etc. Each proposal must be submitted in a sealed envelope, to indicate its contents without being opened. The name of the Bidder, his address and license number must be marked on the outside of the envelope. This envelope shall be placed in another opaque envelope: indicating the project name, the bid date, and sent to the address indicated in the "Notice to Bidders". No verbal or electronic bids will be accepted.

9. **OPENING OF PROPOSALS:** Properly submitted bids will be opened publicly and read promptly at the time, date, and place set forth in the "Notice to Bidders". Bidders or their authorized agents and other interested parties are invited to be present.

10. **BID ERROR:** After the bid opening, if the low bidder finds he has made an error that is clerical in nature and he can support his claim with evidence as defined by law he may request to withdraw the bid. This written request shall be submitted within a period of 72 hours after the opening of bids. Following such event, if the Owner approves the bid withdrawal request in accordance with North Carolina law, action on the remaining bids shall be as if the withdrawn bid had not been received. The Contract shall be awarded to the next responsible, responsive low bidder.

11. **BID VALIDITY:** The Bid Proposal shall be deemed valid for a period of ninety (90) calendar days after the opening thereof, for purposes of execution of the Contract.

12. **AWARDING OF CONTRACT:** The Owner will award a Contract conditioned on the availability of funds. The Owner shall have the right to accept Alternates in any order or combination. The Owner shall award the Contract to the lowest responsible, responsive bidder taking into considerations quality, performance, and the time specified in the Bid Proposal for the performance of the Contract. The Owner reserves the right to negotiate with the apparent lowest responsible, responsive bidder to reduce the scope of the Work to be within budget. The Owner also reserves the right to reject any or

all proposals and to waive informalities or technicalities. After the project has been awarded to the Contractor by the Owner, the Owner shall prepare a Contract for the Contractor to execute. Notice to Proceed shall be issued after all parties have executed the Contract.

13. EXECUTION OF CONTRACT: The successful bidder shall execute the Contract within ten (10) calendar days of receipt of the Contract. Failure to execute the Contract can result in the forfeit of the Bid Bond or Bid Deposit.

14. NON-DISCRIMINATION IN EMPLOYMENT: During the performance of the Contract, the Contractors must agree as follows:

The Contractors will not discriminate against any employee or applicant for employment because of race, color, religion, sex, disability or national origin. The Contractors will take affirmative action to ensure that applicants are employed and that employees are treated equal during employment without regard to race, color, religion and handicap. Such action will include, but not limited to, the following: employment, upgrading, demotion, or transfer, recruitment, or recruitment advertising, layoff or termination: rates of pay or other forms of compensation: and selection of training, including apprenticeship. The Contractors agree to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Local Public Agency setting forth the provisions of this non-discrimination clause.

Bidders must submit with their initial bid a signed statement certifying compliance with requirements of this proposal regarding non-discriminatory employment practices.

15. MINORITY/WOMEN/SMALL BUSINESS ENTERPRISE OPPORTUNITY:
It is the policy of the Owner to provide minorities, women, and small business enterprises equal opportunity for participating in all aspects of the Town/County's contracting and procurement programs, including but not limited to employment, construction development projects, materials/services contracts and/or lease agreements, consistent with the laws of the State of North Carolina. It is further the policy of The Owner to prohibit discrimination against any person or business in pursuit of these opportunities on the basis of race, color, national origin, religion, sex, age, handicap or veteran's status. It is further the policy of the Owner to conduct its contracting and procurement programs so as to prevent such discrimination and to resolve any and all claims of such discrimination.

16. AMERICANS WITH DISABILITIES ACT REQUIREMENTS: The Owner will comply with the Americans with Disabilities Act (ADA), which prohibits discrimination on the basis of a disability. The Owner will make reasonable accommodations in all programs to enable participation by an individual with a disability who meets essential eligibility requirements. The Owner's programs will be available in the most integrated setting for each individual. If any accommodations are necessary for participation in any program or services, participants are encouraged to notify Town Staff. Bidders must also submit a signed statement as provided herein, certifying compliance with the requirements of the Americans with Disabilities Act regarding non-discriminatory employment practices.

17. SUBSTITUTIONS: All Requests for approval of substitutions for specified products will be considered only upon submission of samples and manufacturers' data, in triplicate, of the product intended for substitution. The Consultant, no later than fourteen (14) calendar days prior to the bid opening, must receive all written requests for proposed substitutions for consideration. If the Consultant accepts any proposed substitutions, such acceptance will be set forth in an addendum.

18. DIGITAL FILES: Copies of the digital grading files are available only at Dewberry Engineers Inc, 9300 Harris Corners Parkway, Suite 220, Charlotte, NC, 28269, 704-264-1275, for contractors to purchase and pick up for use in determining earthwork quantities only. Contractor shall submit request for digital files at least five (5) business days prior to the date that files are needed to allow for processing of files and execution of file release agreements.

19. BEST PRACTICE NOTICE: If a contractor has a set of Contract Documents (plans and specifications) that he did not purchase from the Town's authorized distributor, it will be the contractor's responsibility to obtain all addenda. These plans and specifications should be sold only as a full and complete set of documents. If a contractor bids any portion of these plans without receiving the full and complete set of plans and specifications he will do so at his own risk. If the contractor's bid is accepted by the Town, the Contractor will be liable for all work described in the Plans, Specifications, and Addenda.

END OF INSTRUCTIONS TO BIDDERS

00 30 00 Available Information

00 31 00 Available Project Information

00 31 00 Available Project Information

00 31 46 Permits

00 40 00 Procurement Forms and Supplements

00 42 00 Proposal Forms

00 42 13 Proposal Form – Stipulated Sum (Single-Prime Contract)

SINGLE PRIME CONTRACT
GENERAL CONSTRUCTION
PROPOSAL

Bailey Road Park Expansion
Phase 1
for Town of Cornelius
Cornelius, North Carolina.
PREPARED BY:

Dewberry Engineers Inc.
9300 Harris Corners Parkway, Suite 220
Charlotte, NC 28269
Phone (704) 264-1275

Bid Date: _____

TO: Town of Cornelius
North Carolina

From: _____
Name of Bidder

The undersigned Bidder hereby declares that his Proposal is made without connection with any other person, company, or parties making a similar bid or proposal, and that it is in all respect fair and in good faith, without collusion or fraud. It is the Bidder's intention & purpose to enter into a Contract with the Town of Cornelius. The Bidder signifies that his bid is all-inclusive to perform the Work to construct the Bailey Road Park Expansion – Phase 1 as illustrated in the Contract Document prepared by Dewberry Engineers Inc. dated April 24, 2024. The Bidder has carefully examined the Contract Document and Proposal Form and is familiar with the scope, details, intent, and conditions under which the Work, or any part of it, is to be done, and the conditions which must be fulfilled in the furnishing and/or erection or construction of any or all items of the Work.

The Bidder hereby proposes to furnish all labor, materials, equipment and services necessary to perform the Work required in the Construction Document and terms of this Proposal for the amounts listed below.

BASE BID: $_____ (LS)

Base bid consists of converting three (3) existing tennis courts into ten (10) pickleball courts, the construction of six (6) new tennis courts, the expansion of an existing parking lot, the construction of a new parking lot, the expansion of an existing dry detention pond, construction of a new sand filter BMP, rough grading for tennis courts and parking to be constructed during Phase 2, and water/sewer service extensions to serve a restroom building to be constructed during Phase 2, with associated clearing, demolition, erosion control, grading, stormwater, landscaping, and concrete work.

Allowance #1 – Unsuitable Soil Undercut and Replacement with Structural Fill:

Based on report titled: "Geotechnical Engineering Report: Bailey Road Park Tennis Courts" prepared by Carolinas Geotechnical Group dated May 5, 2023, we anticipate the presence of unsuitable soils on site and the need to undercut unsuitable soils under structural and pavement limits as outlined in the Geotechnical Report. This allowance shall be paid for as noted and as specified in the Contract Documents to include, but not limited to, all fees and costs to provide all equipment, material, and manpower to dispose of unsuitable soil legally on-site, backfill with acceptable material within the limits of excavation, compact, and test the soil in the project limits. The contractor shall be responsible to review the Geotechnical Report referenced above prior to bid.

2600 CY @ $_____**/CY =** $_____

TOTAL BID (Base Bid + Allowance #1):
$_____

The Town reserves the right to award the contract based on Base Bid only, or combination of Base Bid and any/all of the Alternate Bid Items below. The Bidder shall indicate if the Alternate is an add or deduct for the overall bid. If the Alternate is left blank, then the Alternate will not change the Base Bid if accepted. The Bidder agrees to provide the Alternates as described in the Contract Documents for the following prices:

Alternate – No alternates are proposed for this project.

The undersigned further agrees to begin the work promptly upon receipt of Notice to Proceed and to pursue the work with an adequate work force to substantially complete the work within two hundred and seventy (270) calendar days of Notice to Proceed. Five Hundred Dollars ($500.00) per calendar day is hereby agreed upon as the Liquidated Damages.

Check, Cash, or Bond is attached in the amount of $_____.

The undersigned Bidder further proposes and agrees to commence the work promptly upon notice to proceed, with adequate forces.

The Bidder acknowledges receipt of the following addenda:

Addendum No.___ Dated _____
Addendum No.___ Dated _____
Addendum No.___ Dated _____
Addendum No.___ Dated _____
Addendum No.___ Dated _____

The undersigned has enclosed the following with this Proposal:

_____ Bid Bond or Bid Deposit
_____ M/WBE Form I or Form II
_____ Certificate of Nondiscrimination
_____ Certificate of Compliance with the Americans With Disabilities Act
_____ MWBE Good Faith Form

CONTRACTOR:_____

ADDRESS:_____

_____

_____

BY: _____

TTTLE:_____

Print Name:_____

N.C. License Number:_____

00 45 00 Representations and Certifications

00 45 46 Governmental Certifications

CERTIFICATION OF

COMPLIANCE WITH AMERICANS WITH DISABILITIES ACT

The undersign, being a licensed Contractor in North Carolina, do hereby agree to comply with all applicable requirements of the Americans With Disabilities Act throughout the duration of this contract.

Signed

Print or Type Name of Signing Official

Title

Firm

Address

City **State** **Zip**

Date

CERTIFICATION OF

NON-DISCRIMINATION IN EMPLOYMENT

The undersign, being a licensed Contractor in North Carolina, do hereby certify that we will not discriminate against employee or applicant for employment because of race, color, religion, sex, or national origin. We will take affirmative action to ensure that applicants are employed, and that employees are treated equal during employment without regard to race, color, or religion, or handicap. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer' recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation' and selection for training, including apprenticeship. We will agree to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Local Public Agency setting forth the provisions of this non-discrimination clause.

_____

Signed

_____

Print or Type Name of Signing Official

_____

Title

_____

Firm

_____

Address

_____

City **State** **Zip**

_____

Date

STATE AND COUNTY SALES/USE TAX STATEMENT AND CERTIFICATION

CONTRACT #_____ Period From _____ to _____ SHEET #_____

Contractor (or Sub-contractor's) name:_____

Address:

Address & PO Box City State Zip code

Project:

INVOICE NUMBER	INVOICE DATE	VENDOR'S NAME	Sub-Total Amount of Invoice	SALES/USE TAX		Name of County where purchased
				State	County	
		TOTALS=				

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

SWORN AND SUBSCRIBED BEFORE ME

BY:_____

THIS _____ DAY OF _____, 20__

TITLE:_____

_____

NOTARY PUBLIC

MY COMMISSION EXPIRES:_____

STATE OF NORTH CAROLINA

AFFIDAVIT OF E-VERIFY COMPLIANCE

COUNTY OF _____

****

I, _____(the individual attesting below), being duly authorized by and on behalf of

_____ (the entity bidding on a Town project or otherwise entering into a contract with the Town, hereinafter "Employer") after first being duly sworn hereby swears or affirms as follows:

1. Employer understands that E-Verify is the federal E-Verify program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law.

2. Employer understands that Employers Must Use E-Verify. Each employer, after hiring an employee to work in the United States, shall verify the work authorization of the employee through E-Verify in accordance with NCGS§64-26(a).

3. Employer is a person, business entity, or other organization that transacts business in this State and that employs 25 or more employees in this State. (mark Yes or No)

a. YES _____, or

b. NO _____

If "yes," Employer is in full compliance with federal and state E-Verify laws.

4. Employer's subcontractors also must comply with E-Verify. If Employer is the winning bidder on the Town project or enters into a contract with the Town, Employer will ensure compliance with E-Verify by any subcontractors subsequently hired by Employer that have 25 or more employees, or will have them attest to less than 25 employees.

This ____ day of _____, 20__.

_____

Signature of Affiant

Print or Type Name: _____

State of North Carolina County of _____

Signed and sworn to (or affirmed) before me, this the _____

day of _____, 2013.

My Commission Expires:

_____ _____

Notary Public

(Affix Official/Notarial Seal)

00 50 00 Contracting Forms and Supplements

00 52 00 Agreement Forms

00 52 00 Agreement Forms

00 52 13 Agreement Form – Stipulated Sum

Town of Cornelius
Standard Form of Agreement
Between the Town and the Contractor

AGREEMENT made as of the __ day of _____ of 202_

BETWEEN the Owner:

Town of Cornelius
PO Box 399
21445 Catawba Ave
Cornelius, NC 28031
Phone: 704-892-6031
Fax: 704-892-2462

and the Contractor:

_____
_____
_____

The Project is: Bailey Road Park Expansion – Phase 1

The Owner and Contractor agree as follows.

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement; these form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 8.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except to the extent specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement for this project shall be the date upon which the Contractor is given a notice to proceed from the Town of Cornelius.

§ 3.2 The Contract Time shall be measured from the date of commencement.

§ 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than 270 days from the date of commencement, or as follows:

Portion of Work	**Substantial Completion Date**
All of work associated with the Bailey Road Park Expansion – Phase 1	270 Days from the Notice to Proceed

subject to adjustments of this Contract Time as provided in the Contract Documents.

Contractor agrees to $500.00 Liquidated Damages for each consecutive calendar day after the end of the contract period.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be _____ dollars and _____ cents ($_____), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 The Contract Sum is based upon the following allowance hereby accepted by the Owner:
Not Applicable.

§ 4.3 Unit Prices provided by Contractor are attached to this contract as Exhibit A – Not Applicable - any overages on the unit prices will be reflective of the unit prices submitted with the Bid.

ARTICLE 5 PAYMENTS

§ 5.1 PROGRESS PAYMENTS

§ 5.1.1 Based upon Applications for Payment submitted to the Owner by the Contractor, the Owner on approval of such application shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month.

§ 5.1.3 Upon approval of the Contractor's application for payment by the Consultant, payment shall be made by the Owner not later than thirty (30) days after receipt of an acceptable and correct payment request from the Consultant. Application approval or disapproval by owner shall occur within fourteen (14) days of receipt of the application.

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Owner may require. This schedule, unless objected to by the Owner, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall indicate the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

.1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of five percent (5%). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in the Contract General Conditions (Exhibit F)

.2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of five percent (5%);

.3 Subtract the aggregate of previous payments made by the Owner; and

.4 Subtract amounts, if any, for which the Owner has withheld or nullified a Certificate for Payment as provided in the Contract General Conditions (Exhibit F)**.**

§ 5.1.7 The progress payment amount determined in accordance with Contract General Conditions (Exhibit F) shall be further modified under the following circumstances:

.1 Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to the full amount of the Contract Sum, less such amounts as the Architect shall determine for incomplete Work, retainage applicable to such work and unsettled claims; and

.2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance the Contract General Conditions (Exhibit F)**.**

§ 5.1.8 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.1.8 Each Application for Payment shall be accompanied by a North Carolina Sales or Use Tax Statement. The statement shall show the Invoice or Receipt Total, North Carolina Sales Tax paid, County Tax paid and which county the tax was paid to.

§ 5.1.9 Contractor shall provide Owner with lien waivers executed by all subcontractors within five business days of each progress payment. Failure to provide such lien waivers may be grounds for Owner to terminate the Agreement or suspend any future payments until compliance is achieved.

§ 5.1.10 Contractor shall provide Owner with an E-Verify form executed by all subcontractors within five business days of execution of this contract. Failure to provide such forms may be grounds for the Owner to terminate the Agreement or suspend any future payments until compliance is achieved.

§ 5.2 FINAL PAYMENT

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when:

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in the Contract General Conditions (Exhibit F) and to satisfy other requirements, if any, which extend beyond final payment; and

.2 A final Certificate for Payment has been issued by the Owner.

.3 Final Payment will be made when accompanied by closeout documents as described in the Contract General Conditions (Exhibit F).

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the final Certificate for Payment.

ARTICLE 6 TERMINATION OR SUSPENSION

§ 6.1 The Contract may be terminated by the Owner or the Contractor as provided in the Contract General Conditions (Exhibit F)**.**

§ 6.2 The Work may be suspended by the Owner as provided in the Contract General Conditions (Exhibit F)

ARTICLE 7 MISCELLANEOUS PROVISIONS

§ 7.1 Where reference is made in this Agreement to a provision of the Contract General Conditions (Exhibit F) or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 7.2 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

One Point Zero Percent (1%) per month.

§ 7.3 The Owner's representative is:

Troy Fitzsimmons
PARC Department Director
Town of Cornelius
PO Box 399
Cornelius, NC 28031
Phone: 704-892-6031

§ 7.4 The Contractor's representative is:

_____
_____
_____
_____
Phone: _____
Fax: _____

§ 7.5 Neither the Owner's nor the Contractor's representative shall be changed without ten days written notice to the other party.

§ 7.6 Other provisions:

Contractor shall purchase and maintain comprehensive general liability, automobile, and workman's compensation comp insurance coverages as detailed in the Contract General Conditions (Exhibit F) and shall list the Owner as an additional insured and loss payee on applicable insurance.

ARTICLE 8 ENUMERATION OF CONTRACT DOCUMENTS
§ 8.1 The Contract Documents, except for Modifications issued after execution of this Agreement are enumerated as follows:

§ 8.1.2 The Contract General Conditions (Exhibit F).

§ 8.1.3 The Supplementary and other Conditions of the Contract are those contained in the Project Manual (Bid Specifications) dated April 24, 2024.

§ 8.1.4 The specifications are those contained in the Project Manual (Bid Specifications) and the Drawings.

§ 8.1.5 The Drawings are as follows, and are as shown below:

Title of Drawings Exhibit: **Bailey Road Park Expansion – Phase 1 drawn by Dewberry Engineers Inc.:**

Project Name: Bailey Road Park Expansion – Phase 1

DRAWINGS

Civil Drawings by: Dewberry Engineers Inc.

Sheet#:	Sheet Title:	Date:	Revision Date:
T1.01	COVER SHEET	2/9/24	4/24/24
T0.02	TOPOGRAPHIC SURVEY (SHEET 1 OF 7)	2/9/24	4/15/24
T0.03	TOPOGRAPHIC SURVEY (SHEET 2 OF 7)	2/9/24	4/15/24
T0.04	TOPOGRAPHIC SURVEY (SHEET 3 OF 7)	2/9/24	4/15/24
T0.05	TOPOGRAPHIC SURVEY (SHEET 4 OF 7)	2/9/24	4/15/24
T0.06	TOPOGRAPHIC SURVEY (SHEET 5 OF 7)	2/9/24	4/15/24
T0.07	TOPOGRAPHIC SURVEY (SHEET 6 OF 7)	2/9/24	4/15/24
T0.08	TOPOGRAPHIC SURVEY (SHEET 7 OF 7)	2/9/24	4/15/24
C0.01	GENERAL NOTES (SHEET 1 OF 2)	2/9/24	4/24/24
C0.02	GENERAL NOTES (SHEET 2 OF 2)	2/9/24	4/24/24
C0.03	NCG01 NOTES (SHEET 1 OF 2)	2/9/24	4/24/24
C0.04	NCG01 NOTES (SHEET 2 OF 2)	2/9/24	4/24/24
C1.01	DEMOLITION AND PHASE I ESC PLAN - OVERALL	2/9/24	4/24/24
C1.02	DEMOLITION AND PHASE I ESC PLAN – AREA 1	2/9/24	4/24/24
C1.03	DEMOLITION AND PHASE I ESC PLAN – AREA 2	2/9/24	4/24/24
C2.01	SITE PLAN – OVERALL	2/9/24	4/24/24
C2.02	SITE PLAN – AREA 1	2/9/24	4/24/24
C2.03	SITE PLAN – AREA 2	2/9/24	4/24/24
C3.01	PHASE II ESC PLAN – OVERALL	2/9/24	4/24/24
C3.02	PHASE II ESC PLAN – AREA 1	2/9/24	4/24/24
C3.03	PHASE II ESC PLAN – AREA 2	2/9/24	4/24/24
C3.04	GRADING AND STORM DRAINAGE PLAN – OVERALL	2/9/24	4/24/24
C3.05	GRADING AND STORM DRAINAGE PLAN – AREA 1	2/9/24	4/24/24
C3.06	GRADING AND STORM DRAINAGE PLAN – AREA 2	2/9/24	4/24/24
C3.07	STORM PROFILES	2/9/24	4/24/24
C3.08	BMP DETAILS	2/9/24	4/24/24
C3.09	SAND FILTER DETAILS	2/9/24	4/24/24
C3.10	SAND FILTER PROFILES	4/24/24	4/24/24
C4.01	UTILITY PLAN	2/9/24	4/24/24
C5.01	ESC DETAILS (SHEET 1 OF 2)	2/9/24	4/24/24
C5.02	ESC DETAILS (SHEET 2 OF 2)	2/9/24	4/24/24
C5.03	SITE DETAILS (SHEET 1 OF 4)	2/9/24	4/24/24
C5.04	SITE DETAILS (SHEET 2 OF 4)	2/9/24	4/24/24
C5.05	SITE DETIALS (SHEET 3 OF 4)	2/9/24	4/24/24
C5.06	SITE DETAILS (SHEET 4 OF 4)	2/9/24	4/24/24
C5.07	STORM DETAILS (SHEET 1 OF 4)	2/9/24	4/24/24
C5.08	STORM DETAILS (SHEET 2 OF 4)	2/9/24	4/24/24
C5.09	STORM DETAILS (SHEET 3 OF 4)	2/9/24	4/24/24
C5.10	STORM DETAILS (SHEET 4 OF 4)	2/9/24	4/24/24
C5.11	UTILITY DETAILS	2/9/24	4/24/24
L1.01	LANDSCAPE PLAN	2/9/24	4/24/24
L1.02	LANDSCAPE NOTES AND DETAILS	2/9/24	4/24/24

§ 8.1.6 The Addenda, if any, are as follows:

Number	Date	Pages
Addendum #1	_____	All Pages
Addendum #2	_____	All Pages
Addendum #3	_____	All Pages
Addendum #4	_____	All Pages

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 8.

§ 8.1.7 Other documents, if any, forming part of the Contract Documents are as follows:

Exhibit A: _____
Exhibit B: _____
Exhibit C: _____
Exhibit D: _____
Exhibit E: _____
Exhibit F: _____
Exhibit G: _____
Exhibit H: _____

This Agreement is entered into as of the day and year first written above and is executed in at least two original copies, of which one is to be delivered to the Contractor, one to the Owner.

OWNER *(Signature)*

Andrew Grant, Town Manager
Town of Cornelius

CONTRACTOR *(Signature)*

_____
(Name)

_____
(Company)

00 70 00 Conditions of the Contract

00 72 00 General Conditions

00 72 00 General Conditions

00 72 13 General Conditions – Stipulated Sum (Single-Prime Contract)
00 73 00 Supplementary Conditions

00 72 13 – GENERAL CONDITIONS -STIPULATED SUM (SINGLE-PRIME CONTRACT)

ARTICLE 1 – GENERAL PROVISIONS

1.1 CAPITALIZATION: Terms capitalized in these General Conditions include those which are (1) specifically defined, (2) the titles of numbered articles and identified references to Paragraphs, Subparagraphs, and Clauses in the Documents or (3) the titles of Documents published by the American Institute of Architects.

1.2 INTENT OF THE CONTRACT DOCUMENTS: The Contractor shall use all the Contract Documents in this project, because they are complimentary. The requirements of one of the Documents shall be as binding as if required by all. Performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as an instrument to produce the indicated results.

If the bidder realizes errors, inconsistencies, discrepancies or omission in the proposed Contract Documents prior to bid, the Bidder shall request clarification from the Design Professional and shall include in the bid, all work required to deliver a fully operational and ready to use system. If inconsistencies, discrepancies or contradictions in the proposed Contract Documents are discovered after the bid, the Bidder shall be deemed by the submittal of his bid, to have included the costliest as to labor, materials, duration, sequence and method of construction to provide the Work.

1.3 INTERPRETATION: In the interest of brevity the Contract Documents frequently omit modifying words such as “all” and “any” and articles such as “the” and “an”, but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

1.4 GOVERNING LAW: The Contract and Contractor shall be governed by the laws of North Carolina and the Federal Government.

1.5 USE OF SITE, CONSTRUCTION PROCEDURES AND SAFETY: The Contractor shall confine construction operations to the limits of construction as indicated in the Contract Documents. The Contractor shall provide the Owner, Consultant, independent testing laboratories, governmental agencies with jurisdictional interests access to the site and the Work at reasonable times for their observation, inspections and testing. The Contractor shall provide them proper and safe conditions for such access and advise them of the Contractor’s site safety procedures and programs so that they may comply.

1.6 SUCCESSORS AND ASSIGNS: The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Construction Contract Documents. Neither party to the Contract shall assign the Construction Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

Any Monies paid to the Contractor by the Town can not be assigned to any project other than this project.

1.7 CONTRACT DOCUMENTS: The specifications shall govern in the case of discrepancy between the specifications and the drawings. In all cases, the figured dimensions shall govern in the case of discrepancy. Detailed drawings shall govern in the case of discrepancy between the general drawings and detailed drawings.

The organization of the Construction Documents has no intent to define or limit the scope of the Work performed by any trade, subcontractor, or supplier. Unless otherwise defined in the Contract Documents, words used will have the well-known technical or construction industry meanings.

In the event of conflicts or discrepancies among the Contact Documents, interpretations will be based on the following priorities:

A. The form of Construction Contract.
B. Addenda, with those of later date having precedence over those of earlier date.
C. The Supplementary Conditions.
D. The General Conditions.
E. Drawings and Specifications. Full-size or large-scale details or drawings shall govern small-scale drawings which they are intended to amplify. Details or conditions indicated for a portion of the Work but not repeated fully for other portions shall apply throughout to all similar portions except as otherwise specifically noted. In the case of an inconsistency between Drawings and Specifications or within either document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Consultant's interpretation.

1.8 RIGHTS AND REMEDIES: Duties and obligations imposed by the Construction Contract and Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

No action or failure to act by the Owner, or Consultant or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

1.9 TESTS AND INSPECTIONS: Tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made at an appropriate time. The Town shall hire a Testing Firm for tests, inspections and approvals. The Contractor shall give the Town, Testing Firm, and Consultant timely notice of when and where tests and inspections are to be made so that they may be present for such procedures. The Consultant shall define the nature of all testing criteria for testing contract proposes.

If such procedures for testing, inspection or approval reveals failure of the portions of the Work to comply with requirements established by the Contract Documents, laws, ordinances, rules or regulations. All necessary cost for re-testing, additional Consultant's fee, repair of the Work shall be paid by the contractor.

The Testing Firm shall distribute the certification of tests, inspections, or approvals to the Owner, Contractor, and Consultant.

1.10 SUBSTANTIAL COMPLETION: When the Contractor considers that the Work, or a portion thereof which the Owner and the Consultant agrees to accept separately, is substantially complete, the Contractor shall consult with the Owner, through the Consultant, to obtain preliminary verification that the Work is ready for its intended use. Once the Owner has stated its agreement the Contractor shall schedule a Substantial Completion walkthrough and notify the Owner, through the Consultant, a minimum of ten (10) days prior to the Substantial Completion meeting. After the Substantial Completion, the Contractor shall prepare and submit to the Consultant a comprehensive list of items to be completed or corrected prior to Final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Upon receipt of the Contractor's list, the Consultant will make an inspection to determine if the Work, or designed portion thereof, is substantially complete. If the Consultant's inspection discloses any items, whether or not included on the Contractor's list, which are not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Consultant. In such case, the Contractor shall then submit a request for another inspection by the Consultant to determine Substantial Completion.

If the Consultant has to inspect the work to determine Substantial Completion more than two (2) times, such additional inspections will be performed at the Contractor's expense. The Consultants' fees and expenses will be deducted from the amounts due to the Contractor in a deductive Change Order.

When the Work or designated portion thereof is substantially completed, the Consultant will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designed portion thereof unless otherwise provided in the Certificate of Substantial Completion.

The Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of responsibilities assigned to them in such Certificate.

The Owner shall allow the Contractor reasonable access to complete or correct the list of items to be completed or corrected prior to Final payment.

1.11 PARTIAL OCCUPANCY OR USE: The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Consultant as described above. The Consultant shall determine the stage of the progress of the Work.

Immediately prior to such partial occupancy or use, the Owner, Contractor and Consultant shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

Unless otherwise agreed, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of the Work not complying with the requirements of Contract Documents.

1.12 PROGRESS PAYMENTS:

A. Before the first application for payment, the Contractor shall submit to the Consultant a Schedule of Values allocated to the various portions of the work organized following the Specification Sections, prepared in such form and supported by such data to substantiate its accurate as the Consultant may require. This schedule shall be used as a basis for reviewing the Contractor's Application for Payment. After the Consultant has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents.

B. The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to its Sub-contractors in similar manner.

C. The Consultant will, on request, furnish to a Subcontractor, if practicable, information regarding percentage of completion or amounts applied for by the Contractor.

D. Neither the Owner nor the Consultant shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

E. Payment to material suppliers shall be treated in a manner similar to that provided in 3 and 4 in this section.

F. The Contractor shall not be paid anticipated profit(s), or revenue, or other economic loss arising out of a result of the Contract being terminated for any cause or the reduction of the Work.

G. The Owner shall pay a payment request within thirty (30) days of receipt of an acceptable and correct payment request from the Consultant. The Contractor shall submit partial payments once a month. See Payment Procedures, in Section 01 29 00.

H. Provide a separate line item in the Schedule of Values for closeout documentation in the amount of 1% of the Contract amount.

I. Upon completion of the work, the Consultant shall proceed with due diligence to measure up the Work and material and present his Final estimate to the Owner, whereupon the Owner shall pay or cause to be paid within thirty (30) days thereafter such amount, less payments previously made, in legal tender of the United States, and such payments of such Final Amount shall release the Owner from all claims from Work done or materials furnished under this Contract.

J. Applications for payment should include only materials and equipment that are stored on site. Payments for materials and equipment stored off site shall be made only after the Owner and/or Consultant have inspected the materials stored off site and the Contractor show proof that the materials and equipment are stored under the Owner's name and

insurance, storage and transportation to the site for such materials and equipment is included in such application.

Application for materials stored off site shall include the storage location is bonded, that the materials are insured while stored and while in transit to the site. If the Owner and/or Consultant need to travel to inspect the storage the Contractor shall pay for the time and expenses of such trip(s).

K. When the Contractor considers that the Work is substantially complete, the Contractor shall prepare and submit to the Consultant a comprehensive list of items to be completed (punch-list) or corrected prior to final payment. Items not included in such list do not alter the responsibility to complete the Work in accordance with the Construction Documents.

L. Upon receipt of the Contractor's list, the Consultant will schedule an inspection to determine completion of the Work. During that inspection the Consultants may add to the list items not included in the Contractor's list, in such case the Contractor will correct and/or complete the items noted within an agreed upon period of time and request another inspection by the Consultant to determine Substantial Completion.

If more than two inspections by the Consultant are necessary, such additional inspections will be done at the Contractor's expense. The Consultant's fees and expenses for such additional expenses will be deducted from amounts due to the Contractor on the subsequent pay application.

1.13 FINAL COMPLETION AND FINAL PAYMENT: Upon receipt of written notice that the Work is ready for Final inspection and acceptance and upon receipt of a Final Certificate for Payment, the Consultant will make an inspection and, when the Consultant finds the Work acceptable under the Contract Documents, has received all close out Documentation, and determines the Contract is fully performed, the Consultant will certify the Final Certificate for Payment. The Consultant's Final Certificate for Payment will constitute a further representation that the comprehensive list of items to be completed or corrected prior to Final payment has been reviewed and all items have been satisfactorily resolved as precedent to the Contractor's being entitled to Final payment have been fulfilled. See Payment Procedures, in section 01 29 00.

The making of Final payment shall constitute a waiver of Claims by the Owner except those arising from:

A. Claims, security interests or encumbrances arising out of the Contract and unsettled;
B. Failure of the Work to comply with the requirements of the Contract Documents; or
C. Terms of special warranties required by the Contract Documents.

Acceptance of Final payment by the Contractor, or a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of Final Certificate for Payment.

Contractor shall submit the following with Final Payment:

1. Warranties and guarantees required by the Contract

2. Release and waiver of claim for all subcontractors
3. Affidavit of Contractor's payment to material suppliers
4. Consent of Surety to final payment
5. As-Built Drawings
6. Owner and Maintenance Manuals

1.14 TERMINATION BY THE OWNER FOR CAUSE

A. The Owner may terminate the Contract if the Contractor:

1. Persistently or repeatedly refuses or fails to supply appropriate properly skilled workers, or appropriate equipment and materials:
2. Fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors:
3. Persistently disregards laws, ordinances, or rules, or regulations or orders of a public authority having jurisdiction:
4. Otherwise is guilty of substantial breach of provision of the Contract Documents.
5. Abandons the Work for 20 days without consent from the Consultant.

B. When any of the above reasons exist, the Owner, upon certifications by the Consultant that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety seven (7) days written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

1. Take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor:
2. Accept assignment of subcontracts after termination of the Contract and only for those Subcontract agreements, which the Owner accepts by notifying the Subcontractor and Contractor in writing. Assignment is subject to the prior rights of the surety obligated under bond relating to the Contract.
3. Finish the Work by whatever reasonable method the Owner may deem expedient. Upon request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

When the Owner terminates the Contract for one of the reasons stated above, the Contractor shall not be entitled to receive further payment until the Work is completed.

If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Consultant's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. This obligation for payment shall survive termination of the Contract.

The Contractor shall not be paid anticipated profit(s), or revenue, or other economic loss arising out of a result of the contract being terminated for any cause or the reduction of the Work.

1.15 SUSPENSION BY THE OWNER FOR CONVENIENCE

The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine. The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption and the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination. Adjustment of the Contract Sum shall not include anticipated profit. No adjustment shall be made to the extent:

A. That performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
B. That an equitable adjustment is made or denied under another provision of the Contract.

1.16 TERMINATION BY THE OWNER FOR CONVENIENCE

The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

A. Cease operations as directed by the Owner in the notice;
B. Take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
C. Except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

1.17 HARASSMENT: The Town of Cornelius is strongly committed to maintaining a workplace and service environment free of harassment and discrimination towards its employees, customers, contractors, and other service providers.

Harassment on the job site by the Contractors or Subcontractors toward another individual (this also includes the general public) because of sex, race, religion, age, national origin, or physical/mental challenged shall not be tolerated. Such behavior is illegal under Title VII of the Civil Rights Act and will be treated as an offense.

Definition – Harassment is verbal or physical conduct that denigrates or shows hostility or aversion toward an individual because of race, color, religion, gender, national origin, age, disability, or political affiliation, which has the purpose or effect of creating an intimidating, hostile, or offensive environment or interferes with an individual's work performance or otherwise adversely affects an individual. Sexual harassment also includes unwelcome behavior such as gestures, comments, suggestions, jokes or derogatory pictures, cartoons or drawings, unwanted sexual advances (ie. including but not limited to whistling, yelling, "cat-calling", etc.), and pressure for sexual favors.

Any person who is aware of any instance of harassment as defined above shall report the alleged act immediately to his or her supervisor or the Town's project manager. The Town's project

manager will contact the Contractor's project manager.

A. The person(s) that have allegedly harassed someone shall be removed from the construction project site for the number of days required to investigate the alleged harassment.
B. If the person(s) having allegedly harassed someone enters the project site or has any contact with those person(s) reporting the alleged harassment during the investigation, that person shall be removed from the site immediately, and a restraining order shall be served. Violation of the restraining order is subject to the legal terms of the order.
C. The Town's project manager shall notify Town's legal department and they will conduct the investigation. The Contractors and Subcontractors shall cooperate fully and completely with the legal department.
D. All complaints will be investigated promptly, impartially and discreetly and, upon completion of the investigation, the appropriate parties will be notified immediately of the findings. Any employee(s) of the Contractor or Subcontractor or the Town who have been found to harass anyone will be subject to appropriate corrective action as deemed by the law.

1.18 EQUAL: For any equipment or product to be considered an equal, it shall perform equal to or better than the performance specifications of the product that is listed. This may also include the weight of the equipment or product. If there are any modifications required to use the "Equal", the cost of such modifications shall be borne by the Contractor. The "Allowance or Contingency" shall not be used for the purpose of modifying the "Work" to be able to use the proposed equipment or product".

1.19 BASIS OF DESIGN: If a model and manufacturer is listed as the basis for a design, it does not preclude any other manufacturer from being able to furnish said equipment or product. Also, it does not exclude manufactures from designing/manufacturing the equipment or product to meet the requirements. For the equipment or product submitted to be considered an "Equal or Substitution", it shall meet the requirements of being an "Equal". The design/manufacturing of said equipment or product will not increase the Owner's cost for the "Work".

Substitution requests after the bid period and after the schedule of values submitted by the Contractor have been approved will be evaluated as a change order after the proposed equipment or product submitted has been deemed to meet the performance described in the Specifications.

ARTICLE 2 – OWNER'S RIGHTS AND RESPONSIBILITIES

2.1 COMMUNICATION TO THE CONTRACTOR: All notices to the Contractor shall be in writing and shall be signed by an authorized representative of the Owner. Such notices can be delivered in person to the official representative of the Contractor or mailed to the Contractor's official address. Such delivery in person or by mail shall constitute service of the notice.

2.2 APPLICATION FOR PAYMENT: The Owner shall make payment to the Contractor as indicated in Division I - General Requirements of the Technical Specifications entitled Payment Procedures. If any Application for Payment is not correct, it will be returned to the Contractor for correction and resubmission.

2.3 STAFF AUTHORIZATION: The Owner through the Consultant shall have the right of approval of the Contractor's superintendent and project manager. If at any time, the Owner or the Consultant deems either the Contractor's superintendent or project manager is performing unsatisfactory, the Owner may request that he or they be replaced to the satisfaction of the Owner.

Within ten (10) days after the Contract is awarded, the Contractor shall furnish in writing, to the Consultant, a list of all of the Subcontractors. The Consultant will promptly reply to the Contractor in writing stating whether or not the Owner or the Consultant, after due investigation, has reasonable objection to any such proposed Subcontractor(s).

2.4 CONSTRUCTION BY THE OWNER OR BY SEPARATE CONTRACTOR(S): The Owner reserves the right to perform Construction with his own forces or to award Separate Contract(s) for the following conditions:

A. When the Contract Documents indicates a portion of the work shall be preformed by the Owner's own forces or be performed by another Separate contractor.
B. The Contractor does not correct work as indicated in "Stop Work Order".
C. Failure of the Contractor to adequately correct the Work or complete the Work on approved schedule as determined to be adequate by the Consultant.
D. Termination of the Contractor.

The Owner shall provide for coordination/supervision of the activities of the Owner's own forces and of each separate Contractor(s) with the Work of the Contractor. All contractors and the Owner's forces shall cooperate with each other, the Consultant, and the Owner. The Contractor shall participate with other separate Contractor(s) and the Owner in reviewing their construction schedule when directed to do so by the Consultant. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement of the Contractor, Separate contractor(s), the Consultant, and the Owner. The new construction schedule shall then constitute the schedule to be used by the Contractor, Separate contractor(s), and the Owner until a subsequent revision is made.

2.5 MUTUAL RESPONSIBILITY: The Contractor shall afford the Owner and Separate contractor(s) reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities and coordinate the Contractor's construction and operations with the Separate contractor'(s) operations as required by the Contract Documents.

If part of the Contractor's Work depends on the proper execution or results by construction or operations by the Owner or a Separate contractor(s), the Contractor shall, prior to proceeding with

that portion of the Work, promptly report to the Consultant any apparent discrepancies or defects in the Work and would render it unsuitable for proper execution and results. Failure of the Contractor to report shall constitute an acknowledgment that the Owner's forces or Separate contractor'(s) completed or partially completed work is fit and proper to receive the Contractor's Work, except as to defects not reasonably discoverable.

Damages to the Contractor, or Separate contractor(s), or Owner caused by delays or improperly timed activities or defective construction shall be borne by the party responsible for the damages.

2.6 OWNER'S RIGHT TO CLEAN UP: If a dispute arises among the Contractor, Separate contractor(s) and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish as described in the Contract Documents, the Owner may clean up and allocate the cost among the responsible parties as determined by the Consultant to be just.

2.7 OWNER'S RIGHT TO CONTRACT MODIFICATIONS: Contractors should note that Owner retains the exclusive right to modify the Contract and Scope of Work for budgetary or other reasons.

2.8 STOP WORK: The Consultant, after concurrence with and on behalf of the Owner, may issue a "Stop Work Order" for the project or portions thereof when the Contractor fails to correct any Work that is deemed not to be in accordance with the Contract Documents. If the Contractor fails to correct said deficiencies within seven (7) days, upon the direction from the Consultant, the Owner shall issue to the Contractor a construction change order or change directive to correct the deficiencies and deduct all costs (including the Owner's expenses, Consultant's fees, legal costs, and any other associated costs) from any future payments to the Contractor. If payments then or thereafter due to the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

The Owner may occupy or use any completed portion of the Work as designated by the Contract Documents. Occupying any portion of the Work shall occur after the Consultant has issued a Certificate of Substantial Completion and the Code Enforcement Agency has issued a Temporary Certificate of Occupancy (TCO).

The Owner shall have the right to terminate the Contractor's Contract in accordance with the Construction Contract.

ARTICLE 3 – ADMINISTRATION OF THE CONTRACT

3.1 REPRESENTATION: The Consultant shall be the Owner's representative during construction, and during the warranty period after Substantial Completion. The Consultant will have authority to act on behalf of the Owner to the extent provided in the Contract Documents unless otherwise modified by written instrument.

3.2 COMMUNICATIONS: The Owner shall communicate to the Contractor through the Consultant about matters arising out of or relating to the execution of the Work and Contract. The Consultant shall not communicate with the Contractor's Subcontractors and suppliers unless the Contractor grants consent. The Consultant shall be responsible for scheduling, managing, facilitating, and conducting the construction meetings.

3.3 EVALUATION OF WORK: The Consultant shall evaluate the executed Work, the schedules, the amounts of Work completed, and substantial and final completion of the Work. The Consultant will review the Contractor's Applications for Payment, certify the amount due the Contractor, and forward to the Owner for execution.

3.4 INTERPRETATION OF CONTRACT DOCUMENTS: The Consultant shall render an interpretation of the requirements of the Contract Documents. Interpretations and decisions made by the Consultant shall be consistent with the Contract Documents or reasonably inferable from them as an instrument to produce the indicated results. The Owner or the Contractor may make written request to the Consultant concerning such interpretations. The Consultant's decisions concerning the interpretations and aesthetic effects of the Contract Documents will be final and consistent with the intent expressed in the Contract Documents.

3.5 SITE VISITS: The Consultant will visit the project site at intervals appropriate to the stage of construction. The purpose of the visits will be:

A. to observe and become familiar with the progress and quality of the Work, and render interpretations necessary for its execution;
B. to endeavor to guard the Owner against defects, insufficiencies, shortages omissions, and deficiencies in the Work;
C. to determine if the Work is in accordance with the Contract Documents and approved Contractor's submittals; and
D. to report to the Owner and Contractor concerning the mentioned purposes.

3.6 WORK ACCEPTANCE AND TESTS: The Consultant shall have the authority to reject Work which does not conform to the Contract Documents and approved Contractor's submittals. When the Consultant considers it necessary or advisable for the implementation of the intent of the Contract Documents, the Consultant will have authority to require additional inspections or testing of the Work whether or not such Work has been fabricated, installed or completed. However, neither the Consultant's authority to act nor any decision made by the Consultant in good faith either to exercise or not to exercise such authority, shall not release any duties or responsibilities of the Contractor and any Subcontractor(s) from performing any of the Work.

3.7 PROJECT MODIFICATIONS: Refer to Section 01 26 00, of the Technical Specifications entitled Contract Modification Procedures for information and procedures related to change orders, construction change directives and minor changes to the work.

The Contractor, Owner, or Consultant may identify a need for modifications to the Contract Documents. Such modification may be accomplished by Change Orders, Construction Directives, or Minor Changes in the Work after the execution of the Contract. All modifications are subjected to the conditions of the Contract Documents.

Any modifications performed to the Work or Contract Documents without prior authorization by the Consultant shall not be considered for a Change Order.

The Contractor shall proceed with the modifications promptly, unless otherwise indicated in the Change Order, Construction Change Directive, or order for a minor change in the Work.

3.8 REVIEW OF SUBMITTALS: The Consultant will review and approve or take appropriate action upon the Contractor's Submittals of samples, product data, shop drawings, and as requested in the Contract Documents. The approval of submittals by the Consultant is for the limited purpose of verifying conformance with the Contract Documents. Such action will be done in accordance with the Section 01 33 00, Submittal Procedures, Paragraph 1.4. The Contractor shall review and approve submittals prior to presenting them to the Consultant for his review and approval. This review by the Contractor will be regarding dimensional accuracy, completeness, quantities, performance, and all characteristics that shall remain the sole responsibility of the Contractor. Review of Submittals by the Consultant shall not indicate approval of an assembly of which the item is a component. The Consultant shall be responsible for reviewing the Contractor's submittal log.

The Contractor, within 30 days of being awarded the Contract shall prepare, keep current for the Consultant's approval, a schedule of submittals which is coordinated with the construction schedule and allow the Consultant ample time to review the submittals.

The Consultant would make available ACAD Drawings for the Contractor to prepare Shop Drawings after the Contractor signs a release of liability form and compensate the Consultant the administrative expenses of creating and formatting each requested file. The Consultant will provide the files on the version and CAD system that the Drawings were created and will not be responsible for any coordination, and/or translation of files to previous or subsequent versions of ACAD or other software.

If any submitted item is reviewed by the Consultant and returned to the Contractor as "Not Approved" or "Revise and Resubmit" two times, the actual required time to perform the third review (and subsequent reviews) of the same item by the Consultant will be done at the Contractor's expense. The Consultant's fees and expenses will be deducted from amounts due to the Contractor in a deductive change order.

3.9 CERTIFICATES FOR PAYMENT: The Consultant will, within seven (7) days after receipt of the Contractor's Application for payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Consultant determines is properly due, or notify the Contractor and Owner in writing of the Consultants reasons for withholding certification.

The issuance of a Certificate for Payment will constitute a representation by the Consultant to the Owner, based on the Consultant's observations at the site and the data comprising the Application and Certification for Payment, that the work has progressed to the point indicated and that, to the best of the Consultant's knowledge, information and belief, quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the

Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to minor deviations from the Contract Documents correctable prior to completion and to specific qualifications expressed by the Consultant. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified.

The Consultant may decide not to certify payment and may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Consultant's opinion the representations to the Owner cannot be made. If the Consultant is unable to certify payment in the amount of the Application, the Consultant will notify the Contractor and Owner. If the Contractor and Consultant cannot agree on a revised payment amount, the Consultant will promptly issue a Certificate for Payment for the amount for which the Consultant is able to make such representations to the Owner. The Consultant may also decide not to certify payment or, because of subsequent observations may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Consultant's opinion to protect the Owner from loss because of:

A. defective Work not remedied;
B. third party claims filed or reasonable evidence indicating probable filling of such claims;
C. failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
D. reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
E. damage to the Owner or another contractor;
F. reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
G. persistent failure to carry out the Work in accordance with the Contract Documents.
H. completed Work has been damaged, requiring correction or replacement**;**
I. the Contract Price has been reduced by Written Chang Order**;**

When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

3.10 CONTRACT MEDIATION PROVISIONS:

Dispute Resolution: It is understood and agreed that N.C.G.S. 143-128(f1) requires that disputes arising under an Agreement for all construction, site work, and alteration or repair of a building shall be subject to a dispute resolution process specified by the Owner. In compliance with this statutory provision, these Contract Mediation Provisions are the dispute resolution process to be used on this Project. It is further understood and agreed that this dispute resolution process is based on non-binding mediation and will only be effective to the extent that the Parties to any mediated dispute participate in the mediation in good faith. It is also understood and agreed that the Owner is under no obligation under any circumstance to secure or enforce the participation of any other Party in the mediation of any dispute subject to these Contract Mediation Provisions and N.C.G.S. 143-128(f1).

Any dispute arising between or among the Parties listed herein that arises from construction of the Project, including without limitation a breach of such Agreement, shall be subject to non-binding mediation administered by the American Arbitration Association under its Construction Industry Mediation Rules, or to such other mediation process to which the parties may agree,

except as otherwise expressly set forth in these Contract Mediation Provisions. To the extent any provision of the Construction Industry Mediation Rules is inconsistent with the provisions of these Contract Mediation Provisions, the provisions of the Contract Mediation Provisions shall control. The mediation provided in the Contract Mediation Provisions shall be used pursuant to this Contract or Agreement and N.C.G.S. 143-128(f1), and shall take precedence over any dispute resolution process adopted by the North Carolina State Building Commission.

The following definitions shall apply for these Contract Mediation Provisions: "Agreement to Construct the Project" means an Agreement to construct the Project that is subject to the requirements of N.C.G.S. 143-128 and does not include any Agreement or Contract related to the Project that is not subject to said statute. "Construct" or "Construction" refers to and includes the construction, alteration or repair of the Project. "Party" or "Parties" refers to the parties listed within these Contract Mediation Provisions; and the "Project" means the building to be erected, constructed, altered or repaired (including site facilities) pursuant to this Contract or Agreement.

The Owner and any Party contracting with the Owner or with any first-tier or lower-tier subcontractor for the construction of the Project hereby agree to participate in good faith in any mediation of a dispute subject to these Contract Mediation Provisions and N.C.G.S. 143-128(f1), including without limitation the following Parties: Consultant(s), architect(s), engineer(s), surveyor(s), prime contractor(s), surety(ies), subcontractor(s), and supplier(s).

In order to facilitate compliance with N.C.G.S. 143-128(f1), the Contractor, and all other Parties, shall include these Contract Mediation Provisions in every agreement to which they are a Party for the construction of the Project, without variation or exception. Failure to do so will constitute a breach of the Construction Contract, and the Contractor or other Party failing to include these Contract Mediation Provisions in any Agreement shall indemnify and hold harmless the remaining Parties from and against any and all claims, including without limitation reasonable attorney fees and other costs of litigation arising in any manner from such breach.

The following disputes are not subject to mediation:

A. A dispute seeking a non-monetary recovery; and
B. A dispute seeking a monetary recovery of $15,000 or less; and
C. A dispute seeking the extension of any time limit shall be subject to mediation pursuant to the Contract Mediation Provisions and N.C.G.S. 143-128 only if the damages which would be suffered by the Party seeking the extension would exceed $15,000. To the extent that liquidated damages are set forth in the Contract Documents and is the measurement of damages for failure by such Party(s) to meet the time limit, the liquidated damages shall be the exclusive standard for determining the amount of damages associated with such dispute.

For purposes of these Contract Mediation Provisions, a dispute is limited to the recovery of monetary damages from the same transaction or occurrence against a single Party or two or more Parties alleged to be jointly liable. Two or more disputes may not be consolidated without the consent of all Parties to such disputes.

A request for mediation shall include the amount of the monetary relief requested.

Prior to requesting mediation, a Party must believe that it is entitled under applicable law to recover the monetary amount to be included in the request from one or more of the remaining Parties. Such belief must be based on a reasonable and prudent investigation into the dispute. The

request for mediation must be based on such investigation and may not include any amount or the name of any remaining Party(s), unless supported by such investigation by the Party requesting the mediation.

If a Party does not perform a reasonable and prudent investigation, it shall indemnify and hold harmless all other Parties from any costs, including reasonable attorney fees and other costs of mediation, litigation, and damages incurred by such other Parties.

All expenses incurred by a Party in preparing and presenting any claim or defense, shall be paid by the Party preparing for mediation. Such expenses shall include, without limitation, any associated cost for witnesses, exhibits, and attorney fees. All other expenses including filing fees and required traveling expenses by the mediator, and other expenses of the mediator, shall be borne as follows: (1) One half by the Party requesting the mediation, with the remaining parties paying equal shares of the remaining expenses and costs. (2) If the Owner is named as a party to the mediation, the Owner shall pay at least one-third of the mediation expenses and 2/3 of the expenses shall be divided among the remaining Parties. (3) If more than one Party to a dispute requests mediation, the mediation expenses and costs to be divided among the Parties shall be borne equally by the Parties to the dispute; however, if the Owner is named as one of the parties to the mediation, the Owner shall pay at least one-third of the mediation expenses.

The mediation shall be held at a location agreeable to the mediator and all of the Parties. If no agreement can be reached, the mediation will be held at a location in the Town of Cornelius as the mediator shall determine.

The provision of these Contract Mediation Provisions is subject to any other provisions of the Construction Contract concerning the submission, documentation and/or proof of any claim(s) or dispute(s).

ARTICLE 4 – CONTRACTOR'S RESPONSIBILITIES

4.1 OBSERVANCE OF LAWS: The Contractor shall observe and comply with all Federal, State and Local laws, ordinances, regulations and all such decrees as exist at present or may be enacted during construction, by bodies or tribunals having any jurisdiction or authority over the Work, in any manner affecting the conduct of the Work. No plea of misunderstanding will be considered on account of the Contractor's ignorance thereof.

4.2 PERMITS AND LICENSES: The Contractor shall procure all permits and licenses, pay all charges and fees, and give all notice necessary and incident to the due and lawful prosecution of the Work.

The Contractor shall include in his contract all fees related to the connection of all utilities as needed such as potable water, storm drainage, sewer, power, natural gas, etc.

It is the responsibility of any Contractor to obtain all applicable licenses and abide by all laws and regulations applicable to General Contracting in the State, as required under the relevant statutes and under regulations issued by the North Carolina State Licensing Board for General Contractors.

4.3 WORK CONFORMANCE: The Contractor shall perform the Work in accordance with the Contract Documents and approved submittals, shop drawings, product data and samples. The Contractor shall furnish the Owner and Consultant every reasonable facility to ascertain that the Work is performed consistent with the requirements of the Contract Documents.

The Contractor shall carefully study the Contract Documents and field conditions and shall promptly report to the Consultant, in writing, any errors, inconsistencies or omissions. If the Contractor performs any construction activity knowing it involves an identified error, inconsistency or omission in the Contract Documents, the Contractor shall be responsible for such performance and shall bear all costs for any corrections with no Contract modifications. The Contractor shall obtain approval from the Consultant for such corrections.

4.4 SUPERVISION AND CONSTRUCTION PROCEDURES: During the performance of the Contract, it shall be the responsibility of the Contractor to pursue the orderly progress of all Work stages throughout the project and to assure that all Work is completed within the time period bid by the Contractor, or stipulated herein as the Contract Time. The Contractor shall have sole responsibility and control of the work, including all means, methods, techniques, sequences, procedures, and coordination of the Work.

If the Contract Documents give specific instructions concerning site conditions, construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice, including recommendations for safer methods to accomplish the task to the Owner and Consultant and shall not proceed with that portion of the Work without further written instructions from the Consultant. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of recommendations proposed by the Contractor, the Owner shall be solely responsible for any resulting loss or damage.

The Contractor shall employ a competent and qualified superintendent and necessary assistants, who shall be in attendance at the project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communication shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case. The Contractor shall keep a minimum of one (1) Superintendent on the job at all times, authorized to act for the Contractor and direct the work of all Subcontractors for the different phases of the work.

The General Contractor shall be the "Project Expeditor" and shall have the responsibility to coordinate, cooperate with, and obtain from the several Subcontractors on the job their respective schedules and to integrate them into a Construction Schedule.

The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Consultant and the administration of the Contract; or by tests, inspections made by testing firms, or approvals required or performed by persons other than the Contractor.

The Contractor shall be responsible for inspection of portions of the Work performed under this Contract to determine that such portions are in proper condition to receive subsequent Work, and are in accordance with the Contract Documents.

4.5 CONTRACT TIME: The Contract Time indicated within the Contract Documents shall begin on the date set forth in a Notice to Proceed from the Consultant to the Contractor and includes all weather and delivery delays. The anticipated Notice to Proceed is expected to be issued as early as thirty (30) days after the bid opening.

The time limits stated in the Contract Documents are the essence of the Contract. By executing the Construction Contract, the Contractor confirms that the Contract Time is a reasonable amount of time for performing the Work. The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

If the Contractor is delayed at any time during the progress of the Work by an act of negligence by the Owner or Consultant, or a separate contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, which the Consultant determines may justify a delay, then the Contract Time shall be extended by a Change Order for such reasonable time as the Consultant may determine. Refer to Supplementary Conditions for additional information of Contract Time.

4.6 CONSTRUCTION SCHEDULES: The Contractor shall submit a full construction schedule to the Owner and Consultant no later than thirty (30) days after the Notice to Proceed. The schedule shall include submittal dates for all required Shop Drawings, product data and samples, physical temporary and/or permanent mock-ups indicated in the Drawings for approval by the Consultant and the Owner, dates for pre-construction conferences. The Consultant will make color selections after all samples for exterior and interior application requiring color selections have been received. Allow thirty (30) days after color samples interior or exterior are received for selections and Owner approvals before Contractor is advised of colors.

The construction schedule shall be a detailed bar chart or Critical Path Method, for the Work to be performed. The schedule shall not exceed time limits current under the Contract Documents

and shall include weather delays and delays due to delivery of the equipment. The schedule shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of Work.

The Contractor shall maintain the construction schedule, making monthly adjustments, updates, and corrections. The construction schedule shall be reviewed at each construction meeting.

The Contractor shall also prepare a schedule of submittals which shall be coordinated with the Contractor's construction schedule. The submittal schedule shall also be reviewed at each construction meeting and adjusted as necessary.

The following chart is the anticipated adverse weather delays for this project.

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
10	10	11	6	6	6	6	5	6	6	7	9

The construction schedule shall reflect the anticipated adverse weather delays.

The Contractor shall maintain a rain gauge (as required by NCDEQ) at the project site and check it daily. The Contractor shall maintain a storm water general permit inspection log (as required by NCDEQ) and record daily rain and weather events. Copies of the storm water general permit log shall be submitted monthly with the pay applications.

National Oceanic and Atmospheric Administration (NOAA) data shall be used to claim addition construction days beyond the above chart for critical path activities.
Weather days occurring on holidays or Sundays will not be considered as delays significant to the Contract completion date. The request for a weather delay must be submitted to the Consultant in writing with supporting data within (20) days following the occurrence.

The Contractor shall allocate sufficient resources to meet the current construction schedule.

4.7 SAFETY PRECAUTIONS AND PROGRAMS: The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

4.8 SAFETY OF PERSONS AND PROPERTY: The Contractor shall take reasonable precautions for safety of and shall provide reasonable protection to prevent damage, injury or loss to:

A. employees on the Work and other persons who may be affected thereby;
B. the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-Subcontractors; and
C. other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in "Work Acceptance and Tests" caused in whole or in part by the Contractor, a Subcontractor, a Sub-Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible except damage or loss attributable to acts or omissions of the Owner or Consultant or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor.

The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent, unless otherwise designated by the Contractor in writing to the Owner and Consultant.

4.9 HAZARDOUS MATERIALS: If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Consultant in writing.

The Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to verify that it has been rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Consultant, the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance.

The Contractor and the Consultant will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Consultant has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Consultant have no reasonable objection. When the material or substance has been rendered harmless, Work in the affect area shall resume upon written agreement of the Owner and Contractor. The Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional cost of shut-down, delay and start-up, which adjustments shall be accomplished as provided in Article 3.7 of the General Conditions.

The Owner, to the fullest extent permitted by law, shall indemnify and hold harmless the Contractor, Subcontractors, Consultants, Consultants Sub-consultants, and agents and employees of any of them from and against claims, damages, losses and expenses including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area, if

in fact the material or substance presents the risk of bodily injury or death , provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) and provided that such damage, loss or expense is not due to the sole negligence of a party seeking indemnity. The Owner shall not be responsible for materials and substances brought to the site by the Contractor unless such materials or substances were required by the Contract Documents. The Contractor shall act at his own discretion to prevent damages, injury or losses as part of the original Work.

If, without negligence on the part of the Contractor, the Contractor is held liable for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred. These additional costs shall follow the procedures established for addition compensation and additional time extension to the Contract.

4.10 EMERGENCIES: In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss.

4.11 WARRANTY: The Contractor warrants to the Owner and Consultant that materials and equipment furnished under the Contract will be of good quality and new, unless otherwise required or permitted by other sections of the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Consultant, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. A one-year general warranty for the complete project shall start when the Contractor achieves Substantial Completion. For warranties associated with the pickleball and tennis courts, see the pickleball and tennis court technical specification.

4.12 REPAIR OBLIGATION: If, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The period of one year shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of Work.

4.13 LIMITATION OF WARRANTY: Nothing contained in the above sections shall be construed to establish a period of limitation with respect to other obligations, which the Contractor might have under the Contract Documents. Establishment of the time period of one year as described in Section 4.11 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

4.14 PROJECT CONTINGENCY AND ALLOWANCES: The Contractor shall include in the Contract Sum the Project Contingency and all Allowances stated in the Contract Documents. Items covered by the Project Contingency and/or Allowances shall be supplied for such amounts as the Owner may direct.

A. Project Contingency: The Contingency or portion thereof is to be used only when directed to do so in writing by the Owner, through the Consultant. The unused portion of the Contingency shall be credited to the owner at the end of the project. The Consultant will prepare change orders at the appropriate time to be signed by the contractor for contingency credits where applicable.

B. Material Allowances: Unless otherwise provided in the Contract Documents:

1. materials and equipment under an allowance shall be selected by performance specification promptly by the Owner, through the Consultant to avoid delay in the Work;
2. allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
3. Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum and not in the allowances;
4. Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances as stated above and (2) changes in Contractor's costs as stated above.

4.15 TAXES: The Contractor shall pay sales, consumer, use and similar taxes for the Work or portions thereof provided by the Contractor which is legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

4.16 SALES AND USE TAX: Upon submission of each Application and Certification for payment, the Contractor must furnish for itself as well as for all Subcontractors**,** certified statements stating the cost of the tangible property purchased from each vendor and the amount of sales and/or use taxes paid thereon. In the event the Contractor makes several purchases from the same vendor, such certified statements must indicate the invoice numbers, date of invoice, the inclusive taxes paid thereon. Such statements must also include the cost of any tangible personal property withdrawn from the Contractor's warehouse stock and the amount of sales or use tax paid thereon by the Contractor. Similar certified statements by his Subcontractors must be obtained by the Contractor and furnished to the Consultant. The subtotal amounts of the prices of the items, state sales tax, and County sales tax, and use tax shall be totaled at the bottom of each page and a grand total of each at the bottom of the last page. Different tax rates (e.g. 7% versus 7-1/2%) shall be listed on separate, notarized tax statements.

Non-Tangible items such as silt fencing, tree-protection fencing, erosion control devices, small tools, owned or rental equipment, etc. shall not be claimed on the tax statement. Only material items, which have become a part of the building, structure, or Work shall be included**.** The Contractor shall attach copies of all listed invoices on the certified statement, only upon request by the Owner.

Use the State and County Sales /Use Tax Statement & Certification form provided.

4.17 CONTRACTOR'S WARRANTY OF TITLE: The Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner free and clear of all Liens no later than the time of payment.

4.18 UNCOVERING AND CORRECTION OF WORK

A. UNCOVERING OF WORK

If a portion of the Work is covered contrary to the Consultant's request, or to the Owner's or governing authority's request or requirements, or to requirements specifically expressed in the Contract Documents, the Contractor must, if required in writing by the Consultant, be uncovered for the Consultant's or governing Authority's examination and be replaced at the Contractor's expense without a change in the Contract Time.

If a portion of the Work has been covered which the Consultant has not specifically requested to examine prior to it's being covered, the Consultant may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, correction shall be at the Contractor's expense unless the Owner or a separate Contractor caused the condition. In such event, the Owner shall be responsible for payment of the costs.

B. CORRECTION OF WORK BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Consultant or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting rejected Work, including additional testing and inspections and compensation for the Consultant's services and expenses made necessary thereby, shall be at the Contractor's expense.

If, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Paragraph 4.11 or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it within seven (7) days after receipt of written notice from the Consultant to do, or within a mutually agreed upon schedule between the Contractor and the Consultant and Owner. This obligation shall survive acceptance of the Work under Contract and termination of the Contract. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Consultant, the Owner may correct the deficiencies at the Contractor's expense.

4.19 LIQUIDATED DAMAGES: If the Contractor fails to achieve Substantial Completion within the Contract Time, the Contractor shall be assessed liquidated damages. The rate of liquidated damages shall be as established in the Supplementary Conditions.

If the Contractor fails to correct defective Work as outlined on a list accompanying the Certificate of the Substantial Completion within fifteen (15) days from the date of Substantial Completion,

liquidated damages shall start to accrue until all defective Work has been corrected.

For each day in excess of the number of consecutive calendar days stated as Contract Time, the Contractor shall pay the Owner $500.00 per day as Liquidated Damages which have been reasonably estimated in advance to cover the losses to be incurred by the Owner by reason of failure of said Contractor to complete the work within the time specified, such time being in the essence of this Contract and a material consideration thereof.

If, through the acts or omissions of the Contractor, the subcontractor or other prime Contractor should suffer loss or damage on the work, the Contractor agrees to settle with such other subcontractor or prime Contractor by agreement. In case the Contractor, by his own acts or the acts of any person or persons in his employ, shall unnecessarily delay, in the opinion of the Consultant, the work of the Owner or other Contractors, the Contractor shall pay all costs and expenses incurred by such parties due to any such delays.

The Contractor shall indemnify the Owner for any claim or legal action against the Owner by any Subcontractor or supplier as a result of injury of damages caused by that Contractor to others. The Contractor responsible of the injury must defend, indemnify and save the Owner harmless, including paying judgments against the Owner, all costs and expenses, legal or otherwise, incurred by the Owner in defending the suit.

4.20 CUTTING AND PATCHING: The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly.

The Contractor shall not damage or endanger any portion of the Work that was fully or partially constructed by the Owner or separate Contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or separate Contractor except with written consent of the Owner and of such separate Contractor. Such consent shall not to be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate Contractor the Contractor's consent to cutting or otherwise altering the Work.

4.21 CLEAN UP: The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove from and about the Project waste material, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials.

If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost shall be charged to the Contractor.

4.22 INDEMNIFICATION: To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Consultant, Consultant's Sub-Consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performances of the Work, provided that such claim, damages, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including loss of use resulting there from, but only to the extent caused in whole or in part by Contactor or anyone employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligations shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would

otherwise exist as to a party or person described in this paragraph.

In claims against any person or entity indemnified under this section by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this section shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under worker's compensation acts, disability benefit acts or other employee benefit acts.

The obligation of the Contractor under this paragraph shall not extend to the liability of the Consultant, the Consultant's Consultant(s), and agents and employees of any of them arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Consultant, the Consultant's Consultant(s), and agents and employees of any of them provided such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 5 – BONDS and INSURANCE

5.1 PERFORMANCE AND PAYMENT BONDS: The successful Bidder shall provide a Performance Bond and Payment Bond. The bond amounts shall be written in the amount of One-Hundred percent (100%) of the Contract Price, and conforming to the Owner's requirements. The bonds shall be delivered to the Owner with the executed Contract.

A. If the provided bonds or insurance do not meet the Owner's requirements, the Contractor shall have ten (10) calendar days after receipt of notice of rejection to provide satisfactory bonds. If the Contractor does not deliver proper bonds, the Contract may be awarded to the next lowest responsible, responsive bidder; or all bids may be rejected and the project re-bid.

5.2 INDEMNITY & INSURANCE: The Contractor shall indemnify and save harmless the Owner, its agents and employees and assigns from and against all loss, cost, damages, expense and liability caused by an accident or other occurrence resulting in bodily injury, including death, sickness and disease to any person; or damage or destruction to property, real or personal; arising directly or indirectly from operations, products or services rendered under this Contract. The Contractor further agrees to purchase and maintain during the life of this Contract with an insurance company acceptable to the Owner authorized to do business in the State of North Carolina the following insurance:
Automobile: Bodily injury and property damage liability covering all owned, non-owned and hired automobiles for limits of not less than $1,000,000 each person, $1,000,000 each occurrence bodily injury liability and $1,000,000 each occurrence property damage liability.

Comprehensive General Liability: Bodily injury and property damage liability insurance as shall protect the Contractor and any Subcontractor performing Work under this Contract from claims of bodily injury or property damage which arise from operations of this Contract whether such operations be performed by the Contractor, any Subcontractor, or anyone directly or indirectly employed by either. The amounts of such insurance shall not be less than $1,000,000 bodily injury and property damage liability each occurrence/aggregate. This insurance shall include coverage for products/completed operations, and contractual liability assumed under the indemnity provision of this Contract. To be included in Comprehensive General Liability is the Broad Form Property Damage. On the policy, list "The Town of Cornelius" as an "Additional Insured".

Workman's Compensation & Occupational Disease Insurance:
Meeting the statutory requirements of the State of North Carolina including employer's liability insurance for an amount of not less than $100,000 for each accident, $100,000 for disease each employee, and $500,000 for policy limit.

Builder's Risk Insurance: The Contractor shall purchase and maintain "all risk" Builder's Risk Insurance, including, without duplication of coverage, theft, vandalism, and malicious mischief. This insurance shall cover the entire Work at the site to which the Contract applies, to the full insurable value thereof and shall be for the benefit of the Owner and Contractor as their interest may appear, except that any loss not covered because of deductible clauses or policy exclusions shall be the sole responsibility of the Contractor.

The Owner's Builder's Risk Insurance shall not cover the Contractor's:

A. Tools
B. Equipment
C. Storage shed or office
D. Vehicles

The Owner's Builder's Risk Policy shall carry a $2,500 maximum deductible, each loss for all perils.

Certificates of such insurance shall be furnished to the Owner and shall contain the provision that should any of the above described polices be cancelled before the expiration date thereof, the issuing insurance company will endeavor to mail thirty (30) days written notice to “The Town of Cornelius”. The Contractor agrees to notify the Owner by telephone and by providing written notice within two (2) days after receipt of information that the insurance company either intends to amend or terminate a policy or has amended or terminated any insurance policy providing the coverage referred to above.

ARTICLE 6 - DEFINITIONS

Whenever in these specifications and Contract Documents the following terms or pronouns in places of them are used, the intent and meaning shall be interpreted as follows:

AS-BUILT DRAWINGS: A set of Construction Documents used by the Contractor to indicate all changes, clarifications, and actual execution of the Work.

BIDDER: Any individual, firm, corporation, or partnership submitting a proposal of the work contemplated.

BID PROPOSAL: The approved prepared form on which the bidder is to, or has submitted his proposal for the contemplated work.

CHANGE ORDER: A written instrument prepared by the Consultant and signed by the Owner, Contractor and Consultant, stating their agreement upon all to modify of the following:

A. The Work;
B. The Contract Sum;
C. The Contract Time.

CHANGE PROPOSAL REQUEST: Outlines proposed changes in the Work and possible changes to the Contract Sum and/or Contract Time.

CONSTRUCTION CHANGE DIRECTIVE: A written order prepared by the Consultant and signed by the Owner and Consultant, directing a change in the Work prior to agreement on an adjustment, if any, in the Contract Sum or Contract Time, or both.

CONSULTANT: The person lawfully licensed to practice Architecture or Engineering or Landscape Architecture, or an entity lawfully practicing Architecture or Engineering or Landscape Architecture which is referred to throughout the Contract Documents as if singular in number. The "Consultant" is the duly authorized representative of the Owner.

CONSTRUCTION CONTRACT: Represents the entire and integrated agreement between the Owner and Contractor and supersedes prior negotiations, representations, or agreements, either written or oral, and consists of the Form of Construction Contract and the Contract Documents. The Construction Contract shall not be construed to create a contractual relationship of any kind (1) between the Consultant and Contractor, (2) between the Owner and a Subcontractor or Sub-Subcontractor, (3) between the Owner and Consultant or (4) between any persons or entities other than the Owner and Contractor. The Construction Contract may also be referred to as the "Contract".

CONSTRUCTION DOCUMENTS: The Bid Package, including without limitation, any Addendum to the Bid Package, the Notice to Bidders, Instructions to Bidders, the General Conditions, the M/W/SBE Provisions all information in the Project Manual including the Technical Specifications, the Contractor's Itemized Proposal, and all other specifications and drawings referenced therein.

CONTRACT: The "Construction Contract".

CONTRACT DOCUMENTS: Consist of all documents shown as incorporated by reference into the "Sample Construction Contract" between the Owner and the Contractor as provided therein. Contract Documents are also sometimes referred to as "Construction Documents".

CONTRACT MODIFICATION: Defined as (1) a Change Order, (2) a Construction Change Directive or (3) a clarification, interpretation, or a written order for a Minor Change in the Work issued by the Consultant.

CONTRACT TIME: The consecutive calendar days, including authorized adjustments, allotted in the Contract for Substantial Completion of the Work. The commencement date of the Work is the date established in the Notice to Proceed.

CONTRACTOR: Any individual, firm, corporation, or partnership, or his/her/their/its employees, agents, or assigns with whom a contract is made with the Owner for the construction of the total project (including, but not limited to Plumbing, Mechanical, Electrical, Landscape, Structural Construction, and Fire Protection work),

CONTRACT SUM: As stated in the Construction Contract and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

DRAWINGS: The graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

DAY(S): The term "day" as used in the Contract Documents shall mean calendar day.

EQUAL or APPROVED EQUAL: The word "equal" or "approved equal" shall mean a product or products by manufacturers other than those listed in the Specifications that may be incorporated into the work after review and concurrence by the Design Professional and Owner.

EVALUATION: The word "evaluation" and any derivative thereof, as used in reference to Consultant means, to become familiar with the progress and quality of the portion of Work.

FURNISH: Unless specifically noted otherwise, the word "furnish", and any derivatives thereof, means furnishing to the Project site items specified such as materials, equipment apparatus, appurtenances, and all other necessary items

INSPECT: The word "inspect" and any derivative thereof, as used in reference to the Consultant shall mean; type of evaluation that a reasonably prudent Consultant, in the exercise of ordinary care, would make to determine if the Work is in general accordance with the Contract Documents at Substantial and Final inspections.

INDICATED: The words "indicated" or "shown" and any derivative thereof shall mean; as detailed, scheduled, schematically depicted or stated in the Contract Documents.

INSTALL: The word "install", and any derivative thereof means; incorporating into the Work all necessary labor, materials, and connections to perform and properly completed in-place, tested, inspected & approved by Governing Agency, and ready for operation or use.

LIQUIDATED DAMAGES: An amount estimated in advance, to cover the losses incurred by the Owner by reason of failure of the Contractor to complete the Work within the time specified in the Contract Documents.

MINOR CHANGES IN THE WORK: A written order prepared by the Consultant for modifications in the Work not involving adjustment in the Contract Sum or Contract Time and not inconsistent with the intent of the Contract Documents.

OWNER: As referred to in these documents is The Town of Cornelius.

PROJECT: The total construction, of which the Work performed under the Contract may be the whole or a part, and which may include construction by the Owner or by separate Contractors.

PROJECT MANUAL: The compilation of all of the written material that is part of the Contract Documents. It contains, but not limited to, bidding requirements, sample forms, conditions of the Contract, schedule of drawings, technical specifications, and all addenda.

PROVIDE: The word "provide", and any derivatives thereof means, to furnish labor and materials to install complete, in-place, new, clean, operational, and ready to use.

RECORD DRAWINGS: A set of drawings produced and certified by the Consultant based on information shown on the "As-Built Drawings" provided by the Contractor.

REMOVE: Shall mean disassemble, disconnect, shut-off, cap-off utility services to

the nearest panel or main which is to remain in operation. Properly and legally dispose of removed materials, patch and finish area affected by removal to match adjacent surfaces.

RIGHT-OF-WAY: The area that has been acquired for the location, installation, and maintenance of a public or private utility, roadway drainage facility, sewer lines and water lines, etc.

SEE: In interest of conciseness, references to specification sections and drawing details are preceded by the word "see" to mean to refer to that work item, section, or part thereof.

SINGLE PRIME CONTRACTOR: Any individual, firm, corporation, or partnership, with whom a contract is made by The Town of Cornelius for the total project. The word "Contractor" is referred to throughout the Contract Documents as if singular in number and means a Contractor or an authorized representative of the Contractor.

SPECIFICATIONS: That portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

STOP WORK ORDER: A written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.

SUB-CONTRACTOR: Any individual, firm, corporation, or partnership, whom has a direct contract with the Single-Prime Contractor to perform a portion of the Work. The word "Sub-Contractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-Contractor or an authorized representative of the Sub-Contractor.

SUB-SUBCONTRACTOR: Any individual, firm, corporation, or partnership, whom has a direct contract with a Sub-Contractor to perform a portion of the Work. The word "Sub-Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-Subcontractor or an authorized representative of the Sub-Subcontractor.

SUBSTITUTION: Shall mean a product or products by manufacturers not listed in the specifications and are not an "Equal" or "Approved Equal". Material, product or equipment substitutions proposed by the Bidders to those specified can only be considered during the bidding phase until (14) days prior to the receipt of bids. Submittals shall have sufficient data to confirm material, product or equipment equality. Proposed substitutions submitted after this time will be considered only as a potential change order.

SURETY: The corporate body, which is bound with and for the Contractor, who is primarily liable and which engages to be responsible for the Contractor and his acceptable performance of the work for which he has contracted.

SUBSTANTIAL COMPLETION: The stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

THE CONTRACTOR SHALL: In interest of conciseness; sentences, statements, and clauses may be verb phrases with expressive verbs such as “furnish”, “install”, “provide”, “perform”, “construct”, “erect”, “comply”, “apply”, “submit”, etc. Any such sentences, statements, and clauses are to be interpreted to include the applicable form of the phrase “the Contractor shall” preceding the expressive verb, with the requirements described interpreted as mandatory elements of the Contract.

WARRANTY WORK: Warranty work refers to repairs to be made during the warranty period to completed Work that has been performed according to the contract documents.

Warranty work does **not** include repairs to Work that has **not** been performed according to the contract documents. These repairs are considered to be punch list items and part of the contract Work to be completed by the contractor before final payment is made. When Work is found after final payment is made not to have been performed as required by the contract documents, the Contractor is still obligated to perform said Work, and it is **not** considered to be warranty work.

Warranty work does not include repairs required because of the following:

a. Abuse of the item
b. Lack of maintenance
c. Misuse (“an item being used in a manner that is was not designed for”). An example of this is when rolls of toilet paper have been flushed down the toilet causing a back-up.

WORK: The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project. The Work also includes providing supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure, complete and functional installation.

WRITTEN NOTICE: A written communication delivered to the Contractor, or to a partner of the firm in the case of a partnership, or to a member of the contracting organization, or an officer or an employee of the organization in the case of a corporation, or sent to the last known business address of the contracting organization.

END OF GENERAL CONDITIONS

MECKLENBURG COUNTY
BUSINESS DIVERSITY & INCLUSION (BDI) PROVISIONS

To be applied by reference to the Town of Cornelius Project

BUSINESS DIVERSITY & INCLUSION (BDI) PROGRAM OVERVIEW

Mecklenburg County has made great strides to ensure business is conducted fairly and with diverse populations in our community. Mecklenburg County's Office of Economic Development engaged Griffin & Strong, P.C. (GSPC) to conduct a disparity study on the availability and utilization of minority and women-owned business enterprises by the County and to examine the relevant evidence of race – or gender – based discrimination in the County's contracting process.

The 2020 Mecklenburg County Disparity Study *(www.mecknc.gov/oed/BDI)* revealed areas for improvement, for which GSPC made recommendations to assist the County in remediating the disparities to ensure that all qualified firms within the relevant market are given equal opportunity to succeed in doing business with the County. The full report and recommendation list can be found on the Mecklenburg County website.

Because the implementation of the Disparity Study recommendations will impact internal and external stakeholders, the County has decided on a phased transitional approach to implement the objectives.

Mecklenburg County Government will provide Minority-owned, Women-owned, and Small Business Enterprises (collectively "MWSBE") as well as other responsible vendors with fair and reasonable opportunity to participate in conducting business with Mecklenburg County.

The BDI Program Provisions Guide requires Contractors and Subcontractors to take all reasonably necessary steps to ensure maximum inclusion opportunity for the participation of Minority Business Enterprises and Women Business Enterprises certified through NC Historically Underutilized Businesses (NCHUB), herein referred to as MBE, WBE or MWBE firms in its contracting activities with Mecklenburg County. Businesses that are not certified MBE or WBE as previously mentioned, will be herein referred to as non-certified. It is further the intent of the Program to broaden opportunities for the participation, increase competition, and to ensure the proper and diligent use of public funds. The BDI Program Provisions Guide includes Contract-by-Contract and Achievement goals for MWBE utilization in proportion to the availability of qualified vendors in particular areas of procurement.

1. Program Statement.

It is the practice of the Mecklenburg County's Business Diversity and Inclusion Program (the "BDI Program"), in conjunction with the County Procurement Division, to foster greater competition, increase opportunities for participation by all segments of the business community, and maximize value for the taxpayers' dollars through efficient use of public funds. The BDI Program accordingly is intended to promote full and equal business opportunities for all businesses contracting with Mecklenburg County by increasing the opportunity for purchase of goods and services from minority-owned and women-owned enterprises.

Consistent with the Mecklenburg County Solicitation Terms & Conditions, which encourage Bidders and Contractors to take all reasonably necessary and responsible steps to ensure that minority, women, and small business enterprises have the maximum opportunity to participate in County contracts, it is the practice of the BDI Program to encourage Contractors to actively seek MWBE participation to the greatest

extent possible, and to monitor compliance.

2. Promotion of Equal Opportunity.
The BDI Program seeks to ensure that firms desiring to participate in contracting and procurement activities with the County are not prevented from doing so based on the race, color, national origin, or gender of their owners. It is the intent of the BDI program that no firm, business enterprise, or person shall be denied the benefit of, or otherwise be discriminated against, on the grounds of race, color, national origin, or gender in connection with the award or performance of any contract paid for, in whole or in part, with funding from Mecklenburg County.

3. Program Objectives.
The objectives of the Mecklenburg County BDI Program are to promote and encourage full and open competition in all County contracting and purchasing; to encourage all County personnel involved in procurement and contracting activities to utilize appropriate procedures to identify and remedy any participation by the County in unintended unlawful discrimination (active or passive).

Mecklenburg County engaged a consultant, Griffin & Strong P.C. ("GSPC" or the "consultant"), to conduct a Disparity Study assessing County purchasing, contracting and the MWSBE Program. The consultant produced its Study Report to the County in 2020, and the BDI Program has the objective of implementing recommendations included in the Study. For example, the consultant found that there is a factual predicate for the continuation of the MWSBE (now BDI) Program. Moreover, the results of the study confirmed that the race and gender-neutral policies and program elements thus far employed by the County have proven insufficient to remedy the present effects of past discrimination in purchasing/contracting in the relevant market. The consultant therefore recommended implementation of certain race conscious and gender conscious elements as part of the Program.

4. Commitment to Program Objectives.
In the 2020 Disparity Study, GSPC recommended that Mecklenburg County increase staffing to facilitate recommendations relating to supportive services, monitoring and compliance, forecasting, and goal-setting. The County is committed to achieving the BDI Program objectives and, accordingly, to providing the necessary budgetary, staffing, and support resources necessary for the success of the BDI Program.

To review the complete BDI Program Provisions Guide, visit www.mecknc.gov/oed/BDI/Pages/faqs-policies-forms.aspx

For assistance, contact the Office of Economic Development's BDI Team.

Mecklenburg County - Office of Economic Development
Business Diversity & Inclusion (BDI) Program
Charlotte-Mecklenburg Government Center
600 East 4th Street Charlotte, North Carolina 28202

Phone: 980.314.2945
Email: BDI@mecknc.gov
Website: oed.mecknc.gov/BDI

SECTION-4 | SUBMITTALS AND TIME FRAME

The specific forms to be utilized are noted on the Bid Solicitation Coversheet per the Participation Goal Type.

"Failure to file a required affidavit or documentation that demonstrates that the contractor made the required good faith effort is grounds for rejection of the Bid." NCGS 143-128.2(c)

Form Name/Description	Submission Requirements	Required Form #
Listing of Good Faith Efforts (GFE) Completed by Bidder(s). Identifies the statutory Good Faith Efforts undertaken to recruit and solicit MWBEs to meet or exceed the participation goal for this Contract.	Due with Bid/Proposal when noted on Bid Solicitation Information (if subcontracting)	Form A
Identification of Subcontractor Participation Completed by Bidder(s). Identifies MWBEs and non-certified firms (their scope of work and dollar value) that are anticipated to receive a subcontract for this Contract.	Due with Bid/Proposal (if subcontracting)	Form B
Identification of Subcontractor Participation - Alternates Completed by Bidder(s)/Participant(s). Identifies certified NCHUB MWBEs and non-NCHUB MWBEs that are anticipated to receive a subcontract for this Contract in the event Construction Alternates are selected by the County.	Due within three (3) business days after receiving a request from the County (if subcontracting)	Form B1
Statement of Intent to Perform Contract with Own Workforce Completed by Bidder(s). Indicates that the Bidder does not customarily subcontract elements of this type of project, normally performs, has the capability to perform, and will perform ALL elements of the work on this Contract with its own current workforce AND will not purchase any material or supplies for the project in the performance of this Contract.	Due with Bid/Proposal (if self-performing)	Form C
MWBE Inclusion Plan Completed by Bidder(s)/Submitter(s). A detailed description of the strategies and actions the Bidder/Submitter will take to outreach fairly and equitably, support, and contract with MWBEs.	Due with Bid/Submission when noted on Bid Solicitation Information Coversheet (if subcontracting	Form D
Subcontractor Commitment Completed by Prime Contractor(s) and ALL of the Subcontractors (Suppliers/Subconsultants). This document shall not serve in a manner as an actual subcontract between the two parties. A separate binding agreement will describe in detail the contractual obligation of the Prime Contractor and the Subcontractor conditioned upon the execution of a contract with Mecklenburg County.	Due within three (3) business days after receiving a request from the County (if subcontracting)	Form E
Tier 2 Subcontractor Commitment (Special Projects Only) Completed by Tier 1 Subcontractor and ALL of the Tier 2 Subcontractors (Suppliers/Subconsultants). This document shall not serve in a manner as an actual subcontract between the two parties. A separate binding agreement will describe in detail the contractual obligation of the Tier 1 Firm conditioned upon the execution of a contract with the Prime and Mecklenburg County and Tier 1 Firm and the Prime.	Due within three (3) business days after receiving a request from the County (if subcontracting–Tier 2)	Form E1
Certificate of MWBE Unavailability Completed by Bidder(s)/Participant(s). This document identifies the MWBE firms that were originally committed to Subcontract in good faith but became unavailable prior to signing a formal Agreement/Contract.	Due with the Subcontractor Commitment Form (Forms E/E1)	Form F
Prime Contractor / Project Identification Completed by Prime Contractor. Identifies the Prime Contractor and Project information.	Due within three (3) business days after receipt of fully executed County Contract	Form G
Statement of Payments to Subcontractors/Suppliers Completed by Prime Contractor(s) (and Tier 1 Subcontractors when applicable). Prime Contractors must submit this form with each request for payment showing work that has been approved and completed for all Subcontractors (suppliers, manufacturers, brokers, and/or members of a joint venture) in connection with the Contract.	Due with Pay Applications	Form H
Good Faith Efforts (GFE) Documentation Completed by Bidder(s). If the established MBE and WBE goals are not achieved at the time of Bid, the Bidder shall provide the backup documentation using the GFE Points System as a guide for documentation submission to support the Good Faith Efforts selected on Form A.	Due upon the time specified by the County, if not specified then within three (3) business days after the bid due date	Backup Documentation using the GFE Points System
Joint Venture Documentation Completed by Prime Contractor(s). Documentation that acknowledges a joint venture, the terms, and percentage breakdown.	Due with Bid/Submission when noted on Bid Solicitation Information Coversheet (if subcontracting)	Backup Documentation

FORM A - GOOD FAITH EFFORTS (GFE) FORM

[Submit with Bid]

Name of Bidder: *(Company Name)*			
Project Name		**Solicitation #:**	

Prior to submission, review your documents for accuracy and ensure all items are complete

I have reviewed and made a good faith effort to comply with Section-5 Good Faith Efforts (GFE) Points System and have marked the following by selecting the checkbox(es) below and totaling the final points attained.

Bidders must earn at least fifty (50) points from the good faith efforts listed for their Bid to be considered responsive. (1 NC Administrative Code 30 I.0101). ***The Bidder agrees to provide any additional information and/or documentation per Section-5 Good Faith Efforts (GFE) Points System requested by the Owner in support of the Bidder's good faith efforts.***

NOTE: All actions necessary to earn GFE Points must be undertaken prior to Bid opening/Bid due date.

☐ (a) - (15 pts)

Subcontractor Solicitation: Bidder/Participant solicited Bids from MWBEs that would meet the Goals stated for the respective project, that reasonably could have been expected to submit a quote, and that were known to the Bidder/Participant or available on State or local government-maintained lists, at least **ten (10) Business Days** before the Bid date and notified them of the nature and scope of the work to be performed.

☐ (b) - (10 pts)

Plan Availability: The Bidder/Participant made the Project Documents (e.g., project descriptions, construction plans, specifications, and/or requirements) available for review by prospective MWBE Subcontractors or provided these documents to them at least **ten (10) Business Days** before the Bids are due. **A Bidder/Participant may receive credit for this GFE only if the Bidder/Participant receives credit for the above Subcontractor Solicitation GFE (subsection (a)) and it responds promptly to any request(s) made for access to the project documents.**

☐ (c) - (10 pts)

Breaking Down Work: The Bidder/Participant separated or combined elements of work into economically feasible units to facilitate MWBE participation. **A Bidder/Participant may receive credit for this GFE only if the Bidder/Participant receives credit for the above Subcontractor Solicitation GFE (subsection (a)).**

☐ (d) - (10 pts)

Working with an MWBE Assistance Organization: The Bidder/Participant must document it worked with MWBE trade, community, or contractor organizations identified by the BDI Program Team, the state Office of Historically Underutilized Businesses, and/or included in the Bid documents that provide assistance in recruitment of MWBE businesses, at least **fifteen (15) Business Days** before Bids are due. **A Bidder/Participant may receive credit for this GFE only if the Bidder/Participant receives credit for the above Subcontractor Solicitation GFE (subsection (a)).**

☐ (e) - (10 pts)

A**ttending Pre-Bid:** The Bidder/Participant attended any pre-Bid meetings scheduled by the Owner.

☐ (f) - (10 pts)

Bonding or Insurance Assistance: After the Bidder/Participant received a Bid/Proposal from an MWBE Subcontractor, the Bidder/Participant committed to providing assistance to the MWBE in obtaining required bonding or insurance or provided alternatives to bonding or insurance. **Mere willingness to offer such assistance in the absence of some MWBE Subcontractor participation will not result in credit for these points.**

☐ (g) - (20 pts)

Negotiating in Good Faith with MWBEs: The Bidder/Participant must demonstrate that the Bidder/Participant negotiated in good faith with interested MWBE businesses (which, at a minimum, means showing some back-and-forth negotiations between the Bidder/Participant and prospective MWBEs), and did not reject any MWBEs as unqualified without sound reasons based on their capabilities and shall document in writing the reasons for rejecting any MWBEs for lack of qualifications.

☐ (h) - (15 pts)

Financial Assistance: After the Bidder/Participant received a Bid/Proposal from an MWBE Subcontractor, the Bidder/Participant committed to providing one of the following types of assistance to an MWBE in connection with the Contract, once awarded:

- assistance in obtaining equipment, a loan, capital, lines of credit, joint pay agreements or guaranties to secure loans, the purchase of supplies, or letters of credit, including waiving credit that is ordinarily required, or
- assistance in obtaining the same unit pricing with the Bidder's/Participant's suppliers as the Bidder/Participant.

☐ (i) - (20 pts)

Joint Venture Arrangement: The Bidder/Participant must demonstrate that the idder/Participant negotiated joint venture/partnership/association arrangements with MWBE in order to increase opportunities for MWBE participation on this project.

☐ (j) - (10 pts)

Quick Payment Commitment: After the Bidder/Participant received a Bid / proposal from an MWBE Subcontractor, the Bidder/Participant committed to providing quick pay agreements and policies to enable such MWBE Subcontractor(s) and/or Supplier(s) to meet cash-flow demands. Mere willingness to offer such agreement in the absence of some MWBE Subcontractor participation will not result in credit for these points.

The undersigned will enter into a formal agreement with the firms listed on the Identification of Subcontractor Participation Form (Form B), conditional upon the 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, giving rise to all contract and/or statutory remedies, including but not limited to cancellation of the contract.

The undersigned hereby certifies that he or she has read the terms of the BDI Program Provisions Guide and the formal agreement with the firms listed on Form B and is authorized to bind the Bidder/Participant to the commitment herein set forth.

Total GFE Points _____ *(Calculate the total GFE points selected with above)*

For each Participation Goal (MBE and WBE) that is unmet, the Bidder must earn at least fifty (50) GFE points (the "Minimum GFE Points") to be considered responsive. Be prepared to submit the documentation following the Bid opening/Bid Due date.

Name of Authorized Person: _____

Date: _____ Signature: _____

Title: _____

State of _____ County of _____

Subscribed and sworn to before me this _____

day of month, year

SEAL

Notary Public _____

My commission expires _____

Form B – Identification of Subcontractor Participation

[Submit with Bid]

The County maintains a strong commitment to the inclusion of MWBEs in the County's contracting and procurement process when there are viable subcontracting opportunities. Bidders must submit this form with their Bid/Proposal outlining any supplies and/or services to be provided by all Subcontractors, including each MBE, WBE, and non-certified firms for the Contract.

Prior to submission, review your documents for accuracy and ensure all items are complete

Name of Bidder: *(Company Name)*		**Certification Status:** *(check all that apply)*	☐ MBE ☐ WBE ☐ NCSBE ☐ CBI-SBE ☐ NCDOT-DBE
Project Name:		**Total Bid Amount:**	
Authorized Person:		**Solicitation #:**	
Email:		**Telephone:**	

I, the Authorized Person, do hereby certify that on this Contract, we intend to use the following certified MWBEs and non-certified firms as Subcontractors (subconsultants, vendors, suppliers, and/or providers of professional and/or other services). We intend to expend the amounts/percentages below of the total dollar amount of the contract with the businesses listed

****MBE and WBE Certification with the NCHUB Office is required to be counted toward participation goals.**

Total Utilization Amount	Total Utilization Percentage	Total MBE Amount	Total MBE Percentage	Total WBE Amount	Total WBE Percentage	Total Non-Certified Amount	Total Non-Certified Percentage

#	Firm's Name / Contact Person	Telephone / Email	County / State	Scope of Work	MBE Amount	WBE Amount	Non-Certified Amount
1							
2							
3							
4							
5							

6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

(add additional sheets if needed)

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with the firms listed on this form, conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract, giving rise to all contract and/or statutory remedies, including but not limited to cancellation of the contract.

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

Signature of Authorized Person | Title | Date

Form B1 – Identification of Subcontractor Participation - ALTERNATES

[Do not submit with Bid – Due within three (3) business days after receiving a request from the County]

In the event Construction Alternates are selected by the County, the established Subcontracting goal(s) for this Contract will apply to the total contract amount, including contingency and the selected Alternates ("Total Contract Amount"). In such an instance, Bidders/Participants must identify additional MWBE commitments and submit Form B1 showing all commitments made after Bid Opening.

The County maintains a strong commitment to the inclusion of MWBEs in the County's contracting and procurement process when there are viable subcontracting opportunities. Bidders must submit this form outlining any supplies and/or services to be provided by all Subcontractors, including each MBE, WBE, and non-certified firms for the Contract.

Prior to submission, review your documents for accuracy and ensure all items are complete

Name of Bidder: *(Company Name)*		**Certification Status:** *(check all that apply)*	☐ MBE ☐ WBE ☐ NCSBE ☐ CBI-SBE ☐ NCDOT-DBE
Project Name:		**Total Bid Amount:**	
Authorized Person:		**Solicitation #:**	
Email:		**Telephone:**	

I, the Authorized Person, do hereby certify that on this Contract, we intend to use the following certified MWBEs and non-certified firms as Subcontractors (subconsultants, vendors, suppliers, and/or providers of professional and/or other services). We intend to expend the amounts/percentages below of the total dollar amount of the contract with the businesses listed

****MBE and WBE Certification with the NCHUB Office is required to be counted toward participation goals.**

Total Utilization Amount	Total Utilization Percentage	Total MBE Amount	Total MBE Percentage	Total WBE Amount	Total WBE Percentage	Total Non-Certified Amount	Total Non-Certified Percentage

#	Firm's Name / Contact Person	Telephone / Email	County / State	Scope of Work	MBE Amount	WBE Amount	Non-Certified Amount
1							
2							
3							

4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

(add additional sheets if needed)

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with the firms listed on this form, conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract, giving rise to all contract and/or statutory remedies, including but not limited to cancellation of the contract.

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

Signature of Authorized Person | Title | Date

FORM C - Statement of Intent to Perform Contract with OWN Workforce

[Submit with Bid]

Prior to submission, review your documents for accuracy and ensure all items are complete

Name of Bidder: *(Company Name)*		**Certification Status:** *(check all that apply)*	☐ MBE ☐ WBE ☐ NCSBE ☐ CBI-SBE ☐ NCDOT-DBE
Telephone:		**Email:**	
Project Name:		**Solicitation #:**	
Total Bid Amount:			

I hereby certify that it is out intent to perform 100% of the contract required for this Contract

1. In making this certification, the Bidder states that the Bidder does not customarily subcontract elements of this type of project, normally performs, has the capability to perform, and will perform **all elements of the work (labor)** on this project with his/her own current workforces – **including any aggregation of material, equipment or supplies required for the project provided by the Bidder's company for utilization on a County Project, with the total value of which is ten percent (10%) or more of the value of the contract or $2,000, whichever is less; and**

The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement.

2.If it should become necessary to subcontract some portion of the work at a later date, the Bidder will comply with all "Good Faith Efforts" requirements in providing equal opportunity to MWBE firms to Subcontract the Work. The BDI Program Office should be notified immediately and approved, and respective BDI Program Provisions and Forms should be adhered to.

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

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

Name of Authorized Person: _____

Date: _____ Signature: _____

Title: _____

State of _____ County of _____

Subscribed and sworn to before me this _____ day of _____ month, year

SEAL

Notary Public _____

My commission expires _____

Form D - MWBE Inclusion Plan

[Submit with Bid/Submission, when selected in the BDI Solicitiation Coversheet]

Create a detailed description of the strategies and actions the Bidder will take to outreach fairly and equitably, support, and contract with MWBEs.

Prior to submission, review your documents for accuracy and ensure all items are complete

The following are elements to incorporate into the MWBE Inclusion Plan to help collaborate with MWBEs by addressing the following, but not be limited to:

- the firms you contacted, when, and how you made contact, and their contact information
- the outreach strategy used to meet this Contract's MWBE achievement goals;
- the specific resources and resource contacts utilized to locate MWBE firms for this Contract;
- the plan for building a connection with MWBEs and developing a project team;
- the plan to strengthen business relationships;
- the methods that will be used to improve lines of communication;
- the approach(es) that will be taken to resolve disputes;
- detailed description of the supportive services and activities that will be established for business development and how the plan will be executed;
- the mentorship opportunities that will be made available and how those opportunities will be executed; and
- the efforts that will be made available for capacity building and how those efforts will be executed.

(add additional sheets if needed)

Form E - Subcontractor Commitment

[Do not submit with Bid - Due within three (3) business days after receiving a request from the County]

This document standing alone shall not be considered an actual subcontract between the two parties. A separate binding agreement will describe in detail the contractual obligation of the Prime Contractor and the Subcontractor. The undersigned will enter into a formal agreement for the scope of work mentioned, conditioned upon the execution of a contract with Mecklenburg County. Breach of this commitment constitutes breach of Bidder's/Participant's contract if awarded. If subcontracting with MBE/WBE Firms, any changes in this commitment must be approved in advance by the BDI Office.

To be completed by the Prime Contractor			
Project Name:		Solicitation Number:	
Company Name:			
Authorized Person:		Title:	
Email:		Telephone:	
Reason for Out-of-State Selection			

If the Prime Contractor has entered into a Quick Pay Agreement, in association with this Commitment, attach a copy of the executed Agreement with the undersigned business.

Upon execution of a Prime Contract with the County for the above referenced project, the Bidder/Participant certifies that it intends to utilize the business listed below, and that the description, cost of work to be performed by the business as described below is accurate. Both parties have or will enter into a formal agreement conditioned upon the execution of a Contract with Mecklenburg County.

Signature of Authorized Person (Prime Contractor) Date

To be completed by the Subcontractor (Supplier/Subconsultant)			
Company Name:			
Authorized Person:		Title:	
Telephone:		Email:	
Address, City, St, Zip:			
County:		Ownership is Minority Female	
Sources of Ownership Category:		Ownership Category	
Contract Date:		Attended the Pre-Bid:	

Identify in complete detail the scope of work to be performed and/or item(s) to be supplied with projected start and end timeframe. The undersigned intends to and is prepared to perform the work and/or provide the supplies (described below) in connection with the above project at the following price.

Price($): _____

NIGP Code	Scope of Work	Projected Start Date	Project End Date

The subcontracting firm certifies that it has read the BDI Program Provisions Guide and agreed to provide such work/supplies for the amount stated above. Both parties have or will enter into a formal agreement conditioned upon the execution of a Contract with Mecklenburg County.

Signature of Authorized Person (Subcontractor/Supplier) **Date**

Form E1 - Tier 2 Subcontractor Commitment (Special Prjects Only)

[Do not submit with Bid - Due within three (3) business days after receiving a request from the County]

This document standing alone shall not be considered an actual subcontract between the two parties. A separate binding agreement will describe in detail the contractual obligation of the Tier 1 Subcontractor and the Tier 2 Subcontractor. The undersigned will enter into a formal agreement for the scope of work mentioned, conditioned upon the execution of a contract between the Prime Contractor with Mecklenburg County and with the Prime Contractor and the Tier 1 Subcontractor. If subcontracting with MBE/WBE Firms, any changes in this commitment must be approved in advance by the BDI Office.

To be completed by the Tier 1 Subcontractor			
Project Name:		Solicitation Number:	
Company Name:			
Authorized Person:		Title:	
Email:		Telephone:	
Reason for Out-of-State Selection			

If the Subcontractor has entered into a Quick Pay Agreement, in association with this Commitment, attach a copy of the executed Agreement with the undersigned business.

Upon execution of the above-mentioned executed Contracts, the Tier 1 Subcontractor certifies that it intends to utilize the business listed below, and the description, cost of work to be performed by the business as described below is accurate. Both parties have or will enter into a formal agreement conditioned upon the above-mentioned executed Contracts.

Signature of Authorized Person (Tier 1 Subcontractor)) Date

To be completed by the Subcontractor (Supplier/Subconsultant)			
Company Name:			
Authorized Person:		Title:	
Telephone:		Email:	
Address, City, St, Zip:			
County:		Ownership is Minority Female	
Sources of Ownership Category:		Ownership Category	
Contract Date:		Attended the Pre-Bid:	

Identify in complete detail the scope of work to be performed and/or item(s) to be supplied with projected start and end timeframe. The undersigned intends to and is prepared to perform the work and/or provide the supplies (described below) in connection with the above project at the following price.

Price($): _____

NIGP Code	Scope of Work	Projected Start Date	Project End Date

The subcontracting firm certifies that it has read the BDI Program Provisions Guide and agreed to provide such work/supplies for the amount stated above. Both parties have or will enter into a formal agreement conditioned upon the above-mentioned executed Contracts.

Signature of Authorized Person (Tier 2 Subcontractor/Supplier) **Date**

Form F - Certificate of MWBE Unavailability

[Do not submit with Bid - Due within three (3) business days after receiving a request from the County]

This document identifies the MWBE firm that was originally committed to Subcontract in good faith but became unavailable prior to providing the work/supplies, originally agreed upon for this project.

To be completed by the Prime Contractor			
Project Name:		Solicitation Number:	
Company Name:			
Authorized Person:		Title:	
Email:		Telephone:	
Reason for Out-of-State Selection			

The undersigned certifies that the below MWBE was contacted in **"Good Faith"** and agreed to participate on the Project mentioned above with the stated price and scope of work but is now unavailable per the reason they have stated below.

Signature of Authorized Person (Prime Contractor) Date

To be completed by the Subcontractor (Supplier/Subconsultant)			
Company Name:			
Authorized Person:		Title:	
Telephone:		Email:	
Address, City, St, Zip:			
County:		Ownership is Minority Female	
Sources of Ownership Category:		Ownership Category	
Contract Date:		Attended the Pre-Bid:	

Price ($)	**Scope of Work**	**Reason for Unavailability**

The firm certifies that it is no longer available to provide such work/supplies for the amount stated above, per the reason stated.

Signature of Authorized Person (Subcontractor/Supplier) **Date**

Form G - Prime Contractor / Project Identification Form

[Do not submit with Bid - Due within three (3) business days after receipt of fully executed County Contract

To be completed by the Prime Contractor			
Project Name:		Solicitation Number:	
Company Name:			
Owner Name:		Owner Email/Telephone:	
Authorized Person:		Title:	
Email:		Telephone:	
Address, City, County, State, Zip:			
Bid Opening Date:		Self-Performing:	
Contract Date		Contract #:	
Original Contract Value:		Current Certification:	
Primary Type of Work for this Contract *(Construction)*		Primary Discipline for this Contract: *(Construction)*	
Construction Method *(Construction)*		Type of Service: *(Construction)*	
Scope of Work *(Services/Goods)*			
Ownership Category		Ownership is Minority Female	
Source of Ownership Category			

Signature of Authorized Person (Subcontractor/Supplier) **Date**

Form H - Statement of Payments to Subcontractors (Suppliers/Subconsultants)

[Do not submit with Bid – Due with pay applications]

Prime Contractors (Tier 1 Subcontractors when applicable) must submit this form or when applicable, input this information into the Contract Compliance Solution System with each request for payment showing work that has been approved and completed for all Subcontractors (suppliers, manufacturers, brokers, and/or members of a joint venture) in connection with the Contract.

Copy this form as needed

Project Name:		**Contract Number:**	
Company Name:			
Authorized Person:		**Title:**	
Email:		**Telephone:**	
Address, City, County, State, Zip:			
Payment Period: *(dates - from/to)*		**Payment/Invoice #:**	
Invoice Amount:		**County Project Manager Name:**	
Notes:			

FINAL PAYMENT: ☐ Check this box only when submitting the Final Pay request **Final Contract Total Value:** _____

☐ No Payments: Certify that no Subcontractors (suppliers/subconsultants) were used in performing the Contract for the payment period indicated above.

PAYMENTS TO ALL SUBCONTRACTORS

Complete the fields below for all Subcontractors (suppliers/subconsultants) on the contract for the above-mentioned period regardless of dollar amount.

Firm's Name	Certification	Scope of Work	NIGP	Amount to be Paid from this pay request	Total Payments to Date	Total Amount Committed

Total Amount Paid on this Statement				**$ -**	**$ -**	**$ -**
Total Amount Paid to MBE firms on this Statement				**$ -**	**$ -**	**$ -**
Total Amount Paid to WBE firms on this Statement				**$ -**	**$ -**	**$ -**
Total Amount Paid to Non-Certified firms on this Statement				**$ -**	**$ -**	**$ -**

The undersigned certifies the preceding chart is a true and accurate statement of all payments that have been made to Subcontractors (suppliers/subconsultants) on the above referenced Contract, and that all Suppliers providing goods under this contract include sales tax. If no Subcontractors or Suppliers are listed on the preceding chart, the undersigned certifies that no Subcontractors or Suppliers were used in performing the Contract for the payment period indicated. Failure to provide accurate and truthful information is a violation of Mecklenburg County's BDI Provisions Guide (Section-9) and may result in the sanctions prescribed therein.

Signature and title of the authorized person of the company and the date must be properly executed or this document will be deemed nonresponsive.

Signature of Authorized Person **Date**

01 00 00 General Requirements

SECTION 01 11 00 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS and REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions of the Technical Specifications, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Bailey Road Park Expansion – Phase 1, 11536 Bailey Road, Cornelius, NC 28031

B. Consultant Identification: The Contract Documents, dated April 24, 2024 were prepared for Project by Dewberry Engineers Inc.

C. The Work consists of a Single Prime General Construction Contract:

1. The work of this contract includes but is not be limited to, converting three (3) existing tennis courts into ten (10) pickleball courts, the construction of six (6) new tennis courts, the expansion of an existing parking lot, the construction of a new parking lot, the expansion of an existing dry detention pond, construction of a new sand filter BMP, rough grading for tennis courts and parking to be constructed during Phase 2, and water/sewer service extensions to serve a restroom building to be constructed during Phase 2, with associated clearing, demolition, erosion control, grading, stormwater, landscaping, and concrete work.
2. Contractor shall furnish all material, labor, tools, supplies, equipment, transportation, temporary construction of every nature, insurance, taxes, contributions and all services and facilities, unless specifically excepted, and install all materials, items and equipment required to complete the construction of the Project, as set forth in the Contract.
3. Coordination of owner provided and owner installed equipment. General Contractor shall coordinate all trades with owner’s contractor for these items.
4. The General Contractor shall act as the Project Expediter and be responsible for coordinating the work and schedules of other trades.

1.3 CONTRACT

A. Project will be constructed as a Single Prime Contract.

1.4 SPECIFICATION FORMATS AND CONVENTIONS

A. Technical Specifications Format: The Specifications are organized into Divisions and Sections using the 16-division format and Construction Specifications Institute / Construction Specifications Canada (CSI/CSC's) "Master Format" numbering system.

1. Section Identification: The Technical Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.

B. Technical Specifications Content: The Technical 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 Technical Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Technical Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

    a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 11 00

SECTION 01 14 00 - WORK RESTRICTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions of the Technical Specifications, apply to this Section.

1.2 USE OF PREMISES

A. Use of Site: Limit use of premises to work in areas indicated on the drawings. Do not disturb portions of site beyond areas in which the Work is indicated.

1. Limits: Confine constructions operations to limits of denuded area and erosion and sediment control devises.

2. Owner Occupancy: Allow for Owner occupancy of site. This area of the park will be closed for the project's duration and use by the public is not allowed.

3. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

    a. Schedule deliveries to minimize use of driveways and entrances.
    b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

4. Construction hours shall start between the hours of 7 A.M. and end at 7 P.M, Monday through Friday unless written authorization to work alternate hours has been requested by the Contractor and approved by the Owner.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 14 00

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SECTION 01 23 00 – ALTERNATES

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Provide all labor, materials, necessary equipment and services to complete the Total Base Bid and Alternates work, as indicated on the drawings, as specified herein or both except as for items specifically indicated as "NIC ITEMS". Contractors are responsible for payment of all applicable fees and taxes in association with their contract.

1.02 USE OF ALTERNATES

A. Submit alternate/total base bid proposals as described herein and in the "Bid Form" stating the total difference in cost to the stipulated Lump Sum Bid for adding or deducting the following alternates to that specified and/or shown on the drawings.

1. Include all applicable omissions, additions, and adjustments of all other applicable trades as required.

1.03 DESCRIPTION OF UNIT PRICES (See Single Prime General Contract Proposal)

A. Include on the Form of Proposal the proposed Total Base Contract Sum, which shall represent the total cost of the Work, including all allowances but excluding all alternates. Also show separately on the Form of Proposal the amounts proposed to be added to or deducted from the Total Base Contract Sum if the Owner accepts particular alternates.

B. Limits of Total Base Bid and Alternates: Alternates are outlined below for the purpose of overall coordination. Note: all contractors shall include in the base bid amounts any and all expense anticipated for the project including all taxes and fees.

C. The Owner reserves the right to accept any alternate and to amend the Contract accordingly, provided the order to proceed with such alternative Work is issued within 60 days after execution of the Contract.

PART 2 - PRODUCTS

2.01 SCHEDULE OF ALTERNATES

A. No alternates are proposed for this project.

2.02 ACCEPTABLE MANUFACTURERS AND MATERIALS

A. The bidder shall utilize all materials and products specified for the base bid in all of the construction for the accepted alternates, or pre-approved equal.

PART 3 - EXECUTION

3.01 A. All construction shall be in strict accordance with manufacturer's printed standards, recommendations and specifications.

END OF SECTION 01 23 00

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions of the Technical Specifications, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications whereas all parties agree to the following:

1. A modification in the Work or Contract Documents.

2. The amount of the adjustment in the Contract Sum, if any.

3. The extent of the adjustment in the Contract Time, if any.

1.3 NOTIFICATION TO SURETY

A. The Contractor shall notify the Surety of any modifications to the Work or provisions of the Contract Documents, including, but not limited to, the Contract Price or Contract Time.

1.4 MINOR CHANGES IN THE WORK

A. The Consultant shall have authority to order Minor Changes in the Work not involving adjustment to the Contract Sum or extension of the Contract Time, and consistent with the intent of the Contract Documents. Such changes shall be in a form of a written order and shall be binding for both the Owner and Contractor.

1.5 CLAIMS FOR ADDITIONAL COST:

A. If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property.

B. The Contractor shall submit a claim if he believes additional cost is involved for reasons including but not limited to the following:

1. A written interpretation from the Consultant,

2. An order by the Owner to stop the Work where the Contractor was not at fault,

3. A written order for a minor change in the Work issued by the Consultant,

4. A change in the Scope of the Work by the Consultant.

1.6 PROPOSAL REQUESTS

A. The Owner initiated Proposal Requests is generated by the Owner to modify the Work or Contract Documents. The Consultant will issue a detailed description of proposed modifications in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications. The description is for information and shall be considered as a directive to automatically stop work or execute the proposed change.

1. Within ten 10 calendar days after receipt of the Proposal Request, the Contractor shall submit a Proposal Request Form with an estimate to adjust the Contract Sum and the Contract Time if necessary to execute the change.

   a. Include a list of quantities of (plus or minus) the materials and/or products required with unit prices, total amount of purchases, and credits to be made. If requested, furnish survey data to substantiate quantities.

   b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

   c. Include costs of labor and supervision directly attributable to the change, including social security, old age and unemployment insurance, fringe benefits, and workmen’s compensation insurance.

   d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start, and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

   e. Provide any additional information related to the Proposal Request requested by the Consultant or Owner to clarify the Proposal within Seven (7) Days of the request. Failure to provide requested information will result in the Consultant researching and documenting the additional cost and assigning a cost that is the fair market value of the proposed modifications to the Work based on all information available to the Consultant.

2. The Contractor may initiate proposals if latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Consultant.

   a. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.

b. Include a list of quantities of (plus or minus) the materials and/or products required with unit prices, total amount of purchases, and credits to be made. If requested, furnish survey data to substantiate quantities.

c. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

d. Include costs of labor and supervision directly attributable to the change, including social security, old age and unemployment insurance, fringe benefits, and workmen's compensation insurance.

e. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

f. Comply with requirements in Division 1 Section, of the Technical Specifications "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

g. Comply with requirements in Division I Section 01 60 00, of the Technnical Specifications "Product Requirements", if the proposed change requires substitution of one product or system for product or system specified.

B. An alternative method to price the changes in the work is to utilize current "Mean's Cost Data".

C. Profit and Overhead shall not exceed ten percent (10%) of the cost of the changes to the Work.

D. Prepare a Proposal Request Form in a format agreed to by the Owner. The Contractor shall prepare three copies, one for the Consultant, one for the Owner and one for himself and for all parties to sign. Each shall keep a copy.

E. The Contractor shall be responsible for keeping and updating a "Proposal Request Log", listing all Proposal Requests and Minor Changes. The log shall also indicate the date of the Proposal Request, approval date, action taken, running balances, and a complete description of the change.

F. After all parties have signed "The Proposal Request Form", it shall be the Contractor's authorization to proceed with the changes to the Work.

G. If the Owner and Contractor do not agree with the requested adjustment in the Contract Sum, the Contract Time or the method of determining each, the provisions for Mediation shall be utilized.

1.7 ALLOWANCES ADJUSTMENT: (Not Used)

1.8 CHANGE ORDER PROCEDURES

A. The Consultant shall issue a Change Order for signatures once all of the Proposal Request(s) amounts exceeds $20,000 or at the end of the project.

B. The Contractor shall not invoice for the Change Order until it has been executed by all parties.

1.9 CONSTRUCTION CHANGE DIRECTIVE

A. The Consultant may issue a Construction Change Directive that has been signed by the Owner to the Contractor directing a change in the Work. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved. And the Contractor shall advise the Consultant of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

C. The Contractor shall maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

2.0 ADDITIONAL TIME

A. Additional work does not automatically translate into additional time. The Contractor must illustrate using Critical Path Schedule in a clearly and logical sequence if additional work has extended to the critical path. The consultant shall review with the Owner the time extension request and make a recommendation to the Owner to approve or reject the time extension request.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PROCESSING CHANGE ORDERS

A. The Change Order will be issued describing the change or changes to the Work and/or Contract Documents and will refer to the Proposal Requests.

B. The Consultant shall issue five copies of the Change Order to the Contractor. The Contractor shall promptly sign all five copies and return all five copies to the Consultant who will sign the Change Order and forward the Change Order to the Owner to execute.

C. Once the Change Order has been full executed, a copy shall be forwarded to the Consultant and to the Contractor for their files.

END OF SECTION 01 26 00

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SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions of the Technical Specifications, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections include the following:

1. Division 1, of the Technical Specifications Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.

2. Division 1, of the Technical Specifications Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

a. Application for Payment forms AIA G702.

b. Continuation Sheets.

2. Submit the Schedule of Values to the Consultant at earliest possible date but no later than fourteen days before the date scheduled for submittal of initial Applications for Payment.

3. Sub-schedules: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values correlated with each phase of payment.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each of the Technical Specifications Section.

1. Identification: Include the following Project information on the Schedule of Values:

   a. Project name and location.
   b. Name of Consultant.
   c. Contract 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 Technical Specifications Section or Division.
   b. Description of the Work.
   c. Name of subcontractors.
   d. Name of manufacturer or fabricator.
   e. Name of suppliers.
   f. Change Orders (numbers) that affect value.
   g. Dollar value.

3. Group items that are “Non-Tangible & Non-Taxable and Tangible & Taxable Items” on the Schedule of Values (see VIII. Forms).

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.

5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include labor and materials and/or equipment purchased or fabricated and stored, but not yet installed.

   a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing if required.

7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

8. Closeout documentation: Provide a separate line item in the Schedule of Values for close out documentation as set forth in the Supplementary Conditions.

9. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

10. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by the Consultant and paid for by Owner.

    1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involves additional requirements.

B. Such applications shall not include requests for payment of amounts the Contractor does not intend to pay to a Subcontractor or material supplier because of a dispute or other reason.

C. Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for material and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner’s title to such material and equipment or otherwise protect the Owner’s interest, and shall include applicable insurance, storage and transportation to the site for such material and equipment stored off the site.

    The Contractor warrants that title to all Work covered by an Application and Certificate for payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application and Certificate for payment all work for which Certificates for payment have been previously issued and payment received from the Owner shall, to the best of the Contractor’s knowledge, information and belief, be free and clear of claims of liens, claims, security, interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

D. Payment Application Times: Each Month, the Town can make a partial payment to the Contractor on the basis of a duly notarized Application and Certification for Payment approved and certified by the Consultant.

E. Contractor shall provide Owner with lien waivers executed by all subcontractors within five (5) business days of each progress payment. Failure to provide such lien waivers may be grounds for Owner to terminate the Agreement or suspend any future payments until compliance is achieved.

F. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. The Consultant will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.

2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

3. The Town shall retain five (5%) percent of each payment up to fifty (50%) percent completion of the Contract.
   a) The Owner shall not retain more than five percent (5%) of any periodic payment due a prime Contractor.
   b) When the project is fifty percent (50%) complete, the Owner, with written consent of the surety, **shall not retain any further** retainage from periodic payments due the Contractor if the Contractor continues to perform satisfactorily and any nonconforming work identified in writing prior to that time by the Consultant or Owner has been corrected by the Contractor and accepted by the Consultant and Owner. If the Consultant determines the Contractor's performance is unsatisfactory, the Owner may reinstate retainage for each subsequent periodic payment application as authorized in this subsection up to the maximum amount of five percent (5%). The project shall be deemed fifty percent (50%) complete when the Contractor's gross project invoices, excluding the value of materials stored off-site, equal or exceed fifty percent (50%) of the value of the contract, except the value of materials stored on-site shall not exceed twenty percent (20%) of the Contractor's gross project invoices for the purpose of determining whether the project is fifty percent (50%) complete.
   c) Within 60 days after the submission of a pay request and one of the following occurs, as specified in the contract documents, the Owner with written consent of the surety shall release to the Contractor all retainage on payments held by the Owner:
      i. The Owner receives a certificate of substantial completion from the Consultant in charge of the project; or (ii) the Owner receives beneficial occupancy or use of the project. However, the Owner may retain sufficient funds to secure completion of the project or corrections on any work. If the Owner retains funds, the amount retained shall not exceed two and one-half times the estimated value of the work to be completed or corrected. Any reduction in the amount of the retainage on payments shall be with the consent of the Contractor's surety.

d) The existence of any third-party claims against the Contractor or any additive change orders to the construction contract shall not be a basis for delaying the release of any retainage on payments.

i Full payment, less authorized deductions, shall also be made for those trades that have reached one hundred percent (100%) completion of their contract by or before the project is fifty percent (50%) complete if the Contractor has performed satisfactorily. However, payment to the early finishing trades is contingent upon the Owner's receipt of an approval or certification from the Consultant of record or applicable engineer that the work performed by the subcontractor is acceptable and in accordance with the contract documents. At that time, the Owner shall reduce the retainage for such trades to **five-tenths percent (0.5%)** of the contract. Payments under this subsection shall be made no later than 60 days following receipt of the subcontractor's request or immediately upon receipt of the surety's consent, whichever occurs later. Early finishing trades under this subsection shall include structural steel, piling, caisson, and demolition. The early finishing trades for which line-item release of retained funds is required shall not be construed to prevent an Owner or an Owner's representative from identifying any other trades not listed in this subsection that are also allowed line-item release of retained funds. Should the Owner or Owner's representative identify any other trades to be afforded line-item release of retainage, the trade shall be listed in the original bid documents. Each bid document shall list the inspections required by the Owner before accepting the work, and any financial information required by the Owner to release payment to the trades, except the failure of the bid documents to contain this information shall not obligate the Owner to release the retainage if it has not received the required certification from the Consultant of record or applicable engineer.

ii Notwithstanding 3-a & b of this section, following fifty percent (50%) completion of the project, the Owner shall be authorized to withhold additional retainage from a subsequent periodic payment, not to exceed five percent (5%) as set forth in 3-a of this section, in order to allow the Owner to retain two and one-half percent (2.5%) total retainage through the completion of the project. In the event that the Owner elects to withhold additional retainage on any periodic payment subsequent to release of retainage pursuant to 3-d-i of this section, the General Contractor may also withhold from the subcontractors remaining on the project sufficient retainage to offset the additional retainage held by the Owner, notwithstanding the actual percentage of retainage withheld by the Owner of the project as a whole.

iii Neither the Owner's nor Contractor's release of retainage on payments as part of a payment in full on a line-item of work under 3-d-i of this section shall affect any applicable warranties on work done by the Contractor or subcontractor, and the warranties shall not begin to run any earlier than either the Owner's receipt

of a certificate of substantial completion from the Consultant in charge of the project or the Owner receives beneficial occupancy.

f) Nothing in this section shall prevent the prime Contractor at the time of application and certification to the Owner from withholding application and certification to the Owner for payment to the subcontractor for unsatisfactory job progress; defective construction not remedied; disputed work; third party claims filed or reasonable evidence that claim will be filed; failure of subcontractor to make timely payments for labor, equipment, and materials; damage to prime Contractor or another subcontractor; reasonable evidence that subcontract cannot be completed for the unpaid balance of the subcontract sum; or a reasonable amount for retainage not to exceed the initial percentage retained by the Owner.

g) Nothing in this section shall prevent the Owner from withholding payment to the Contractor in addition to the amounts authorized by this section for unsatisfactory job progress, defective construction not remedied, disputed work, or third-party claims filed against the Owner or reasonable evidence that a third-party claim will be filed.

4. Provide a separate line item in the Schedule of values for close out documentation as set forth in the Supplementary Conditions.

G. Transmittal: Submit five (5) signed and notarized original copies of each Application for Payment to the Consultant.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

H. With each Application and Certification for payment, the Contractor must furnish for themselves, as well as for all Subcontractors**,** certified statements stating the cost of the property purchased from each vendor and the amount of sales and/or use taxes paid. See General Conditions, Sales and Use Tax for additional information**.**

I. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

J. Neither Final payment nor any remaining retained percentage shall become due until the Contractor submits the following to the Consultant for approval:

1. An affidavit that payrolls, bills for material and other indebtedness connected with the Work has been paid or otherwise satisfied,

2. A certificate evidencing that insurance required by the Contract Document to remain in force after Final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner,

3. Consent of surety to Final payment, and

4. If required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of claim of liens, claims security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If the Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such claim of lien. If such claim of lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such claim, including all costs and reasonable attorneys' fees.

5. MWSBE form VI.

6. A list of all suppliers and subcontractors that were involved with the project. As part of the list, the Contractor shall include the address, phone number, what they supplied or Work preformed, and a contact name.

7. "As-Builts" Drawings and all other specified closeout documents.

8. Maintenance and Operation instructions and guarantees.

K. Final Payment Application: Submit three originals with the final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Warranties and Test results required by the Contract Documents.

2. Updated final statement, accounting for final changes to the Contract Sum.

3. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."

4. AIA Document G706A, "Contractor's Affidavit of Release of Liens."

5. AIA Document G707, "Consent of Surety to Final Payment."

6. Additional Evidence that claims has been settled if required by the Owner. An example of the evidence could be a letter from a subcontractor indicating that he has been paid in full for the work that he has preformed.

7. Certificates from all local and State Governing Agencies as required by Law.

8. Final liquidated damages settlement statement.

9. List of Subcontractors and Suppliers that has contributed to the completion of the Work. The list shall include:

a. Material they supplied or type of construction they performed.
b. Address
c. Contact person
d. Phone number

10. M/WSBE From VI

11. Final Sales Tax Form.

2.0 PRODUCTS (Not Used)

3.0 EXECUTION (Not Used)

END OF SECTION 01 29 00

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions of the Technical Specifications, apply to this Section.

1.2 SUMMARY

A. To enable orderly review during progress of the Work, and to provide for systematic discussion of problems, the Consultant will chair and conduct project meetings and compile an agenda for each meeting throughout the construction period.

B. This Section includes administrative provisions for coordinating construction operations on the Project including, but not limited to, the following:

1. General project coordination procedures.
2. Conservation.
3. Coordination Drawings.
4. Administrative and supervisory personnel.
5. Project meetings.

C. Related Sections: The following Sections contain requirements that relate to this Section:
1. Division 1, of the Technical Specifications Section "Construction Progress Documentation" for preparing and submitting the Contractor's Construction Schedule.
2. Division 1, of the Technical Specifications Section "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Division 1, of the Technical Specifications Section "Closeout Procedures" for coordinating Contract closeout.

1.3 COORDINATION

A. Coordination: Coordinate construction operations included in various Sections of the Technical Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

B. If necessary, the Consultant shall prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Pre-installation conferences.
7. Project closeout activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work.

1.4 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Indicate relationship of components shown on separate Shop Drawings.
2. Indicate required installation sequences.

B. Staff Names: Fourteen days prior to the Pre-Construction conference, submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room.

1.5 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting.
2. Agenda: The Consultant shall prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes:
   a. The Consultant will compile minutes of each project meeting, and will distribute copies to the Contractor and required copies to the Owner.
   b. Recipients of copies may make and distribute such other copies as they wish.

4. Attendance:
   a. To the maximum extent practical, assign the same person or persons to represent the Contractor at the project meetings throughout progress of the Work.
   b. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspect of the Work is involved.

5. Minimum agenda:
   a. Review, revise as necessary, and approve minutes of previous meetings.
   b. Review progress of the Work since last meeting, including status of submittals for approval.
   c. Identify problems which impede planned progress.
   d. Develop corrective measures and procedures to regain planned schedule.
   e. Complete other current business.

B. Pre-construction Conference: Schedule a pre-construction conference before starting construction, at a time convenient to Owner and Consultant, but no later than 14 days after execution of the Construction Contract. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Consultant, and their consultants; Contractor and its superintendent; major subcontractors and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Discuss items of significance that could affect progress, including the following:

   a. Tentative construction schedule.
   b. Phasing.
   c. Critical work sequencing.
   d. Designation of responsible personnel.
   e. Procedures for processing field decisions and Change Orders.
   f. Procedures for processing Applications for Payment.
   g. Distribution of the Contract Documents.
   h. Submittal procedures.
   i. Preparation of Record Documents.

j. Use of the premises.
k. Responsibility for temporary facilities and controls.
l. Parking availability.
m. Office, work, and storage areas.
n. Equipment deliveries and priorities.
o. Security.
p. Working hours.

C. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.

1 Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Consultant of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related Change Orders.
d. Purchases.
e Deliveries.
f. Submittals.
q. Review of mockups.
h. Possible conflicts.
i. Time schedules.
j. Weather limitations.
k. Manufacturer's written recommendations.
l. Temporary facilities and controls.
m. Space and access limitations.
n. Regulations of authorities having jurisdiction.
o. Testing and inspecting requirements.
p. Required performance results.
q. Protection of construction and personnel.

Record significant conference discussions, agreements, and disagreements.
Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at a minimum of once every month. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: Representatives at the meeting shall be the Owner, Consultant, Subcontractors, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

    b. Review present and future needs of each entity present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Status of submittals.
        4) Deliveries.
        5) Access.
        6) Work hours.
        7) Hazards and risks.
        8) Review of Record Drawings
        9) Review of construction defects that has been identified by the Consultant

3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

    a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

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SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions of the Technical Specifications, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Preliminary Construction Schedule.
2. Contractor's Construction Schedule.
3. Submittals Schedule.
4. Daily construction reports.
5. CPM Reports

B. Related Sections include the following:

1. Division 1, of the Technical Specifications Section "Payment Procedures" for submitting the Schedule of Values.
2. Division 1, of the Technical Specifications Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
3. Division 1, of the Technical Specifications Section "Submittal Procedures" for submitting schedules and reports.
4. Division 1, of the Technical Specifications Section "Quality Requirements" for submitting a schedule of tests and inspections.
5. Division 1, of the Technical Specifications Section "Closeout Procedures" for Project Record Documents at Project closeout.

1.3 SUBMITTALS

A. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of consultants and owners,

and other information specified. The date shall be submitted for any change of construction personal.

B. Preliminary Construction Schedule: Submit three printed copies; one a single sheet, of the Preliminary Construction Schedule.

C. Contractor's Construction Schedule: Submit three printed copies of initial schedule, large enough to show entire schedule for entire construction period.

1. If required, submit an electronic copy of schedule, using software indicated, on a CD and labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date on label.

D. Daily Construction Reports: Submit two copies at monthly intervals.

E. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.

2. Of the Technical Specifications Section number and title.

3. Submittal category (action or informational).

4. Name of subcontractor.

5. Description of the Work covered.

6. Scheduled date for Consultant's final release or approval.

1.4 COORDINATION

A. Coordinate preparation and processing of schedules and daily construction reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.

2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, re-submittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.

2. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
   a) At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.

3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed, through the date of Substantial Completion and Final Completion.

1. Contract completion date shall not be changed, unless specifically authorized by Change Order.

B. Activities: Treat as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities by number of days to complete.

2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

3. Submittal Review Time: Include review and re-submittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.

4. Startup and Testing Time: Include number of days for startup and testing.

5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Consultant's administrative procedures necessary for certification of Substantial Completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in the schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.

2. Work Restrictions: Show the effect of the following items on the schedule:

a) Coordination with existing construction.

b) Limitations of continued occupancies.

c) Uninterruptible services.

d) Partial occupancy before Substantial Completion.

e) Use of premises restrictions.

f) Environmental control.

3. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:

a) Submittals.

b) Purchases.

c) Mockups.

d) Fabrication.

e) Sample testing.

f) Deliveries.

g) Installation.

h) Tests and inspections.

i) Startup and placement into final use and operation.

D. Milestones: If not included in the Construction Documents, milestones shall be indicated in the Construction Schedule for the Consultant's and Owner's approval and shall be reference points of the construction progress.

E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragments to demonstrate the effect of the proposed change on the overall project schedule.

2.3 PRELIMINARY CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within seven (7) days of date established for the Notice to Proceed

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work.

2.4 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. High and low temperatures and general weather conditions.
5. Accidents.
6. Meetings and significant decisions.
7. Unusual events (refer to special reports).
8. Stoppages, delays, shortages, and losses.
9. Services connected and disconnected.
10. Equipment or system tests and startups.
11. Visitors to the site
12. Activities accomplished that day

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.

2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.

3. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Consultant, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms.

2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 32 00

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions of the Technical Specifications, apply to this Section.

1.2 SUMMARY

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

B. Related Sections include the following:

1. Division 1, of the Technical Specifications Section "Payment Procedures" for submitting Applications for Payment.
2. Division 1, of the Technical Specifications Section "Project Management and Coordination" for submitting Coordination Drawings.
3. Division 1, of the Technical Specifications Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
4. Division 1, of the Technical Specifications Section "Quality Requirements" for test and inspection reports and Delegated-Design Submittals and for erecting mockups.
5. Division 1, of the Technical Specifications Section "Closeout Procedures" for submitting warranties Project Record Documents and operation and maintenance manuals.
6. Division 1, of the Technical Specifications Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Consultant's responsive action.

B. Informational Submittals: Written information that does not require Consultant's approval. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. The Contractor shall provide the submittals as required by the Consultant’s Submittal Log and the Contract Documents.

B. General: Electronic copies of CAD Drawings of the Contract Drawings will be provided by Consultant for Contractor's use in preparing submittals.

C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Consultant reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

D. Submittals Schedule: Comply with requirements in Division 1, of the Technical Specifications Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities. (Submittal Log)

E. Processing Time: Allow enough time for submittal review, including time for re-submittals, as follows. Time for review shall commence on Consultant's receipt of submittal.

1. Initial Review: Allow seven (7) days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Consultant will advise Contractor when a submittal being processed must be delayed for coordination.
2. Concurrent Review: Where concurrent review of submittals by Consultant's consultants, Owner, or other parties is required, allow twenty one (21) days for initial review of each submittal.
3. If intermediate submittal is necessary, process it in same manner as initial submittal.
4. Allow seven (7) days for processing each re-submittal.
5. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

F. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Consultant.
3. Include the following information on label for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name and address of Consultant.
    d. Name and address of Contractor.
    e. Name and address of subcontractor.
    f. Name and address of supplier.
    g. Name of manufacturer.
    h. Unique identifier, including revision number.
    i. Number and title of appropriate Technical Specifications Section.
    j. Drawing number and detail references, as appropriate.
    k. Other necessary identification.

G. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.

H. Additional Copies: Unless additional copies are required for final submittal, and unless Consultant observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.

1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Consultant.
2. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.

I. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Consultant will return submittals, without review, received from sources other than Contractor.

1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Consultant on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
3. Transmittal Form: Use on form to be approved by the Consultant.

J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

K. Use for Construction: Use only final submittals with mark indicating action taken by Consultant in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

1. Number of Copies: Submit 6 copies of each submittal, unless otherwise indicated. Consultant will return 5 copies that have been marked-up. Retain three returned copies as a Project Record Document.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's written recommendations.
b. Manufacturer's product specifications.
c. Manufacturer's installation instructions.
d. Standard color charts.
e. Manufacturer's catalog cuts.
f. Wiring diagrams showing factory-installed wiring.
g. Printed performance curves.
h. Operational range diagrams.
i. Mill reports.
j. Standard product operating and maintenance manuals.
k. Compliance with recognized trade association standards.
l. Compliance with recognized testing agency standards.
m. Application of testing agency labels and seals.
n. Notation of coordination requirements.
o. Manufacturer’s location.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Include the following information, as applicable:

a. Dimensions.
b. Identification of products.
c. Fabrication and installation drawings.
d. Roughing-in and setting diagrams and existing conditions.
e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
f. Shopwork manufacturing instructions.
g. Templates and patterns.
h. Schedules.
i. Design calculations.
j. Compliance with specified standards.
k. Notation of coordination requirements.
l. Notation of dimensions established by field measurement.

2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches .
4. Number of Copies: Submit 6 blue- or black-line prints of each submittal, print will be required for operation and maintenance manuals. Consultant will retain two prints; remainder will be returned.

D. Coordination Drawings: Comply with requirements in Division 1 Section "Project Management and Coordination."

E. Samples: Prepare physical units of materials or products, including the following:

1. Comply with requirements in Division 1 Section "Quality Requirements" for mockups. Verify the samples are true presentation of the materials to be used.

2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
3. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Consultant's sample where so indicated. Attach label on unexposed side that includes the following:

    a. Generic description of Sample.
    b. Product name or name of manufacturer.
    c. Sample source.

4. Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, provide the following:

    a. Size limitations.
    b. Compliance with recognized standards.
    c. Availability.
    d. Delivery time.

5. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.

    a. If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least three sets of paired units that show approximate limits of the variations. The consultant will return submittal with the option selected.
    b. Refer to individual Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

6. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

F. Product Schedule or List: Prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product.
2. Number and name of room or space.
3. Location within room or space.

G. Delegated-Design Submittal: Comply with requirements in Division 1 Section "Quality Requirements."

H. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."

I. Application for Payment: Comply with requirements in Division 1 Section "Payment Procedures."

J. Schedule of Values: Comply with requirements in Division 1 Section "Payment Procedures."

K. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Consultant will not return copies.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

B. Contractor's Construction Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."

C. Qualification Data: If requested, prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Consultants and owners, and other information specified.

D. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.

G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.

I. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation for the application.

J. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

K. Coordinate individual Specification Sections with paragraph below by including specific model code organization in that Section. If all are same, insert name below.
Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 1 Section "Closeout Procedures Operation and Maintenance Data."

L. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

M. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

N. Material Safety Data Sheets: Submit two copies for the Consultant and the Owner and keep a copy at the job site. Post warning signs when appropriate.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Consultant.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 CONSULTANT'S ACTION

A. General: Consultant will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Consultant will review each submittal, make marks to indicate corrections or modifications required, and return it. Consultant will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. No Exceptions Taken
2. Make Changes Noted
3. Revise and Resubmit
4. Rejected

C. Informational Submittals: Consultant will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Consultant will forward each submittal to appropriate party.

D. Submittals not required by the Contract Documents will not be reviewed and may be discarded unless a justification is also submitted.

END OF SECTION 01 33 00

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions of the Technical Specifications, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-control services required by Consultant, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections include the following:

1. Division 1, of the Technical Specifications Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction comply with requirements. Services do not include contract enforcement activities performed by Consultant.

C. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.4 SUBMITTALS

A. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Technical Specifications Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent for a second option.

F. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

1.6 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.

2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

    a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Special Tests and Inspections: Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

1. Testing agency will notify Consultant and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Consultant with copy to Contractor and to authorities having jurisdiction.
3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Testing agency will retest and re-inspect corrected work.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

E. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services as requested by the Consultant at the Contractor’s expense, including retesting and re-inspecting, for construction that revised or replaced Work, at the Contractor’s expense, that failed to comply with requirements established by the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Consultant and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. In the event there is a need for the Contractor to have testing performed.

2. Notify Consultant and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
3. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field-curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for the Notice to Proceed.

1. Distribution: Distribute schedule to Owner, Consultant, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

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SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions of the Technical Specifications, apply to this Section.

1.2 SUMMARY

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

B. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

C. Temporary utilities include, but are not limited to, the following:

1. Sewers and drainage.
2. Water service and distribution.
3. Sanitary facilities, including toilets, wash facilities, and drinking-water facilities.
4. Heating and cooling facilities.
5. Ventilation.
6. Electric power service.
7. Lighting.
8. Telephone service.

D. Support facilities include, but are not limited to, the following:

1. Temporary roads and paving.
2. Dewatering facilities and drains.
3. Project identification and temporary signs.
4. Waste disposal facilities.
5. Storage and fabrication sheds.
6. Lifts and hoists.
7. Construction aids and miscellaneous services and facilities.

E. Security and protection facilities include, but are not limited to, the following:

1. Environmental protection.
2. Stormwater control.
3. Tree and plant protection.
4. Pest control.
5. Site enclosure fence.
6. Security enclosure and lockup.
7. Barricades, warning signs, and lights.
8. Temporary enclosures.

9. Temporary partitions.
10. Fire protection.

F. Related Sections include the following:

1. Division 1, of the Technical Specifications Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
2. Division 1, of the Technical Specifications Section "Execution Requirements" for progress cleaning requirements.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Consultant, permanent or temporary roofing is complete, insulated, and weather tight; exterior walls are insulated and weather tight; and all openings are closed with permanent construction or substantial temporary enclosures.

1.4 USE CHARGES

A. General: Cost or use charges for temporary facilities are not chargeable to Owner or Consultant and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:

1. Owner's construction forces.
2. Consultant.
3. Testing agencies.
4. Personnel of authorities having jurisdiction.
5. Occupants of Project

B. Sewer Service: Pay sewer service use charges for sewer usage, by all parties engaged in construction, at Project site.

C. Water Service: Pay water service use charges, whether metered or otherwise, for water used by all entities engaged in construction activities at Project site.

D. Electric Power Service: Pay electric power service use charges, whether metered or otherwise, for electricity used by all entities engaged in construction activities at Project site.

E. Communications: Pay all charge associated with communications.

F. Streets, Sidewalks, and Temporary Easements: Pay all charges associated with the Work where charges will occur.

1.5 SUBMITTALS

A. Implementation and Termination Schedule: Within 15 days of date established for submittal of Contractor's Construction Schedule, submit a schedule indicating implementation and termination of each temporary utility.

1.6 QUALITY ASSURANCE

A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.

1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.7 PROJECT CONDITIONS

A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.

1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:

1. Keep temporary services and facilities clean and neat.
2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if indicated on the plans and/or specifications. Provide materials suitable for use intended.

B. Chain-Link Fencing: Minimum 2-inch , 0.148-inch- thick, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts**,** with 1-5/8-inch- OD top rails.

C. Portable Chain-Link Fencing: Minimum 2-inch 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide concrete or galvanized steel bases for supporting posts.

D. Water: Potable.

2.2 EQUIPMENT

A. General: Provide equipment suitable for use intended.

B. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.

1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure and the requirements of the local Governing agency.

C. Self-Contained Toilet Units: The Owner will permit the Contractor to utilize the existing public bathroom facilities at the park for the duration of the project. In the event that the contractor damages or misuses these facilities, the Owner reserves the right to revoke this allowance. In the event that the Contractor is no longer permitted to use the existing public facilities, they shall provide single-occupant units of chemical or aerated recirculation or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

D. Drinking-Water Fixtures: Containerized, tap-dispenser, bottled-water drinking-water units, including paper cup supply.

E. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.

F. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.

G. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. 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.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
3. If existing easements cannot be used, the Contractor shall consult and coordinate with the Consultant and Owner to secure as necessary to obtain the temporary easement. Add provisions for work not in the Contract but served by temporary facilities if required.

B. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. 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.

1. Filter out excessive soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
2. Connect temporary sewers to municipal system or private system indicated as directed by sewer department officials.
3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. After heavy use, restore normal conditions promptly.
4. Provide temporary filter beds, settlement tanks, separators, and similar devices to purify effluent to levels acceptable to authorities having jurisdiction.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction until permanent water service is in use. Sterilize temporary water piping before use.

D. Sanitary Facilities: The Owner will permit the Contractor to utilize the existing public bathroom facilities at the park for the duration of the project. In the event that the contractor damages or misuses these facilities, the Owner reserves the right to revoke this allowance. In the event that the Contractor is no longer permitted to use the existing public facilities, they shall provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.

1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Subparagraph below may be excessive for small- and medium-size projects.
3. Wash Facilities: Install wash facilities supplied with potable water at convenient locations as required. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.
4. Drinking-Water Facilities: Provide drinking-water.

E. Heating and Cooling: Provide temporary heating and cooling as required by construction activities.

F. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear as required.

G. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment as required.

1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

H. Telephone Service: Provide temporary telephone service throughout construction period for common-use facilities used by all personnel engaged in construction activities.

1. At each telephone, post a list of important telephone numbers in Spanish and English.

a. Police and fire departments.
b. Ambulance service.
c. Contractor's home office.
d. Consultant's office.
e. Engineers' offices.
f. Owner Representative’s office.
g. Principal subcontractors' field and home offices.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: If required, Comply with the following:

1. Locate storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
2. Maintain support facilities until approved by the Consultant to be removed.

B. Temporary Roads and Paved Areas: If applicable/as needed, construct and maintain temporary roads and paved areas to avoid damage to the site. Locate temporary roads and paved areas in same location as permanent roads and paved areas. If applicable, extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

C. Traffic Controls: Provide temporary traffic controls at junction of temporary roads with public roads. Include warning signs for public traffic and "STOP" signs for entrance onto public roads. Comply with requirements of authorities having jurisdiction.

D. Project Identification and Temporary Signs: A project sign is not required for this project. Do not permit installation of other unauthorized signs.

E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with "Construction and Demolition Waste Management Recycling.

F. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment involved. Locations of the sheds shall be approved by the Owner prior to placement.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

B. Storm water Control: Comply as indicated on the erosion control plan/measures before any earth disturbing activities start.

C. Tree and Plant Protection: Comply with the plans and specifications for protection.

D. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

E. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.

F. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather tight enclosure for building exterior.

G. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

H. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

B. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1, of the Technical Specifications Section "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions of the Technical Specifications, apply to this Section.

1.2 SUMMARY

1. This Section includes the following administrative and procedural requirements: selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

1.3 DEFINITIONS

1. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

    1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
    2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.

1.4 SUBMITTALS

1. Product List: Submit a list, in tabular from, showing specified products. Coordinate this list with other specification section submittal requirements. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

    1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
    2. Form: Tabulate information for each product under the following column headings:

        a. Specification Section number and title.
        b. Generic name used in the Contract Documents.
        c. Proprietary name, model number, and similar designations.
        d. Manufacturer's name and address.
        e. Supplier's name and address.
        f. Installer's name and address.
        g. Projected delivery date or time span of delivery period.

h. Identification of items that require early submittal approval for scheduled delivery date.

3. Initial Submittal: Within 5 days after date of commencement of the work, submit 3 copies of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.

4. Completed List: Within 10 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.

5. Consultant's Action: Consultant will respond in writing to Contractor within 10 days of receipt of completed product list. Consultant's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Consultant's response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

1. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

    1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
    2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
    3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
    4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
    5. Store products to allow for inspection and measurement of quantity or counting of units.
    6. Store materials in a manner that will not endanger Project structure.
    7. Store products that are subject to damage by the elements, under cover in a weather tight enclosure above ground, with ventilation adequate to prevent condensation.
    8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
    9. Protect stored products from damage.

2. Storage: Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

PART 2 - PRODUCTS

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

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SECTION 01 70 00 – EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions of the Technical Specifications, apply to this Section.

1.2 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Progress cleaning.
4. Starting and adjusting.
5. Protection of installed construction.
6. Correction of the Work.

B. Related Sections include the following:

1. Division 1, of the Technical Specifications Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
2. Division 1, of the Technical Specifications Section "Submittal Procedures" for submitting surveys.
3. Division 1, of the Technical Specifications Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 SUBMITTALS

A. Qualification Data: For land surveyor to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Consultants and owners, and other information specified.

B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

D. Certified Surveys: Submit two copies signed by land surveyor or professional engineer as required.

1.4 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A licensed professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

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

1. Before construction, verify the location and points of connection of utility services.

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

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility, Owner, and Consultant that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Consultant, Owner, adjacent property owners not less than **two** days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Consultant's and Owner's written permission.

C. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to

other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

E. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Consultant. Include a detailed description of problem encountered, together with recommendations for modifications of the Contract Documents.

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Consultant promptly.

B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Consultant when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
7. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
8. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
9. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Consultant.

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Consultant. Report lost or destroyed permanent benchmarks or control points

promptly. Report the need to relocate permanent benchmarks or control points to Consultant before proceeding.

2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

C. Certified Survey: 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 site work.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations. Dispose of material accordance to Division 1, Section “Construction Waste Management”.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

1. Thoroughly clean surfaces and similar features before applying paint or other finishing materials.

H. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

I. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration until Substantial Completion.

J. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

3.7 PROTECTION OF INSTALLED CONSTRUCTION

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

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 70 00

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions of the Technical Specifications, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Project As-Builts Documents.
3. Operation and maintenance manuals.
4. Warranties.
5. Instruction of Owner's personnel.
6. Final cleaning.

B. Related Sections include the following:

1. Division 1, of the Technical Specifications Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
2. Division 1, of the Technical Specifications Section "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives.
3. Division 1, of the Technical Specifications Section "Execution and Closeout Requirements" for progress cleaning of Project site.
4. Division 1, of the Technical Specifications Section “Project Record Documents”.
5. Divisions 2 through 33, of the Technical Specifications Sections for specific closeout and special cleaning requirements for products of those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: The Contractor shall, before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, “As-Builts” drawings operation and maintenance manuals, Final Completion construction photographs and photographic negatives if required, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Consultant will either proceed with inspection or notify Contractor of unfulfilled requirements. Consultant will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Consultant, that must be completed or corrected before certificate will be issued. The Consultant’s Substantial Completion list is composed by verification of the punch list submitted by the Contractor and any additional defects in the work observed by the Consultant.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1, of the Technical Specifications Section "Payment Procedures."
2. Submit certified copy of Consultant's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Consultant. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training videotapes if required.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Consultant will either proceed with inspection or notify Contractor of unfulfilled requirements. Consultant will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. The Contactor shall take immediate steps to correct the stated deficiencies, and send a written notice to the Consultant, certifying the Project is complete, at which time the Consultant will re-inspect the Work. This review and additional reviews by the Consultant where the Work is not considered Substantial Completion or Final Completion will be considered an additional service from the Consultant. The Contractor will be charged for these additional services incurred by such failure including travel time, observation time, and administrative time at the Consultant's hourly rate, as well as all expenses associated with the distribution of a written notice stating the reasons for failure to reach final completion.

3. In the event the Contractor is granted Substantial Completion by the Consultant and the Contractor fails to complete and/or correct all of the items listed in the Substantial Completion within **15** calendar days of the date of Substantial Completion, the liquated damages shall start to accrued until all of the items on the Substantial Completion list are completed and/or corrected and have been approved by the Consultant.

4. If the Consultant is required to make more than two inspections for the project to achieve Substantial Completion, the Contractor shall pay for the Consultant's time and expensive.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, use the room number as indicated on the drawings and on the exterior areas include a location diagram indicating the defects.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

    a. Project name.
    b. Date.
    c. Name of Consultant.
    d. Name of Contractor.
    e. Page number.

1.6 PROJECT RECORD DOCUMENTS

A. The Contractor shall provide Project Record Documents, O&M, "As-Builts" Drawings, and Warrantees as indicated in Division 1, of the Technical Specifications Section Project Record

Documents. Use Division 1, of the Technical Specifications Section "Project Record Documents".

1.7 OPERATION AND MAINTENANCE MANUALS

A. Not Applicable.

1.8 WARRANTIES

A. Submittal Time: Submit written warranties on request of Consultant for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

D. Provide copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
f. Remove labels that are not permanent.
g. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
h. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
i. Replace parts subject to unusual operating conditions.
j. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01 77 00

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SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and all Divisions of the Technical Specifications, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. As-Built Drawings.
2. Record Specifications.
3. Record Product Data.

B. Related Sections include the following:
1. Division 1, of the Technical Specifications, Section "Closeout Procedures" for general closeout procedures.

1.3 SUBMITTALS

A. As-Built Drawings: Comply with the following:

1. Number of Copies: Submit two sets of marked-up As-Built Drawings to the Consultant for the Consultant to prepare the Record Drawings.

B. Record Specifications: Submit two copies of Project's marked up Specifications, including addenda and contract modifications.

C. Record Product Data: Submit two copies of each Product Data submittal.

1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 AS-BUILT DRAWINGS

A. As-Built Drawings: Maintain one set of black-line white prints of the Contract Drawings and Shop Drawings.

1. Preparation: Mark As-Built Drawings to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up As-Built Drawings.

    a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    b. Accurately record information in an understandable drawing technique.
    c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

    a. Dimensional changes to Drawings.
    b. Revisions to details shown on Drawings.
    c. Depths of foundations below first floor.
    d. Locations and depths of underground utilities.
    e. Revisions to routing of piping and conduits.
    f. Revisions to electrical circuitry.
    g. Actual equipment locations.
    h. Duct size and routing.
    i. Locations of concealed internal utilities.
    j. Changes made by Change Order or Construction Change Directive.
    k. Changes made following Consultant's written orders.
    l. Details not on the original Contract Drawings.
    m. Field records for variable and concealed conditions.
    n. Record information on the Work that is shown only schematically.
    o. Clarification Drawings.

3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
7. Identify and date each As-Builts Drawing; include the designation "PROJECT AS-BUILTS DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

B. Newly Prepared As-Built Drawings: Prepare new Drawings instead of preparing As-Built Drawings where Consultant determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.

1. New Drawings may be required when a Change Order is issued as a result of accepting a substitution or other modification.
2. Consult with Consultant for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate

newly prepared As-Built Drawings into Record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of the manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
5. Note related Change Orders, As-Built Drawings, and Product Data where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, As-Built Drawings, and Product Data where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other of the Technical Specifications Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible

condition, protected from deterioration and loss. Provide access to Project Record Documents for Consultant's reference during normal working hours.

END OF SECTION 01 78 39

02 00 00 Existing Conditions

02 40 00 Demolition and Structure Moving

SECTION 02 41 15 – TREE PROTECTION & TRIMMING

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 protection and trimming of existing trees that interfere with, or are affected by, execution of the Work, whether temporary or permanent construction.

B. Related Sections include the following:
   1. Division 31 Section "Site Clearing" for removal limits of trees, shrubs, and other plantings affected by new construction.
   2. Division 31 Section "Earth Moving" for building and utility trench excavation, backfilling, compacting and grading requirements, and soil materials.
   3. Division 32 Section "Exterior Plants" for tree and shrub planting, tree support systems, and soil materials.

1.3 DEFINITIONS

A. Tree Protection Zone: Area surrounding individual trees or groups of trees to remain during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Tree Pruning Schedule: Written schedule from arborist detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

C. Qualification Data: For tree service firm and arborist.

D. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

E. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

1.5 QUALITY ASSURANCE

A. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed tree protection and trimming work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of tree protection and trimming.

B. Arborist Qualifications: An arborist certified by ISA or licensed in the jurisdiction where Project is located.

C. Tree Pruning Standard: Comply with ANSI A300 (Part 1), "Tree, Shrub, and Other Woody Plant Maintenance--Standard Practices (Pruning)."

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1. Before tree protection and trimming operations begin, meet with representatives of authorities having jurisdiction, Owner, Architect, consultants, and other concerned entities to review tree protection and trimming procedures and responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Drainage Fill: Selected crushed stone, or crushed or uncrushed gravel, washed, ASTM D 448, Size 24, with 90 to 100 percent passing a 2-1/2-inch sieve and not more than 10 percent passing a 3/4-inch sieve.

B. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1 inch in diameter; and free of weeds, roots, and toxic and other nonsoil materials.

1. Obtain topsoil only from well-drained sites where topsoil is 4 inches deep or more; do not obtain from bogs or marshes.

C. Filter Fabric: Manufacturer's standard, nonwoven, pervious, geotextile fabric of polypropylene, nylon, or polyester fibers.

D. Chain-Link Fence: Metallic-coated steel chain-link fence fabric of 0.120-inch-diameter wire; a minimum of 48 inches high; with 1.9-inch-diameter line posts; 2-3/8-inch-diameter terminal and corner posts; 1-5/8-inch-diameter top rail; and 0.177-inch-diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.

E. Organic Mulch: Double hammered hardwood, free of deleterious materials.

PART 3 - EXECUTION

3.1 PREPARATION

A. Temporary Fencing: Install temporary fencing around tree protection zones to protect remaining trees and vegetation from construction damage. Maintain temporary fence and remove when construction is complete.

1. Install chain-link fence according to ASTM F 567 and manufacturer's written instructions.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

C. Mulch areas inside tree protection zones and other areas indicated.

1. Apply 3-inch average thickness of organic mulch. Do not place mulch within 6 inches of tree trunks.

D. Do not store construction materials, debris, or excavated material inside tree protection zones. Do not permit vehicles or foot traffic within tree protection zones; prevent soil compaction over root systems.

E. Maintain tree protection zones free of weeds and trash.

F. Do not allow fires within tree protection zones.

3.2 EXCAVATION

A. Install shoring or other protective support systems to minimize sloping or benching of excavations.

B. Do not excavate within tree protection zones, unless otherwise indicated.

C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks and comb soil to expose roots.

1. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction.
2. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

D. Where utility trenches are required within tree protection zones, tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand.

1. Root Pruning: Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots with sharp pruning instruments; do not break or chop.

3.3 REGRADING

A. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade beyond tree protection zones. Maintain existing grades within tree protection zones.

B. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist, unless otherwise indicated.

1. Root Pruning: Prune tree roots exposed during grade lowering. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots with sharp pruning instruments; do not break or chop.

C. Minor Fill: Where existing grade is 6 inches or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.

D. Moderate Fill: Where existing grade is more than 6 inches but less than 12 inches below elevation of finish grade, place drainage fill, filter fabric, and topsoil on existing grade as follows:

1. Carefully place drainage fill against tree trunk approximately 2 inches above elevation of finish grade and extend not less than 18 inches from tree trunk on all sides. For balance of area within drip-line perimeter, place drainage fill up to 6 inches below elevation of grade.
2. Place filter fabric with edges overlapping 6 inches minimum.
3. Place fill layer of topsoil to finish grade. Do not compact drainage fill or topsoil. Hand grade to required finish elevations.

3.4 TREE PRUNING

A. Prune trees to remain that are affected by temporary and permanent construction.

B. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by arborist.

C. Pruning Standards: Prune trees according to ANSI A300 (Part 1).

D. Cut branches with sharp pruning instruments; do not break or chop.

E. Chip removed tree branches and spread over areas identified by Architect.

3.5 TREE REPAIR AND REPLACEMENT

A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to arborist's written instructions.

B. Remove and replace trees indicated to remain that die or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.

1. Provide new trees of same size and species as those being replaced; plant and maintain as specified in Division 32 Section "Exterior Plants."
2. Provide new trees of 6-inch caliper size and of a species selected by Architect when damaged trees more than 6 inches in caliper size, measured 12 inches above grade, are required to be replaced. Plant and maintain new trees as specified in Division 32 Section "Exterior Plants."

C. Aerate surface soil, compacted during construction, 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch-diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augered soil and sand.

3.6 DISPOSAL OF WASTE MATERIALS

A. Burning is not permitted.

B. Disposal: Remove excess excavated material and displaced trees from Owner's property.

END OF SECTION 02 41 15

SECTION 02 41 19 – SITE DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplemental General Conditions, and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes demolition and removal of the following:

1. Existing concrete and asphaltic paving, curbs, sidewalk, piping, underground utilities, and miscellaneous storm structures within the areas designated for new construction work shall be completely demolished and all debris removed from the site.

1.03 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or recycled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Owner.

C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or recycled.

1.04 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during building demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.

1.05 SUBMITTALS

A. Qualification Data: For the following:

1. Demolition firm.

B. Proposed Protection and Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate. Include measures for the following:

1. Environmental protection.

2. Dust control.

3. Noise control.

C. Schedule of Demolition Activities: Indicate detailed sequence of demolition and removal work, with starting and ending dates for each activity, interruption of utility services, and locations of temporary protection and means of egress.

D. Pre-demolition Photographs: Show existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by building demolition operations.

E. Submit before Work begins.

1. Landfill Records: Indicate receipt and acceptance of wastes by a landfill facility licensed to accept wastes from the project site.

1.06 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241.

1.07 PROJECT CONDITIONS

A. Provide not less than 10 days notice to Owner of activities that will affect Owner’s operations.

B. Maintain access to existing walkways, exits, and other adjacent occupied or used facilities.

1. Do not close or obstruct walkways, exits, roads, or other occupied or used facilities without written permission from authorities having jurisdiction.

C. Owner assumes no responsibility for structures to be demolished.

D. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

E. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

F. Hazardous materials will be removed by Owner before start of the Work.

G. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Engineer and Owner. Hazardous materials will be removed by Owner under a separate contract.

H. Storage or sale of removed items or materials on-site is not permitted.

1.08 COORDINATION

A. Arrange demolition schedule so as not to interfere with Owner's on-site operations.

PART 2 - NOT USED

PART 3 - EXECUTION

3.01 EXAMINATION

A. Survey existing conditions and correlate with requirements indicated to determine extent of building demolition required.

B. Review Project Record Documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Inventory and record the condition of items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to Owner.

E. Perform an engineering survey of condition of dam to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during demolition operations.

F. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.02 PREPARATION

A. Existing Utilities: Locate, identify, disconnect, and seal or cap off indicated utilities serving buildings and structures to be demolished.

B. Arrange to shut off indicated utilities with utility companies.

C. If utility services are required to be removed, relocated, or abandoned, before proceeding with building demolition provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.

D. Cut off pipe or conduit a minimum of 24 inches (610 mm) below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing. Demolish and completely remove from site existing underground utilities indicated to be removed. If utilities cannot be removed due to existing field conditions they shall be filled with flowable fill (minimum 200psi) and noted as “Abandoned” on as-built drawings. However, in all cases the contractor shall demolish all utilities within the footprint of any proposed structure and within the area extending 5’ from the proposed building footprint.

E. Holes left in existing utility structures from removed utilities shall be plugged and patched as appropriate.

F. Existing Utilities: Refer to Division 32 and 33 Sections for shutting off, disconnecting, removing, and sealing or capping utilities. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing

G. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

H. Removed and Salvaged Items: Comply with the following:

1. Clean salvaged items of dirt and demolition debris

2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in secure area until delivery to Owner.

4. Transport items to Owner's storage area designated by Owner.

5. Protect items from damage during transport and storage.

I. Existing utilities to be abandoned in place shall be filled with flowable fill prior to sealing or capping ends. Abandoned utilities shall be identified on Contractor record drawings.

3.03 PROTECTION

A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations.

B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during demolition. When permitted by Owner, items may be removed to a suitable, protected storage location during demolition and cleaned and reinstalled in their original locations after demolition operations are complete.

C. Existing Utilities: Maintain utility services indicated to remain and protect them against damage during demolition operations.

D. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.

E. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.

1. Provide at least 10 days notice to Owner if shutdown of service is required during changeover.

F. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated.

G. Protect existing site improvements, appurtenances, and landscaping to remain.

H. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

I. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.

J. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.

3.04 DEMOLITION, GENERAL

A. General: Demolish indicated items within limits shown on the drawings. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Do not use cutting torches until work area is cleared of flammable materials. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.

2. Maintain adequate ventilation when using cutting torches.

3. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Engineering Surveys: Perform surveys as the Work progresses to detect hazards that may result from building demolition activities.

C. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

D. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner or building manager and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

E. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

3.05 EXPLOSIVE DEMOLITION

A. Explosives: Use of explosives is not permitted.

3.06 SITE RESTORATION

A. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials according to backfill requirements in

Division 31 and 33 Sections.

B. General: Promptly repair damage to adjacent construction caused by building demolition operations.

C. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

D. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.07 RECYCLING DEMOLISHED MATERIALS

A. General: Separate recyclable demolished materials from other demolished materials to the maximum extent possible. Separate recyclable materials by type.

B. Provide containers or other storage method approved by Engineer for controlling recyclable materials until they are removed from Project site.

C. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

D. Stockpile materials away from demolition area. Do not store within drip line of remaining trees.

E. Store components off the ground and protect from the weather.

F. Transport recyclable materials off Owner's property and legally dispose of them.

G. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling building demolition materials shall accrue to Contractor.

3.08 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

B. Do not allow demolished materials to accumulate on-site.

C. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

D. Burning: Do not burn demolished materials.

E. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.09 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

END OF SECTION 02 41 19

31 00 00 Earthwork

SECTION 31 10 00 – SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplemental General Conditions, and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. The CONTRACTOR shall be responsible for preparation of the site for construction of the project in accordance with the Contract Documents and as specified herein.

1.3 REFERENCES

A. North Carolina Department of Environmental Quality Erosion and Sediment Control Planning and Design Manual, latest edition.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to store at the site and handle in a manner which will maintain the materials in their original manufactured or fabricated condition until ready for use.

PART 2 - (Not Used)

PART 3 - EXECUTION

3.1 TRAFFIC

A. Conduct site clearing operations to ensure minimum interference with roads, streets, walks, businesses, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without prior permission from Owner, NCDOT, and/or authorities having jurisdiction.

3.2 PROTECTION

A. General: Provide temporary fences, barricades, coverings, or other protection to preserve existing items indicated to remain and to prevent injury or damage to persons or property. Provide protection for adjacent properties as required.

B. Restoration/Repair: Restore damaged items to condition existing prior to start of WORK.

C. Existing Trees/Vegetation: Protect existing trees and vegetation adjacent to the actual WORK area or borrow area from physical damage. Do not store equipment or materials within tree drip line.

D. Road and Walks: Keep roads and walks free of dirt and debris at all times.

E. Utility Lines: Protect existing utility lines that are indicated to remain from damage. Notify ENGINEER immediately of damage to or an encounter with unknown existing utility lines. CONTRACTOR shall be responsible for the repairs of damage to existing utility lines that are indicated or made known to CONTRACTOR prior to start of clearing and grubbing operations. When utility lines which are to be removed are encountered within the area of operations, CONTRACTOR shall notify ENGINEER and OWNER and Utility Owner within 10 days time to minimize interruption of the service.

3.3 EROSION/SEDIMENT CONTROL

A. Provide appropriate erosion and sediment control measures for all off-site borrow areas in full compliance with the North Carolina Department of Environmental Quality Erosion and Sediment Control Planning and Design Manual and regulations of the local jurisdiction. CONTRACTOR shall be solely responsible for all borrow sites outside of the Project area.

3.4 CLEARING

A. Clearing shall consist of the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within the areas to be cleared. Cut off flush with or below the original ground surface trees, stumps, roots, brush, and other vegetation in areas to be cleared, except for trees and vegetation indicated or directed to be left standing. CONTRACTOR shall coordinate all clearing with OWNER prior to proceeding.

3.5 TREE REMOVAL

A. Where indicated or directed by OWNER, trim designated trees or remove designated trees and stumps and grub roots.

3.6 GRUBBING

A. Remove and dispose of roots larger than 3 inches in diameter, matted roots, and stumps from the indicated grubbing areas. Excavate this material together with logs, organic and metallic debris, brush, and refuse and remove to a depth of not less than 18 inches below the original soil surface in areas indicated to be grubbed and in areas indicated as construction areas for this Project. Fill depressions made by grubbing with suitable material and compact in accordance with the requirements of the Contract Documents to make the new surface conform with the existing adjacent surface of the ground.

3.7 DISPOSAL OF CLEARED AND GRUBBED MATERIALS

A. Nonsalable Materials: Disposal shall be CONTRACTOR's responsibility.

3.8 STORING MATERIALS

A. Strip and stockpile topsoil material and other cleared materials that will be reused in the WORK.

3.9 EXISTING IMPROVEMENTS/FACILITIES

A. Remove existing improvements, both above-grade and below-grade to extent indicated or as otherwise required to permit new construction and provide for proper disposal off-site. Existing improvements and facilities such as mailboxes, signs, ornamental or decorative items, etc. that require temporary removal to permit new construction shall be promptly replaced and/or restored to the location and condition prior to construction. Improvements and facilities that are damaged by the CONTRACTOR during the course of construction shall be promptly replaced at the CONTRACTOR's expense.

3.10 SALVABLE ITEMS

A. No salvable items are anticipated for this project.

3.11 FUGITIVE DUST

A. Control air pollution caused by dust and dirt; comply with governing regulations.

3.12 FILLING

A. Fill depressions and voids resulting from site clearing operations. Comply with the requirements of Specification Section 31 20 00, "Earth Moving".

3.13 GRADING

A. Grade ground surface to conform to required contours and to provide positive surface drainage away from the WORK or borrow area.

3.14 DISPOSAL

A. Dispose of waste materials, including trash and debris, and excess topsoil, legally off-site.

3.15 BURNING

A. Burning of waste materials is prohibited for this project.

END OF SECTION 31 10 00

SECTION 31 20 00 – EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplemental General Conditions, and Division 01 Specification Sections, apply to this Section.

B. Geotechnical report titled “Geotechnical Engineering Report: Bailey Road Park Tennis Courts” by Carolinas Geotechnical Group. dated May 5, 2023.

C. North Carolina Department of Transportation (NCDOT) Standard Specifications for Roads and Structures dated January 2024.

1.2 SUMMARY

A. Prior to beginning construction, the Geotechnical Engineer should evaluate the subgrade soils for suitability based on observations of proofrolling with a loaded dump truck or other method considered acceptable to the Geotechnical Engineer. Fill meeting the requirements herein shall then be placed to the grade shown.

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. Borrow: Soil material obtained off site when sufficient approved soil material is not available from excavations.

D. Subbase Course: The layer placed between the subgrade and surface of a pavement or walk.

E. Design Subgrade: Elevation of bearing for foundations, bottom of porous fill beneath slabs on grade (4" below bottom of slab), bottom of turn down slabs, and bottom most portion of stairs and ramps.

F. Drainage Fill: Course of washed granular material supporting slab on grade placed to cut off upward capillary flow of pore water.

G. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be at the Contractor's expense.

H. 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.

I. Utilities include on site underground pipes, conduits, ducts, and cables, as well as underground services within building lines.

1.4 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

B. Test Reports: In addition to test reports required under field quality control, submit the following:

1. Laboratory analysis (including grain size and plasticity analyses) of each soil material proposed for fill and backfill from on site and borrow sources.
2. One Standard Proctor compaction test (moisture density relationship) in accordance with ASTM D698 for each soil material.

C. Submit excavation support system design and details for trench excavation.

1.5 QUALITY ASSURANCE

A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction. These include, but are not limited to, Town of Cornelius, Mecklenburg County, North Carolina Department of Environmental Quality, and the State of North Carolina.

B. Testing and Inspection Service: Owner shall 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.

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 Engineer and then only after acceptable temporary utility services have been provided.

1. Provide a minimum 10 day notice to the Owner and receive written notice to proceed before interrupting any utility.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. If utilities cannot be removed due to existing field conditions they shall be filled with flowable fill (minimum 200psi) and noted as “Abandoned” on as-built drawings. However, in all cases the contractor shall demolish all utilities within the footprint of any proposed structure and within the area extending 5’ from the proposed footprint. Coordinate with utility companies to shutoff services if lines are active.

C. Excavation support system design and details for trench excavation, shall be sealed and signed by a professional engineer licensed in the State of North Carolina, copy of design shall be filed with ENGINEER.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide approved borrow soil materials from off site when sufficient approved soil materials are not available from excavations. Contractor is responsible for locating appropriate off-site borrow areas.

B. Satisfactory Soil Materials:

1. Engineered Fill: Compacted structural fill should consist of material classified as CL, ML, SC, SM, or GW, per ASTM D 2487 and shall have a maximum liquid limit (LL) of 50 and a maximum plasticity index (PI) of 30. High plasticity soils such as CH and MH should not be used as engineered fill. The maximum particle size should not exceed 4 inches. Fill should be free of debris, waste, frozen materials, vegetation, and any other deleterious matter. Off-site borrow materials should have a CBR value no less than 6 percent or as otherwise noted in the field by the Owner's Geotechnical Engineer.

C. Unsatisfactory Soils: Soil Classification Groups including but not limited to CH and MH according to ASTM D 2487 or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Shall be in accordance with NCDOT Standard Specifications for Roads and Structures dated January 2024.

E. Base Course: Shall be in accordance with NCDOT Standard Specifications for Roads and Structures dated January 2024.

F. Engineered Fill: Shall be in accordance with NCDOT Standard Specifications for Roads and Structures dated January 2024.

G. Bedding Course: Shall be in accordance with NCDOT Standard Specifications for Roads and Structures dated January 2024.

H. Drainage Course: Shall be in accordance with NCDOT Standard Specifications for Roads and Structures dated January 2024.

I. Filter Material: Shall be in accordance with NCDOT Standard Specifications for Roads and Structures dated January 2024.

J. Sand: ASTM C 33; fine aggregate, natural, or manufactured sand.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 GEOTEXTILE FABRIC

A. Geotextile Fabric installed between sand and stone in sand filter shall be as follows:

1. Weight: 4.0 oz/sy as per ASTM D-5261.
2. Grab Tensile Strength: 120 lbs as per ASTM D-4632-86.
3. Grab Tensile Elongation: 50% as per ASTM D-4632-86.
4. Trapezoid Tear Strength: 50 lbs as per ASTM D-4533-85.
5. CBR Puncture Strength: 310 lbs as per ASTM D-6241.
6. Apparent Opening Size: 70 U.S. Std. Sieve as per ASTM D-4751-87.
7. Permittivity: 1.7 sec(-1) as per ASTM D-4491-85.
8. Water Flow Rate: 135 gal/min/sf as per ASTM D-4491-85.
9. Ultraviolet Stability: 70% as per ASTM D-4355-84.

B. Geotextile Fabric installed underneath riprap aprons and riprap channels shall be as follows:

1. Grab Tensile Strength: 200 lbs as per ASTM D-4632-86.
2. Grab Tensile Elongation: 15% as per ASTM D-4632-86.
3. Trapezoid Tear Strength: 75 lbs as per ASTM D-4533-85.
4. CBR Puncture Strength: 700 lbs as per ASTM D-6241.
5. Apparent Opening Size: 40 U.S. Std. Sieve as per ASTM D-4751-87.
6. Permittivity: 0.05 sec(-1) as per ASTM D-4491-85.
7. Water Flow Rate: 4 gal/min/sf as per ASTM D-4491-85.
8. Ultraviolet Stability: 70% as per ASTM D-4355-84.

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. Prior to proceeding with construction, all topsoil and other deleterious, non-soil materials shall be stripped from proposed construction area. Stripping shall extend at least 5 feet horizontally beyond building limits, and stripping of unsatisfactory soils shall be as identified by the Geotechnical Engineer.

E. Subgrades which are to support slabs, pavements, or compacted fill shall be proofrolled with a 20 to 30 ton fully loaded truck or other pneumatic-tired vehicle of similar size and weight to identify areas of localized soft soil or unsuitable soil. Any soft or unsuitable material encountered during proofrolling shall be removed and replaced with engineered fill. The Geotechnical Engineer shall observe all proofrolling operations.

1. The proofrolling procedures should consist of complete passes of the exposed area, with half of the passes being in a direction perpendicular to the preceding ones.

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.

C. Dewatering disposal shall be in accordance with Erosion and Sediment Control permit.

3.3 EXCAVATION

A. Explosives: Do not use explosives.

3.4 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.10 foot. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

2. Excavation for Mechanical or Electrical Appurtenances: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot. Do not disturb bottom of excavations intended for bearing surface.

3.5 APPROVAL OF SUBGRADE

A. Notify Engineer when excavations have reached required subgrade.

B. When Engineer determines that unforeseen unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Engineer.

3.6 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 or flowable fill may be used to bring elevations to proper position.

3.7 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.

3.8 BACKFILL

A. Backfill excavations promptly, but not before completing the following:

1. Acceptance of construction below finish grade including, where applicable, damp-proofing, waterproofing, and perimeter insulation.

2. Surveying locations of underground utilities for record documents.

3. Testing, inspecting, and approval of underground utilities.

4. Concrete form-work 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.

3.9 SUBSURFACE DRAINAGE BACKFILL

A. Subsurface Drain: Place a layer of filter fabric around perimeter of drainage trench or at footing, as indicated. Place a 6 inch compacted course of filtering material on filter fabric to support drainage pipe. After installing and testing, encase drainage pipe in a minimum of 6 inches of compacted filtering material and wrap in filter fabric, overlapping edges at least 6 inches.

B. Drainage Backfill: Place and compact drainage backfill of filtering material over subsurface drain, in width indicated, to within 18 inches of final subgrade. Overlay drainage backfill with one layer of filter fabric, overlapping edges at least 6 inches.

C. Fill: Place and compact fill material over drainage backfill to final subgrade.

3.10 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 8 inches, pulverize, moisture condition, or aerate soil and recompact to required density.

C. Place fill material in layers to required elevations for each location listed below.

1. Under grass, use General Site Fill.

2. Under walks and pavements, use aggregate base to the required depth and, General Site Fill.

3. Under steps and ramps, aggregate base.

4. Under building slabs, use porous fill to the required depth, and General Site Fill.

5. Under footings and foundations, use Engineered Fill, aggregate base, or flowable fill.

6. Behind below-grade walls, use Engineered Fill or porous fill.

3.11 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.

b. If excavation must remain open overnight or rainfall becomes imminent while the bearing soils are exposed, place a 1 to 3 inch thick “mud mat” of lean concrete on the bearing soils before the placement of reinforcing steel.

c. Costs associated with removing and replacing previously approved backfill due to being too wet shall be borne by the CONTRACTOR.

3.12 COMPACTION

A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand operated tampers.

B. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698.

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 98 percent.

2. Under paved tennis and pickleball courts, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 100 percent.

3. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 98 percent.

4. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90 percent.

5. For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

3.13 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 0.10 foot.

2. Walks: Plus or minus 0.10 foot.

C. Grading Inside Building Lines: Finish subgrade to a tolerance of ½ inch when tested with a 10 foot straightedge.

3.14 POROUS FILL

A. Under slabs on grade, place porous fill course on prepared subgrade.

1. Compact porous fill to required cross sections and thickness.

3.15 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 6938, (nuclear method) 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 6938.

a. 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 Engineer.

2. Footing Subgrade: The Geotechnical Engineer shall observe all subgrades and determine suitability to support design loads.

3. 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 2,500 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.

4. Foundation Wall Backfill: In each compacted backfill layer, perform at least one field in place density test for each 100 feet or less of wall length, but no fewer than two tests along a wall face.

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.

3.16 PROTECITON

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.

1. Scarify or remove and replace material to depth directed by the Engineer; 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.

D. Costs associated with restoration or replacement of backfill which has not been protected shall be borne by the CONTRACTOR.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and topsoil and dispose of on-site at locations indicated. Waste material, including unsatisfactory soil, trash, and debris, shall be legally disposed of off the Owner's property. Contractor is responsible for all costs associated with disposal and for all erosion and sediment control measures at off-site disposal areas.

END OF SECTION 31 20 00

SECTION 31 25 00 – EROSION CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplemental General Conditions, and Division 01 Specification Sections, apply to this Section.

1.2 SCOPE

A. Compliance: This WORK shall be performed in accordance with the erosion and sediment control plan of the Construction Drawings and the details provided therein, and as described, detailed and required by the North Carolina Department of Environmental Quality in the most recent edition of the North Carolina Department of Environmental Quality Erosion and Sediment Control Planning and Design Manual; and in the latest edition of the Mecklenburg County Land Development Standard Drawings.

B. Details: In the event a detailed plan is not shown, CONTRACTOR shall comply with the requirements of the local authority and provide a plan if required by that authority.

1.3 REFERENCES

A. North Carolina Department of Environmental Quality Erosion and Sediment Control Planning and Design Manual, latest edition.

B. Mecklenburg County Land Development Standard Drawings, latest edition.

1.4 SUBMITTALS

A. Temporary Seed Mixture: Provide written notification as to the temporary seed mixture to be used.

B. Temporary Riser: Provide shop drawings for all risers shown on the approved plans, including trash racks, and anti-flotation blocks.

C. Temporary Skimmer Device: Provide shop drawings for temporary skimmers as indicated on the approved plans.

1.5 MAINTENANCE

A. Maintain all erosion and sediment control structures to be utilized during the life of the Project in compliance with the regulations of the Division of Soil and Water Conservation until vegetative cover is acceptable to the Division’s field personnel and approval acceptance is received.

PART 2 - PRODUCTS

2.1 TEMPORARY SEEDING

A. A suitable mixture shall be selected from those listed in North Carolina Department of Environmental Quality Erosion and Sediment Control Planning and Design Manual.

PART 3 - EXECUTION

3.1 EROSION AND SEDIMENT CONTROL MEASURES

A. Measures: Silt fence, construction entrance, check dams, inlet protection, diversion ditches, skimmer basin, sediment basin, temporary vegetation, and all other items for erosion and sediment control shall be constructed as directed by the ENGINEER or in the locations shown or designated on the Drawings in accordance with the details provided.

B. Schedule: CONTRACTOR shall institute the erosion and sediment control program as a part of clearing and grubbing, and prior to rough grading. The initial program shall include, however is not limited to, the installation of silt fences, diversion ditches and/or gravel weirs as shown on erosion and sediment control drawing at the limits of clearing and grubbing where silt-carrying surface water runoff may be diverted and/or filtered prior to leaving the disturbed area.

C. Temporary Seeding: Establish temporary cover for erosion control by seeding and/or mulching graded areas which may otherwise be exposed for a period greater than 30 days. This should be accomplished as soon as rough grading WORK is done. Begin temporary seeding within 72 hours after earth disturbance.

D. Pipe Outfalls: All pipe outfall areas disturbed by construction shall be protected with non-erodible materials conforming to the North Carolina Department of Environmental Quality Erosion and Sediment Control Planning and Design Manual.

E. Maintenance: All siltation and erosion control devices installed during the course of construction shall be maintained in proper working order at all times, and shall not be removed until final stabilization of all disturbed areas or at the direction of the ENGINEER.

3.2 CLEANING OF ROADS AND STREETS

A. CONTRACTOR shall maintain a vehicle wash rack or gravel bed at all vehicle egress areas. All vehicles shall be thoroughly cleaned of mud and silt before leaving the construction site to avoid tracking mud and silt onto roads, streets, and highways. In the event that tracking does occur, CONTRACTOR shall immediately clean the street or road of all debris, mud or silt and shall pay all damages resulting therefrom. A daily survey of the condition of the adjacent streets and roads shall be made and recorded in the field log along with daily cleanup of the streets of the tracking from the site onto roads, alleys, parking lots, and highways.

3.3 PROTECTION OF STORMWATER SYSTEMS

A. Stormwater structures which will receive runoff from the construction shall be protected from the buildup of mud or silt as outlined by the North Carolina Department of Environmental Quality Erosion and Sediment Control Planning and Design Manual or as directed by ENGINEER.

END OF SECTION 31 25 00

32 00 00 Exterior Improvements

32 10 00 Bases, Ballasts, and Paving
32 12 00 Flexible Paving
32 12 16 Asphalt Paving
32 13 00 Rigid Paving
32 13 13 Concrete Paving
32 18 00 Athletic and Recreational Surfacing
32 18 10 Pickleball and Tennis Courts

32 30 00 Site Improvements
32 31 00 Fences and Gates
32 31 14 Chain Link Fencing

32 90 00 Planting
32 92 00 Lawns & Grasses
32 93 00 Exterior Plants

SECTION 32 12 16 – ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Cold milling of existing hot-mix asphalt pavement.

2. Hot-mix asphalt patching.

3. Hot-mix asphalt paving.

4. Hot-mix asphalt paving overlay.

5. Asphalt surface treatments.

6. Pavement-marking paint.

7. Traffic-calming devices.

8. Imprinted asphalt.

B. Related Sections:

1. Division 02 Section "Site Demolition" for demolition, removal, and recycling of existing asphalt pavements, and for geotextiles that are not embedded within courses of asphalt paving.

2. Division 31 Section "Earth Moving" for aggregate subbase and base courses and for aggregate pavement shoulders.

1.3 DEFINITION

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

1. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.

2. Job-Mix Designs: For each job mix proposed for the Work.

B. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

C. Qualification Data: For qualified manufacturer and Installer.

D. Material Certificates: For each paving material, from manufacturer.

E. Material Test Reports: For each paving material.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of state in which Project is located.

B. Installer Qualifications: Imprinted-asphalt manufacturer's authorized installer who is trained and approved for installation of imprinted asphalt required for this Project.

C. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

D. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.

b. Review condition of subgrade and preparatory work.

c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Prime Coat: Minimum surface temperature of 60 deg F.

2. Slurry Coat: Comply with weather limitations in ASTM D 3910.

3. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.

4. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

B. 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 55 deg F for water-based materials], and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.

C. Fine Aggregate: ASTM D 1073, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.

1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: AASHTO M 320 or AASHTO MP 1a.

B. Asphalt Cement: ASTM D 3381 for viscosity-graded material.

C. Water: Potable.

D. Undersealing Asphalt: ASTM D 3141, pumping consistency.

2.3 AUXILIARY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.

B. Sand: ASTM D 1073, Grade Nos. 2 or 3.

C. Paving Geotextile: AASHTO M 288, nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.

D. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type II, with drying time of less than 45 minutes.

2.4 MIXES

A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proofroll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proofroll wet or saturated subgrades.

1. Completely proofroll subgrade in one direction. Limit vehicle speed to 3 mph.

2. Proofroll with a loaded 10-wheel, tandem-axle dump truck weighing between 20 to 30 tons.

3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineeer, and replace with compacted backfill or fill as directed.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

D. Verify that utilities, traffic loop detectors, and other items requiring a cut and installation beneath the asphalt surface have been completed and that asphalt surface has been repaired flush with adjacent asphalt prior to beginning installation of imprinted asphalt.

3.2 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.

1. Pump hot undersealing asphalt under rocking slab until slab is stabilized or, if necessary, crack slab into pieces and roll to reseat pieces firmly.

2. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.

C. Patching: Fill excavated pavements with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

D. Patching: Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

3.3 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.

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.

1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.

C. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.

2. Protect primed substrate from damage until ready to receive paving.

D. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd.

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.

2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

E. Machine place hot-mix asphalt 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 thicknesses indicated.

2. Place hot-mix asphalt surface course in single lift.

3. Spread mix at minimum temperature of 250 deg F.

4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.

5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

F. Place paving in consecutive strips not less than 10 feet wide unless 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. Complete a section of asphalt base course before placing asphalt surface course.

G. 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 a 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 to joints.

2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.

3. Offset transverse joints, in successive courses, a minimum of 24 inches.

4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.

5. 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 with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling with nine-wheel rubber tired roller 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. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm. Density: Acceptable compaction should be defined as a test section density within the range of 98% to 102% of the maximum density determined on a density control strip. In addition, no one test should be below 92% of maximum (Rice) specific gravity.

D. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

E. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.6 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Surface Course: Plus 1/4 inch, no minus.

B. Pavement 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. Surface Course: 1/8 inch.

2. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.7 PAVEMENT MARKING

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

B. Allow paving to age for 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

3.8 FIELD QUALITY CONTROL

A. Testing Agency: The Owner will engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.

2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.

b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

E. Replace and compact hot-mix asphalt where core tests were taken.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.9 DISPOSAL

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

1. Do not allow milled materials to accumulate on-site.

END OF SECTION 32 12 16

SECTION 32 13 13 – CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Driveways.

2. Roadways.

3. Parking lots.

4. Curbs and gutters.

5. Walks.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Other Action Submittals:

1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified ready-mix concrete manufacturer and testing agency.

B. Material Certificates: For the following, from manufacturer:

1. Cementitious materials.

2. Steel reinforcement and reinforcement accessories.

3. Fiber reinforcement.

4. Admixtures.

5. Curing compounds.

6. Applied finish materials.

7. Bonding agent or epoxy adhesive.

8. Joint fillers.

C. Material Test Reports: For each of the following:

1. Aggregates.

D. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Detectable Warning Installer Qualifications: An employer of workers trained and approved by manufacturer of stamped concrete paving systems.

B. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

C. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

D. Concrete Testing Service: Owner will engage a qualified testing agency to perform material evaluation tests and to design concrete mixtures.

E. ACI Publications: Comply with ACI 301 unless otherwise indicated.

F. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to concrete paving, including but not limited to, the following:

a. Concrete mixture design.

b. Quality control of concrete materials and concrete paving construction practices.

2. Require representatives of each entity directly concerned with concrete paving to attend, including the following:

a. Contractor's superintendent.

b. Independent testing agency responsible for concrete design mixtures.

c. Ready-mix concrete manufacturer.

d. Concrete paving subcontractor.

e. Manufacturer's representative of stamped concrete paving system used for detectable warnings.

1.7 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn-]steel wire into flat sheets.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

C. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 plain-steel bars. Cut bars true to length with ends square and free of burrs. Retain one of first two paragraphs below. Tie bars or hook bolts may be used for connection between new and existing paving and between paving and gutters.

D. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.

E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

F. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.

G. Zinc Repair Material: ASTM A 780.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150, gray portland cement Type I

a. Fly Ash: ASTM C 618, Class F.

b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Normal-Weight Aggregates: ASTM C 33, Class 4M, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 1-1/2 inches nominal.

2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: Potable and complying with ASTM C 94/C 94M.

D. Air-Entraining Admixture: ASTM C 260.

E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.

2. Retarding Admixture: ASTM C 494/C 494M, Type B.

3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.

4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.

6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.4 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

2.5 RELATED MATERIALS

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

2.6 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.

2. When automatic machine placement is used, determine design mixtures and obtain laboratory test results that meet or exceed requirements.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 3600 psi for hardscape.

2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45

3. Slump Limit: 4 inches, plus or minus 1 inch.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content: 5-1/2 percent plus or minus 1.5 percent for 1-1/2-inch nominal maximum aggregate size.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

E. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash or Pozzolan: 25 percent.

2. Ground Granulated Blast-Furnace Slag: 50 percent.

3. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For concrete batches of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.

2. For concrete batches larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.

3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proofroll subbase in one direction. Limit vehicle speed to 3 mph (5 km/h).

2. Proofroll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing between 20 to 30 tons.

3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Section 31 20 00 "Earth Moving."

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Zinc-Coated Reinforcement: Use galvanized-steel wire ties to fasten zinc-coated reinforcement. Repair cut and damaged zinc coatings with zinc repair material.

F. Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M.

G. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.

2. Provide tie bars at sides of paving strips where indicated.

3. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.

4. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 50 feet unless otherwise indicated.

2. Extend joint fillers full width and depth of joint.

3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.

4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.

5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.

6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch 3/8-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

K. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

L. Cold-Weather Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.

2. Do not use frozen materials or materials containing ice or snow.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

M. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

a. Water.

b. Continuous water-fog spray.

c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm) and sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas that have been subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating, and repair damage during curing period.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 1/4 inch.

2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).

3. Surface: Gap below 10-foot- (3-m-) long, unleveled straightedge not to exceed 1/2 inch (13 mm).

4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches (13 mm per 300 mm) of tie bar.

5. Lateral Alignment and Spacing of Dowels: 1 inch (25 mm).

6. Vertical Alignment of Dowels: 1/4 inch (6 mm).

7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches (6 mm per 300 mm) of dowel.

8. Joint Spacing: 3 inches (75 mm).

9. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.

10. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.10 PAVEMENT MARKING

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

B. Allow concrete paving to cure for a minimum of 28 days and be dry before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils (0.4 mm).

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to concrete surface. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.

2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal. (0.72 kg/L).

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 50 cu. yd. or fraction thereof of each concrete mixture placed each day.

a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.

5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C 39/C 39M; test one specimen at seven days and two specimens at 28 days.

a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.

3.12 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Engineer.

B. Drill test cores, where directed by Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 13 13

SECTION 32 18 10 – PICKLEBALL AND TENNIS COURTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Geotechnical report titled "Geotechnical Engineering Report: Bailey Road Park Tennis Courts" by Carolinas Geotechnical Group. dated May 5, 2023.

C. American Sport Builders Association (ASBA) Asphalt Guidelines.

1.2 SUMMARY

A. Related Sections include the following:

1. Division 31, of the Technical Specifications, Section "Earth Moving" for requirements on subgrade preparation requirements for pickleball and tennis courts.

1.3 DEFINITIONS

A. Surface Course – The low volume surface / wearing course shall be installed uniformly, to all finished lines and grades, smooth, durable, impervious thus protecting lower layers, and stable. Workmanship of the finished surface course shall be of the highest industry standards (NAPA, AI, ASBA, and NHI references) and applicable to sports surfaces prior to acceptance by the Owner. The surface course shall be built with a fine-graded, ½" maximum aggregate particle size (Nominal Maximum Aggregate Size of ⅜") or smaller. Surface course shall be installed to a minimum average 1-½" compacted thickness; ensure that no thickness of less than 1- ¼" compacted thickness is placed.

B. Leveling Course – The course and location of the recreational area that requires placement of a variable thickness of HMA to 'true up' the area prior to placement of the surface course. This course has a Maximum Aggregate Size (MAS) no greater than that of the surface course.

C. Base Course – The lower courses of the pavement structure below the surface course with a MAS of between ¾" and 1". Base courses shall not be allowed to remain without the surface course placed over an extended period and as approved by the engineer. The base shall be kept clean and must be completely dry before proceeding. If the minimum thicknesses shown above cannot be met, then install surface mixture as base course.

D. Tacking / Priming – The process of applying one coat of emulsified asphalt to all horizontal and vertical surfaces of either an existing pavement for an overlay or between lifts while building an improved or new structure (tacking), or upon the aggregate base (priming).

1.4 SUBMITTALS

A. Contractor shall submit the following to the Owner and Designer of Record prior to the ordering of materials:

1. Asphalt Mixture Design

2. Asphalt Mix Design Submittal Checklist containing at a minimum the following information:

   a. All Aggregate Gradations and Quality Measurements

   b. Plot (0.45 power graph) of Final Aggregate Blend

   c. Bulk (dry) Specific Gravity of All Aggregates and Final Blend (G_{sb}) including worksheets for natural (virgin) as well as reclaimed asphalt pavement (RAP).

   d. Statement of Asphalt Binder (PG) being used in Asphalt Mixture

   e. Optimum % Asphalt Binder (P_b)

   f. Mix Air Voids at Optimum (V_a)

   g. Bulk Specific Gravity of Mix at Optimum (G_{mb})

   h. Theoretical Maximum Specific Gravity at Optimum (G_{mm})

   i. Voids in the Mineral Aggregate (VMA) and Voids Filled with Asphalt (VFA)

   j. Dust to total AC Ratio

   k. All Design Data and associated Design Curves

3. Asphalt Placement Work Plan: This plan shall indicate paving pass widths, paving directions, site access, and timing / coordination of athletic equipment installation (tennis net posts, vault boxes, fencing, etc.).

4. Surfacing system product data shall be submitted to the Owner and Designer of Record for review and approval. Include technical data and tested physical and performance properties.

5. Provide a colored court striping plan detailing lines and layout to the Owner and Designer of Record for review and approval.

6. Qualification Data: For qualified manufacturer and Installer.

7. Material Certificates: For each paving material, from manufacturer.

B. Contractor shall submit the following to the Owner and Designer of Record prior to the start of construction of pickleball and tennis courts:

   1. Current Quality Control testing of the mixture, aggregates, and RAP proposed to be used on the project shall be submitted to the Owner prior to acceptance of the proposed mix design.

C. Contractor shall submit the following to the Owner and Designer of Record upon completion of asphalt placement and prior to application of the court surfacing system:

1. Material test reports for each paving material installed.

2. Notarized Certificate of Compliance for all products used on the project.

3. Yield calculations for all products used on the project. (For example, placement of 1,300 sq. yds. of Hot Mix Asphalt, 1-3/4" compacted thickness will require 128 tons when the unit weight = 150 pcf.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Hot Mix Asphalt (HMA) shall be manufactured from a state approved / certified HMA manufacturing facility. The manufacturing facility shall be capable of producing HMA in accordance with the following requirements and all applicable local agency specifications on an ongoing and consistent basis.

1. Manufacturer shall provide Quality Control manual for material production oversight and testing measures being performed at the asphalt plant.

2. HMA Mix Designs shall be performed by qualified personnel with proven past experience and successes in the mix design and quality control of asphalt production. Resumes of the signing "individual-in-charge" may be required by the Owner and shall be supplied if requested. The design shall meet the following requirements and be less than 24-months old. However, the mix design method used shall be the Contractors option, as stated previously, based on various methods which currently exist around the nation. A completed design shall be signed by a professional engineer and require submittal of documentation as detailed within this specification. This is required by the Owner for the producer to demonstrate knowledge of asphalt mix design and production criterion needed to supply athletic asphalt.

B. Installer Qualifications:

1. Installer shall provide the following documents to the Owner:

a. Approved vendor certificate for the locality (state / county / city, et. al.) where work is being done,

b. Testing measures to be performed on the job site, and

c. List / Organizational Chart showing personnel responsible for use of equipment and actions of the crew on the grade while paving and compacting asphalt.

2. Installer shall designate a "Person-in-Charge" who is responsible for oversight of the installation and quality assurance of HMA. This individual will be the point of contract for the Owner and shall work with the Owner to ensure timely project completion and specification compliance. This individual shall be knowledgeable in all aspects of asphalt mix design, production, and installation and shall be an employee of the General Contractor holding the contract with the Owner, even if the HMA is being produced, supplied, and installed by separate vendor(s).

3. Installer shall provide calibrated equipment and qualified personnel must always be accessible during the construction of the HMA to complete the job acceptable to the

Owner and in accordance with applicable contract documents. Variations in the size and amount of equipment will depend on the size of the area being paved.

C. Testing:

1. Testing required to validate or control the mix supplied is the Paving Contractor's responsibility and will be included in the bid cost for providing these HMA items. Daily maximum theoretical specific gravity (Gmm) values must be made available to the Contractor's density technician for verifying in-place density within four hours of start of production. Asphalt content, gradation, and bulk specific gravity (Gmb) testing shall be performed on the first day of installation for each product used, then done a minimum of once every 400 tons of HMA supplied or every third day for low tonnages that when added together successively do not equal 400 tons. Acceptable average measures are made by use of a correlated nuclear density gauge, a correlated Pavement Quality Indicator or PaveTracker (non-nuclear) or by cutting (4) cores per lift, per day and testing per AASHTO T-166, Method C. Additional testing shall be performed on any given day once 400 tons of asphalt is placed on that day.

2. The average sub-lot (daily or 400 tons; whichever is less) in-place density measure for surface course mixtures shall be 94.0% of Gmm with no value less than 92.5% of Gmm. Base and leveling installation of asphalt shall meet local DOT specifications for in-place density measures or average of 92.0% of Gmm, whichever is greater. Surface course longitudinal joints shall be measured directly upon the joint, centered upon by core or density gauge, and shall meet the mat density requirements. Base and leveling course longitudinal joint density measures shall achieve between 95% - 102% of maximum achievable individually, with an average of 98% on any given day.

3. Process Control testing shall be in accordance with state standards for frequency and methods where the work being performed is done with a minimum of testing meeting the above QC requirements.

4. Process Control Voids and minus #200 gradation shall target mix design with no test outside plus / minus 1.0% and VMA shall target the asphalt mix design value or greater, with no test value less than minimum allowed minus 0.3%.

5. Print outs of ingredients used shall be supplied for each run of asphalt; data logger or computer screen shot. Print outs shall be supplied daily with the final load of asphalt ticket.

D. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

E. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.

b. Review condition of subgrade and preparatory work.

c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver court surfacing system materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store court surfacing system materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Prime Coat: Minimum surface temperature of 60 deg F.

2. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.

3. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

B. Acrylic Surface: Minimum surface and air temperature of 55 deg F and rising at time of application and for at least 24 hours after application.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Base Mixes: Shall have a minimum of 45% passing the #4 sieve.

C. Surface and Leveling Mixes:

1. Shall have a minimum of 45% passing the #8 sieve.

2. Maximum particle size shall be ½” or less.

D. Coarse Aggregate: shall be hard, durable particles, or fragments of limsestone or granite stone. Materials that break up when alternately frozen and thawed, or wetted and dried, should not be used. All fragments should contain at least one face resulting from fracture.

1. Coarse Aggregate Fraction: Shall have a minimum of 85% / 75% crushed faces.

E. Fine Aggregate: Angularity (AASTHO T-304, Method A), shall be >= 40% with no more than 20% natural sand allowed.

2.2 ASPHALT MATERIALS

A. Tack Coat and Prime Coat: AASHTO M140 or M208 (Reference the Asphalt Institute MS-19 for handling, storage, and application criteria: typically, 0.05 gal / sy to 0.15 gal / sy (0.02 gal / sy to 0.05 gal / sy residual AC) depending on the existing surface condition; see Surface Preparation section and current AI and NAPA publications.

1. Tack Coat: SS-1, SS-1h, CSS-1 or CSS-1h diluted with an equal amount of water, or agency acceptable product.

2. Prime Coat: Prime Coat materials of MS-2, CMS-2, or HFMS-2s.

B. Hot Mix Asphalt (Low Volume):

1. Aggregates, mineral filler, and asphalt binder shall meet or exceed the requirements of local specifications for asphalt pavements placed under this contract for qualities and types. The coarse aggregate shall be sound, angular crushed stone, crushed gravel, or crushed air-cooled blast furnace slag (not steel). The fine aggregate shall be well graded, moderately sharp to sharp (angular) sands. No aggregates known to cause rust spots or pop-outs (steel slag, iron pyrite, and / or dust balls) are allowed in the asphalt. No recycled concrete is allowed in any of the asphalt mixtures.

2. All HMA mix designs shall be performed in accordance with the Asphalt Institute Manual Series #2 (MS-2), current edition. The HMA mix designs developed shall meet the requirements of one of the following for compactive effort in the laboratory:

a. Marshall, 50-Blow,

b. Superpave, 50-Gyration, or

c. Hveem, Low Volume Mix.

d. Alternate ***Low Volume*** Asphalt Mix Designs may be allowed with the Engineers approval prior to time of bidding.

C. Asphalt Binder: Performance Graded (PG) binder shall be PG 64-22 per the requirements of the NCDOT Asphalt QMS Manual 2022 edition and AASHTO M 320.

D. Water: Potable.

E. Reclaimed Asphalt Pavement (RAP):

1. The use of asphalt mixtures with RAP is not recommended in the surface course of asphalt due to their potential negative impact on pavement longevity and staining of acrylic surfaces.

2. May be used up to 20% in the HMA Binder / Base and Leveling Courses.

3. Typically, 0% for HMA Surface Course due to potential blemishes forming from unknown (varying?) aggregate qualities, however, may be used up to 15% in the HMA Surface Course only if approved by the architect / engineer of record.

4. Requires a signed and notarized letter stating that no pyrite, steel slag, or aggregates known to rust or deteriorate are within the RAP being utilized is required.

5. Requires the Gsb of the RAP to be determined and used in VMA calculations, not the Gse. The RAP Gsb shall be determined after running the RAP Gmm and then from calculating the RAP Gse minus 0.1 for high absorptive aggregates and RAP Gse minus 0.05 for low absorptive aggregates.

6. Requires that all RAP shall be crushed and screened over a ⅝" screen deck or smaller for Binder / Base and Leveling Courses and ½" screen deck for surface mixtures; no exceptions.

F. Reclaimed Asphalt Shingles (RAS): Not allowed for use in pickleball and tennis court asphalt per the requirements of the ASBA Asphalt Guidelines.

2.3 AUXILIARY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.

B. Sand: ASTM D 1073, Grade Nos. 2 or 3.

C. Paving Geotextile: AASHTO M 288, nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.

2.4 SURFACING SYSTEM MATERIALS

A. Acrylic Filler: Product shall contain or shall be mixed on-site with 50-60 mesh silica sand and water in accordance with manufacturer recommendations.

B. Acrylic Surface: Color(s) shall be per the approved striping plan. Product shall contain or shall be mixed on-site with 80-100 mesh silica sand and water in accordance with manufacturer recommendations.

C. Marking Paint: Textured Acrylic paint as recommended by the manufacturer of the color coating system. Color shall be per the approved striping plan.

1. The speed of the playing lines shall match the speed of the adjacent playing surface.

2. Oil, alkyd, or solvent-based paint is unsuitable for court lines and should not be used.

PART 3 - EXECUTION

3.1 EQUIPMENT

A. Tack / Prime Coat Distributor Truck must have an insulated tank, heating system, and a calibrated distributor capable of maintaining a uniform application of emulsified asphalt under pressure throughout the area to be paved. This requires a pump in good working order, full circulating spray bars, and free flowing nozzles. Small, isolated areas may be tacked with a wand.

B. Trucks shall have smooth, clean, and tight metal beds that do not have mixture sticking to the truck bed and from which the entire quantity of HMA can be discharged smoothly into the spreading equipment. Trucks shall have a tarp and insulation as needed to protect the asphalt mixture from wind, rain, and cold temperatures. Trucks for hauling asphalt mixture shall be in good, safe working condition.

C. Paving Equipment must be capable of placing, spreading and finishing courses of HMA to the specified thicknesses. HMA shall be free of marks, segregation and be placed to the required uniform elevation with a smooth texture not showing tearing, shoving, or gouging. Auger extensions are required while pavers are extended beyond the basic screed width. Paving Equipment shall be self-propelled and capable of maintaining the line and grade shown on the plans with suitable electronic equipment. The screed shall be straight and true with no bow and utilizing a vibratory screed. Hand work shall be minimized to ensure the best possible finished surface. It is recommended that paving equipment be equipped with sonar pods or no contact skis for sports asphalt construction. Additionally, it should be equipped with automatic slope control to maintain required tolerances. Finally, paving equipment should have fully functional screed heaters and joint preheaters.

D. Rollers shall conform to the manufacturer's specifications for all ballasting. At least one vibratory roller shall be required for each project with two rollers required as a minimum. (Three rollers shall be required when tonnage is greater than 300 tons / day.) Rollers shall be of good condition and capable of compacting the HMA to the minimum in-place density required by this specification.

3.2 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving. Subgrade shall be prepared in accordance with the requirements of section 31 20 00 Earth Moving of the project specifications.

B. Proofroll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proofroll wet or saturated subgrades.

1. Completely proofroll subgrade in one direction. Limit vehicle speed to 3 mph.

2. Proofroll with a loaded 10-wheel, tandem-axle dump truck weighing between 20 to 30 tons. The proofrolling procedures should consist of complete passes of the exposed area, with half of the passes being in a direction perpendicular to the proceeding ones.

3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineeer, and replace with compacted backfill or fill as directed.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.3 SURFACE PREPARATION

A. Repair pavement failures and perform crack repair according to specification requirements prior to HMA installation.

B. Cold-milling and/or grinding may be necessary to ensure that the asphalt edges at concrete abutments such as approaches, sidewalks, curbing, and drainage basins have smooth transitions.

C. After site review, detail whether wedge milling is necessary to assure positive drainage and transition. Install leveling course, if required, on the project per the site details and quantities shown on the plan sheets.

D. Existing surfaces to receive HMA must be clean prior to the installation of any portion of the work. Clean the surface on which the asphalt concrete is to be placed, and keep it free of accumulations of materials that would contaminate the mixture, prevent bonding, or interfere with spreading operations. Methods used may include but not be limited to the use of a sweeper that can wet and vacuum the area free of dirt and debris, clay, and dust, or any other foreign material.

E. Any oil or grease spots shall be scraped and treated to prevent bleeding through the tack coat. Bad oil spills may require removal with a wire brush or other suitable tool. Maintain clean pavements prior to applying emulsified tack coat. When approved sub-grade or pavement courses previously constructed under the Contract become loosened, rutted, or otherwise defective, the Contractor must correct the deficiency according to the contract item or items involved before the spreading of a subsequent pavement course.

F. If subsequent lifts are laid beyond 24 or 48 hours, apply tack coat at the diluted rate of 0.05 gal / sy (0.02 gal / sy residual AC) over newly constructed asphalt leveling or base mixes, 0.10 gal / sy (0.04 gal / sy residual AC) over existing asphalt pavements and 0.15 gal / sy (0.05 gal / sy residual AC) over milled surfaces. The higher rate shall be used on dry and brittle surfaces. All vertical edges abutting proposed asphalt surfaces shall receive a tack coat. Excessive asphalt applications, drooling, or pooling shall be swept with a broom to ensure proper bonding of the HMA. Install the HMA after the asphalt emulsion has ‘broken’; i.e. turned from a brown to a black color, indicating water has evaporated. If pick up occurs, wait until emulsion cures.

G. If shown on the plans, apply prime coat at the diluted rate of 0.30 gal / sy over newly placed aggregate base course prior to the installation of the base asphalt.

H. Install tack / prime coat during appropriate weather conditions and protect the tack / prime coat from traffic so as not to wear and track. Allow the tack / prime coat to ‘break’, i.e. turn from brown to black prior to installation of the HMA.

I. Perform work in appropriate weather conditions that are dry with no rain, snow, or other forms of precipitation falling or imminent (anticipated during installation of the HMA).

3.4 PAVEMENT PLACEMENT

A. Install HMA which shall generally arrive on the project between 270 – 300° Fahrenheit (see producer recommendation) asphalt in accordance with above weather conditions and with a temperature of 50° F. and rising for all asphalt lifts.

B. Establish an acceptable rolling pattern with the assistance of a density technician on the first day of construction. Record temperatures, equipment, rolling pattern, and in-place density results throughout the project.

C. Surface course longitudinal joints shall be smooth and true; no deviation from level and true as required of the mat will be allowed. Detail and submit to the Owner a paving plan on the site plan sheet prior to placement of asphalt.

D. The entire athletic surface course shall be paved on the same day. The timing and process should be discussed with and approved by the Owner before proceeding with the work. If a cold seam will occur it must be agreed to with the Owner in advance such as: occur near or at a planned saw and seal joint or under the fence line.

1. Every attempt should be made to complete the surface course placement process in one continuous placement with no cold joints. The timing and process should be discussed with the Owner before proceeding with the work.

E. Rolling shall start as soon as the HMA can be compacted without displacement. Rolling shall continue until the HMA is thoroughly compacted and all roller marks have disappeared. Compact the HMA to a minimum in-place density of 94.0% of the Theoretical Maximum Specific Gravity, Gmm. Complete compaction before mix temperature cools to 185 deg F.

1. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

2. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

3. Intermediate Rolling: Begin intermediate rolling with nine-wheel rubber-tired roller 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:

    a. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm. Density: Acceptable compaction should be defined as a test section density within the range of 98% to 102% of the maximum density determined on a density control strip. In addition, no one test should be below 92% of maximum (Rice) specific gravity.

4. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

5. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

F. Smoothness shall meet the requirements of no greater than ¼" in 10 ft. for base and leveling courses and ⅛" in 10 ft. for surface course. [Reference ASBA manual.]

G. Thickness of the overall mat shall be within ¼" (surface course, no minus) of the specified plan thickness at all locations. However, the yield for the day and for the entire site shall meet calculated theoretical based on 94% of Gmm supplied from the Contractors mix joidesign and daily test values.

H. Paving Joints

1. Minimize construction, longitudinal, and transverse joints left open for an extended period.

2. Construct longitudinal joints by paving in a hot fashion with a temperature of not less than 220°F to ensure maximum performance.

3. Compact all joints to provide for a neat, uniform and tightly bonded joint that will meet both surface tolerances and density requirements.

4. Cut straight and true (vertical) construction or transverse joints if the material has cooled to less than 220°F prior to the placement of the next pass to ensure the best performing joint possible.

5. Off-set joints a minimum of 6" between lifts of asphalt.

I. Allow positive drainage off of the athletic facility and towards drainage outlets. Any ponding of water is not acceptable and shall require correction or replacement at the Contractor's expense and as directed by the Engineer. Please reference the ASBA Tennis Construction & Maintenance Manual or ASBA Running Tracks Construction & Maintenance Manual for ponding tolerances. Flood pavement areas as directed by the Owner and in the presence of the Architect / Engineer and surfacing contractor to determine positive drainage acceptability.

J. Protect the HMA until such time that coating can be placed upon the properly compacted asphalt, particularly during other construction activities between asphalt installation and athletic surface installation.

K. If excessive segregation is occurring during placement operations, the Contractor will investigate the cause(s) and make appropriate changes to the satisfaction of the Owner. [Reference AI MS-22.]

L. Excessive leveling and smoothness correction required to be performed by the surfacing contractor shall be the responsibility of the paving contractor.

3.5 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into

adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Patching: Fill excavated pavements with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

C. Patching: Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

3.6 SURFACING SYSTEM PLACEMENT

A. Do not apply surfacing system until layout, colors, and products have been verified with Engineer.

B. New asphalt pavement surfaces must cure 14 to 30 days prior to application of surfacing system.

C. Thoroughly clean asphalt pavement to ensure all foreign materials are removed. Depending on conditions, methods such as sanding, blowing and scraping debris, washing loose material, or power washing may be used to ensure a clean surface.

D. Flood the asphalt pavement surface with water and allow to drain to check for planarity.

1. Low areas, or “birdbaths”, are defined as any areas where standing water more than 1/16” (1.58 mm) deep (commonly measured using a nickel) remains after drainage of the area has ceased or after one hour at 70 degrees F or above in sunlight.

2. Identify whether birdbaths are caused by low areas or adjoining high areas prior to making any corrections.

3. Correct high areas by scraping or grinding. Low areas shall be patched and leveled according to the recommendations of the color surface system manufacturer and prior to proceeding with coating.

E. Apply a minimum of two (2) filler coats in accordance with recommendations and specifications provided by the colored surface supplier. Application rates shall be as recommended by manufacturer but shall not be less than 0.07 gallons per square yard over the entire surface.

1. Filler coats shall not be placed when rain is imminent or when the minimum surface and air temperatures are below 50 degrees F for 24 hours before and after the application of each coat.

2. Ensure adequate dry time is provided for each coat per manufacturer recommendations before applying the next coat.

3. Scrape and blow surface clean prior to installation of subsequent coats.

F. Apply a minimum of two (2) surface coats in accordance with recommendations and specifications provided by the colored surface supplier. Application rates shall be as

recommended by manufacturer but shall not be less than 0.05 gallons per square yard over the entire surface.

1. Surface coats shall not be placed when rain is imminent or when the minimum surface and air temperatures are below 50 degrees F for 24 hours before and after the application of each coat.

2. Ensure adequate dry time is provided for each coat per manufacturer recommendations before applying the next coat.

3. Scrape and blow surface clean prior to installation of subsequent coats.

G. Begin striping of the court once the court surface has cured for at least 72 hours, or as otherwise directed by the manufacturer.

1. Use a taping machine and masking tape to delineate striping lines.

2. Prior to painting, verify dimensions of delineated lines to ensure conformity with the approved striping plan.

3. Paint lines with one (1) or two (2) coats of textured line paint in accordance with recommendations and specifications provided by the colored surface supplier.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: The Owner will engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances noted above.

D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.

2. In-place density of compacted pavement shall be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

a. One test shall be performed for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.

E. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.8 DISPOSAL

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

1. Do not allow milled materials to accumulate on-site.

END OF SECTION 32 18 10

SECTION 32 31 14 – CHAIN-LINK FENCING

PART 1 - GENERAL

1.1 SCOPE

A. Work included in this Section
(1) PVC coated fence framework, fabric and accessories
(2) Excavation for post bases, concrete footings
(3) Manual gates and related hardware
(4) Temporary Protection of Work in progress

1.2 SYSTEM DESCRIPTION

A. Fence Height and Layout: See Plans.

B. Line Post Spacing: At intervals not exceeding 10 feet.

C. Furnish and install "black" color PVC coated fence and gate system.

D. This section shall include the furnishing of all labor, materials, equipment and transportation required for the installation of the chain link fence as shown on drawings or specified herein.

E. Submit complete shop drawings for all tennis court chain link fencing, latches, post foundation dimensions and appurtenances to Owner's Representative prior to purchase and installation in accordance with the Conditions of the Contract.

F. Provide product data on fabric, posts, accessories, fittings and hardware.

G. Dimensions indicated for pipe sections are outside dimensions, exclusive of coatings.

1.3 REFERENCES

A. ASTM F567 - Installation of Chain-Link Fence

B. ASTM C94 - Ready-mixed Concrete

C. ASTM F668 - Poly Vinyl Chloride (PVC) Coated Steel Chain Link Fence Fabric

D. Chain Link Fence Manufacturers Institute (CLFMI) - Product Manual

E. FS RR-F191 - Fencing, Wire and Post Metal (and Gates, Chain Link Fence Fabric, and Accessories).

1.4 QUALITY ASSURANCE

A. Perform work in accordance with Chain Link Fence Manufacturers Institute.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.6 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

PART 2 - PRODUCTS

2.1 CHAIN LINK FABRIC

A. The chain link fabric shall be American made with No. 9 ga core size, PVC coated steel wires, 1 3/4" diamond woven mesh. PVC coating shall be Class 2b fused and adhered to metallic-coated steel wire. Furnish one-piece fabric widths.

B. Top and bottom selvage shall be knuckled (no twist).

C. Bottom of fence fabric shall be within 1/2" maximum above grade surface and not touching surface.

D. All fittings and accessories shall be pressed steel or cast iron, PVC coated in accordance with RRF 191/4c.

2.2 FRAMING (STEEL) AND ACCESSORIES

A. Manufacture framing from galvanized steel, PVC coated in accordance with RRF 191/3c grade A standard weight, one piece without joints.

2.3 LINE POSTS

A. Line posts shall be PVC coated galvanized piping, galvanized both inside & outside. Line posts shall be sized per Section 2.13 below.

B. The chain link fabric shall be tied to the line posts with No. 9 gauge PVC coated tie wires.

C. Line post caps shall be PVC coated weather tight closure cap with loop to receive top rail.

2.4 TERMINAL, CORNER AND GATE POSTS

A. Terminal corner and gate posts shall be PVC coated galvanized piping, galvanized both inside & outside. Terminal posts shall be sized per Section 2.13 below.

B. Weather tight closure caps shall be PVC coated to be acorn type, one cap for each post.

2.5 TOP AND BOTTOM RAIL

A. Top and Bottom rail shall meet the same specifications of quality as line and terminal posts. The top rail shall be minimum 1.625" O.D.

B. Top and bottom rail pipe sections shall not be less than 18' long and shall be fitted with PVC coated couplings for connected lengths into a continuous run. The couplings shall be not less than 6" long, with 0.070 minimum wall thickness, and shall allow for expansion and contraction of the rail. Open seam outside sleeves shall be permitted only with a minimum wall thickness of 0.100". Top rail shall pass through the line post tops. Top rail shall be securely fastened to terminal posts with PVC coated pressed steel or malleable steel connections.

C. The chain link fabric shall be tied to the top and bottom rails at intervals of eighteen inches (18") with No. 9 gauge PVC coated tie wire.

2.6 TERMINAL AND GATE POST FITTINGS

A. Terminal and gate post fittings shall be PVC coated, galvanized, cold-rolled carbon steel of good commercial quality.

B. No aluminum, cast iron, or pot metal fittings will be accepted as equal or substitutes.

2.7 TERMINAL AND GATE POST BRACES

A. Provide manufacturer's standard adjustable brace at end and terminal section adjacent to gate posts, terminal sections at both sides or corners and pull posts. Use 1.625” O.D. pipe meeting the same specifications of quality as top rail. Truss rods shall be 0.375" diameter PVC coated steel rod with adjustable tightener.

B. Braces on these sections shall be installed midway between top rail and grade, and extend from each terminal post at gate to the first adjacent line post. Braces shall be securely fastened to posts by PVC coated heavy pressed steel connections and also to be trussed from line post back to terminal post.

2.8 TENSION BARS

A. Provide one-piece lengths for PVC coated tension bars equal to full height of fabric, with minimum cross-section of 1/4" X 3/4". Provide one tension bar for each gate and end post, and 2 for each corner and pull post, except where fabric is integrally woven into post. Space tension bar bands not over 15"o.c., to secure tension bars to end, corner, pull and gate posts.

2.9 GATES

A. Gates shall be located and of sizes as shown on the Plans. Frames shall be constructed of PVC coated galvanized pipe having an outside diameter of 1.90" minimum with finish to match fabric and framework.

B. Gate frames shall be welded or alternately, shall utilize corner fittings or heavy malleable iron or pressed steel securely riveted to the frames, providing security against removal or breakage connections. Provide horizontal and vertical members to ensure proper gate operation and attachment of fabric, hardware and accessories.

C. Fabric matching the fence fabric shall be installed in the frame by means of tension (stretcher) bars and hook bolts. Frames having corner of fittings shall be equipped with adjustable truss rods having a diameter of three-eighths inch (3/8").

2.10 GATE HARDWARE

A. Provide PVC coated hardware and accessories for each gate per manufacturer's recommendation for size and type of gate.

B. Hinges shall be PVC coated size and material to suit gate size, non-lift-off type, offset to permit 180 deg. gate opening. Provide 1-1/2 pair (3) of hinges for 40" height fence and two pair (4) of hinges for 6' and greater height, for each leaf. Under no conditions of use or abuse shall the hinges twist or turn under the action of the gate. Hinges, latches and catches shall be one of the manufacturer's standard designs as selected and approved by the Owner's Representative. Latch shall be PVC coated fork latch to permit operation from either side of gate.

C. All gate hardware to be PVC coated.

2.11 TENSION WIRE

A. Provide 7 ga., PVC coated steel, single strand tension wire (metal and finish to match fabric) and located at bottom of fabric. Tension wire shall be placed 1.5" above grade surface plus or minus 0.5".

2.12 WIRE TIES

A. Wire ties shall be 9 ga., PVC finish. For tying fabric to line posts, use wire ties spaced 12"o.c. For tying fabric to rails and braces, use wire ties spaced 18"o.c. For tying fabric to tension wire, use hog rings spaced 24"o.c. Manufacturer's standard procedure will be accepted if of equal strength and durability.

2.13 FENCE POST SIZE REQUIREMENTS

A. Refer to Plans for location and sizes of fence required.

Fence Height	Line Post	Corner Post	Terminal Post	Brace Rail
4'	2.5" OD	3" OD	3" OD	1.625" OD
10'	3.5" OD	3.5" OD	3.5" OD	1.625" OD

B. All posts shall meet industry standards for weight.

2.14 MATERIALS

A. Concrete: ASTM C94; Portland Cement, 3,600 psi strength at 28 days, 4 inch slump; 3/4 inch normal sized coarse aggregate.

2.15 FINISHES

A. Components and Fabric: Vinyl coating shall be class 2b PVC coating fused and adhered to metallic coated steel wire, "black" color as selected.

B. Vinyl (PVC coated) components and accessories: "Black" color, ASTM F934.

PART 3 - EXECUTION

3.1 FENCE INSTALLATION

A. Install chain link fence in accordance with ASTM F-567 following grades, lines and details approved by the Owner's Representative prior to installation, and written installation instructions of fencing manufacturer to provide secure, aligned installation. If not shown on drawings, excavate postholes to minimum depth and diameter as recommended by fence manufacturer. Fill all postholes with concrete and set posts plumb, in line, and at proper spacing. Slope top of concrete for water runoff. Allow concrete to set for 48 hours before stretching any fabric.

1. No concrete footing is to be exposed. Install top of footing 2" min. below finished grade. Patch asphalt prior to installation of colorcoat surface.

B. Post holes to be as shown on the plans and as approved by the Owner's Representative. 'Flare' bottom to create pyramidal shaped footing.

C. Do not begin operations until grading, paving or other work that may interfere with or damage fencing is complete.

D. Install line posts uniformly and not more than 10' feet apart. Terminal posts shall be set at ends and braced.

E. Install fabric on play side of fence and anchor to framework so that fabric remains in tension after pulling force is released. Install bottom tension wire stretched taut between terminal posts.

F. Install gates plumb, level and secure for full opening without interference. Install ground set items in concrete for anchorage as recommended by fence manufacturer. Adjust hardware for smooth operation and lubricate where necessary.

G. Use U-shaped tie wires, conforming to diameter of pipe to which attached, clasping pipe and fabric firmly with ends twisted at least 2 full turns. Bend wire to minimize hazard to persons or clothing.

H. Install nuts for all bolts on side of fence opposite fabric side. "Peen" ends of bolts to prevent removal of nuts if requested by the Owner.

3.2 ERECTION TOLERANCES

A. Maximum variation from plumb: 1/4 inch.

B. Maximum offset from true position: 1 inch.

3.3 PROTECTION AND INSPECTIONS

A. All material installed under this specification shall be subject to testing by Owner at his expense. Any material so inspected and found to be not in strict conformance with this specification shall be promptly removed and replaced by the Contractor at his expense.

B. The fence contractor accepts responsibility for any damage done to finished paving by fence installers. Any such damage shall be repaired at the fence contractor's expense.

C. All fence shall appear new and unused upon inspection for acceptance.

D. Provide flagging or barricades where necessary to alert construction traffic of the presence of the fencing.

END OF SECTION 32 31 14

SECTION 32 92 00 – LAWNS & GRASSES

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. Section Includes:

1. Seeding.
2. Hydroseeding.
3. Sodding.

B. Related Sections:

1. Division 31 Section "Earth Moving" for topsoil stripping and stockpiling, excavation, filling and backfilling, and rough grading.
2. Division 32 Section "Exterior Plants" for border edgings.

1.3. DEFINITIONS

A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

B. Finish Grade: Elevation of finished surface of planting soil.

C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

F. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.

H. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

I. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4. SUBMITTALS

A. Product Data: For each type of product indicated.

1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of supplier.

C. Qualification Data: For qualified landscape Installer.

D. Product Certificates: For soil amendments and fertilizers, from manufacturer.

E. Material Test Reports: For existing in-place surface soil and imported or manufactured topsoil.

F. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of turf during a calendar year. Submit before expiration of required initial maintenance periods.

1.5. QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: Five years' experience in turf installation in addition to requirements in Division 1 Section "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's [field supervisor] shall have certification in all of the following categories from the Professional Landcare Network:

a. Certified Landscape Technician - Exterior, with installation, maintenance, and irrigation specialty area(s), designated CLT-Exterior.
b. Certified Turfgrass Professional, designated CTP.
c. Certified Turfgrass Professional of Cool Season Lawns, designated CTP-CSL.

5. Maintenance Proximity: Not more than two hours' normal travel time from Installer's place of business to Project site.
6. Pesticide Applicator: State licensed, commercial.

B. Soil-Testing Laboratory Qualifications: An independent laboratory or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of the soil.

1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
2. The soil-testing laboratory shall oversee soil sampling, with depth, location, and number of samples to be taken per instructions from Architect. A minimum of three representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
3. Report suitability of tested soil for turf growth.

a. Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

D. Preinstallation Conference: Conduct conference at Project site.

1.6. DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.

B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.

C. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.

1.7. PROJECT CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of final acceptance.

1. Spring Planting: March 1 thru June 1
2. Fall Planting: September 1 thru December 1.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

1.8. MAINTENANCE SERVICE

A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:

1. Seeded Turf: 60 days from date of planting completion.

a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

2. Sodded Turf: 60 days from date of planting completion.

B. Continuing Maintenance Proposal: From Installer to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1. SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species: State-certified seed of grass species as follows:

C. Seed Species: Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:

D. Grass Seed Mix: Fescue Rebel II or approved equal.

2.2. TURFGRASS SOD

A. Turfgrass Sod: Certified Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.

B. Turfgrass Species: Bermudagrass (Cynodon dactylon) – Variety Tiff Tuff™ for use in select areas as identified on plans. Fescue sod shall be used in all other areas – see plans for more information.

C. Turfgrass Species: Sod of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:

2.3. INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
   1. Provide lime in form of ground dolomitic limestone.

B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, and with a minimum of 99 percent passing through No. 6 sieve and a maximum of 10 percent passing through No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Aluminum Sulfate: Commercial grade, unadulterated.

E. Perlite: Horticultural perlite, soil amendment grade.

F. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 sieve.

G. Sand: Clean, washed, natural or manufactured, and free of toxic materials.

H. Diatomaceous Earth: Calcined, 90 percent silica, with approximately 140 percent water absorption capacity by weight.

I. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.4. ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture, with a pH range of 3.4 to 4.8.

C. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent.

D. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

1. In lieu of decomposed wood derivatives, mix partially decomposed wood derivatives with ammonium nitrate at a minimum rate of 0.15 lb/cu. ft. of loose sawdust or ground bark, or with ammonium sulfate at a minimum rate of 0.25 lb/cu. ft. of loose sawdust or ground bark.

E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.5. FERTILIZERS

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 10 percent phosphoric acid.

B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

C. 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 formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.6. PLANTING SOILS

A. Planting Soil: Existing, in-place surface soil. Verify suitability of existing surface soil to produce viable planting soil. Remove stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix surface soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

1. Supplement with imported planting soil when quantities are insufficient.
2. Mix existing, native surface topsoil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

    1. Ratio of Loose Compost to Topsoil by Volume: 1:3
    2. Ratio of Loose Wood Derivatives to Topsoil by Volume: 1:8.
    3. Weight of Lime per 1000 Sq. Ft.: Based on soil test results.
    4. Weight of Sulfur, Iron Sulfate, Aluminum Sulfate per 1000 Sq. Ft.: Based on soil test results.
    5. Weight of Agricultural Gypsum per 1000 Sq. Ft.: Based on soil test results
    6. Volume of Sand Plus 10 Percent Diatomaceous Earth per 1000 Sq. Ft.: Based on soil test results.
    7. Weight of Bonemeal per 1000 Sq. Ft.: Based on soil test results
    8. Weight of Superphosphate per 1000 Sq. Ft.: Based on soil test results
    9. Weight of Commercial Fertilizer per 1000 Sq. Ft.: Based on soil test results
    10. Weight of Slow-Release Fertilizer per 1000 Sq. Ft.: Based on soil test results

2.7. MULCHES

A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

B. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 2 to 5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

C. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

D. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

E. Asphalt Emulsion: ASTM D 977, Grade SS-1; nontoxic and free of plant-growth or germination inhibitors.

2.8. PESTICIDES

A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

2.9. EROSION-CONTROL MATERIALS

D. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples.

PART 3 - EXECUTION

3.1. EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2. PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
2. Protect grade stakes set by others until directed to remove them.

B. Install 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.

3.3. TURF AREA PREPARATION

A. Limit turf subgrade preparation to areas to be planted.

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Apply fertilizer directly to subgrade before loosening.

2. Spread planting soil to a depth of 6 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

   a. Spread approximately 1/2 the thickness of planting soil over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil.
   b. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:

1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
2. Loosen surface soil to a depth of at least 6 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Till soil to a homogeneous mixture of fine texture.

   a. Apply fertilizer directly to surface soil before loosening.

3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

E. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

F. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4. PREPARATION FOR EROSION-CONTROL MATERIALS

A. Prepare area as specified in "Turf Area Preparation" Article.

B. For erosion-control mats, install planting soil in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.

C. Fill cells of erosion-control mat with planting soil and compact before planting.

D. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.

E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.5. SEEDING

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.

1. Do not use wet seed or seed that is moldy or otherwise damaged.
2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Sow seed at a total rate of 3 to 4 lb/1000 sq. ft.

C. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.

D. Protect seeded areas with slopes exceeding 4:1 with erosion-control blankets installed and stapled according to manufacturer's written instructions.

E. Protect seeded areas with erosion-control mats where shown on Drawings; install and anchor according to manufacturer's written instructions.

F. Protect seeded areas with slopes not exceeding 4:1 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.

1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.
2. Bond straw mulch by spraying with asphalt emulsion at a rate of 10 to 13 gal./1000 sq. ft. Take precautions to prevent damage or staining of structures or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.

G. Protect seeded areas from hot, dry weather or drying winds by applying compost mulch and/or planting soil within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 1/2 inch and roll surface smooth.

3.6. HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.

3.7. SODDING

A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across angle of slopes exceeding 1:3.
2. Anchor sod on slopes exceeding 1:6 with wood pegs[or steel staples] spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.8. TURF MAINTENANCE

A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf with fine spray at a minimum rate of 1 inch (25 mm) per week unless rainfall precipitation is adequate.

C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

D. Turf Postfertilization: Apply fertilizer after initial mowing and when grass is dry.

1. Use fertilizer that will provide actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.

3.9. SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Architect:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 95 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
3. Satisfactory Plugged Turf: At end of maintenance period, the required number of plugs has been established as well-rooted, viable patches of grass, and areas between plugs are free of weeds and other undesirable vegetation.
4. Satisfactory Sprigged Turf: At end of maintenance period, the required number of sprigs has been established as well-rooted, viable plants, and areas between sprigs are free of weeds and other undesirable vegetation.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.10. PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.11. CLEANUP AND PROTECTION

C. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

D. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

E. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION 32 92 00

SECTION 32 93 00 – EXTERIOR PLANTS

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

B. Section Includes:

1. Plants.
2. Planting soils.
3. Tree stabilization.
4. Landscape edgings.

C. Related Sections:

1. Division 02 Section "Site Demolition" for protection of existing trees and plantings, topsoil stripping and stockpiling, and site clearing.
2. Division 02 Section "Tree Protection and Trimming" for protecting, trimming, pruning, repairing, and replacing existing trees to remain that interfere with, or are affected by, execution of the Work.
3. Division 31 Section "Earthwork" for excavation, filling, and rough grading and for subsurface aggregate drainage and drainage backfill materials.
4. Division 32 Section "Lawns and Grasses" for turf (lawn), and hydroseeding.

1.3. DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required.

D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for type and size of plant required.

E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

F. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

G. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.

H. Finish Grade: Elevation of finished surface of planting soil.

I. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

J. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

K. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

L. Planting Area: Areas to be planted.

M. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

N. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

O. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

P. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

Q. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

R. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

S. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4. SUBMITTALS

A. Product Data: For each type of product indicated, including soils.

1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
2. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to the Project.

B. Samples for Verification: For each of the following:

1. Organic Compost Mulch: 1-quart (1-liter) volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
2. Mineral Mulch: 2 lb (1.0 kg) of each mineral mulch required, in sealed plastic bags labeled with source of mulch. Sample shall be typical of the lot of material to be delivered and installed on the site; provide an accurate indication of color, texture, and makeup of the material.
3. Weed Control Barrier: 12 by 12 inches.
4. Edging Materials and Accessories: Manufacturer's standard size, to verify color selected.

C. Qualification Data: For qualified landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

D. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

E. Material Test Reports: For existing in-place surface soil, and imported or manufactured topsoil.

F. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods.

G. Warranty: Sample of special warranty.

1.5. QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: Five years' experience in landscape installation in addition to requirements in Division 1 Section "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's field supervisor shall have certification in all of the following categories from the Professional Landcare Network:

    a. Certified Landscape Technician - Exterior, with installation, maintenance, and irrigation specialty area(s), designated CLT-Exterior.

5. Pesticide Applicator: State licensed, commercial.

B. Soil-Testing Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of the soil.

1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
2. The soil-testing laboratory shall oversee soil sampling; with depth, location, and number of samples to be taken per instructions from Architect. A minimum of three representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
3. Report suitability of tested soil for plant growth.

    a. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
    b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

D. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1. Selection of plants purchased under allowances will be made by Architect, who will tag plants at their place of growth before they are prepared for transplanting.

E. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

F. Plant Material Observation: Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Architect of sources of planting materials seven days in advance of delivery to site.

G. Preinstallation Conference: Conduct conference at Project site.

1.6. DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers, and soil amendments with appropriate certificates.

C. Deliver bare-root stock plants freshly dug. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.

D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

E. Handle planting stock by root ball.

F. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F until planting.

G. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Heel-in bare-root stock. Soak roots that are in dry condition in water for two hours. Reject dried-out plants.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly-wet condition.

1.7. PROJECT CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of each service or utility.
2. Do not proceed with interruption of services or utilities without Owner's written permission.

C. Planting Restrictions: Plant during the periods required by the local municipality. In the event the local municipality does not specify a period, install plan material per one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting: March 1st to June 15th.
2. Fall Planting: September 1st to December 1st.

D. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

E. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.8. WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
b. Structural failures including plantings falling or blowing over.
c. Faulty performance of tree stabilization, and edgings
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods from Date of Final Acceptance

a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.
c. Annuals: Two months.

3. Include the following remedial actions as a minimum:

a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

1.9. MAINTENANCE SERVICE

A. Initial Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.

1. Maintenance Period: 12 months from date of final acceptance

B. Initial Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.

1. Maintenance Period: Six months from date of final acceptance.

C. Continuing Maintenance Proposal: From Installer to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date initial maintenance service is

concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1. PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots will be rejected.
2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant as shown on Drawings.

E. If formal arrangements or consecutive order of plants is shown on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

F. Annuals and Biennials: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery.

2.2. INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
1. Class: O, with a minimum of 95 percent passing through No. 8 sieve and a minimum of 55 percent passing through No. 60 sieve.

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 sieve and a maximum of 10 percent passing through No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Aluminum Sulfate: Commercial grade, unadulterated.

E. Perlite: Horticultural perlite, soil amendment grade.

F. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 sieve.

G. Sand: Clean, washed, natural or manufactured, and free of toxic materials.

H. Diatomaceous Earth: Calcined, 90 percent silica, with approximately 140 percent water absorption capacity by weight.

I. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.3. ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or granular texture, with a pH range of 3.4 to 4.8.

C. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent.

D. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.

2.4. FERTILIZERS

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 10 percent phosphoric acid.

B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

C. 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 formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

E. Planting Tablets: Tightly compressed chip type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.

1. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

F. Chelated Iron: Commercial-grade FeEDDHA for dicots and woody plants, and commercial-grade FeDTPA for ornamental grasses and monocots.

2.5. PLANTING SOILS

A. Planting Soil: Existing, in-place surface soil. Verify suitability of existing surface soil to produce viable planting soil. Remove stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix surface soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

1. Ratio of Loose Compost to Topsoil by Volume: 1:3
2. Ratio of Loose Wood Derivatives to Topsoil by Volume: 1:8.
3. Weight of Lime per 1000 Sq. Ft.: Based on soil test results.
4. Weight of Sulfur, Iron Sulfate, Aluminum Sulfate per 1000 Sq. Ft.: Based on soil test results.
5. Weight of Agricultural Gypsum per 1000 Sq. Ft.: Based on soil test results

6. Volume of Sand Plus 10 Percent Diatomaceous Earth per 1000 Sq. Ft.: Based on soil test results.
7. Weight of Bonemeal per 1000 Sq. Ft.: Based on soil test results
8. Weight of Superphosphate per 1000 Sq. Ft.: Based on soil test results
9. Weight of Commercial Fertilizer per 1000 Sq. Ft.: Based on soil test results
10. Weight of Slow-Release Fertilizer per 1000 Sq. Ft.: Based on soil test results

2.6. MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Double hammered hardwood mulch.
2. Size Range: 3 inches maximum, 1/2 inch minimum.
3. Color: Natural.

B. Mineral Mulch: Hard, durable stone, washed free of loam, sand, clay, and other foreign substances, of following type, size range, and color:

1. Type: Rounded riverbed gravel or smooth-faced stone
2. Size Range: 4” maximum.
3. Color: Readily available natural gravel color range.

2.7. WEED-CONTROL BARRIERS

A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally-encountered chemicals, alkalis, and acids.

B. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd.

2.8. PESTICIDES

A. General: Pesticide registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

2.9. TREE STABILIZATION MATERIALS

A. Stakes and Guys:

1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.
2. Wood Deadmen: Timbers measuring 8 inches in diameter and 48 inches long, treated with specified wood pressure-preservative treatment.
3. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or turnbuckles.
4. Guys and Tie Wires: ASTM A 641/A 641M, Class 1, galvanized-steel wire, two-strand, twisted, 0.106 inch in diameter.
5. Tree-Tie Webbing: UV-resistant polypropylene or nylon webbing with brass grommets.
6. Guy Cables: Five-strand, 3/16-inch- diameter, galvanized-steel cable, with zinc-coated turnbuckles a minimum of 3 inches long, with two 3/8-inch galvanized eyebolts.
7. Flags: Standard surveyor's plastic flagging tape, white, 6 inches long.
8. Proprietary Staking-and-Guying Devices: Proprietary stake and adjustable tie systems to secure each new planting by plant stem; sized as indicated and per manufacturer's written recommendations.

    a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

        1) Arborbrace; ArborBrace Tree Guying System.
        2) Decorations for Generations, Inc.; Reddy Stake System.
        3) Other as approved by Landscape Architect

B. Root-Ball Stabilization Materials:

1. Upright Stakes and Horizontal Hold-Down: Rough-sawn, sound, new hardwood or softwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated; stakes pointed at one end.
2. Wood Screws: ASME B18.6.1.
3. Proprietary Root-Ball Stabilization Devices: Proprietary at- or below-grade stabilization systems to secure each new planting by root ball; sized per manufacturer's written recommendations unless otherwise indicated.

2.10. LANDSCAPE EDGINGS

A. Steel Edging: Standard commercial-steel edging, rolled edge, fabricated in sections of standard lengths, with loops stamped from or welded to face of sections to receive stakes.
1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

    a. Border Concepts, Inc.
    b. Collier Metal Specialties, Inc.
    c. Russell, J. D. Company (The).
    d. Sure-Loc Edging Corporation.
    e. Other as approved by Landscape Architect

2. Edging Size: 1/8 inch wide by 6 inches deep.
3. Stakes: Tapered steel, a minimum of 12 inches long.
4. Accessories: Standard tapered ends, corners, and splicers.
5. Finish: Standard paint
6. Paint Color: Black or Brown.

2.11. MISCELLANEOUS PRODUCTS

A. Wood Pressure-Preservative Treatment: AWPA C2, with waterborne preservative for soil and freshwater use, acceptable to authorities having jurisdiction, and containing no arsenic; including ammoniacal copper arsenate, ammoniacal copper zinc arsenate, and chromated copper arsenate.

B. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

C. Burlap: Non-synthetic, biodegradable.

D. Planter Drainage Gravel: Washed, sound crushed stone or gravel complying with ASTM D 448 for Size No. 8.

E. Planter Filter Fabric: Nonwoven geotextile manufactured for separation applications and made of polypropylene, polyolefin, or polyester fibers or combination of them.

F. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb (0.45 kg) of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb (0.45 kg) of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

PART 3 - EXECUTION

3.1. EXAMINATION

A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2. PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install 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.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

F. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

3.3. PLANTING AREA ESTABLISHMENT

A. Loosen subgrade of planting areas to a minimum depth of 12 inches Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Apply fertilizer directly to subgrade before loosening.
2. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.

    a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
    b. Mix lime with dry soil before mixing fertilizer.

3. Spread planting soil to a depth of 12 inches but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

a. Spread approximately one-half the thickness of planting soil over loosened subgrade. Mix thoroughly into top 4 inches of subgrade. Spread remainder of planting soil.

B. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

D. Application of Mycorrhizal Fungi: At time directed by Architect, broadcast dry product uniformly over prepared soil.

3.4. EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.

1. Excavate approximately three times as wide as ball diameter for balled and burlapped and container-grown stock.
2. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
3. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
4. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
5. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
6. Maintain supervision of excavations during working hours.
7. Keep excavations covered or otherwise protected when unattended by Installer's personnel.
8. If drain tile is shown on Drawings or required under planting areas, excavate to top of porous backfill over tile.

B. Subsoil and topsoil removed from excavations may be used as planting soil.

C. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Drill 6-inch-diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.

D. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5. TREE, SHRUB, AND VINE PLANTING

A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare 1 to 2 inches adjacent finish grades.

1. Use planting soil for backfill.
2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Set container-grown stock plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.

1. Use planting soil for backfill.
2. Carefully remove root ball from container without damaging root ball or plant.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6. MECHANIZED TREE SPADE PLANTING

A. Trees may be planted with an approved mechanized tree spade at the designated locations. Do not use tree spade to move trees larger than the maximum size allowed for a similar field-grown, balled-and-burlapped root-ball diameter according to ANSI Z60.1, or larger than the manufacturer's maximum size recommendation for the tree spade being used, whichever is smaller.

B. When extracting the tree, center the trunk within the tree spade and move tree with a solid ball of earth.

C. Cut exposed roots cleanly during transplanting operations.

D. Use the same tree spade to excavate the planting hole as was used to extract and transport the tree.

E. Plant trees as shown on Drawings, following procedures in "Tree, Shrub, and Vine Planting" Article.

F. Where possible, orient the tree in the same direction as in its original location.

3.7. TREE, SHRUB, AND VINE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees, shrubs, and vines as directed by Architect.

C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

D. Do not apply pruning paint to wounds.

3.8. TREE STABILIZATION

A. Install trunk stabilization as follows unless otherwise indicated:

B. Staking and Guying: Stake and guy trees per Mecklenburg County Land Development Standards.

3.9. PLANTING IN PLANTERS

A. Place a layer of drainage gravel at least 6 inches thick in bottom of planter. Cover bottom with filter fabric and wrap filter fabric 12 inches up on all sides. Duct tape along the entire top edge of the filter fabric, to secure the filter fabric against the sides during the soil-filling process.

B. Fill planter with planting soil. Place soil in lightly compacted layers to an elevation of 2-inches below top of planter, allowing natural settlement.

3.10. GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines spaced as shown on the drawings and in even rows with triangular spacing.

B. Use planting soil for backfill.

C. Dig holes large enough to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that will minimally disturb the root system but to a depth not less than two nodes.

E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.11. PLANTING AREA MULCHING

A. Install weed-control barriers before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of 12 inches and secure seams with galvanized pins.

B. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Trees and Tree-like Shrubs in Turf Areas: Apply organic mulch ring of 4” average thickness, with 36-inch radius around trunks or stems. Do not place mulch within 3 inches of trunks or stems.
2. Organic Mulch in Planting Areas: Apply 4-inch average thickness of organic mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 2 inches of trunks or stems.
3. Mineral Mulch in Planting Areas: Apply 3-inch average thickness of mineral mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.12. EDGING INSTALLATION

A. Steel Edging: Install steel edging where indicated according to manufacturer's written instructions. Anchor with steel stakes spaced per manufacturers instructions, driven below top elevation of edging.

B. Shovel-Cut Edging: Separate mulched areas from turf areas, curbs, and paving with a 45-degree, 4- to 6-inch-deep, shovel-cut edge.

3.13. PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.

B. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated past management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.14. PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Pre-Emergent Herbicides (Selective and Non-Selective): Apply to tree, shrub, and ground-cover areas in accordance with manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.15. CLEANUP AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.

B. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

C. After installation and before [Substantial Completion] <Insert time>, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

3.16. DISPOSAL

A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION 32 93 00

33 00 00 Utilities

33 05 00 Earthwork for Utilities
33 05 26 Utility Location and Identification

33 40 00 Stormwater Utilities
33 41 00 Storm Drainage

SECTION 33 05 00 – EARTHWORK FOR UTILITIES

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplemental General Conditions, and Division 01 Specification Sections, apply to this Section.

1.2. SUMMARY

A. The CONTRACTOR shall furnish all labor and equipment for excavation, installation, backfill, and testing of all utility lines and appurtenances as shown on the Drawings and specified herein. This section specifies excavation and backfill for all underground utilities.

1.3. REFERENCE SECTIONS

A. Section 02 41 19 – Site Demolition

B. Section 31 20 00 – Earth Moving

1.4. REFERENCES

A. American Society of Testing and Materials (ASTM)

B. NCDOT Standard Specifications for Roads and Structures

C. Occupational Safety and Health Administration Regulations (OSHA)

1.5. SUBMITTALS

A. Submit Excavation support system design and details sealed by a professional engineer licensed in the State of North Carolina for trench excavation.

1.6. COORDINATION

A. The CONTRACTOR shall be responsible for coordinating all excavations with the Town of Cornelius.

1.7. QUALITY ASSURANCE

A. Standards: Testing of backfill material shall comply with the following standards.

1. ASTM D6938 Standard Test Methods for In-Place Density and Water Content of Soil

and Soil-Aggregate by Nuclear Methods (Shallow Depth).

2. ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

B. Excavation support system design and details for trench excavation, shall be sealed and signed by a professional engineer licensed in the State of North Carolina, copy of design shall be filed with ENGINEER.

PART 2 - PRODUCTS

2.1. BACKFILL AND PIPE BEDDINGS MATERIALS:

A. All new pipe installed shall use crushed aggregate or sand to meet the requirements of NCDOT Roadway Standard Drawings or as shown on the drawings, for pipe bedding.

B. Utilities installed in paved area shall use backfill to meet the requirements of NCDOT Roadway Standard Drawings or as shown on the drawings,

C. All other utilities installed shall be backfilled in accordance with Section 31 20 00.

PART 3 - EXECUTION

3.1. EXCAVATION

A. General: All excavation shall be performed in accordance with the current OSHA guidelines and all other regulatory authorities having jurisdiction. Provide adequate equipment to comply with OSHA regulations. All excavation shall be open-cut type except where otherwise shown on the Drawings. The slope of the sides of the excavation shall be kept as nearly vertical as possible consistent with the types of materials encountered. A clear area shall be maintained a sufficient distance back from the top edge of the excavation to avoid overloading which may cause slides, cave-ins or shifting of the pipe. All damage to pipes or structures occurring through settlements, heaving, water or earth pressures, slides, cave-ins or other causes shall be repaired by CONTRACTOR at its expense. CONTRACTOR has the option of shoring, including sheet piling, which shall be installed during excavation where required for the protection of workmen, banks, roadways and adjacent paving, structures, and utilities or as directed by ENGINEER.

B. Excavation Classification: Excavation will be classified as Common Excavation or Rock Excavation in accordance with the following definitions or will be designated as classified.

C. Common Excavation shall be defined as the excavation of all materials that can be excavated, transported and unloaded by the use of heavy ripping equipment and wheel tractor-scrapers with pusher tractors or that can be excavated and dumped in place or loaded onto hauling equipment by means of excavators having a rated capacity of one cubic yard and equipped with attachments (such as shovel, bucket, backhoe, dragline or clam shell) appropriate to the character of the materials, and the site conditions. Common Earth Excavation includes removal

and disposal of pavements and other obstructions visible to ground surface, underground structures and utilities indicated to be demolished and removed, material of any classification indicated in data on subsurface conditions, and other materials encountered that are not classified as rock excavation.

D. Rock Excavation shall be defined as any material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cu. yd. that cannot be removed by rock excavating equipment equivalent to late-model, track mounted hydraulic excavator; equipped with a 42-inch wide, short-tip-radius rock bucket; rated at not less than 120-hp flywheel power with bucket-curling force not less than 25,000 lbf and stick-crowd force of not less than 18,700 lbf; measured according to SAE J-1179, without systematic drilling, ram hammering or ripping (blasting not permitted).

E. Protection: Protect existing structures, utilities, sidewalks, pavements, and other facilities in areas of work. Barricade open excavations and provide warning lights. Maintain service to/from existing homes, businesses, and facilities.

F. Shoring or Sheeting: Shoring or sheeting shall be removed as the WORK progresses, unless left in place by written order of ENGINEER. Sheeting or shoring to remain after completion of the project shall be cut a minimum of 1’ below finished grade.

G. Trench Excavation: CONTRACTOR shall comply with all local, state and federal guidelines when excavating trenches. The width of the trench at and below the top of the pipe shall not exceed the outside diameter of the pipe plus 24 inches, except the minimum trench width shall be 36 inches in all cases. The width of the trench above the top of the pipe may be as wide as necessary for sheeting and bracing and the proper performance of the WORK.

H. Sidewalls: The sidewalls of pipe trenches shall be as nearly vertical as practicable to a point above the top of the pipe.

I. Over-excavation: Trenches shall be excavated to the design grade of the pipe to provide uniform bearing and support along the entire length of pipe. Care shall be taken not to over excavate. Over excavation of otherwise suitable material shall be replaced with suitable material as directed by ENGINEER. The cost of such fill shall be borne by CONTRACTOR.

J. Unsuitable Material/Rock: When material is found to be of poor supporting value or of rock and when the ENGINEER cannot make adjustments in the location of the pipe, undercut existing foundation material within the limits established in the plans. Backfill the undercut with foundation conditioning material. Encapsulate the foundation conditioning material with foundation conditioning geotextile before placing bedding material. Overlap all transverse and longitudinal joints in the geotextile at least 18 inches.

K. Disposal: All excavated material being disposed of off site shall be done legally.

3.2. SEPARATION OF WATERLINES AND SANITARY SEWERS

A. Waterlines shall be laid at least ten feet horizontally from sewer lines and sewer manholes whenever possible; the distance shall be measured edge-to-edge.

1. When local conditions prevent a horizontal separation of ten feet, the waterline may be laid closer to a sewer main or sewer manhole provided that: (1) the bottom of the

waterline is at least 18 inches above the top of the sewer; or (2) the water main shall be laid in the same trench as the sewer, with the water main located at one side on a bench of undisturbed earth and with the elevation of the bottom of the water main at least 18 inches above the top of the sewer.

B. Crossing: Waterline crossing over sewer line shall be laid to provide a separation of at least 18 inches between the bottom of the waterline and the top of the sewer whenever possible. The length of waterline shall be centered at the point of the crossing so that joints shall be equidistant from the sewer.

1. When local conditions prevent a vertical separation described above, the following construction shall be used: (1) sewers passing over or under waterlines shall be constructed of AWWA approved water pipe, pressure tested in place to 30 psi without leakage prior to back-filling; (2) waterlines passing under sewers shall, in addition, be protected by providing:

a. A vertical separation of at least 18 inches between the bottom of the sewer and the top of the waterline.

b. Adequate structural support for the sewer to prevent deflection of joints.

C. Sewer Manholes: If a waterline passes within 10 feet of a sewer manhole, the sewer manhole shall be tested and made watertight.

D. Sewers and Sewer Manholes: No water pipes shall pass through or come in contact with any part of a sewer manhole.

3.3. BACKFILLING

A. Operation: CONTRACTOR shall keep trenches backfilled on a daily basis. Prior to the end of the working day, each trench will be completely backfilled. All backfill shall be brought up equally along each side of the pipe in such manner as to avoid displacement of or damage to the pipe.

B. Material: Shall conform to PART 2 – PRODUCTS above.

C. No fill shall be placed until the subgrade has been checked and approved by the Geotechnical Engineer, and in no case shall fill be placed on a subgrade that is muddy, frozen, or that contains frost.

D. Disposal of Unsatisfactory Material: When, in the opinion of ENGINEER, the excavated material is not satisfactory for use as backfill, the material shall be disposed of offsite legally. Select material shall be brought in by CONTRACTOR.

E. Compaction:

1. Washed sand bedding material shall be brought up in layers not exceeding 3 inches in compacted depth for the full length of pipe. Each layer shall be thoroughly compacted by mechanical tampers or hammers. Bedding material, and compaction shall comply with pipe manufactures specifications.

2. Backfill materials shall be placed and compacted in accordance with the requirements of Section 31 20 00, “Earth Moving”.

3. Asphalt pavement subbase and concrete shall be placed in accordance with Section 32 12 16, “Asphalt Paving” and Section 32 13 13 “Concrete Paving”.

F. Testing: The backfill shall be tested to insure that the required density is being achieved. OWNER is responsible for costs associated with testing. ENGINEER shall select the depth at which the test is to be taken. Backfill not compacted to the required density shall be removed, recompacted, and retested at CONTRACTOR'S expense until the requirements are met.

G. Excess Disposal: Excess material shall be disposed of on site or off site legally at the discretion of the OWNER.

H. Settlement: All backfilled areas where settlement occurs shall be filled and maintained during the life of the Project and for a period of 1 year following the date of final acceptance of all WORK.

I. Hazards: When the CONTRACTOR is notified by ENGINEER or OWNER that all backfill presents a hazard, CONTRACTOR shall correct such hazardous condition at once.

3.4. BORROW

A. Availability: Where satisfactory materials are not available in sufficient quantity from required excavations, suitable materials shall be obtained from approved off-site borrow areas.

B. Placement: Borrow material shall be placed and compacted only when approved by ENGINEER and a Licensed Geotechnical Engineer.

C. Payment: No separate payment will be made for furnishing and placing approved borrow material. Compensation in full is included in the agreed to price paid for this Project.

3.5. BLASTING

A. Not Applicable.

END OF SECTION 33 05 00

SECTION 33 05 26 – UTILITY LOCATION AND IDENTIFICATION

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Supplemental General Conditions, and Division 01 Specification sections, apply to work of this section.

1.2. SUMMARY

A. The purpose of this Section is to specify the requirements for utility location tape and buried detection wire. In general, all utility pipelines shall be marked by appropriately marked metallic tape 12 to 24 inches above the conduit. Buried detection wire shall be buried just above conduit.

1.3. REFERENCES

A. North Carolina General Statutes

1.4. SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

1.5. SEQUENCING

A. The tape or wire shall be installed at the same time as the pipeline.

PART 2 - PRODUCT

2.1. WARNING AND IDENTIFICATION TAPE

A. Polyethylene plastic and metallic core or metallic-faced, acid-and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inch minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, “CAUTION, BURIED (intended service) LINE BELOW” or similar wording. Color and printing shall be permanent, unaffected by moisture or soil.

Warning Tape Color Codes

Red:	Electric
Yellow:	Gas, Oil, Steam
Blue:	Water

Green:	Sewer
Purple:	Storm
Orange:	Communications

B. Warning Tape for Metallic Piping: Acid and alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of tape shall be 0.003 inch. Tape shall have a minimum strength of 1500 psi otherwise, and 1250 psi crosswise, with a maximum 350 percent elongation.

C. Detectable Warning Tape for Non-Metallic Piping: Polyethylene plastic tape conforming to the width, color and printing requirements specified above. Minimum thickness of the tape shall be 0.004 inch. Tape shall have a minimum strength of 1500 psi lengthwise and 1250 psi crosswise. Tape shall be manufactured with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to 3 feet deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection. Color coded tape shall be installed flat with color side up to 12 inches to 24 inches over all installed utility lines including main line and service lateral or service connection.

2.2. BURIED DETECTION WIRE

A. Detection wire shall be insulated single strand, solid copper with a minimum of 12 AWG for a buried depth of less than 4 feet and 4 AWG for a buried depth greater than or equal to 4 feet. Detection wire shall be buried directly above piping at a distance not to exceed twelve (12) inches above the top of pipe. The wire shall extend continuously and unbroken, from point of access to point of access. The ends of the wire shall terminate with a minimum of three (3) feet of wire, coiled, remaining accessible in each tank, manhole, structure, and fire. The wire shall be exposed at the connection between contact A & b until the connection can be made to the wire by the last contractor to make the pipe connection.

END OF SECTION 33 05 26

SECTION 33 41 00 – STORM DRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplemental General Conditions, and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Work under this section shall consist of providing all labor, plant facilities, materials, tools, equipment, shop drawings and supervision necessary and required to install all of the storm drainage facilities, including piping, fittings, structures, bedding, and backfilling, as specified in accordance with the contract documents.

1.3 REFERENCE SECTIONS

A. Section 33 05 00 – Earthwork for Utilities

1.4 REFERENCE STANDARDS

A. American Society For Testing and Materials (ASTM)

1. A185 – Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
2. A615 – Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
3. C76 – Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
4. C478 – Precast Reinforced Concrete Manhole Sections
5. C913 – Precast Concrete Water and Wastewater Structures
6. C1479 – Installation of Reinforced Concrete Pipe
7. C990-01A – Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Pre-formed Flexible Joint Sealants
8. D2321 – Installation of Thermoplastic Pipe for Sewer/Gravity-Flow Applications
9. D3034 – Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
10. D3212 – Joints for Drain and Sewer Plastic Pipes Using Elastomeric Seals
11. F477 – Elastomeric Seals (Gaskets) for Joining Plastic Pipe
12. F794 – Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter

13. F949 – Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings

B. American Association of State Highway and Transportation Officials (AASHTO)

1. M198 – Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets

2. M252 – Corrugated Polyethylene Drainage Tubing

3. M294 – Corrugated Polyethylene Pipe.

4. M199 – Standard Specification for Precast Reinforced Concrete Manhole Sections

C. American Water Works Association (AWWA)

1. C110 – Ductile-Iron and Gray-Iron Fittings, 3 in through 48 in (75 mm through 1200 mm), for Water and Other Liquids (revision of ANSI/AWWA C110/A21.10-93)

2. C111 – Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

3. C151 – Ductile-Iron Pipe, Centrifugally Cast, for Water

D. American Concrete Institute (ACI)

1. 301 – Structural Concrete for Buildings, Specifications for

2. 318 –Building Code Requirements for Structural Plain Concrete

1.5 PROJECT RECORD DOCUMENTS

A. Accurately record as-built locations of pipe runs, connections, catch basins, cleanouts, top elevations and invert elevations.

B. Identify and describe unexpected variations of subsurface conditions and location of any utilities encountered.

1.6 QUALITY ASSURANCE

A. All costs related to reinspection due to failures shall be paid for by the Contractor at no additional expense to the Owner. Owner reserves the right to direct any inspection that is deemed necessary. Contractor shall provide free access to site for inspection activities.

1.7 PROJECT CONDITIONS

A. Removal/Relocation of Existing Utilities: The contractor shall be responsible for removal and/or relocation of existing utilities, whether shown or not shown on the drawings, at locations where conflicts occur with proposed storm drainage improvements at no additional cost to the owner.

1.8 SUBMITTALS

A. The General Contractor and the Subcontractor shall execute the Conformance Submittal(s) at the end of this section.

B. Product Data: Submit manufacturer's technical product data and installation instructions for storm drainage piping and products, in accordance with requirements of Division 1.

C. Record drawings: At project closeout, submit record drawings of installed storm drainage piping and products, in accordance with requirements of Division 1.

PART 2 - PRODUCTS

2.1 PIPES AND FITTINGS

A. Reinforced Concrete Pipe (RCP)

1. ASTM C76, Class III unless otherwise noted on drawings; and,

2. Butyl mastic sealant shall meet the requirements of ASTM C990-01a or AASHTO M198 for Type B flexible plastic gaskets.

B. Polyvinyl Chloride Pipe (PVC)

1. Pipe shall meet the requirements of ASTM D1784, and 1785 for Schedule 40 pipe; and,

2. PVC pipe shall be joined by solvent weld joint type connections. The pipe joints shall be tightly sealed against infiltration and exfiltration.

3. Maximum allowable diameter shall be 12 inches.

C. High Density Polyethylene Pipe (HDPE) Smooth Interior

1. Pipe and fittings shall conform to AASHTO M252 and M294;

2. Rubber gaskets shall meet the requirements of ASTM F477 with joints conforming to ASTM D3212; and,

3. Maximum permitted diameter of 24 inches and only where indicated on drawings; and,

D. Subdrains

1. Subdrains shall be installed along all foundation walls, retaining walls, seat walls, and as indicated in the contract documents.

2. Shall be perforated PVC Schedule 40 or HDPE; and,

3. PVC pipe shall be limited to pipe diameters less than 12-inches; and,

4. PVC pipe shall be joined by solvent weld joint type connections. The pipe joints shall be tightly sealed against infiltration and exfiltration.

5. All subdrains shall be installed with a sock filter to prevent the migration of fines into the pipe.

2.2 DRAINAGE STRUCTURES, DROP INLETS, CATCH BASINS, MANHOLES, JUNCTION BOXES, AND YARD INLETS (ALL STRUCTURES SHALL BE PRECAST UNLESS OTHERWISE APPROVED BY THE OWNER)

A. Structures:

1. Precast Concrete Drainage Structures;

2. Heavy-duty traffic rated (HS-20) conforming to ASTM C478, ASTM C913 and ASTM C890.

3. Walls and bottom slab shall be 6 inches thick for structures 8 feet in height or less. For structures between 8 feet and 16 feet in height, walls and bottom slab shall be 8 inches thick.

B. Steps

1. Shall meet the requirements of NCDOT 840.66 for design, materials, and dimensions;

2. Built into the walls of all structures over 3.5 feet in height; and,

3. Steps shall be 12 inches on center with lowest step being no more than 16 inches from the bottom.

C. Reinforcement

1. Reinforcement shall be provided as needed to obtain HS-20 traffic rating as noted above.

D. All joints in precast structures shall be patched inside and out with non-shrink grout.

2.3 CLEANOUTS & PLUGS

A. Installation shall be in accordance with the details and at locations shown on the drawings.

B. All Cleanouts shall have a concrete apron.

2.4 BEDDING AND BACKFILL MATERIAL

A. Bedding and backfill shall meet the requirements of NCDOT 300.01 or as directed by the Owner's geotechnical engineer.

2.5 CONCRETE

A. No concrete or masonry shall be placed when the temperature is below 40 degrees Fahrenheit, or when indications are for lower temperatures within 24 hours, unless protection of concrete and masonry is approved by the Owner. Damage to the structure because of freezing shall be

corrected by the Contractor at his own expense, to the satisfaction of the Owner.

B. Concrete shall conform to ACI 301 and applicable referenced specifications and shall have a 28 day compressive strength of 3,600 psi.

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall install all drainage structures and pipe in the locations shown on the drawings and/or as approved by the Owner. Pipe shall be of the type and sizes specified on the drawings and shall be laid accurately to line and grade. Structures shall be accurately located and properly oriented.

B. Excavation and Backfill – The provisions in Section 33 05 00, Earthwork for Utilities shall govern all work under this Section.

C. Storage and Handling of Pipe – All pipe shall be protected against impact, shock and free fall, and only equipment of sufficient capacity and proper design shall be used in the handling of the pipe. Storage of pipe on the job shall be in accordance with the pipe manufacturer's recommendations.

D. Damage to Pipe

1. Pipe which is defective from any cause, including damage caused by handling, and determined by the Owner as unrepairable, shall be unacceptable for installation and shall be replaced at no cost to the Owner and as directed by the Owner; and,

2. Pipe that is damaged or disturbed through any cause prior to acceptance of the work, shall be repaired realigned or replaced as directed by the Owner, at the Contractor's expense.

E. Manholes, catch basins and drain inlets shall be constructed as soon as the pipe laying reaches the location of the structures. Should the Contractor continue his pipe laying without making provisions for completion of the structures, the Owner shall have the authority to stop the pipe laying operations until the structure is completed.

F. Any structure, which is mislocated or oriented improperly, shall be removed and re-built in its proper location, alignment and orientation at the Contractor's expense.

3.2 BEDDING

A. Bedding material, when required, shall be in accordance with Section 33 05 00, Earthwork for Utilities for work described within this Section.

3.3 PIPE INSTALLATION

A. Comply with Section 33 05 00, Earthwork for Utilities

B. Laying Pipe

1. Unloading and Handling: All pipes shall be unloaded and handled with reasonable care. Pipes shall not be rolled or dragged over gravel or rock during handling. The Contractor shall take necessary precautions to ensure the method used in lifting or placing the pipe does not induce stress fatigue in the pipe and the lifting device used uniformly distributes the weight of the pipe along its axis or circumference;

2. Each length of pipe shall be inspected for defects and cracks before carefully lowered into the trench. Any damaged or any pipe that has had its grade disturbed after laying shall be removed and replaced. Bituminous coated pipe shall be handled with special care and repair of damaged coating shall conform with AASHTO M190;

3. Lay pipe on prepared foundation starting at the downgrade end according to line and grade with the necessary drainage structures, fittings, bends and appurtenances as shown on the drawings. Rigid pipes shall be laid with the bell or groove ends upgrade with the spigot or tongue fully inserted. Flexible pipes shall be laid with the inside circumferential laps pointing downstream and with the longitudinal laps at the side or quarter points. Reinforced concrete pipe shall be installed in accordance with ASTM C1479. HDPE pipes shall be installed in accordance with pipe manufacture's installation guidelines for heavy duty drainage applications and ASTM D2321; and,

4. Pipe sections shall be firmly joined together with appropriate gaskets or bands.

3.4 DROP INLET, CATCH BASIN, MANHOLE, JUNCTION BOX, AND YARD INLET INSTALLATION

A. Pre-cast Drainage Structures

1. Structure units shall be assembled in accordance with the manufacturer's instructions to form a sound structural unit. Precast elements are to conform to ASTM C478 and designed per ASTM C890 for HS-20 loading.

2. Patch joints of pre-cast pieces from inside and outside with non-shrink grout and finish smooth.

3. Waterproof from outside with bituminous coating per the manufacturer recommendations. Coal Tar Epoxy shall have a minimum dry film thickness of 16 millimeters (22 millimeters wet). Apply a minimum of two coats of bituminous coating. Each coat to be 8-10 millimeters thick (dry thickness).

4. Minimum Catch Basin size is 2'-2" x 3' inside dimensions per NCDOT detail 840.02 with frame, grate, and hood dimensions per NCDOT detail 840.03.

5. Minimum Drop Inlet size is 2'x3' inside dimensions per NCDOT detail 840.14 with grate dimensions per NCDOT detail 840.16.

6. Minimum Junction Box size is 2'-3" x 2'-3" inside dimensions per NCDOT detail 840.31.

7. Epoxy coated steps for structures over 3.5’ deep.

8. Base slab shall be shaped for inverts per NCDOT detail 840.00.

B. Fittings and Connections

1. Pipe connections shall be made so that the pipe is flush with the inside wall of the drainage structure, and shall be grouted as necessary to make smooth and uniform surfaces on the inside of the structure. Boxes to have bottoms filled with concrete to provide a bench between pipe inverts.

2. Flexible boots shall be used for all pipe connections.

C. Frames, Grates and Hoods

1. Shall be set to grade in accordance with the drawings;

2. Firmly embedded in mortar approximately 1 inch thick and aligned to fit the top section of the structure; and,

3. Bricks set in mortar used to adjust the frame to finished grade shall be limited to no more than four courses for pre-cast structures and have a minimum wall thickness of 8 inches.

4. Shall be HS-20 rated and installed with 24” minimum clear opening.

D. Interface with Existing Facilities

1. Compliance with Facility Owner Requirements: Connections made into existing drainage facilities shall be performed in accordance with the requirements of the Owner of the facility, and all pipes shall be cut flush with wall of structure. Pipe connections to existing structures shall be made through the installation of a wall sleeve and grout, and then the use of a flexible boot connector. The Contractor will be required to comply with all such requirements, including securing of all required permits, and paying the costs thereof. The cost of making the connections in accordance with the requirements of the Owner of the existing facility shall be included in the Contract Sum; and,

2. Requirements: The Contractor shall make all required connections of the proposed drainage facilities into existing drainage facilities, where and as shown on the Drawings and/or as approved by the Owner.

3.5 CONSTRUCTION WITHIN THE PUBLIC R.O.W.

A. Construction within the public right-of-way shall conform to all requirements of the regulatory authority having jurisdiction.

3.6 MODIFICATIONS OF EXISTING STRUCTURES

A. General: The Contractor shall alter, reconstruct and/or convert existing structures where and as shown on the drawings, and/or as approved by the Owner. In general, alterations shall be performed with the same type of material used in the original construction unless otherwise indi-

cated on the drawings or approved by the Owner.

B. Damage to Existing Installations: The Contractor shall exercise extreme care during such alteration, reconstruction and/or conversions so as not to damage any portions of the structure and/or pipe shown to remain. Any such damage shall be repaired by the Contractor at his own expense and to the satisfaction of the Owner.

3.7 CONCRETE PLACEMENT

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

3.8 PROTECTION AND CLEANING

A. The Contractor shall maintain all pipe installations and drainage structures in a condition such that they will function continuously and shall be kept clean of silt, debris and other foreign matter from the pipe and drainage structure is installed until the project is accepted.

3.9 FINAL INSPECTION

A. Upon completion of the work and before final acceptance by the Owner, the entire drainage system shall be subject to a final inspection in the presence of the Owner and/or Site Engineer. The work shall not be considered as complete until all requirements for line, grade, cleanliness, and workmanship have been completed.

B. Storm Sewer Pipe Testing: Storm sewer pipes and structures shall be visually inspected by the CONTRACTOR and testing agency of the OWNER prior to backfilling.

END OF SECTION 33 41 00