PROJECT MANUAL

Swan Lake North Entrance Renovation

822 West Liberty Street
Sumter South Carolina 29150

Table of Contents

Prepared by

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Project Number 24020

September 29, 2025

The City of Sumter is soliciting ***SEALED*** bids for the items listed below. Please list the cost of each item separately. Delivery charges and taxes will also be listed separately. All bids ***MUST*** be received by the Procurement Department on or before **Tuesday, October 28, 2025 at 2:00pm ET** in the City of Sumter Department of Public Works, 303 East Liberty Street, Sumter, SC 29150 . ***SEALED*** Bids may be Mailed, Overnighted or Hand Delivered (BIDS WILL BE DEEMED UNRESPONSIVE IF RETURNED VIA FAX OR EMAIL).

***MANDATORY PRE-BID MEETING ON: Wednesday, October 15, 2025 at 10:00 AM**

Swan Lake Visitors Center
822 West Liberty Street
Sumter, SC 29150

*PLEASE SEE ATTACHMENT FOR QUANTITIES, DESCRIPTION, DETAILS AND SPECIFICATIONS.

*ALL BIDS MUST SPECIFY PER UNIT COST WHEN SHOWN IN SPECIFICATIONS, IF APPLICABLE. PROVIDE LUMP SUM ONLY IF YOU CANNOT PROVIDE UNIT COST.

*A CERTIFICATE OF INSURANCE (COI) AND A SUMTER CITY COUNTY BUSINESS LICENSE ARE REQUIRED BEFORE ANY WORK CAN BEGIN ON CITY OWNED PROPERTY.

Anyone wishing to mail or hand deliver bids should address the envelope as follows:

City of Sumter
Department of Public Works
Attn: Procurement Department
303 East Liberty Street
Sumter, SC 29150
ITB #11 – 25/26: Swan Lake North Entrance Renovation

The bid ITB number and name must appear on the envelope. All questions concerning scope of work, specifications, and items must be emailed to the project manager Michael Geddings at: mgeddings@sumtersc.gov. If you have questions concerning the bid process, email Tony Butts at tbutts@sumtersc.gov. The City reserves the right to reject any or all bids and to waive any technicalities in the best interest of the City.

Sincerely,

Anthony J. Butts, Jr.
Procurement Agent
www.sumtersc.gov/purchasing/itb

CITY OF SUMTER BID FORM

City of Sumter, South Carolina, a Body Politic and Corporate and Political Subdivision of the State of SC

FORMAL INVITATION-TO-BID: ITB #11-25/26
Swan Lake North Entrance Renovation
BID MUST BE RECEIVED BY: Tuesday October 28, 2025 at 2:00pm ET at below address.
MANDATORY PRE-BID MEETING ON: Wednesday, October 15, 2025 at 10:00 AM

MAIL, OVERNIGHT OR HAND CARRY TO:
City of Sumter Department of Public Works
Attn: Procurement Department
303 East Liberty Street
Sumter, SC 29150

ITB #11 – 25/26:

Hardscape and landscape improvements to the north entrance including brick walkways, concrete walkways, granite curbing, concrete edging, concrete curb and gutter, brick walls and columns, stone columns, wood arbor, steel work including trellis, railings, guards, connectors and accent pieces, planting and irrigation.

*PRICING WILL REMAIN VALID FOR 90 DAYS AFTER BID CLOSING DATE.
*COI's MAY BE EMAILED TO (tbutts@sumtersc.gov).

Base Bid: Single-Prime (All Trades) Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared by McIver Landscape Architecture and Architect's consultants, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services necessary to complete the construction of the above-named Project, in accordance with the requirements of the Procurement and Contracting Documents, for the stipulated sum of:

_____ Dollars ($_____).

Time of Completion: The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Notice to Proceed to be issued by Architect, and to substantially complete the Work within **one hundred and fifty (150) calendar days.**

Acknowledgement of Addenda: The undersigned Bidder acknowledges receipt of and use of the following Addenda (if applicable) in the preparation of this Bid:

1. Addendum No. 1 _____ (date of addendum and bidder initials)
2. Addendum No. 2 _____(date of addendum and bidder initials)
3. Addendum No. 3 _____ (date of addendum and bidder initials)
4. Addendum No. 4 _____ (date of addendum and bidder initials)

Project Site Address: **Swan Lake**
822 West Liberty Street
Sumter, SC 29150

VENDOR NAME:_____

ADDRESS:_____

CITY-STATE-ZIP:_____

TELEPHONE NO:_____**FED TAX ID NO.:**_____

EMAIL: _____

AUTHORIZED SIGNATURE (WRITTEN): _____

AUTHORIZED SIGNATURE (TYPE/PRINT):_____**DATE:**_____

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting a bid for the same materials, supplies, or equipment, and is in all respects fair and without collusion or fraud. I agree to abide by all conditions of this bid and verify that I am authorized to sign this bid for the offerer. I further state that the company affiliated with this bid currently complies with all applicable federal and state laws and directives relative to non-discriminatory practices in employment.

The Bidder, in compliance with your Invitation-To-Bid, and having examined the Project Documents, and being familiar with all of the conditions surrounding the proposed project, including the availability of materials, labor, and work site environmental conditions, hereby proposes to furnish all permits, labor, materials, supplies, and equipment and to perform the duties in accordance with the contract documents of which this Bid Form is a part.

The undersigned, as Bidder, hereby declares that he has read, understands, and accepts the Vendor Agreements which are part of the bid documents.

The undersigned, as Bidder, hereby declares that the only person or persons interested in the Bid as principal(s) is, or are, named herein and that no other person has any interest in the Bid or in the contract to be entered into; that this Bid is made without connection with any other person, company or parties making a bid; and that is in all respects fair and in good faith without collusion or fraud.

The Bidder further proposes and agrees, if this Bid is accepted, to contract with City of Sumter, to furnish all permits, materials, equipment, tools, apparatus, means of transportation, and labor necessary hereto, and to complete the proposed project in full and complete accordance with the Project Documents, to the full and entire satisfaction of the Owner, at the prices listed in the Bid Schedule.
Names of equipment and material suppliers, proposed subcontractors and other information that maybe requested herein must be shown. My failure to do so may result in the rejection of this Bid.

Bidder offers for the City of Sumter's consideration and use, the following UNIT PRICES. The UNIT PRICES offered by the Bidder indicate the amount to be added or deducted from the Contract Sum for each item-unit combination for changes to the project scope after contract execution. Prices listed shall be for the item as detailed or described in the drawings and specifications. The amounts listed on the Schedule of Unit Prices section of this Bid Form include all installation in accordance with the drawings, permits, labor, materials, tools, equipment, transportation, removal, overhead, profit, bonding, fees, insurance, taxes, permits, shipping, handling and other costs both indirect and direct, etc., to complete the Project. The amounts listed on the Schedule of Unit Prices section of this Bid Form shall also include all costs associated with the compliance

of all applicable State laws, local ordinances, and the rules and regulations of all authorities and professional association standards having jurisdiction over the project or the materials used throughout. The City of Sumter reserves the right to include or not include any of the following UNIT PRICES in the Contract and to negotiate the UNIT PRICES with the Bidder prior to including in the Contract. The schedule of UNIT PRICES is not inclusive of all project components.

Schedule of Unit Prices – (Include with Bid)

No.	Item	Unit of Measure	Price to Add	Price to Deduct
1.	Concrete sidewalk	square foot	$_____	$_____
2.	Concrete curb and gutter	linear foot	$_____	$_____
3.	Concrete roll curb	linear foot	$_____	$_____
4.	Brick paver walk	square foot	$_____	$_____
5.	6” concrete border	linear foot	$_____	$_____
6.	Granite planter curb	linear foot	$_____	$_____
7.	Steel guardrail (42” ht)	linear foot	$_____	$_____
8.	Steel rail mounted to brick (24” ht)	linear foot	$_____	$_____
9.	Brick major column	each	$_____	$_____
10.	Brick minor column	each	$_____	$_____
11.	Stone gateway columns	each	$_____	$_____
12.	Stone arbor columns	each	$_____	$_____
13.	Brick seat wall	linear foot	$_____	$_____
14.	Brick planter wall	linear foot	$_____	$_____
15.	Black chain link fence	linear foot	$_____	$_____
16.	Removable bollards	each	$_____	$_____
17.	Flag poles	each	$_____	$_____

BID SECURITY – ALL BIDS $25,000 AND OVER

Each Bid MUST be accompanied by certified check of the bidder, or a bid bond prepared on the Form of Bid Bond attached hereto, duly executed by the bidder as principal and having the surety thereon, a surety company approved by the Owner (City of Sumter), in the amount of 5% of the bid. Such checks, or bid bonds will be returned to all EXCEPT the three lowest bidders within three business days after the opening of bids, and the remaining cash, checks, or bid bonds will be returned promptly after the Owner and the accepted bidder have executed the contract, or if no award has been made within 60 days after the date of the opening of the bids, upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid. Please do not submit cash as security.

BID BOND

KNOW ALL MEN BY THESE PRESENTS: that we, the undersigned,

_____ As Principal, and

_____ As Surety, are hereby

held and firmly bound unto the City of Sumter ("Owner") in the penal sum of

_____ for payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed this_____ day of _____, 20_____. The condition of the above obligation is such that whereas the Principal has submitted to the Owner a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing, for the

_____

_____

NOW, THEREFORE,
(a) If said BID shall be rejected, or
(b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with BID) and shall furnish a BOND for his faithful performance of said contract, shall furnish a BOND for the payment of all persons performing labor or furnishing materials in connection therewith, shall provide proof of insurance as required by the contract documents, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated. The Surety, for value received hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the Owner may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Principal:_____ / Surety:_____

By:_____ (SEAL)

VENDOR AGREEMENTS – FORMAL INVITATIONS-TO-BID

Submittal of Sealed (Formal) Bids On the date set and at the time designated for the opening of the sealed bid, each prospective bidder is required to submit the bid deposit in the amount and form specified herein. Outside of envelope containing the **sealed** bid must be clearly marked with: **ITB # and Bid Name.** Each prospective bidder is required to complete and execute the bid form attached in this Invitation to Bid, and all information and certifications called for thereon must be furnished. Bids submitted in any other manner or which fail to furnish all information or certifications required may be summarily rejected. Bids shall be filled out legibly with all erasures, strikeovers, and corrections initialed by the person signing the bid and the bid must be manually signed. Negligence on the part of the bidder in preparing the bid confers no right for withdrawal or modification of the bid.

City of Sumter reserves the right to obtain clarification or additional information necessary to properly evaluate a bid. Failure of vendor to respond to a request for additional information or clarification could result in rejection of that vendor's bid. City of Sumter reserves the right to accept or reject any and all bids, in whole or in part, separately or together, with or without cause; to waive technicalities in submissions, to secure a project that is deemed to be in the best interest of the City. City of Sumter also reserves the right to make purchases outside of the awarded contracts where it is deemed in the best interest of the City.

Each responder, by submitting a bid to the City of Sumter a result of this Invitation-to-Bid, agrees to and acknowledges its acceptance of and agreement with the procedures outlined herein and all terms, conditions and requirements of the applicable City of Sumter Bid documents. If a vendor cannot agree to these terms, or violates these procedures, the response will be judged non-responsive and not considered. If the procedures are violated during the evaluation process or prior to the issuance of a contract by the City of Sumter, the offer of the firm in question will be void and City of Sumter will procure the goods/services in question from other eligible vendors.

At the time of the opening of bids, each responder will be presumed to have read and to be thoroughly familiar with the Documents (including all addenda). The failure or omission of any responder to examine any form, instruction or document shall in no way relieve any responder from any obligation in respect to this Invitation-to-Bid.

Responses submitted are final and complete offers by the vendor. No additions, corrections, modifications, changes or interpretations will be allowed. In the event questions arise on what is meant by an offer, the Procurement Manager will make a determination as to the city's interpretation of the vendor's offer. If, after informing the vendor of the city's opinion, disagreement as to scope of the offer is present, the offer will be declared VOID. City of Sumter reserves the right to award proposals received on the basis of individual items, groups of items, or the entire list of items; to reject any and all proposals; and to waive any technicalities. In every case, the City reserves the right to make awards deemed to be in the best interest of the City and to negotiate further the offer determined by the City to be in the best interest of the City. Unit prices will govern over extended prices. Prices must be stated per unit. The Owner reserves the right to increase or decrease the amount of work under the Contract at the unit prices quoted in the bid received from the successful responder.

Responders must clearly mark as "Confidential" each part of their offer which they consider proprietary information that could be exempt from disclosure under Section 30-4-40, Code of Laws of South Carolina, 1976 as amended (Freedom of Information Act). If any part is designated as "confidential", there must be attached to that part an explanation of how this information fits within one or more categories listed in Section 30-4-40. City of Sumter reserves the right to determine whether this information should be exempt from disclosure and no legal action may be brought against City of Sumter or its agents for its determination in this regard. Should any responder fail to perform or comply with any provision or terms and conditions of any documents referenced and made part hereof, City of Sumter may terminate this contract, in whole or in part, and may consider such failure or non compliance a breach/default of contract.

The City reserves the right to purchase any/all items or service in default on the open market. No additional responses will be considered from a firm in default until the default expenses are paid. No principals of a defaulting firm may submit a response under another organization or individual name until their previous default is settled.

Upon award of a contract or Purchase Order under this proposal, the person, partnership, association, or corporation to whom the award is made must comply with the laws of South Carolina, which require such person or entity to be authorized and/or licensed to do business in this state. Notwithstanding the fact that applicable statutes may exempt or exclude the successful responder from requirements that it be authorized and/or licensed to do business in this state, by submission of this signed proposal, the responder agrees to subject itself to the jurisdiction and process of the courts of the State of South Carolina, to all matters and disputes arising or to arise under the contract and performance thereof, including any questions as to the liability for taxes, licenses, or fees levied by the State.

RIGHT TO INCREASE OR DECREASE THE AMOUNT OF WORK: The Owner reserves the right to increase or decrease the amount of work under the Contract at the unit prices quoted in the bid received from the successful responder.

LAW AND REGULATIONS: The responder's attention is directed to the fact that all applicable Federal, State and Local laws, statutes, ordinances, and the rules and regulations of all authorities having jurisdiction over the project shall apply to the contract and the project throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

OBLIGATION OF RESPONDER:
The Responder agrees to secure at Responder's own expense all personnel necessary to carry out Responder's obligations under this Bid. Such personnel shall not be deemed to be employees of the City nor shall they or any of them have or is deemed to have any direct contractual relationship with the City. The City shall not be responsible for withholding taxes with respect to the Responder's compensation hereunder. Responder shall not hold himself out as an employee of the City, and shall have no power or authority to bind or obligate the City in any manner, except the City shall make payment to Responder for services as herein provided. Responder shall obtain and maintain all licenses and permits required by law for performance of this contract by him. The Responder shall have no claim against the City hereunder or otherwise for vacation pay, sick leave, retirement benefits, social security, worker's compensation, health or disability benefits, unemployment insurance benefits, or employee benefits of any kind, State or Federal governments' benefits, including but not limited to Social Security, workmen's compensation, Employment Security, sales or use tax and any other taxes and licenses or insurance premiums required by law. The City shall pay no employee benefits or insurance premiums of any kind to or for the benefit of Responder or his employees, agents, and servants by reason of this contract. The Responder will carry liability insurance relative to any service that he performs for the City. A certificate of insurance must be submitted to the procurement office prior to services performed, with the requested coverage and limits per the City, with City of Sumter listed as additional insured.

1. Contractor's and Subcontractor's Insurance: Before commencing the Work, and until completion and final acceptance of the Work, the Contractor shall procure and maintain, at its own expense, the insurance coverages described below. Before starting the Work, Contractor shall furnish a Certificate of Insurance, in a form acceptable to Owner, evidencing the Contractor's compliance with the Agreement's insurance requirements. All insurance policies are to be written through a company duly authorized to transact that class of insurance within the jurisdiction of the Project site and shall be with insurance companies acceptable to Owner and with A.M. Best Rating of A minus or better. The Certificates and policies for the Commercial General Liability and Business Automobile Liability Policy shall name Owner, and if requested, Owner's agents, as Additional Insureds for completed and ongoing operations on a primary and non-contributory basis. All Insurance Certificates shall state policy numbers, dates of expiration, policy limits, and provide that the insurance will not be cancelled or changed unless Owner has been given written notice at least thirty (30) days prior to the date of the proposed change or cancellation.

If the Contractor fails to procure or maintain required insurance coverages, Owner shall have the right, but not the obligation, to procure and maintain the required insurance for and in the name of the Contractor, and Contractor shall pay the cost thereof and furnish all necessary information to make effective and maintain such insurance. Contractor shall not commence work until all insurance requirements are met.

a. Required Insurance Coverages: The insurance coverages to be provided include those as set forth below unless modified in an Insurance Exhibit attached to the Agreement:

(1) Commercial General Liability Insurance with limits of $1,000,000.00 per occurrence/$1,000,000 aggregate Bodily Injury and Property Damage Liability. This coverage must, at a minimum, include coverage and/or endorsements for premises operations, products/completed operations, contractual liability assumed by Contractor under this Agreement, personal injury, advertising injury and broad form Property Damage (including coverage for explosion, collapse and underground hazards), and independent Contractor coverages. All liability policies must be written on an "occurrence" basis. Such policy shall not contain Endorsement, CG 22 94 10 01. The Commercial General Liability and Automobile Liability insurance required herein shall protect the Contractor and the Owner against liability from damages growing out of any Contractor operations (including the operation of all automobiles, trucks, and other vehicles owned or rented) in connection with the performance of this Agreement, as well as liability arising after the completion of the Contractor's operations. (2) Motor Vehicle Liability Insurance with bodily injury limits of $1,000,000.00 and property damage limits of $1,000,000.00 or a combined single limit of $1,000,000.00.

(3) Worker's Compensation in accordance with, and providing coverages meeting or exceeding the limits required by, the laws of the State of South Carolina jurisdiction, and Employer's Liability Insurance with the following minimum limits: $100,000 Per Accident, $100,000 Per Disease for Each Employee, $500,000 aggregate.

(4) Excess or Umbrella Liability Insurance with a policy limit of $1,000,000.00 per occurrence and aggregate.

(5) Sub-Contractor Insurance: If Contractor elects, with Owner's approval, to subcontract any portion of the Work to another Contractor, Contractor shall require of such Subcontractor insurance coverage similar to that required of Contractor hereunder and shall furnish to Owner evidence that such insurance coverages are currently in effect. Moreover, Contractor shall require any such Subcontractor to name Contractor and Owner as additional insured's on Subcontractor's Commercial General Liability Insurance and will provide Contractor with a waiver of subrogation form from such sub-Contractors worker's compensation carrier. Failure of Contractor to require Subcontractor to obtain the coverages required herein or to furnish Owner evidence of such coverage shall be grounds for termination for default.

b. The Contractor shall furnish one copy of each Certificate of Insurance herein required attached to each copy of the Agreement, plus three additional copies of each Certificate of Insurance herein required, which shall specifically set forth evidence of all coverages set forth above. The Contractor shall furnish to the Owner copies of any endorsements that are subsequently issued amending coverage or limits. COI's may be mailed (same address as bids) or emailed to: Tony Butts (tbutts@sumtersc.gov).

2. Payment and Performance Bonds (CONSTRUCTION BIDS ONLY): If the Contractor's work as set forth in the Scope of Work exceeds $50,000.00, Contractor shall provide payment and performance bonds in the full amount of the Contract Sum.

a. The payment and performance bonds, if any, shall name Owner as the obligee. Such bonds must be secured by cash or must be issued by a surety company licensed in the State of South Carolina with an "A" minimum rating of performance as stated in the most current publication of "Best Key Rating Guide, Property Liability".

b. Upon execution of the Contract Documents, the Contractor shall furnish to the Owner a Performance Bond and a separate Labor and Material Payment Bond in a form acceptable to the Owner. The bonds shall guarantee the Contractor's faithful performance of the Contract and payment of all obligations arising thereunder. The bonds shall remain in force until the Work has been completed and accepted by the Owner, the provisions of all guarantees required by these Contract Documents have been fulfilled, and the warranty periods and period for correction of the Work as provided in the Contract Documents have expired, or the period for filing mechanics' liens has expired, whichever occur latest, after which time the bonds shall lapse. The Contractor shall bear all costs in connection with the bonds as a part of the Contract. One executed copy of each bond shall be attached to each executed copy of the Contract Documents prior to the execution of the Contract Documents by the Owner.

c. The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

For construction contracts, all items delivered to or drop shipped to the City of Sumter site remain the sole responsibility of the Bidder until fully installed and attached to the City of Sumter which is the subject of this bid; Bidder is solely responsible for maintaining insurance on and replacing said items in the event of theft, damage, or other loss.

Each of the bidders shall fully familiarize itself with the conditions relating to the bid to insure complete understanding of all the details involved. The bidder shall satisfy itself as to the actual requirements of the bid by personal examination of its location or other means, so as to enable the bidder to make an informed bid. Failure to do so shall not relieve the successful bidder of its obligation to furnish all materials, products, and/or labor necessary to complete the provision of the awarded contract and failure to do so may result in the claims against bonds. No allowance will be made for any claims that a bid and/or response was based on incomplete information as to the nature and character of the sites and of the work involved.

The responder shall indemnify, defend and hold harmless City of Sumter, its officers, agents and employees from liability and any claims, suits, judgments, and damages of any nature brought because of, arising out of, or due to breach of the agreement by Responder, its subcontractors, suppliers, agents, or employees or due to any negligent act or occurrence or any omission or commission of Responder, its subcontractors, suppliers, agents, or employees.

The successful responder shall indemnify and hold harmless the City of Sumter, its officers, agents and employees from all suits or claims of any character resulting from patent, trademark or copyright infringement or accidents/injury at any point in the delivery of goods/services.

Should any responder fail to perform or comply with any provision or terms and conditions of any documents referenced and made part hereof, City of Sumter may terminate this contract, in whole or in part, and may consider such failure or non compliance a breach/default of contract. The City reserves the right to purchase any/all items or service in default on the open market. By submittal of a response, all responders agree to this provision. No additional responses will be considered from a firm in default until the default expenses are paid. No principals of a defaulting firm may submit a response under another organization or individual name until their previous default is settled.

City of Sumter may terminate this agreement with or without cause at anytime. In the event of termination by either party, uncontested fees due for services satisfactorily performed or goods accepted prior to the termination shall be paid.

S.C. LAW CLAUSE: Upon award of a contract or Purchase Order under this bid, the person, partnership, association, or corporation to whom the award is made must comply with the laws of South Carolina, which require such person or entity to be authorized and/or licensed to do business in this state. Notwithstanding the fact that applicable statutes may exempt or exclude the successful responder from requirements that it be authorized and/or licensed to do business in this state, by submission of this signed proposal, the responder

agrees to subject itself to the jurisdiction and process of the courts of the State of South Carolina, to all matters and disputes arising or to arise under the contract and performance thereof, including any questions as to the liability for taxes, licenses, or fees levied by the State.

ATTACHMENT:

PROJECT SITE LOCATION:

Swan Lake
822 West Liberty Street
Sumter, SC 29150

A MANDATORY PRE-BID MEETING AT THE SITE LOCATION ON:
Wednesday October 15, 2025 at 10:00 AM / ET

Important Dates:

PREBID	Wednesday, October 15, 2025 at 10:00 am
LAST DAY FOR QUESTIONS	Tuesday, October 21, 2025 at 4:00 pm
POST ANSWERS TO QUESTIONS	Thursday, October 23, 2025 NLT 5:00 pm
BID SUBMITTAL	Tuesday, October 28, 2025 at 2:00 pm

A MANDATORY PRE-BID AT THE PROJECT SITE IS REQUIRED. BIDS SUBMITTED WITHOUT ATTENDING THE MANDATORY PRE-BID WILL BE REJECTED AND DEEMED UNRESPONSIVE.

DETAILS/SCOPE OF WORK:

The project and the contract for construction will include hardscape and landscape improvements to the north entrance of Swan Lake including brick walkways, concrete walkways, granite curbing, concrete edging, concrete curb and gutter, brick walls and columns, stone columns, wood arbor, steel work including trellis, railings, guards, connectors and accent pieces, planting and irrigation and other elements as depicted, detailed and described in the drawings as prepared by McIver Landscape Architecture and sub-consulting designers, as well as in the specifications listed below.

DRAWING SHEETS:

L1.0 EXISTING CONDITIONS AND DEMOLITION PLAN
L1.1 SITE PLAN
L2.1 GRADING PLAN
L2.2 STORM DRAINAGE PLAN
L2.3 EROSION CONTROL PLAN
L3.1 SCDOT SCHEMATIC
L4.1 EROSION CONTROL NOTES AND DETAILS
L4.2 SITE AND STORM DETAILS
L4.3 CIVIL NOTES
L5.1 ENLARGED SITE PLAN
L5.2 STAKING PLAN
L5.3 SLEEVING PLAN
L6.1 SITE DETAILS
L6.2 SITE DETAILS
L6.3 STONE PILLAR DETAILS
L6.4 ARBOR SWING DETAILS
L6.5 RAILING DETAILS
L6.6 RAMP DETAILS
L7.1 PLANTING PLAN
L7.2 PLANTING DETAILS
E1.0 ELECTRICAL NOTES AND LEGENDS
E2.0 ELECTRICAL OVERALL SITE PLAN
E3.0 ELECTRICAL POWER AND LIGHTING PLAN

SPECIFICATIONS:

Section 042000 Unit Masonry
Section 321400 Unit Paving
Section 323119 Decorative Metal Fences and Gates
Section 328400 Underground Irrigation
Section 329000 Planting

SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Brick.
2. Mortar and grout materials.
3. Reinforcement.
4. Ties and anchors.
5. Embedded flashing.
6. Mortar and grout mixes.

B. Related Requirements:

1.2 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: For each type and color of the following:

1. Clay face brick, in the form of straps of five or more bricks.
2. Pigmented mortar. Make Samples using same sand and mortar ingredients to be used on Project.
3. Accessories embedded in masonry.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each type of the following:

1. Masonry units.

a. Include data on material properties.
b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
c. For exposed brick, include test report for efflorescence in accordance with ASTM C67/C67M.

2. Cementitious materials. Include name of manufacturer, brand name, and type.
3. Mortar admixtures.
4. Grout mixes. Include description of type and proportions of ingredients.
5. Reinforcing bars.
6. Joint reinforcement.
7. Anchors, ties, and metal accessories.
8. Flashing systems

1.5 MOCKUPS

A. Wall Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Build mockups for each type of exposed unit masonry construction in sizes approximately 60 inches long by 72 inches high by full thickness, including face and backup wythes and accessories.

    a. Include a sealant-filled joint at least 16 inches long in mockup.
    b. Include through-wall flashing installed for a 24-inch length in corner of exterior wall mockup approximately 16 inches down from top of mockup, with a 12-inch length of flashing left exposed to view (omit masonry above half of flashing).
    c. Include studs, sheathing, water-resistive barrier, veneer anchors, flashing, and weep holes in exterior masonry-veneer wall mockup.

2. Where masonry is to match existing, erect mockups adjacent and parallel to existing surface.
3. Clean exposed faces of mockups with masonry cleaner as indicated.
4. Protect accepted mockups from the elements with weather-resistant membrane.
5. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations by Change Order.
6. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe, and hold cover in place.

B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain exposed masonry units, cementitious mortar components, and mortar aggregate from single source, producer, or manufacturer.

B. For exposed masonry units, and cementitious mortar components, obtain each color and grade from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 UNIT MASONRY, GENERAL

A. Masonry Standard: Comply with TMS 602, except as modified by requirements in the Contract Documents.

B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.

C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

2.3 BRICK

A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:

1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.

B. Building (Common) Brick: ASTM C62

1. Size (Actual Dimensions): 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.
2. Application: Use where brick is indicated for concealed locations. Face brick complying with requirements for grade, compressive strength, and size indicated for building brick may be substituted for building brick.

2.4 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

1. Alkali content will not be more than 0.1 percent when tested in accordance with ASTM C114.

B. Hydrated Lime: ASTM C207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

D. Mortar Cement: ASTM C1329/C1329M.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Argos Masonry Cement

E. Colored Cement Products: Packaged blend made from or and mortar pigments, all complying with specified requirements, and containing no other ingredients.

1. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.

2. Pigments do not exceed 10 percent of portland cement by weight.
3. Pigments do not exceed 5 percent of or by weight.

F. Aggregate for Mortar: ASTM C144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
3. White-Mortar Aggregates: Natural white sand or crushed white stone.
4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

G. Aggregate for Grout: ASTM C404.

H. Water: Potable.

2.5 REINFORCEMENT

A. Masonry-Joint Reinforcement, General: ASTM A951/A951M.

1. Interior Walls: Hot-dip galvanized carbon steel.
2. Exterior Walls: Hot-dip galvanized carbon steel.
3. Wire Size for Side Rods: 0.148-inch diameter.
4. Wire Size for Cross Rods: 0.148-inch diameter.
5. Wire Size for Veneer Ties: 0.148-inch diameter.
6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
7. Provide in lengths of not less than 10 ft. with prefabricated corner and tee units.

B. Masonry-Joint Reinforcement for Multiwythe Masonry:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Heckmann Building Products, Inc.
b. Hohmann & Barnard, Inc
c. Wire-Bond

2. Ladder type with one side rod at each face shell of hollow masonry units more than 4 inches wide, plus one side rod at each wythe of masonry 4 inches wide or less.

2.6 TIES AND ANCHORS

A. General: Ties and anchors extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.

B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:

1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A1064/A1064M, with ASTM A153/A153M, Class B-2 coating.

C. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches wide.

1. Wire: Fabricate from 3/16-inch- diameter, hot-dip galvanized steel wire

2.7 EMBEDDED FLASHING

A. Drainage Plane Flashing: Fabricate from rubberized asphalt or elastomeric membrane and drainage membrane to shapes indicated, including weep tabs, termination bar, and drip edge. Provide flashing materials as follows:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Mortar Net Solutions
b. STS Coatings, Inc.
c. York Manufacturing, Inc

2.8 ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from or.

B. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).

C. Weep/Cavity Vents: Use one of the following unless otherwise indicated:

1. Wicking Material: Absorbent rope, made from cotton, 1/4 to 3/8 inch in diameter, in length required to produce 2-inch exposure on exterior and 18 inches in cavity. Use only for weeps.
2. Round Plastic Weep/Vent Tubing: Medium-density polyethylene, 3/8-inch OD by 4 inches long.
3. Rectangular Plastic Weep/Vent Tubing: Clear butyrate, 3/8 by 1-1/2 by 3-1/2 inches long.

2.9 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Use or mortar unless otherwise indicated.
3. For exterior masonry, use or mortar.
4. For reinforced masonry, use or mortar.
5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Mortar for Unit Masonry: Comply with ASTM C270. Provide the following types of mortar for

applications stated unless another type is indicated.

1. For masonry below grade or in contact with earth, use Type M.
2. For reinforced masonry, use Type S.
3. For mortar parge coats, use Type S.
4. For exterior, above-grade, load-bearing, nonload-bearing walls, and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type N.
5. For interior nonload-bearing partitions, Type O may be used instead of Type N.

C. Pigmented Mortar: Use colored cement product.

D. Grout for Unit Masonry: Comply with ASTM C476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C476, paragraph 4.2.1.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
3. Provide grout with a slump of 8 to 11 inches as measured in accordance with ASTM C143/C143M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
2. Verify that foundations are within tolerances specified.
3. Verify that reinforcing dowels are properly placed.
4. Verify that substrates are free of substances that impair mortar bond.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.

D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.

F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested in accordance with ASTM C67/C67M. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/4 or minus 1/4 inch.
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 ft., or 1/2-inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 ft., 1/4 inch in 20 ft., or 1/2-inch maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 ft., 3/8 inch in 20 ft., or 1/2-inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 ft., 1/4 inch in 20 ft., or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 ft., 3/8 inch in 20 ft., or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 ft., or 1/2-inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or

minus 1/4 inch.

4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.

H. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

A. Lay solid masonry units and hollow brick with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

C. Cut joints flush where indicated to receive waterproofing unless otherwise indicated.

3.6 CAVITY WALLS

A. Bond wythes of cavity walls together as follows:

1. Masonry-Joint Reinforcement: Installed in horizontal mortar joints.

    a. Where bed joints of both wythes align, use ladder-type reinforcement extending across both wythes.

B. Bond wythes of cavity walls together using bonding system indicated on Drawings.

C. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

3.7 CONTROL AND EXPANSION JOINTS

A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form expansion joints in brick as follows:

1. Build in compressible joint fillers where indicated.
2. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch for installation of sealant and backer rod specified in Section 079200 "Joint Sealants."

3.8 FLASHING, WEEP HOLES, AND CAVITY VENTS

A. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.

3.9 REINFORCED UNIT MASONRY

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in TMS 602.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

3.10 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
6. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
7. Clean masonry with a proprietary acidic masonry cleaner applied according to manufacturer's written instructions.

3.11 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.

1. Crush masonry waste to less than 4 inches in each dimension.
2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312000 "Earth Moving."
3. Do not dispose of masonry waste as fill within 18 inches of finished grade.

C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.

D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described

above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

SECTION 321400 - UNIT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Brick pavers.
2. Concrete pavers.
3. Curbs and edge restraints.

1.2 ACTION SUBMITTALS

A. Product Data:

1. For materials other than water and aggregates.
2. For the following:

a. Pavers.
b. Mortar and grout materials.
c. Edge restraints.

B. Sieve Analyses: For aggregate setting-bed materials, according to ASTM C136.

C. Samples for Verification: For full-size units of each type of unit paver indicated. Assemble no fewer than five Samples of each type of unit on suitable backing and grout joints., Include Samples of the following:

1. Joint materials.
2. Exposed edge restraints.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Adhesion and Compatibility Test Reports: From latex-additive manufacturer for mortar and grout containing latex additives.

C. Material Certificates: For unit pavers. Include statements of material properties indicating compliance with requirements, including compliance with standards. Provide for each type and size of unit.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for unit pavers, indicating compliance with requirements.

1. For solid interlocking paving units, include test data for freezing and thawing according to ASTM C67.

1.4 QUALITY ASSURANCE

A. Installer Qualifications for Brick Pavers: Installer shall have at least two years experience and have installed at least 200,000 square feet of sand set pavers in commercial projects.

B. Installer Qualifications for concrete pavers: A qualified unit paving installer. Installer's field supervisor must have Concrete Paver Installer Certification from the Interlocking Concrete Pavement Institute (ICPI) with both of the following designations:

1. Residential Paver Technician Designation.
2. Commercial Paver Technician Designation.

C. Mockups: Install a 10’ x 10’ paver area demonstrating surcharge of sand layer, joint sizes, tolerances, lines, laying patterns, color and textures. The mockup area shall be the standard for the remaining work. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavers to the site in steel banded, plastic banded or plastic wrapped cubes or on ballets capable of transfer for fork lift or clamp lift. Unload pavers at job site in such a manner that no damage occurs to the product.

B. Store pavers on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied.

C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

E. Store sand with waterproof covering secured in place to prevent exposure to rainfall or removal by wind.

F. Store liquids in tightly closed containers protected from freezing.

G. Store asphalt cement and other bituminous materials in tightly closed containers.

1.6 FIELD CONDITIONS

A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

B. Weather Limitations for Bituminous Setting Bed:

1. Install bituminous setting bed only when ambient temperature is above **40 deg F** and when base is dry.
2. Apply asphalt adhesive only when ambient temperature is above **50 deg F** and when temperature has not been below **35 deg F** for 12 hours immediately before application. Do not apply when setting bed is wet or contains excess moisture.

C. Weather Limitations for Mortar and Grout:

1. Cold-Weather Requirements: Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
2. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6. Provide artificial shade and windbreaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of **100 deg F** and higher.

a. When ambient temperature exceeds **100 deg F**, or when wind velocity exceeds **8 mph** and ambient temperature exceeds **90 deg F**, set pavers within 1 minute of spreading setting-bed mortar.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain each type of unit paver, joint material, and setting material from single source with resources to provide materials and products of consistent quality in appearance and physical properties.

2.2 BRICK PAVERS

A. Brick Pavers, Light-Traffic Paving Brick: ASTM C902, Class SX, Type I, Application PS. Provide brick without frogs or cores in surfaces exposed to view in the completed Work. Paving brick shall conform to the PX standard and have a minimum average compressive strength of 10,000 psi. The average cold water absorption shall not be greater than 6% with no individual unit testing greater than 7%. Absorption test results may not be achieved through the use of sealers or other products applied to the paver.

1. Thickness: 2-1/4 inches.
2. Face Size: 4 by 8 inches.
3. Color: Refer to drawings.

B. Efflorescence: Brick to be rated "not effloresced" when tested according to ASTM C67.

C. Resistance of 50 freeze-thaw cycles when tested in accordance with ASTM C67. In addition the clay paver must pass CSA-A231.2 freeze thaw test in saline solution without the use of sealers or other products applied to the paver.

D. Temporary Protective Coating: Precoat exposed surfaces of brick pavers with a continuous film of a temporary protective coating that is compatible with brick, mortar, and grout products and can be removed without damaging grout or brick. Do not coat unexposed brick surfaces; handle brick to prevent coated surfaces from contacting backs or edges of other units. If, despite these precautions, coating does contact bonding surfaces of brick, remove coating from bonding surfaces before setting brick.

E. The contractor shall ensure that the manufacturer conducts a test sampling of 24 pavers every 50,000 pavers manufactured to determine the pavers compliance with dimensional and water absorption characteristics. The 24 paver sample shall be representative of the color mix in the typical finished package and chose on a consistent basis from one kiln car.

2.3 MORTAR MATERIALS – TYPE S CONFORMING WITH ASTM 270

A. Portland Cement: ASTM C150/C150M, Type I or Type II.

B. Hydrated Lime: ASTM C207, Type S.

C. Sand: ASTM C144.

D. Water: Potable.

2.4 CURBS AND EDGE RESTRAINTS

A. Job-Built Concrete Edge Restraints: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mixed concrete with minimum 28-day compressive strength of **3000 psi**.

2.5 ACCESSORIES

A. Cork Joint Filler: Preformed strips complying with ASTM D1752, Type II.

B. Compressible Foam Filler: Preformed strips complying with ASTM D1056, Grade 2A1.

2.6 AGGREGATE SETTING-BED MATERIALS

A. Graded Aggregate for Subbase: Sound, crushed stone or gravel complying with requirements in Section 312000 "Earth Moving" for subbase material.

B. Graded Aggregate for Base: Sound, crushed stone or gravel complying with requirements in Section 312000 "Earth Moving" for base course.

C. Bedding and joint sand shall be clean, non-plastic, free from deleterious or foreign matter. The sand shall be naturally occurring and particle shape shall be a mix of sub-angular and sub-rounded , sound, sharp, washed, natural sand or crushed stone complying with graduation requirements in ASTM C33/C33M for fine aggregate with No. 200 sieve modification. Grading of samples shall be done according to ASTM C136.

1. Provide sand of color needed to produce required joint color.

D. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications; made from polyolefins or polyesters, with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2, AASHTO M 288.
2. Apparent Opening Size: **No. 60** sieve, maximum; ASTM D4751.
3. Permittivity: 0.02 per second, minimum; ASTM D4491.
4. UV Stability: 50 percent after 500 hours' exposure, ASTM D4355.

E. Drainage Geotextile: Nonwoven needle-punched geotextile fabric, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2, AASHTO M 288.
2. Apparent Opening Size: **No. 40** sieve, maximum; ASTM D4751.
3. Permittivity: 0.5 per second, minimum; ASTM D4491.
4. UV Stability: 50 percent after 500 hours' exposure, ASTM D4355.

F. Herbicide: Commercial chemical for weed control, registered with the EPA. Provide in granular, liquid, or wettable powder form.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces indicated to receive unit paving, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Where unit paving is to be installed over waterproofing, examine waterproofing installation, with waterproofing Installer present, for protection from paving operations, including areas where waterproofing system is turned up or flashed against vertical surfaces.

C. Proceed with installation only after unsatisfactory conditions have been corrected and waterproofing protection is in place.

D. Verify that base is dry, uniform, even and ready to support sand, pavers and imposed loads.

E. Verify correct gradients and elevations of base.

F. Verify location, type, installation and elevations of edge restraints.

3.2 PREPARATION

A. Sweep concrete substrates to remove dirt, dust, debris, and loose particles.

B. Proof-roll prepared subgrade according to requirements in Section 312000 "Earth Moving" to identify soft pockets and areas of excess yielding. Proceed with unit paver installation only after deficient subgrades have been corrected and are ready to receive subbase course for unit pavers.

3.3 INSTALLATION, GENERAL

A. Do not use unit pavers with chips, cracks, voids, discolorations, or other defects that might be visible or cause staining in finished work.

B. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.

C. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable. Cut pavers so that no segment is smaller than one quarter of a full paver.

1. For concrete pavers, a block splitter may be used.

D. Handle protective-coated brick pavers to prevent coated surfaces from contacting backs or edges of other units. If, despite these precautions, coating does contact bonding surfaces of brick, remove coating from bonding surfaces before setting brick.

E. Joint Pattern: As indicated.

F. Tolerances:

1. Do not exceed **1/32-inch** unit-to-unit offset from flush (lippage) or **1/8 inch in 10 feet** from level, or indicated slope, for finished surface of paving.

G. Provide edge restraints as indicated. Install edge restraints before placing unit pavers.

1. Install edge restraints to comply with manufacturer's written instructions. Install stakes at intervals required to hold edge restraints in place during and after unit paver installation.
2. For metal edge restraints with top edge exposed, drive stakes at least **1 inch** below top edge.

3.4 AGGREGATE SETTING-BED APPLICATIONS

A. Place separation geotextile over prepared subgrade, overlapping ends and edges at least **12 inches**.

B. Place aggregate subbase and base, compact to 100 percent of ASTM D1557 maximum laboratory density, and screed to depth indicated.

C. Place drainage geotextile over compacted base course, overlapping ends and edges at least **12 inches**.

D. Place leveling course and screed to a thickness of **1 to 1-1/2 inches**, taking care that moisture content remains constant and density is loose and uniform until pavers are set and compacted.

E. Treat leveling course with herbicide to inhibit growth of grass and weeds.

F. Set pavers with a minimum joint width of **1/16 inch** and a maximum of **1/8 inch**, being careful not to disturb leveling base. If pavers have spacer bars, place pavers hand tight against spacer bars. Use string lines to keep straight lines. Fill gaps between units that exceed 3/8 inch with pieces cut to fit from full-size unit pavers.

1. When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.

G. Vibrate pavers into leveling course with a low-amplitude plate vibrator capable of a **3500- to 5000-lbf** compaction force at 80 to 90 Hz. Use vibrator with neoprene mat on face of plate or other means as needed to prevent cracking and chipping of pavers. Perform at least three passes across paving with vibrator.

1. Compact pavers when there is sufficient surface to accommodate operation of vibrator, leaving at least **36 inches** of uncompacted pavers adjacent to temporary edges.
2. Before ending each day's work, compact installed concrete pavers except for **36-inch** width of uncompacted pavers adjacent to temporary edges (laying faces).
3. As work progresses to perimeter of installation, compact installed pavers that are adjacent to permanent edges unless they are within **36 inches** of laying face.
4. Before ending each day's work and when rain interrupts work, cover pavers that have not been compacted and cover leveling course on which pavers have not been placed with nonstaining plastic sheets to protect them from rain.

H. Spread dry sand and fill joints immediately after vibrating pavers into leveling course. Vibrate pavers and add sand until joints are completely filled, then remove excess sand. Leave a slight surplus of sand on the surface for joint filling.

I. Do not allow traffic on installed pavers until sand has been vibrated into joints.

J. Repeat joint-filling process 30 days later.

3.5 REPAIRING, POINTING, AND CLEANING

A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.

B. Cleaning: Remove excess grout from exposed paver surfaces; wash and scrub clean.

1. Remove temporary protective coating as recommended by coating manufacturer and as acceptable to paver and grout manufacturers.

2. Do not allow protective coating to enter floor drains. Trap, collect, and remove coating material.

3. All materials generated by construction work in this section shall be removed at the end of each section of the work and the site shall be left in a clean and safe condition.

END OF SECTION 321400

SECTION 323119 - DECORATIVE METAL FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Iron fencing, rails and gates.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For fencing and gates.

1. Include plans, elevations, sections, post spacing, and details.

C. Samples: For each fence material and for each color specified.

1. Provide Samples 12 inches in length for linear materials (pickets, posts and rails).
2. Provide Samples for all attachment hardware.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Include 10-foot length of fence complying with requirements.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.1 STEEL AND IRON

A. Plates, Shapes, and Bars: ASTM A36/A36M.

B. Bars (Pickets): Hot-rolled, carbon steel complying with ASTM A29/A29M, Grade 1010.

C. Tubing: ASTM A500/A500M, cold-formed steel tubing.

2.2 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

1. For aluminum, provide type and alloy as recommended by producer of metal to be welded and as required for strength and compatibility in fabricated items.

2.3 FINISHES

A. Powder Coating: Immediately after cleaning, apply manufacturer's standard two-coat finish consisting of epoxy primer and TGIC polyester topcoat to a minimum total dry film thickness of not less than 8 mils. Comply with coating manufacturer's written instructions.

1. Color and Gloss: Black, semi-gloss. All welds shall be completed prior to powder coating.

B. All mounting hardware shall be powder-coated black to match fencing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, construction layout, and other conditions affecting performance of the Work. Take field measurements as required to fabricate correctly sized fence elements.

B. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 DECORATIVE FENCE INSTALLATION

A. Install fences by setting posts as indicated and fastening rails to posts and pickets to posts as indicated.

END OF SECTION 323119

SECTION 32 84 00 - UNDERGROUND IRRIGATION SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK:

A. The work covered by this Section consists of furnishing all labor, equipment and materials and performing all operations necessary for installing an automatic irrigation system. The work includes: System design; coordination of sleeving; preparation and excavation of trenches; installation of irrigation system (including: plastic pipe, fittings and connectors, sprinkler heads, automatic control valves and valve boxes, drip accessories, electric control cable, wiring to controller and required submittals).

1.2 QUALITY ASSURANCE:

A. The landscape contractor is responsible for the layout and installation of a new irrigation system to conform with the following performance standards:

1. Achieve adequate coverage of all plant material as required to keep plant material alive and in a vigorous condition.
2. Achieve zone separation such that all new turf zones can be controlled separately from tree, shrub and groundcover zones. Zones controlling heads that water both turf and tree/shrub/groundcover areas will not be accepted.
3. Zones shall be configured for optimum performance based on available pressure and flow rates. Do not exceed manufacturer recommended pressure and flow tolerances for pipe, heads, nozzles, tubing and valves.
4. Install drip irrigation in all tree/shrub/groundcover areas. Drip irrigation shall water new plantings at rates which will optimize plant growth. The contractor shall evaluate soil types to determine the best rate at which to water plantings.
5. Install heads at a spacing to allow for head to head coverage to ensure even watering.
6. Install nozzles within zones with a matched precipitation rate to ensure even watering at each nozzle within a single clock cycle. Nozzle selection or head layout leading to excessively wet or dry areas will be rejected.
7. Overspray onto walks, drives and buildings shall not be permitted. Layout leading to such circumstances will be rejected.

B. Subcontract work to a single firm specializing in irrigation systems.

C. Manufacturer Qualifications. Provide underground sprinkler system as a complete unit produced by a single acceptable manufacturer including heads, valves, piping circuits, controls and accessories.

D. Work and materials shall be in accordance with current rules and regulations, and other applicable state or local laws. Nothing in contract documents or on drawing is to be construed to permit work not conforming to these codes.

1.3 SUBMITTALS

A. Irrigation Design: Submit a layout plan for proposed irrigation coverage of the project area based on the planting plan. Show all connections for water and power sources. Show piping layout, valve

locations, sprinkler heads and drip line areas. Identify all component parts. For each valve, calculate the rate of discharge in gallons per minute at the design pressure flow and show this information on a valve schedule on the plan. Field-verify the PSI and GPM available after a water source is available and prior to installation.

B. Product Data: Submit manufacturer's catalog cut sheets, equipment data sheets, or shop drawings for the following products:

1. Sprinkler heads
2. Swing Joints
3. Valves: electric and manual
4. Controller and controller accessories
5. Valve boxes
6. Pipe and pipe fittings
7. Control wire and splice connectors
8. Drip components
9. Solvent, primer and Teflon tape

C. Record Drawings - Prepare accurate as-built drawings as installation proceeds and submit three copies of the as-built drawings to the owner prior to final inspection. The landscape architect will provide a base landscape plan on which the as-built drawings can be drawn.

D. Instruction Manual

1. Provide instruction manual, which lists complete instructions for system operation (including controller, valves, and heads) and maintenance, including winterization.

2. Provide written zone numbers, zone locations and watering days/times.

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials and products shall be new. While being stored and during construction, all materials should be protected from damage and prolonged exposure to sunlight.

B. Rotor, fixed spray sprinklers, valves, controllers and rain sensor shall be manufactured by:

- Rainbird Sprinkler Mfg. Corp. 1-800-247-3782 www.rainbird.com

2.2 GRAVEL:

A. Material for gravel sump shall be pea gravel or approved equal.

2.3 PLASTIC PIPE AND FITTINGS:

A. The plastic pipe shall be rigid unplasticized PVC class 200 or class 160 (SDR 26), extruded from virgin parent material. Mainline piping, 4” and above should be gasketed class 160 pvc, with proper pipe manufacture approved thrust blocks. The pipe shall be homogeneous throughout and free from visible

cracks, holes, foreign materials, blisters, deleterious wrinkles and dents. Pipe sizes shall be adequate to provide necessary flow and pressure and to withstand operating conditions for the life of the system. Pipe shall be continuously and permanently marked with manufacturer's name, size and schedule type, and working pressure.

B. All plastic pipe fittings shall be schedule 40 PVC and shall be manufactured by the same manufacturer as the plastic pipe.

C. Swing joints shall be prefab PVC triple swing joint assemblies OR flexible swing pipe (14 inch minimum) with spiral barb fittings.

2.4 SHRUB AND LAWN SPRINKLER HEADS:

A. Rotor and fixed-spray sprinklers shall be of the pop-up type with spring retraction. The body of the sprinkler shall be constructed of Cycolac Material and the sprinkler shall be easily serviced from the Manufacturer's specifications with regard to the diameter of throw and gallonage at a given pressure. Spacing of heads shall not exceed the manufacturer's maximum recommendation.

B. Matched precipitation will be required on all full and part circle sprinklers operation on the same zone.

2.5 PVC SLEEVING:

A. Schedule 40 PVC pipe shall be used for sleeving. Irrigation installer shall coordinate installation with Site Contractor.

B. Sleeving stub-ups shall include sweep fittings, not 90-degree elbows.

2.6 AUTOMATIC CONTROL VALVES:

A. Valves shall be PEB Series by Rainbird.

B. The remote control valve shall be a normally closed 24 volt A.C. 50/60 cycle solenoid type. Valve pressure rating shall not be less than 150 PSI.

C. The valve body and bonnet shall be constructed of heavy duty glass-filled nylon, diaphragm shall be on nylon reinforced nitrile rubber. Solenoid coil shall be encapsulated in molded epoxy.

D. The valve body shall be activated by a low power, 2.0 watt 24 volt A.C. solenoid. The solenoid plunger shall have a filter to insure positive valve operation.

E. The valve shall have a flow control stem with wheel handle for regulation or shutting off the flow of water and a bleed screw for manual operation without electrically energizing the solenoid coil.

F. The valve construction shall be such as to provide for all internal parts to be removable from the top of the valve without disturbing the valve installation.

G. Quantity of Control Valves (zones) shall be adequate for optimum operation of irrigation system and zone separation as required by these specifications.

2.7 VALVE BOXES:

A. All control valves shall be installed in a valve box in accordance with manufacturer's specifications. Valve boxes shall be NDS or approved equal with heavy duty plastic covers and lock top or snap top lids.

2.8 CONTROL VALVE CABLE:

A. All wiring to be used for connecting the automatic remote control valve to the automatic controllers shall be Type "UF", 14-1 stranded or solid copper, single conduction wire with PVC insulation and bear UL approval for direct underground burial feeder cable. Wire shall be separately colored for each valve connection. Wire connections to remote control electric valves and splices of wire in the field shall use Pen-Tite wire connectors or approved equal and scaling cement. All splices are to be located within a valve box.

2.9 BACKFLOW PREVENTER:

A. Coordinate with Owner on size of existing and/or proposed meters. Install size as indicated on the approved design drawing. Backflow preventers shall meet the standards of local codes.

2.10 DRIP IRRIGATION ACCESSORIES:

A. Drip Line. Shrubs and trees to be covered by individual emitters spaced 12” on center. Extensive areas of groundcover may use in-line emitter tubing (with emitter spacing at 12” o.c.).

B. Filter. Provide filter at valve to each drip zone. Provide screen having equivalent of 140-mesh filtration capacity.

C. Pressure Regulator. Incorporate regulator into each drip system if supply pressure exceeds 40 PSI.

D. Closure Caps. Provide in accordance with manufacturer's recommendations.

2.11 SOIL STAPLES:

A. Soil staples shall be 6” galvanized 11 gauge steel u-shaped staples.

2.12 AUTOMATIC RAIN SENSOR

A. The rain sensor shall be a micro-electronic solid-state type, capable of interrupting the power from the irrigation controller to the valves when rainfall exceeds a preselected setting of 1/8” to 3/4”. Device shall be made of corrosion resistant plastic casing.

2.13 AUTOMATIC CONTROLLER:

A. The controller shall be capable of operating 24 V.A.C. electric remote control valves. The controller shall have an active day light with timing accurate to 1 minute per month. (See plan for more specific information).

B. The controller cabinet shall be of injection-molded high-impact plastic which shall resist corrosion

and provide for an attractive appearance. The door shall be mated with the other cabinet parts and be made of the same material. The controller shall have adequate lightning protection.

C. Controller to be installed within a metal cabinet and pedestal, mounted to a concrete pad. Pedestal dimensions to be 14.25”w x 28”h x 7.5” d. Cabinet dimensions to be 14.5” w x 12.875” h x 7.75”d.

PART 3 - EXECUTION

3.0 Protection

A. Maintain uninterrupted service of all utilities.

B. Work of others damaged during course of work shall be replaced or repaired by original installer at irrigation contractor’s expense.

3.1 LAYOUT OF LINES:

A. The Landscape Contractor shall stake out the location of each run of pipe and all sprinkler heads or valve locations for approval by Landscape Architect prior to digging trench.

B. The lawn irrigation system shall be installed so that it will drain at all points.

C. Install PVC pipe in dry weather when temperature is above 40° F in strict accordance with manufacturer's instructions. Allow joints to cure at least 24 hours at temperature above 40° F (4°C) before testing unless otherwise recommended by manufacturer.

3.2 EXCAVATION AND BACKFILL:

A. Trenches for PVC pipe main lines shall be excavated to sufficient depth (15" minimum) and an unspecified width to permit proper handling and installation of pipe and fittings. Trenches for PVC pipe lateral sprinkler lines shall be excavated to sufficient depth (12" minimum) and an unspecified width to permit proper handling and installation of pipe and fittings. Over excavate trenches 2 inches and bring back to indicated depth by filling with rock free soil or sand.

B. On sodded areas the Landscape Contractor will remove and replace the sod where possible from the trench area to the necessary width and depth required to facilitate his installation.

C. The backfill shall be thoroughly compacted and brought to finish grade, with proper allowance for topsoil. Selected dirt or sand shall be used if soil conditions are rocky. In rocky areas the trenching depth shall be two inches (2’’) below normal trench depth to allow for this bedding. The pea gravel fill shall be used in filling the top 4" above the pipe. The remainder of the backfill shall contain no lumps or rocks larger than three inches (3"). The top six inches (6") of backfill shall be free of rocks over one inch (1") diameter, subsoil or trash.

3.3 PLASTIC PIPE AND FITTINGS:

A. All pipe fittings and valves, etc. shall be installed and joined in accordance with the manufacturer's recommendations. Interior of pipes shall be kept free from dirt and debris and when pipe laying is not

in progress, open ends of pipe shall be closed by approved means.

B. Pipe shall be firmly supported throughout its entire length. Extreme care shall be exercised to prevent low points except at drains so that every section of pipe is placed with positive gravity drainage flow towards a drain valve.

C. Sharp changes in alignment and grade shall be made with appropriate fittings. All elbows, tees and fittings shall be installed with a reaction block bearing against undisturbed soil to prevent breakage or separation of the joint.

D. Install pipe in manner to provide for expansion and contraction as recommended by manufacturer.

E. When two pipes share a common ditch, there shall be 3 inches of clean rock free soil between the two pipes and the upper pipe will conform to cover minimum.

F. Cut pipe square and remove burrs at cut ends prior to installation.

G. Make solvent weld joints in the following manner.

a. Clean mating pipe and fittings with clean dry cloth.
b. On excessively dirty pipe or pipe 2 inches or larger, apply one coat of cleaner primer to pipe and fitting.
c. Apply uniform coat of solvent to outside of pipe.
d. Apply solvent to fitting in similar manner.
e. Reapply a light coat of solvent to pipe and quickly insert into fitting.
f. Give pipe or fitting a quarter turn to insure even distribution of solvent and make sure pipe is inserted to full depth of fitting socket.
g. Hold in position for 15 seconds or long enough to secure joint.
h. Wipe off excess solvent on outside of fitting.
i. Do not use an excessive amount of solvent to cause an obstruction to form on inside of pipe.
j. Allow joints to set at least 24 hours before applying pressure to pipe and fittings.

3.4 AUTOMATIC CONTROL VALVES:

A. Automatic control valves shall be installed in accordance with the manufacturer's specifications. Locate valve box top at finish grade

3.5 VALVE BOXES:

A. Valve boxes shall be installed on a suitable base of gravel for proper foundation box and easy leveling of box to proper grade and also to provide proper drainage of the box. All valve boxes shall be provided with the proper size extensions, wherever required, to bring the valve boxes level with the finished grade.

3.6 ELECTRICAL INSTALLATION:

A. The entire installation shall fully comply with all local and state laws and ordinances and with all the established codes applicable thereto.

B. All control circuitry, whether electrical or hydraulic, passing through the wall of the building or beneath a sidewalk, road or drive shall be installed in a suitable sleeve; whereas in all other locations they shall be installed in the pipe trench and protected by the pipe whenever possible.

C. The joining of all underground wires shall be by the use of wire nuts covered with Scotch Lok per installation instructions provided by manufacturer.

3.7 CONTROL VALVE CABLE:

A. All control valve cables shall be installed by direct burial at a minimum depth of 12". Where practical the wire shall be installed in same trench as mainline pipe.

B. Extreme care shall be exercised during backfilling of trench to avoid damage and displacement of mainline pipe.

C. Each control valve shall be connected to one station of the controller by a control wire. All of the valves shall be connected to a common ground.

3.8 SPRINKLER HEADS:

A. Sprinkler heads shall be installed as shown on the drawings and in accordance with manufacturer's specifications. The height of each sprinkler head in relation to the finish grade shall be approved by the Landscape Architect. No heads shall be installed closer than two inches from walks, mow strips, etc. Prior to installation of sprinkler heads, system shall be flushed with a full head of water.

3.9 INSTALLATION OF DRIP IRRIGATION SYSTEM:

A. Install main lines and valves. Before installing emitter laterals, perform pressure test then flush out sand, plastic shaving and other foreign matter.

B. Emitter Hose. Bury emitter laterals under 3 inches of mulch. Solvent weld each connection in accordance with manufacturer's recommendation to standard weight Schedule 40 PVC fittings and bushings. Install hose in a serpentine manner. When cutting hose, use a shearing tool such as a pipe cutter, knife or shears. Use only manufacturer's recommended tool and procedure when punching hose for emitters.

C. Emitter Heads. Connect emitter on a rigid PVC nipple to PVC drip lateral with a tee or elbow. Attach tubing to barbed fitting and daylight distribution tubing at rootball secured with stake. Add bug cap at end of secured distribution tubing. If necessary after installing emitters and before operating system, open end of drip lateral and flush lines clean. The number of emitters on a line shall not exceed manufacturer's recommendations for that hose or distribution tubing size and length.

D. Pin emitter hose securely to soil with soil staples at 18” on center (minimum). Ensure that drip tubing is firmly secured and not exposed above mulch

E. Drip tubing and emitters shall be installed throughout the overall planting bed area so that root growth occurs beyond the boundaries of initial planting hole.

F. Install pressure regulators as required for optimum performance and longevity of drip system.

G. Loop drip tubing at trees to locate four emitters at each tree.

3.10 FLUSHING:

A. After all new sprinkler piping and risers are in place and connected for a given section, and all necessary work has been completed and prior to installation of sprinkler heads, all control valves shall be opened and a full head of water shall be flushed through the system to remove any foreign material.

3.11 TESTING:

A. Tests shall be made on portions of the line as completed. Final testing, however, shall be made on the entire system. Trenches shall be partially backfilled to prevent displacement of pipes.

B. Pressure test shall be performed to a maximum hydrostatic pressure of 200 PSI based on the elevation of the lowest point in the system and corrected to the elevation of the test gauge. Duration of the pressure test shall be at least one hour.

C. Leakage test shall be performed after satisfactory completion of the pressure test. The leakage test shall be conducted at a hydrostatic pressure of 130 PSI without showing a leakage in excess 7.5 gallons per hour. Extend the leakage test for a period of time necessary to allow inspection, but in no case shall the duration be less than two hours.

D. Remove and replace any defective materials of installations discovered in testing and repeat the test until satisfactory to the Landscape Architect. This work shall be performed at the Landscape Contractor's expense.

D. The tests shall be witnessed by the Landscape Architect.

E. Adjust sprinkler heads for proper distribution and trim minimizing spraying of buildings, walks, fences, etc.

F. Adjust watering time of valves to provide proper amounts of water to all plants and turf.

3.12 INSTRUCTIONS:

A. After completion and testing of the system, the Landscape Contractor will instruct the Owner's personnel and provide a maintenance and operations manual in the proper operation and maintenance of the system.

3.13 MAINTENANCE AND OPERATING INSTRUCTIONS:

A. Provide four (4) hours of instruction for Owner's Representative's personnel upon completion of

check/test/start-up/adjust operations. Owner's Representative shall be notified at least one (1) week in advance of check/test/start-up/adjust operations.

B. Upon completion of the irrigation system and in conjunction with application for final payment, submit one Maintenance and Operation Manual. Each Manual shall be a 3-ring binder with:

1. One (1) hard copy of the "RECORD" drawing of the irrigation system, and
2. One (1) complete set of the "APPROVED" Submittals required above.
3. One (1) copy of the suggested "SYSTEM OPERATING SCHEDULE" which shall call out the controller program required in order to provide 1.0" of water per week to each planted zone area and 1.5" of water per week to each turf zone area.
4. A typewritten description of the procedures to be followed for proper winterization of the entire system.

3.14 AS-BUILT DRAWINGS:

A. After completion of the irrigation installation, the Landscape Contractor shall furnish a signed Record Drawing showing exact dimensions, depths and locations of all pipe, drains, controls, heads, etc. of sprinkler system. The drawing shall be also submitted in AutoCAD format 2014 or later. Instruction sheets and parts lists covering all operating equipment will be bound into a folder and furnished to the Owner in duplicate.

3.15 CLEAN-UP:

A. Upon completion of the work and before acceptance and final payment will be made, the Landscape Contractor shall make any necessary repairs, adjustments and corrections to the work as required by the Drawings and Specifications. The Landscape Contractor shall remove from the site all machinery, equipment, surplus and discarded materials, rubbish, temporary structures and all other items not incorporated into the work. The site shall be left in a neat and presentable condition. Any damage to roads buildings, walks, vegetation, utilities or any other item of personal property which is the responsibility of the Landscape Contractor, through accident, negligence or normal usage, shall be satisfactorily repaired or replaced as a requirement for completion of this contract.

3.16 FINAL ACCEPTANCE

The landscape contractor shall notify the Landscape Architect and the Owner at least seven (7) days prior to the requested date of inspection for acceptance. The Landscape Architect will issue a punch list for work to be corrected. All work on the punch list must be completed within seven (7) calendar days from date of inspection. Upon completion of all punch list items, the Landscape Architect will issue a letter of Final Acceptance. The one-year guarantee period commences on the date of issuance of the letter of Final Acceptance.

3.17 MAINTENANCE

A. For two months after the date of final acceptance, the landscape contractor shall inspect the project on a bi-weekly basis. During this time, the contractor shall make adjustments as necessary to the irrigation system to ensure adequate watering and proper function of the system.
B. After two months from the date of final acceptance, maintenance shall become the responsibility of the

owner, however the terms of the guarantee as stated below shall be in force. The landscape contractor shall inspect the site regularly during the remainder of the one year guarantee period and note the condition of the irrigation system. Should the landscape contractor find any circumstances or defects requiring repair, he should advise the landscape architect and the owner immediately in a written field report and should make any required repairs at the landscape contractor's expense.

3.18 GUARANTEE:

A. For a period of one year from date of final acceptance of the work performed under this Contract, the Landscape Contractor shall promptly furnish, without cost to the Owner, any and all parts and labor which prove defective in material, workmanship, or proper functioning of system. Repair work completed during the initial one- year guarantee shall be subject to a one (1) year guarantee from the date of satisfactory repair. Parts damaged by vandalism or vehicular traffic are not subject to the guarantee. Required work shall include the repair or replacement of malfunctioning equipment, repair or replacement of equipment not meeting the requirements set forth in these specifications, and the filling and repairing of depressions caused by settlement of irrigation trenches.

3.19 REPLACEMENTS:

A. Landscape Irrigation System - During the last month of the guarantee period, the Landscape Architect and Landscape Contractor shall inspect the installation to determine the condition of the complete system. A list of defective materials or installations to be replaced shall be made by the Landscape Contractor within thirty days of receiving written notification. Replaced materials and installation shall be in accord with these Specifications, Drawings and/or schedules.

END OF SECTION 32 84 00

SECTION 329000 - PLANTING

Part 1 – GENERAL

1.1 Description of Work

A. Work included: Work under this Section includes installation of all trees, shrubs, ground cover, annuals, sod and related work required for completion of the project as shown on the Drawings and specified herein. Included hereunder are the furnishing of all equipment, materials and labor necessary to furnish and/or install soil treatment, sodding, planting and mulching of trees, shrubs and vines, protection, maintenance, guarantee and replacement of plants and all work related to the above as specified.

1.2 Quality Assurance

A. Contract landscape work to a single firm specializing in landscape work.

1.3 Site Conditions

A. Existing Underground Utilities: The landscape contractor is hereby notified of the existence of underground utilities within the project area. Under all circumstances, the contractor shall ensure that every possible measure has been taken to determine the locations of existing utility lines prior to construction. The contractor shall contact Palmetto Utility Protection Services, Inc. (1-888-721-7877) and other utility companies as necessary for location services.

B. Soil Drainage: Before planting any area, use a post hole digger or auger to dig a percolation test hole in dry soil in each planting area (one in each parking island and at 30 feet on center in open areas). The test hole shall be 18 inches deep. Fill the test hole with water and allow it to drain completely once. Refill the hole and measure the amount of time it takes to drain. The contractor shall notify the landscape architect in writing of the locations of test holes that drain at a rate of less than 1” per hour. Do not plant in such areas until acceptable soil drainage improvements have been proposed to and accepted by the landscape architect and subsequently installed by the contractor.

C. Notification of unsatisfactory conditions: Should the landscape contractor encounter unsatisfactory surface or subsurface drainage conditions, soil depth, latent soils, hard pans, steam or other utility lines or other conditions that will jeopardize the health and vigor of the plants, he shall advise the landscape architect and owner of the conditions prior to installing the plants. Otherwise, the landscape contractor warrants that all planting areas are suitable for proper growth and development of the plants to be installed and provides a one-year guarantee as stated below.

D. Positive Surface Drainage: The landscape contractor shall take care to ensure that positive surface drainage away from all structures is maintained throughout and at the completion of

the installation. The landscape contractor shall not create and shall repair low spots or grades sloping downward toward structures. If such conditions arise due to settling or erosion within the one year guarantee period, the landscape contractor shall be responsible for repairing such conditions.

E. Project Safety: The landscape contractor shall be responsible for maintaining the site in a safe condition throughout the installation process. The landscape contractor shall utilize safety warning signals to protect pedestrians and workers from hazards and shall direct pedestrian traffic elsewhere as necessary to ensure the safety of pedestrians. Sidewalks and parking spaces shall remain open unless coordinated with and approved by the Owner. No sidewalks or parking spaces shall be blocked overnight. The landscape contractor shall be responsible for cleaning up the site at the completion of the project and shall maintain the site in a reasonably neat and clean state throughout the installation process. Streets and paved areas shall be cleaned regularly (daily) to remove construction materials and other debris resulting from work of the project. No excavation or planting pit shall be left open overnight. The contractor shall leave the site in a safe condition at all times.

F. Protection of Existing Features: The landscape contractor shall protect existing walls, structures, curbs and paved surfaces from damage during installation and shall be responsible for repairing any damage occurring during and caused by the planting or irrigation installation.

1.4 Source Quality Control

A. General Ship landscape materials with certificates of inspection required by governing authorities.

B. Comply with regulations applicable to landscape materials.

C. Analysis and Standards: Package standard products with the manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agricultural Chemists, wherever applicable.

1.5 Submittals

A. General – Provide all submittals at least two weeks prior to installation of plantings or use of product.

B. Soil Analysis – Obtain soil samples and submit for analysis from the Clemson Extension soil testing service. Submit results to Landscape Architect.

C. Plant samples – Notify landscape architect 48 hours in advance of delivery of plant materials to the project site. Submit a copy of a bill of lading from each grower indicating the quantity, species and cultivar of each plant delivered. Provide representative samples of each species

and cultivar labeled with the species and cultivar. Plants delivered to the site or planted without proof of species and cultivar will be rejected.

D. Topsoil – Provide source information and soil analysis of off-site topsoil to be used.

E Soil Amendments and Fertilizer – Provide manufacturer or source information including chemical analysis.

F. Herbicides - Provide manufacturer or source information including chemical analysis.

G. Proof of Maintenance: Provide written record of maintenance activities during the maintenance period and of herbicide applications during and after planting.

H. Mulch - Provide one-gallon sample of mulch product for inspection prior to installation.

1.6 Permitting: All permitting is the responsibility of the landscape contractor. Contact all applicable local, state and federal agencies as required to obtain necessary permits.

Part 2 - PRODUCTS

2.1 Plant Material

A. All plant material shall comply with ANZI Z60.1-20104, American Standard for Nursery Stock and with the specifications listed on the plans. Plant material not meeting these specifications will be rejected.

B. Pot-bound plant material shall not be used.

C. Plant Sizes:

1. Plant material not meeting the specified size, container, ball and/or caliper requirements shown on the plant list will be rejected.

2. Plant sizes specified on the plant list are minimum sizes, not average sizes. Each plant shall meet the minimum size specified.

    a. Shrubs: The number of canes/stems specified on the plant list shall meet the minimum required height.
    b. Multi-stemmed trees: The number of canes (main trunks) is specified on the plant list. Each of these shall meet the minimum required height from ground to tip. The number of canes at the ground shall not exceed the number specified on the plant list.
    c. Single-stemmed trees: The central leader shall meet the minimum required height from ground to tip.

3. Plants shall have spreads proportional to their heights, as indicated on the plant list. Plants meeting the required height but disproportional in spread (leggy) will be rejected.

4. Do not combine plants to meet size specifications.

5. For plants where no cultivar is specified on the plant list, the contractor shall install the straight species or shall submit a cultivar recommendation to the landscape architect for approval prior submitting a bid. Where multiple cultivars are listed on the plant list, the contractor may choose one of the cultivars and shall use this cultivar for the entire project.

D. All plant material shall be in good health, free of disease and infestation at the time of planting.

E. A representative sample of each plant shall be submitted to the landscape architect for approval prior to the installation of plants of the same species and cultivar.

F. Obtain each species or cultivar from a single source. Do not obtain plants of the same species or cultivar from different nurseries.

G. Do not make substitutions. If specified landscape material is not obtainable, submit proof of non- availability to Landscape Architect, together with proposal for use of equivalent material

H. The landscape contractor shall store the plant material for period of at least one week prior to installation in order to ensure that the plant material has not been damaged during shipping. Any plant material that shows signs of such damage will not be accepted.

I. All plant material shall be labeled by the nursery providing the material. Labels shall indicate genus, species and cultivar of each plant. Labeling shall remain in place until all plants have been inspected and approved by the landscape architect, at which time the landscape contractor shall remove all labeling.

J. Quantities: The landscape contractor shall verify all plant quantities between the plans and the plant list prior to submitting a bid. The landscape contractor shall notify the Landscape Architect of any discrepancies between quantities prior to bidding.

2.2 Sod

Sod shall be well-rooted certified turf-grass and shall not contain any weeds or grasses other than the grass species specified on the drawings. Sod shall have a uniform soil thickness of not less than 1” and not greater than 1 ¼”. Sod shall be mowed to a uniform height before being stripped from the grower’s field. Pieces shall be uniform in size and shape. Sod shall be delivered and laid on the project site within 24 hours of being stripped from the grower’s field. Store sod in a cool, shady location on the project site. Sod shall be certified to be the species and cultivar

specified by the landscape architect. The contractor shall submit this certification to the landscape architect in writing.

2.3 Seed

Grass seed shall be clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixtures composed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified. Seed shall conform to all State laws and requirements and regulations of the SC Department of Agriculture. The Owner reserves the right to test, reject, or approve all seed.

2.4 Mulch

A. Hardwood mulch shall be triple-shredded mulch from hardwood trees, aged for a minimum of six months and frequently turned during that time period. Mulch shall be natural color without dye.

B. Pine straw mulch shall be fresh, clean, and free from sticks and debris.

2.5 Topsoil

A. Obtain topsoil only from naturally well-drained sites where topsoil occurs at a depth of not less than 4". Topsoil shall be original surface loam obtained from well-drained areas from which topsoil has not been removed previously, either by erosion, clearing and removal of trees or mechanical means. Do not obtain from bogs or marshes.

B. Topsoil shall not contain subsoil, debris, clay lumps or rocks larger than 1" in diameter, discarded fragments of building materials or weeds and weed seeds.

C. Topsoil shall be classified as loam, silt loam, clay loam or any combination thereof. Classifications are as determined by the Bureau of Plant Industry, Soils and Agricultural Engineering USDA Triangular Soil Texture Chart.

D. Topsoil shall be rich friable loam containing not less than three percent and not more than 10 percent by weight of organic matter, as determined by weight loss upon ignition of oven-dried samples.

2.6 Soil Amendments

A. Compost: Compost shall be cow manure or ot her blended and ground leaf, wood and other plant based material, composted for a minimum of 9 months and at temperatures sufficient to break down all woody fibers, seeds and leaf structures, free of toxic material at levels that are harmful to plants or humans. Source material shall be yard waste trimmings blended with other plant or manure based material designed to produce compost high in

fungal material. Compost shall be commercially prepared compost and meet US Compost Council STA/TMECC criteria. Provide a two-gallon sample with manufacturer's literature and material certification that the product meets the requirements.

B. Commercial fertilizer shall be complete slow release fertilizer as specified by soil analysis and shall conform to the applicable state fertilizer laws. Fertilizer shall be uniform in composition, dry and free- flowing and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer which becomes caked or otherwise damaged making it unsuitable for use will not be accepted.

C. Fertilizer Tablets or Packets. Fertilizer planting tablets or packets shall contain prolonged-release nitrogen, derived from Urea-formaldehyde. Tablets or packets shall be at least a strength of 16-8-5. The amount of available nitrogen, phosphorus or potash may be increased slightly to meet the standard manufactured products available. This fertilizer shall conform to the applicable state fertilizer laws and shall be delivered to the site in the original unopened containers, each bearing the manufacturer's guaranteed analysis.

D. Herbicide shall be an approved commercial grade pre-emergent herbicide used in soil preparation. The particular type of herbicide shall be certified safe for the plants specified in the Plant List or for the plants around which the herbicide shall be used. Post-emergent herbicide shall be safe for use in areas with woody ornamental plantings and herbaceous groundcover.

E. Lime shall be ground limestone (Dolomite) containing not less than eighty-five (85) percent of total carbonates and shall be ground to a fineness that fifty (50) percent will pass through a 100-mesh sieve and ninety (90) percent will pass through a 20-mesh sieve. Courser material shall be acceptable provided that specified rates of application are increased proportionally on the basis of quantities passing the 100-mesh sieve.

2.7 Staking

A. Below-ground anchorage systems to be constructed of 2 x 2 dimensional untreated wood securing (using 3 inch long screws) horizontal portions to 4 feet long vertical stakes driven straight into the ground outside the root ball.

Part 3 - EXECUTION

3.1 General

A. For the entire planting area (defined as the area to received trees, shrubs, groundcover, and the surrounding mulched planting bed beyond and between plants, as well as all areas to be sodded or seeded) remove all debris larger than 2" in any direction such as, but not limited to, rocks, construction debris and sticks. Break up soil and clay clods to achieve an even,

friable texture throughout the planting area. Soil preparation shall be approved by site inspection by the landscape architect and owner prior to planting.

B. For both trees and shrubs, cut any circling roots so they will not strangle the plant later on. Use a serrated knife to make slices 1 to 2 inches deep going from the top of the root ball to the bottom at 3-4 locations around the root ball. Gently pull the roots growing along the outside of the root ball away from the root ball.

C. Backfill the hole with the soil removed from the planting hole which has been amended as described in these specifications.

D. Water all plantings immediately after planting. The contractor shall set the irrigation system to establish a watering frequency, volumes and duration that maximizes plant health.

E. The landscape contractor shall mulch all planting beds with 3" clean hardwood mulch free of all debris, sticks, stones, weed seeds and any other extraneous material.

F. All beds shall be treated with a pre-emergent herbicide prior to applying mulch. The pre-emergent herbicide shall be safe for all new and existing plant material and shall be applied according to the manufacturer's recommendations. Apply the pre-emergent herbicide before laying mulch. Do not disturb the soil once the pre-emergent has been applied. The contractor shall re-apply pre-emergent herbicide 60 days after initial application.

G. Planting Depth in Well-drained Soils: Dig the planting hole the same depth as the root ball or soil in the container. The topmost layer of roots should be level with the soil surface. The bottom of the planting hole shall be undisturbed or, if disturbed, compacted to prevent the plant from settling in the hole.

H. Planting Depth in Poorly-drained Soils: Place the top of the root ball 2 inches higher than the existing soil level in the bed. Build up soil beside the root ball so that the sides of the root ball are not exposed. Do not place additional soil on top of the root ball. The bottom of the planting hole shall be undisturbed or, if disturbed, compacted to prevent the plant from settling in the hole.

I. Layout of bed lines. The landscape contractor shall lay out all bed lines using marking spray paint. Curved bed lines shall be established to reflect the lines shown on the plans. Curves should be established using center points and string to achieve a uniform radius and smooth curve. All bed lines shall be approved by the landscape Architect prior to installing irrigation heads, plantings or sod. A v-ditch shall be constructed on the perimeter of all beds.

J. Layout of Plantings Within Beds: The layout of all plantings within beds shall be approved by the landscape architect prior to planting with all plant material in place. The layout of planting beds without all plant material in position will not be approved.

K. The landscape contractor shall submit a soil sample of all areas to be planted, seeded or sodded to Clemson University Extension Service for analysis and obtain results prior installation. The landscape contractor shall apply all materials (including but not limited to fertilizer and lime) recommended by the analysis of a type and at the rate recommended by the analysis and using methods recommended by the manufacturer.

L. If, during the process of amending soil as described in this document, conditions are created which require removal of soil to maintain or achieve positive drainage, the landscape contractor shall dispose of such soil off-site. The landscape contractor shall include soil disposal in his/her bid. Some soil may be utilized to raise planting beds if approved by the Landscape Architect.

3.2 Planting Shrubs and Groundcover

A. Prepare the entire planting area (see definition in section 3.1) by tilling and incorporating 1” of compost and soil amendments recommend by the soil analysis into the top 8" of soil for the entire width and length of the planting area.

B. Dig individual planting holes twice the diameter of the planting container. Slope the sides of the planting hole towards the bottom of the hole.

3.3 Planting Shrubs in Beds with Existing Established Trees

A. The contractor shall take great care to avoid disturbing or cutting existing tree roots. The contractor shall not cut any existing roots greater than 1" in thickness.

B. Plant material may be re-spaced to avoid cutting roots of existing established trees; however, the general layout of plant groupings/masses as indicated on the plans shall be followed.

C. Do not prepare the entire planting bed. Dig individual holes for each plant. All excavation shall be accomplished using hand equipment. Do not till.

D. When possible without cutting tree roots greater than 1" in thickness, dig planting holes three times the diameter of the planting container. When tree roots greater than 1" in thickness prevent such a planting hole, dig the planting hole as large as possible without disturbing such roots. Slope the sides of the planting hole towards the bottom of the hole.

E. Before setting plant and backfilling hole, scarify sides of planting hole using a trowel to allow for root penetration into adjacent soil.

F. Amend each planting hole with compost by incorporating the composted material with the soil removed from the hole to a volume of 15% organic composted material and 85% native soil. Spread 1" of compost over the remaining area of the bed as a top dressing.

G. For groundcover areas, lightly till top 4” of existing soil taking care not to damage existing tree roots.

3.4 Planting Trees

A. Prepare the entire planting area (see definition in section 3.1) by tilling and incorporating 1” of compost and soil amendments recommend by the soil analysis into the top 8" of soil for the entire width and length of the planting area.

B. Dig individual planting holes twice the diameter of the root ball. Slope the sides of the planting hole towards the bottom of the hole and scarify the sides of the hole to promote root penetration.

C. Remove synthetic burlap entirely from the root ball, using care to avoid cracking the root ball. If synthetic burlap has been used, cut away the entire wire basket to facilitate removing the burlap.

D. Natural burlap can be left along the sides and bottom of the root ball but must be removed from the top of the root ball. In poorly drained soils, remove the natural burlap entirely. Once the root ball is in place, remove the top half of the wire basket.

E. Do not prune trees at planting time. Only injured, diseased or dead branches should be removed, however, these circumstances may be an indication of a poor-quality tree and the landscape architect reserves the right to require a replacement. Do not prune to establish form. Proper form should be established by the grower and improperly formed trees will be rejected.

F. Do not allow mulch to contact the trunk of the tree.

G. Construct a 3-inch-hich water ring around the edge of the root ball to hold irrigation water. Do not cover the root ball with soil.

3.5 Staking

A. Stake trees as required by site conditions to keep trees plumb, including in high wind or other hazardous conditions. Staking is not required if root ball condition, soil conditions, or other site conditions do not jeopardize tree stability. The Landscape Architect shall have the authority to require that trees are staked or to reject staking as an alternative way to stabilize the tree.

B. Trees that required heavily modified root balls to meet the root quality standards may become unstable. The Landscape Architect may choose to reject these trees rather than utilize staking to temporarily support the tree.

C. Trees that are guyed shall have their guys and stakes removed after one full growing season or at other times as required by the Landscape Architect.

D. Tree guying shall utilize the tree staking and guying materials specified. Guying to be tied in such a manner as to create a minimum 12-inch loop to prevent girdling. Refer to manufacturer's recommendations and the planting detail for installation.

E. Plants shall stand plumb after staking or guying. Stakes shall be driven to sufficient depth to hold the tree rigid.

F. All palm trees must be staked.

3.6 Laying Sod

A. Cleaning: Remove all debris from the location to be planted. This includes rocks, bottles, large roots and old tree trunks.

B. Amend soil as recommended by the required soil analysis. Also, amend soil with 1" of compost (3 cubic yards per 1000 s.f). Work amendments into the top 6" of soil.

C. After incorporating soil amendments, fine grade as necessary achieve a smooth grade throughout area to be sodded. Firm the soil by rolling with a water ballast roller before seeding, sodding and plugging. Maintain positive drainage in all areas at all times.

D. Dampen the soil just prior to laying the sod to avoid placing the turf roots in contact with excessively dry and hot soil.

E. Lay sod with the ends staggered in a checkerboard fashion. Pieces should be tightly spaced but not overlapping. Do not stretch the sod while laying. The sod will shrink upon drying and cause voids. Stagger lateral joints to promote more uniform growth and strength. Immediately after the sod has been transplanted, it is important to roll or tamp it. This will eliminate any air spaces between the soil and the sod. Roll perpendicular to the direction the sod was laid.

F. Water newly transplanted sod immediately to wet the soil below to a 4-inch depth to enhance rooting. Do not let the soil dry out until a good union between the sod and soil surface has been achieved. Water daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of at least 4 inches. After one week of daily

watering, adjust irrigation times to a permanent schedule which applies 1 1/2" of water every 4-5 days.

G. Do not mow until the turf-grass sod is firmly rooted and securely in place.

H. In areas with existing tree roots, add 1” of topsoil in-lieu of soil amendments and tillage. Fine grade topsoil to maintain positive drainage away from buildings and walks and toward subsurface drainage system. Eliminate low spots.

3.7 Seeding

A. Refer to Civil drawings and specifications (if applicable) for additional stabilization methods and seeding schedules.

B. See Planting Plans for location of areas to be seeded. In addition to these areas, the contractor shall seed all areas disturbed during the course of construction of other work within this contract.

C. Spray to remove any actively growing weeds. After spraying, allow period of time specified by herbicide manufacturer prior to seeding.

D. Loosen the grade of to-be-seeded areas to a minimum depth of 6 inches. Remove stones over 1-1/2" in any dimension and sticks, roots, rubbish and other extraneous matter. Till soil to a homogenous mixture of fine texture, free of lumps and clods. Fine grade all areas shall prior to seeding. All soft spots, ruts, high spots and inequalities in grade shall be corrected.

E. Mulch seeded areas to minimize erosion and washing of seeding. Use a weed-free mulch.

F. Seed permanent seeding areas with centipede seed unless otherwise specified on the drawings. The contractor is required to provide temporary seeding (annual grass) of disturbed areas for the purpose of stabilizing soil if timing is not acceptable for permanent seeding. Permanent seeding shall be performed as soon as conditions are favorable for establishment of permanent lawn.

G. Permanently seeded areas will be accepted only after spring germination of seed. (Approximately June 1) At that time, seeded areas will be inspected for germination and establishment. 95% of all seeded area as measured on a per-square-yard basis shall be germinated, established and in a healthy condition at this time. (e.g. for any square yard of sod area, 95% of the area of that square yard shall have established turf in a healthy condition at this time.) The contractor shall be responsible for re-seeding areas not meeting this criterion.

H. Apply a slow-release fertilizer with the chemical analysis recommended by the seed producer and at a rate recommended by the seed producer as shown on the product label.

3.8 Maintenance during installation.

A. The landscape contractor shall maintain the installed plantings and turf areas until installation of planting is complete and the planting is accepted by the landscape architect and owner (final acceptance). Maintenance shall include mowing, watering, weeding, edging, cultivating, mulching, pruning, dead heading, tightening and repairing of guys, removal of dead material, resetting plants to proper grades or upright positions, restoration of the planting saucer and other necessary operations. Any damage resulting from planting operations shall be repaired promptly.

3.9 Maintenance after installation

A. For two months after the date of final acceptance, the landscape contractor shall inspect the project on a bi-weekly basis. During this time, the contractor has the following responsibilities:

1. Remove or control all weeds.
2. Make adjustments and repairs to irrigation system to ensure adequate watering.
3. Control all diseases or pests present in plant material.
4. Provide written record of maintenance activities during the maintenance period and of herbicide applications during and after planting. Email correspondence with owner and landscape architect is acceptable form of written record.

B. After two months from the date of final acceptance, maintenance shall become the responsibility of the owner. The Landscape Contractor shall submit to the Owner typewritten instructions recommending the monthly procedures to be established by Owner for the maintenance of landscape plantings during the remainder of the guarantee period and for the life of the plant material. The landscape contractor still guarantees the plant material until one year from the date of final acceptance as stated below. The Landscape Contractor shall inspect the site during the remainder of the one year guarantee period and note the condition of the plant material. Should the Landscape Contractor find the plant material is not receiving the proper maintenance at any time prior to the end of the guarantee period, he should advise the Landscape Architect and the Owner immediately in a written field report.

3.10 Final Acceptance

A. Final Acceptance: The landscape contractor shall notify the Landscape Architect and the Owner at least seven (7) days prior to the requested date of inspection for acceptance. The Landscape Architect will issue a punch list for work to be corrected. All work on the punch list must be completed within seven (7) calendar days from date of inspection. Upon completion of all punch list items, the Landscape Architect will issue a letter of Final Acceptance. The one-year guarantee period commences on the date of issuance of the letter of Final Acceptance.

3.11 Guarantee

A. Plants shall be guaranteed for the duration of one (1) full year after the final acceptance of the planting by the landscape architect and owner and shall be alive and in satisfactory growth at the end of the guarantee period. Any plant not in a healthy and vigorous state during or at the end of the guarantee period shall be replaced at no cost to the owner. Replacements of dead or unsatisfactory material shall be made as specified in the plant list. The owner or landscape architect shall inspect replaced plants when all replacements have been made. Replacements are to be alive and in a healthy condition when the replacements are complete, and shall be subject to a one (1) year guarantee from the date of satisfactory replacement. Should the contractor not make replacements in a satisfactory and timely fashion in accord with the planting notes, the owner, after proper notification to the contractor, may utilize the funds of the retainage to have the replacements made in accordance with the specifications by another contractor. Plants severely damaged by vandals are not subject to replacement by the contractor.

END OF SECTION 329000