PROPOSAL FORM

BALTIMORE COUNTY
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
TOWSON, MARYLAND

Division of Construction Contracts Administration

CIVIL ENGINEER

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Contract Number 25021 PO0
Property Management Project
Parkville Senior Center Parking Lot Reconfiguration –
8601 Harford Road, Parkville, Maryland 21234
Parkville – District 14c6
Workday Number
PROJ-107011880

CONTRACT BASED ON SEPTEMBER 2023
STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS
AND STANDARD DETAILS FOR CONSTRUCTION

Bidders Information

A pre-bid meeting will be held on Wednesday, August 13, 2025 at 10:00 a.m. EST via WebEx. *Phone-In* (Audio Only) 1-415-655-0001, Meeting Number 2314 863 3969##. *Video Conference* go to https://signin.webex.com/join Meeting Number 2314 863 3969,**Password**: **AMbaXjMW623**, for Webex link go to: www.baltimorecountymd.gov/departments/public-works/engineering/contracts/current-solicitations

Baltimore County Prevailing Wage & Local Hiring Affidavit, Requirements & Wage Rates **see pages 333-340**.
(Contract Disclosure): "***Wage rates that are in effect as of the contract solicitation date will be the wage rates through the duration of the project***"

MBE/WBE Requirements & Forms **see pages 341-355**

THIS PROPOSAL FORM INCLUDES AND INCORPORATES ALL DOCUMENTS AND INFORMATION REFLECTED, LISTED, AND/OR REFERENCED IN THIS TABLE OF CONTENTS, AND ALL SUCH DOCUMENTS AND INFORMATION ARE PART OF AND INCORPORATED INTO THE CONTRACT DOCUMENTS.

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S E C T I O N I

INFORMATION FOR BIDDERS

ELECTRONIC SUBMITTAL PROCESS

To be considered, Bids (Section IV – Proposal) shall be received by the bid closing date and time to the following email address dpwbid@baltimorecountymd.gov. The contract number and company name should be referenced in the Subject Line of the email. Bids may not be submitted by any other means. Bids that are mailed or otherwise delivered to the Purchasing Division (including emails which indicate links to locations where the bid may be downloaded) and/or emails sent to any other Baltimore County email address will not be accepted.

Late Bids will not be considered. Bidders are strongly encouraged not to wait until the last minute to submit bids. The time stated on the auto-receipt (described below) will be definitive of the time of receipt. Bids received after the deadline will not be accepted. Bidders are advised that the County cannot receive email attachments greater in size than twenty-five (25) megabytes and this size limitation may be further reduced by requirements of the Bidder's email provider which are beyond the control of the County. Bidder should consider separating any large bid attachment into multiple parts and emailing each part separately. In such case, Bidder will note that each email is *1 of 2*, *2 of 2*, etc. Multiple part bids will not be considered unless all parts are received by the bid closing date and time.

After submitting a Bid to dpwbid@baltimorecountymd.gov, and upon successful receipt by the County thereof, Bidder will receive an auto-receipt email. This receipt is proof that the bid has been received by the Division of Construction Contracts Administration and should be retained for Bidder's records. In the case of a bid submitted in multiple parts as described above, an auto-receipt email will be generated for each part. The County has no obligation to consider any Bid for which an auto-receipt was not generated.

As with any system, power outages or technology problems may arise that are outside of the County's control and could affect your submission. The County will not be held accountable for such issues that may delay the transmission of any Bid.

NOTE: Electronic copy of the Bid Bond will be accepted at bid opening. The apparent low bidder is required to submit the original Bid Bond within ten (10) days after the bid opening to the Division of Construction Contracts Administration, 111 West Chesapeake Avenue, Room 300B, Towson, Maryland 21204.

INSTRUCTIONS AND SPECIFICATIONS

Refer to the enclosed proposal sheets for quantities to be bid upon. All proposals submitted on the attached form must give the price in clear figures for each item of the proposed work and be signed by the bidder with his name and address. Bidders must not change any item in the proposal for which a price has been stipulated by the County. Any change will cause rejection of the proposal.

NOTE: STATEMENT UNDER OATH FORM TO ACCOMPANY BID as per Baltimore County Purchasing Act 65-98, Section 15-94 and 15-95 which requires that the enclosed affidavit (see Proposal Affidavit pages in Section IV) be completed and submitted as part of the sealed bid.

Proposals made on any other than the attached form will not be considered. All papers included in, bound thereto, or attached to the Proposal Form are necessary parts thereof and shall not be detached, separated, or altered in their intent.

Changes in the phraseology of the proposal, additions, or limiting provisions will render the proposal informal or void and may cause its rejection.

All right is hereby reserved by the Purchasing Agent to reject any or all proposals and to waive formalities and technicalities as the interest of the County may require.

No successful bidder may withdraw his bid within NINETY (90) days after the opening thereof.

The successful bidder will be required to be bonded to Baltimore County, Maryland to the sum of One Hundred per Cent (100%) of the amount of his proposal or proposals according to the form of bond hereto attached for projects in excess of $25,000.00.

This Proposal must be accompanied by a Bid Bond in an amount of 5% of the bid, the exact amount to be determined by the difference between the low bid and the next lowest bid if two or more bids are received, or 5% of the bid if one bid is received. This guarantees payment of the amount thus determined in case of a default in any matter specified as required before award or in any matter resulting in failure to execute and deliver an Agreement, together with Payment and Performance Bonds, after award. The Bid Bond must be in the form accompanying the Proposal executed by a Surety licensed in the State of Maryland. The Surety must be currently rated "B" or better by the A. M. Best Company, and the bid must be in an amount less than, or equal to, the underwriting limitation contained in Department of Treasury Circular 570 as amended at the time of the underwriting.

All work to be performed under this contract shall be done under strict compliance with Baltimore County Department of Public Works and Transportation September 2023 Standard Specifications for Construction and Materials and Standard Details for Construction and any and all proposed revisions thereto as of the date of advertisement and copies of which are available on the County's website at www.baltimorecountymd.gov/departments/public-works/standards, and all of which are made a part hereof and incorporated herein (collectively, the "Specifications").

If the bidder to whom an award is made shall fail to execute the contract and bond hereto attached and as herein provided, the award may be annulled and the contract awarded to the lowest responsible bidder who has consented to a time extension, and such bidder shall fulfill every stipulation embraced herein as if he were the original party to whom the award was made, or the Purchasing Agent may reject all of the bids as the interest of the County may require.

The Bid Bond of the three lowest bidders is deemed to be effective until the execution and delivery of the Contract Agreement, together with Payment and Performance Bonds for projects in excess of $25,000.00 or until rejection of all bids, whereupon Surety is deemed relieved of all further obligations under the bid bonds provided.

Bidders must examine the drawings and specifications carefully and must make a personal examination of the location and nature of the proposed work. In case doubt shall arise as to the meaning or intent of anything shown on the drawings or comprised in the specification, inquiry shall be made of the Director of Public Works and Transportation at least five (5) days prior to the date of

bid opening. The submission of the Proposal shall indicate that the bidder thoroughly understands the drawings and the terms of the Specifications.

To better ensure fair competition and to permit a determination of the lowest bidder, unresponsive bids or bids obviously unbalanced may be rejected by the Purchasing Agent.

Bidders are required to fill out the total price column and total their proposals so that the result of the bidding, barring possible arithmetical errors, will be known at once. Any errors in computations will be corrected by the Engineer when the proposals are canvassed. Where the unit price and the total price are at variance, the unit price will prevail.

Bidders must be prepared to complete the work within the time stated in the proposal.

NOTE: ONLY CONTRACTORS FORMALLY PRE-QUALIFIED WITHIN THE ADVERTISED WORK CLASSIFICATION BY THE DIRECTOR OF PUBLIC WORKS AND TRANSPORTATON OF BALTIMORE COUNTY 10 CALENDAR DAYS PRIOR TO BID OPENING WILL BE ELIGIBLE TO SUBMIT BIDS.

Contracts for work under this proposal will obligate the contractors and subcontractors not to discriminate in employment practices. Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the contract. Successful bidders must be prepared to comply in all respects with the Contract Provisions regarding nondiscrimination.

Baltimore County has adopted a Minority Business Enterprise (MBE) program and Women's Business Enterprise (WBE) Program. The percentage of participation applies to the contract amount awarded to the Contractor. Qualified minority subcontractors are those certified as being a Minority Business Enterprise by the following:

1. Maryland Department of Transportation Certification Committee (MDOT)

2. City of Baltimore, Minority Business Certification Council

Projects funded by the Federal Highway Administration are limited to the certification listed under #1 (MDOT).

More detailed information regarding the County's MBE/WBE Program can be obtained from the County MBE Office, telephone (410) 887-3407. See Executive Order dated December 6, 2022. MBE/WBE Participation Summary and Forms A, B, C, D and E enclosed in this proposal booklet.

NOTE: If you do not complete and submit the enclosed forms with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer **NON-RESPONSIVE** and accordingly the **COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD**.

The County reserves the right to require the low bidder to produce evidence indicating that the company's financial condition is equal to, or better than, that enjoyed by the company at the time of prequalification. This additional information may be in the form of a financial statement or other evidence satisfactory to the Office of Budget and Finance.

Bidders' attention is directed to the requirement that a permit must be obtained from the Baltimore County Bureau of Highways and Bureau of Traffic Engineering prior to cutting any County

road for the purpose of obtaining sub-surface soils information, and permission must be obtained from the State Highways Administration prior to making any openings in a State road.

Under no circumstances shall a bidder enter upon any property outside a County or State road for the purpose of securing sub-surface soils information until permission is received from the property owner. The fact that the County has obtained a utility easement does not give the bidder the right to enter upon the property.

Prevailing index price of asphalt cement/ton $640.00**.**

INCLEMENT WEATHER POLICY: If Baltimore County General Government Offices are open or open with liberal leave the day the bids are due, the bids are due as stated in the bid documents (date and time). **ONLY** when the Baltimore County General Government Offices are **OFFICIALLY CLOSED** the day the bids are due, the bid date will be postponed and an Addendum will be issued the next business (or next day buildings are officially open) day the county offices are open with the new bid date and time.

BID TABULATIONS: All bid tabulations will be confidential until after final award, at which time the total bid amounts for all bidders, as well as the complete bid tabulations for the top three (3) bidders, can be inspected by others when requested in writing pursuant to the Maryland Public Information Act.

ALTERNATIVE SOURCES OF CONTRACT BONDS: In the event your company is unable to qualify for bonding through a traditional commercial surety company, you may qualify for the required bonds through the State of Maryland, Department of Commerce (DOC). The **Maryland Small Business Development Financing Authority (MSBDFA, pronounced Mis-Bid-Fa)**, an agency of DOC, operates a Surety Bond Program designed to assist small businesses, based in Maryland, that are unable to obtain adequate bonding on reasonable terms in the commercial marketplace. MSBDFA provides bid, payment and performance bonds for contracts funded by government agencies, regulated utilities and private entities. The penal sums of the bonds are limited to the aggregate amount of $2,500,000 and companies may pre-qualify for multiple bonds within pre-approved terms and conditions. MSBDFA also provides lines of credit, term loans and loan guarantees to help qualified businesses purchase equipment and real property, make improvements to leased property, refinance existing debt and assist them with their working capital needs. For more information on how to apply, you may contact: Meridian Management Group, Inc. (MMG), (the Program's Manager), 826 E. Baltimore Street, Baltimore, Maryland 21202, Telephone: (410) 333-4270. Or visit their website at www.mmgcapitalgroup.com for information, applications and a checklist of required documents and reports that must accompany the application.

S E C T I O N I I

SPECIAL PROVISIONS

MAINTENANCE BOND

Per the Baltimore County Department of Public Works and Transportation September 2023 Standard Specifications for Construction and Materials, Section GP – 4.10 (C) states, the contractor is required to post a maintenance bond in the amount of five (5) percent of the total cost of the contract or withhold five (5) percent retainage for two (2) years from the date of Final Acceptance.

BALTIMORE COUNTY, MARYLAND

BOND NO. _____

CONTRACT NO. _____

MAINTENANCE BOND

THIS MAINTENANCE BOND is entered into on this _____ day of _____, 20____, by and between _____ as principal ("Principal") and _____, a business entity that is authorized to transact business in the State of Maryland and is organized and existing under the laws of the State of _____, as surety ("Surety"), are held and firmly bound unto Baltimore County, Maryland, a body corporate and politic of the State of Maryland ("County"), as Obligee.

WHEREAS, the above-named Principal has entered into a written contract known as Contract Number _____ dated _____, 20___ with Obligee for _____ (the "Agreement"), the terms of which are hereby incorporated by reference; and

WHEREAS, Principal has completed construction under the Agreement; and

WHEREAS, the Agreement includes a warranty on the quality of the Work performed that runs for a period of two (2) years from the date of the County's final acceptance and that runs for two (2) additional years beyond the repair date if any repair is done during the warranty period; and

WHEREAS, Principal is required to cause this instrument to be executed and delivered to Obligee as security for maintenance during the warranty period in an amount equal to 5% of the total value of the Contract.

NOW, THEREFORE, the Principal and Surety are held and firmly bound unto the Obligee in the sum of $_____ Dollars ($ _____), lawful money of the United States of America, for the payment of which sum of money the Principal and Surety do bind themselves and their personal representatives, legal representatives, successors, and assigns, jointly and severally, firmly by this maintenance bond.

The conditions of this bond are as follows:

1. The Principal shall, for a period of two (2) years from and after the date of completion and acceptance of same by Obligee, replace all defects arising in the Work, whether resulting from defective materials, equipment, design furnished or workmanship. After such period, this obligation shall be null and void; otherwise it shall remain in full force and effect.

2. In the event of a default on the part of the Principal that may be the subject of a claim under this bond, Obligee shall mail, by certified mail, to Surety at the address listed below, a written statement that a claim is being made under the bond and, with substantial accuracy, the amount of the claim. Surety shall have no obligation to Obligee under this bond until the notice of claim is mailed.

3. When the Obligee has satisfied the condition of Paragraph 2 that a notice of claim be mailed, the Surety shall promptly and at the Surety's expense send an answer to Obligee within 30 days after the date of the claim. The answer shall state the amounts that are undisputed and the basis for challenging any amounts that are disputed. The answer shall be accompanied by payment (or arrangements for immediate payment) of any undisputed amounts.

4. Surety expressly waives any right to receive notice of extensions of time or alterations or modifications to the Agreement that may be granted by Obligee and agreed upon by Principal, and any such extensions, alterations, or modifications shall not affect the obligation of the Surety under this bond.

5. This bond is a specialty governed by the twelve-year statute of limitations period set forth in the Annotated Code of Maryland Courts and Judicial Proceedings §5-102.

WITNESS OR ATTEST:

_____

_____
(Principal – Contractor Name)

By:_____

Type Name:_____

Type Title: _____

Date: _____

_____
(Surety)

_____

By:_____

Type Name:_____

Type Title:_____

Type Address:_____

_____

Date:_____

The Contract shall be done in strict compliance with the Baltimore County Department of Public Works and Transportation September 2023 "Standard Specifications for Construction and Materials" and "Standard Details for Construction", and any and all revisions thereto as of the date of the fully executed Contract, including but not limited to the General Conditions Building Projects, as applicable, and all of which are made a part hereof and incorporated herein (collectively, the **"Specifications").** Copies of which are available on the County's website at www.baltimorecountymd.gov/departments/public-works/standards. **IN ADDITION, THE CONTRACTOR UNDERSTANDS AND AGREES THAT THE FOLLOWING SECTIONS OF THE SPECIFICATIONS (GP-1.03 AND GP-5-15) SHALL BE STRICKEN AND THE FOLLOWING SHALL BE INSERTED IN AND INCORPORATED INTO THE CONTRACT IN LIEU THEREOF:**

GP-1.03 ORGANIZATIONAL DEFINITIONS

Administration - Baltimore County.

Administrator - The Director of the Office of Budget and Finance, Baltimore County.

Baltimore County - Baltimore County, Maryland: a body corporate and politic.

Department - The word "Department" shall mean the Office of Budget and Finance of Baltimore County.

Engineer - One of the following engineering executives:

Director of Office of Budget and Finance
Chief, Property Management Division of the Office of Budget and Finance

Any delegation of the Engineer's authority must be authorized in writing by any one of the above listed officials, and such delegation of authority will pertain only to the specific contract and/or contracts shown by the authorization. The title of the specific official will appear in those cases within these specifications where the word "Engineer" as defined herein is not sufficiently specific.

Inspector - The authorized representative of the procurement officer assigned to make detailed inspection of any or all portions of the work, or materials therefor.

Procurement Officer - See Engineer.

GP-5.15 DISPUTES

(a) Except as otherwise may be provided by applicable law or regulation, all disputes arising under or as a result of a breach of this Contract that are not disposed of by mutual agreement shall be resolved in accordance with this General Provision.

(b) As used herein, "claim" means a: written demand or assertion by one of the parties seeking, as a legal right, the payment of money, adjustment or interpretation of Contract terms, or other relief, arising under or relating to this Contract.

A voucher, invoice, or request for payment that is not in dispute when submitted is not a claim under this General Provision. However, if the submission subsequently is not acted upon in a reasonable time, or is disputed either as to liability or amount, it may be converted to a claim for the purpose of this General Provision.

(c) When a claim cannot be resolved by mutual agreement, the Contractor shall submit a written request for decision to the Department's Chief of the Property Management Division for his decision in consultation with the County Office of Law. The Contractor's written request shall set forth all the facts surrounding the controversy, including, but not limited to, those items listed in GP-5.14(b). Any claim by the County shall be decided in like manner.

(d) The Contractor, at the discretion of the Engineer, may be afforded an opportunity to be heard and to offer evidence in support of his claim. Pending resolution of a claim, the Contractor shall proceed diligently with the performance of the Contract.

(e) The Department's Chief of the Property Management Division shall decide any and all claims. The decision by the Department's Chief of the Property Management Division shall be issued within ninety (90) Days on matters of less than fifty thousand dollars ($50,000) and within one hundred eighty (180) Days on matters of fifty thousand dollars ($50,000) or more. The written decision of the Department's Chief of the Property Management Division shall be final and binding unless appealed in writing to the Director of the Department within thirty (30) Days of the Chiefs written opinion to the parties. If the Chiefs decision is timely appealed in writing to the Director of the Department, the Director of the Department, serving as referee, will review the written appeal submitted to assure all reasonable attempts were made to resolve the appeal.

(f) The Director shall issue his/her decision in writing within ninety (90) Days. The Director's decision shall be final and conclusive unless a written appeal is mailed or otherwise filed with the County Administrative Officer within thirty (30) Days of the Director's written decision.

(g) When the County Administrative Officer is satisfied all efforts at the Department level were made to resolve the dispute, a claim shall be resolved as follows:

(1) Subject to, and without in any way enlarging or limiting the other provisions of the Contract, the parties to any Agreement which adopts or incorporates by reference these Standard Specifications, appoint the County Administrative Officer as an administrative hearing officer pursuant to Article 25A, "Chartered Counties of Maryland", of the Annotated Code of Maryland.

(2) The parties further grant the County Administrative Officer the right to delegate this responsibility and authority in writing to a County official who is a registered professional engineer, independent of the Department of Public Works and Transportation’s Division of Construction Contracts Administration, or to any other County official.

(3) For disputes involving ten thousand dollars ($10,000) or more the decision of the administrative hearing officer shall be final and binding on both parties, subject only to such appeals on the record as provided by Article 25A. For disputes involving less than ten thousand dollars ($10,000), the decision of the administrative hearing officer shall be final and binding on both parties.

GENERAL CONDITIONS

BUILDING PROJECTS

Revised September 1, 2024,
in compliance with September 2023
Standard Specifications for Construction and Materials

INDEX GENERAL CONDITIONS
BUILDING PROJECTS

VII. LAWS, PERMITS, LICENSES, INSURANCE & BONDS

VIII. INSPECTION AND SURVEYS

IX. CONSTRUCTION

X. MISCELLANEOUS ADDENDA

GENERAL CONDITIONS
DESIGN BUILD BUILDING PROJECTS

I. SPECIFICATIONS

Article 1 Applicable Specifications

All work performed under this Contract shall be done under strict compliance with the *Specifications* bound herewith, and with the *Baltimore County Standard Specifications for Construction and Materials* and the *Standard Details for Construction* dated September 2023 and subsequent addenda thereto, so far as the same may be applicable, copies of which are available on the County's website at www.baltimorecountymd.gov/departments/public-works/standards. These General Conditions are in addition to the aforementioned Specifications. Should there be any conflict with the aforementioned manuals, the *General Conditions* take preference.

II. DEFINITIONS

Article 2 Definitions

A. *Architect and/or Engineer* shall mean the registered Architect and/or Engineer commissioned by the County to prepare the plans and contract documents.

B. *Engineer* in these General Conditions and in the Construction Specifications in some instances refers to authorized representatives of the Office of Budget and Finance, Property Management.

C. *Subcontractor,* as employed herein, includes only those having a direct contract with the Contractor. It includes one who furnished material worked to a special design according to the Plans and Specifications for the "work." It excludes one who merely furnished material not so worked.

D. *Written Notice* shall be deemed to have been duly served if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered to or sent by registered mail to the last business address known to him who gives the notice.

E. *Repair* means to restore after injury, deterioration, or wear; to mend, to renovate, by such means as appropriate, and to supply such materials and labor as necessary to render the item to be repaired sound, solid, true, plumb, square, even, smooth, and fully serviceable. Upon completion of such repair it must be, unless otherwise stated, rendered to such condition as to present a first-class finished work, or in instances where the repaired item serves as a base for additional finish, the repaired work must be such as to permit a first-class finish, to be applied without extra cost to the County. When the word "repair" is used in connection with machinery or mechanical equipment, it shall mean, in addition to the above, rendering the equipment completely serviceable and efficient, ready for the normal use for which it was originally intended.

F. Some parts of the "Construction Specifications," bound herewith are of the abbreviated or "streamlined" type and includes incomplete sentences. Omissions of words or phrases such as "the Contractor shall", "in conformity therewith", "shall be", "as noted on the drawings", "according to the plans", "a", "an", "the", and "all" are intentional. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the drawings. Words "shall be" or "shall" will be supplied by inference when colon (:) is used within sentences or phrases.

Article 3 Time Limits

The proposal shall indicate whether the contract limit is based on Working Days or Calendar Days. If this is not indicated in the Proposal, then the time limits will be based on Calendar Days.

Article 4 Sunday, Night and Holiday Work

If Sunday, night or holiday work is necessary due to an emergency or is permitted by the Engineer, the Contractor shall secure and pay for any and all permits required in connection with this work.

III. CONTRACT DOCUMENTS AND SHOP DRAWINGS

Article 5 Contract Documents

A. Clarification

It is assumed that the Contractor has obtained clarification of all questions which may have arisen as to intent of the contract documents, or assumed, or actual conflict between two or more items in the Contract Documents as required in "Instructions to Bidders." Should the Contractor have failed to obtain such clarification as required by the "Instructions to Bidders," then the Engineer may direct the work to proceed by any method indicated, specified or required by the Contract Documents in the interest of maintaining the best construction practice. Such direction by the Engineer shall not constitute a claim for extra by the Contractor.

B. Jargon

Work described in words that have a well-known technical or trade meaning shall be held to refer to such recognized standard use.

C. Drawings

The Contractor shall do no work without proper drawings and instructions. Drawings are, in general, drawn to scale; however, symbols are used to indicate materials and structural and mechanical requirements. When symbols are used, the drawings are, of necessity, diagrammatic, as it is not possible to indicate all connections, fittings, fastenings, etc., which are included as a part of the work. Diagrammatic indication of mechanical piping, ducts, and conduit within the buildings is subject to adjustment in order to obtain proper grading, passage over, under or past obstructions, to avoid exposure in finished rooms and unsightly and obstructing conditions. The Contractor shall coordinate these adjustments.

1. Copies no longer Furnished

   The County will no longer furnish the Contractor any copies of the Drawings and Specifications. Additional copies may be obtained by the Contractor down loading drawings and specifications from the Baltimore County Solicitation Web Page.

2. Copies of the Work

   The Contractor shall keep in the office on the job a complete set of all drawings, specifications, shop drawings, schedules, etc., in good order and available to the Engineer and representatives of the County.

3. Ownership

   All documents as furnished by the County remain the property of the County. They must not be used on other work but shall be returned to the County upon completion of the work.

D. Large Scale Detail Drawings

The Architect shall furnish, when necessary, additional instructions in the form of large scale developments of the drawings used for bidding, or to amplify Construction Specifications for the proper execution of the work. These shall be true developments of the bidding documents and reasonably inferable there from. The work shall be executed in conformity herewith. [See Article 6, Paragraph A.3.(c)]

E. Dimensions

The Contractor shall carefully check all dimensions prior to execution of the particular work affected. Whenever inaccuracies or discrepancies are found, the Contractor shall consult the Engineer prior to any construction or demolition. Should any dimensions be missing, the Engineer will be consulted and supply them prior to execution of the work. Dimensions for items to be fitted into constructed conditions at the job will be taken at the job and will be the responsibility of the Contractor. The obvious intent of the documents or obvious requirements dictated by conditions existing or being constructed supersedes dimensions or notes which may be in conflict herewith.

Whenever a stock size manufactured item or piece of equipment is specified by its nominal size, it is the responsibility of the Contractor to determine the actual space requirements for setting or entrance to the setting space. No extra will be allowed by reason of work requiring adjustment in order to accommodate the particular item of equipment.

Whenever new work, building, addition or portions thereof are not accurately located by plan dimensions, the Engineer will supply exact position prior to execution of the work.

Article 6 Shop Drawings

A. Shop Drawings (those prepared by the Contractor or Vendor of Material)

The Contractor shall submit for the Architect's approval, at such times as agreed (see Article 8), shop drawings (to include setting drawings and schedules) as required for the work of the various trades. These drawings shall be prepared in conformity with the best practice and standards for the trade concerned. Due regard shall be given to speed and economy of fabrication and erection.

1. Items to be Detailed

Shop details shall be supplied for all items which are specially fabricated for the work or when the assembly of several items is required of a working unit. Shop drawings are required for all reinforcing and structural steel, specially made or cut masonry units, miscellaneous metal work, specially made flashings or roofing and sheet metal work, specially made millwork, special rough hardware and all heating, ventilating, plumbing and electrical requiring special fabrication or detailed connections, including ducts.

2. Submissions

Shop drawings, brochures and catalog cut submissions shall consist of sufficient copies to provide for the retention by the Architect and County of five (5) copies total plus such additional copies as the Contractor may require. Drawings shall not exceed 24 in. x 36 in. in size.

3. Examination and Approval

The Contractor shall review all shop drawings, brochures and catalog cuts provided by the subcontractors and vendors prior to submitting them to the Architect. The Architect shall examine shop drawings with reasonable promptness, noting desired corrections, or granting approval.

a. Field Dimensions and Conditions

The Architect is not responsible for the checking of dimensions or existing conditions in the field. This is the sole responsibility of the Contractor.

b. Resubmission

When the Architect's notations or corrections are extensive, then the Contractor shall resubmit the drawings with changes made on the drawings.

c. Contractor's Responsibility

Unless the Contractor has in writing, notified the Architect to the contrary, at the time of submission, it will be assumed that the drawings are in conformity with the Contract Documents and do not involve any change in the Contract price or any change which will alter the space within the structure or alter the manner of operation from that contemplated in the Contract Documents.

d. Architect's Notations

Should the Contractor consider any change or notation received in compliance with paragraph (c) above as increasing the cost of the work from that contemplated in the Contract Documents, then the Contractor shall desist from further action relative to the item he/she questions and shall notify the Engineer, in writing, within five (5) days of the additional cost involved. No work shall be executed until the entire matter is cleared or a Change Order issued, or the Contractor is ordered by the Engineer to proceed under the provisions of the County's Standard Specifications. Failure of the Contractor to serve written notice, as above required, shall constitute a waiver of any claim in relation thereto.

(1) Similarly, should the Architect's notation or change involve less work than is covered by the Contract Documents, the Contractor shall allow the County the credit resulting from the change.

(2) Should the Contractor consider that any notation or change made by the Architect under provisions of this paragraph, paragraph (c), above, as involving a complete change in the subcontractor's relation or the substitution of a material different from that on which the Contract was based, then the Contractor shall act as herein stated or as in paragraph (c) above.

4. Project Completion

At the completion of the project, the Contractor shall submit a list of shop drawings for the entire project. This list shall contain the following information: title, description, specialty (Architectural, Structural, Mechanical, etc.), decision (no exceptions taken, approved, approved as noted, etc.).

Article 7 Separate Contracts

A. The County reserves the right to let other contracts in connection with paving and utilities adjoining this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

B. If any part of the Contractor's work depends for proper execution or results upon the work of any other contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results. Failure to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of the work, except as to the defects which may develop in the other contractor's work after the execution of the work.

C. To ensure the proper execution of his/her subsequent work, the Contractor shall verify work already in place and shall at once report to the Engineer any discrepancy between the executed work and the drawings.

IV. PAYMENTS

Article 8 Payments

A. Under this Contract payments will be made monthly on the valuation of work accomplished and on account of materials delivered on the site, for incorporation in the work, which are suitably stored.

B. At the first of each month, the Contractor shall submit to the Engineer an application for payment on a form provided by the Engineer. Prior to application for first payment, the Contractor shall submit to the Engineer a schedule of values for the various parts of the work, including quantities, aggregating to the total sum of the Contract. This shall be so divided as to facilitate payment to subcontractors in accordance with Article 28, Paragraph C.1. The form of this submission shall be such as the Contractor or Engineer have agreed upon, and, if required, shall be supported by such evidence as to its correctness as the engineer may direct. This schedule, when approved by the Engineer, shall be used as a basis for approval of payment unless it is found to be in error. In applying for payment, the Contractor shall submit a statement based upon the schedule, itemized in such form and supported by such evidence as the Engineer may require, showing the Contractor's right to the payment claimed. If required, the Contractor shall show receipts and other vouchers for the payments for materials and labor including payments to subcontractors, as required by Article 28.

C. Materials Purchased Under Allowance

The Engineer will provide schedules for all materials to be purchased from specified allowance.

Article 9 Approval of Payments

If the Contractor has made application, as above, the Engineer shall review and approve such payments as is decided to be properly due in accordance with the approved schedule. In approving such partial payments, there shall be retained no more than 10% of the total amount for the first 50% of the contract, after which only 5% of the total amount of the contract may be withheld unless the need is demonstrated for retaining more to protect the public interest.

Article 10 Payment Withheld

A. The Engineer may withhold, or on account of subsequently discovered evidence, nullify the whole or a part of any payment to such extent as may be necessary to protect the County from loss on account of:

1. Defective work not remedied.

2. Claims filed, or reasonable evidence indicating probable filing of claims, by parties other than the Contractor.

3. Failure of the Contractor to make payments properly to subcontractors or for material or labor.

4. A reasonable doubt that the Contract can be completed for the balance then unpaid.

5. Damage to another Contractor.

6. Failure of the Contractor to submit data required within the time limits stated in the Contract Documents.

Upon removal of the above, payment shall be made for the amounts withheld.

Article 11 Changes in Work

A. The County, without invalidating the Contract, may order changes in the work by altering, adding to or deduction from the work, the Contract sum being adjusted accordingly. Such change shall be executed under these *General Conditions.* Extension of time made necessary thereby shall be adjusted at the time of such Change Order.

B. The Engineer shall have authority to make minor changes in the work not involving extra cost and not inconsistent with the purpose of the project. Otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless a written order for the Office Budget and Finance, Property Management signed or countersigned by the Director has been received by the Contractor. No claim for addition to the Contract sum shall be valid unless so ordered.

C. The value of any such extra work or change shall be determined in one or more of the following ways as determined by the Office of Budget and Finance, Property Management.

1. By Estimate and Acceptance of a Lump Sum

a. The prime Contractor shall furnish a breakdown of the estimated construction cost. The breakdown shall be of sufficient detail to describe the extra work and related costs for labor, material, overhead and profit.

b. Overhead and Profit

(1) Extra work by Subcontractor:

Subcontractor will be allowed 10% overhead and 10% profit added to the direct labor and material costs. The prime contractor will be allowed to increase the subcontractors total lump sum by 10% to cover his/her administration.

(2) Extra work by Prime Contractor:

The prime contractor will be allowed 10% overhead and 10% profit added to the labor and material costs.

c. The prime contractor will be allowed 1 % for the bond added to the labor and material costs.

d. The allowed overhead will include all supervision; no additional allowance will be made for it.

2. By Unit Prices Named in the Contract or Subsequently Agreed Upon

Such unit prices are to include all supervision, overhead, taxes, insurance and profit.

3. By Cost and a Fixed Fee

Added to the cost is a fixed fee portion which is to include supervision, overhead, insurance and profit.

4. By Force Account (Labor and Material Cost plus)

In accordance with the *Baltimore County Specifications for Construction and Materials* Section GP 9.02, the Contractor is allowed to add 65% mark-up.

D. Should none of the methods stated in Paragraph C. 1, 2, or 3 be determined, the Contractor shall, providing he/she receives an order as defined in Paragraph B, above, proceed with the work on the basis of Paragraph C. 4. Force Account.

The Contractor and Engineer shall keep accurate costs, in such form as the Engineer may direct, for presentation, together with vouchers, to the Office of Budget and Finance Property Management for determination of the value of the work included in each Change Order. Pending determination of the final value, the Engineer may include payments for materials and labor, as stated in Article 8, in monthly vouchers.

Article 12 Claims for Extra Cost

No claim for extra will be granted which includes cost of delays or work stoppage due to strikes, lockouts, fire, avoidable casualties or damage or delay in transportation for which the County or its agents are not responsible. (See also Article 14.)

Article 13 Deductions for Uncorrected Work

If the Engineer and County deem it expedient to correct work injured or done not in accordance with the Contract, an equitable deduction from the Contract price shall be made therefore.

Article 14 Delays and Extension of Time

If no schedule or agreement stating the dates upon which drawings shall be furnished is made (see Article 8), then no claim for delay shall be allowed on account of failure to furnish drawings until two (2) weeks after demand for such drawings, and then not unless such claim is reasonable.

Article 15 Correction of Work After Final Payment

Neither the final certificate nor payment nor any provision in the Contract Documents shall relieve the Contractor of responsibility for faulty materials and workmanship. Unless otherwise specified, the Contractor shall remedy any defects and pay for any damage to other work resulting there from that appears within the guarantee period. The County shall give notice of observed defects with reasonable promptness. All questions arising under this Article shall be decided by the Director of Budget and Finance, Property Management.

Article 16 (Deleted)

Article 17 Assignment

The Contractor shall not assign the Contract. It shall not be sublet as a whole or sublet by trades or other portions in an amount of more than 75% of the monetary value of the Contract. The remaining 25% shall be executed by the Contractor with labor and materials directly purchased and paid for by the Contractor. Costs for insurance, over-head, supervisions, etc., may not be claimed as a portion of the 25% mentioned above. The execution of work by a subsidiary of the Contractor is not considered direct employment. The Contractor shall not assign any monies due or to become due to him/her hereunder, without the previous written consent of the County.

Article 18 Maryland State Sales Tax

A. Contractors who are performing work for the State of Maryland or any of its political subdivisions are required to pay tax on materials and supplies which will be incorporated into the work.

B. The Contractor must pay the tax on all equipment which is purchased, Even though it may be used on a job for the State of any of its political subdivisions.

V. MATERIALS

Article 19 Materials

Materials include all manufactured products and processed and unprocessed natural substances required for completion of the Contract. The Contractor in accepting the Contract is assumed to be thoroughly familiar with the materials required and their limitations as to use and requirements for connections, setting, maintenance and operation.

Whenever an article, material or equipment is specified and a fastening, furring, connection (including utility connections), bed or accessory is normally considered essential to its installation in good quality construction, such shall be included as if fully specified. Nothing in the Construction Specifications shall be interpreted as authorizing any work in any manner contrary to applicable law, codes or regulations (See Article 31).

A. Approval

All materials are subject to the Architect's or Engineer's approval as to conformity with the specifications, quality, design, color, etc. No work for which approval is necessary shall be contracted for, or used, until written approval is given by the Architect or Engineer. Approval of a subcontractor, as such, does not constitute approval of a material which is other than that included in the Construction Specifications.

B. New Materials

Unless otherwise specified, all materials shall be new.

C. Quality

Unless otherwise specified, all material shall be of the best quality of the respective kinds.

D. Samples

The Contractor shall furnish for approval all samples as directed. The work shall be the same as the approved samples.

E. Painting and Color

The Architect and Contractor shall jointly prepare the paint and color schedules. The Architect shall direct the exact color, texture and finish.

F. Proof of Quality

The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials either before or after installation. The Contractor shall pay for any tests as may be deemed necessary in relation to "Substitutions" (Paragraph I. below).

G. Contractor's Option

When several products or manufacturers are named in the Construction Specifications for the same purpose or use, then the Contractor shall select any of those so named. However, all of the units of a thing required for a project must be the same in material and manufacture.

H. "Or Equal", "Equal", "Approved Equal"

The above terms are used as synonyms throughout the Construction Specifications. They are implied in reference to all named manufacturers. Only materials that, in the opinion of the Engineer, are fully equal in all details of construction, methods of assembly, finish and design quality will be considered. (See A, C, E, above, and I. below.)

I. Substitutions

Should the Contractor desire to substitute another material for one or more specified by name, the Contractor shall apply, in writing, for such permission and state the credit or extra involved by the use of such material. The Engineer will not consider the substitution of any material different in type or construction methods unless such substitution effects a benefit to the County. (See A. and D. above.)

The Contractor shall <u>not</u> submit for approval, materials other than those specified without a written statement why such a <u>Substitution</u> is proposed. Approval of a "substitute" material by the Architect or Engineer when the Contractor has not designated such material is a "substitute," shall not be binding on the County nor release the Contractor from any obligations of the Contract, unless the Architect or Engineer approves such "substitutions" in writing.

J. Standard Specifications

Whenever references are made in the Contract Documents to the *Baltimore County Standard Specifications for Construction and Materials* and *Standard Details for Construction,* it shall be understood that the latest standards and/or requirements are intended and shall apply. When no specification is cited and the quality, processing, composition or method of installation of a thing is only generally referred to then:

1. For things not otherwise specified below, the latest edition of the Applicable American Society for Testing Materials Specifications shall apply.

2. For things covered by the applicable portions, the National Bureau of Fire Underwriters Code shall apply.

3. For things generally considered as plumbing and those things requiring plumbing connections, the applicable portions of the latest edition of the American Society of Mechanical Engineers Code and the Baltimore County Plumbing Code shall apply.

4. For things generally considered as heating and ventilating work and not covered by A.S.M.E. Code, the applicable portions of the latest edition of the Heating and Ventilating Guide, published by the American Society of Heating and Ventilating Engineers, and the Baltimore County Building Code shall apply.

K. Storage

The contractor shall confine apparatus and storage of materials to the "off-road" area delineated as the "Limit of Contract." The Contractor shall not load or permit any part of the structure to be loaded with a weight that will endanger the safety of the structure or any part thereof.

VI. QUALIFICATION, EMPLOYEES, WORKMANSHIP, SUBCONTRACTORS AND ADVERTISING

Article 20 Qualification of Bidders

Bidders are required to be prequalified 10 days prior to bid opening, satisfactorily evidencing that they have the ability, equipment, organization and financial resources sufficient to enable completion of the work satisfactorily within the time specified in the Proposal.

Article 21 Employees and Workmanship

A. Employees

1. Qualification

Only personnel thoroughly trained and skilled in the task assigned them may be employed on any portion of the work, or they shall be removed.

2. Licensed

When County, State or Federal laws require that certain personnel (electricians, plumbers, etc.) be licensed, then all such personnel employed on the work shall be so licensed.

B. Quality of Labor

The Contractor shall employ on the work, at all times, sufficient personnel to complete the work within the time stated in the Proposal.

C. Work Areas

The Contractor shall confine the operations of his/her employees to the limits as provided by law, ordinance, permits or directions of the Office of Budget and Finance Property Management. Generally, the "off-road" area will be the same as the "limit of Contract" line.

D. Methods and Quality

1. All workmanship shall be of good quality. Whenever the method of the work or manner of procedure is not specifically stated or shown in the Contract Documents, then it is intended that the best standard practice shall be adhered to. Recommendations of the manufacturers of approved materials shall be considered as a part of Construction Specifications and all materials shall be applied, installed, connected, erected, used, cleaned and conditioned as so called for thereby. This, however, does not remove any requirement in Construction Specifications to add to the manufacturer's recommendations.

2. All materials shall be accurately assembled, set, etc., and when so required in good construction, shall be true to line, even, square, plumb, level and regularly spaced, coursed, etc. Under no circumstances, either in new or old work, shall any material be applied over another which has not been thoroughly cleaned, sanded or otherwise treated so as not to impair the finish, adhesion, or efficiency of the next applied item.

3. All methods, procedures and results are subject to the Engineer's approval as to finished result to be obtained. However, this is not to be interpreted as placing upon the Engineer any responsibility for the "work" management which is solely the responsibility of the Contractor.

E. Joining of Work

1. The Contractor shall so schedule the work as to ensure efficient and uninterrupted progress and to hold to an absolute minimum the cutting and patching of new work. All cutting, patching and digging necessary to the execution of the work is included.

2. The Contractor shall so schedule (to include subcontracts) the construction performed by each group or trade that each installation or portion of the construction shall member with and join with all other work as required for a complete installation, all according to accepted good construction practice.

F. Superintendent

The Contractor shall keep on the work, at all times during its progress, a competent superintendent and all necessary assistants, all approved by the

Office of Budget and Finance Property Management. Prior to commencement of the work, the Contractor shall submit in writing to the Office of Budget and Finance Property Management the name and qualifications of the person to be employed as Superintendent for the execution of the Contract. A written approval or rejection will be given following review of the data. Persons who have previously proved unsatisfactory on work executed for the County, or who are without proper qualifications, will not be approved. Should the Superintendent be complained of by the Office of Budget and Finance Property Management for cause, he/she shall be removed from the work. Should it be necessary to change the Superintendent, the above procedure shall be repeated. The Superintendent will represent the Contractor. All directions given to the Superintendent shall be as binding as if given to the Contractor. Important directions shall be confirmed on written request in each case.

G. Discipline

The Contractor shall at all times enforce strict discipline and good order among his/her employees and shall not employ or permit to remain on the work any unfit person. The Contractor shall enforce all instructions relative to use of water, heat, power, no smoking, and control any use of fires, as required by law and for the Office of Budget and Finance Property Management. Employees must not be allowed to loiter on the premises before or after job working hours.

Article 22 Employment Lists

The Contractor may contact MARYLAND STATE EMPLOYMENT SERVICE, Towson, MD, 21204, if so desired, for additional labor regarding this project.

Article 23 Contractor's Supervision (Also see Article 21, Paragraph F.)

The Contractor shall constantly maintain efficient supervision of the work, using his/her best skills and coordinating ability. The Contractor shall carefully study and compare all drawings, specifications, and other instructions and check them against conditions existing or being constructed on the project. The Contractor shall report to the Engineer any error inconsistency or omission which may be discovered. (See also Article 5, Paragraph E, and Instructions to Bidders.) The Contractor shall not be held responsible for the existence or discovery of such errors or conflicts and neither shall the adjustment of such errors or conflicts be grounds for claim for extra on the art of the Contractor unless such adjustment involves work not obviously contemplated by the Contract Documents or necessary to progress of the work. The Contractor shall be responsible for the coordination of the work of all subcontractors.

Article 24 The County’s Right to do Work

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this Contract, the County after three days' written notice to the Contractor may, without prejudice to any other remedy, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

Article 25 County's Right to Terminate Contract

A. Terminate Contract

The Office of Budget and Finance, Property Management, upon proof that sufficient cause exists to satisfy such action, may without prejudice to any other right or remedy, and after giving the Contractor seven (7) days' written notice, terminate the employment of the Contractor and take possession of the premises and of all materials, tools, and appliances thereon and finish the work by whatever method may be deemed expedient, if any of the following conditions exists:

1. If the contractor should

   a. Be adjudged a bankrupt or make a general assignment for the benefit of creditors,

   b. Has a receiver appointed on account of insolvency.

   c. Fails to or repeatedly and persistently refuses to supply properly skilled workers or proper materials, except in cases for which extension of time is provided,

   d. Fails to make payment to subcontractors, or for materials and labor,

   e. Persistently disregards laws, ordinances or the instructions of the Engineer, or

   f. Is otherwise guilty of a substantial violation of any provision of the Contract.

2. Payment Status

   In cases such as identified above, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Contract price shall exceed the expenses of finishing the work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the contractor shall pay the difference to the County. The expense incurred by the County as herein provided, and the damage incurred through the Contractor's default, shall be itemized by the Engineer and a certified copy supplied to the Contractor.

Article 26 Sanitary Conveniences

A. The Contractor shall arrange for the erection and Maintenance of temporary toilets equipped with running water and drain connection for use of employees. These conveniences shall be erected and kept clean and in good condition, as required by law, until ordered removed by the Engineer.

B. In lieu of A. above, the Contractor may install a portable approved chemical toilet at an approved location.

C. The permanent plumbing fixtures to be constructed under this Contract shall not be used during construction, under any circumstances.

Article 27 Subcontracts Deleted

Article 28 Relation of Contractor and Subcontractor

A. **The Contractor agrees** to bind every subcontractor and every subcontractor agrees to be bound by the terms of the Agreement, *Baltimore County's Standard Specifications for Construction and Materials* and *Standard Details for Construction* the *General Conditions,* the Drawings and Construction Specifications, as far as applicable, to his/her work, including the following provisions of this Article, unless specifically noted to the contrary in the subcontract approved in writing as adequate by the Office of Budget and Finance, Property Management.

B. **The Subcontractor agrees** to be bound to the Contractor by the terms of the Agreement, *Baltimore County's Standard Specifications for Construction and Materials* and *Standard Details for Construction, General Conditions,* Special Provisions, Construction Specifications, and to assume towards him/her all obligations and responsibilities that he/she, by those documents, assumes towards the County.

1. To submit to the Contractor applications for payment in such reasonable times as to enable the Contractor to apply for payment under Article 8 of these *General Conditions.*

2. To make all claims for extras, for extensions of time and for damages for delays or otherwise, to the Contractor in the manner provided in *Baltimore County's Standard Specifications for Construction and Materials* or those *General Conditions* for like claims by the Contractor upon the County, except that the time for making claims for extra cost is one (1) week.

C. **The Contractor agrees** to be bound to the Subcontractor by all the obligations the County assumes to the Contractor under Agreement, *Baltimore County's Standard Specifications for Construction and Materials, General Conditions,* Drawings and Construction Specifications, and by all the provisions thereof affording remedies and redress to the Contractor from the County.

1. To pay the Subcontractors:

   a. Upon receipt of payment, if issued under the schedule of values described in *Baltimore County's Standard Specifications for Construction and Materials,* G.P.-9.03 or Article 8 of these *General Conditions,* the amount allowed to the Contractor on account of the Subcontractor's work, to the extent of the Subcontractor's interest herein.

   b. Upon the receipt of payment, if issued otherwise than as in Paragraph C.1., above, so that at all times the total payments shall be as large in proportion to the value of the work done by him as the total amount certified to the Contractor is to the value of the work done by him/her.

   c. To such extent as may be provided by the Contract Documents or the subcontract, if either of these provides for earlier or larger payments than the above.

   d. On demand for his/her work or materials as far as executed and fixed in place, less the retained percentage, at the time the payment is requested, even though the Engineer fails to approve it for any cause not the fault of the Subcontractor.

   e. A just share of any fire insurance money received by him/her, the Contractor, under Article 35 of these *General Conditions.*

2. To make no demand for liquidated damages or penalty for delay in any sum in excess of such amount as may be specified in the subcontract.

3. That no claim for services rendered or materials furnished by the Contractor to the Subcontractor shall be valid unless written notice thereof is given by the Contractor to the Subcontractor during the first ten (10) days of the calendar month following that in which the claim was originated.

4. To give the Subcontractor an opportunity to be present and to submit evidence in any manner involving his/her rights.

5. The Contractor and the Subcontractor agree that nothing in this Article shall create any obligation on the part of the County to pay to or to see to the payment of any sums to any Subcontractor.

Article 29 Interlocking Contracts

The attention of the Contractor and all Subcontractors is specifically called to the necessity of reading the Specifications covering items of the work which connect with or are dependent upon the work specified under each heading, and each Contractor executing the work called for there under shall be responsible for arranging for proper provision for connecting and coordinating his/her work with such other items.

Article 30 Advertising Signs

A. The Contractor will furnish, erect and maintain a project sign for the duration of the project. The sign shall be placed on the site where and as directed by the Engineer. The sign shall be fastened to three posts spaced 4' apart. The posts shall be 4" x4", seven feet above ground and three feet below ground.

B. The project sign is shown on page GC-27 in this book.

VII. LAWS, PERMITS, LICENSES, INSURANCE, AND BONDS

Article 31 Laws, Permits and Regulations

A. Permit and Service Connections:

1. **BUILDING PERMIT** - The County will obtain the building permit at no cost to the Contractor.

2. **PERMANENT WATER SERVICE** - The County will apply for the water service and pay all related charges; i.e., water meter, water systems connection charge, water distribution charge and sewer systems connection charge. Total installation of the permanent water service is part of this Contract. Water service shall be installed by a County Prequalified Utility Contractor.

3. **PLUMBING PERMIT** - The Contractor shall apply for the Permit; however, the County will pay all related charges and fees.

4. **PERMANENT ELECTRIC SERVICE** - The Contractor shall apply for and pay for the electrical permit. The County shall obtain BGE permanent gas and electric service to the site at no cost to the Contractor.

   The Contractor shall coordinate the installation of permanent gas and electric service with Baltimore Gas & Electric

Company. Both the gas and electric services shall be activated at the same time under one account number showing Baltimore County as owner. The Contractor shall be responsible for payment of consumption charges for the use of gas and electric energy obtained through the permanent service until the building is accepted by the County or until agreed upon by the County in direct coordination with the Building Services Division of Baltimore County. Charges from BGE for removal of existing electric service will be paid by the County.

5. **PERMANENT TELEPHONE SERVICE** - The County shall pay for the telephone service and systems to and in the building. The Contractor is responsible for supplying and installing all conduit, cables and junction boxes as shown on the drawings or called out in the Specifications.

6. **CABLE** - The County shall pay for any cable television service into the building. The contractor is responsible for supplying and installing the remaining work as shown on the drawings and called out in the Specifications.

7. **TEMPORARY SERVICES** -All temporary services, such as water, electric, telephone, etc., shall be the Contractor's entire responsibility. (Also see Article 46.)

8. **MISCELLANEOUS PERMITS** - The Contractor shall procure any and all necessary permits not previously mentioned and pay any and all related charges and fees required and incidental to the due and lawful prosecution of the work.

B. The Contractor shall give all notices and comply with all State and Federal laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the Drawing and Contract Specifications are at variance therewith, he/she shall promptly notify the Engineer, in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Engineer, he/she shall bear all costs arising there from.

Article 32 Compensation, Liability, and Property Damage Insurance

(See Insurance Provision in Part VI of this Contract.)

Article 33 Builder's Risk Insurance

A. The Contractor shall, at his/her own cost, insure the work and keep it insured at all times during the period of construction, and until final acceptance of it by the County, against loss or damage covered by

an "All Risk" Builders Risk type of policy. The amount of insurance shall be the 100% estimated replacement cost of the work.

B. The policies shall be made payable to the County and the Contractor, as their interest may appear, and the policies shall be left in the possession of the Engineer, prior to the start of construction.

Article 34 Guaranty Bonds

A. Prior to signing of the Contract, the Contractor will be required to furnish bond covering the faithful performance of the Contract and the payment of all obligations arising there under, in such form as the County may prescribe with such sureties as the County may approve. The premiums shall be paid by the Contractor.

B. The Bond to be in the amount of the total Contract price.

C. At the direction of the Office of Budget and Finance, Property Management, the Contractor may be required to increase the above bond. Such addition will be paid for by the County in the amount of actual cost to the Contractor.

Article 35 Damages

A. If either party to this Contract should suffer damages in any manner because of the wrongful act or neglect of the other party or of anyone employed by him/her, then reimbursement shall be made by the other party for such damage.

B. Claims under this clause shall be made in writing to the party liable within a reasonable time at the first observance of such damage and not later than the time of final payment, except as expressly stipulated otherwise in the case of faulty work or materials, and shall be adjusted by agreement.

C. Should the Contractor cause damage to any separate contractor on the work, the Contractor agrees, upon due notice, to settle with such contractor by agreement or refer the matter to the Office of Budget and Finance, Property Management, who will render a decision after hearing all evidence in the matter. The Contractor shall pay or satisfy such decision.

VIII. INSPECTION AND SURVEYS

Article 36 Inspection

A. If the Construction Specifications, the Engineer's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Engineer timely notice of its readiness for inspection, and if the inspection is by another authority, the date fixed for such inspection. Inspections by

the Engineer shall be made promptly, and where practicable, at the source of supply. Any work covered without approval of the Engineer must, if required, be uncovered for examination at the Contractor's expense.

B. If initial tests and/or inspections show substandard products, materials, workmanship, etc. and the Contractor elects, with the Engineer's approval, to perform additional tests and/or inspections to prove the acceptability of the substandard products, materials, workmanship etc., he/she shall perform same at his/her expense.

Article 37 Surveys

A. The General Contractor shall, at his/her own expense, employ a registered surveyor to provide Elevation Bench Mark, and locate corners of the building and the limits of contract.

B. The General Contractor shall, at his/her own expense, employ a competent field engineer, to give the lines and levels for the building, sidewalks and footings, etc. The Contractor will be responsible for all lines and levels and will guarantee all lines and levels as are shown on drawings.

Article 38 Unauthorized Work

Work done without lines and grades being established, work done beyond the lines and grades shown on the Plans or as established, except as herein provided, or any extra work done without written authority will be considered as unauthorized and at the expense of the Contractor and will not be measured by the Engineer, or paid for by the County. Work so done may be ordered by the Engineer to be removed and replaced at the Contractor's expense.

IX. CONSTRUCTION

Article 39 Construction Schedule

The Contractor shall hold bi-weekly "progress meetings" at the site, at a time suitable to the Engineer, at which the progress of the work shall be reported upon in detail with reference to schedules. Each interested subcontractor shall be required to have present a competent representative to report the condition of his/her branch of the work and to receive instructions. Minutes of these "progress meetings" shall be taken by the Contractor who shall type them for distribution to members of the conference, the Office of Budget and Finance, Property Management, and other interested persons. These minutes shall be received by all parties prior to the next scheduled "progress meeting."

Article 40 Protection of Work and Property

A. All trees along the way of access shall be boxed, also all trees surrounding the building which are liable to injury by the moving, storing and working up of materials. No permanent tree shall be used for attachment of any ropes or derricks. Every public way, catch basin, conduit, tree, fence or things injured in carrying out this Contract, shall be replaced and put in good condition, unless the same shall be permanently done away with by order of the Engineer.

B. The Contractor shall erect and properly maintain at all times as required by the conditions and progress of the work, all necessary safeguards for the protection of workers and the public and shall post danger signs warning against the hazards created by such features of construction as protruding nails, hod hoists, well holes, elevator hatchways, scaffolding, window openings, stairways and falling material.

C. In an emergency affecting the safety of life, or of the work, or of the adjoining property, the contractor, without special instruction or authorization is hereby permitted to act, at his/her discretion, to prevent such threatened loss or injury, and he/she shall so act, without appeal, if so instructed or authorized. Any compensation claimed by the Contractor on account of emergency work shall be determined as outlined in Article 11.

Article 41 Shoring, Bracing and Sheeting

A. The Contractor shall do all necessary shoring, bracing and sheeting required, or as directed by the Engineer, to carryout the work, install the foundations and other building construction, to protect the street, sidewalks and all adjoining buildings and property. He/she shall thoroughly brace and protect all earth banks sides of pits, trenches, and other excavations to prevent danger to persons or structures, and to prevent injurious cavings or erosion of any sort. Shoring and sheeting shall be removed after, or as, the walls are built and properly set.

B. Full responsibility for both the design (by an Engineer licensed in Maryland) and the execution of all shoring, bracing, and sheeting work shall rest upon the contractor. While the Engineer shall be fully advised of all details for such work before the work itself is executed, this shall not in any way relieve the Contractor for full responsibility for all damage or expense arising from faulty installation of the said work of shoring, bracing, or sheeting.

Article 42 Tests

A. Soils testing shall be performed by an independent testing firm arranged and paid for by the County.

B. Materials testing shall be performed by an independent testing firm, paid for by the Contractor, which has previously been approved by the County and Architect/Engineer. Certified copies of all such test reports shall be submitted to the Engineer for approval.

Article 43 Cleaning Up

A. The Contractor shall at all times keep the premises free from accumulations of waste material or rubbish caused by his/her employees or work, and at the completion of the work, shall remove all his/her rubbish from and about the project site, and all his/her tools, scaffolding and surplus material.

   In case of dispute, the County may remove the rubbish and charge the cost to the several contractors as the Engineer shall determine to be just.

B. All debris shall be kept sprinkled to reduce dust and shall be promptly removed from the building, and no combustible materials shall be stored against perimeter walls.

C. The Contractor shall clean entirely the building as it is completed, wash all windows, scrub all floors at least once, and leave all floors free from spots and blemishes. The interior of the building and the project area shall be left "broom clean," or its equivalent.

Article 44 As-Built Drawings

The Contractor shall, as the project progresses, neatly record on a set of white prints any changes and all revisions to the work wherever they shall differ from the Contract Drawings. Upon completion of the work, the · Contractor shall turn over to the Architect this set of prints.

Article 45 Drainage and Pumping

The Contractor shall remove all water, including rain water, encountered during the entire progress of the work, using pumps, drains or other methods approved by the Engineer. Excavations and the project site shall be kept free from water until all backfilling is completed. The water shall be discharged to catch basins, or other drainage points as directed by the Engineer.

Article 46 Temporary Water, Electric and Other Services

A. The Contractor shall arrange for and pay for the installation of temporary connection to the County's water mains, including all incidental fees and expenses for water supply during construction of the project, and shall pay for all water used. Wasting of County water will not be permitted.

B. The Contractor shall arrange for and pay for temporary electric light and power service required during construction of the project, and shall pay for all electricity used. Gasoline or other torches for lighting will not be permitted.

C. The Contractor shall provide and pay for any other temporary services which may be required for the satisfactory completion of the project.

D. The Contractor shall provide, at his/her own expense, all cold weather protection, temporary heat and fuel as necessary to carry on the work expeditiously during inclement weather, to protect work and materials against injury from dampness and cold, to dry out the building and provide suitable working conditions. Refer to other sections for temperatures required for work under the various trades

The methods of heating and type of fuel and equipment used shall be subject to approval by Engineer.

With special permission, in writing, permanent heating system may be used to dry out building and provide suitable working conditions in all or various parts thereof as soon as practicable. If used, Contractor shall be responsible for use of permanent heating system for purpose described and all costs of fuel, attendance, etc. in connection therewith shall be borne by him/her. Such use shall not relieve Contractor of his/her responsibility to turn over system to Owner in perfect condition on completion of project, including the removal of all dust of construction from air handling units, etc., the replacing of all filters, etc., nor shall it shorten stipulated guarantee period which will commence upon the date of final acceptance of the work.

Article 47 Connecting to Existing Utilities

The Contractor shall, at his/her own cost and expense and as part of this work under the Contract, furnish all labor, materials, tools, and appliances, and do all work required for making connections to existing storm drains, sanitary sewer, water, gas and electric service connections, as shown on drawings, and the cost of making such connections shall be included in his/her bid.

Article 48 Existing Utilities Shown on Plans

Water mains, gas mains, storm drains, sanitary sewers, and other utilities are shown on the Plans, in accordance with the best information available, for the information of the Contractor. The County assumes no responsibility for accuracy or completeness of the information shown. Existing mains and services shall be carefully protected and any damage to them caused by the work shall be immediately repaired to the satisfaction of the Engineer by the Contractor at his own expense, using materials of the quality and kinds damaged.

X. MISCELLANEOUS ADDENDA

Article 49 Holidays

The word "holidays" used in these Contract Documents shall be taken to mean the below listed holidays, which in Baltimore County, occur as shown below:

January 1	New Year's Day
3rd Monday in January	Martin Luther King's Birthday
3rd Monday in February	President's Day
4th Monday in May	Memorial Day
June 19	Juneteenth Independence
July 4	Independence Day
1st Monday in September	Labor Day
2nd Monday in October	Indigenous Peoples' Day
November 11	Veteran's Day
4th Thursday in November	Thanksgiving Day
December 25	Christmas
All Days of General Elections	

If any holiday occurs on Sunday, the following Monday shall be considered a holiday. If the holiday occurs on Saturday, the Friday immediately preceding shall be considered a holiday.

Article 50 Buy American Steel Act

The State of Maryland has approved House Bill No. 1659 to "Buy American Steel" for all Public Works projects in the State of Maryland, effective July 1, 1978. Compliance with Article 20.17 Metal Pipe (Page 100) and Article 20.18 Metal for Structures (Page 102) in the *S.H.A. Specifications for Materials, Highways, Bridges and Incidental Structures* dated March 1968 will satisfy this condition. Also see *Baltimore County's Standard Specifications for Construction and Materials* Section GP 7.28.

Article 51 Guarantee

A. The Contractor guarantees all work against faulty or imperfect materials, against all imperfect or careless and/or unskilled workmanship, against all leaks and against all mechanical and electrical failure of equipment for a period of two (2) years from the date of acceptance of the project by the County. See other Sections of this Specification for other guarantees.

B. The Contractor shall remove, replace or re-execute, without cost to the Owner, any work found to be imperfect during the guarantee period.

Article 52 Offices and Telephones

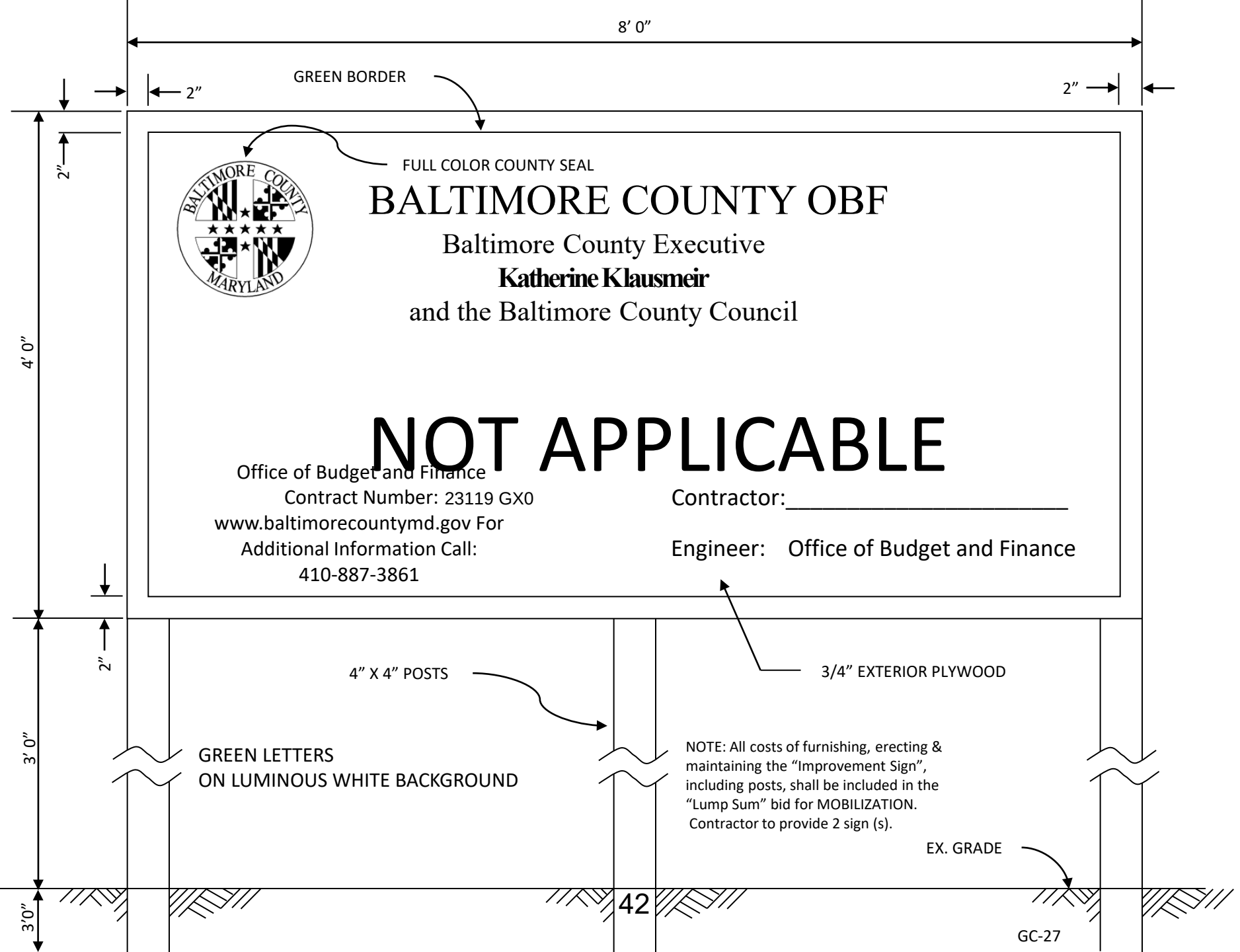
A. The Contractor shall erect and maintain upon the project site, and where directed by the Engineer, suitable offices for his/her own use and that of the Engineer.

B. A room of adequate size shall be provided and maintained in the Contractor's office to be used for "Progress Meetings," which frequently involve fifteen (15 or more persons). This space shall be so arranged that they can be held without interference with or from the other office or supervisory work. The room shall be 300 sq. ft. minimum and 10 ft. minimum width.

These offices shall be provided with adequate heating and lighting, all at the expense of the Contractor. In addition to the above requirements, air-conditioning will be required, the cost of which is to be included in the lump sum bid price. The system must be capable of maintaining a temperature of 80 degrees F dry bulb and approximately 50% relative humidity in the conditioned area when outside temperatures are 95 degrees F dry bulb and 78 degrees F wet bulb.

C. The Engineer's office shall meet or exceed all requirements for a Type 1 office in accordance with *Baltimore County's Standard Specifications for Construction and Materials,* Section 103 Engineer's Office.

The Contractor shall provide telephone and FAX service in the Office of the Engineer. The Contractor shall pay all costs of installation and all charges for local and Baltimore City calls, but will not be expected to pay for long distance calls made from the Engineer's Office.


8’ 0”
GREEN BORDER
2”
2”
2”
FULL COLOR COUNTY SEAL
BALTIMORE COUNTY OBF
Baltimore County Executive
Katherine Klausmeir
and the Baltimore County Council
NOT APPLICABLE
Office of Budget and Finance
Contract Number: 23119 GX0
www.baltimorecountymd.gov For
Additional Information Call:
410-887-3861
Contractor:_____
Engineer: Office of Budget and Finance
4’ 0”
2”
3/4” EXTERIOR PLYWOOD
4” X 4” POSTS
3’ 0”
GREEN LETTERS
ON LUMINOUS WHITE BACKGROUND
NOTE: All costs of furnishing, erecting & maintaining the “Improvement Sign”, including posts, shall be included in the “Lump Sum” bid for MOBILIZATION.
Contractor to provide 2 sign (s).
EX. GRADE
3’0”
42
GC-27

SECTION 000114

PROJECT MANUAL TABLE OF CONTENTS

END OF SECTION 000114

SECTION 001000

SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to Project Site.
4. Occupancy requirements.
5. Work restrictions.

1.3 PROJECT INFORMATION

A. Project Identification: Parking Lot Reconfiguration with parking and ADA accessible parking spaces, walkways, recreational facilities, site lighting, stormwater management, and site related improvements.

1. Project Location: 8601 Harford Road, Parkville, MD 21234

B. Owner: Baltimore County, Department of Aging.

a. Owner's Representative: Mr. Mike Goodyear, Senior Project Manager, Baltimore County, Department of Property Management, 12200A Long Green Pike, Glen Arm, Maryland 21057
Telephone: (410) 887-6595

b. Civil Engineer: Mr. Mark Hadley, Associate Principal, Site Resources, Inc. (SRI), 4 North Park Drive, Suite 100, Cockeysville, Maryland 21030
Telephone: (410) 683-3388

c. Electrical Engineer: Mr. Ryan Dimaano, Principal Electrical Engineer, MIN Engineering, Inc., 10 Sudbrook Lane, Pikesville, Maryland 21208
Telephone: (410) 486-4692

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of the Project is defined by the Contract Documents and generally consists of the following:

1. Installation of temporary Sediment and Erosion Control (ESC) devices and measures, and site clearing operations.
2. Demolition of existing on-site curb and gutter, driveways, walkways and parking, basketball court area, site lighting, and other designated existing site improvements.
3. Grading and construction of new on-site driveways and parking with ADA accessible parking spaces; site lighting; walkways, ramps and steps; retaining walls; three Pickleball Courts; storm drainage system and stormwater management (SWM) facilities; a new dumpster enclosure, fencing and other related site improvements.
4. Installation of new site landscaping and planting for a new SWM Micro-Bioretention Facility.
5. Installation of permanent vegetative stabilization measures, and removal of temporary Sediment and Erosion Control devices and measures.

B. Type of Contract:

1. The Project will be constructed under a Single Prime Contract.

1.5 ACCESS TO SITE

A. General: The Contractor shall have use of the premises within the Limit of Disturbance (LOD) for demolition and new construction operations within designated portions of the Project site. Contractor's use of premises is limited only by the Owner's need for periodic access to and into the existing building, and to allow Subcontractor’s activities on-site.

B. Use of the Site: Contractor shall limit use of the premises to Work in areas within the contract limits (LOD). Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is required.

1. Limits: Confine construction operations within the area defined as the Limit of Disturbance (LOD).
2. On-site Driveways and Entrances: Keep driveways and entrances serving the construction site available to Subcontractors at all times. Designate areas for storage of materials.

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

3. Truck deliveries shall be scheduled so that delivery trucks delivering materials to the site do not impede public use of the adjoining streets (Hiss Avenue, Harford Road, and Willoughby Road). Trucks must be scheduled accordingly, or wait for the opportunity to unload within the project’s perimeter construction fence or off of the Owner's property.

C. Condition of Existing Building: Protect the features of the existing building adjacent to the Work area/Limit of Disturbance (LOD) as necessary throughout the Contract period. Repair all damage to the existing building caused by construction operations.

D. Condition of Existing Grounds: Protect existing site features and utilities adjacent to and outside of the Work area/Limit of Disturbance (LOD) throughout the Contract period. Repair all damage caused by construction operations outside the Work area and the LOD.

1.6 OCCUPANCY REQUIREMENTS

A. Full Owner Occupancy: The Owner reserves the right to occupy the building throughout the Contract period. Contractor shall cooperate with Owner and the Owner's Representative during demolition and construction operations to minimize conflicts and facilitate the Owner's usage of the existing building. Perform the Work so as to avoid interference with the Owner's operations and use of the existing building.

B. Owner's Limited Use and Occupancy of Completed Areas of Site Construction: With advance written notice and approval by the Contractor, the Owner reserves the right to occupy completed portions of the Work prior to Substantial Completion, provided such occupancy does not interfere with completion of the Contractor's Work. Such limited occupancy shall not constitute total Acceptance of the Work.

1.7 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with Baltimore County restrictions on construction activities and operations.

1. Comply with requirements of applicable permits, including but not limited to the Grading Permit (for Erosion and Sediment Control), Stormwater Management (SWM), and related permits issued by an authority having jurisdiction.
2. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
3. Critical site controls include, but are not limited to the following:

    a. Off-hour work shall be coordinated with the Owner in advance.
    b. Non-interruption of utilities.
    c. Any activities or issues not covered above shall be coordinated in advance with the Owner and/or Project Manager.
    d. Protection of stored materials.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Interruptions to utility services and utility outages: The Contractor shall include planned disruptions to utilities in the agendas for project meetings, but in no case shall the Contractor proceed with any work that could disrupt services to the buildings without a fourteen-day (14) written notice to the Owner and a written agreement with the Owner for the proposed outage or disruption period.

C. Existing Underground Utilities

1. Contractor shall notify Owner (Project Manager}, in writing, at least two (2) weeks prior

to any excavation or underground work, and shall also notify all public and private utility companies as required by law in advance of construction so that existing underground utilities may be located and marked by the appropriate agency or utility.

2. Prior to start of any excavation or underground work, the Contractor shall confirm all underground utility locations and top and bottom elevations at all new connection points and at all crossing points or points of potential conflict with new work. Confirmation is to be made by vacuum excavation test pits or other method approved by Owner.
3. The Contractor shall immediately notify Owner and appropriate authorities when encountering an unknown utility line and await a decision as to how to dispose of same. When an existing utility line must be cut and plugged or capped, moved, or relocated, or has become damaged, Contractor shall notify Owner and utility company involved, and assure protection, support, or moving of utilities to adjust them to new work. Contractor shall be responsible for damage caused to existing, active utilities under work of this Contract, including resultant damages or injuries to persons or properties.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise which are in excess of Baltimore County noise and vibration ordinances, odors, or other disruptions to Owner occupancy with Owner.

PART 2 - PRODUCTS (As Required to Complete the Work)

PART 3 - EXECUTION (As Required to Complete the Work)

END OF SECTION 001000

SECTION 012220

SITE-CIVIL UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for Unit Prices.

B. Related Requirements:

1. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
2. Section 014000 "Quality Requirements" for field testing by an independent Testing Agency.
3. Section 312000 “Earth Moving” for specified products and materials.

1.3 DEFINITIONS

A. Unit Price: A monetary amount incorporated into the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, and services or a portion of the Work.

1. The specific Unit Price shall be used to add to or deduct from the Contract Sum by appropriate modification if the scope of Work required by the Contract Documents is increased or decreased.

1.4 PROCEDURES

A. Unit Prices include all necessary material (including cost of the material and delivery to the Project Site), removal and disposal off-site of unsatisfactory material(s) as applicable, installation, insurance, applicable taxes, exclusive of allowable overhead, profit, and bonding as applicable.

B. Prior to removal and furnishing designated Unit Price items, Contractor shall provide the Owner’s Representative and Project Civil Engineer with a detailed written description of the estimated quantity of the applicable Unit Price item, and accompanied by the Professional Surveyor’s estimated quantity for the Owner’s Representative’s review and written approval prior to proceeding with the Unit Price work.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established Unit Prices and to have this work measured, at Owner's expense, by an independent, Professional Land Surveyor registered in the State of Maryland, or by a separate arrangement with the Project’s approved Testing Agency.

D. List of Site-Civil Unit Prices: A schedule of Unit Prices is included in PART 3 below.

1. Specification Sections referenced in the PART 3 "Schedule of Site-Civil Unit Prices" Article contain requirements for materials described under each Unit Price.
2. Refer to the Bid Form and contract documents for incorporating the specified Site-Civil Unit Prices below.

PART 2 - PRODUCTS (In accordance with referenced Specification Sections)

PART 3 - EXECUTION

3.1 SCHEDULE OF SITE-CIVIL UNIT PRICES

A. Unit Price No. 1: Removal of Unsatisfactory Soil Material and Replacement with Satisfactory Soil Material

1. Description: Excavation of unsatisfactory soil material and legal disposal off-site. Furnish and replace with satisfactory soil material or Engineered/Structural Fill obtained off-site, in accordance with Section 312000 "Earth Moving." Compaction of replacement material shall be included in this Unit Price, in accordance with referenced Specifications.
2. Unit of Measurement: Per Cubic yard (CY) of soil excavated and replaced, based upon the Professional Land Surveyor's estimate of in-place volume before removal, and verified after replacement.

B. Unit Price No. 2: Soil Moisture Reduction – Provision and Incorporation of "Quicklime"

1. Description: Removal of excessive moisture from satisfactory soils utilizing calcium oxide Quicklime (agricultural lime is an unacceptable substitute for Quicklime). Rate and depth of Quicklime application shall be determined in the field by the Testing Agency. Incorporation of Quicklime shall be in accordance with the compaction and optimum soil moisture content requirements of Section 312000 "Earth Moving."
2. Unit of Measurement: Pounds (LBS) of Quicklime added and incorporated in the soil, and confirmed by the Quicklime material supplier's tickets.

C. Unit Price No. 3: MDSHA Graded Aggregate Base (GAB)

1. Description: Furnish and install MDSHA Graded Aggregate Base (GAB) in accordance with Specification Section 312000 "Earth Moving", and Table 901A and 901B of the referenced MDSHA Specifications. Compaction of installed material shall be included in this Unit Price, in accordance with referenced Specifications.
2. Unit of Measurement: Per Cubic Yard (CY) of Graded Aggregate Base (GAB) furnished and installed in accordance with Specification Section 312000 "Earth Moving", and confirmed by the material supplier's tickets.

D. Unit Price No. 4: MDSHA #57 Washed Aggregate

1. Description: Furnish and install MDSHA #57 washed aggregate in accordance with Specification Section 312000 "Earth Moving", and Table 901A and 901B of the referenced MDSHA Specifications. Consolidation/compaction of installed material shall be included in this Unit Price, in accordance with referenced Specifications.

2. Unit of Measurement: Per Cubic Yard (CY) of #57 washed aggregate furnished and installed in accordance with Specification Section 312000 "Earth Moving", and confirmed by the material supplier's tickets.

E. Unit Price No. 5: MDSHA #2 Course Aggregate

1. Description: Furnish and install MDSHA #2 Course Aggregate in accordance with Specification Section 312000 "Earth Moving", and Table 901A and 901B of the referenced MDSHA Specifications. Compaction of installed material shall be included in this Unit Price, in accordance with referenced Specifications
2. Unit of Measurement: Per Cubic Yard (CY) of MDSHA #2 Course Aggregate furnished and installed in accordance with Specification Section 312000 "Earth Moving", and confirmed by the material supplier's tickets.

F. Unit Price No. 6: Hot-Mix Asphalt Intermediate-Duty "Superpave" Paving and Aggregate Base Course

1. Description: Furnish and install full section Hot-Mix Asphalt (HMA) Intermediate-Duty "Superpave" Asphalt Paving including HMA surface course, HMA base course, and aggregate base course over fully compacted subgrade, thickness as indicated on the Drawings, and in accordance with Specification Section 321216 "Asphalt Paving" and Section 312000 "Earth Moving."
2. Unit of Measurement: Per Square Yard (SY) of full section Hot-Mix Asphalt Intermediate-Duty "Superpave" Asphalt Paving and aggregate base course, furnished and installed in accordance with the referenced Specification sections, and confirmed by the material supplier's tickets.

G. Unit Price No. 7: Hot-Mix Asphalt "Superpave" Overlay

1. Description: Furnish and install Hot-Mix Asphalt (HMA) "Superpave" Overlay Course upon existing asphalt paving, thickness as indicated on the Drawings, and in accordance with Specification Section 321216 "Asphalt Paving" and Section 312000 "Earth Moving."
2. Unit of Measurement: Per Square Yard (SY) of Hot-Mix Asphalt "Superpave" Overlay Paving, furnished and installed in accordance with the referenced Specification sections, and confirmed by the material supplier's tickets.

H. Unit Price No. 8: Concrete Paving, Reinforcement and Aggregate Base Course

1. Description: Furnish and install concrete paving, welded wire fabric reinforcement, isolation-expansion joint, and aggregate base course over fully compacted subgrade, thickness as indicated on the Drawings, and in accordance with Specification Section 321313 "Concrete Paving" and Section 312000 "Earth Moving."
2. Unit of Measurement: Per Square Foot (SF) of Concrete Paving
3. , welded wire fabric reinforcement, isolation-expansion joint, and aggregate base course over fully compacted subgrade, furnished and installed in accordance with the referenced Specification sections, and confirmed by the material supplier's tickets.

I. Unit Price No. 9: Planting Mix for Turf Establishment

1. Description: Furnish and install Planting Mix in accordance with Specification Section 329113 "Soil Preparation." Consolidation and light compaction of installed material shall be included in this Unit Price in accordance with referenced Specifications.

2. Unit of Measurement: Per Cubic Yard (CY) of Planting Mix furnished and installed, and confirmed by the material supplier's tickets.

J. Unit Price No. 10: Hydroseeding for Turf Establishment

1. Description: Furnish and install Planting Mix in accordance with Specification Section 329200 "Turf and Grasses" in accordance with referenced Specifications.
2. Unit of Measurement: Per Square Yard (SY) of Hydroseeding furnished and installed, and confirmed by the material supplier's tickets.

END OF SECTION 012220

SECTION 012500

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for Substitutions.

B. Related Requirements:

1. Section 012200 "Unit Prices" for administrative and procedural requirements for Site-Civil Unit Prices.
2. Section 012300 "Alternates" for products selected under an Alternate.
3. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or inability to comply with required warranty terms.

1.4 ACTION SUBMITTALS

A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form provided in Project Manual acceptable to Project Civil Engineer and Owner’s Representative.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.

b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of Civil Engineer's and Owner's Representative's s and owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Project Civil Engineer's and Owner's Representative's Action: If necessary, Civil Engineer or Owner's Representative will request additional information or documentation for evaluation within seven (7) days of receipt of a request for substitution. Civil Engineer or Owner's Representative will notify Contractor of acceptance or rejection of proposed substitution within fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Civil Engineer's or Owner's Representative's Supplemental Instructions for minor changes in the Work.
b. Use product specified if Civil Engineer or Owner's Representative does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified Testing Agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Revise or adjust affected Work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than fifteen (15) days prior to time required for preparation and review of related submittals.

1. Conditions: Civil Engineer or Owner’s Representative will consider the Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, the Civil Engineer or Owner’s Representative will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Substitution request is fully documented and properly submitted.
c. Requested substitution will not adversely affect Contractor's construction schedule.
d. Requested substitution has received necessary approvals of authorities having jurisdiction.
e. Requested substitution is compatible with other portions of the Work.
f. Requested substitution has been coordinated with other portions of the Work.
g. Requested substitution provides specified Warranty.
h. If requested substitution involves more than one sub-contractor, the requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all sub-contractors involved.

B. Substitutions for Convenience: Not allowed, unless prior written authorization is provided by the Owner’s Representative.

PART 3 - EXECUTION

A. In accordance with the Product manufacturer’s installation requirements and applicable Sections of the Project Specifications.

END OF SECTION 012500

SECTION 012600

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

B. Related Requirements:

1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: The Project Civil Engineer or the Owner's Representative will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Work Change Proposal Requests issued by Project Civil Engineer or Owner's Representative are not instructions either to stop work in progress or to execute the proposed change.
2. Within fourteen (14) consecutive days after receipt of Proposal Request, submit a quotation to Property Management estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

a. Include a list of quantities of products required or eliminated, and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
c. Include costs of labor and supervision directly attributable to the change.
d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

e. Quotation Form: Use forms acceptable to Property Management. Provide cover letter.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Property Management. The proposal shall be in the form of a cover letter with associated proposal and cost backup.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one (1) product or system for product or system specified.

a. Proposal Request Form: Use form acceptable to Property Management and include a cover letter.

1.4 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Project Civil Engineer or Owner’s Representative may issue a Construction Change Directive instructing Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900

PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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

B. Related Requirements:

1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.

1.3 DEFINITIONS

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

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with continuation sheets.
b. Submittal schedule.
c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the schedule of values to Property Management at earliest possible date, but no later than seven (7) days after Notice of Low Bid for review and modification by Property Management is necessary.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for

the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

    a. Project name and location.
    b. Name of Engineer.
    c. Contractor's name and address.
    d. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document G703.
3. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
4. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

    a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.

5. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

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

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

B. Payment Application Times: Submit Application for Payment to Engineer by the 15th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.

    1. Submit draft copy of Application for Payment seven days prior to due date for review by Engineer.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

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

    1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
    2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
    3. Include amounts of Change Orders and Construction Change Directives issued before last

day of construction period covered by Application.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.

F. Transmittal: Submit electronic signed and notarized copies of each Application for Payment to Property Management by a method ensuring receipt within twenty-four (24) hours. Electronic submission of applications is required. All lien releases or waivers, if required, shall be included.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous Application, after deduction for retainage, on each item.
2. When an Application shows completion of an item, submit conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of Sub-contractors.
2. Schedule of values.
3. Contractor's construction schedule (preliminary, if not final).
4. Submittal schedule {preliminary if not final).
5. Certificates of insurance and insurance policies.
6. Performance and payment bonds.
7. Data needed to acquire Owner's insurance.

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

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Updated final statement, accounting for final changes to the Contract Sum.

3. AIA Document G706A, "Contractor's Affidavit of Release of liens."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013200

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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

1. Startup construction schedule.
2. Contractor's construction schedule.
3. Construction schedule updating reports.
4. Daily construction reports.
5. Material location reports.
6. Site condition reports.

B. Related Requirements:

1. Section 013300 "Submittal Procedures" for submitting schedules and reports.
2. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Engineer.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations

determine when activities can be performed and the critical path of Project.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. PDF electronic file.

B. Startup construction schedule.

1. Approval of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.

C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Total Float Report: List of all activities sorted in ascending order of total float.

E. Construction Schedule Updating Reports: Submit with Applications for Payment.

F. Daily Construction Reports: Submit at monthly intervals.

G. Material Location Reports: Submit at monthly intervals.

H. Site Condition Reports: Submit at time of discovery of differing conditions.

I. Progress Meeting Agendas: Submit forty-eight (48) hours prior to progress meetings an agenda of items to be discussed at the progress meetings.

J. Progress Meeting Minutes: Contractor shall provide meeting minutes of all construction progress meetings.

1.5 QUALITY ASSURANCE

A. Prescheduling Conference: Conduct conference at Project site to review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:

1. Discuss constraints, including phasing work stages area separations interim milestones and partial Owner occupancy.
2. Review delivery dates for Owner-furnished products.
3. Review submittal requirements and procedures.
4. Review and finalize list of construction activities to be included in schedule.
5. Review procedures for updating schedule.

1.6 COORDINATION

A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to the date of final completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

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

1. Phasing: Arrange list of activities on schedule by phase.
2. Work Restrictions: Show the effect of the following items on the schedule:

a. Coordination with existing construction.

b. Limitations of continued occupancies.
c. Use of premises restrictions.

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

a. Submittals.
b. Purchases.
c. Fabrication.
d. Deliveries.
e. Installation.
f. Tests and inspections.
g. Adjusting.
h. Curing.
i. Startup and placement into final use and operation.

4. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

a. In water work for soft launch.
b. Substantial Completion.

C. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.

D. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

1. Unresolved issues.
2. Unanswered Requests for Information.
3. Rejected or unreturned submittals.
4. Notations on returned submittals.
5. Pending modifications affecting the Work and Contract Time.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART}

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within fourteen (14) days of date established for the Notice to Proceed. Base schedule on the startup construction schedule and additional information received since the start of Project.

2.3 REPORTS

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

1. List of Sub-contractors at Project site.
2. Approximate count of personnel at Project site.

3. Equipment at Project site.
4. Material deliveries.
5. High and low temperatures and general weather conditions, including presence of rain or snow.
6. Accidents.
7. Unusual events (see special reports}.
8. Stoppages, delays, shortages, and losses.
9. Change Orders received and implemented.
10. Construction Change Directives received and implemented.
11. Services connected and disconnected.
12. Equipment or system tests and startups.
13. Partial completions and occupancies.

B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:

C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

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

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. As the Work progresses, indicate final completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Engineer, Owner, separate Contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility within forty-eight (48) hours of progress meeting.

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

END OF SECTION 013200

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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

1.3 DEFINITIONS

A. Preliminary Submissions: It is incumbent upon the Contractor to submit in writing, and obtain acceptance in writing for each of the following items prior to commencing work.

1. The names and qualifications of the proposed full time staff at the job site.
2. A list of all trade contractors, including their license number, date and place of issuance and their phase of work.
3. A list of equipment and material suppliers, indicating the particular items, by name/description, which they are to supply.
4. Schedule of Values.
5. Preliminary Submittal Schedule.

B. Action Submittals: Written and graphic information that requires the Engineer's responsive action.

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

1.4 SUBMITTAL PROCEDURES

A. General: The Contractor shall submit to the Property Management for review all shop drawings, product data, samples and other submittals for all items required in the Technical Sections of the Specifications and for all items proposed for use in the Work.

1. Electronic copies of CAD Drawings of the Contract Drawings may be provided by the Engineer for Contractor's use in preparing submittals.
2. Submittals shall be made via email or file transfer website. No proprietary project management software will be allowed.

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

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity. Submit shop drawings, product data and samples far enough in advance to allow ample time for Engineer's review, re-submittal if required, and fabrication without creating any delay in the Work.

    a. Make submittals a minimum of thirty (30) days prior to needed return date.

2. Coordinate transmittal of different types of submittals for related parts of the Work so that processing will not be delayed because of the need to review submittals concurrently for coordination.

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

C. Submittals Schedule:

1. Full Submittal: Within 14 days of Notice to Proceed, prepare and submit a tabular Submittal Schedule, sorted by date, of all submittals required during the full duration of the project. The full submittal shall utilize the same format and provide the same type of information as specified for the preliminary submittal.

    a. Heading, including project title and location and Contractor's name;
    b. Columnar organization with the following sub-headings

        1) Submittal No (Line numbers, serial order);
        2) Type of Submittal (Data, Shop Drawings, Reports, etc.);
        3) Specification Reference (Spec section number and paragraph reference);
        4) Description of Item Submitted (misc. metals, wood flooring, gyp board, etc.);
        5) Submit By (date);
        6) Approve By (date);
        7) Long lead time item (yes or no);
        8) Critical Path (yes or no);
        9) Float;
        10) Actual date of submittal;
        11) Re-submittal Date;
        12) Final release or approval;
        13) Remarks.

2. Give Owner two (2) weeks’ notice of anticipated significant revisions to accepted schedule of submittals.
3. Identify all long lead time items and state impact on schedule.
4. Owner will review and alter submittal schedule if required to meet project requirements.

D. Processing Time: Allow enough time for submittal review, including time for re-submittal, as follows. Time for review shall commence on Engineer's receipt of submittal and conclude on date sent from Engineer's office.

1. Initial Review: Allow twenty-one (21) days for initial review of each submittal

    a. Engineer's review to require twenty-one (21) days.
    b. Owner review to be forwarded to the Engineer within ten (10) days.

2. Concurrent Review: Where concurrent review of submittals by the Engineer's Consultants, Owner, or other parties is required, allow twenty-eight (28) days for initial review of each submittal.
3. If intermediate submittal is necessary, process it in same manner as initial submittal.
4. Allow twenty-one (21) days for processing each re-submittal.
5. No extension of Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

E. Identification: Place title block or cover sheet on each submittal for identification.

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

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

4. Submittal Numbering System: All submittals shall be assigned a submittal number clearly visible on all transmittal forms and on each copy of each submittal adjacent to the Contractor review stamp. The numbering system shall track the Specifications format. In the example: 15050-001.0 the number represents the following:

    a. First six Digits-015050, the specification section,
    b. Digit six through eight -001, The numerical log of submittal within each specification section, the first submittal in that section,
    c. Last Digit: Initial or re-submittal of each submittal, .0 for initial, .1 for first re-submittal, and so forth.

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

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

1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant

information, requests for data, revisions other than those requested by the Engineer on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.

2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
3. Transmittal Form: Contractors coversheet.

H. Quantities:

1. Product Data:

   a. Submit all information electronically to the Owner for distribution to the engineer. Submittals will be returned to the contractor in electronic format only. Submittals must be by email. Property Management does not allow the use of proprietary project management software.
   b. The Owner will provide its comments to the Engineer within two weeks of receipt of the submittal. The Engineer shall incorporate the Owner's comments into its consolidated response. Allow one additional week for Engineer's action.
   c. The Engineer's Consultant will return submittals all marked with action taken and corrections or modifications required in electronic format only. No hard copies will be returned to the contractor.

2. Shop Drawings:

   a. Submit all information electronically to the Owner for distribution to the engineer. Submittals will be returned to the contractor in electronic format only. Submittals must be by email. Property Management does not allow the use of proprietary project management software.
   b. The Owner will provide its comments to the Engineer within two weeks of receipt of the submittal. The Engineer shall incorporate the Owner's comments into its consolidated response. Allow one additional week for Engineer's action.
   c. The Engineer's Consultant will return submittals all marked with action taken and corrections or modifications required in electronic format only. No hard copies will be returned to the contractor.
   d. Re-submittals: Same as initial submittal. Note date of previous submittal. Use same submittal number with numeric suffix to indicate first and subsequent resubmittals.
   e. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

3. Samples:

   a. Submit four (4) sets: two (2) to the Engineer, and two (2) to the Owner. The Owner will provide its comments to the Engineer within two weeks of receipt of the submittal. The Engineer shall incorporate the Owner's comments into its consolidated response. Allow one additional week for Engineer's action. The Engineer will retain one (1) set, will send one (1) to the Owner, and will return one (1) to the Contractor for action.
   b. If the primary reviewer is the Engineer's Consultant, then submit one (1) additional copy directly to that party.

c. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

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

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

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

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

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

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

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

4. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
5. Preliminary Submittal: Submit a preliminary single-copy of Product Data where selection of options is required.

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

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

a. Dimensions.
b. Identification of products.
c. Fabrication and installation drawings.
d. Roughing-in and setting diagrams.
e. Shop work manufacturing instructions.
f. Templates and patterns.
g. Schedules.
h. Design calculations.
i. Compliance with specified standards.
j. Notation of coordination requirements.
k. Notation of dimensions established by field measurement.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 36 by 48 inches.

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

1. Comply with requirements in Division 1 Section 01400 "Quality Control Requirements" for mockups.
2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following:

a. Partial sections of manufactured or fabricated components;
b. Small cuts or containers of materials;
c. Complete units of repetitively used materials;
d. Swatches showing color, texture, and pattern; color range sets;
e. And components used for independent testing and inspection.

4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Engineer's sample where so indicated. Attach label on unexposed side that includes the following:

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

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

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

6. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between

final submittal and actual component as delivered and installed.

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

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

a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

2.2 INFORMATION SUBMITTALS

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

1. Submit to the Owner in electronic format.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

B. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Engineers and Owners, and other information specified.

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

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

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

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

G. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

H. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.

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

J. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.

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

L. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

M. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

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

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

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

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.

4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

P. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

Q. Construction Photographs: Comply with requirements in Division 1 Section 013200 Photographic Documentation.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

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

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

1. Submittals received without Contractor's review stamp will be returned not reviewed.

3.2 ENGINEER'S ACTION

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

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

1. "No Exception Taken": That part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
2. "Acceptable As Noted – Incorporate Noted Comments – No Resubmission Required": That part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
3. "Revise As Noted and Resubmit": Do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other related activities.

a. Revise or prepare a new submittal in accordance with the notations; resubmit

without delay. Repeat as necessary to obtain a "No Exception Taken" or "Acceptable As Noted – Incorporate Noted Comments – No Resubmission Required" status.

b. Do not permit submittals marked "Revise As Noted and Resubmit" to be used at the Project site or elsewhere where Work is in progress.

4. "Not Acceptable" or "No Action Taken": Not in compliance with Contract Documents. Submission has been returned without review.

a. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat as necessary to obtain a "No Exceptions Taken" or "Acceptable As Noted – Incorporate Noted Comments – No Resubmission Required" status.

b. Do not permit submittals marked "Not Acceptable" or "No Action Taken" to be used at the Project site or elsewhere where Work is in progress.

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

D. Submittals not required by the Contract Documents might not be reviewed and may be discarded.

END OF SECTION 013300

SECTION 014000

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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

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

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements. The Contractor shall be responsible for hiring all testing agencies required for the project completion.
3. Requirements for Contractor to provide quality-assurance and -control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

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

B. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

C. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

D. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

E. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

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

G. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, or a Sub-contractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

H. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five (5) previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two (2) or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Engineer for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

1.5 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

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

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

1.6 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.7 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

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

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

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

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

F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

G. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

H. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

a. Provide test specimens representative of proposed products and construction.
b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Engineer, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

I. The Contractor shall be responsible for submittal of all as-built data for stormwater management verification. The Contractor shall provide surveys, material tickets, geotechnical certifications, if required, and other information as required by the permit such that the Owner can close out the project permits.

1.8 QUALITY CONTROL

A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not. Contractor shall have prior experience within jurisdiction Work is to be performed and shall therefore have knowledge of jurisdictions quality control services required. Quality control services required by the AHJ shall be included within contract and shall not be considered for additional services or Change to the Contract.
2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

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

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

B. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

C. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in pre-installation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

F. Associated Services: Coordinate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and-control services with a minimum of delay and to avoid the necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Engineer.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Engineer's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. Section 011000 "Summary of Work" for the Contract scope of Work, work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

A. Installation, removal, and use charges for temporary facilities to be included in the Contract Sum unless deleted by the Owner or the Owner’s Representative. Allow other entities engaged in the Project to use temporary services and facilities without cost including, but not limited to, Owner's construction forces, testing agencies, and authorities having jurisdiction.

B. Water Service: Is not available for use by the Contractor for construction operations.

C. Electric Power Service: Is not available for use by the Contractor for construction operations.

D. Water and Sewer Service from Existing System: Is not available for use by the Contractor for construction operations.

E. Electric Power Service from Existing System: Electric power from Owner's existing system is not available for use by the Contractor for construction operations.

1.3 INFORMATIONAL SUBMITTALS

A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.

B. Implementation and Termination Schedule: Within fifteen (15) working days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.

C. Project Identification and Temporary Signs: The Owner may or may not provide a Project Identification Sign and Temporary Signs to the Contractor for installation at designated locations. Coordinate the installation with the Owner’s Representative.

D. Noise and Vibration Control Plan: Identify construction activities that may impact the occupancy and use of existing spaces within the existing building and adjacent to the existing building occupied by Owner. Include the following:

1. Methods used to meet the goals and requirements of Owner.
2. Concrete cutting method(s) to be used.
3. Location of construction devices on the site.
4. Show compliance with the use and maintenance of quieted construction devices for the duration of the Project.
5. Indicate activities that may disturb building occupants and that are planned to be performed during non-standard working hours as coordinated with Owner.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Refer to Section 260100 “Electrical General Provisions” for additional information.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

C. Accessible Temporary Egress: Comply with applicable provisions in the DOJ's "2010 ADA Standards for Accessible Design" and the Owner’s specific requirements.

1.5 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 SITE ENCLOSURE FENCE MATERIALS

A. Fixed Chain-Link Fencing: 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with galvanized 0.177-inch top tension wire.

B. Portable Chain-Link Fencing: 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top and bottom rails. Provide concrete bases for supporting posts.

2.2 TEMPORARY FACILITIES

A. Contractor’s Temporary Field Office:

1. At the Contractor's discretion, a Temporary Field Office may be temporarily installed with the Limit of Disturbance (LOD) for use by his personnel and sub-contractors at his discretion.
2. The location of the Contractor's Field Office shall be coordinated with the Owner's Representative prior to its installation on the Project Site.

B. Temporary Storage Sheds: For the Contractor's convenience a shed may be installed to accommodate non-combustible materials and equipment for construction operations.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

C. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements.

3.3 SUPPORT FACILITIES INSTALLATION

A. Comply with the following:

1. Provide construction for temporary field office, shops, and sheds located within construction area or within 30 feet of building lines that is non-combustible in accordance with ASTM E136. Comply with NFPA 241.
2. Maintain support facilities until the Owner's Representative schedules Substantial Completion inspection. Remove temporary field office and sheds prior to Substantial Completion.

B. Temporary Paved Areas: Construct and maintain temporary paved areas adequate for construction operations. Locate temporary paved areas as indicated and within construction limits indicated on Drawings.

1. Provide dust-control treatment that is non-polluting and non-tracking. Reapply treatment as required to minimize dust.

C. Temporary Use of Planned Permanent Paved Areas: Locate temporary paved areas in same location as permanent paved areas. Construct and maintain temporary paved areas adequate for construction operations. Extend temporary paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas in accordance with Section 312000 "Earth Moving."
3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course in accordance with Section 321216 "Asphalt Paving."

D. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain, including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

E. Storage and Staging:

1. Provide temporary offsite area if adequate temporary storage is not available on-site, and use designated areas of Project site for storage and staging needs.

F. Temporary Dewatering Facilities and Drains:

1. Comply with requirements of the approved Erosion and Sediment Control (ESC) Drawings.
2. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
3. Remove snow and ice as required to minimize accumulations.

G. Project Signs: Provide and install Project signs as indicated.

1. Unauthorized signs are not permitted.
2. Identification Signs: Provide Project identification signs as indicated on Drawings.
3. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project. Provide temporary, directional signs for construction personnel and visitors.
4. Maintain and touch up signs, so they are legible at all times.

H. Waste Disposal Facilities:

1. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal".
2. Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."

C. Temporary Erosion and Sediment Control:

1. Comply with requirements of the approved Erosion and Sediment Control (ESC) Drawings.

D. Temporary Tree and Plant Protection:

1. Comply with requirements specified in Section 015639 "Temporary Tree and Plant Protection."
2. Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

E. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals, so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.

F. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.

2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

G. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

I. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain temporary facilities in good operating condition until removal.

C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. Remove temporary facilities not intended for or acceptable for integration into permanent construction.
3. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill and Planting Mix. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns.
4. Repair or replace street paving, curbs, and sidewalks at entrances, as required by the Owner’s Representative or authorities having jurisdiction.
5. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period.
6. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 015639

TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

B. Related Requirements:

1. Section 311000 "Site Clearing" for erosion and sediment control requirements, marking existing utilities, removing existing trees, shrubs and vegetation.
2. Section 312000 “Earth Moving” for excavation, backfilling, and compaction requirements in adjoining construction areas.
3. Section 329113 “Soil Preparation” for Planting Mix requirements.

1.3 DEFINITIONS

A. ANSI: American National Standards Institute.

B. ASCA: American Society of Consulting Arborists.

C. ASTM: American Society for Testing and Materials International.

D. Arborist: A licensed or certified professional experienced in the cultivation, management, and horticultural practices necessary to promote the health and safety of trees, shrubs, and woody plants.

E. Caliper (DBH): Diameter at breast height. Diameter of a trunk as measured by a diameter tape at a height fifty-four (54) inches above the ground line.

F. CLFMI: Chain Link Fence Manufacturer’s Institute.

G. DNR: Maryland Department of Natural Resources.

H. ISA: International Society of Arboriculture.

I. LOD: Limit of Disturbance.

J. LOW: Limit of Work.

K. Non-Specimen Tree: An existing tree having a diameter measured at 4.5 feet above the ground that is less than thirty (30) inches in diameter.

L. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction as indicated.

M. Specimen Tree: An existing tree having a diameter measured at 4.5 feet above the ground of 30 inches or more, or trees having 75% or more of the diameter of the current State champion of that species as defined in the current edition of the State Forest Conservation Technical Manual, as amended to date, published by the Maryland Department of Natural Resources (MD-DNR). Specimen Trees also includes Champion Trees.

N. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction as indicated.

O. Tree Service Firm: A professional tree service firm operating in the State of Maryland as a "Licensed Tree Expert" as noted in Maryland DNR's current Forest Service "Tree Expert List". The tree service firm shall employ a full-time Arborist licensed in the State of Maryland, and shall have at least ten (10) years' of successful experience performing these services.

P. Vegetation: Trees, shrubs, groundcovers, grass, and other woody and herbaceous plants.

1.4 PRE-INSTALLATION MEETING

A. Pre-installation Conference: Conduct conference at Project site.

1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:

   a. Tree-service firm's personnel and equipment required to make progress and avoid delays in the Work.
   b. Arborist's responsibilities.
   c. Quality-control program.
   d. Coordination of site clearing operations and equipment movement adjacent to plant protection-zone locations.
   e. Trenching by hand or with air spade within protection zones.
   f. Field quality control.
   g. Extent of root, branch, and crown pruning.

2. Submit Meeting Notes to Landscape Architect and Owner's Representative from Pre-Installation Conference.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:
1. Include plans, elevations, sections, and locations of protection-zone fencing, signage, and gates. Show relationship of equipment-movement routes and material storage locations in relation to plant protection-zones.

2. Detail fabrication and assembly of protection-zone fencing, gates, and signage.
3. Indicate extent of trenching by hand or with air spade within protection zones.

C. Samples: For each type of the following:

1. Shredded Hardwood Mulch: One (1) quart volume of shredded hardwood mulch, in sealed plastic bag labeled with composition of materials by percentage of weight and source of mulch.
2. Protection-Zone Signage: One (1) full-size sample of each required, showing size and text, ready for installation.

D. Protection-Zone Fencing Mockups:

1. Install at least one (1) fully assembled mockup panel for each type of protection-zone fencing. Mockup panel may be incorporated into the Work if approved by the Landscape Architect or Owner's Representative.

E. Tree Branch, Root, and Crown Pruning Schedule: Submit written schedule that details the scope and extent of pruning for trees to remain that interfere with or are affected by construction.

1. Species and size of tree.
2. Location on site plan. Include unique identifier for each.
3. Reason for pruning.
4. Description of pruning to be performed.
5. Description of maintenance following pruning.

F. Written Certification from Arborist: Certifying that trees have been adequately protected throughout construction in accordance with referenced standards, and that trees were promptly and properly treated and repaired when damaged.

G. Written Maintenance Recommendations: From Arborist, for care and protection of trees affected by construction during and after completion of the Work.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Arborist and Tree Service firm.

B. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1. Submit sufficiently detailed digital photographs or video recordings to document conditions of existing specimen trees and plant material to remain.
2. Include diagrams with notations to indicate specific wounds and damage conditions of each tree or other plants to remain.

C. Quality-control program from Arborist and Tree Service firm.

1.7 QUALITY ASSURANCE

A. American National Standards Institute (ANSI): Referenced standards and publications.

B. American Society for Testing and Materials International (ASTM): Referenced standards and publications.

C. Chain Link Fence Manufacturer's Institute (CLFMI), 10015 Old Columbia Road, Suite B215, Columbia, Maryland 21046 Telephone: 301-596-2583 Website: www.chainlinkinfo.org

1. Chain Link Fence Manufacturer's Institute "Product Manual", as amended to date.
2. Chain link fencing and related components for temporary tree and plant protection shall comply with CLFMI recommendations.

D. Arborist Qualifications by one or more of the following: Certified Arborist certified by ISA, Certified Arborist-Municipal Specialist certified by ISA**,** Licensed Arborist in the State of Maryland**,** or Registered Consulting Arborist designated by ASCA**.**

E. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and will assign an experienced, qualified Arborist to Project site during execution of the Work.

F. Quality-Control Program: Prepare and submit a written program to demonstrate systematically the ability of personnel to properly follow procedures and handle materials and equipment during the Work without damaging trees and plantings.

1. Include Arborist's and Tree Service firm's responsibilities.
2. Include dimensioned diagrams for proposed placement of protection-zone fencing, gates and signage.
3. Adequate instructions given to workers on the use and care of protection zones, and enforcement of requirements for protection zones.

1.8 FIELD CONDITIONS

A. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, and excavated material.
2. Moving or parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation and proposed disturbances, unless otherwise indicated or prior written permission is provided by the Arborist and Landscape Architect.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Planting Mix for Adjusting Grades:

1. Satisfactory stockpiled on-site topsoil mixed with prepared Planting Mix (refer to Section 329113 “Soil Preparation” for Planting Mix requirements), having satisfactory moisture content and granular texture for installing around trees and plants.
2. Planting Mix shall be free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and all other extraneous materials harmful to plant growth.

B. Shredded Hardwood Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of the following:

1. Type: Shredded hardwood bark and wood chips, aged.
2. Size Range: Three (3) inches maximum length, one-half (1/2) inch minimum length, one (1) inch maximum diameter.
3. Color: Natural, dark brown.

C. Protection-Zone Fencing: Fencing shall be installed in temporary positions indicated and meeting the following requirements:

1. Chain-Link Protection-Zone Fencing: Galvanized-steel fencing, fabricated from 2-inch opening (maximum), 0.148-inch diameter wire chain-link fabric, as indicated.

a. Pipe posts, minimum 2-3/8-inch O.D. line posts, and 2-7/8-inch O.D. corner and pull posts.
b. 0.177-inch diameter top tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.
c. 0.177-inch diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.
d. Height: As indicated.

D. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes pre-punched and reinforced; legibly printed with nonfading lettering in accordance with local regulations, and as follows:

1. Sign Size and Text Style: As indicated.
2. Lettering: 3-inch high black characters on white background.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Erosion and Sediment Control Devices and Measures: Examine the site to verify that temporary erosion and sediment control devices and measures are in place.

1. Meet on-site with the Arborist and Grading/Sediment Control Inspector to resolve potential conflicts, and to make minor adjustment of devices and measures with the Inspector's approval in the field.
2. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

B. Prepare written report from Arborist to Landscape Architect listing conditions detrimental to tree and plant protection. Provide written recommendations for proposed corrective action.

3.2 PREPARATION

A. Locate and clearly identify trees, shrubs and shrub beds, and all other designated vegetation to remain with sequential numbering and labeled as such on a copy of the applicable Existing Conditions & Demolition Plan. Submit the marked-up Drawing to the Landscape Architect and Architect for review and approval.

1. For trees to remain, label and tie a 1-inch blue vinyl tape around each tree trunk at fifty-four (54) inches above the ground.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

C. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.

1. Apply 4-inch uniform thickness of shredded hardwood mulch unless otherwise indicated. Do not place mulch within six (6) inches of tree trunks.

3.3 PLANT PROTECTION-ZONES

A. Plant Protection-Zone Fencing:

1. Install protection-zone fencing along edges of protection zones as indicated before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people and animals from easily entering protected areas except by entrance gates.

2. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

3. Chain-Link Fencing: Install as indicated and noted, and comply with CLFMI recommendations and ASTM F567 requirements.

a. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings.
b. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Landscape Architect and Owner's Representative.

4. Access Gates: Install where indicated.

    a. Adjust to operate smoothly, easily, and quietly; free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction throughout entire operational range.
    b. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Plant Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Landscape Architect.

1. Install one sign spaced approximately every twenty (20) feet on protection-zone fencing, but no fewer than four (4) signs with each facing a different direction.

C. Maintain protection-zone free of weeds and trash, fencing and signage in good condition as acceptable to Landscape Architect. Remove when construction operations are complete and equipment has been removed from the site.

1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
2. Temporary access might be allowed, subject to preapproval in writing by Arborist, if recommended root buffer protection to avoid soil compaction is installed as directed by Arborist. Maintain root buffer as long as temporary access is allowed.

3.4 EXCAVATION

A. General: Excavate at edge of protection zones where indicated adjacent to protection zones according to requirements in Section 312000 "Earth Moving".

B. Trenching within Protection Zones: With Arborist and Landscape Architect’s advance written permission, where utility trenches are required within Plant Protection-Zones, excavate under or around tree roots by hand or with air spade, tunnel under the roots by drilling, auger boring, or pipe jacking.

1. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities.
2. With Arborist’s approval, cut roots as required for root pruning. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots.

C. Redirect roots in backfill areas where possible.

1. If encountering large, main lateral roots, with Arborist’s direction expose roots beyond excavation limits as required to bend and redirect them without breaking.
2. If encountered immediately adjacent to location of new construction, and redirection is not practical, cut roots approximately three (3) inches back from new construction and as required for root pruning.

D. Do not allow exposed roots to dry out before backfilling with Planting Mix.

1. With Arborist’s approval, install temporary earth cover or pack using peat moss and wrap with burlap.

2. Water as required to maintain in a satisfactory moist condition.
3. Install temporary support and protect roots from damage until they are permanently relocated and covered with Planting Mix.

3.5 ROOT PRUNING

A. Prune tree roots that are affected by temporary and permanent construction. Prune roots as directed by Arborist and in accordance with ANSI Standard A300, Part 8, as amended to date and as follows:

1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
2. Cut Ends: Do not paint cut root ends.
3. Temporarily support and protect roots from damage until they are permanently redirected and covered with Planting Mix.
4. Cover exposed roots with burlap and water regularly.
5. Backfill as soon as possible as directed by Arborist.

B. Root Pruning at Edge of Plant Protection-Zones: Prune tree roots six (6) inches inside of the protection zone by cleanly cutting all roots to the depth of the required excavation.

C. Root Pruning within Plant Protection-Zones: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems as directed by Arborist. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

3.6 BRANCH AND CROWN PRUNING

A. Prune branches that are affected by temporary and permanent construction. Prune branches as directed by Landscape Architect and Arborist.

1. Prune to remove only injured, broken, dying, or dead branches and do not prune for shape unless directed by Landscape Architect.
2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
3. Pruning Standards: Prune trees according to ANSI A300 (Part 1) as amended to date.
4. Type of Pruning: Raising and thinning as directed by Landscape Architect and Arborist.

B. Do not cut tree leaders.

C. Cut branches with sharp pruning instruments; do not break or chop.

D. Do not paint or apply sealants to wounds.

E. Provide subsequent maintenance pruning during the Project Warranty period as recommended by Arborist.

F. Remove all pruned branches and dispose of off-site.

3.7 REGRADING

A. Lowering Grade beyond Plant Protection-Zones: Where proposed finish grades are indicated to be lower than existing grade beyond the Plant Protection-Zone, provide satisfactory slope and grade transition as directed by Landscape Architect. Maintain existing grades within the Plant Protection-Zone.

B. Lowering Grade within a Plant Protection-Zone: Where proposed finish grade is indicated to be lower than existing grade around existing trees and vegetation, install Planting Mix and other measures indicated. Provide satisfactory slope and grade a transition away from existing trees and vegetation as directed by Landscape Architect and Arborist.

1. Root Pruning: Prune tree roots exposed by lowering the grade.
2. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as directed for root pruning.

C. Raising Grade within a Plant Protection-Zone: Where proposed finish grade is indicated to be higher than existing grade around existing trees and vegetation, install Planting Mix and other measures as indicated. Provide satisfactory slope and grade a transition within and beyond the Plant Protection-Zone as directed by Arborist and Landscape Architect.

D. Minor Fill within Plant Protection-Zones: Where existing grade is two (2) inches or less below proposed finish grade elevations, fill with Planting Mix as indicated. Place Planting Mix in a single layer, hand grade and lightly compact to designated proposed s finish grade elevations.

3.8 FIELD QUALITY CONTROL

A. Inspections: Engage a qualified Arborist to direct plant-protection measures, root and crown pruning, and other necessary Work for trees, shrubs, and other vegetation to remain in a healthy condition.

1. Prepare and submit inspection reports to the Landscape Architect and Owner’s Representative.

3.9 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain, or be relocated, that are damaged by construction operations, as directed by Arborist and Landscape Architect.

1. Submit details of proposed pruning and repairs for approval by Arborist and Landscape Architect.
2. Perform repairs of damaged trunks, branches, and roots within twenty-four (24) hours according to Arborist’s written instructions.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as directed by Landscape Architect.

B. Existing Non-Specimen Trees: Remove and replace existing trees indicated to remain that are more than twenty-five (25) percent dead, or in an unhealthy condition, due to damage during construction operations that Landscape Architect determines are incapable of restoring to normal growth pattern.

1. Small Tree: Provide one (1) new tree of same size and species as those being replaced for each tree that measures four (4) inches or smaller in caliper size.
2. Non-Specimen Large Tree: Provide three (3) new trees of 6-inch caliper size for each tree being replaced that measure more than six (6) inches in caliper size.
3. Species: To be selected by Landscape Architect.
4. Plant and maintain replacement trees as specified in Section 329300 "Plants."

C. Existing Specimen Trees: Damage to an existing specimen tree will require assessment by the Arborist to determine the extent of damage and proposed measures in an attempt to repair and/or mitigate unrepairable damage to each individual specimen tree.

1. Prior to implementing proposed repairs and/or remedial measures, the Arborist shall submit a detailed description with associated cost estimate for each option for the proposed repairs and remedial measures to the Landscape Architect and Owner’s Representative for review and approval.
2. The Contractor and Arborist shall implement the approved repairs and remedial measures at no additional cost to the Owner.

3.10 DISPOSAL OF SURPLUS SOIL, TRIMMINGS, MULCH AND WASTE MATERIALS

A. Trimmings: Immediately dispose of branches and limbs removed as the result of crown and branch thinning and selective thinning.

B. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a 4-inch uniform thickness.

C. Remove all excess excavated soil and temporary protection-zone fence at the completion of construction.

1. Dispose of trees removed for replacement, branches and related trimmings, trash, and debris.
2. Legally dispose of all materials off of the Owner's property.

END OF SECTION 015639

SECTION 017123

FIELD ENGINEERING

PART 1 - GENERAL

1.1. RELATED DOCUMENTS:

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this Section.

B. Throughout the Specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Engineer for consideration. Those judged to be equal to that specified will receive written approval.

C. Baltimore County, Department of Public Works, Standard Specifications for Construction and Materials, as amended to date.

D. Baltimore County, Department of Public Works, Standard Details for Construction, dated February 2000, and as amended to date.

E. Additional requirements for “Field Engineering” may also be described in other Sections of the Project Specifications.

1.2. SUMMARY

A. Work included: All Work shall be furnished and provided at the Contractor's expense, such field engineering services as are required for proper execution of the Work.

B. The Contractor shall be responsible for all stakeouts and elevation checks required for proposed construction. All such Work shall be performed by a Professional Land Surveyor. The Surveyor shall verify adequacy of Project benchmarks before starting construction.

C. Before the start of any construction, the Contractor shall have a Professional Land Surveyor locate and stakeout proposed driveways and parking areas, walkways, steps and retaining walls, utility structures and light poles, and site features shown on the Site Geometry Plan. If there are discrepancies between the preliminary stake-out and the Site Geometry Plan, they shall be brought to the attention of the Engineer and resolved before Work proceeds. A site stake out drawing stamped and signed by the Professional Land Surveyor may be submitted in addition to the preliminary stake out.

D. At the end of the Project, the Contractor shall have a Professional Land Surveyor prepare and certify an “As-Built” survey showing the accurate horizontal and vertical locations of all completed grading, paved areas and sidewalks, fencing, retaining walls, site lighting,

stormwater management facilities, and all significant features located within the limits of the Project.

E. "As-Built" survey shall be submitted in a current Computer Aided Design (CAD) format such as "AutoCAD Civil 3D" or "MicroStation" and shall include 2-foot contours within the Limits of the Project.

F. The Contractor shall submit to Property Management all related materials necessary for Stormwater Management "As-Builts" that meet Baltimore County requirements, including but not limited to, the survey indicated in Paragraphs C and D above, material tickets, digital photographs of the completed stormwater facilities, including geotechnical certifications as necessary for subgrade and compaction testing reports, and other related items.

1.3. QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.

1.4. SUBMITTALS

A. Comply with pertinent provisions of Section 017700 "Closeout Procedures".

B. Upon request of the Engineer, submit;

1. Data demonstrating qualifications of persons proposed to be engaged for field engineering services.
2. Documentation verifying accuracy of field engineering work.
3. Certifications, signed by the Contractor's retained field engineer, certifying that elevations and locations of improvements are in conformance with requirements of the Contract Documents.
4. All certifications and surveys described in the Summary section of this Specification section.

1.5. PROCEDURES

A. In addition to procedures directed by the Contractor for the proper performance of the Contractor's responsibilities:

1. Locate and protect survey control points before starting Work on the site.
2. Preserve permanent survey reference points during process of the Work.
3. Do not change or relocate survey reference points or items of the Work without specific approval from the Engineer.
4. Promptly advise the Engineer when a survey reference point is lost or destroyed, or requires relations because of other changes in the Work.

a) Upon direction of the Engineer, require the field engineer to replace survey reference stakes or markers.

b) Locate such replacements according to the original survey control.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION (As Required to Complete the Work)

END OF SECTION 017123

SECTION 017419

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements for waste reduction and for the recycling of non-hazardous, recyclable, construction and demolition debris.

1. Reduce waste by minimizing factors that contribute to waste.

1.3 DEFINITIONS

A. Waste Reduction: Construction practices that achieve the most efficient use of resources and materials; uses water efficiently; avoids practices such as over-packaging, improper storage, ordering errors, poor planning, breakage, mishandling and contamination.

B. Construction and Demolition Debris: Solid wastes arising from demolition or removal, excess or unusable construction materials, packing materials for construction products, and other materials generated on site during the construction process but not incorporated into the Work.

C. Recyclable Materials: Construction and demolition debris that can be recovered and processed into new products or materials. Recyclable materials include, but are not limited to, the following:

1. Metals: Ferrous (iron, steel, stainless steel, galvanized steel, etc.) and non-ferrous (copper, brass, bronze, aluminum, etc.) types and containers made from metals such as but not limited to pails, buckets, and beverage cans.
2. Milled hot-mix asphalt paving materials.
3. Cleared and demolished concrete paving and related materials.
4. Wood products, including untreated dimensional lumber, plywood, oriented strand board, hardboard, particleboard, crates and pallets made from wood products.

D. Non-Recyclable Materials: Construction and demolition debris not capable of being reused or reprocessed, exclusive of the recyclable materials listed above. In addition, construction and demolition debris deemed unsuitable for reuse based on sampling analytical data or geotechnical criteria.

E. Hazardous Materials: Construction and demolition debris that are regulated for disposal by applicable City of Baltimore, Baltimore County, State of Maryland, and Federal authorities having jurisdiction.

1.4 SUBMITTALS

A. Construction Waste Management Program: Submit the proposed location where all construction waste will be transported to and disposed of.

1. Submit verification of the materials being legally disposed of.

B. Project Closeout: Upon project completion submit the Waste Management Records to the Property Management.

1.5 QUALITY ASSURANCE

A. Disposal Sites and Waste Material Processors: Use only facilities with valid legal permits for disposal, recycling and waste processing issued by the jurisdictions in which they are located.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Distribution: The Contractor shall distribute copies of the Waste Management Plan to the Contractor’s Foreman, each Sub-contractor, Baltimore County Property Management and the Owner’s Representative.

B. General: For the duration of the project implement and maintain construction waste management. During the prosecution of the Work encourage the practice of efficient waste reduction when sizing, cutting, and installing products and materials.

C. Transportation: Arrange for the regular collection, transport from the site, and delivery of the construction wastes and debris to the designated recyclers, and waste material processors and disposal sites.

END OF SECTION 017419

SECTION 017700

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for Contract closeout, including but not limited to, the following:

1. Substantial Completion procedures.
2. Final Completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

B. Related Requirements:

1. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.

1.3 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

1.4 MAINTENANCE REFERENCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Reference Material Submittal Items: Include maintenance reference material submittal items specified in other Sections.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's Punch List), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of ten (10) days prior to requesting inspection for determining date of Substantial Completion. List items

below that are incomplete at time of request.

1. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
2. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications and related documents.

C. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of ten (10) days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.6 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), certified and dated by Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of ten (10) days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. A back-

punch inspection will be conducted to verify all Punch List items have been properly addressed.

B. The list will be compiled by all stakeholders, including but not limited to the Department of Property Management, the Department of Recreation and Parks, the Engineer, and other applicable Baltimore County and State of Maryland agencies.

1.8 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

1. Warranty Electronic File: Scan warranties and bonds and assemble complete a Warranty and Bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
2. All Operation and Maintenance information shall be included in the Warranty submittal package.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (As Required to Complete the Work)

END OF SECTION 017700

SECTION 017839

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.
4. Miscellaneous record submittals.
5. Stormwater Management “As-Built” Data.

B. Related Requirements:

1. Section 017123 “Field Engineering” for final property survey.
2. Section 017700 “Closeout Procedures” for general closeout procedures.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of Record Drawings as follows:

a. Initial Submittal:

1) Submit PDF electronic files of scanned record prints and one of file prints.

b. Final Submittal:

1) Submit PDF electronic files of scanned Record Drawings and three (3) sets of paper prints.
2) Print each drawing, whether or not changes and additional information were recorded.

B. Record Specifications: Submit annotated PDF electronic files of the Project’s Specifications, including Addenda and Contract modifications.

C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities.

1. Submit annotated PDF electronic files and directories of each submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark Record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, Sub-contractor, or related entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations below first floor.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. At the end of the project, the Contractor shall have a Professional Land Surveyor prepare and certify an "As-Built" survey showing the accurate constructed horizontal and vertical locations of all constructed driveways and parking areas, walkways, steps and retaining walls, utility structures and light poles, and site features located within the Limit of the Project.

C. "As-Built" Survey shall be submitted in a current Computer Aided Design (CAD) format such as "AutoCAD Civil 3D" or "MicroStation" and shall include 2-foot contours within the Limits of the Project.

D. The Contractor shall provide to property management all materials necessary for stormwater management "As-Builts" that meeting county requirements including but not limited to the survey indicated in items C and D above, material tickets, digital photographs of the stormwater facilities, geotechnical certifications as necessary for subgrade, compaction, or other similar items.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark the Project Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, Addenda, and Contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. Note related Change Orders and record Drawings where applicable.

B. Format: Submit Record Project Specifications as scanned PDF electronic file(s) of marked-up paper copy of the Project Specifications.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders and record Drawings where applicable.

B. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.

C. Include record Product Data directory organized by Specification Section number and title,

electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as scanned PDF electronic file(s) of marked-up miscellaneous record submittals.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.

B. Maintenance of Project Record Documents and Samples: Store Project Record Documents and Samples in the field office apart from the Contract Documents used for construction.

1. Do not use Project Record Documents for construction purposes.
2. Maintain Project Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss.
3. Provide access to Project Record Documents for reference by the Owner’s Representative during normal working hours.

END OF SECTION 017839

SECTION 055214

EXTERIOR PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Hot-dipped galvanized steel handrails (railings).

B. Related Requirements:

1. Section 321314 “Concrete Paving and Retaining Walls” for cast-in-place concrete ramp site improvement associated with handrail installation requirements.

1.3 COORDINATION

A. Coordinate hot-dip galvanizing procedures with fabrication of handrails.

B. Coordinate installation procedures for handrails. Provide recommendations for installing handrail assemblies, including cores in cast-in-place concrete.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Welded handrail assemblies.
2. Nonshrink, nonmetallic grout.

B. Shop Drawings: Include fabrication plans, elevations, sections, details, expansion joints, and attachments for handrails.

C. Samples for Verification: For each type of exposed finish.

1. Assembled sample of handrail systems, made from full-size components, including top rail, posts, handrail, and infill. Sample shall be full height.
2. Show method of connecting and finishing members at intersections.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For handrail fabricator.

B. Welding certificates.

1.6 QUALITY ASSURANCE

A. American Society for Testing & Materials, International (ASTM) referenced publications.

B. American Welding Society (AWS) Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Americans with Disabilities Act (ADA), 2010 ADA Standards for Accessible Design regulations, as amended to date, published by the United States Department of Justice.

D. National Ornamental & Miscellaneous Metals Association (NOMMA) referenced publications.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes on exposed surfaces of handrails from damage during shipping and immediately prior to installation.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify field dimensions of cast-in-place concrete ramp site improvements, and other contiguous construction, prior to handrail fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Handrails, including post embedment, shall withstand the effects of applicable loads and stresses in accordance with State and local code requirements.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS

A. General: Provide metal materials with smooth surfaces without fabrication seam marks, stains, discolorations, or blemishes.

2.3 HOT-DIPPED GALVANIZED STEEL HANDRAILS

A. Source Limitations: Obtain handrail materials from a single source and handrail assemblies from a single fabricator.

B. Tubing: ASTM A500 (cold formed) or ASTM A513, Type 5.

1. Hot-dipped galvanized steel.

C. Pipe: ASTM A53, Type F or Type S, Grade A, Standard Weight (Schedule 40).

1. Hot-dipped galvanized steel.

2.4 MISCELLANEOUS MATERIALS

A. Handrail Connection Pieces: As indicated.

B. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.

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

2.5 ANCHORING CEMENT- NON SHRINK GROUT

A. Anchoring Cement- Non Shrink Grout shall be “Super Por-Rok” Anchoring Cement - Non-shrink Grout as manufactured by the following, or approved equal:

CGM Incorporated
1445 Ford Road
Bensalem, Pennsylvania 19020
Telephone: 215-638-4400 Website: www.cgmbuildingproducts.com

1. Factory-packaged, nonstaining, noncorrosive, nonshrink grout formulation, without gypsum materials, for mixing with water at Project site to create pourable anchoring and grouting compound.
2. Complying with ASTM C1107/C1107M and ASTM C109.
3. Provide anchoring cement-nonshrink grout, recommended in writing by manufacturer, specifically for exterior applications.

2.6 FABRICATION

A. General: Fabricate handrails to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop-fabricate and assemble handrails to minimize field splicing and assembly.

1. Clearly mark units for reassembly and coordinated installation.
2. Use connections that maintain structural value of joined pieces.

C. Cut metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
2. Remove sharp and rough areas on exposed surfaces.

D. Form work true to line and level with accurate angles and surfaces.

E. Connections: Fabricate handrail and pedestrian guardrails with welded connections as indicated.

F. Welded Connections: Cope components at connections to provide tight fit. Weld all around at connections.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #2 welds: Completely filled joint, good appearance.

G. Form changes in direction as follows:

1. Fabricate angles and radius bends to prevent distortion of handrail members.

H. Bend members in jigs to produce uniform curvature for each configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

I. Each handrail assembly shall be hot-dip galvanized after fabrication.

2.7 HOT-DIPPED GALVANIZED STEEL HANDRAIL FINISH

A. Hot-dipped Galvanized Steel Handrails Finish:

1. Prepare the fabrication with drainage and vent holes prior to hot-dip galvanizing.
2. Comply with ASTM A123 after fabrication.
3. Finish shall be continuous, smooth and uniform, without issues that will interfere with each fabrications intended use.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine completed cast-in-place concrete steps and applicable features to confirm if conditions are satisfactory to receive handrails. Notify Landscape Architect of unsatisfactory conditions prior to installing any handrail assembly.

3.2 INSTALLATION, GENERAL

A. Handrails:

1. Install handrail in locations, lines, alignment, and elevations indicated.
2. Do not cut or abrade surfaces of railing assemblies that are finished after fabrication.
3. Set posts plumb within a tolerance of 1/16 inch in 3 feet of height.

B. Adjust handrail assemblies to proper position before final embedment in concrete to achieve accurate alignment and required height and elevations.

3.3 HANDRAIL CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for shop-welded connections in "Fabrication" Article above.

B. Expansion Joints: Install expansion joints at locations to accommodate thermal movement. Provide slip-joint internal sleeve, extending 2 inches beyond joint on either side; fasten internal sleeve securely to one side; and locate joint within 6 inches of post. Indicate locations of all expansion joints in shop drawing submission.

3.4 ANCHORING POSTS

A. Core-drill holes 1/2 inch larger than OD of post for installing posts in concrete.

B. Clean holes of loose material, insert posts, and fill annular space between post and concrete with anchoring cement-nonshrink grout, mixed and placed to comply with anchoring cement-nonshrink grout manufacturer's written instructions.

3.5 CLEANING

A. Hot-dipped Galvanized Surfaces: Clean in accordance with American Galvanizers Association recommendations.

3.6 PROTECTION

A. Protect finishes of railings from damage during construction period using satisfactory temporary protective coverings. Remove protective coverings at time of Substantial Completion.

B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 055214

SECTION 260010 - ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, shall apply to this Specification Section. Division 26 Specification Sections and other Specification Sections where electrical work is indicated or described, shall also apply to this Specification Section.

1.2 GENERAL REQUIREMENTS

A. The requirements indicated in this specification section shall apply to all electrical work.

B. Equipment: All electrical equipment, including but not limited to, wiring devices, wiring materials and electrical construction materials shall be new and of the highest quality and latest improved design.

C. Workmanship: Workmanship shall be of the highest grade and all installation work shall be performed by thoroughly qualified mechanics of the appropriate trade. All equipment shall be installed and connected in accordance with the best engineering practice. Manufacturer’s instructions and recommendations shall be followed and all electric connections shall be provided.

D. Completeness: The Contractor shall furnish and install all labor, materials, tools, equipment, programming, software, startup, licenses, and services as required to make all equipment complete and fully operational. Provide all required mounting hangers, supports, hardware and accessories to install all equipment and devices. Make all equipment and devices complete and fully operational.

E. Drawings: The drawings showing the layout of the electrical system indicate approximate locations of outlets, apparatus and equipment. The runs of feeders and branches as shown, the drawings are schematic only and are not intended to show the exact routing and location of conduits and conduit terminations. The final determination as to routing, location and termination shall be governed by structural conditions, obstructions and job conditions. This shall not be construed to mean that the design of the system may be changed without the written approval of the Engineer; it merely refers to the exact run of raceways and the exact placement of outlets, etc. It shall be the Contractor's responsibility to obtain all shop drawings affecting conduit terminations to the equipment specified in this or other sections or furnished by others, and to verify conduit locations before installation. The Contractor shall consult all contract drawings and specifications which may affect the location of any outlet, equipment or conduit run, to avoid improper locations of such items and to avoid interference with other trades.

F. Accessibility: Electrical equipment such as junction and pull boxes, panelboards, switches, controls, and other apparatus that may require maintenance or operation from time to time, shall be made easily accessible. Although the equipment may be shown on the drawings in certain locations, in the course of building construction, it may develop that such locations do not

afford proper accessibility, in which case the Contractor shall direct the Engineer's attention to the condition before advancing the construction.

G. Site examinations: All bidders, prior to submitting a bid, shall thoroughly acquaint themselves with the conditions under which the work will be performed. No allowance shall be made subsequently in connection with this, for any error or negligence on the contractor's part.

H. Unless noted as "EXISTING", "BY OTHERS" or "NIC", all work, devices and equipment are new and shall be furnished and installed by the contractor.

I. The contractor shall comply with all the requirements indicated in the contract documents. The contractor shall provide all the items indicated in the contract documents, without any additional cost or time extension, regardless of whether or not the item is a special order, the item is in short supply, the item has a minimum quantity order requirement, the item has a long lead time, and/or the item has additional/non-standard costs associated with it. The contractor shall coordinate with the manufacturer and supplier of the item prior to submitting a bid.

J. Where there is a conflict in the Contract Documents, contact the owner and the engineer immediately. The owner and the engineer will provide further direction. For pricing and bidding purposes, the more stringent or higher quality requirement shall be used. All work shall comply with all applicable codes, and shall be inspected and approved by the Authority Having Jurisdiction.

K. Furnish and install devices and equipment in accordance with the NEC, the manufacturer's recommendations, and the contract documents.

L. All devices and equipment shall be suitable for its intended use, environment, and location in the accordance with the NEC, UL, the manufacturer's recommendations and the contract documents.

M. All work shall be coordinated with the electrical contractor.

N. Wire lugs, connectors and splices shall be UL Listed and shall be compatible with the wire size/material/type. Coordinate equipment and wiring to ensure that they are compatible with each other.

O. The following applies to circuits rated 600V or less:
   1. For circuits rated 100 amperes or less, or marked for 14 AWG through 1 AWG conductors, the equipment shall be listed and identified for use with 75 degrees C conductors, unless otherwise noted.

P. The ABBREVIATIONS indicated in the electrical drawings shall also apply to the abbreviations used in the electrical specifications, unless otherwise noted.

Q. Exact location of electrical receptacles/floor boxes and/or electrical connections to equipment shall be coordinated with the exact location of items in the field (including, but not limited to, the following: exact location of cabinets/backsplashes/countertops/electrified systems furniture associated with the receptacles/floor boxes, exact locations of equipment, etc.); and, shall be coordinated with the exact location of wire terminals at the equipment (which shall be based on the wiring diagrams of the equipment, the installation manuals of the equipment, and/or coordination with the manufacturer). Coordination shall take place prior to starting any work.

R. Wet Locations:
   1. The following areas shall be considered Wet Locations and shall be provided with equipment/materials that are suitable for Wet Locations in accordance with the NEC and the contract documents:
      a. All outdoor or exterior locations
   2. Hangers, supports, raceways, boxes, and other equipment/materials shall be suitable for use in Wet Locations in accordance with the NEC and the contract documents.

S. Do not exceed the maximum wire pulling tension recommended by the wire manufacturer. Coordinate with the wire manufacturer as required. Pull wire through handholes, manholes, and other underground structures in a manner that shall minimize the pulling tension on the wire.

T. Prior to installing the equipment, the contractor shall field survey and verify the exact locations where the equipment are being installed, and shall notify the engineer immediately if there are any issues or conflicts. Also, prior to installing the equipment, the contractor shall coordinate the exact location of the equipment with the engineer, whether or not there are any issues or conflicts. Prior to installing the equipment, the contractor shall adjust the exact locations of the equipment, in accordance with the direction provided by the engineer. The contractor's bid price shall include adjusting the exact locations of the equipment up to 12 feet away (within the same room) from the locations indicated in the plan drawings.

U. Mounting heights indicated in the Contract Documents are measured from the finished floor or finished grade to the bottom of the equipment, unless otherwise noted.

V. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

W. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

X. Provide touch up paint as required on equipment finishes that have been scratched, and provide touch up paint as directed by the Engineer. Touch up paint shall be provided in accordance with the manufacturer's recommendations. Do not allow paint to come in contact with conductors, insulation or any live parts. All nameplates and labels shall remain visible and legible.

Y. Unless the context otherwise requires, a reference to one gender shall include reference to the other genders. For example, the word "his" shall be interpreted to include both the masculine and feminine genders.

Z. Where the contract documents specifies a product name, model, or manufacturer, and this product has been discontinued or is no longer in production, the contractor shall provide a product from the same manufacturer, that meets the requirements indicated in the contract documents, at no additional cost to the owner. The product provided by the contractor shall be an approved equal of the specified product. Also, the contractor shall provide a written statement from the specified manufacturer, indicating that the specified product has been discontinued or is no longer in production. All products shall be submitted for review and approval by the design team.

1.3 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies: Comply with electrical construction code requirements of State, City and such other local political subdivision specifications as may exceed the requirements of national codes, standards and approving bodies.

B. All electrical equipment installed under this contract shall bear UL label. Equipment shall be installed in accordance with the requirements of UL and the manufacturer.

C. Comply with the National Electrical Code.

D. Certificates and Permits: Upon completion of work, and prior to final payment, furnish to the Engineer formal certification of final inspections from authorities having jurisdiction and secure required permits or certificates (if any) from such authorities. Additionally, prepare detailed diagrams and drawings which may be required by those authorities having jurisdiction. All the cost for obtaining certificates and permits will be paid by the Contractor.

1.4 REFERENCES AND DEFINITIONS

A. Basic References: The following codes, standards, and approvals as referenced throughout the drawings and specifications, shall serve as the minimum standards and quality requirements directly appropriate to the work and workmanship. References to catalogs, standards, codes, specifications and recommendations, etc., means latest edition of such publications in effect at the date of invitation to submit bid.

1. American National Standards Institute (ANSI): ANSI C2; National Electrical Safety Code .
2. National Electric Manufacturer's Association (NEMA) Standards as apply to specified Products.
3. National Fire Protection Association (NFPA): NFPA 70 (National Electrical Code), NFPA 72 (National Fire Alarm Code), NFPA 70E (Standard for Electrical Safety Requirements for Employee Workplaces), and other applicable NFPA codes
4. Underwriters' Laboratories, Inc. (UL) Listings, Labels, and Approvals shall govern the quality and performance of specified Products.
5. Americans with Disabilites Act (ADA)
6. Institute of Electrical and Electronics Engineers, Inc (IEEE)
7. National Electrical Contractor’s Association (NECA)
8. International Electrical Testing Association (NETA)
9. Occupational Safety and Health Administration (OSHA)
10. Code of Maryland Regulations (COMAR)

B. Definitions:

1. “Provide” - means “furnish and install”
2. “Indicated” - means “indicated in contract documents”
3. “Concealed” - means items referred to are hidden from normal sight, this includes items partly excavated or crawl spaces and in service tunnels used solely for repairs and maintenance
4. “Exposed” - means items are not “concealed”

5. "Feeder" - means "All circuit conductors between the service equipment, the source of a separately derived system, or other power supply source and the final branch-circuit overcurrent device"
6. "Feeder circuit breakers" - means circuit breakers protecting feeders.
7. NETA ATS - International Electrical Testing Association Acceptance Testing Specifications, Latest Edition
8. "Building" – A structure that stands alone or that is cut off from adjoining structures by fire walls with all openings therein protected by approved fire doors
9. "degrees C" – means "degrees Celsius"
10. "degrees F" – means "degrees Fahrenheit"
11. "homerun" – This word shall refer to that portion of the electrical circuit wiring and conduit between the circuit breaker or fuse protecting the electrical circuit, and the first equipment or load on the electric circuit. There is no other equipment or load on the electrical circuit between the first equipment or load, and the circuit breaker or fuse. For example, a 120V, 20A circuit breaker feeds #12 AWG wiring which connects to 3 – NEMA 5-20R receptacles. The wiring and conduit that runs from the circuit breaker to the 1st receptacle is considered the homerun wiring and conduit. There is no other receptacle on the electrical circuit between the 1st receptacle and the circuit breaker.
12. "duct" – This word shall mean conduit that are installed underground
13. "Branch circuit" – means "The circuit conductors between the final overcurrent device protecting the circuit and the outlets(s)."
14. "Suspended ceiling" – Suspended ceiling (sometimes referred to as dropped ceiling or false ceiling) is a secondary ceiling suspended or supported from the building structure above, creating a void between the underside of the building structure and the top of the suspended ceiling. Suspended ceilings include, but are not limited to, grid type ceilings, gypsum board ceilings, drywall type ceilings, and other ceilings which are located below the building structure. Suspended ceilings are either accessible ceilings (including, but not limited to, grid type ceilings with removable ceiling panels or tiles) or non-accessible ceilings (including, but not limited to, gypsum board ceilings and drywall type ceilings).
15. "Equipment" shall include, but not be limited to, fittings, devices, appliances, luminaires, apparatus, machinery, and the like used as a part of, or in connection with, an electrical installation.

1.5 SUBMITTALS

A. Product Data: Submit Product Data applicable to items listed under Submittals in each individual Specification Section; and such items as may be indicated on the Drawings.

B. Coordination Drawings:

1. Where the contractor has any question or request-for-information that relates to locations of equipment, or coordination of equipment locations, the contractor shall provide a coordination drawing together with the question or request-for-information. The coordination drawing shall have reflected ceiling plans, structural plans, floor plans and other relevant drawings, drawn to scale on one drawing, on which the following items are shown and coordinated with each other, based on actual dimensions of the items, input from actual installer of the items involved, and existing conditions (the contractor shall field measure all existing conditions):

    a. Routing of underground ducts or ductbanks.

b. Routing of conduit encased in concrete slab.
c. Routing of electrical wiring/conduit
d. Structural beams, trusses and columns.
e. Motors and all other mechanical equipment.
f. Mechanical pipes and ducts
g. Junction/pull boxes and electrical enclosures
h. Electrical Distribution Equipment (switchgear, transformers, motor control centers, panelboards, switchboards, etc.)
i. All equipment/devices which are relevant to the question or request-for-information

C. Shop Drawings

1. General: The Contractor shall submit to the Engineer for approval, before fabrication, detailed shop drawings for all electrical equipment and materials.
2. Shop drawings shall clearly indicate, using arrows and/or highlighting on all copies, which items are being submitted and that each item being submitted is in compliance with all requirements on the drawings and in these specifications. All pertinent specification and drawing requirements shall be indicated on the manufacturer's drawings. Complete model number of equipment shall be indicated.
3. Shop drawing shall include a cover sheet that indicates the project name, the name of the contractor, and the name of the supplier/distributer.
4. Shop drawing shall have a summary page that indicates the following: quantities of all equipment, manufacturer/model number for all equipment, and lead time for all equipment.
5. Shop drawings of related equipment shall be submitted together.

D. "As-Built" Drawings:

1. The contractor shall provide "as-built" drawings, in both electronic and hardcopy formats. The contractor shall provide accurate project record drawings, showing in red color on the working drawings and electrical drawings, all changes, modifications, and alterations from the original drawings, made during installation of the work. Upon completion of the work, the contractor shall provide the Owner with a USB drive that has an electronic copy of the project record drawings, and a full size hardcopy of the project record drawings.

E. Operating and Maintenance Manuals

1. General: Upon completion of the work, the Contractor shall furnish Operating and Maintenance Manuals for use by the Owner. The manuals shall include operating and maintenance information on all systems and items of equipment. The data shall consist of catalogs, brochures, bulletins, charts, schedules and drawings describing location, operation, maintenance, lubrication, operating weight and other information necessary for the Owner to establish an effective operating and maintenance program.
2. Shop Drawings: Copies of appropriate shop drawings shall be included in the Operating and Maintenance Manuals. The requirements for manuals is a separate contractual item and in no way supersedes the requirements for shop drawings and vice-versa.
3. Approval: Completed manuals shall be submitted to the Engineer for review and approval. Incomplete or inadequate manuals will be returned to the Contractor for correction and resubmission.

4. Provide an electronic copy (PDF format) on 3 USB drives, and 3 hardcopies in 3-ring binders, of all operating and maintenance manuals, unless a greater quantity is specified elsewhere in the contract documents, in which case the greater quantity shall apply. Each drive and each hardcopy shall have all the operating and maintenance manuals for all the equipment.
5. Equipment keys and passwords shall be provided to the Owner's authorized representative or representatives. A document shall be provided indicating who received the keys and what are the passwords. Document shall be neat and typewritten.
6. Provide a separate section in the O&M Manuals for maintenance testing schedules of all equipment. A factory authorized representative of the equipment manufacturer shall certify the maintenance program. Include calendar schedule in table format to indicate all maintenance actions included during the warranty period with spaces for future testing.
7. All factory and field test reports by the contractor, manufacturer, and/or independent testing company shall be included in the O&M Manuals.
8. Wiring diagrams for all factory and field wiring shall be included in the O&M Manuals.

F. Spare Parts and Accessories List

1. A complete list of spare parts and accessories for equipment shall be provided.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials and equipment to the Project site in a clean condition with openings plugged or capped (or otherwise sealed by packaging) both during shipping and during temporary storage.

B. Delivered electrical equipment crating and/or packaging shall clearly identify pick-points or lift-points. In the absence of crating or packaging, pick-points or lift-points must be identified on the equipment.

C. When unloading materials and equipment provide special lifting harness or apparatus as may be required by manufacturers. Handle materials and equipment in accordance with manufacturer's written instructions.

D. The Contractor shall determine the required equipment needed for unloading operations and have such equipment on site to perform unloading work on the date of equipment delivery.

E. Store materials and equipment, both on and off site, in accordance with manufacturer's written instructions. Keep equipment in a dry location.

1. Temporary Heating: Apply temporary heat to materials and equipment, according to manufacturer's written instructions, throughout periods when environment is not controlled for temperature and humidity within manufacturer's stipulated service conditions.

1.7 WARRANTY

A. The Contractor shall guarantee that all work performed, and all materials/equipment installed by him, are free from defects. The Contractor shall repair or replace any defective equipment,

materials or workmanship, free of cost to the Owner, for a period of two (2) years from the date of final acceptance of the Contractor's work. The date of final acceptance is determined by the Owner. Where individual specification sections indicate a Warranty period longer than two (2) years, the longer warranty period shall apply.

B. During this warranty period the Contractor shall:

1. Correct and make good all electrical defects. Faulty equipment and materials shall be repaired or replaced as required to produce satisfactory results as directed by the engineer and without additional cost to the Owner. Contractor shall provide service within 24 hours after the call has been made by the Owner.

1.8 DAMAGE TO OTHER WORK

A. Damage: Cutting or damage to existing structures, surfaces or installations shall be repaired at the expense of the Contractor. All such repairs or patching shall be neatly done by mechanics of the appropriate trade, and shall be done in such a fashion as to leave no readily apparent joint or change in appearance, and to leave no structural or other weakness.

1.9 TEMPORARY POWER

A. Contractor shall be entirely responsible for temporary power. The contractor shall provide temporary generators and temporary electrical equipment as required. The contractor shall apply for temporary electrical service from the utility as required. All applications, fees, temporary connections, etc. shall be made by the contractor.

B. The contractor shall provide wiring, conduit, connections, supports, and equipment as required to start/run the temporary power system, and keep it fully operational. All work shall comply with the NEC and the applicable codes.

C. Where temporary generators are provided, the contractor shall comply with the following:
1. The contractor shall monitor the temporary generator and the associated power distribution equipment remotely for low fuel level, alarms, and faults; and, shall provide all wireless communications equipment required for monitoring.
2. The contractor shall make sure that the generator has sufficient fuel, and is fully operational. The contractor shall refuel the generator as required.
3. The maximum noise produced by the generator shall not exceed 55dB at the property line.

D. The use of building power for temporary power is not allowed.

1.10 COORDINATION

A. General: The Contractor shall coordinate the work performed and equipment furnished by the Electrical Contractor with work performed and equipment furnished by other trades to ensure a complete and satisfactory installation.

B. For all site work, comply with all the requirements of the state or local jurisdiction which apply to locating existing utilities. The requirements in Maryland include, but are not limited to, contacting “Miss Utility” prior to starting any site work.

1.11 INTERRUPTION OF ELECTRIC SERVICE

A. Do not interrupt electric, data, telephone, and/or cable tv services to facilities occupied by the owner or others, unless permitted under the following conditions, and then only after arranging to provide temporary electric, data, telephone and/or cable tv services, according to requirements indicated:

1. Notify the owner no fewer than 14 days in advance of proposed interruption of electric, data, telephone, and/or cable tv services.
2. Do not proceed with interruption of electric, data, telephone, and/or cable tv services without the owner’s written permission.

1.12 CONTRACTOR’S CERTIFICATION

A. The Contractor shall submit a signed and dated letter to the owner and the engineer certifying the following:
1. He shall certify that all work has been performed in accordance with the contract documents (including, but not limited to: any amendments, addendums, and contract modifications) ;
2. He shall certify that all work has been inspected and approved by the Authorities Having Jurisdiction; AND,
3. He shall certify that all work has been performed in accordance with the National Electrical Code and all applicable codes.

1.13 TRACER WIRE

A. Provide tracer wire for underground civil and/or plumbing utilities in accordance with State, Local Jurisdiction, and/or Utility requirements. All work shall comply with the NEC, and State/Local Jurisdiction/Utility requirements. Coordinate with Civil and/or Plumbing drawings/specifications/contractors.

1.14 TRAINING

A. Provide training for all equipment. Schedule training with at least 21 days advance notice, to the owner and engineer, by submitting a draft training schedule. Indicate all proposed training dates with specific equipment descriptions. The Contractor shall then confirm these dates with the owner and engineer. After receiving approval of these dates, the Contractor shall submit a final training schedule at least 14 days prior to the agreed upon dates.

B. Provide a minimum of 4 hours of training for each equipment. Where individual specification sections indicate a training period longer than 4 hours, the longer training period shall apply.

C. Provide a video recording of all demonstration and training. The demonstration and training video shall be saved onto USB Flash Drives. 3 sets of USB Flash Drives shall be provided to the owner.

PART 2 - NOT USED

PART 3 - NOT USED

END OF SECTION 260010

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, shall apply to this Specification Section. Division 26 Specification Sections and other Specification Sections where electrical work is indicated or described, shall also apply to this Specification Section.

1.2 SUMMARY

A. Section Includes:

1. Electrical equipment coordination and installation.
2. Sleeves for raceways and cables.
3. Sleeve seals.
4. Grout.
5. Touch up paint
6. Common electrical installation requirements.
7. Wire guards.

1.3 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

C. NECA: National Electrical Contractors Association

1.4 SUBMITTALS

A. Product Data: Provide product data for all items indicated in this specification section.

1.5 COORDINATION

A. Coordinate arrangement, mounting, and support of electrical equipment:

1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for piping and conduit installed at required slope.

4. Connecting raceways, cables, wireways, cable trays, and busways shall be clear of obstructions and of the working and access space of other equipment.

B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

C. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed.

D. Coordinate sleeve selection and application with selection and application of firestopping.

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

A. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

B. Sleeves for Rectangular Openings: Galvanized sheet steel.

1. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches and no side more than 16 inches, thickness shall be 0.052 inch.
b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches and 1 or more sides equal to, or more than, 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE SEALS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

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. Advance Products & Systems, Inc.
b. Calpico, Inc.
c. Metraflex Co.
d. Pipeline Seal and Insulator, Inc.

2. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
3. Pressure Plates: Carbon steel. Include two for each sealing element.
4. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.3 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.4 ACCESS DOORS

A. Door and frame shall be constructed of steel, 16 gauge minimum. Access door shall have a continuous piano hinge. Door shall have a flush mounted lock. Finish shall be prime coat of rust inhibitive electrostatic powder, baked enamel. Access door shall be field painted to match the surrounding wall or ceiling.

B. Provide fire rated access doors to maintain the fire rating of wall and ceiling assemblies, to restore original fire-resistance rating of assembly.

2.5 DUCT-SEALING COMPOUND

A. Duct-sealing compound shall be Polywater FST Foam Sealant or approved equal. Duct-sealing compound shall be a 2-part, 98% closed-cell urethane foam. It shall react and set in 5-10 minutes at 70 degrees F. It shall be capable of sealing 3/4" to 10" conduits with multiple cable configurations. Duct-sealing compound shall be re-enterable. It shall be capable of withstanding temperatures from -20 degrees F to 200 degrees F continuous, and be chemically resistant to gasoline, oils, dilute acids, and bases. Duct-sealing compound shall not affect the physical or electrical properties of wires and cables.

B. Duct-sealing compound shall have good adhesion to duct and cable jacket surfaces with good structural strength. It shall have 120 lb compressive strength (ASTM D1621). Duct-sealing compound shall be capable of holding 22 feet water head pressure continuous, or 90 feet water head pressure short-term. It shall block up to 5 psi gas or vapor continuous. It shall meet NEC codes for Raceway Seals, meet UL 94 fire rating HBF, and be UL recognized.

C. Duct-sealing compound shall be compatible with the wires/cables used in the project. The cured foam is an inert solid that does not affect wire/cable components. It does not change the physical or electrical properties of wires/cables, based on tensile – elongation and volume resistivity testing.

D. Duct-sealing compound shall have excellent adhesion to PVC, rigid steel, EMT, IMC, fiberglass, and polyethylene conduits.

2.6 TOUCH UP PAINT

A. Provide touch up paint from the manufacturer of the electrical equipment. Paint shall match the finish of the equipment. At a minimum, provide touch up paint for all power distribution equipment.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Comply with NECA 1.

B. Comply with NFPA 70, National Electrical Code.

C. Mounting heights indicated in the contract documents are measured from the finished floor or finished grade to the bottom of the equipment, unless otherwise noted.

D. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

E. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

F. Right of Way: Give to piping systems installed at a required slope.

G. Where underground ducts or conduit enter the building, the inside of the ducts or conduit shall be sealed with Duct-Sealing Compound.

H. Provide touch up paint as required on equipment finishes that have been scratched, and provide touch up paint as directed by the engineer. Touch up paint shall be provided in accordance with the manufacturer’s recommendations. Do not allow paint to come in contact with conductors, insulation or any live parts. All nameplates and labels shall remain visible and legible.

I. Overcurrent devices shall be readily accessible and shall be installed so that the center of the grip of the operating handle of the switch or circuit breaker, when in its highest position, is not more than 6 feet 7 inches above the floor or working platform.

J. All exterior wall penetrations shall be made watertight. Seal inside and around conduit as required. The inside of the conduit shall be sealed with Duct-Sealing Compound.

K. Provide access doors where required to keep concealed electrical devices and equipment accessible in accordance with the National Electrical Code.

L. Unless otherwise noted, access doors shall be painted to match surrounding wall or ceiling.

M. Enclosures, troughs, wireways, boxes and raceways which contain unmetered wiring, shall be provided with a suitable means to accommodate the seals of the electric utility. Coordinate with electric utility and comply with their requirements.

N. Provide boards, channels, blocking, wall anchors, screws, hardware, and other supports for mounting electrical equipment on walls. Where the electrical equipment are mounted in finished spaces (including, but not limited to, offices, etc.), the supports shall be concealed. Where the electrical equipment are mounted in wet locations, the supports shall be suitable for wet locations.

O. Where electrical equipment are mounted above suspended ceilings, provide coordinate exact location of the equipment such that it does not block or prevent the removal/operation of ceiling tiles and access doors.

P. Where underground conduit enter buildings, and terminate at electrical equipment (including, but not limited to, panelboards, enclosed circuit breakers, lighting relay panels, etc.), the conduit shall terminate at the bottom of the electrical equipment, unless otherwise noted.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

E. Cut sleeves to length for mounting flush with both surfaces of walls.

F. Extend sleeves installed in floors 2 inches above finished floor level.

G. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable, unless indicated otherwise.

H. Seal space outside of sleeves with grout for penetrations of concrete and masonry

1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint.

J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials.

K. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using cast-iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated ceiling, floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly.

B. Install UL Listed Firestopping Material in accordance with the manufacturer's recommendations, and UL's requirements.

END OF SECTION 260500

SECTION 260519 - CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, shall apply to this Specification Section. Division 26 Specification Sections and other Specification Sections where electrical work is indicated or described, shall also apply to this Specification Section.

1.2 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.
3. Sleeves and sleeve seals for cables.

1.3 DEFINITIONS

A. AWG: American Wire Gauge

B. KCMIL: Thousand Circular Mil

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field Quality Control Test Reports

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.6 COORDINATION

A. Set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. American Insulated Wire Corp.; a Leviton Company.
2. General Cable Corporation.
3. Senator Wire & Cable Company.
4. Southwire Company.

B. Copper Conductors: Comply with NEMA WC 70.

C. Conductor Insulation:

1. THHN/THWN-2 Wire:
   a. Complies with NEMA WC 70
   b. Listed to UL 83
   c. Suitable for operation at 600 volts or less in wet or dry locations.
   d. 90 degree C rated in wet or dry locations.
2. XHHW-2 Wire:
   a. Complies with NEMA WC 70
   b. Listed to UL 44
   c. Suitable for operation at 600 volts or less in wet or dry locations
   d. 90 degree C rated in wet or dry locations.
   e. Insulation is an abrasion, moisture, and heat resistant cross-linked polyethylene (XLP)

D. Branch Circuit Type Metal Clad Cable:

1. Conductor Insulation: THHN 90 degree C
2. Copper conductor.
3. Neutral wire shall be insulated and shall be the same size as the phase conductors.
4. Voltage Rating: 600V
5. Conductor covering: Polypropylene assembly tape overall
6. Armor: Interlocked galvanized steel
7. Fire Wall Rated for 1, 2 and 3 hour rated penetrations
8. Grounding Means: One insulated copper grounding conductor, unless otherwise noted.
9. Suitable for use in environmental air handling spaces
10. UL 1569 Listed

2.2 CONNECTORS AND SPLICES

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

1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.

4. 3M; Electrical Products Division.
5. Tyco Electronics Corp.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

C. 600V Vinyl Insulating Tape: The tape is based on polyvinyl chloride (PVC) and/or its copolymers and has a rubber based, pressure-sensitive adhesive. The tape shall be 7 mils thick, and UL Listed and marked per UL Standard 510 as "Flame Retardant, Cold and Weather Resistant."

D. Screw-on Pressure Cable Connector: Connector shall be UL Listed. Voltage rating shall be 600 volts for building wire and 1000 volts for signs and fixtures.

E. Mechanical Connector: Connector shall be UL Listed. Connector shall be wrapped with electrical insulating tape in accordance with the NEC and the manufacturer's requirements. Connectors shall be dual rated (suitable for use with copper or aluminum conductors), unless other wise noted.

F. Compression Connector: Connector shall be UL Listed. Connector shall be wrapped with electrical insulating tape in accordance with the NEC and the manufacturer's requirements. Use compression tool recommended by manufacturer. Connectors shall be dual rated (suitable for use with copper or aluminum conductors), unless other wise noted.

G. Submersible Connectors and Splices: Submersible connectors and splices shall have all of the following features:
1. UL listed as a sealed wire-connector system
2. UL 486D Listed for direct burial and submersible applications

PART 3 - EXECUTION

3.1 CONDUCTOR/WIRE SIZES

A. Conductor/wire sizes are indicated in the drawings. Where conductor/wire sizes are indicated in both the power one-line/riser diagrams, and the panel/panelboard/switchboard schedules, the conductor/wires sizes indicated in the power one-line/riser diagrams shall take precedence.

3.2 CONDUCTOR MATERIAL APPLICATIONS

A. Service: Copper. Stranded.

B. Feeders: Copper. Stranded.

C. Branch Circuits: Copper.

1. Solid for No. 10 AWG and smaller, unless otherwise noted and except as follows:

a. Where the conductors connect to vibrating equipment (including, but not limited to, transformers, motors, and generators), the conductors shall be stranded.

b. Where the equipment manufacturer recommends stranded conductors, the associated conductors shall be stranded.

2. Stranded for No. 8 AWG and larger.

D. Class 1 and Class 2 Control Wiring: Copper. Stranded.

3.3 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Aboveground Service Entrance: Type THHN/THWN-2, single conductors in raceway, unless otherwise noted.

B. Aboveground Exposed Feeders: Type THHN/THWN-2, single conductors in raceway, unless otherwise noted.

C. Aboveground Feeders Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway, unless otherwise noted.

D. Aboveground Exposed Branch Circuits: Type THHN/THWN-2, single conductors in raceway, unless otherwise noted.

E. Aboveground Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway, unless otherwise noted and except as follows:

1. Branch Circuit Type Metal Clad Cable may be used in lieu of THHN/THWN-2, single conductors in raceway where ALL of the following conditions are met:
   a. Metal Clad Cable is fed from circuit breakers or fuses rated at 20 amperes or less.
   b. Metal Clad Cable is only used for branch circuit conductors.
   c. Metal Clad Cable is used only in dry locations.
   d. Metal Clad Cable is used only in aboveground applications.
   e. Metal Clad Cable is not subject to physical damage.
   f. Metal Clad Cable is used only in concealed ceilings, walls, and partitions.
   g. Metal Clad Cable is installed only where allowed by the National Electrical Code, NFPA Codes, and Federal/State/Local Codes.

F. Aboveground Class 1 and Class 2 Control Wiring: Type THHN/THWN-2, single conductors in raceway unless otherwise noted.

G. Underground Service, Feeders and Branch Circuits: XHHW-2 single conductors in raceway, unless otherwise noted. The wiring shall be type XHHW-2 from end-to-end, regardless of whether or not the wiring starts or ends aboveground or underground. For example, a branch circuit for an underground lighting circuit shall be XHHW-2 from where the branch circuit starts (at the aboveground panelboard), up to where it ends (at the aboveground light pole).

H. Underground Class 1 and Class 2 Control Wiring: XHHW-2 single conductors in raceway, unless otherwise noted. The wiring shall be type XHHW-2 from end-to-end, regardless of whether or not the wiring starts or ends aboveground or underground. For example, a branch

circuit for an underground lighting circuit shall be XHHW-2 from where the branch circuit starts (at the aboveground panelboard), up to where it ends (at the aboveground light pole).

3.4 INSTALLATION OF CONDUCTORS AND CABLES

A. Comply with the NEC.

B. Comply with the manufacturer’s recommendations and requirements.

C. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

D. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

E. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

F. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

G. Identify and color-code conductors and cables according to Specification Section "Electrical Identification."

H. Do not splice feeders and underground branch circuits unless otherwise noted, and except as follows:

1. Where existing wiring is pulled through a handhole, and the wiring needs to be spliced/extended, splices may be allowed as long as all of the following conditions are met:

   a. Splicing is only used where existing wiring is being extended. New branch circuits shall not be spliced.

   b. Splicing is only used inside the handhole.

   c. All splices are submersible type.

I. Provide insulated bushings at the end of each Metal Clad Cable.

J. Use insulating bushings to protect ALL conductors, including conductors smaller than No. 4 AWG. Provide insulated grounding bushings where required by NFPA 70 or the Contract Documents.

K. Cables associated with roof mounted equipment or outdoor wall mounted equipment shall run concealed inside the building.

L. Spare wires shall be disconnected at both ends and shall be insulated at both ends with wire nuts held in place by electrical insulating tape. For large wire sizes, the spare wires shall be disconnected at both ends and shall be insulated at both ends with double wrapped electrical insulating tape.

M. Provide dedicated neutral wires for all branch circuits.

N. Do not combine separate feeder circuits in the same raceway, unless otherwise noted.

O. Do not combine separate branch circuits in the same raceway, unless otherwise noted and except as follows:
   1. Branch circuits may be combined in the same raceway where ALL of the following conditions are met:
      a. The branch circuits being combined in the same raceway serve the same area or adjacent areas.
      b. The branch circuits being combined in the same raceway homerun to the same panelboard.
      c. The number of branch circuits being combined in the same raceway does not exceed 3.
      d. The number of current carrying conductors installed in the same raceway does not exceed 6.
      e. The branch circuits are installed in a manner that does not subject them to any ampacity derating, except for the ampacity derating caused by having 4 to 6 current carrying conductors in the same raceway.
      f. The branch circuits that are being combined in the same raceway are all fed from 1-pole circuit breakers that have a trip rating of either 15 amperes or 20 amperes.
      g. The branch circuits that are being combined in the same raceway are not fed from circuit breakers that have a trip rating greater than 20 amperes.
      h. The branch circuits that are being combined in the same raceway are limited to 1-phase circuits that have a voltage of either 120V or 277V.
      i. The smallest wire size, in the branch circuits which are being combined in the same raceway, is not smaller than #12 AWG.
      j. The wires that are combined in the same raceway do not exceed the NEC wire fill capacity of the raceway. The raceway size is increased as required to comply with NEC requirements.
      k. The branch circuits which are being combined in the same raceway are limited to lighting and receptacle branch circuits.
      l. Dedicated neutral wires are provided for all branch circuits.
      m. Ground wires are provided in accordance with NEC requirements. Grounding and bonding are provided in accordance with NEC requirements.
      n. Where the NEC does not allow branch circuits to be combined in the same raceway, the branch circuits are not combined in the same raceway.
      o. All work complies with the NEC, the manufacturer’s recommendations, and the contract documents.

P. All metal clad cable shall be concealed, unless otherwise noted.

Q. Underground splices of service, feeder, and branch circuits shall not be permitted, unless otherwise noted.

R. Where wires larger than #10 AWG are installed on 15A or 20A branch circuits, splice #10AWG “pigtails” for connections to circuit breakers, devices and equipment. “Pigtails” in this paragraph shall mean short leads used to connect a circuit breaker, device or equipment to branch circuit wires. Comply with all of the following:
   1. Length of the wires of the “pigtails” shall be less than 48”, unless otherwise noted and except as follows:

a. At light poles, the length of the “pigtails” shall be increased to match the height of the light pole such that the “pigtail” splice is located in the handhole at the base of the pole. The length of the “pigtail” shall not exceed 125% of the overall height of the light pole.

2. Where the “pigtails” are run inside raceways, the length of the raceways shall be less than 23”, and the raceways shall be sized per NEC requirements.
3. Provide junction boxes as required for splicing wires.
4. The wire size of the phase, neutral, and ground wires of the “pigtails” shall not be less than #10AWG, except as follows:
   a. The wire size of the phase, neutral and ground wires of the “pigtails” shall be #12AWG where the wire terminals at the circuit breaker, device, or equipment are not suitable for wires larger than #12AWG.
5. All work shall comply with NEC, the manufacturer’s recommendations, and the contract documents.

3.5 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

END OF SECTION 260519

SECTION 260526 - GROUNDING AND BONDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, shall apply to this Specification Section. Division 26 Specification Sections and other Specification Sections where electrical work is indicated or described, shall also apply to this Specification Section.

1.2 SUMMARY

A. This Section includes methods and materials for grounding systems and equipment.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise noted.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.

2.2 CONNECTORS

A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.

1. Pipe Connectors: Clamp type, sized for pipe.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 3/4 inch diameter by 10 foot long.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller (exception: conductors for vibrating equipment, such as transformers, motors and generators, shall use stranded conductors; or, where stranded conductors are recommended by the manufacturer of the equipment, use stranded conductors), and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.

B. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors.
3. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits. This includes, but is not limited to, low and medium voltage feeders and branch circuits.

B. Unless otherwise noted, all equipment grounding conductors shall be insulated.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground cable shielding, metallic conduits, wireways, cable boxes, luminaires, light poles, electrical equipment housings, and all noncurrent carrying metallic parts.

C. All metal conduit stub-ups shall be grounded, and where multiple stub-ups are made within an equipment enclosure, they shall be equipped with grounding bushings, bonded together, bonded to the enclosure, and bonded to the enclosure ground bus/terminal.

END OF SECTION 260526

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, shall apply to this Specification Section. Division 26 Specification Sections and other Specification Sections where electrical work is indicated or described, shall also apply to this Specification Section.

1.2 SUMMARY

A. This Section includes the following:

1. Hangers and supports for electrical equipment and systems.
2. Construction requirements for concrete bases.

1.3 DEFINITIONS

A. RMC: Rigid metal conduit.

B. MFMA: Metal Framing Manufacturer’s Association

C. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.4 PERFORMANCE REQUIREMENTS

A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.

B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Delegated Design Submittal:
1. Structural Design:

a. Prior to starting any work, provide a delegated design submittal (signed/sealed by a structural engineer licensed in the State of Maryland) where delegated design is required by the contract documents.

2. All delegated design submittals shall include dimensioned drawings and detailed specifications on how to perform the work. The contractor shall coordinate with the manufacturer of each equipment, so that the weights of the equipment can be determined prior to purchase/installation. The contractor shall perform field investigations and geotechnical investigations (the contractor shall hire the services of a geotechnical survey/engineering/testing company, and a professional engineer licensed in the State of Maryland shall seal/sign the geotechnical report), as required, in order to determine existing conditions of the walls/floors/ceilings/earth/soil, so that all the information that is required for the submittals can be determined and provided to the Structural Engineer (hired by the contractor). The submittals with dimensioned drawings, detailed specifications, and structural calculations shall be sealed and signed by a Structural Engineer (hired by the contractor) that is licensed in the State of Maryland. The submittals shall be submitted to the design team for review and approval. The people who will review/approve the submittals will include, but not be limited to, the design team's Structural Engineer.

3. Delegated design shall comply with all applicable codes, and the requirements of the Authorities Having Jurisdiction.

1.6 QUALITY ASSURANCE

A. Comply with NFPA 70.

1.7 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.

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

a. Allied Tube & Conduit.
b. Cooper B-Line, Inc.; a division of Cooper Industries.
c. ERICO International Corporation.
d. Thomas & Betts Corporation.
e. Unistrut; Tyco International, Ltd.

f. Hilti

2. Comply with the following for Outdoor Locations, unless otherwise noted:
   a. Steel Channel Metallic Coatings: Hot-dip galvanized after fabrication in accordance with ASTM A123 and applied according to MFMA-4.
   b. Fittings and Accessories:
      1) Conduit hangers, conduit clamps, beam clamps, and wall brackets shall be steel, hot-dip galvanized after fabrication in accordance with ASTM A123.
      2) Threaded hardware such as mechanical expansion anchors, nuts, bolts, and threaded rods shall be steel, hot-dip galvanized after fabrication in accordance with ASTM A123. Threaded hardware not available as hot-dip galvanized after fabrication shall be stainless steel type 304.
3. Comply with the following for Indoor Locations, unless otherwise noted:
   a. Steel Channel metallic Coatings: Pre-Galvanized Steel with mill galvanized coating designation G90.
   b. Fittings and Accessories:
      1) Conduit hangers, conduit clamps, beam clamps, and wall brackets shall be pre-galvanized (designation G90) or electroplated zinc (ASTM B633).
      2) Threaded hardware shall be electroplated zinc (ASTM B633).

4. Channel Dimensions: Selected for applicable load criteria.

B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

C. Conduit and Cable Support Devices: Hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Mechanical-Expansion Anchors: Insert-wedge-type, steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.

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

      1) Cooper B-Line, Inc.; a division of Cooper Industries.
      2) Empire Tool and Manufacturing Co., Inc.
      3) Hilti Inc.
      4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      5) MKT Fastening, LLC.

2. Concrete Inserts: Steel slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.

3. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
4. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
5. Toggle Bolts: All-steel springhead type.
6. Hanger Rods: Threaded steel.
7. Fire retardant plywood board:
    a. Provide Hoover Treated Wood Products Inc, Pyro-Guard Interior Fire-Retardant-Treated Wood or approved equal, except where the architectural/structural drawings/specifications indicate that a different product be used, in which case the architectural/structural drawings/specifications shall take precedence. The plywood board shall have the following features:
        1) Plywood board shall have a flame spread rating of 25 or less (Class A) when tested in accordance with ASTM E84, "Standard Test Method for Surface Burning Characteristics of Building Materials". Plywood board shows no evidence of significant progressive combustion when the test is extended for an additional 20-mionute period. In addition, the flame front does not progress more than 10 ½ feet beyond the centerline of the burners at any time during the test. The flame spread and smoke developed index for each species and product are classified by Underwriters Laboratories Inc (UL).
        2) Plywood board is manufactured under the independent third-party inspection of UL Follow-Up Service and each piece shall bear the UL classified mark indicating the extended 30 minute ASTM E84 test.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with single-bolt conduit clamps using spring friction action for retention in support channel.

D. Provide fire retardant plywood board as required for mounting equipment on the walls. Coordinate width and height of board with the quantity/sizes of equipment being mounted to it.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
6. To Light Steel: Sheet metal screws.
7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

D. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

E. The use of powder-actuated tools is not allowed.

F. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.

G. Do not use spring steel clips and clamps.

H. In wet or damp locations, use steel channel supports to standoff non-recessed, wall mounted cabinets and panelboards, at least one inch from the mounting surface.

I. Where electrical equipment (including, but not limited to, lighting fixtures, wiring, conduit, etc.), or the items to which the electrical equipment are attached to or supported from (including, but not limited to, metal channels, junction boxes, etc), are suspended, and the vertical length of the supports (including, but not limited to, threaded rods) for these equipment/items are longer than 48 inches, provide bracing supports to prevent swinging of the equipment/items.

J. Suspended electrical equipment (including, but not limited to, lighting fixtures, wiring, conduit, etc.) shall be supported from the building structure. Where suspended electrical equipment are not located directly under roof trusses, roof supports, or other structural elements, or where other equipment (mechanical, plumbing, etc) are located above the electrical equipment, provide metal channels and other supports to span, or attach to, the roof trusses, roof supports, or other structural elements. The electrical equipment shall be installed at the locations indicated

in the Contract Documents, and metal channels and other supports shall be provided as required in order to support the electrical equipment.

K. Provide supports for conductors in vertical conduit in accordance with the manufacturer's recommendations and NEC requirements.

3.3 CONCRETE BASES

A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 3500-psi, 28-day compressive-strength concrete, unless otherwise indicated.

C. Anchor equipment to concrete base.

1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

D. Concrete Pad Protection and Curing:
1. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
2. Cure concrete for at least 28 days

3.4 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 260529

SECTION 260533 - RACEWAYS AND BOXES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, shall apply to this Specification Section. Division 26 Specification Sections and other Specification Sections where electrical work is indicated or described, shall also apply to this Specification Section.

1.2 DEFINITIONS

A. FMC: Flexible metal conduit.

B. LFMC: Liquidtight flexible metal conduit.

C. RNC: Rigid nonmetallic conduit.

D. EMT: Electrical metallic tubing.

E. Where RGS (Rigid Galvanized Steel) Conduit, GRS (Galvanized Rigid Steel) Conduit, or RMC (Rigid Metal Conduit) are indicated in the contract documents, this shall mean Rigid Steel Conduit.

F. Conduit shall mean raceway of circular cross section, and shall include, but not be limited to, FMC, LFMC, RNC, EMT, and RGS conduit.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Source quality-control test reports.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

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

1. AFC Cable Systems, Inc.
2. Allied Tube & Conduit; a Tyco International Ltd. Co.
3. Anamet Electrical, Inc.; Anaconda Metal Hose.
4. O-Z Gedney; a unit of General Signal.
5. Wheatland Tube Company.
6. Robroy Industries Electrical Products Division

B. Rigid Steel Conduit:
1. Manufactured in accordance with ANSI C80.1.
2. UL 6 Listed

C. FMC:
1. UL 1 Listed. UL Type RW (Reduced Wall)
2. Zinc-coated steel construction

D. EMT:
1. Manufactured in accordance with ANSI C80.3
2. UL 797 listed
3. Fittings: Set-screw or Compression type.

E. LFMC:
1. UL 360 Listed
2. Flexible steel conduit with PVC jacket.
3. PVC jacket shall be moisture, oil and sunlight resistant.

F. Fittings for Conduit (Including all Types and Flexible and Liquidtight), and Cable: NEMA FB 1; UL listed for type and size raceway with which used, and for application and environment in which installed.
1. Insulating Bushings: Plastic, 105 degree C minimum temperature rating.
2. Insulated Grounding Bushings: Malleable Iron with plastic liner, 105 degree C minimum temperature rating.

2.2 NONMETALLIC CONDUIT AND TUBING

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

1. AFC Cable Systems, Inc.
2. Anamet Electrical, Inc.; Anaconda Metal Hose.
3. CANTEX Inc.
4. Condux International, Inc.
5. Electri-Flex Co.

6. Lamson & Sessions; Carlon Electrical Products.
7. RACO; a Hubbell Company.
8. Thomas & Betts Corporation.

B. RNC: NEMA TC 2, Type EPC-40-PVC (PVC Schedule 40) and Type EPC-80-PVC (PVC Schedule 80), UL 651, with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B. RNC shall be sunlight resistant and rated for use with 90 degree C conductors.

2.3 METAL TROUGHS

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

1. Cooper B-Line, Inc.
2. Hoffman.
3. Square D; Schneider Electric.

B. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 1, unless otherwise indicated.

C. Covers: Screw-cover type, unless otherwise noted

D. Finish: ANSI 61 gray polyester powder paint finish inside and out over phosphatized surfaces.

2.4 METAL WIREWAYS

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

1. Cooper B-Line, Inc.
2. Hoffman.
3. Square D; Schneider Electric.

B. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 1, unless otherwise indicated.

C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Wireway Covers: Screw-cover type, unless otherwise noted

E. Finish: ANSI 61 gray polyester powder paint finish inside and out over phosphatized surfaces.

2.5 BOXES

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

1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. EGS/Appleton Electric.
3. Hoffman.
4. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
5. O-Z/Gedney; a unit of General Signal.
6. RACO; a Hubbell Company.
7. Robroy Industries, Inc.; Enclosure Division.
8. Spring City Electrical Manufacturing Company.
9. Thomas & Betts Corporation.
10. Walker Systems, Inc.; Wiremold Company (The).

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, aluminum, Type FD, with gasketed cover.

D. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

E. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.

2.6 ENCLOSURES AND CABINETS

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

B. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous-hinge cover with flush latch, unless otherwise indicated.

C. Metal Enclosures: Steel, finished inside and out with manufacturer’s standard enamel.

2.7 CORROSION PROTECTION TAPE

A. Corrosion protection tape shall be 3M Scotchrap Tape 51 or approved equal with the following features:

1. Tape is a tough, polyvinyl chloride based tape with special high tack adhesives formulated to resist corrosion of metal piping systems above and below ground, fittings, and joints on all mill-coated pipe and electrical conduit systems.

2. Tape is resistant to corrosive salt water, soil acids, alkalies and salts, common chemicals, chemical vapors, and exposure to outdoor weathering and sunlight.

3. Tape is resistant to impact, abrasions, punctures and tears.

4. Tape is 20 mil thick.

5. Tape is suitable for -55 to 175 degree F service temperatures

6. Tape shall be compatible with the conduit.

B. Where the tape manufacturer recommends that a primer be used with the tape, provide a primer that is recommended by the manufacturer. The primer shall be manufactured by the same manufacturer as the tape. For the 3M Scotchrap Tape 51, use 3M Scotchrap Pipe Primer, unless the manufacturer recommends a different primer for the application. The primer shall be compatible with the tape and the conduit.

C. Where the tape manufacturer recommends that putty be used with the tape, provide putty that is recommended by the manufacturer. The putty shall be manufactured by the same manufacturer as the tape. For the 3M Scotchrap Tape 51, use 3M Scotchfil Electrical Insulation Putty, unless the manufacturer recommends a different putty for the application. The putty shall be compatible with the tape and the conduit.

PART 3 - EXECUTION

3.1 RACEWAY AND BOXES APPLICATION

A. Indoor locations:
1. Raceway shall be EMT, unless otherwise noted and except as follows:
   a. Where raceway is used for supporting lighting fixtures, lighting control devices, occupancy sensors, photo sensors, wiring devices, receptacles, and other electrical equipment, the raceway shall be Rigid Steel Conduit, unless otherwise noted.
   b. Use Rigid Steel Conduit in damp or wet locations, unless otherwise noted.
   c. Conduit Larger than 4-inch trade size shall be Rigid Steel Conduit.
   d. Where raceway is subject to physical damage, use Rigid Steel Conduit, unless otherwise noted.
   e. For raceway embedded within a concrete/masonry wall or floor slab, use Rigid Steel Conduit, unless otherwise noted.
   f. Use FMC for connection to vibrating equipment (including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment), and for connection to equipment where the manufacturer recommends a flexible raceway, unless otherwise noted and except as follows:
      1) Use LFMC for damp or wet locations.
      2) Use LFMC where LFMC is recommended by the manufacturer of the equipment.
2. Boxes and enclosures shall be NEMA 1, galvanized steel, unless otherwise noted, and except as follows:
   a. Boxes and enclosures in damp or wet locations shall be NEMA 3R, die cast aluminum, gasketed covers, unless otherwise noted and except as follows:
      1) Boxes and enclosures in shower rooms shall be NEMA 4X stainless steel type 304, unless otherwise noted.

B. Outdoor locations: Apply raceway and boxes products as specified below, unless otherwise noted:
1. Raceway shall be Rigid Steel Conduit, unless otherwise noted and except as follows:
   a. For underground raceway (including, but not limited to, raceway below the bottom of the lowest floor slab of the building/structure), use PVC Schedule 40 conduit, unless otherwise noted.

b. Use LFMC for connection to vibrating equipment (including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment), and for connection to equipment where the manufacturer recommends a flexible raceway, unless otherwise noted.

2. Boxes and enclosures shall be NEMA 3R, die cast aluminum, gasketed covers, unless otherwise noted.

C. Wireways and Troughs: All Wireways and Troughs shall be metal, with ANSI 61 gray polyester powder paint finish inside and out over phosphatized surfaces, unless otherwise noted.

D. Minimum Raceway Size: 3/4-inch trade size, unless otherwise noted.

E. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise noted.

F. Conduit sizes:

1. Conduit sizes are indicated in the drawings. Where the conduit sizes are indicated in both the power one-line/riser diagrams, and the panel/panelboard/switchboard/conduit size schedules/tables, the conduit sizes indicated in the power one-line/riser diagrams shall take precedence.

3.2 INSTALLATION

A. Transitions from PVC conduit that is located underground (including, but not limited to, conduit below the bottom of the lowest floor slab of the building/structure), to aboveground metal conduit:

1. Where the conduit is coming through the floor, an equipment pad, or finished grade, change from PVC conduit to Rigid Steel Conduit 12” below the top of the floor/pad/grade, and continue with Rigid Steel Conduit up to 24” above the finished floor or grade, or up to the equipment which the conduit connects to, whichever is lower, unless otherwise noted. Above 24” or above the equipment, use the raceway specified in the RACEWAY AND BOXES APPLICATION paragraph of this Specification Section, unless otherwise noted. Metal conduit shall be grounded and bonded in accordance with the NEC.

a. Exceptions:

1) Where the PVC conduit turns up under freestanding, floor or concrete pad mounted, electrical equipment that completely enclosed and conceal the conduit, such as pad mounted switchboards/switchgear, the conduit shall be PVC conduit from underground up to where the conduit stops aboveground.

2) The conduit shall be PVC conduit from below floor or grade up to where the conduit stops at the following locations:

a) Outdoors, where PVC conduit turns up at the utility transformer.

b) Outdoors, where PVC conduit turns up at the utility poles

c) Indoors, where PVC conduit from the utility poles or utility manholes, containing telephone, cable tv and fiber internet service cables, turns up at the telephone terminal board in the electrical/telecom room.

B. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.

C. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

D. Complete raceway installation before starting conductor installation.

E. Arrange stub-ups so curved portions of bends are not visible above the finished slab.

F. Raceway Terminations: Use insulating bushings to protect ALL conductors, including conductors smaller than No. 4 AWG. Provide insulated grounding bushings where required by NFPA 70 or the Contract Documents.

G. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.

H. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.

I. Flexible Conduit Connections: Use maximum of 72 inches of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers and motors. Comply with the following:

1. Use LFMC where required by the Contract Documents.

J. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

K. Raceway shall run parallel or perpendicular to wall and ceiling structures (columns, joists, support beams, etc.) for a neat appearance.

L. All metallic raceways, boxes and enclosures shall be grounded.

M. Provide watertight hubs for all junction boxes and enclosures installed outdoors or in wet locations. Hubs used with NEMA 3R junction boxes and enclosures shall be NEMA 3R or NEMA 4X rated. Hubs used with NEMA 4 or 4X junction boxes and enclosures shall be NEMA 4X rated.

N. Underground raceway shall be made watertight.

O. Provide reducers as required to match the conduit size with the hub or conduit entry on the junction box or equipment. Install reducers in accordance with the manufacturer’s recommendations and NEC requirements.

1. Where there are no available reducers in the sizes required, provide an interposing junction box between the larger conduit and the smaller hub or conduit entry, then provide a smaller conduit from the junction box to the hub or conduit entry. The size of the smaller conduit shall be the largest that can fit at the hub or conduit entry. Length of smaller conduit shall be less than 24". Do not exceed the conduit fill requirements indicated in the NEC. All work shall comply with the manufacturer's recommendations and NEC requirements.

P. Bending radius of conduit shall be selected to minimize wire or cable pulling tensions. Do not exceed the maximum pulling tension of the wire or cable manufacturer. Coordinate with wire or cable manufacturer.

Q. Raceway associated with roof or canopy mounted equipment shall run concealed under the roof or canopy.

R. Raceway associated with indoor or outdoor wall mounted equipment shall be concealed.

S. Where raceway is installed above the roof, the distance from the roof to the bottom of the raceway shall not be less than 4 inches. Provide mounting and supporting devices as required.

T. Floor Box Installation
1. Furnish and install floor box in accordance with the manufacturer's recommendation and NEC requirements.
2. Provide accessories as required for a complete installation.
3. Close unused raceway openings using the manufacturer's recommended accessories.
4. Coordinate floor box installation with the construction of the floor. Coordinate exact location of floor box with the owner/architect/engineer prior to installation.

U. Where the voltage between adjacent switches, receptacles or similar devices, in the same junction box or enclosure is 300V or greater, provide an internal securely installed barrier between the adjacent switches. Comply with NEC requirements.

V. All raceway shall be concealed, unless otherwise noted and except as follows:
1. Raceway may be exposed in electrical and mechanical rooms.

W. Raceways/boxes and associated electrical equipment shall not block or impede the movement/operation of equipment that move (including, but not limited to, overhead doors, sliding doors, etc.).

X. Provide corrosion protection tape on all metal conduit (including, but not limited to, empty/spare conduit, conduit that have wiring within, conduit used as support posts, etc.) that is in contact with earth, soil, or concrete. Provide corrosion protection tape on all metal conduit that is located underground. Provide primer and putty in accordance with the recommendations of the tape manufacturer. Tape, primer, and putty shall be installed in a manner which does not reduce the electrical continuity of the electrical conduit system. All work shall comply with the requirements of the manufacturer, the NEC, and the AHJ.

3.3 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

SECTION 260540 - UNDERGROUND DUCTS AND UTILITY STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, shall apply to this Specification Section. Division 26 Specification Sections and other Specification Sections where electrical work is indicated or described, shall also apply to this Specification Section.

1.2 SUMMARY

A. This Section includes the following:

1. Conduit, ducts, and duct accessories for direct-buried and concrete-encased duct banks, and in single duct runs.

1.3 DEFINITION

A. RNC: Rigid nonmetallic conduit.

B. OSHA: Occupational Safety and Health Administration

C. Duct: Conduit that are suitable for use underground

D. Ductbank: Two or more ducts

E. Direct buried duct: Duct that is buried in the ground, without any concrete encasement

F. Direct buried ductbank: Ductbank that is buried in the ground, without any concrete encasement

G. AASHTO: American Association of State Highway and Transportation Officials

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Duct-Bank Coordination Drawings: Show duct plans, duct profiles and coordination with other utilities and underground structures.

1. Include plans and sections, drawn to scale, and show bends and locations of expansion fittings.

2. Show exact location/routing of all ductbanks and all outdoor equipment (including, but not limited to, manholes and handholes), as coordinated with all other site utilities and

structures (including, but not limited to, wetlands, storm water ponds, drains, water/sanitary piping, hydrants, etc.), on a plan drawing at 1" = 20' scale. Indicate depth of ductbanks where they cross with other underground utilities and structures.

C. Field quality-control test reports.

D. Product Certificates: For concrete and steel used in precast concrete manholes and hand-holes, as required by ASTM C 858.

E. Shop Drawings for Factory-Fabricated Handholes and Boxes Other Than Precast Concrete (including, but not limited to, Polymer Concrete Handholes): Include dimensioned plans, sections, and elevations, and fabrication and installation details, including the following:

1. Duct entry provisions, including locations and duct sizes.

2. Cover design.

F. Shop Drawings for Precast Concrete Manholes and Handholes, or Factory-Fabricated Underground Utility Structures: Include plans, elevations, sections, details, attachments to other work, and accessories, including the following:

1. Duct entry provisions, including locations and duct sizes.

2. Reinforcement details.

3. Frame and cover design and manhole and handhole frame support rings.

4. Ladder details.

5. Grounding details.

6. Dimensioned locations of cable rack inserts, pulling-in and lifting irons, and sumps.

7. Joint details.

8. Structural Calculations

9. Shop drawings, manhole/handhole drawings, and structural calculations shall be signed and sealed by a Professional Engineer licensed in the State of Maryland.

G. As-built drawings shall be provided showing the quantities/routing/sizes/locations of underground ducts and utility structures. The as-built drawings shall indicate a section of all ductbank segments, indicating which wiring/circuits are run in each duct, and which ducts are spare.

1.5 QUALITY ASSURANCE

A. Comply with ANSI C2.

B. Comply with NFPA 70.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver ducts to Project site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.

1.7 COORDINATION

A. Coordinate elevation, layout and installation of ducts with final arrangement of other utilities, site grading, and surface features as determined in the field.

B. Coordinate elevations of ducts and duct-bank entrances into manholes, handholes, and boxes with final locations and profiles of ducts and duct banks as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations from those indicated as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by the Owner and/or the Engineer.

C. Coordinate all work with the electric and telecom utilities (for example: BGE, VERIZON, COMCAST, etc.).

PART 2 - PRODUCTS

2.1 CONDUIT

A. RNC: NEMA TC 2, Type EPC-40-PVC (PVC Schedule 40) and Type EPC-80-PVC (PVC Schedule 80), UL 651, with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B. RNC shall be sunlight resistant and rated for use with 90 degree C conductors.

2.2 DUCT ACCESSORIES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Cantex, Inc.
2. Condux International, Inc.
3. Lamson & Sessions; Carlon Electrical Products.
4. Manhattan/CDT; a division of Cable Design Technologies.
5. Spiraduct/AFC Cable Systems, Inc.

B. Duct Accessories:

1. Duct Separators: Factory-fabricated rigid PVC interlocking spacers, sized for type and sizes of ducts with which used, and selected to provide minimum duct spacings indicated while supporting ducts during concreting or backfilling.
2. Warning Tape: Underground-line warning tape

2.3 HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

A. Polymer Concrete Handhole:

1. Enclosures, boxes, and covers shall conform to all test provisions of the most current ANSI/SCTE 77 “Specification For Underground Enclosure Integrity” for Tier 22 applications. All covers are required to have the Tier level rating embossed on the surface. In no assembly can the cover design load exceed the design load of the box.

2. Handhole shall be tested by UL to meet the requirements of ANSI/SCTE 77. Handhole shall be UL Listed.

3. Handhole shall have an open bottom, unless otherwise noted.

4. Handhole design load (including box and cover) shall be 22,500 pounds.

5. Handhole cover shall be secured to the box with stainless steel bolts.

6. Handhole shall be manufactured by Quazite or approved equal. See drawings for dimensions of handhole.

2.4 PRECAST CONCRETE MANHOLES AND HANDHOLES

A. Comply with ASTM C 858, and with interlocking mating sections, complete with accessories, hardware, and features.

1. Duct Entrances in Manhole and Handhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.

a. Type and size shall match fittings to duct or conduit to be terminated.
b. Fittings shall align with elevations of approaching ducts and be located near interior corners of manholes and handholes to facilitate racking of cable.

B. Concrete Knockout Panels: 1-1/2 to 2 inches thick, for future conduit entrance and sleeve for ground rod.

C. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.

D. Precast Manholes and Handholes, when buried, shall be designed to support AASHTO HS20 loading.

2.5 UTILITY STRUCTURE ACCESSORIES

A. Manhole and Handhole Frames, Covers, and Chimney Components: Comply with structural design loading specified for manhole and handhole.

1. Frame and Cover: Weatherproof, gray cast iron complying with ASTM A 48, Class 35B**,** with milled cover-to-frame bearing surfaces; 30” diameter clear opening, heavy duty.

a. Cover Finish: Nonskid finish.
b. Provide security bolts and gasket for frame and cover where indicated in the plan drawings.

c. Designed to support AASHTO HS20 loading.

2. Cover Legend: Cast in. Selected to suit system.

a. Legend: As indicated on the drawings.

3. Manhole and Handhole Chimney Components: Precast concrete rings, HS-20 rated, with dimensions matched to those of roof opening.

a. Mortar for Chimney Ring and Frame and Cover Joints: Comply with ASTM C 270, Type M, except for quantities less than 2.0 cu. ft. where packaged mix complying with ASTM C 387, Type M, may be used.

B. Pulling Eyes in Concrete Walls: Eyebolt with reinforcing-bar fastening insert, 2-inch- diameter eye, and 1-by-4-inch bolt.

1. Working Load Embedded in 6-Inch, 4000-psi Concrete: 13,000-lbf minimum tension.

C. Pulling-In and Lifting Irons in Concrete Floors: 7/8-inch- diameter, hot-dip galvanized, bent steel rod; stress relieved after forming; and fastened to reinforcing rod. Exposed triangular opening.

1. Ultimate Yield Strength: 40,000-lbf shear and 60,000-lbf tension.

D. Bolting Inserts for Concrete Utility Structure Cable Racks and Other Attachments: Flared, threaded inserts of noncorrosive, chemical-resistant, nonconductive thermoplastic material; 1/2-inch ID by 2-3/4 inches deep, flared to 1-1/4 inches minimum at base.

1. Tested Ultimate Pullout Strength: 12,000 lbf minimum.

E. Expansion Anchors for Installation after Concrete Is Cast: Zinc-plated, carbon-steel-wedge type with stainless-steel expander clip with 1/2-inch bolt, 5300-lbf rated pullout strength, and minimum 6800-lbf rated shear strength.

F. Cable Rack Assembly: Nonmetallic. Components fabricated from nonconductive, fiberglass-reinforced polymer.

1. Stanchions: Nominal 36 inches high by 4 inches wide, with minimum of 9 holes for arm attachment.
   a. A minimum of 2 stanchions shall be located on each short wall of the manhole or handhole
   b. A minimum of 2 stanchions shall be located on each long wall of the manhole or handhole
2. Arms: Arranged for secure, drop-in attachment in horizontal position at any location on cable stanchions, and capable of being locked in position. Arms shall be available in lengths ranging from 3 inches with 450-lb minimum capacity to 20 inches with 250-lb minimum capacity. Top of arm shall be nominally 4 inches wide, and arm shall have slots along full length for cable ties.
   a. Provide a minimum of three (3) 14” long arms per stanchion.
3. Hardware: Stainless Steel Type 316.

G. Cover Hooks: Heavy duty, designed for lifts 60 lbf and greater. Two required.

H. Warning Sign: Install "Confined Space Hazard" warning sign inside the manhole.

2.6 SOURCE QUALITY CONTROL

A. Test and inspect precast concrete utility structures according to ASTM C 1037.

B. Polymer Concrete Handhole: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.

PART 3 - EXECUTION

3.1 DUCT APPLICATION

A. Direct-buried ducts: Duct shall be NEMA TC 2, Type EPC-40-PVC (PVC Schedule 40), unless otherwise noted on the drawings.

B. Concrete encased ducts: Duct shall be NEMA TC 2, Type EPC-40-PVC (PVC Schedule 40), unless otherwise noted on the drawings.

3.2 EARTHWORK

A. Excavation and Backfill: Do not use heavy-duty, hydraulic-operated, compaction equipment.

B. Restore surface features at areas disturbed by excavation and reestablish original grades, unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching.

D. Cut and patch existing streets, roads, driveways, parking lots, and paved areas in the path of underground ducts and utility structures. Repair existing streets, roads, driveways, parking lots, and paved areas after underground ducts and utility structures have been constructed/installed. The repaired streets, roads, driveways, parking lots, and paved areas shall match the adjacent streets, roads, driveways, parking lots, and paved areas.

E. Remove, re-install and repair as required, existing fences, sign posts, walls or structures that are in the path of underground ducts and utility structures.

3.3 DUCT INSTALLATION

A. Burial Depth:
1. Direct buried duct or ductbanks: All direct buried duct or ductbanks shall have a minimum of 36” of cover from the top of the duct or ductbank to finished grade, unless otherwise noted on the drawings.

2. Concrete encased ducts or ductbanks: All concrete encased duct or ductbanks shall have a minimum of 36" of cover from the top of the duct or ductbank to finished grade, unless otherwise noted on the drawings.

B. Slope: Pitch ducts a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope ducts from a high point in runs between two manholes or handholes to drain in both directions.

C. Where new ducts/ductbanks cross existing underground utilities, comply with the minimum cover requirements and minimum separation requirements indicated in the contract documents. Provide supports under the new ducts/ductbanks and existing underground utilities as required. The new duct/ductbanks shall be installed below the existing underground utilities, unless otherwise noted and except as follows:
1. The new duct/ductbanks may be installed above the existing underground utilities where ALL of the following conditions are met:
   a. Where it is installed, the new duct/ductbanks comply with the minimum cover requirements and minimum separation requirements indicated in the contract documents.
   b. Adequate supports are provided for the new duct/ductbanks such that it does not add weight onto the existing underground utilities.
   c. There will be no damage to the existing underground utilities.

D. Where new ducts/ductbanks cross other new ducts/ductbanks, comply with the minimum cover requirements and minimum separation requirements in the contract documents. The new ducts/ductbanks shall be installed above and below each other as required to comply with the minimum cover requirements and minimum separation requirements indicated in the contract documents. Provide supports under the new ducts/ductbanks as required.

E. Do not damage existing underground utilities and structures. Any damage caused by the contractor to existing underground utilities and structures shall be repaired by the contractor at no cost to the owner.

F. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends, both horizontally and vertically, at other locations, unless otherwise noted.

G. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.

H. Provide duct sealing compound where underground ducts and ductbanks stub up at utility poles/transformers and where underground ducts and ductbanks enter buildings. Duct sealing compound shall provide a watertight seal inside the ducts and ductbanks. Where duct sealing compound is in contact with wiring that is furnished and/or installed by the utility company, product data of the duct sealing compound shall be submitted to the utility company for their review/approval prior to its use.

I. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig (1.03-MPa) hydrostatic pressure.

J. Pulling Cord: Install 100-lbf- (445-N-) test nylon cord in ducts, including spares.
   1. Provide pulling cord in all unused or spare ducts.

K. Duct Entrances to Manholes and Handholes: Use end bells, spaced approximately 10 inches o.c. for 5-inch ducts, and vary proportionately for other duct sizes.

   1. Begin change from regular spacing to end-bell spacing 10 feet from the end bell without reducing duct line slope and without forming a trap in the line.
   2. Grout end bells into structure walls from both sides to provide watertight entrances.

L. Building Wall Penetrations: Install conduit penetrations of building walls as specified in Specification Section "Common Work Results for Electrical."

M. Concrete-Encased Ducts:
   1. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature. Where there are multiple sizes of conduit in a ductbank, provide spacers and spacer accessories to accommodate the conduit.
   2. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, with not less than 5 spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent floating during concreting. Stagger separators approximately 6 inches between tiers. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
   3. Excavate trench bottom to provide firm and uniform support for ducts.
   4. Place and compact bedding course on trench bottoms. Use satisfactory soil, free of particles larger than 1 inch in any direction, as the compact bedding course. Depth of bedding course shall be not less than 6”.
   5. Concreting Sequence: Pour each run of envelope between manholes, handholes or other terminations in one continuous operation.

      a. Start at one end and finish at the other, allowing for expansion and contraction of ducts as their temperature changes during and after the pour. Use expansion fittings installed according to manufacturer's written recommendations, or use other specific measures to prevent expansion-contraction damage.
      b. If more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch reinforcing rod dowels extending 18 inches into concrete on both sides of joint near corners of envelope.

   6. Pouring Concrete: Spade concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto ducts. Use a plank to direct concrete down sides of bank assembly to trench bottom. Allow concrete to flow to center of bank and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application.
   7. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.
   8. Comply with all of the following separation requirements, unless otherwise noted:
      a. Provide a minimum of 12” separation between 600V power or communications ducts and foreign structures (including, but not limited to, gas, water, sanitary and oil pipes).

b. Provide a minimum of 12” separation between 600V power or communications ducts and medium voltage (>600V) duct/wiring.
c. Provide a minimum of 6” separation between 600V power ducts and communications (including, but not limited to, telephone and cable tv) ducts.
d. Provide a minimum of 3” separation between 600V power ducts and other 600V power ducts.
e. Provide a minimum of 3” separation between communication ducts and other communication ducts.
f. Comply with the minimum separation requirements of the Utility Companies. Coordinate with the Utility Companies as required.

9. Stub-Ups: Use manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated. Extend concrete encasement throughout the length of the elbow.
10. Warning Tape: Bury warning tape above all concrete-encased ducts. Align tape parallel to and within 3 inches of the centerline of duct bank. Provide an additional warning tape for each 12-inch increment of duct-bank width over a nominal 36 inches. Space additional tapes 12 inches apart, horizontally. Depth of warning tape shall be 12” below finished grade.

N. Direct-Buried Ducts:

1. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature. Where there are multiple sizes of conduit in a ductbank, provide spacers and spacer accessories to accommodate the conduit.
2. Space separators close enough to prevent sagging and deforming of ducts, with not less than 5 spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent displacement during backfill and yet permit linear duct movement due to expansion and contraction as temperature changes. Stagger spacers approximately 6 inches between tiers.
3. Excavate trench bottom to provide firm and uniform support for ducts.
4. Place and compact bedding course on trench bottoms. Use satisfactory soil, free of particles larger than 1 inch in any direction, as the compact bedding course. Depth of bedding course shall be not less than 6”.
5. After installing first tier of ducts, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand-place backfill to 4 inches over ducts and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction.
6. Comply with all of the following separation requirements, unless otherwise noted:
   a. Provide a minimum of 12” separation between 600V power or communications ducts and foreign structures (including, but not limited to, gas, water, sanitary and oil pipes).
   b. Provide a minimum of 12” separation between 600V power or communications ducts and medium voltage (>600V) duct/wiring.
   c. Provide a minimum of 12” separation between 600V power ducts and communications (including, but not limited to, telephone and cable tv) ducts.
   d. Provide a minimum of 3” separation between 600V power ducts and other 600V power ducts.

e. Provide a minimum of 3” separation between communication ducts and other communication ducts.
f. Comply with the minimum separation requirements of the Utility Companies. Coordinate with the Utility Companies as required.

7. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated.
8. Warning Tape: Bury warning tape above all direct buried ducts. Align tape parallel to and within 3 inches of the centerline of duct bank. Provide an additional warning tape for each 12-inch increment of duct-bank width over a nominal 36 inches. Space additional tapes 12 inches apart, horizontally. Depth of warning tape shall be 12” below finished grade.
9. Concrete encasement at bends and 90 degree elbows: All bends and 90 degree elbows shall be concrete encased with a minimum of 3” thick of 3000 psi concrete at 28 days.

O. Provide underground-line warning tape above all direct buried and concrete encased ducts.

P. Excavation for Utility Trenches:

1. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of ducts and ductbanks.

Q. Utility Trench Backfill:

1. Place backfill on subgrades free of mud, frost, snow, or ice.
2. Backfill material shall be free of particles larger than 1 inch in any dimension.
3. Carefully compact initial backfill under conduit haunches and compact evenly up on both sides and along the full length of conduit to avoid damage or displacement of conduit.
4. Backfill voids while installing and removing shoring and bracing.
5. Backfill in layers not more than 4 inches for material compacted by hand operated tampers.
6. Compact soil material to not less than the following percentage of maximum dry unit weight according to ASTM D698:
   a. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

R. Ducts and ductbanks shall be made watertight.

S. Bending radius of ducts shall be selected to minimize wire or cable pulling tensions. Do not exceed the maximum pulling tension of the wire or cable manufacturer. Coordinate with wire or cable manufacturer.

T. Provide pull wires in all empty ducts.

U. Underground conduit, ducts, or ductbanks shall not be installed under concrete footings, piers, or other load bearing structures of the building. Additionally, these items shall not be located within a 45 degree zone that extends downwards and outwards from the bottom outer edge of the load bearing structures.

V. Where ducts run under bollards or the outside perimeter of the building, comply with the following:

1. Increase the depth of the ducts to provide a minimum of 12” clearance between the top of the ducts and the bottom of the bollard or the outside perimeter of the building.
2. For Direct-Buried Ducts: Provide concrete encasement. Concrete encasement shall be a minimum of 3” thick on the sides, and 12” thick at the top and bottom, of the ducts. Concrete encasement shall extend a minimum of 3’ before and after the bollard or the outside perimeter of building. Concrete shall be 3000 PSI at 28 days.
3. For Concrete-Encased Ducts: Increase the thickness of the concrete encasement to a minimum of 12” thick at the top and bottom. Concrete encasement shall extend a minimum of 3’ before and after the bollard or the outside perimeter of building. Concrete shall be 3000 PSI at 28 days.

W. Where the burial depth of a duct is indicated in the Contract Documents, the indicated depth is the shortest distance measured between a point on the top surface of the duct, and the top surface of finished grade, concrete, or similar cover.

X. Where an underground duct penetrates an exterior wall below grade, and enters a room that is located below grade, the wall penetration shall not be located above any electrical equipment, unless otherwise noted.

3.4 INSTALLATION OF HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of ducts, and seal joint between box and extension as recommended by the manufacturer.

B. Unless otherwise indicated, support handhole/box on a level bed of crushed stone or gravel, 8” deep minimum, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth. Where the handhole/box manufacturer requires a different type of stone/gravel, or requires a greater depth of stone/gravel, comply with the manufacturer’s recommendations.

C. Elevation: Cover surface will be flush with finished floor or finished grade.

D. Field-cut openings for ducts and conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

E. For solid bottom handholes, provide a 1” diameter hole at the bottom of the handhole, to allow water to drain through.

F. Install handholes and boxes in accordance with the manufacturer’s recommendations, so that the installed handholes and boxes comply with the load ratings required by the contract documents.

3.5 INSTALLATION OF PRECAST CONCRETE MANHOLES, HANDHOLES, AND BOXES

A. Precast Concrete Handhole and Manhole Installation:

1. Comply with ASTM C 891, unless otherwise indicated.

2. Install units level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances.

3. Unless otherwise indicated, support handhole/manhole on a level bed of crushed stone or gravel, 8" deep minimum, graded from 1-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth. Where the handhole/manhole manufacturer requires a different type of stone/gravel, or requires a greater depth of stone/gravel, comply with the manufacturer's recommendations.

B. Elevations:

1. Manhole and Handhole Frame: Set frames flush with finished grade.

C. Manhole and Handhole Access: Circular opening in manhole or handhole roof; sized to match cover size.

1. Install chimney, constructed of precast concrete collars and rings to support frame and cover and to connect cover with manhole or handhole roof opening. Provide moisture-tight masonry joints and waterproof grouting for cast-iron frame to chimney.

D. Hardware: Install removable hardware, including pulling eyes, cable stanchions, and cable arms, as required for installation and support of cables and conductors and as indicated.

E. Install handholes and manholes in accordance with the manufacturer's recommendations, so that the installed handholes and manholes comply with the load ratings required by the contract documents.

F. Provide a 1" diameter hole at the bottom of the manhole/handhole, to allow water to drain through.

3.6 TEST PIT EXCAVATION

A. Provide test pits where the new underground ducts will cross with the location of the existing underground utilities and structures. Coordinate location of underground ducts, utilities and structures with the plans, the drawings provided by the utility locator contractor, and field conditions.

B. The test pits shall be used to determine the depth of existing underground utilities and structures where these utilities and structures are located within the depth of the test pits.

C. Depth of test pit shall be as required to determine there is no conflict between the new and existing underground ducts, utilities and structures. Minimum depth and separation requirements for the new underground ducts are indicated in the contract documents.

D. Upon completion, the test pit shall be backfilled, compacted, repaired, and the site returned to the original condition.

E. Perform test pit excavation prior to installing underground conduit, manholes/handholes or other underground structures.

F. Any damage to existing underground utilities and structures due to the test pit excavation shall be repaired by the contractor at no cost to the owner.

G. Coordinate depth and routing of ductbank with the results of the field investigation.

3.7 LOCATING EXISTING UNDERGROUND UTILITIES

A. The drawings do not show all the existing underground utilities. Also, the existing underground utilities shown on the drawings are shown in their approximate locations only. The contractor is responsible for determining the existing underground utilities and their exact location for the areas where he will be working.

B. Before starting any work, hire the services of a Utility Locator contractor to determine the locations of existing underground utilities in the following areas:
1. Where underground ducts are being installed
2. Where concrete foundations are being installed for various equipment and structures
3. Where any underground equipment or structures are being installed
4. Where light poles and light bollards are being installed
5. Where handholes and manholes are being installed
6. Where the existing grade is being lowered
7. Where there is excavation or any other earthwork

C. Location of existing underground utilities shall be marked up on the drawings.

D. The location of existing underground utilities shall be marked on the ground in the field.

E. Coordinate depth and routing of ductbank with the results of the field investigation.

3.8 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:

1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts.
2. Pull aluminum or wood test mandrel through duct to prove joint integrity and test for out-of-round duct. Provide mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.

B. Correct deficiencies and retest as specified above to demonstrate compliance.

3.9 CLEANING

A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

B. Clean internal surfaces of manholes and handholes, including sump. Remove foreign material.

C. Do not damage the ducts during cleaning.

END OF SECTION 260540

SECTION 260553 - ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, shall apply to this Specification Section. Division 26 Specification Sections and other Specification Sections where electrical work is indicated or described, shall also apply to this Specification Section.

1.2 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

1.3 QUALITY ASSURANCE

A. Comply with NFPA 70.

B. Comply with 29 CFR 1910.145.

1.4 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 RACEWAY AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Color for Printed Legend:

1. Power Circuits: Black letters on an orange field.
2. Instrumentation and Control Circuits: Black letters on a yellow field.
3. Legend: Indicate system or service and voltage, if applicable.

C. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches wide; compounded for outdoor use.

2.2 CONDUCTOR AND COMMUNICATION- AND CONTROL-CABLE IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

C. Write-On Tags: Polyester tag, 0.010 inch thick, with corrosion-resistant grommet and polyester or nylon tie for attachment to conductor or cable.

1. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.

2.3 UNDERGROUND-LINE WARNING TAPE

A. Description: Permanent, bright-colored, continuous-printed, polyethylene tape.

1. Not less than 6 inches wide by 4 mils thick.
2. Compounded for permanent direct-burial service.
3. Embedded continuous metallic strip or core.
4. Printed legend shall indicate type of underground line.

2.4 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels: Factory printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment, unless otherwise indicated.

2.5 INSTRUCTION SIGNS

A. Self-Adhesive Instruction Signs: Factory printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment, unless otherwise indicated.

2.6 EQUIPMENT IDENTIFICATION LABELS

A. Self-Adhesive, Engraved, Laminated Acrylic or Phenolic Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

2.7 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.

1. Minimum Width: 3/16 inch.
2. Tensile Strength: 50 lb, minimum.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black, except where used for color-coding.

PART 3 - EXECUTION

3.1 APPLICATION

A. Power-Circuit Conductor Identification: For conductors No. 4/0 AWG and larger in vaults, pull and junction boxes, manholes, and handholes use write-on tags. Identify source and circuit number of each set of conductors. For single conductor cables, identify phase in addition to the above.

B. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use marker tape. Identify each ungrounded conductor according to source and circuit number.

C. Locations of Underground Lines: Provide underground-line warning tape for direct buried and concrete encased ducts or ductbanks.

D. All receptacles, starters, disconnects, and drop cords (receptacles and lights) shall be labeled with its associated circuit number.

E. All panelboards shall be labeled with the circuit number associated with the feeder breaker that supplies power to it.

F. All equipment with integral disconnects shall be labeled with its associated circuit number.

G. All fire alarm control panels and fire alarm remote booster power supplies shall be labeled with its associated circuit number.

H. Warning Labels for Cabinets, Boxes, and Enclosures for Power and Lighting: Comply with 29 CFR 1910.145 and apply self-adhesive warning labels. Identify system voltage with black letters on an orange background. Apply to exterior of door, cover, or other access.

1. Equipment Requiring Workspace Clearance According to NFPA 70: Unless otherwise indicated, apply to door or cover of equipment but not on flush panelboards and similar equipment in finished spaces.

I. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

a. Indoor Equipment: Adhesive film label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where 2 lines of text are required, use labels 2 inches high.
b. Outdoor Equipment: Adhesive film label with clear protective overlay

2. Equipment to be labeled includes, but is not limited to, the following:

a. All power distribution equipment (including, but not limited to, panelboards, disconnects, breakers, transformers, electrical cabinets/enclosures, etc.)

3.2 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Color-Coding for Phase and Voltage Level Identification, 600 V and Less: Use the colors listed below for ungrounded service, feeder, and branch-circuit conductors.

1. Color shall be factory applied or, for sizes larger than No. 10 AWG if authorities having jurisdiction permit, field applied.
2. Colors for 208/120-V and 240/120V Circuits:

a. Phase A: Black.
b. Phase B: Red.
c. Phase C: Blue.
d. Neutral: White

3. Colors for 480/277-V Circuits:

a. Phase A: Brown.
b. Phase B: Orange.
c. Phase C: Yellow.
d. Neutral: Gray

4. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

F. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 12 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 36 inches overall.

END OF SECTION 260553

SECTION 265119 - LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, shall apply to this Specification Section. Division 26 Specification Sections and other Specification Sections where electrical work is indicated or described, shall also apply to this Specification Section.

1.2 SUMMARY

A. This Section includes the following:

1. Lighting Fixtures
2. Lighting Controls

1.3 DEFINITIONS

A. BF: Ballast factor.

B. CRI: Color-rendering index.

C. CU: Coefficient of utilization.

D. HID: High-intensity discharge.

E. LER: Luminaire efficacy rating.

F. Luminaire: Complete lighting fixture, including ballast housing if provided.

G. RCR: Room cavity ratio.

1.4 SUBMITTALS

A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:

1. Physical description of lighting fixture including dimensions.
2. Emergency lighting units including battery and charger.
3. Ballast.
4. Energy-efficiency data.
5. Life, output, and energy-efficiency data for lamps.

B. Shop Drawings: Show details of nonstandard or custom lighting fixtures. Indicate dimensions, weights, methods of field assembly, components, features, and accessories.

1. Wiring Diagrams: Power and control wiring.

C. Field quality-control test reports.

D. Operation and Maintenance Data: For lighting equipment and fixtures to include in emergency, operation, and maintenance manuals.

E. IES Photometric files for each lighting fixture. Label for the files shall match the labeling of each lighting fixture indicated in the Lighting Fixture Schedule.

F. Color samples

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.6 COORDINATION

A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In Lighting Fixture Schedule where titles below are column or row headings that introduce lists, the following requirements apply to product selection:

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

2.2 LIGHTING FIXTURES AND COMPONENTS, GENERAL REQUIREMENTS

A. Metal Parts: Free of burrs and sharp corners and edges.

B. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

D. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.
4. Laminated Silver Metallized Film: 90 percent.

E. Plastic Diffusers, Covers, and Globes:

1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

a. Lens Thickness: At least 0.125 inch minimum unless different thickness is indicated.
b. UV stabilized.

2. Glass: Annealed crystal glass, unless otherwise indicated.

2.3 LIGHTING FIXTURES

A. See "Lighting Fixture Schedule" on the Drawings, for the manufacturer and model number of each lighting fixture.

2.4 TIME CLOCK

A. Time clock shall be Intermatic ET90815CR Astronomic Time Switch or approved equal with the following features:

1. Product Description:
   a. The time clock combines powerful and intuitive scheduling with truly maintenance-free convenience. The PC App and Mobile App provide real-time remote control, and the USB connection and Ethernet capabilities enable in-field updates. The PC App and Mobile App shall be provided to the owner.
2. Features:
   a. Automatic input voltage selection from 120 to 277VAC, 50/60Hz
   b. Over 2,000 events plus holiday schedules
   c. Advanced scheduling including relative events, such as fourth Thursday of November or first week of year
   d. 30A rated contacts
   e. 100-hour supercapacitor eliminates the need for batteries
   f. USB connection for uploading, downloading and transfering programs

g. Easy-to-follow on-screen menus for programming to-the-minute accuracy
h. Non-volatile memory protects programming indefinitely
i. Firmware can be upgraded in-field via USB or Ethernet
j. PC App for easy scheduling or control, either remotely or through USB flash drive
k. Mobile app for real time status and overrides.

3. Applications
   a. Indoor Lighting Control
   b. Outdoor Lighting Control
   c. Timing/Schedule ON/OFF
   d. Machinery and Pump Controls
4. Technical Data
   a. Description: Astronomic 365-Day, Electronic Control, 120-277VAC, 50/60Hz, Outdoor Metal Enclosure, Ethernet Included
   b. Warranty Period: 3-Year Limited
5. Control Specifications:
   a. Minimum ON/OFF Times: 1 second
   b. Minimum Pulse Time: 1 second
   c. Maximum Pulse Time: 23 hours, 59 minutes
   d. Maximum ON/OFF Times: 365 days
   e. Maximum ON/OFF Operations: 2000
   f. Setpoint Program Count: 2000
   g. ON/OFF Operations: 2000
   h. Operations Features: Astronomic; Holiday
   i. Operation Mode: 365 day
   j. Data Transfer Options: Ethernet and USB
   k. Daylight Savings Adjustment: Automatic
   l. Backup Restoration Time: 30 Minutes
   m. Backup Type: Supercapacitor
   n. Backup Protection Time: 100 Hour
6. Mechanical Specifications
   a. Enclosure Type: Outdoor type 3R metal
7. Dimensions:
   a. Not more than 17.9” high x 12.7” wide x 5.4” deep
8. Load Ratings or Normally Open Contacts:
   a. Magnetic Ballast: 20A, 120-277VAC, 50/60Hz
   b. Resistive: 30A, 12-240VAC, 50//60Hz
   c. General Purpose: 30A, 12-240VAC, 50/60Hz

d. Motor Load Ratings: 1 HP, 120V, 50/60Hz

9. Electrical Specifications:
   a. Voltage Selection Type: Auto Voltage
   b. Wiring Option: Terminals
   c. Input Voltage Range: 120-277VAC, 50/60Hz
   d. Number of Circuits: 8
   e. Switch Type: 8 x SPDT
   f. Maximum Power Consumption (W): 50W
10. Standards and Certifications:
   a. UL Listed
11. Wiring Terminals are suitable for use with #20 to #6 AWG wire.
12. Suitable for operation in -40 degrees F to 104 degrees F temperatures.

B. The contractor shall provide a laptop that is preloaded with the PC App which provides programming and control for the Time Clock. The contractor shall provide training to the owner in the use of the PC App. After the training, the laptop shall become the property of the owner. The contractor shall also provide all cabling necessary for making the connection from the laptop to the Time Clock.

2.5 LIGHTING FIXTURE SUPPORT COMPONENTS

A. Comply with Specification Section "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.

B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.

C. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.

D. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage.

E. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.

F. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.

B. Wall-Mounted Lighting Fixture Support:

1. Provide all necessary blocking, channels, and other hardware for securing lighting fixtures to the wall. The blocking/channels shall be concealed inside the hollow spaces of the wall where the wall is gypsum board or other similar wall type.

C. Adjust aimable lighting fixtures to provide required light intensities.

D. Connect wiring according to Specification Section "Conductors and Cables."

E. Where non-IC rated lighting fixtures are installed in insulated ceilings, provide clearance between the lighting fixture and the insulation in accordance with the manufacturer's recommendations and NEC requirements.

F. Where non-fire rated lighting fixtures are recessed into fire rated ceilings, build a fire rated enclosure around the lighting fixtures such that a fire in the lighting fixture shall have to pass through the fire rated enclosure and a fire in the ceiling shall have to pass through the fire rated enclosure. The fire rating of the enclosure shall match the fire rating of the ceiling.

G. Where lighting fixtures have inputs for dimming signal (including, but not limited to, 0-10V) control wiring, but dimming signal control wiring is not provided, this shall mean that the lighting fixture is not intended to be dimmed remotely, and the lighting fixture shall be wired for full light output, unless otherwise noted.

H. Floodlights, sign lights, sports lights (including but not limited to, lighting for skating, basketball, football, etc.), or any lighting fixture that is aimable, shall be aimed in order to maximize the average lighting level across the entire area being lit, and to minimize the average-to-minimum lighting level across the entire area being lit, prior to final acceptance of the project. The contractor shall include in his bid price, a return trip to the site up to 6 months after final acceptance of the project, in order to re-aim any or all of the lighting fixtures. Coordinate with the owner and obtain approval, before aiming or re-aiming lighting fixtures.

I. Lighting fixtures with field adjustable light output shall be adjusted in order to maximize the average lighting level across the entire area being lit, and to minimize the average-to-minimum lighting level across the entire area being lit, prior to final acceptance of the project. The contactor shall include in his bid price, a return trip to the site up to 6 months after final acceptance of the project, in order to re-adjust the lighting levels. Coordinate with the owner and obtain approval, before adjusting or re-adjusting lighting levels.

J. Time controls shall be programmed in accordance with the direction provided by the owner, prior to final acceptance of the project. The contractor shall include in his bid price, a return trip to the site up to 6 months after final acceptance of the project, in order to re-program the time controls. Coordinate with he owner and obtain approval, before programming or re-programming the time clocks.

3.2 FIELD QUALITY CONTROL

A. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.3 DEMONSTRATION AND TRAINING

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain the lighting fixtures.

B. The System Supplier shall schedule and present a minimum of 4 hours of documented formalized instruction for the building owner, detailing the proper operation and maintenance of the installed lighting fixtures.

C. The instruction shall be presented in an organized and professional manner by a person factory trained in the operation and maintenance of the equipment and who is also thoroughly familiar with the installation.

D. In addition to any training indicated in the previous paragraphs above, an additional 4 hours of training shall be provided in the use of the Time Clock for the following:
   1. Changing time settings and scheduling
   2. Manual override of the schedules
   3. Use of Software

END OF SECTION 265119

SECTION 26 56 13 - EXTERIOR LIGHTING POLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, shall apply to this Specification Section. Division 26 Specification Sections and other Specification Sections where electrical work is indicated or described, shall also apply to this Specification Section.

1.2 SUMMARY

A. This Section includes the following:

1. Poles and accessories.

B. Related Sections include the following:

1. Specification Section "Lighting" for exterior luminaires.

1.3 DEFINITIONS

A. Luminaire: Complete lighting fixture

B. EPA: Effective Projected Area

C. AASHTO: American Association of State Highway and Transportation Officials

1.4 SUBMITTALS

A. Product Data: For each pole, and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:

1. Details of attaching luminaires and accessories.

2. Materials, dimensions, and finishes of poles.

3. Means of attaching luminaires to supports, and indication that attachment is suitable for components involved.

4. Anchor bolts for poles.

5. Locations, weights, and EPA of accessories and equipment on the pole, including but not limited to, the following:

a. Handhole

b. Ground Lug

c. Luminaire and associated arm, bracket or bullhorn

6. Maximum weight rating and EPA rating of the pole.

7. Detailed wiring diagrams.

8. IES photometric files for each luminaire shall be provided via email

B. Shop Drawings:

1. Anchor-bolt templates keyed to specific poles and certified by manufacturer.

2. Pole drawings.

C. Operations and maintenance manuals.

D. Structural Design for Poles

1. The pole manufacturer shall provide the structural drawings and calculations for the poles.
2. The structural drawings/calculations of the pole shall be submitted for review
3. The pole manufacturer shall provide a signed and dated letter indicating that the design for the pole complies with the STRUCTURAL CRITERIA indicated in this specification section.
4. The pole design shall take into consideration the weight, wind loading, and other factors associated with all equipment mounted to or supported from the pole.
5. Where EPA is not provided by the manufacturers of the equipment mounted on the pole, the pole manufacturer shall calculate EPA based on the shape, dimensions, and other factors associated with the equipment.

1.5 COORDINATION

A. The contractor shall coordinate with the manufacturers of all equipment and accessories mounted/attached to the pole, and shall obtain all information that is required to perform all the work required in the contract documents.

1.6 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with IEEE C2, "National Electrical Safety Code."

C. Comply with NFPA 70.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store poles on decay-resistant-treated skids at least 12 inches above grade and vegetation. Support poles to prevent distortion and arrange to provide free air circulation.

B. Retain factory-applied pole wrappings on metal poles until right before pole installation. For poles with nonmetallic finishes, handle with web fabric straps.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND MODEL NUMBERS

A. See the Drawings for the manufacturer and model number of each light pole.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers indicated in the Drawings.

2.2 POLES AND SUPPORT COMPONENTS, GENERAL REQUIREMENTS

A. Structural Criteria: Comply with AASHTO LTS-6.

1. The pole and anchor bolts, along with all items attached/mounted on it (including, but not limited to, luminaires), shall withstand basic wind speeds (basic wind speed is defined in AASHTO LTS-6) of 120 mph. Gust effector factor shall be 1.14. Wind importance factor shall be 1.0.

2. Where the light pole specified in the drawings does not meet the requirements indicated in the previous paragraph above, provide a light pole with a thicker wall or larger diameter/cross sectional area at no additional cost.

B. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts, unless otherwise indicated.

C. Mountings, Fasteners, and Appurtenances: Corrosion-resistant items compatible with support components.

1. Materials: Shall not cause galvanic action at contact points.

D. Concrete Pole Foundations: Cast in place, with anchor bolts to match pole-base

2.3 POLES

A. See the drawings for the manufacturer and model number of each light pole.

B. Handhole:

1. Provide weathertight reinforced handhole for the pole.

2. Handhole shall comply with NEC requirements.

C. Grounding and Bonding Lugs: Threaded lug (grounded and bonded to the pole), listed for attaching grounding and bonding conductors, and accessible through handhole. Lug shall be coordinated with the ground wire size/material.

D. Vibration Damper: Where the model number indicated in the drawings indicate that a vibration damper shall be provided, the pole shall include a factory installed canister type vibration damper. The moving parts of the vibration damper shall be contained within the canister, and shall not be in contact with the wiring inside the pole.

E. Provide full base cover for pole. This shall cover the anchor bolts.

F. Poles without tenon mounted luminaires at the top of the pole, shall have a top cap at the top of the pole.

PART 3 - EXECUTION

3.1 POLE INSTALLATION

A. Align pole foundations and poles for optimum directional alignment of luminaires and their mounting provisions on the pole.

B. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer.

C. Foundation-Mounted Poles: Mount pole with leveling nuts, and tighten top nuts to torque level recommended by pole manufacturer.

1. Install base covers, unless otherwise indicated.

D. Raise and set poles using web fabric slings (not chain or cable).

E. Poles shall be installed in accordance with the manufacturer’s recommendations.

3.2 GROUNDING

A. Ground metal poles and support structures.

1. Install ground rods for each pole.

3.3 DEMONSTRATION AND TRAING

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain the equipment.

B. The System Supplier shall schedule and present a minimum of 8 hours of documented formalized instruction for the building owner, detailing the proper operation and maintenance of the installed equipment.

C. The instruction shall be presented in an organized and professional manner by a person factory trained in the operation and maintenance of the equipment and who is also thoroughly familiar with the installation.

END OF SECTION 265613

SECTION 311000

SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Utility locating-designating and test pitting.
4. Clearing and grubbing.
5. Stripping and stockpiling topsoil.
6. Removing above- and below-grade site improvements.
7. Disconnecting, capping or sealing, and removing site utilities and abandoning site utilities in place.
8. Temporary erosion and sediment control.
9. Coordination, removal, salvaging and temporary storage of salvaged items.
10. Temporary traffic control, including pedestrian access from Willoughby Road to the existing Tot Lot and other designated areas and facilities.

B. Related Requirements:

1. Section 015639 “Temporary Tree and Plant Protection” for temporary tree and plant protection requirements during demolition, clearing, and new construction activities.
2. Section 312000 “Earth Moving” for excavation, fill and backfill materials, and compaction requirements.
3. Section 329113 “Soil Preparation” for Planting Mix requirements.

1.3 DEFINITIONS

A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow.

1. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil.
2. Satisfactory stripped and stockpiled topsoil shall be reasonably free of subsoil and non-soil materials including clay lumps, gravel, and other objects larger than 2 inches in diameter, and free of weeds, roots, toxic materials, trash and other waste materials.

D. Plant Protection-Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction as indicated.

E. Tree Protection-Zone: Area surrounding individual trees or groups of trees to be protected during construction as indicated and according to requirements in Section 015639 "Temporary Tree and Plant Protection".

F. Utilities: Domestic and fire supply water services, sanitary sewer, storm drainage, natural gas, steam, chilled water supply and return systems, electrical, and telecommunication utilities and associated structures, including related surface and subsurface structural and mechanical features and conditions.

G. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PRE-INSTALLATION MEETING

A. Pre-installation Conference: Conduct conference at Project site.

1. Review the field stakeout of the proposed Limit of Disturbance (LOD), proposed locations for tree and plant protection measures, and the Sequence of Construction operations.
2. Review the proposed locations of saw cuts within existing paved areas for utility trenching.
3. Review temporary traffic control, including pedestrian access from Willoughby Road to the existing Tot Lot and other specifically designated areas and facilities.

1.5 MATERIAL OWNERSHIP

A. All cleared and grubbed materials, except for materials and items indicated to be salvaged and stockpiled or otherwise remain the Owner's property, shall become Contractor's property and shall be removed from Project site.

1.6 INFORMATIONAL SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.

1. Use sufficiently detailed digital photographs or video recordings to document all applicable existing conditions.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.
3. Refer to Section 015639 “Temporary Tree and Plant Protection” for additional requirements.

1.7 QUALITY ASSURANCE

A. Topsoil stripping, and on-site stockpiling program if applicable.

B. Record Drawings: Identifying and accurately showing the locations of all existing utilities by subsurface utility locating-designating methods, and test pitting as applicable.

C. Topsoil Stripping and On-site Stockpiling Program: Prepare a written program to demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work. Include dimensioned diagrams for placement and protection of stockpiles.

1.8 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
3. Temporary Traffic Control: Provide and maintain temporary traffic control devices and labor as necessary to ensure 24-hour per day access requirements of the Owner and entities making deliveries, including maintenance and emergency vehicles that would require access through the Work area, and pedestrian access from Willoughby Road to the existing Tot Lot and other specifically designated areas and facilities.

B. Existing Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated and as directed by Owner’s Representative.

C. Utility Locating-Designating Services and Test Pitting:

1. Notify and obtain utility locating-designating services to field locate and mark existing utilities within the Limit of Disturbance (LOD) and adjoining areas where Project is located prior to beginning any site demolition, site clearing and earth-moving operations.
2. Complete test pitting operations and submit all reports to the Project Architect, Project Civil Engineer, and Owner’s Representative for further direction before proceeding with site demolition, clearing, grubbing, and earth-moving operations.

D. Do not commence site clearing and grubbing operations until temporary erosion and sediment control and plant protection measures are in place.

E. Temporary Tree and Plant Protection Zones: Protect as necessary and according to requirements in Section 015639 "Temporary Tree and Plant Protection.".

F. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."

1. Obtain approved satisfactory borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Stake out the proposed Limit of Disturbance (LOD) according to the approved erosion and sediment control Drawings, proposed saw cut limits for removal of existing pavement for improvements and for utility trench excavations, and for temporary tree and plant protection zones for review and approval by Arborist and Landscape Architect at the Pre-Installation Conference prior to beginning any clearing and grubbing operations.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner’s Representative.

3.2 TEMPORARY EROSION AND SEDIMENT CONTROL

A. Install temporary erosion and sediment control measures and devices to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways in accordance with the approved Erosion and Sediment Control (ESC) Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion and sediment control measures and devices after rainfall events and throughout construction until permanent vegetation has been established.

D. With the approval of the Sediment Control/Grading Inspector and applicable authorities having jurisdiction, remove erosion and sediment controls, restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

A. Protect trees and plants designated to remain on-site located within the Limit of Disturbance (LOD). Do not disturb existing trees and vegetation located outside of the LOD unless specifically noted and indicated.

B. Repair or replace trees, shrubs, and other vegetation indicated to remain, or be relocated, that are damaged by demolition, clearing, grubbing, and construction operations in accordance with requirements in Section 015639 "Temporary Tree and Plant Protection".

3.4 EXISTING UTILITIES

A. Complete field locating-designating and surface marking existing utilities, and test pitting operations and reporting, prior to beginning any site demolition, clearing and earth moving operations.

B. Request that the Owner arrange for disconnection and sealing/capping of designated public utility services (water, electric, gas, telephone/telecommunication, as applicable) that serve existing structures before beginning site clearing.

C. Locate, identify, disconnect, and seal/cap private on-site utilities indicated to be removed or abandoned in place as indicated.

1. Confirm that Owner has made arrangements with applicable utility service companies to shut off pertinent utilities.
2. Verify that designated utilities have been disconnected/capped before proceeding with site clearing.

D. Interrupting Existing Utilities: Do not interrupt public and private utilities that serve existing facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner’s Representative not less than ten (10) days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner Representative's written permission.

E. Excavate for and remove underground utilities as indicated. Backfill and compact trenches and excavated areas after utility removal in accordance with Section 312000 “Earth Moving” requirements.

F. Excavation, backfill, and compaction related to the removal of underground utilities is included in Section “Earth Moving”. Refer to applicable fire suppression, plumbing, HVAC, electrical, communications, electronic safety and security systems specified in other applicable utility sections for specific removal or protection as applicable.

3.5 CLEARING AND GRUBBING

A. Within the indicated Limit of Disturbance (LOD), remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated within the LOD.
2. Completely remove, or grind down stumps, and remove roots larger than two (2) inches in diameter to a depth of at least 18 inches below exposed subgrade in turf areas and at least 36 inches below exposed subgrade in proposed paved or hardscape areas.
3. Completely remove obstructions and debris to a depth of at least 18 inches below exposed subgrade.
4. Use only hand methods or air spade for grubbing within protection zones.
5. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of eight (8) inches, and compact each layer to a density matching adjacent original ground.

3.6 TOPSOIL STRIPPING

A. Remove plants, sod and grass before stripping topsoil.

B. Strip topsoil to its full depth in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Satisfactory stripped topsoil shall be stockpiled and reasonably free of subsoil and non-soil materials including clay lumps, gravel and other objects larger than two (2) inches in diameter; trash, debris, weeds, roots, trash and other waste materials.

C. Temporarily stockpile satisfactory topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

1. Limit height of topsoil stockpiles to 72 inches.
2. Do not stockpile topsoil within protection zones.
3. Dispose of surplus topsoil. Surplus topsoil is that which remains after finish grading and topsoiling have been satisfactorily completed.
4. With the Landscape Architect and Owner Representatives written approval, surplus satisfactory topsoil may be used for respreading topsoil to a deeper depth in proposed turf areas if proposed grading can be adjusted and positive drainage is maintained in the regraded areas.

3.7 EXISTING SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove concrete slabs, asphalt paving, and aggregate base courses, curbs and gutters, and all existing features within the indicated Limit of Disturbance (LOD) as noted and indicated.

1. Review limits of designated milling of hot-mix asphalt paving, removal of pavements, and limits of proposed saw cutting of pavements, with Landscape Architect and Owner's Representative prior to removal. Where designated limits are within six (6) inches of existing full-depth joints, review with Landscape Architect and Owner's Representative to verify if minor adjustments to saw cutting locations should be made.
2. Unless existing full-depth joints coincide with proposed lines of demolition, neatly saw-cut existing pavement at designated limits before removing adjacent pavement. Cleanly saw-cut pavement faces vertically.
3. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.8 REMOVAL AND SALVAGING EXISTING SITE IMPROVEMENTS

A. Remove designated existing site improvements: Carefully remove items indicated to be salvaged.

B. Coordinate, transport and store items on the Owner's premises as directed by Owner's Representative.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsatisfactory soil and topsoil, obstructions, demolished and waste materials including trash and debris, and legally dispose of them off the Owner's property.

B. Burning tree, shrub, and other vegetation waste is prohibited. Burning of all other waste and debris is prohibited.

C. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials, and transport them to recycling facilities.

END OF SECTION 311000

SECTION 312000

EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Utility locating-designating and test pitting.
2. Excavating and filling for rough grading the Site.
3. Preparing subgrades for concrete retaining walls, slabs-on-grade, walkways and sidewalks, pavements, retaining walls, turf and grasses, and plants.
4. Excavating and backfilling for structures, retaining walls, pavements, concrete slabs-on-grade, and utilities.
5. Aggregate base course for concrete slabs-on-grade, walkways and sidewalks, and pavements.
6. Aggregate base course for asphalt paving.
7. Subsurface drainage bedding and backfill for foundation, retaining walls and site walls, and trenches.
8. Excavating and backfilling trenches for utilities and pits for buried utility structures.
9. Fine grading, scarifying and removal of stones and debris from subgrade.
10. Disposal of unsatisfactory and surplus soil and topsoil.
11. Temporary traffic control.

B. Related Requirements:

1. Section 012200 “Unit Prices” for unit price provisions.
2. Section 013200 "Construction Progress Documentation" for recording preexcavation and earth-moving progress.
3. Section 015639 “Temporary Tree and Plant Protection” for temporary tree and plant protection requirements during demolition, clearing, and new construction activities.
4. Section 311000 "Site Clearing" for site stripping, grubbing, stripping and stockpiling satisfactory topsoil, and removal of above- and below-grade improvements and utilities.
5. Section 329113 “Soil Preparation” for Planting Mix requirements.
6. Section 329200 "Turf and Grasses" for finish grading in turf and lawn areas, including preparing and placing Planting Mix for turf and lawn areas.
7. Section 329300 "Plants" for finish grading in planting areas, and tree and shrub pit excavation.

1.3 UNIT PRICES

A. Refer to Section 0122000 "Unit Prices" for prices per unit of measurement for materials, equipment or services, or a portion of the Work added to or deducted from the Contract Sum by appropriate modification, if the scope of Work required by the Contract Documents is increased or decreased.

1.4 EXCAVATION

A. All excavation shall be Unclassified for this Project.

B. Additional payment for excavation of Rock will not be approved or authorized.

1.5 DEFINITIONS

A. Backfill: Satisfactory soil material or controlled low-strength material (CLSM) used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Aggregate Base Course: Aggregate layer placed between subgrade and a hot-mix asphalt (HMA) base/binder course for asphalt paving or walk, or an aggregate layer placed between subgrade and a concrete slab, pavement, walkway or sidewalk.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe or designated utilities and related structures.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Controlled Low-Strength Material (CLSM) consists of a ready-mix, self-leveling and self-compacting concrete material.

F. Drainage Course: Aggregate layer supporting a slab-on-grade that also minimizes upward capillary flow of pore water, or open graded, washed aggregate in a subsurface drainage system.

G. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Project Civil Engineer or Testing Agency. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Project Civil Engineer or Testing Agency, or MEP. Unauthorized excavation, as well as remedial work directed by Project Civil Engineer, Testing Agency, or MEP shall be without additional compensation.

H. Fill: Satisfactory soil materials used to raise existing grades.

I. Flowable Fill: Controlled Low Strength Material (CLSM) consisting of a self-leveling and self-compacting material.

J. MEP Engineer: Mechanical, Electrical, or Plumbing Engineer for the Project.

K. Structural Fill: Soil materials approved by the Testing Agency to be used to raise existing grades under structures and buildings.

L. Structures: Buildings, footings, foundations, retaining walls, cement-concrete slabs, tanks, curbs, utility manholes and structures, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

M. Subbase Course: Aggregate layer placed between the subgrade and aggregate base course for hot-mix asphalt pavement or walkway, or aggregate layer placed between the subgrade and aggregate base course for a concrete pavement or a concrete walkway or sidewalk.

N. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below a subbase course, aggregate base course, drainage course, topsoil, or planting mix materials.

O. Temporary Tree and Plant Protection-Zone: Area surrounding individual trees, groups of trees, shrubs, and other vegetation to be protected during construction.

P. Utilities: On-site and off-site underground pipes, conduits, ducts, cables, and utility structures as well as underground services within buildings.

1.6 PRE-INSTALLATION MEETING

A. Pre-installation Conference: Conduct at Project site.

1. Review methods and procedures related to earthmoving, including, but not limited to, the following:

a. Personnel and equipment needed to make progress and avoid delays.
b. Coordination of Work with underground utility locating-designating service.
c. Coordination of Work and equipment movement with the locations of temporary tree- and plant-protection zones.
d. Extent of trenching by hand or with air spade.
e. Field quality control.
f. Review the approved erosion and sediment control (ESC) Drawings and approved stormwater management (SWM) Drawings with related earth moving operations and sequence of construction.
g. Temporary traffic control requirements.

1.7 ACTION SUBMITTALS

A. Product Data: For each type of the following manufactured products required:

1. Geotextiles.
2. Controlled low-strength material (CLIM), including design mixture.
3. Detectable warning tape.

B. Samples for Verification: For the following products, in sizes indicated below, and submitted with the product data:

1. Geotextiles: 12 by 12 inches, of each type.
2. Detectable warning tape: 12 inches long; of each color.

1.8 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D2487.
2. Laboratory compaction curve according to ASTM D698 (Standard Proctor).

C. Pre-excavation Digital Photographs or Videotape: Submit sufficiently detailed digital photographs or videotapes showing existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earth-moving operations. Submit before earth moving operations begin.

1.9 QUALITY ASSURANCE

A. Project Geotechnical Report: Refer to the "Geotechnical Engineering Study, Parkville Senior Center", 8601 Harford Road, Baltimore, Maryland, DWK Contract Number 23012.D, dated March 1, 2024 and prepared by D.W. Kozera, Inc., 1408 Bare Hills Avenue, Suite 200, Baltimore, MD 21209; Telephone: (410) 823-1060.

B. Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials (MDSHA), July 2023, and current Special Provisions, as amended to date.

1. References to "Measurement and Payment" and "Price Adjustment" provisions do not apply to Section 312000.

C. Baltimore County, Department of Public Works Specifications for Material, Highways, Bridges, Utilities, and Incidental Structures (BCDPW), as amended to date.

1. References to "Measurement and Payment" do not apply to Section 312000.

D. Blasting is not allowed on this Project.

E. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E329 and ASTM D3740 for testing indicated.

1.10 UTILITY LOCATING-DESIGNATING AND TEST PITTING

A. Utility Locating-Designating Services: Notify and obtain utility locating-designating services to field locate and mark existing utilities within the Limit of Disturbance (LOD) and associated areas where Project is located prior to beginning any site demolition, clearing, grubbing, and earth-moving operations.

1. Obtain "Miss Utility" services to field locate and surface mark utilities.
2. For utilities not located and marked by “Miss Utility”, obtain the services of a private utility locating-designating service to identify and surface mark utilities.
3. Review marked utilities with the Owner’s Representative in the field prior to proceeding with site clearing, grubbing, and earth-moving operations.
4. Complete test pitting operations and submit all reports to the Project Architect, Project Civil Engineer, and Owner’s Representative for further direction before proceeding with site demolition, clearing, grubbing, and earth-moving operations.

1.11 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
3. Temporary Traffic Control: Provide temporary traffic control devices and labor as necessary to ensure 24-hour per day access requirements of the Owner and entities making deliveries, including maintenance and emergency vehicles that would require access through the Project Work area as applicable.

B. Do not commence earth-moving operations until temporary site fencing, erosion and sediment control measures specified in Section 311000 "Site Clearing" are in place.

C. Do not commence clearing, grubbing, and earth-moving operations until plant-protection measures installed specified in Section 015639 "Temporary Tree and Plant Protection" are in place.

D. The following practices are prohibited within Temporary Tree and Plant Protection Zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other disturbances without written authorization from the Project Landscape Architect, Project MEP, or Project Civil Engineer.
7. Attachment of signs to or wrapping materials around trees or plants unless indicated.

E. Do not direct vehicle or equipment exhaust towards Temporary Tree and Plant Protection Zones.

F. Prohibit heat sources, flames, ignition sources, and smoking within or near Temporary Tree and Plant Protection Zones.

PART 2 - PRODUCTS

2.1 GENERAL:

A. Basis of Design: Products specified in PART 2 – PRODUCTS are intended to establish the "Basis of Design" for product and material requirements.

2.2 SOIL MATERIALS

A. Provide satisfactory off-site borrow soil materials when sufficient satisfactory on-site soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups SM, SP, SW, GM, GP, and GW according to ASTM D2487, or a combination of these groups approved by Testing Agency; free of rock fragments or gravel larger than 3 inches in any dimension, rubble, debris, waste, frozen materials, vegetation, and other deleterious matter.

1. Liquid Limit: As approved by the Testing Agency.
2. Plasticity Index: As approved by the Testing Agency.
3. Soil imported for use as compacted fill or backfill shall be classified as SM or more granular, with a maximum dry density of 110 psf or greater, and within 2 percentage points of the optimum moisture content of the soil.
4. Retaining wall backfill shall consist of imported SM or more granular material approved by the Testing Agency.

C. Unsatisfactory Soils: Soil Classification Groups ML, CL, OL, OH, MH, CH, and PT according to ASTM D2487, or a combination of these groups unless approved in advance with written authorization from the Testing Agency.

1. Unsatisfactory soils also include rock, boulders, soil materials of all types and conditions, obstructions, rubble, and satisfactory soils not maintained within three (3) percent of optimum moisture content at time of compaction, unless approved in advance with written authorization from the Testing Agency.
2. Reclaimed/recycled concrete (RC) is considered an Unsatisfactory Soil material.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

E. Aggregate Base Course: "Graded Aggregate – Base" in accordance with MDSHA Section 901, Table 901 A and Table 901 B.

1. Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

F. Engineered/Structural Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve. Engineered Fill shall be approved by the Testing Agency.

G. Bedding Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.

H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.

I. Sand: ASTM C33/C33M; fine aggregate.

J. Impervious Fill: Clayey gravel and sand mixture, capable of compacting to a dense state, as determined by Testing Agency.

2.3 GEOTEXTILES

A. Subsurface Drainage Geotextile: Nonwoven geotextile, manufactured for subsurface drainage applications, composed of polypropylene fibers; complying with MDSHA Specification Section 919 GEOTEXTILES for Application Class SD, Type I:

1. Grab Strength: 160 lb. minimum per ASTM D4632.
2. Puncture Strength: 310 lb. minimum per ASTM D6241.
3. Permittivity: 0.50 sec^{-1} minimum per ASTM D4491.
4. Apparent Opening Size: 0.43 mm, maximum opening size per ASTM D4751.
5. Flow Rate: Minimum 110 $gal/min/ft^2$ per ASTM D4491.
6. Trapezoid Tear Strength: 55 lb. per ASTM D4533.
7. UV Resistance: 50 percent (minimum percent-retained test value) at 500 hours exposure per ASTM D4355.

B. Separation Geotextile: Non-woven needle-punched geotextile fabric, manufactured for separation applications, composed of polypropylene fibers; complying with complying with MDSHA Specification Section 919 GEOTEXTILES for Application Class SE:

1. Grab Tensile Strength: 160 lb. minimum per ASTM D4632.
2. Puncture Strength: 310 lb. minimum per ASTM D6241.
3. Permittivity: 0.20 sec^{-1} minimum per ASTM D4491.
4. Flow Rate: Minimum 95 $gal/min/ft^2$ per ASTM D4491.
5. Apparent Opening Size: 0.30 mm, maximum opening size per ASTM D4751.
6. Trapezoid Tear Strength: 80 lb. per ASTM D4533.
7. UV Resistance: 50 percent (minimum percent-retained test value) at 500 hours exposure per ASTM D4355.

2.4 CONTROLLED LOW-STRENGTH MATERIAL (CLSM)

A. Controlled Low-Strength Material: Type B, in accordance with MDSHA Specification Section 902.16.

2.5 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric power lines, cables, conduit and lighting cable systems.
2. Yellow: Gas, oil, steam, petroleum or gaseous material systems.
3. Orange: Communication, alarm or signal lines, cables or conduit systems.
4. Blue: Potable water systems.
5. Green: Sanitary sewer and storm drain systems.
6. Purple: Reclaimed water, irrigation and slurry line systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

B. Protect and properly maintain erosion and sediment devices and controls during earth-moving operations. Immediately inspect and make necessary repairs after rainfall events, and as directed by the Grading/Sediment Control Inspector.

C. Protect subgrades and foundation soils from water, freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

D. Temporary Traffic Control: Provide and maintain temporary traffic control devices and labor as necessary to ensure 24-hour per day access requirements of the Owner and entities making deliveries, including maintenance and emergency vehicles that would require access through the Project Work area.

3.2 DEWATERING

A. Provide dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding the Project site and surrounding areas.

C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

D. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in accordance with the approved Erosion and Sediment Control Drawings, and in a manner that avoids inconvenience to others.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, boulders, soil materials of all types and conditions, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of rock, boulders, soil materials of all types and conditions, rubble, or obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

a. 24 inches outside of concrete forms other than at footings.
b. 12 inches outside of concrete forms at footings.
c. 6 inches outside of minimum required dimensions of concrete cast against grade.
d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
e. 6 inches beneath bottom of concrete slabs-on-grade.
f. 6 inches beneath pipe in trenches and the greater of 24 inches wider than pipe or 42 inches wide.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree and Plant-Protection Zones:

1. Perform excavations and grading within and adjacent to Tree Protection-Zones and Plant Protection-Zones in accordance with Section 015639 “Temporary Tree and Plant Protection” requirements.
2. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
3. Cut and protect roots in accordance with requirements in Section 015639 "Temporary Tree and Plant Protection."

3.6 EXCAVATION FOR WALKWAYS AND PAVEMENTS

A. Excavate surfaces under walkways and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Excavate trenches to allow installation of top of pipe below frost line unless indicated otherwise on the applicable utility profile.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit or as indicated.

1. Clearance: 12 inches each side of pipe or conduit, or as indicated.

C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.8 SUBGRADE INSPECTION

A. Notify Testing Agency, Project MEP, and Project Civil Engineer when excavations have reached required subgrade.

B. If Testing Agency, Project MEP, or Project Civil Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired, loaded 10-wheel, tandem-axle dump truck weighing not less than 20 tons or suitable compaction equipment approved by Testing Agency for trenches and confined areas, to identify soft pockets and areas of excess yielding in the presence of the Testing Agency. Do not test or proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, repeating proof rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting as determined by Testing Agency, Project MEP, or Project Civil Engineer and replace with compacted backfill or fill as directed.

D. Authorized undercutting excavation and replacement material will be paid for according to Contract provisions for changes in the Work. Refer to Section 012200 “Unit Prices” for additional information and requirements.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Testing Agency, Project MEP, Project Civil Engineer,, without additional compensation.

F. Refer to the approved stormwater management (SWM) Drawings for subgrade testing, specific backfill materials, and compaction requirements for all proposed SWM facilities.

3.9 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day minimum compressive strength of 2500 psi, may be used when approved by Architect.

1. Fill unauthorized excavations under site related construction, pipe, or conduit as directed by the Project MEP, Project Civil Engineer, or Testing Agency.

3.10 STORAGE OF SOIL MATERIALS

A. Borrow soil materials and excavated satisfactory soil materials shall be stockpiled without intermixing.

1. Place, grade, and shape stockpiles to drain surface water.
2. Cover to prevent windblown dust. Comply with the approved Erosion and Sediment Control Drawings.

3. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of water, mud, frost, snow, or ice.

C. Place fill and backfill behind retaining walls in maximum 4-inch thick loose lifts.

3.12 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of water, mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with satisfactory soil. Fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 "Cast-in-Place Concrete."

D. Trenches under Roadways: Install a minimum 8-inch- thick, concrete-base slab support for piping or conduit less than 24 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 8 inches of concrete before backfilling or placing roadway aggregate base course. Concrete is specified in Section 321313 “Concrete Paving”.

E. Backfill voids with satisfactory soil while removing shoring and bracing.

F. Initial Backfill:

1. Soil Backfill: Place and compact initial backfill of bedding course, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.
2. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
3. Controlled Low-Strength Material: Where indicated, place initial backfill of controlled low-strength material to a height of 12 inches over the pipe or conduit. Coordinate backfilling with utilities testing.

G. Final Backfill:

1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.
2. Controlled Low-Strength Material: Where indicated, place final backfill of controlled low-strength material to final subgrade elevation.

H. Detectable Warning Tape:

1. Install detectable warning tape directly above utilities, 12 inches below subgrade.
2. Install 6 inches below subgrade under pavements and slabs.

3.13 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas: Use satisfactory soil material.
2. Under walks and pavements: Use satisfactory soil material or engineered/structural fill.
3. Under steps and ramps: Use engineered/structural fill or satisfactory soil material.
4. Under building slabs: Use engineered/structural fill.
5. Under footings and foundations, use engineered/structural fill.

C. Place soil fill on subgrades free of water, mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compacting to within three (3) percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain water, frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by three (3) percent and is too wet to compact to specified maximum dry density.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry density according to ASTM D698 (Standard Proctor):

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material to at least 97 percent of maximum dry density.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material to at least 95 percent of maximum dry density.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material to 85 percent of maximum dry density.
4. For retaining walls, compact each layer of initial and final backfill soil material to at least 95 percent of maximum dry density.
5. For utility trenches, compact each layer of initial and final backfill soil material to at least 95 percent of maximum dry density. Utility trench backfill and compaction requirements shall be the same whether located beneath structures, paving, or turf areas.

3.16 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1/2 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.17 EXTERIOR SUBSURFACE DRAINAGE

A. Subsurface Drain, Geotextile Fabric, and Initial Drainage Course Backfill: Place subsurface drainage geotextile upon subgrade and extend up the sides of the trench.

1. Place a 6-inch deep, or depth as indicated, drainage course upon the subsurface drainage geotextile above the subgrade to support subdrainage pipe.
2. Install the subdrainage pipe and encase with a minimum 12-inch depth of drainage course material all around the pipe, placed in compacted layers 6-inches deep.
3. Compact each drainage course layer with a minimum of two passes of a plate-type vibratory compactor.
4. Wrap the top with subsurface drainage geotextile, overlapping the top and ends a minimum of 6-inches.
5. Place and compact satisfactory soil backfill above the encased subdrainage system to reach finish grade subgrade above.

3.18 AGGREGATE BASE COURSE UNDER CONCRETE SLABS-ON-GRADE, PAVEMENTS, WALKS AND WALKWAYS

A. Where indicated on the Drawings, place aggregate base course on approved subgrades free of mud, frost, water, snow, or ice.

B. On approved subgrade, place aggregate base course under pavements and walks as follows:

1. Shape aggregate base course to required crown elevations and cross-slope grades.
2. Place aggregate base course 6 inches or less in compacted thickness in a single layer.
3. Place aggregate base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
4. Compact aggregate base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 97 percent of maximum dry density according to AASHTO T180 (Modified Proctor).

3.19 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified geotechnical engineering testing agency to perform tests and inspections.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design-bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

D. Testing agency will test compaction of soils in place according to one of the following methods as determined by Testing Agency:

1. ASTM D1556 (Standard Test Method for Density and Unit Weight of Soil in Place by Sand Cone Method);
2. ASTM D2167 (Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method);
3. ASTM D2937 (Standard Test Method for Density and Unit Weight of Soil in Place by Drive-Cylinder Method);
4. ASTM D6938 (Standard Test Method for In-Place Density of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

E. Tests will be performed at the following locations and frequencies:

1. Concrete Slabs-on-Grade and Paved Areas: At subgrade and at each compacted fill and backfill layer, at least one (1) test for every 500 sq. ft. or less of paved area but in no case fewer than three (3) tests.
2. Retaining Wall Backfill: At each compacted backfill layer, at least one (1) test for every 50 feet or less of wall length but no fewer than two (2) tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one (1) test for every 50 feet or less of trench length but no fewer than two (2) tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

1. Recompact and retest until specified compaction is obtained.
2. If the required degree of compaction cannot be obtained as indicated above, notify the Owner's Representative, Project MEP, and Project Civil Engineer for consultation with the Testing Agency in order to determine a recommended course of action in order to achieve the specified compaction requirements.

3.20 PROTECTION

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

B. Repair and reestablish grades to tolerances specified when completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Project Landscape Architect or Project Civil Engineer; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.21 DISPOSAL OF ROCK, SURPLUS AND WASTE MATERIALS

A. Remove excavated rock, surplus satisfactory soils, unsatisfactory soils, and all waste materials including trash and debris, and legally dispose of all those materials off of the Owner's property.

END OF SECTION 312000

SECTION 321216

ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Cold milling existing asphalt pavement.
2. Hot-mix asphalt patching and joint repair.
3. Hot-mix asphalt paving overlays.
4. Hot-mix asphalt paving.
5. Pavement markings.
6. Parking wheel stops.
7. Parking signage and accessible (ADA) parking signage.

B. Related Requirements:

1. Section 311000 “Site Clearing” for demolition and removal of existing asphalt pavement.
2. Section 312000 “Earth Moving” for subgrade preparation, fill and backfill materials, aggregate base courses, and compaction requirements.
3. Section 321313 “Concrete Paving” for concrete pavement, concrete curb and gutter, and driveway aprons.
4. Section 321823 “Sports Court Surface Color Coating System” for colored surface installation.

1.3 PRE-INSTALLATION MEETING

A. Pre-installation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
b. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

2. Require representatives of each entity directly concerned with hot-mix asphalt paving to attend, including the following:

a. Contractor's superintendent.
b. Asphalt paving Subcontractor.

1.4 ACTION SUBMITTALS

A. Hot-Mix Asphalt Designs: For each Hot-Mix Asphalt (HMA) Course indicated.

1. HMA Design Mix Approval: Submit current BCDPW approved “Superpave” asphalt paving mixture for each job-mix proposed for the Work.
2. Submit written documentation from the hot-mix asphalt producer indicating that each applicable HMA Design Mix complies with BCDPW Specification Section 904.06 “Hot Mix Asphalt (HMA)”. Include technical data and tested physical properties for each proposed HMA Design Mix.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For paving-mix producers and testing agency.

B. Material Certificates: Include statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.

1. Aggregates.
2. Asphalt binder.
3. Asphalt cement.
4. Tack coat.

C. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of referenced specifications, standards and publications for hot-mix asphalt paving construction.

1. Unless indicated otherwise, the most stringent requirement applies to materials and construction of hot-mix asphalt paving.
2. If a conflict is apparent between referenced standards and publications, bring it to the attention of the Project’s Design Civil Engineer and Testing Agency for resolution.

B. American Association of State Highway and Transportation Officials (AASHTO) referenced standards and publications.

C. American Society for Testing & Materials (ASTM) referenced standards and publications.

D. Americans with Disabilities Act (ADA), 2010 ADA Standards for Accessible Design regulations, as amended to date, published by the United States Department of Justice.

E. Asphalt Pavement Alliance (AI), "MS-22 Construction of Asphalt Pavements", referenced publications as amended to date.

F. Baltimore County, Department of Public Works, Standard Specifications for Construction and Materials (BCDPW), latest edition, as amended to date.

1. References to "Measurement and Payment" and Bid Price Adjustment provisions do not apply to Specification Section 321216.

G. Baltimore County, Department of Public Works, Standard Details for Construction 2007, latest edition, as amended to date.

H. Baltimore County, Department of Public Works, Division of Construction Contracts Administration, Source of Supply, latest edition, as amended to date.

I. HMA Producer Qualifications: A paving-mix producer / supplier approved by BCDPW, Division of Construction Contracts Administration as indicated on their Source of Supply, latest edition.

J. U.S. General Services Administration "Federal Specifications" (FS) referenced specifications and standards.

K. Testing Agency Qualifications: Qualified in accordance with ASTM D3666 for testing indicated.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not apply aggregate base course and asphalt materials if subgrade is wet, if rain is imminent or expected before time required for adequate cure. Comply with BCDPW Specifications.

PART 2 - PRODUCTS

2.1 Basis of Design: Products specified in PART 2 – PRODUCTS are intended to establish the "Basis of Design" for products and materials that are required for this Project.

2.2 GENERAL:

A. Comply with referenced Specifications, standards and publications.

2.3 AGGREGATES

A. General: In accordance with BCDPW Specifications and specification Section 312000 "Earth Moving".

2.4 ASPHALT MATERIALS

A. In accordance with BCDPW Specifications.

B. Water: Potable.

2.5 AUXILIARY MATERIALS

A. Roadway, Parking, and Accessible (ADA) Parking Signage: As indicated.

B. Precast Concrete Wheel Stops:

1. Minimum 4000-psi compressive strength, steel-reinforced, air entrained concrete.
2. Size: 4-1/2 inches high by 9 inches wide by 72 inches long, or as indicated.
3. Provide chamfered corners, transverse drainage slots on underside, and a minimum of two factory-formed vertical holes through wheel stop for anchoring to substrate.
4. Surface Appearance: Free of pockets, sand streaks, honeycombs, and other obvious defects. Corners shall be uniform, straight, and sharp.
5. Installation Hardware: Deformed-steel rebar dowels, 1/2-inch diameter and 15-inch minimum length.

C. Joint Sealant: ASTM D6690, Type I, hot-applied, single-component, polymer-modified sealant for hot-mix asphalt and concrete pavements, or approved equal.

D. Pavement Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type I, with drying time of less than three minutes.

1. Color: White for general applications, except handicapped space symbol shall be blue and white, and fire lane curb shall be red.

E. Recycled Materials for Hot-Mix Asphalt (RAP): In accordance with BCDPW Specifications.

2.6 MIXES

A. Hot-Mix Asphalt: Dense-graded, hot-mix “Superpave” asphalt plant mixes in accordance with BCDPW Specifications and as indicated on the Drawings. Materials and ingredient composition for Recycled Hot-Mix Asphalt (RAP) shall be in accordance with BCDPW Specification requirements.

1. HMA “Superpave” Base/Binder Course: As indicated.
2. HMA “Superpave” Surface Course: As indicated.

PART 3 - EXECUTION

3.1 GENERAL

A. Construct in accordance with BCDPW Specifications, referenced standards and publications.

3.2 EXAMINATION AND PREPARATION

A. Verify that subgrade is dry and in satisfactory condition prior to beginning paving operations.

B. Proof-roll compacted subgrade with appropriate heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding in accordance with Section 312000 “Earth Moving” before installing aggregate base course. Correct unsatisfactory subgrade conditions.

C. Proceed with installation of aggregate base course and paving only after unsatisfactory conditions have been corrected.

D. Protection: Provide protective materials, procedures, and worker training to prevent asphalt materials from spilling, coating, or building up on curbs, driveway aprons, manholes, and other surfaces adjacent to the Work.

3.3 PERFORM COLD MILLING OF EXISTING ASPHALT PAVEMENT

A. Clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement by cold milling to receive new HMA paving as indicated.

1. Mill existing asphalt pavement to depths indicated.
2. Mill to a uniform finished surface free of excessive gouges, grooves, and ridges.
3. Control rate of milling to prevent tearing of existing asphalt surface course.
4. Mill existing asphalt surface course to reach asphalt base course, but do not mill asphalt base course.
5. Repair or replace curbs, driveway aprons, manholes, and other construction damaged during cold milling operations.
6. Remove loose material and dust from milled pavement surface. Patch depressions deeper than 1-inch after milling, before tack coat and new HMA surface course is installed.
7. Handle milled asphalt material in accordance with BCDPW requirements for "Construction Waste Management and Disposal."
8. Do not allow milled materials to accumulate on-site.

B. Prior to placing new hot-mix asphalt paving, thoroughly clean cold milled pavement surface and apply tack coat in accordance with BCDPW Specifications.

3.4 PATCHING

A. Vertically saw cut perimeter of rectangular or trapezoidal area of unsatisfactory asphalt pavement, extending at least six (6) inches into adjacent satisfactory pavement as indicated.

B. Remove unsatisfactory existing pavement to reach aggregate base course. Proof-roll or test existing exposed aggregate base course in accordance with Section 312000 “Earth Moving” and replace unsatisfactory base course as necessary.

C. Placing Single-Course Asphalt Patch Material: Apply tack coat to saw cut edges and fill patch areas with HMA surface course for full thickness of patch and compact flush with adjoining existing surface.

D. Placing Two-Course Patch Material: Apply tack coat to saw cut edges and partially fill patch area with HMA base course mix to match original base course thickness and compact. Install tack coat

and HMA surface course to match original surface course thickness and compact flush with adjoining existing surface.

3.5 CRACK AND JOINT REPAIR

A. Crack and Joint Repair: Remove existing joint filler, dirt and deleterious material from cracks and joints to a depth of 1/2 inch or as recommended by the joint sealant manufacturer.

1. After removing and cleaning cracks and joints, use hot-applied joint sealant to seal cracks and joints. Fill flush with surface of existing pavement

3.6 INSTALLATION OF HMA OVERLAY COURSE

A. HMA Overlay Course: After repairing cracks and joints, install tack coat and HMA surface course as indicated.

B. Install HMA overlay course in accordance with INSTALLATION OF HOT-MIX ASPHALT (HMA) PAVEMENT Article below.

3.7 INSTALLATION OF AGGREGATE BASE COURSE FOR NEW HMA PAVING

A. Ensure that prepared subgrade has been proof-rolled in accordance with Section 312000 “Earth Moving” and corrective repair of unsatisfactory subgrade areas have been performed.

B. Install aggregate base course in accordance with Section 312000 “Earth Moving.”

3.8 INSTALLATION OF HOT-MIX ASPHALT (HMA) PAVEMENT

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Install hot-mix asphalt base/binder course in number of lifts and thicknesses indicated.
2. After applying tack coat, install hot-mix asphalt surface course in single lift.
3. Spread mix at a minimum temperature of 250 deg F.
4. Begin installing mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than ten (10) feet wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement approximately 1 to 1-1/2 inches from strip to strip to ensure proper compaction of mix along longitudinal joints.
2. Complete a section of asphalt base/binder course before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.9 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
3. Offset transverse joints, in successive courses, a minimum of 24 inches.
4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method in accordance with AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints to a density within two (2) percent of specified course density.

3.10 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density, “Superpave” Gyratory Compactor test method: 96 percent of reference laboratory density in accordance with ASTM D6927, but not less than 94 percent or greater than 100 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.11 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce thickness indicated within the following tolerances:

1. Base/Binder Course: Plus or minus 1/4 inch.
2. Surface Course: Plus 1/8 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base/Binder Course: 1/4 inch.
2. Surface Course: 1/8 inch.
3. All ADA handicapped parking spaces and associated aisles: Completed surface course slopes shall not exceed two (2) percent in any direction.
4. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.12 SPORTS COURT SURFACE COLOR COATING SYSTEM

A. Refer to Section 321823 “Sports Court Surface Color Coating System” for installation of colored surfaces on Pickleball Courts.

3.13 PAVEMENT MARKINGS, ACCESSIBLE (ADA) PARKING AND SIGNAGE INSTALLATION

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Landscape Architect and Owner’s Representative.

B. Allow paving to age for at least fifteen (15) days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of fifteen (15) mils.

E. Install accessible (ADA) parking markings and signage as indicated, in accordance with State of Maryland and ADA regulations.

3.14 PARKING WHEEL STOP INSTALLATION

A. Securely anchor wheel stops to finished pavement surface with reformed bars in each preformed vertical hole as indicated, or with hardware recommended by wheel stop manufacturer.

B. Recess head of bar or dowel flush with top of wheel stop.

3.15 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined in accordance with ASTM D3549.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement in accordance with ASTM D979.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared in accordance with ASTM D2041, and compacted in accordance with job-mix specifications.
2. In-place density of compacted pavement will be determined by testing core samples in accordance with ASTM D1188 or ASTM D2726.

    a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than three cores taken.
    b. Field density of in-place compacted pavement may also be determined by nuclear method in accordance with ASTM D2950 and coordinated with ASTM D1188 or ASTM D2726.

E. Replace and compact hot-mix asphalt where core tests were taken.

F. Remove and replace hot-mix asphalt or install additional material as directed by the Owner with written approval, where test results or measurements indicate that it does not comply with specified requirements.

3.16 WASTE HANDLING

A. General: Handle asphalt-paving waste in accordance with approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."

END OF SECTION 321216

SECTION 321314

CONCRETE PAVING AND RETAINING WALLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Curbs and gutters.
2. Sidewalks and walkways.
3. Depressed curb ramps.
4. Miscellaneous slabs-on-grade.
5. Steps and stairs.
6. Dumpster pads.
7. Retaining walls.
8. Footings for site furnishings, fencing, bollards, and miscellaneous site construction.
9. Sealants for concrete joints.

B. Related Requirements:

1. Section 312000 “Earth Moving” for subgrade preparation, filling and backfilling, compaction, and graded aggregate base course requirements.
2. Section 321216 “Asphalt Paving" for pavement markings, accessible (ADA) and parking signage, and wheel stops.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other approved pozzolans.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PRE-INSTALLATION MEETING

A. Pre-installation Conference: Conduct conference at Project site.

1. Review methods and procedures related to concrete paving, including but not limited to, the following:

a. Concrete mixture designs.
b. Quality control of concrete materials and concrete paving construction practices.

2. Require representatives of each entity directly concerned with concrete paving to attend, including the following:

a. Contractor's superintendent.
b. Concrete paving Subcontractor.
c. Concrete retaining wall Subcontractor**.**

1.5 ACTION SUBMITTALS

A. Portland Cement Concrete Mixture: For each type of MDSHA or BCDPW Portland Cement Concrete Mixture indicated on the Drawings.

1. Portland Cement Concrete Mixture Approval: Submit documentation indicating that each applicable Portland Cement Concrete Mixture complies with MDSHA Specification or BCDPW Specification Section 902.10.03 “Portland Cement Concrete Mixtures”. Include technical data and tested physical properties for each mixture.

2. Alternate Design Mixtures: Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

B. Samples: As applicable for each type of product as follows:

1. Expansion-joint filler, expansion joint cap, backer rod, and joint sealant.

C. Shop drawings: For retaining walls including locations of proposed forms and related components, reinforcement, form ties, expansion and control joints.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified ready-mix concrete producers and testing agency including applicable ACI Certificates for testing technicians.

B. Material Certificates: For the following, from manufacturer:

1. Portland cement and cementitious materials.
2. Steel reinforcement and reinforcement accessories**.**
3. Admixtures.
4. Curing compounds.
5. Sealants for concrete joints.

C. Material Test Reports: For each of the following:

1. Aggregates: Include service-record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

D. Distribute notes from Pre-Construction Conference to attendees, including the Project Civil Engineer, Project Landscape Architect, and the Owner's Representative.

E. Distribute Field Quality-Control Reports to the Project Civil Engineer, Project Landscape Architect, and the Owner's Representative.

1.7 QUALITY ASSURANCE

A. Comply with MDSHA and BCDPW Specifications as applicable, referenced Standards and publications.

1. Unless indicated otherwise, the most stringent MDSHA or BCDPW Specification requirement applies to materials and construction of concrete paving.
2. If a conflict is apparent between referenced Specifications or publication, bring it to the attention of the Civil Engineer and Testing Agency for resolution.

B. American Concrete Institute (ACI) referenced publications.

C. American Society for Testing & Materials (ASTM) referenced publications.

D. Americans with Disabilities Act (ADA), 2010 ADA Standards for Accessible Design regulations, as amended to date, published by the United States Department of Justice.

E. Concrete Reinforcing Steel Institute (CRSI) referenced publications.

F. Baltimore County, Department of Public Works, Standard Specifications for Construction and Materials (BCDPW), latest edition, as amended to date.

1. References to "Measurement and Payment" and Bid Price Adjustment provisions do not apply to Specification Section 321313.

G. Baltimore County, Department of Public Works, Standard Details for Construction 2007, latest edition, as amended to date.

H. Baltimore County, Department of Public Works, Division of Construction Contracts Administration, Source of Supply, latest edition, as amended to date.

I. Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials (MDSHA), July 2023, with current Special Provisions, as amended to date.

1. References to "Measurement and Payment" and "Price Adjustment" provisions do not apply to Specification Section 321313.

J. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups of full-thickness sections of concrete paving to demonstrate typical joints; surface finish, texture, and color; curing; and standard of workmanship.

2. Build mockups of concrete paving in the location and of the size directed by Landscape Architect. Mockups shall include a full-size detectable warning area for sidewalks and plaza/courtyard areas as applicable.
3. Retaining Walls: Build wall section in the location indicated or, if not indicated, as directed by Project Civil Engineer or Project Landscape Architect. After removal of forms, review and approve exposed finish surfaces for acceptance or rejection.
4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Project Civil Engineer or Project Landscape Architect specifically approves such deviations in writing.

K. National Ready Mix Concrete Association (NRMCA) referenced publications.

L. Ready-Mix-Concrete Producer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M and BCDPW requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

M. Laboratory and Field Quality-Control Testing Agency Qualifications: Qualified according to ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests on plastic concrete properties shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Comply with MDSHA and BCDPW Specifications.

1.9 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for construction activities.

B. Cold-Weather Concrete Placement:

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures.
2. Comply with BCDPW Specifications or MDSHA Specifications as applicable and the following:
3. When air temperature has fallen to or is expected to fall below 40 deg F,:

a. Heat water and aggregates uniformly before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
b. Do not use frozen materials or materials containing ice or snow.

4. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless specifically approved in design mixtures.
5. Do not use frozen materials or materials containing ice or snow.
6. Do not place concrete in contact with surfaces less than 35 deg F, other than reinforcing steel.

C. Hot-Weather Concrete Placement:

1. Comply with MDSHA Specifications or BCDPW Specifications as applicable.
2. Cool ingredients before mixing to maintain concrete temperature below 95 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated in total amount of mixing water.
3. Fog-spray forms, steel reinforcement, and aggregate base course immediately before placing concrete.
4. Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
5. Keep aggregate base course moisture uniform without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 BASIS OF DESIGN: Products specified in PART 2 – PRODUCTS are intended to establish the "Basis of Design" for products and materials that are required for this Project.

2.2 CONCRETE MATERIALS, AGGREGATES AND ADMIXTURES

A. General: In accordance with MDSHA Specifications or BCDPW Specification Section 902 as applicable.

B. Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type of admixture from single source from single manufacturer

C. Normal-Weight Aggregates: ASTM C33, Class 4S, uniformly graded. Provide aggregates from a single source with documented service-record data of at least 10 years' satisfactory service in similar paving applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: In accordance with MDSHA Specifications or BCDPW Specifications as applicable.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement. Air-Entraining Admixture: ASTM C260 and in accordance with MDSHA Specifications or BCDPW Specifications as applicable.

D. Chemical Admixtures: In accordance with MDSHA Specifications or BCDPW Specifications as applicable.

1. Admixtures certified by manufacturer to be compatible with other admixtures.
2. Shall not contain more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
3. Water-Reducing Admixture: ASTM C494, Type A.
4. Retarding Admixture: ASTM C494, Type B.
5. Water-Reducing and Retarding Admixture: ASTM C494, Type D.
6. High-Range, Water-Reducing Admixture: ASTM C494, Type F.
7. High-Range, Water-Reducing and Retarding Admixture: ASTM C494, Type G.
8. Plasticizing and Retarding Admixture: ASTM C1017, Type II.

E. Water: Potable and complying with ASTM C94M.

2.3 CONCRETE MIXTURES

A. General: In accordance with MDSHA Specifications or BCDPW Specifications, Article 902.10 Portland Cement Concrete Mixtures requirements as applicable.

1. When slip-form machine placement is used, submit an appropriate design mixture and obtain laboratory test results that meet or exceed normal design mixture requirements.

B. Portland Cement Concrete Mixtures:

1. Normal-weight concrete in accordance with MDSHA Specifications or BCDPW Specifications, Section 902.10.03, Table 902 A and Table 902 B.
2. Refer to Drawings for mixture designations as applicable.

C. Chemical Admixtures: In accordance with MDSHA Specifications or BCDPW Specifications as applicable.

1. Use water-reducing admixtures, plasticizing and retarding admixtures for placement and workability, or when required by high temperatures, low humidity, or other adverse placement conditions.

2.4 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete in accordance with MDSHA Specifications or BCDPW Specifications as applicable. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. On-site batching and mixing of concrete is NOT allowed in lieu of ready-mixed concrete.

2.5 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and exposed surfaces. Appropriate materials shall be used for chamfers and special exposed joints with adjacent curbing and walkways sections.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.6 STEEL REINFORCEMENT

A. Plain-Steel Welded-Wire Reinforcement: ASTM A1064, fabricated from as-drawn steel wire into flat sheets.

B. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064, flat sheet.

C. Reinforcing Bars: ASTM A615/A615M, Grade 60; deformed.

D. Steel Bar Mats: ASTM A184/A184M; with ASTM A615/A615M, Grade 60 deformed bars; assembled with clips.

E. Plain-Steel Wire: ASTM A1064, as drawn.

F. Deformed-Steel Wire: ASTM A1064.

G. Joint Dowel Bars: ASTM A615, Grade 60 plain-steel bars. Cut bars true to length with ends square and free of burrs.

H. Prefabricated speed dowels: Manufactured by the following or approved equal:

Sika St. Louis
3400 Tree Court Industrial Boulevard
St. Louis, MO 63122
Telephone: (800) 325-9504 Website: https://usa.sika.com

I. Tie Bars: ASTM A615, Grade 60; deformed.

J. Hook Bolts: ASTM A307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against paving form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

K. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.7 CURING MATERIALS

A. General: In accordance with MDSHA Specifications or BCDPW Specifications as applicable.

B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.

1. Color:

a. Ambient Temperature Below 50 deg F (10 deg C): Black.
b. Ambient Temperature between 50 and 85 deg F (10 and 29 deg C): Any color.
c. Ambient Temperature Above 85 deg F (29 deg C): White.

2. Water: Potable water that does not cause staining of the surface.

C. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete, in accordance with MDSHA Specifications or BCDPW Specifications as applicable.

D. White, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 2, Class B, dissipating.

2.8 RELATED MATERIALS

A. Joint Fillers:

1. Asphalt-Saturated Cellulosic Fiber: ASTM D1751, asphalt-saturated cellulosic fiber in preformed strips, thicknesses as indicated.

B. Backer Rod for Retaining Wall Joints: “Kool-Rod” as manufactured by W.R. Meadows, or approved equal, in accordance with ASTM C1330-96, Type C and ASTM D5249-92, Type 3.

C. Isolation-Expansion Joint Sealant for Retaining Wall Joints: Use the following two-component, non-sag, polyurethane elastomeric sealant, or approved equal:

1. “Sikasil-2c NS EZ Mix” as manufactured by Sika Corporation, in accordance with ASTM C920, Type M, Grade NS, Class 25, Use T, NT, M, G, A, O, and I.
2. Color shall be selected by the Architect or Landscape Architect from the manufacturer’s standard range of colors.

D. Bonding Agent: ASTM C1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

E. Epoxy-Bonding Adhesive: ASTM C881, two-component epoxy resin capable of humid curing and bonding to damp surfaces; of class suitable for application temperature, of grade complying with requirements, and of the following types:

1. Types I and II, non-load bearing and Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.9 FOOTINGS FOR SITE FURNISHINGS, FENCES, AND MISCELLANEOUS SITE CONSTRUCTION ITEMS

A. Refer to the Drawings for concrete mix and related material requirements for site furnishing footings, fences, and miscellaneous site construction item concrete footings.

PART 3 - EXECUTION

3.1 GENERAL: In accordance with MDSHA Specifications or BCDPW Specifications as applicable.

3.2 EXAMINATION

A. Examine exposed subgrades and aggregate base surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subgrade below in accordance with Section 312000 “Earth Moving” to identify soft pockets and areas of excess yielding.

1. Completely proof-roll compacted subgrade as directed by the Testing Agency. Limit vehicle speed to 3 mph.
2. Correct subgrade with soft spots and areas of pumping or rutting as directed by the Testing Agency.
3. Proceed with installation of graded aggregate base course and concrete paving only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Remove loose material from surface of satisfactory compacted graded aggregate base course immediately before placing concrete.

B. Proceed with aggregate base course installation only after unsatisfactory conditions have been corrected.

3.4 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.5 RETAINING WALL FORMS INSTALLATION AND REMOVAL

A. General: In accordance with BCDPW Specifications Section 414 – Portland Cement Concrete Structures, Article 414.03.02 Forms.

1. Furnish and install form ties as necessary for the configuration of the retaining wall section/profile, nor within 2-1/2 inches of the surface.

2. Remove forms in accordance with BCDPW Specifications Section 414.

3.6 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded-wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

3.7 JOINTS

A. Form construction, isolation-expansion, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.
3. Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
4. Keyed Joints: Install preformed keyway-section forms or bulkhead forms with keys where indicated. Embed keys at least 1-1/2 inches into concrete.

C. Isolation-Expansion Joints: Form isolation-expansion joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, fixed objects, and in other locations as indicated.

1. Locate isolation-expansion joints at intervals as indicated. If not indicated, isolation-expansion joints shall be located at a maximum interval of 20 feet on center.
2. Furnish joint fillers in one-piece lengths.

    a. Where more than one length is required, lace or clip joint-filler sections together, and install joint filler the full width and depth of joint, unless indicated otherwise.
    b. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.

3. Install temporary expansion-isolation joint cap on top of isolation-expansion joint filler in accordance with manufacturer's instructions.
4. After concrete has sufficiently cured, remove top potion of isolation-expansion joint cap after concrete has been placed on both sides of joint and install backer rod and joint sealant in accordance with manufacturers' instructions.

D. Contraction or Control Joints: Form weakened-plane contraction joints, sectioning concrete into designated areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to radius indicated.

    a. Where indicated, repeat grooving of contraction joints after applying surface finishes.
    b. If not indicated, remove grooving-tool marks after applying surface finishes.

2. Sawed Joints: Form contraction joints with power saws equipped with appropriate abrasive or diamond-rimmed blades.

    a. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

3. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat smooth dowel one-half of dowel length with grease to prevent concrete bonding to one side of joint, or install prefabricated speed dowel assemblies in lieu of manually lubricated and sleeved assemblies.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to the radii indicated. Repeat tooling of edges after applying surface finishes.

3.8 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in-place.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten aggregate base course to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they have been installed at required finish elevation and slope, and isolation-expansion joints are in place.

D. Comply with BCDPW Specifications for measuring, mixing, transporting, and placing concrete as applicable.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete in accordance with BCDPW Specifications as applicable using mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not additionally disturb concrete surfaces before beginning finishing operations.

J. Curbs (and integral Gutters if indicated):

1. Construct curbs and gutters to required cross section, lines, grades, finish, and jointing as indicated.
2. Use special design mixture for automatic machine placement and if color pigment batching is required. Produce paving to required thickness, lines, grades, finish, and jointing.
3. Prepare subgrade and install aggregate base course of sufficient width to prevent displacement of slip-form paving machine during concrete placement operations.

K. Steps and Stairs:

1. Construct steps and stairs as indicated on the Drawings including reinforcement, finishes and jointing.

L. Retaining Walls:

1. Place and consolidate concrete in accordance with BCDPW Specification Section 414.03.04 Concreting and 414.03.06 Consolidating.

3.9 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

C. Application of Surface Finishes for Flatwork:

1. Refer to the Drawings for locations and types of broomed surface finishes.
2. Medium-to-Fine-Textured Broom Finish: Use a soft-bristle broom drawn across float-finished concrete surface, perpendicular to primary flow of traffic, or as indicated, to provide a uniform, fine-line surface texture.
3. Medium-to-Coarse-Textured Broom Finish for Dumpster Slabs, and Other Indicated Locations: Use a stiff-bristle broom drawn across float-finished concrete surface, perpendicular to primary flow of traffic, or as indicated, to provide a uniform, coarse surface texture.

3.10 FINISHING EXPOSED PORTIONS OF RETAINING WALLS

A. Finishing concrete surfaces shall be in accordance with BCDPW Specification Section 414.03.07 (b) Special Surface.

B. Refer to the Drawings for specific finishes of exposed above grade portions of retaining walls.

3.11 CONCRETE CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with MDSHA Specifications or BCDPW Specifications for cold-weather protection as applicable.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture-retaining-cover curing, using curing compound or a combination of these as follows:

1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed

by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period, using cover material and waterproof tape.

2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions.

    a. Do not use curing compound on surfaces to be covered by unit pavers or other materials set in mortar.
    b. Recoat areas subjected to heavy rainfall within three hours after initial application.
    c. Maintain continuity of coating, and repair damage during curing period.

3.12 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 1/8 inch.
2. Thickness: Plus 3/8 inch, no minus.
3. Surface: Gap below 10-feet-long; unleveled straightedge: 1/8 inch or less.
4. All ADA accessible route walkways and associated features: Plus 1/8 inch, no minus. Completed surface cross slopes shall not exceed two (2) percent.
5. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie bar.
6. Lateral Alignment and Spacing of Dowels: 1 inch.
7. Vertical Alignment of Dowels: 1/4 inch.
8. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
9. Joint Spacing: As indicated.
10. Contraction Joint Depth: Plus 1/4 inch, no minus.
11. Joint Width: Plus 1/8 inch, no minus.

3.13 CONCRETE FOOTINGS FOR SITE FURNISHINGS, FENCES, AND MISCELLANEOUS SITE CONSTRUCTION ITEMS

A. Refer to the Drawings for concrete footing requirements for site furnishings, fences, and miscellaneous site construction items.

3.14 PAVEMENT MARKING, PARKING WHEEL STOPS AND PARKING SIGNAGE

A. Refer to Section 321216 “Asphalt Paving” for installation of pavement markings, wheel stops, and parking signage.

3.15 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C172 shall be performed according to the following requirements:

1. Include the following information:

    a. Admixture dosage rates.
    b. Slump.
    c. Air content.
    d. Seven-day compressive strength.
    e. 28-day compressive strength.

2. Testing Frequency:

    a. Obtain at least one composite sample for each 20 cu. yd., 500 sq. ft. or fraction thereof of each concrete mixture placed each day for flatwork.
    b. Obtain at least one composite sample for each 5 cu. yd., or fraction thereof of each concrete mixture placed each day for retaining walls.
    c. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

3. Slump: ASTM C143, one test at point of placement for each composite sample, but not less than one test for each pour of each concrete mixture. Perform additional tests when concrete consistency changes.
4. Air Content: ASTM C231, pressure method; one test for each composite sample, but not less than one test for each pour of each concrete mixture.
5. Concrete Temperature: ASTM C1064, one test hourly when air temperature is 40 deg F and below and when it is 80 deg F and above, and one test for each composite sample.
6. Compression Test Specimens: ASTM C31, cast and laboratory cure one (1) set of three (3) standard cylinder specimens for each composite sample.
7. Compressive-Strength Tests: ASTM C39, test one specimen at seven (7) days and two (2) specimens at 28 days.

    a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three (3) consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to Landscape Architect and Owner's Representative, concrete producer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by the Project Landscape Architect or Project Civil Engineer, but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have

not been met, as directed by Landscape Architect, Project Civil Engineer, or Owner's Representative.

G. Concrete paving will be considered defective if it does not pass tests and inspections.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare and submit test and inspection reports.

3.16 REPAIR AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Landscape Architect, Project Civil Engineer, or Owner's Representative.

B. Drill test cores, where directed by Landscape Architect, Project Civil Engineer, or Owner's Representative, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with Portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

SECTION 321823

SPORTS COURT SURFACE COLOR COATING SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Cushioned surface color coating system for hot-mix asphalt Pickleball Courts.

B. Related Requirements:

1. Section 321216 "Asphalt Paving" for hot-mix asphalt (HMA) base and surface courses.

1.3 REFERENCE STANDARDS

A. American Sports Builders Association (ASBA).

B. USA Pickleball

USA Pickleball
P.O. Box 7354
Surprise, AZ 85374
Website: https://usapickleball.org

1.4 ACTION SUBMITTALS

A. Product Data: Submit manufacturer’s recommended product data, including components for surface preparation and application instructions.

B. Samples for Verification: Submit manufacturer’s color samples for selection by the Baltimore County Project Representative.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: Submit installer's list of successfully completed asphalt tennis or sports court cushioned surface color coating system projects, including project name, location, and date of application.

B. Product Certificates: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

C. Product Test Reports:

1. Submit independent test results for solar reflectance index.
2. Submit independent test results for 2000 Hour ASTM G154, accelerated weathering UV test, to demonstrate long-term durability and fade resistance.
3. Submit independent test results for 2000 Hour, accelerated weathering ASTM G155 Xenon Arc test, to demonstrate long-term fade resistance and quality of pigment

D. Field quality-control reports.

E. Warranty: Submit manufacturer's standard warranty.

1.6 QUALITY ASSURANCE

A. Manufacturer's Qualifications:

1. Manufacturer regularly engaged, for past 5 years, in manufacture of asphalt tennis or sports court surface color coating systems.
2. Membership in: USA Pickleball and American Sports Builders Association.

B. Applicator's Qualifications:

1. Applicator regularly engaged, for past 3-syears, in application of tennis or sports court cushioned surface color coating systems of similar type to that specified for this project.
2. Employ persons trained for application of tennis or sports court surface cushioned color coating systems.

1.7 DELIVERY, STORAGE AND HANDLING

A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling Requirements:

1. Store and handle materials in accordance with manufacturer's instructions.
2. Keep materials in manufacturer's original, unopened containers and packaging until application.
3. Store materials in clean, dry area indoors.
4. Store materials out of direct sunlight.

5. Keep materials from freezing.
6. Protect materials during storage, handling, and application to prevent contamination or damage.
7. Close containers when not in use.

1.8 AMBIENT CONDITIONS

A. Do not apply asphalt tennis or sports court cushioned surface color coating system when air or surface temperatures are below 50 degrees F during application or within 24 hours after application.

B. Do not apply asphalt tennis or sports court cushioned surface color coating system when rain is expected during application or within 24 hours after application.

1.9 WARRANTY

A. Warranty: Installer agrees to repair or replace components asphalt tennis or sports court surface color coating system that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Delamination, fading or cracking.

2. Warranty Period: In accordance with Project requirements.

PART 2 - PRODUCTS

2.1 Basis of Design: Products specified in PART 2 – PRODUCTS are intended to establish the "Basis of Design" for products and materials that are required for this Project.

A. Manufacturer, or approved equal:

SportMaster (ThorWorks, Inc.)
PO Box 2277
2520 South Campbell Street
Sandusky, Ohio 44870
Telephone: 800-326-1994 Website: www.sportmaster.net

Local SportMaster Store: 10817 Williamson Lane
Cockeysville, MD 21030
Telephone: (410) 365-4496

2.2 MATERIALS

A. Pickleball Court Cushioned Surface Color Coating System: SportMaster "PickleMaster".

1. All Cushioned Surface Color Coating System components shall be selected and specified by the local SportMaster Representative
2. Filler Course: SportMaster "Acrylic Resurfacer".
3. Surface Color Coating System: "PickleMaster".

    a. Court Colors: Shall be selected by Baltimore County Project Representative.

4. Line Markings Primer: SportMaster "Stripe-Rite".
5. Line Paint: SportMaster "Textured Line Paint".

    a. Court Line Color: Shall be White, or as selected by Baltimore County Project Representative.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine new hot-mix asphalt sports court surfaces that they are acceptable to receive cushioned color coating system.

B. Verify Pickleball sports court meet USA Pickleball requirements.

C. Notify Project Civil Engineer of conditions that would adversely affect application or subsequent use.

D. Do not begin surface preparation or application until unacceptable conditions are corrected.

3.2 SURFACE PREPARATION

A. Protection of In-Place Conditions: Protect adjacent surfaces and landscaping from contact with asphalt tennis or sports court cushioned surface color coating system.

B. Prepare surfaces in accordance with manufacturer's instructions.

C. Cure new asphalt surfaces a minimum of 14 to 30 days before application of asphalt tennis or sports court cushioned surface color coating system.

D. Remove dirt, dust, debris, oil, grease, vegetation, loose materials, and other surface contaminants which could adversely affect application of asphalt tennis or sports court cushioned surface color coating system. Pressure wash entire surface.

E. Repair cracks, depressions, and surface defects in accordance with manufacturer's instructions before application of filler course.

F. Level depressions 1/8 inch and deeper with patch binder in accordance with manufacturer's instructions.

G. Apply two coats of filler course as required by surface roughness and porosity to provide smooth underlayment for application of cushion layers and color coatings.

H. Ensure surface repairs are flush and smooth to adjoining surfaces.

3.3 APPLICATION

A. Apply Pickleball sports court cushioned surface color coating system in accordance with manufacturer's instructions at locations indicated on the Drawings.

B. Mix materials in accordance with manufacturer's instructions.

C. Apply Filler Course, Cushion Layers, and Color Coating with a 50-60 durometer, soft rubber squeegee.

D. Filler Course: Apply 2 coats on new asphalt.

E. Cushion Layers: Apply 3 coats of the base layer (coarse granule) cushion, followed by 2 coats of the finish layer (fine granule) cushion in accordance with the manufacturer's instructions.

F. Color Coating: Apply a minimum of 2 coats of color coating to prepared surfaces in accordance with manufacturer's instructions.

G. Allow material drying times in accordance with manufacturer's instructions before applying other materials or opening completed surface to foot traffic.

3.4 LINE MARKINGS

A. Lay out Pickleball sports court line markings as indicated on the Drawings.

B. Apply line markings primer, after masking tape has been laid, to seal voids between masking tape and sports court surface to prevent bleed-under when line paint is applied.

C. Apply a minimum of 1 coat of line paint in accordance with manufacturer's instructions.

3.5 PROTECTION AND CLEANUP

A. Allow a minimum of 24 hours curing time before opening sports courts for play.

B. Protect applied Pickleball sports court cushioned surface color coating system to ensure that, except for normal weathering, coating system will be without damage or deterioration at time of Substantial Completion.

C. Remove all excess sports court materials, waste and debris and properly dispose of off from the Owner's property.

END OF SECTION 321823

SECTION 323113

CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Chain-link fences with designated finishes.
2. Swing gates.
3. Dumpster enclosure.

B. Related Requirements:

1. Section 321313 "Concrete Paving" for cast-in-place concrete post footings.

1.3 PRE-INSTALLATION MEETING

A. Pre-installation Conference: Conduct conference at Project site.

1. Review the specific locations for color coated fence systems and for non-colored coated galvanized fence systems.
2. Review the installation of fence in retaining walls and site walls with the Landscape Architect and the Contractor prior to the construction of any retaining walls and site walls. Review proposed locations for post sleeves and/or core drilling for fence posts to be installed in retaining walls and site walls.
3. Review location of gates and gatekeepers.
4. Review required testing, inspecting, and certifying procedures.

1.4 ACTION SUBMITTALS

A. Delegated-Design Submittal: For structural performance of chain-link fence frameworks and post embedment for fence installed in retaining walls and site walls, including analysis data signed and sealed by the qualified Professional Engineer, registered in the State of Maryland, responsible for preparation of the Delegated Design Submittal.

B. Product Data: For each type of product.

1. Include construction details, detailed material descriptions and certifications, dimensions of individual components and profiles, and finishes for the following:

    a. Fence posts, rails, members, fittings, and framework.
    b. Gate framework, components and fittings.
    c. Chain-link fabric, reinforcements, fittings and attachments.
    d. Gates and hardware.
    e. Privacy slats.
    f. Anchoring cement-nonshrink grout.

C. Shop Drawings: For each type of fence assembly and gate assembly.

1. Include plans, elevations, sections, details for installations on top of retaining walls and site walls.
2. Include accessories, hardware, gate operation, and operational clearances.

D. Samples for Verification: For each type of component with factory-applied finish, prepared on Samples of size indicated below:

1. Polymer-Coated Components: In 6-inch lengths for components and full-sized units for accessories.
2. Galvanized Steel Wire: In 6-inch lengths.
3. Privacy slats.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Professional Engineer preparing the Delegated-Design Submittal.

B. Product Certificates: For each type of chain-link fence and gate**.**

C. Product Test Reports: For framework strength according to ASTM F 1043, for tests performed by a qualified testing agency.

D. Field quality-control reports.

E. Sample Warranty: For special warranty.

1.6 QUALITY ASSURANCE

A. Chain Link Fence Manufacturer's Institute (CLFMI), 10015 Old Columbia Road, Suite B215, Columbia, Maryland 21046 Telephone: 301-596-2583 Website: www.chainlinkinfo.org

1. Chain Link Fence Manufacturer's Institute "Product Manual", as amended to date.
2. Chain Link Fence Wind Load Guide (WLG 2445) for the selection of line posts and line posts spacing for 105 mph wind speed, Exposure Category B, no icing.

B. Manufacturer: Company having manufacturing facilities in the United States with a minimum of five (5) years of experience specializing in manufacturing chain link fence products.

C. Fence Contractor: Contractor having a minimum of 5 years' experience installing similar projects in accordance with ASTM F567.

D. Substitutions: Alternate chain link products may be acceptable by the Architect "as equal" if approved in writing ten days prior to bidding and that the items submitted meet the specifications contained in this document.

E. Single source: To ensure system integrity, obtain the chain link system, framework, fabric, fittings, gates and accessories from a single source. Mockups: Build mockups to set quality standards for fabrication and installation.

1.7 FIELD CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates to be installed in retaining walls, site walls, and on walkways. Verify dimensions by field measurements.

1.8 WARRANTY

A. Special Warranty: Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure to comply with performance requirements.
b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period: In accordance with the Project's contractual requirements.

PART 2 - PRODUCTS

2.1 POSTS

A. Minimum Post Size: Determine according to ASTM F1043 for post spacing not to exceed 10 feet for Material Group IC, electric-resistance-welded round steel pipe.

2.2 CHAIN-LINK FENCE FABRIC

A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist according to "CLFMI Product Manual" and requirements indicated below:

1. Fabric Height: As indicated on Drawings.
2. Steel Wire for Fabric:

a. Wire diameter of 0.148 inch.

b. Mesh Size: Two (2”) inches.

3. Selvage: Knuckled at both selvages.

B. Polymer-Coated Fabric: ASTM F668, Class 2b over zinc-coated steel wire.

1. Refer to Drawings for locations of fence with polymer-coated finish.
2. Mesh size: Two (2”) inches.
3. Coat selvage ends of metallic-coated fabric after the weaving process with manufacturer's standard clear protective coating.
4. Color: Black, in accordance with ASTM F934.

C. Galvanized Steel Wire for Fabric: Wire diameter of 0.148 inch. ASTM F668, Class 2b zinc-coated steel wire.

1. Refer to Drawings for locations of fence with galvanized finish (not polymer-coated).
2. Mesh Size: Two (2”) inches.
3. Coat selvage ends of metallic-coated fabric after the weaving process with manufacturer's standard clear protective coating.

2.3 FENCE FRAMEWORK

A. Posts and Rails: ASTM F1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F1043 based on the following:

1. Fence Height: As indicated on Drawings.
2. Heavy-Industrial-Strength Material: Group IC, round steel pipe, electric-resistance-welded pipe, galvanized after forming coating.

a. Line Post: 2.875 inches in diameter.
b. End, Corner, and Pull Posts: 4.0 inches.

3. Horizontal Framework Members: Intermediate, top and bottom rails according to ASTM F1043.

a. Top Rail: 1.66 inches in diameter.

4. Brace Rails: ASTM F1043.
5. Metallic Coating for Steel Framework:

a. ASTM F1043, Group IC, round steel pipe, electric-resistance-welded pipe, galvanized after fabrication.

B. Galvanized Finish: Metallic Coating for Steel Framework

a. Refer to Drawings for locations of fence, posts, and framework with galvanized finish.

b. Type A: Not less than minimum 2.0-oz./sq. ft. average zinc coating according to ASTM A123/A123M or 4.0-oz./sq. ft. zinc coating according to ASTM A653/A653M.

C. Polymer Coating over Metallic Coating for Steel Framework

a. Refer to Drawings for locations of polymer coated fence, posts, and framework.
b. Polymer coating over metallic coating. Color: Match chain-link fabric, in accordance with ASTM F934.

2.4 SWING GATES

A. General: ASTM F900 for gateposts and single and double swing gate types.

1. Gate Leaf Width: As indicated.
2. Framework Member Sizes and Strength: Based on gate height as indicated.

B. Pipe and Tubing:

1. Zinc-Coated Steel: ASTM F1043; 1.900-inch diameter with protective coating and finish to match fence framework.
2. Gate Posts: Round tubular steel.
3. Gate Frames and Bracing: Round tubular steel.

C. Frame Corner Construction: Welded.

D. Hardware:

1. Hinges: 180-degree outward swing.
2. Latch: Permitting operation from both sides of gate.

2.5 FITTINGS

A. Provide fittings according to ASTM F626.

B. Post Caps: Provide for each post.

1. Provide Dome top for end and corner post caps.
2. Provide line post caps with loop to receive top rail.

C. Rail and Brace Ends: For each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:

1. Top Rail Sleeves: Pressed-steel or round-steel tubing not less than 6 inches long.
2. Rail Clamps: Line and corner boulevard clamps for connecting intermediate and bottom rails to posts.

E. Tension and Brace Bands: Pressed steel.

F. Tension Bars: Steel, length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.

G. Truss Rod Assemblies: Steel, finish to match framework and hardware rod and turnbuckle or other means of adjustment.

H. Tie Wires, Clips, and Fasteners: In accordance with ASTM F26 and F668.

1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, according to the following:
2. ASTM F668: 0.148-inch-diameter wire; match finish of chain-link fence fabric.

I. Finish:

1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz./sq. ft. of zinc.
2. Polymer-coating over metallic coating with color to match fabric.

2.6 PRIVACY SLATS

A. Tubular Polyethylene Slats:

1. Minimum 0.023-inch-thick tubular polyethylene, manufactured for chain-link fences from virgin polyethylene with UV inhibitor.
2. Sized to fit mesh specified for direction indicated, with vandal-resistant fasteners and lock strips.

B. Color: Black, to match fence fabric.

2.7 ANCHORING CEMENT- NON SHRINK GROUT

A. Anchoring Cement - Non Shrink Grout shall be “Super Por-Rok” Anchoring Cement - Non-shrink Grout as manufactured by the following, or approved equal:

CGM Incorporated
1445 Ford Road
Bensalem, Pennsylvania 19020
Telephone: 215-638-4400 Website: www.cgmbuildingproducts.com

1. Factory-packaged, nonstaining, noncorrosive, nonshrink grout formulation, without gypsum materials, for mixing with water at Project site to create pourable anchoring and grouting compound.
2. Complying with ASTM C1107/C1107M and ASTM C109.
3. Install anchoring cement-nonshrink grout, recommended in writing by manufacturer, specifically for exterior applications.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, installation of fence in retaining walls and site walls, and other conditions affecting performance of the Work.

1. Do not begin fence installation before final grading is completed, and the installation of fence in retaining walls and site walls has been coordinated with the Landscape Architect, the Owner's Representative, and the Contractor.

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

3.2 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts.

1. Do not exceed intervals of 20 feet or line of sight between stakes.
2. Review the specific locations for color coated fence systems and for non-colored coated galvanized fence systems.

B. Indicate locations of underground utilities, underground structures, benchmarks, and property monuments.

C. Review staked out location in the field for approval by the Landscape Architect and the Owner's Representative prior to installation of fence and gates.

3.3 CHAIN-LINK FENCE INSTALLATION

A. Install chain-link fencing according to ASTM F567 and, if specified, more stringent requirements herein.

B. Post Excavation in Soil: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

C. Post Setting in Soil: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
2. Concrete Fill: Place and vibrate concrete around posts to dimensions indicated to consolidate. Protect aboveground portion of posts from concrete splatter.

    a. Concealed Concrete: Place top of concrete 2-inches below grade to allow covering with surface material.

D. Posts Set into Sleeves in Retaining Walls and Site Walls:

1. Use pipe sleeves, length as determined by the Delegated-Design Submittal, preset and anchored into concrete for installing posts.
2. After posts are inserted into sleeves, fill annular space between post and sleeve with anchoring cement-nonshrink grout, mixed and placed according to anchoring material manufacturer's written instructions.
3. Finish anchorage joint to slope away from post to provide positive drainage away from post.

E. Dumpster Enclosure Fencing, Posts and Gates:

1. Refer to the Drawings for height of fence, post spacing, and details for installing fencing, posts, and gates within the Dumpster Enclosure Pad.
2. Top of post footers shall be installed flush with, but isolated (independent) from, the surrounding cast-in-place concrete slab-on-grade.
3. Finish top of footer to slope slightly away from post to provide positive drainage onto adjoining concrete dumpster slab.

F. Terminal Posts: For posts set in Retaining Walls and Site Walls, install terminal end, corner, and gateposts according to ASTM F567 and terminal pull posts at changes in horizontal or vertical alignment as indicated on the Drawings.

G. Line Posts: For posts set in Retaining Walls and Site Walls, space intermediate posts an equal distance between corner posts, not exceeding 10 feet on center.

H. Post Bracing and Intermediate Rails: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gateposts and at both sides of corner and pull posts.

1. Locate horizontal braces at mid-height on fences with top rail. Install so posts are plumb when diagonal rod is under proper tension.

I. Top Rail: Install according to ASTM F567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

J. Intermediate and Bottom Rails: Secure to posts with fittings.

K. Chain-Link Fabric: Apply fabric to inside of the basketball court. Leave 1-inch bottom clearance between finished top of wall surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

L. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts, with tension bands spaced not more than 15 inches O.C.

M. Tie Wires: Use wire of proper length to secure fabric firmly to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric according to ASTM F567. Bend ends of wire to minimize hazard to individuals and clothing.

1. Maximum Spacing: Tie fabric to line posts at 12 inches O.C. and to braces at 24 inches O.C.

N. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

O. Privacy Slats: Install slats in direction indicated on the Drawings, securely locked in place.

3.4 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference.

1. Attach fabric as for fencing.
2. Install privacy slats.

3.5 ADJUSTING GATES

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment or malfunction throughout entire operational range. Confirm that latches engage accurately and securely without forcing or binding.

B. Lubricate hardware and other moving parts.

3.6 CLEAN-UP

A. Clean up all debris and unused material. Remove from site.

END OF SECTION 323113

SECTION 323300

SITE FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Pickleball court posts, sleeves, and nets.
2. Backed benches.
   Fixed bollards.
3. Anchors, fasteners and grout.

B. Related Requirements:

1. Section 312000 "Earth Moving" for excavation required to install cast-in-place concrete footings.
2. Section 321314 “Concrete Paving and Retaining Walls” for installation of site related cast-in-place concrete construction.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product, including the Marine Grade 316 Stainless Steel fastener’s specific size and length for each applicable surface mounted product.

B. Samples for Verification:

1. One full size sample delivered to the Project site for each indicated Product. If approved by the Owner’s Representative or Landscape Architect, the sample may be incorporated into the Work.
2. Anchor bolt, washer and fasteners (submit a representative Sample for review and approval).

C. Schedule of Products: For each product indicated.

D. Shop Drawings: For all products specified.

E. Basis of Design: Products specified in PART 2 – PRODUCTS are intended to establish the “Basis of Design” for products and materials that are required for this Project.

1.4 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver products to site in manufacturer's original, unopened packaging. Upon delivery, examine packages immediately to ensure all products are complete and undamaged.

B. Storage: Store products in a protected, dry area in manufacturer's unopened containers and packaging.

C. Handling: Protect product's finish from damage during handling and installation.

PART 2 - PRODUCTS

2.1 PICKLEBALL COURT POSTS, SLEEVES AND NET

A. Pickleball Posts with Ground Sleeves and Net

1. Model "PPR10GR Deluxe Pickleball Post" manufactured by the following or approved equal:

   Jaypro Sports
   976 Hartford Turnpike
   Waterford, CT 06385
   Telephone: (800) 243-0533 Website: www.jaypro.com

2. Official Post Height: 36 inches.
3. Materials: 2-7/8" O.D. x 0.203" wall thickness steel pipe with die cast end cap.
4. Finish: "Green" Powder Coat with zinc undercoat.
5. Adjustable height stop.
6. Heavy-duty self-locking winch and hook to secure the net.
7. Include "TP-278G 24" long ground sleeve with cap.
8. Include Black "PT-21N" net:

   a. 2.5mm twisted polyethylene, 1-3/4" square black mesh.
   b. Double mesh over top 5 rows.
   c. 2-1/2" white woven polyester top headband, 2-1/2" PVC side fabric with ½" fiberglass dowel rods
   d. Top cord: 4mm vinyl coated steel cable.

2.2 BENCHES WITH BACK

A. Benches with Back

1. Model "RB-28 Bench with Back" manufactured by the following or approved equal:

   Victor Stanley, LLC
   2103 Brickhouse Road
   Dunkirk, Maryland 20754
   Telephone: (800) 368-2573 Website: https://www.victorstanley.com

2. Length: 6 feet.

3. Installation type: Surface mount.
4. Materials: Recycled solid steel bar with solid welds and vertical steel scrolls.
5. Finish: Standard “Green” with TGIC polyester powder coat.
6. Option: Include Intermediate Armrest.

2.3 FIXED BOLLARDS

A. Fixed Bollards

1. Model “SSF06080-316-36-12-F” manufactured by the following or approved equal:

   Calpipe Industries, In.
   19440 S. Dominguez Drive
   Rancho Domiguez, CA 90220
   Telephone: (562) 803-4388 Website: https://www.Calpipebollards.com

2. Height: 36”
3. Installation type: Fixed, in ground.
4. Materials: Schedule 80, Stainless steel.
5. Finish: #4 Brushed.
6. Cap Style: Flat.

2.4 ANCHORS, FASTENERS AND GROUT

A. Anchors, Washers and Fasteners, as applicable: Marine Grade 316 Stainless Steel Fasteners.

1. Size shall be in accordance with the specific site furnishing product manufacturer’s recommendations.
2. Anchors and fasteners that do not meet Marine Grade 316 Stainless Steel are not acceptable.

B. Anchoring Cement/Non-shrink Grout: “Super Por-Rok” as manufactured by the following, or approved equal:

   CGM Incorporated
   1445 Ford Road,
   Bensalem, Pennsylvania 19020
   Telephone: 215-638-4400 Website: www.cgmbuildingproducts.com

1. A factory-packaged, nonstaining, noncorrosive, non-shrink grout exterior formulation, without gypsum materials, for mixing with water at Project site to create a pourable anchoring compound for anchors and fasteners.
2. Complying with ASTM C1107/C1107M and ASTM C109.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for proper finished grade, mounting surfaces, installation tolerances, and other conditions affecting installation of the Work.

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

3.2 INSTALLATION, GENERAL

A. Comply with manufacturer's written installation instructions for each product, unless other requirements or conditions are indicated. Perform shop and field assembly as required to complete each product's installation.

B. Unless otherwise indicated, install surface mounted site furnishings after landscaping and paving have been completed. Protect in-place landscaping and paving as necessary during installation of site furnishings.

C. Install all site furnishings level and plumb in locations indicated.

D. Site Furnishings and Other Components Requiring Cast-In-Place Concrete Footings:

1. Install in cast-in-place concrete footings in accordance with Section 321314 – Concrete Paving and Retaining Walls", the manufacturer's instructions, and as indicated on the Drawings.
2. Protect portion of site furnishings located above the footings from concrete splatter.
3. Verify that supports are installed plumb or at designated setting angle, and are aligned at correct height and spacing. Provide temporary measures for supports in proper position during placement and finishing operations until concrete has sufficiently cured.

E. Surface Mounted Site Furnishings:

1. Install on completely finished pavement surfaces using Marine Grade 316 Stainless Steel fasteners in accordance with the quantity of fasteners recommended by the manufacturer.
2. Marine Grade 316 Stainless Steel fastener components shall be provided by the Contractor.
3. Install anchoring cement/non-shrink grout in accordance with the manufacturer's recommendations for exterior applications.

END OF SECTION 323300

SECTION 329113

SOIL PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes preparation of Planting Mix for installation of landscape plant materials, Stormwater Management (SWM) Facilities, and for turf establishment.

B. Related Requirements:

1. Section 311000 “Site Clearing” for stripping and stockpiling existing topsoil.
2. Section 312000 “Earth Moving” for excavation, backfilling, and compaction requirements.
3. Section 329200 “Turf and Grasses” for installing Planting Mix for turf establishment.
4. Section 329300 “Plants” for installing Planting Mix for landscape plant material.

1.3 DEFINITIONS

A. Backfill: The material used to replace, or the act of replacing, existing earth in an excavation.

B. CEC: Cation exchange capacity.

C. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.

D. Duff Layer: A surface layer of soil, typical of forested areas, that is composed primarily of decayed leaves, twigs, and detritus.

E. Imported (Borrow) Topsoil: Satisfactory topsoil that is transported to Project site for use.

F. Manufactured Topsoil: Topsoil produced on-site or off-site by blending satisfactory soils, sand, stabilized organic soil amendments, and other materials to produce satisfactory Planting Mix.

G. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."

H. Planting Mix: Satisfactory natural or manufactured topsoil combined with other materials and soil amendments that have been modified in accordance with testing agency recommendations and specified requirements in order to produce a suitable Planting Mix for proper plant growth.

I. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.

J. Sand: Angular, granular, inorganic silica material, ranging in size from approximately 0.425mm to 0.125mm, to be used as a component in the Planting Mix composition.

K. Soil Scientist: A qualified person who evaluates and interprets soils and soil-related data for the purpose of understanding soil resources in order for soils to achieve satisfactory plant growth, but also as they affect environmental quality and as they are managed for protection of human health and the environment.

L. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before Planting Mix is placed.

M. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1% organic matter and few soil organisms.

N. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil" but in disturbed areas, such as urban environments, the surface soil may be subsoil.

O. Topsoil: In undisturbed areas, the soil material beneath the duff layer, and above subsoil, typified by an organic matter content of between 1.5 and 10.0% and capable of sustaining vigorous plant growth. It shall be free of any add-mixture of subsoil and contain no stones, lumps, clods of hard earth, slag, cinders, sticks, plants or their roots, trash, or other extraneous material. Topsoil must also be free of plant parts of Bermuda grass, quack grass, Johnson grass, nutsedge, poison ivy, Canada thistle, or other invasive species.

1.4 PRE-INSTALLATION MEETING

A. Pre-installation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include recommendations for application and use.
2. Include test data substantiating that products comply with requirements.
3. Include sieve analyses for soil and aggregate materials.
4. Material Certificates: For each type of aggregate, imported topsoil, lime and fertilizer, and all other soil amendments before delivery to the site, according to the following:

    a. Manufacturer's qualified testing agency's certified analysis of standard products.
    b. Analysis of lime and fertilizer, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.

c. Analysis of non-standard materials by a qualified testing agency according to SSSA methods, where applicable.

B. Lime, Fertilizer and Soil Amendments:

1. Submit two (2) copies of testing agencies certified analysis for lime, fertilizer, and soil amendments proposed for use in the Planting Mix.
2. Certified analysis shall show the fertilizer grade, indicating the percentage (%) of each component.
3. Certified analysis for lime shall show total minimum carbonates and minimum percentages of the material furnished that passes 100- and 200-mesh sieves.

C. Topsoil Analysis and Certifications:

1. Topsoil Analysis Reports: Topsoil samples shall be taken for ALL topsoil proposed for use as Planting Mix, whether it is obtained from on-site or from an off-site location.

   a. All topsoil analysis shall be performed within one (1) month of the date of installation, conducted and certified by a recognized soil testing facility, and shall contain the information specified in Articles 1.8, 1.9 and 1.10 below.
   b. Submit two (2) copies of the topsoil analysis reports to the Architect and Landscape Architect for review and approval.

2. On-Site Topsoil Certifications: Contractor shall submit two (2 copies) to the Landscape Architect and Architect containing specific recommendations of amendments for both on-site and offsite imported topsoil. THE LANDSCAPE ARCHITECT'S APPROVAL OF TOPSOIL REPORTS AND CERTIFICATIONS WILL BE REQUIRED PRIOR TO PREPARATION OF PLANTING MIX.

3. Provide certifications performed by a qualified field Testing Agency for:

   a. Organic content;
   b. pH value;
   c. Soluble salts content;
   d. Classification (in accordance with the USDA Textural Triangle).

4. Imported Topsoil: Prior to delivery of satisfactory imported topsoil, the following information shall be submitted to the Landscape Architect and Architect for review and approval:

   a. Organic content;
   b. pH value;
   c. Soluble salts content;
   d. Classification (in accordance with the USDA Textural Triangle);
   e. Source and location of the imported topsoil;
   f. Certified copies of the imported topsoil's test results;
   g. Two (2) one-pound representative samples (in bags) of the imported topsoil.

5. Manufactured Topsoil: Prior to delivery of satisfactory manufactured topsoil, the following information shall be submitted to the Landscape Architect and Architect for review and approval if proposed for use as a Planting Mix component:

a. Organic content;
b. pH value;
c. Soluble salts content;
d. Classification (in accordance with the USDA Textural Triangle);Source and location of the manufactured topsoil components;
e. Gradation and sieve analysis of the manufactured topsoil;
f. Certified copies of the manufactured topsoil test results
g. Two (2) one-pound representative samples (in bags) of the manufactured topsoil.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For each Testing Agency responsible for performing tests and analyses.

B. Pre-construction Test Reports: For pre-construction soil analyses specified in Articles 1.8, 1.9, and 1.10 below.

C. Field quality-control test reports (submit to Landscape Architect and Architect).

1.7 QUALITY ASSURANCE

A. Association of American Plant Food Control Officials (AAPFCO) referenced standards and publications as amended to date.

B. American Association of State Highway and Transportation Officials (AASHTO) referenced standards and publications as amended to date.

C. American Society for Testing and Materials (ASTM) referenced standards and applicable publications as amended to date.

D. United States Environmental Protection Agency (EPA) referenced standards and applicable publications as amended to date.

E. Maryland Department of Transportation, State Highway Administration, Office of Materials Technology (MDOT) referenced standards and publications, as amended to date.

F. Maryland Department of Transportation, State Highway Administration, Standard Specifications for Construction and Materials (MDSHA), July 2023, with current Special Provisions, as amended to date.

1. References to “Measurement and Payment” and “Price Adjustment” provisions do not apply to specification Section 329113.

G. North American Proficiency Testing Program (NAPT) referenced and applicable publications as amended to date.

H. Soil Science Society of America (SSSA) referenced standards and applicable publications as amended to date.

I. U.S. Composting Council (USCC) referenced standards and applicable publications as amended to date.

J. United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) referenced standards and applicable publications as amended to date.

K. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.

1. Multiple Laboratories: At the Contractor's option, work may be divided among one or more qualified testing laboratories specializing in physical testing, chemical testing, and fertility testing.

1.8 PRE-CONSTRUCTION TESTING – GENERAL

A. All pre-construction testing and analyses shall be performed and submitted for review and approval in accordance with Article 1.5 “ACTION SUBMITTALS” above and Article 1.9 “SAMPLING REQUIREMENTS” below.

B. Pre-construction Testing Service: Engage a qualified testing agency to perform pre-construction analyses of existing on-site topsoil, imported topsoil, manufactured topsoil, and organic compost proposed for use as a Planting Mix component.

1. Notify Landscape Architect and Architect at least seven (7) days in advance of the dates and times when laboratory samples will be taken.

C. Pre-construction Analyses of Topsoil, Subsoil, and Organic Compost: For each type and source proposed for use as a Planting Mix component.

1. Testing agency shall identify and label samples and test reports according to sample collection and labeling requirements.
2. For Bioretention Soil Mix, comply with approval and certification requirements in accordance with the approved Stormwater Management (SWM) Drawings.

1.9 SAMPLING REQUIREMENTS

A. Soil Samples Collection and Labeling:

1. Samples shall be taken and labeled by a State of Maryland certified, licensed, or registered Testing Agency.
2. Number and Location Samples: Minimum of three (3) representative soil samples, at varied locations for each soil to be used or amended for planting and turf establishment purposes.
3. Procedures and Depth of Samples: According to USDA-NRCS's "Field Book for Describing and Sampling Soils."
4. Labeling: Label each sample taken on-site with the date, location keyed to the project site plan or other appropriate Drawing, visual soil condition, and sampling depth.

B. Organic Compost Samples Collection and Labeling:

1. Samples shall be taken and labeled by a State of Maryland certified, licensed, or registered Soil Scientist under the direction of the Testing Agency.
2. Number and Location Samples: Minimum of three (3) representative organic compost samples, taken from the supplier's location, proposed to be used for preparing Planting Mix's composition.
3. Labeling: Label each organic compost sample taken at the supplier's location with the sample #, date, name, address, and phone number of the supplier.

1.10 TESTING REQUIREMENTS

A. Physical Testing:

1. Soil Texture: Soil-particle, size-distribution analysis by one of the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":

   a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
   b. Hydrometer Method: report percentages of sand, silt, and clay.

2. Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
3. Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
4. Saturated Hydraulic Conductivity: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods"; at 85% compaction according to ASTM D698 (Standard Proctor).

B. Chemical Testing:

1. CEC: Analysis by sodium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."
2. Clay Mineralogy: Analysis and estimated percentage of expandable clay minerals using CEC by ammonium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 1- Physical and Mineralogical Methods."
3. Metals Hazardous to Human Health: Test for presence and quantities of RCRA metals including aluminum, arsenic, barium, copper, cadmium, chromium, cobalt, lead, lithium, and vanadium. If RCRA metals are present, include recommendations for corrective action.
4. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.

C. Fertility Testing: Soil-fertility analysis according to standard laboratory protocol of SSSA, NAPT NEC-67, including the following:

1. Percentage of organic matter.
2. CEC, calcium percent of CEC, and magnesium percent of CEC.
3. Soil reaction (acidity/alkalinity pH value).

4. Buffered acidity or alkalinity.
5. Nitrogen ppm.
6. Phosphorus ppm.
7. Potash.
8. Potassium ppm.
9. Manganese ppm.
10. Manganese availability ppm.
11. Zinc ppm.
12. Zinc availability ppm.
13. Copper ppm.
14. Sodium ppm and sodium absorption ratio.
15. Soluble-salts ppm.
16. Presence and quantities of problem materials including salts and minerals cited in the standard protocol. If such problem materials are present, provide additional recommendations for corrective action.
17. Other deleterious materials, including their characteristics and content of each.

D. Organic-Matter Content of Topsoil: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."

E. Recommendations: Based on the test results, provide recommendations for soil treatments and soil amendments that will be incorporated in order to produce satisfactory Planting Mix:

1. Planting Mix shall be used as the proper medium in order to produce healthy, viable plants and turf for this Project.
2. Include the necessary recommendations for nitrogen, phosphorous, potassium fertilization, treatments, amendments, and micronutrients.
3. Fertilizers and Soil Amendment Rates: Provide fertilizer recommendations in pounds per 1000 square feet (lbs./S.F.).
4. Soil Reaction: Provide the recommended liming rates for raising the pH or sulfur for lowering the pH according to the buffered acidity or buffered alkalinity in pounds per 1000 square feet (lbs./S.F.).

F. Bioretention Soil Mix shall be sampled and tested according to the requirements of MDSHA Specifications Article 920.01.05 and the approved SWM Drawings.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas, plants or plant beds.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways in accordance with the approved Erosion and Sediment Control (ESC) Drawings.

3. Do not move or handle materials when they are wet or frozen.
4. Accompany each delivery of bulk materials with required certification and invoices.

C. Bioretention Soil Mix (BSM):

1. Store under tarp or in shed so stockpile is protected from wind and weather.
2. BSM that is stored for six (6) months or longer shall be resampled, retested, and reapproved before utilization on this Project.
3. Certified in accordance with the approved Stormwater Management (SWM) Drawings.

PART 2 - PRODUCTS

2.1 BASE SOIL FOR BIORETENTION SOIL MIX

A. Comply with MDSHA Specifications Article 920.01.05 and in accordance with the approved Stormwater Management (SWM) Drawings and as supplemented with more stringent requirements herein.

2.2 PLANTING MIX - SPECIFIED BY COMPOSITION

A. General: Soil amendments, fertilizers, and rates of application specified in this specification Article are guidelines that may need to be revised based on testing agency's recommendations after pre-construction soil testing and analyses has been performed.

B. Topsoil: Topsoil shall comply with the following requirements:

1. Topsoil for Turf Establishment

a. The minimum organic matter content of the amended topsoil shall be 5%;
b. Topsoil shall have a pH from 6.0 to 7.0;
c. Topsoil shall not have soluble salts greater than 500 ppm;
d. Topsoil shall be classified as “Sandy Loam” in accordance with the USDA Textural Triangle.

2. Topsoil for Planting Mix

a. The minimum organic matter content of the unamended topsoil shall be 2%;
b. Topsoil shall have a pH from 6.0 to 7.0;
c. Topsoil shall not have soluble salts greater than 500 ppm;
d. Topsoil shall be classified as “Sandy Loam” in accordance with the USDA Textural Triangle.

C. Planting Mix for Landscape Plant Material:

1. Satisfactory excavated on-site topsoil, satisfactory imported topsoil, manufactured topsoil, or an approved combination of these materials that has been modified in accordance with Testing Agency recommendations for soil amendments and fertilizers in order to produce a suitable Planting Mix for proper plant growth.

2. Blend satisfactory topsoil, manufactured soil, and soil amendments in the following ratios to produce Planting Mix for landscape plant materials:

   a. Ratio of Loose Compost to Topsoil: 1:3 by volume.
   b. Ratio of Loose Topsoil: 1:3 by volume.
   c. Ratio of Loose Sand: 1:3 by volume.

D. Planting Mix for Turf Establishment: Satisfactory existing on-site topsoil and satisfactory imported topsoil that has been modified in accordance with testing agency recommendations with soil amendments and fertilizers in order to produce a suitable Planting Mix for proper turf establishment.

1. Blend satisfactory topsoil and soil amendments to produce Planting Mix for turf establishment.

E. Bioretention Soil Mix (BSM)

1. Shall comply with MDSHA Specifications Article 920.01.05 and in accordance with the approved Stormwater Management (SWM) Drawings.

2.3 INORGANIC SOIL AMENDMENTS

A. Agricultural Gypsum: Minimum 90% calcium sulfate, finely ground with 90% passing through a No. 50 sieve.

B. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20% iron and 10% sulfur.

C. Lime: ASTM C602, agricultural liming material containing a minimum of 80% calcium carbonate equivalent and as follows:

1. Class: T, with a minimum of 99% passing through a No. 8 sieve and a minimum of 75% passing through a No. 60 sieve.
2. Class: O, with a minimum of 95% passing through a No. 8 sieve and a minimum of 55% passing through a No. 60 sieve.

D. Sulfur: Granular, biodegradable, and containing a minimum of 90% elemental sulfur, with a minimum of 99% passing a No. 6 sieve and a maximum of 10% passing a No. 40 sieve.

E. Sharp Sand: In accordance with ASTM C33 for Fine Aggregate, and as specified herein:

1. Sharp Sand shall be washed angular silica sand.
2. Sharp Sand shall include less than 1% by weight of clay or silt size particles, and less than 5% by weight of any combination of diabase, greystone, calcareous or dolomitic sand.

2.4 ORGANIC SOIL AMENDMENTS

A. Compost: Shall be Type B Compost in accordance with MDSHA Section 920.02.05 (b), and shall be obtained from an approved supplier noted in MDOT's "List of Qualified

Producers/Manufacturers". Compost shall be well-composted, stable, and weed-free organic matter, bearing USCC's "Seal of Testing Assurance" and as follows:

1. Feedstock: Limited to leaves.
2. Reaction: pH of 5.5 to 8.
3. Soluble-Salt Concentration: Less than 4dS/m.
4. Moisture Content: 35 to 55% by weight
5. Organic Matter Content: 50 to 60% of dry weight, average.
6. Particle Size: Minimum of 98% passing through a 2-inch sieve.

B. Fine Bark: Shall be bark from harvesting healthy hardwood trees, milled and screened to a uniform particle size of 2-inches or less.

1. Fine Bark shall be composted, aged for at least six (6) months, free from sawdust, and foreign materials harmful to healthy plant growth.

2.5 FERTILIZERS

A. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50% water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified Testing Agency.

PART 3 - EXECUTION

3.1 GENERAL

A. Install Planting Mix in accordance with the requirements of Specification Section 329200 "Turf and Grasses" and Section 329300 "Plants."

B. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in Planting Mix and surrounding soils.

C. Proceed with placement after all unsatisfactory conditions have been corrected.

3.2 PREPARATION OF SOIL PRIOR TO AMENDMENT

A. Excavation: Excavate and stockpile satisfactory soils. Cover and protect until amended.

B. Unacceptable Materials: Soil with concrete slurry or washings, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and all materials that are harmful to plant growth.

C. Unsuitable Materials: Soil exceeding 8%, by dry weight, of stones, roots, plants, sod, clay lumps, and pockets of coarse sand.

D. Screening: Mechanically screen unamended soil through a 3/4-inch sieve to remove materials larger than ¾-inch in size.

3.3 MIXING AND INSTALLATION OF PLANTING MIX

A. General: Mix satisfactory on-site and borrow soils with amendments in designated on-site location, approved by the Landscape Architect or Owner's Representative, as required to prepare Planting Mix for installation of plants and for turf establishment. Do not apply materials or till if soils or subgrade is frozen, muddy, or excessively wet.

1. To facilitate the proper installation of the Planting Mix, immediately prior to installation, mechanically rescreen the mix to break up consolidated clumps of the material to the specified size.
2. Do not mix or apply Planting Mix materials, or till subgrade, if frozen, muddy, or excessively wet.
3. Minimum Depth of Planting Mix for turf areas shall be four (4) inches or as indicated.
4. Minimum Depth of Planting Mix for trees and shrubs as indicated.
5. Minimum Depth of Planting Mix for Groundcovers and all other landscape plants shall be twelve (12) inches.
6. Depth of Planting Mix for Stormwater Management Bioretention Facilities: In accordance with the approved Stormwater Management (SWM) Drawings.

B. Subgrade Preparation: Till subgrade to a minimum depth of four (4) inches. Remove stones larger than 3/4-inch in any dimension, plus sticks, roots, rubbish, and other extraneous matter. Legally dispose of off Owner's property.

C. Spread Planting Mix to depth as indicated, but not less than required to meet finish grades. Do not spread if Planting Mix or subgrade is frozen, muddy, or excessively wet.

1. Lifts: Install Planting Mix in lifts not exceeding four (4) inches in loose depth for all plant material, and four (4) inches in loose depth for turf establishment.

D. Compaction:

1. Landscape Plants: Hand-tamp each lift of Planting Mix to consolidate the mix around each plant to minimize settlement and air pockets. Compaction by mechanized equipment shall not be allowed.
2. Turf Establishment: Compact each lift of Planting Mix to within 75 to 82% of maximum dry density in accordance with ASTM D698 (Standard Proctor).

E. Finish Grading:

1. Completed Planting Mix shall have a smooth, uniform surface finish grade.
2. Lightly roll and rake to remove ridges, and fill depressions as necessary to meet proposed finish grades.

3.4 INSTALLING BIORETENTION SOIL MIX (BSM)

A. Contractor shall take care to minimize compaction of both the subgrade of SWM Bioretention Facilities and installation of the required BSM.

B. Confirm that required underdrains, stone, and geotextile have been properly installed and inspected in accordance with the Drawings and Specifications prior to placing bioretention soil mix.

C. Place BSM in lifts of twelve (12) to eighteen (18) inches to meet proposed finish grade and elevations in accordance with the approved Stormwater Management (SWM) Drawings.

D. Do not use heavy equipment within the SWM Bioretention Facilities. Heavy equipment may be operated around the perimeter of the facilities in order to install stone, underdrains, sand, BSM, plants, and mulch. Rough and finish grade BSM materials by hand raking and tamping.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform all tests and inspections performed during construction operations.

B. Prepare and submit test reports.

C. Label each sample and test report with the date, location keyed to the applicable drawing, the visibility conditions, when sample and test was taken, and sampling depth.

D. Contractor shall perform regular inspections and documentation at the following specified stages of construction in accordance with the following:

1. Excavations to subgrade.
2. Placement and backfill of underdrain system, if applicable.
3. Placement of geotextiles and all filter media for SWM Facilities.
4. Monitoring construction of all SWM Facilities for preparation and submission of “As-Built” documents and reports.

3.6 PROTECTION

A. Protect areas of completed installation from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Vehicle traffic.
4. Foot traffic.
5. Erection of sheds of structures.
6. Impoundment of water.
7. Excavation and other disturbances, unless otherwise approved.

B. For areas that have been previously over-compacted, disturbed, or contaminated by foreign or deleterious materials or liquids:

1. Remove contamination and contaminated Planting Mix as applicable.
2. Restore subgrades in accordance with the requirements of Section 312000 “Earth Moving” and as directed by the Testing Agency.
3. Correct contaminated and improperly prepared subgrades as required.
4. Replace contaminated Planting Mix with satisfactory Planting Mix.

3.7 CLEANUP AND REMOVAL OF DEBRIS AND EXCESS MATERIALS

A. Protect areas with installed Planting Mix from contamination. Keep adjacent paving and construction clean and work area in orderly condition.

B. Remove surplus Planting Mix and waste materials, including excess subsoil, unsuitable materials, trash, and debris, and legally dispose of them off of the Owner's property.

1. Excess topsoil shall be removed from the site unless otherwise directed in writing by Owner.

END OF SECTION 329113

SECTION 329200

TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Seeding.
2. Hydroseeding.
3. Sodding.
4. Erosion-control material(s).

B. Related Requirements:

1. Section 329113 “Soil Preparation” for preparation of Planting Mixes and testing procedures.
2. Section 329300 "Plants" for trees, shrubs, ground covers, and other plants as well as border edgings and mow strips.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting mix.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. Pesticides also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Mix: Existing, on-site topsoil and imported topsoil that has been modified with soil amendments and fertilizers to produce a soil mixture best for plant growth. Refer to Section 32 9113 "Soil Preparation" for planting mix requirements.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting mix is placed.

1.4 PRE-INSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. The year of production and associated date of packaging shall be no older than 1 (one) year from the date of installation on the Project.

1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of supplier.

C. Product Certificates: For fertilizers, from manufacturer.

D. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of turf during a calendar year. Submit before expiration of required maintenance periods.

1.7 QUALITY ASSURANCE

A. State of Maryland, Department of Agriculture (MDA), Office of Plant Industries and Pest Management, and MDA’s Turf and Seed Section’s regulations.

B. Turfgrass Technical Update Bulletin (TT-77) referenced herein, latest edition, published by the University of Maryland, Department of Natural Resource Science and Landscape Architecture.

C. Association of Official Seed Analysts’ (AOSA) referenced publications.

D. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf establishment.

1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: Three years' experience in turf installation in addition to requirements in Section 01 4000 "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:

a. Landscape Industry Certified Technician - Exterior.

b. Landscape Industry Certified Lawncare Technician.

5. Pesticide Applicator: State licensed, commercial.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Sod: Harvest, deliver, store, and handle sod according to requirements of "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding."

1. Sod shall be harvested, rolled for handling and transportation, and delivered to the site within 24 hours of harvesting.
2. Protect rolls of sod from breakage and drying during transportation, and temporarily store on site.
3. Protect from dehydration, contamination, freezing and heating at all times. Keep stored sod moist and under shade or covered with moistened burlap.
4. Do not drop sod rolls from carts, trucks or pallets.

C. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

1.9 FIELD CONDITIONS

A. Planting Restrictions: Plant when temperature is above 32 degrees Fahrenheit and the soil is not frozen, during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.

1. Spring Planting Season: March 1st through May 15th.
2. Fall Planting Season: August 15th through October 15th.

B. Extensions beyond the Planting Seasons indicated above may be approved by the Landscape Architect, depending upon weather conditions for the period in question. Any planting outside of the specified dates shall be solely at the Contractor’s risk and shall not be subject to compensation until satisfactory stabilization has been accomplished in accordance with the Specifications.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.

B. Seed shall be packed 50 lbs. net weight and packed in clean, poly woven bags, tightly woven to prevent leaking and contamination.

C. Each container or bag shall have an accurate analysis tag and certification tag permanently affixed to it.

D. All seed lots to be used in this mixture shall have been pretested by the Maryland Seed Laboratory to insure compliance with the Specifications.

E. Seed Species:

1. Quality: Seed of grass species as listed below for solar exposure, with not less than 85 percent germination, not less than 98 percent pure seed, and not more than 0.5 percent weed seed.
2. Turf-Type Tall Fescue Seed (and Sod) shall consist of a three-way blend (34%, 33%, and 33%) of Tall Fescue 'Proven' cultivars noted in the "Recommended Turfgrass Cultivars for Certified Sod Production and Seed Mixtures in Maryland" (Turfgrass Technical Update TT-77), latest edition, published by the University of Maryland, Department of Natural Resource Science and Landscape Architecture.
3. Kentucky Bluegrass shall be from the Kentucky Bluegrass Varieties noted in the "Recommended Turfgrass Cultivars for Certified Sod Production and Seed Mixtures in Maryland" (Turfgrass Technical Update TT-77), latest edition, published by the University of Maryland, Department of Natural Resource Science and Landscape Architecture.

Variety of Certified Tall Fescue and Variety of Kentucky Bluegrass

Purity	Germination	Other Crop	Weed Seed	Weeds
Minimum	Minimum	Maximum*	Maximum**	Noxious***
98%	85%	0.1%	0.1%	None

* Must be free of ryegrass, timothy, orchardgrass, bentgrass, Canada bluegrass, clover, or any other contaminants that will become unsightly and uncontrollable.
** Must be free of dock, cheat, chess, chickweed, crabgrass, plantain, and black magic.
*** Must be free of all Maryland prohibited and restricted noxious weeds as listed in the Maryland Department of the Environment 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control, as amended to date.

F. Seed Mixes:

1. Work of this Section consists of all labor, materials, equipment, and services necessary for and incidental to the establishment of lawn areas. The below seed mixes supersede those mixes shown on the Erosion and Sediment Control Plans in the Drawings.

Permanent Turfgrass Seed Mix

Seed Type	lbs/ac.	lbs/1000 sf	% of mix
Turf Type Tall Fescue (Three-Way Blend)	285	6.50	95%
Kentucky Bluegrass	15	0.34	5%
Total Seeding Rate:	300	6.84	100%

*See Article 2.1.E.2 above for requirements of Turf Type Tall Fescue (Three-Way Blend)

2.2 TURFGRASS SOD

A. Turfgrass Sod: Maryland State Certified, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted.

B. Sod Species: Turf-Type Tall Fescue with Kentucky Bluegrass.

C. Sod labels must be made available at the site for inspection by Landscape Architect and/or Owner’s Representative at the time of sod installation.

D. Sod must be machine cut at a uniform soil thickness of ¾ inch, plus or minus ¼ inch, at the time of cutting. Measurement for thickness must exclude top growth and thatch. Broken pads and torn or uneven ends will not be acceptable.

E. Standard size sections of sod must be strong enough to support their own weight, and retain their size and shape, when suspended vertically with a firm grasp on the upper 10 percent of the section.

F. Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its’ survival.

G. Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist at the Contractor’s expense prior to its installation.

2.3 FERTILIZERS

A. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory, unless otherwise specified herein.

2.4 MULCHES

A. Straw Mulch: Provide air-dry, clean, mildew, noxious weed and seed-free, threshed straw of wheat, rye, oats, or barley. Shall be reasonably bright in color. Shall be free of noxious weed

seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty.

B. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

C. Non-asphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

2.5 PESTICIDES

A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.6 EROSION-CONTROL MATERIALS

A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.

B. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

PART 3 - EXECUTION

3.1 GENERAL

A. Seed all areas within project limits that are not to be sodded, paved, or designated in the Drawings to receive special treatment.

3.2 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint

thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.

2. No seeding or sodding shall be performed during windy weather, when the ground is wet or otherwise untillable.
3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.

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

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the Planting Mix and contamination, as directed by Landscape Architect, and replace with new Planting Mix.

3.3 PREPARATION

A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.4 TURF AREA PREPARATION

A. General: Prepare planting area for planting mix placement in accordance with Section 32 91 13 "Soil Preparation."

B. Placing Planting Mix: Place Planting Mix over exposed subgrade to a minimum depth of 4”.

C. If Planting Mix is dry, moisten as necessary. Water thoroughly and allow surface to dry before planting. Do not create muddy or excessively wet Planting Mix.

D. Before planting, obtain Landscape Architect's or Owner’s Representative’s acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.5 INSTALLATION OF EROSION-CONTROL MATERIALS

A. Prepare area as specified in "Turf Area Preparation" article above.

B. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy Planting Mix.

C. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions.

1. Fasten as recommended by blanket or mesh manufacturer.

3.6 DRY SEEDING METHOD

A. Sow seed with broadcast or rotary spreader. A “Brillion” Agricultural or Landscape Seeder shall not be used for dry seeding. Do not broadcast or drop seed when wind velocity exceeds 5 mph.

1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
2. Do not use wet seed, or seed that is moldy or otherwise damaged.
3. Do not seed against existing trees. Limit extent of seeding to the outside edge of planting saucer.

B. Sow seed at a total rate noted in Article 2.1.F.1.a above.

C. Lightly rake seed into top ¼ to ½ inch of soil, roll lightly, and water with fine spray.

D. Protect seeded areas with slopes exceeding 4 horizontal to 1 vertical (4:1) with erosion-control blankets installed and stapled according to manufacturer's written instructions.

E. Protect seeded areas with erosion-control mats where indicated on Drawings; install and anchor according to manufacturer's written instructions.

F. Protect seeded areas with slopes not exceeding 4 horizontal to 1 vertical (4:1) by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1 to 2 inches in uniform loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.

1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.

3.7 HYDROSEEDING METHOD

A. Hydroseeding: Mix specified seed, commercial fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseeding application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with fiber-mulch manufacturer's recommended non-asphaltic tackifier.
2. Spray-apply slurry uniformly to all areas to be seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 1500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.

3.8 SODDING

A. Proceed with sod installation only after unsatisfactory conditions have been corrected and approved by the Landscape Architect or Owner’s Representative. Beginning sod installation means acceptance of existing conditions.

B. Install sod within 36 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

C. During periods of excessively high temperature (above 90 degrees Fahrenheit), or in areas where subsoil is dry, lightly irrigate the subsoil immediately prior to laying the sod.

D. Lay sod in straight, parallel lines to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to soil or sod during installation. Tamp and roll lightly to ensure contact with soil, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across slopes exceeding 3 horizontal to 1 vertical (3:1).
2. Anchor sod on slopes exceeding 6 horizontal to 1 vertical (6:1) with steel staples spaced as recommended by sod manufacturer but not less than two anchors per sod strip to prevent slippage.
3. Lightly roll sodded areas after installation to ensure proper contact with the Planting Mix below.

E. Saturate sod with fine water spray within two hours of planting until the underside of the new sod pad and soil surface below the sod are thoroughly wet. During first week after installation, water daily or more frequently as necessary to produce a healthy stand of turf grass.

3.9 TURF RENOVATION

A. Renovate existing turf where indicated.

B. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.

1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
2. Install new planting mix as required.

C. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.

D. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting mix.

E. Mow, dethatch, core aerate, and rake existing turf.

F. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

G. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

H. Roto-till stripped, bare, and compacted areas thoroughly to a soil depth of 4 inches.

I. Apply soil amendments and initial fertilizer required for establishing new turf and mix thoroughly into top 4 inches of existing topsoil. Install planting mix to fill low spots and meet finish grades.

1. Soil Amendment(s): In accordance with requirements of Section 32 91 13 "Soil Preparation" after specific soil testing in renovation areas has identified amendment requirements.

J. Apply seed and protect with straw mulch as required for new turf.

K. Water newly planted areas and keep moist until new turf is established.

3.10 TURF MAINTENANCE

A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

C. Mow turf as soon as top growth is tall enough to cut, and not less than 3 inches in height. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades are bent over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:

1. Mow turf grass to a height of 3 to 4 inches. Do not mow to less than 3 inches in height.
2. Mow every seven to ten days during active growth periods so grass height will not exceed five inches.
3. For sodded areas, do not mow until the sod is firmly rooted into the soil below.

D. Fertilizer:

1. Initial Fertilization:

a. Apply slow-release fertilizer after initial mowing, when grass is dry.
b. Use fertilizer that provides actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.
c. Water turf immediately following fertilizer application, if rain is not imminent within 24 hours.

2. Maintenance Fertilization:

Apply one of the following fertilizer types annually in the Fall season at the specified rates:

Type	Rate	Rate
N-P-K	lb/ac	lb/1000 sf
10-10-10	500	11.5
30-10-10	400	9.2

3.11 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Landscape Architect:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 95 percent over any 10 sq. ft. area and bare spots not exceeding 5 by 5 inches.
2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

B. When seeded turfgrass establishment is not satisfactory, perform overseeding and re-seeding as directed by the Landscape Architect.

1. Overseeding thin turf: Overseeding consists of seeding and mulching areas where turfgrass coverage is 40 to 90 percent.

a. Cut turfgrass to a height of 3 to 4 inches and remove debris that will interfere with seeding.
b. Do not apply herbicide or till soil.
c. Apply specified seed mix and mulch at the specified rates.
d. Ensure that a minimum of 90 percent of the soil surface is covered with mulch or established turfgrass when overseeding is completed.

2. Reseeding failed turf: Reseeding consists of tilling, seeding and mulching areas where turfgrass coverage is less than 40 percent.

a. Grade, prepare soil and seedbed, and mulch as specified herein.

C. Use specified materials to reestablish turf that complies with requirements, herein and continue maintenance until turf is satisfactory.

3.12 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.13 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove nondegradable erosion-control measures after grass establishment period.

3.14 MAINTENANCE SERVICE

A. Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in "Turf Maintenance" Article. Begin maintenance immediately after each area is planted and continue until acceptable turf is established, but for not less than the following periods:

1. Seeded Turf: 1 year from date of Substantial Completion.

    a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

2. Sodded Turf: 1 year from date of Substantial Completion.

3.15 FINAL ACCEPTANCE

A. The Landscape Architect shall inspect the turf during the substantial completion walk through for the entire Project.

END OF SECTION 329200

SECTION 329300

PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Plant material.
2. Planting mix and soil amendments.
3. Tree stabilization materials.
4. Fertilizers, herbicides, pesticides, and mulches.
5. Slow release tree-watering devices, when indicated.
6. Tree root barrier, where indicated on the Drawings.

B. Related Requirements:

1. Section 015639 "Temporary Tree and Plant Protection" for protecting, trimming, pruning, repairing, and replacing existing trees to remain that interfere with or are affected by execution of the Work.
2. Section 329113 “Soil Preparation” for preparation of planting mixes and testing procedures.
3. Section 329200 "Turf and Grasses" for turf (lawn) seeding, hydroseeding, sodding, and erosion-control materials.

1.3 DEFINITIONS

A. Backfill: The plant mix used to replace earth, or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with a ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required. Wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

D. Finish Grade: Elevation of finished surface of Planting Mix.

E. Herbicide/Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest or undesirable plant. Pesticides include, but are not limited to, insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

F. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include, but are not limited to, insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, rats and mice), unwanted plants (weeds and invasive plants), fungi, bacteria, and viruses.

G. Planting Area: Areas for installation of plant material.

H. Planting Mix: Satisfactory existing on-site topsoil, satisfactory imported topsoil, or manufactured soil that has been modified with soil amendments and fertilizers to produce a satisfactory soil mixture for plant growth. Refer to Section 329113 "Soil Preparation" for planting mix requirements.

I. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, ground covers, ornamental grasses, bulbs, corms, tubers, and herbaceous vegetation.

J. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

K. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

L. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting mix is placed.

1.4 COORDINATION

A. Coordination with Turf (Lawn) Installation Areas: Install trees, shrubs, and other plants after finish grades have been established, and before installing turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after turf areas have been installed: Protect turf areas and promptly repair damage caused by planting operations.

1.5 PRE-INSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
2. Plant “Standard of Comparison” Images: Include color images in digital format for each required species and size of plant material as it will be furnished to Project. Obtain images

from an angle that depicts actual size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each image. For species where more than ten (10) plants are required, include a minimum of three (3) images showing the average plant, the best quality plant, and the plant of least quality to be furnished. Identify in each image: the full scientific name and variety or cultivar of the plant, the plant size, and name of the growing nursery. Images shall be of a high enough resolution as to clearly see the condition of trunk and foliage.

3. Tree root barrier.

B. Samples for Verification: for each of the following:

1. Mulch: 1-quart volume of each type of mulch; submit in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the material to be furnished: provide an accurate representation of color, texture, and organic makeup.

2. Tree root barrier: Two (2) full sized module pieces.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of that Owner’s contact person.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists (AOAC), where applicable.

C. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established and performed by Owner for maintenance of plants during each calendar year. Submit before expiration of required maintenance period for this Project.

1.9 QUALITY ASSURANCE

A. The “American Standard for Nursery Stock” (ANSI Z60.1), 2014 edition, published by AmericanHort, as amended to date.

B. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.

1. Professional Membership: Installer shall be a member in good standing of either the National Association of Landscape Professionals (formerly the *Professional Landcare Network*), or AmericanHort (formerly the *American Nursery and Landscape Association*).
2. Experience: At least five (5) years' experience in landscape installation for projects of similar scale in addition to requirements in Section 014000 "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the National Association of Landscape Professions (formerly the PLANET).

    a. Landscape Industry Certified Technician - Exterior.
    b. Landscape Industry Certified Horticultural Technician.

5. Pesticide Applicator: Commercial, licensed in the State of Maryland.

C. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

D. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

E. Observation of Plant Material: The Landscape Architect may choose either to observe plant material at the nursery's location, or at the Project site prior to installation, for compliance with ANSI Z60.1 requirements for genus, species, variety, cultivar, size, and quality. Landscape Architect may also choose to observe installed plant material for size, condition of balls, root systems, pests, disease symptoms, injuries, and latent defects that may be cause for rejection of unsatisfactory or defective material, at any time, during the prosecution of work. Immediately remove rejected plant material from Project site.

1. Furnish the "Standard of Comparison" images and notify Landscape Architect of sources of all planting materials a minimum of fourteen (14) days in advance of delivery to site.
2. The Landscape Architect, the Owner, or his designated representative will inspect and approve or reject plant material delivered to the site.

F. Plant Quantities: Quantities shown in the Planting Schedule on the Drawings are estimates only. The Contractor shall install the quantities shown and labeled in plan view as indicated on the Drawings. Contractor shall notify Landscape Architect of any discrepancies between the quantities listed in the Planting Schedule and quantities shown and noted in plan view.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Provide appropriate certificates with each delivery of bulk materials to the site.

C. Deliver bare-root stock plants within 36 hours of digging. Immediately after digging bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting. Transport in covered, temperature-controlled vehicles, keeping plants cool and protected from sun and wind at all times.

D. Do not prune trees and shrubs prior to delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

E. Handle plant materials by root ball or container.

F. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F. until installation.

G. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

H. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

I. Deliver plants after preparations for planting have been completed, then install immediately. If planting is delayed more than six hours after delivery, temporarily set plants in the appropriate location (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Heel-in bare-root stock. Soak roots that are in less than a moist condition in water for two hours. Reject plants with dry roots.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.11 FIELD CONDITIONS

A. Field Measurements: Verify proposed grade elevations, utility locations and services, landscape irrigation system components, and locations of plantings and contiguous construction in relation to new plantings by field measurements before proceeding with installation.

B. Verify that all planting bed areas have positive drainage with a 2% minimum slope prior to laying out plant materials. Correct grading as required to obtain positive drainage. Proposed stormwater management Micro-Bioretention facilities are intended to receive drainage as indicated on the approved Drawings.

C. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Deciduous Trees and Shrubs:

a. Balled and Burlapped Materials:

1) Spring Planting: February 15th through April 30th.
2) Fall Planting: October 15th through December 15th.

b. Container Grown Materials:

1) Spring Planting: March 1st through June 15th.
2) Fall Planting: August 15th through December 15th.

2. Evergreen Trees and Shrubs:

a. Balled and Burlapped Materials:

1) Spring Planting: March 15th through April 30th.
2) Fall Planting: September 1st through November 15th.

b. Container Grown Materials:

1) Spring Planting: March 15th through June 30th.
2) Fall Planting: August 15th through November 15th.

3. Perennials and Grasses

a. Container Grown Materials:

1) Spring Planting April 15th through June 30th.
2) Fall Planting: September 1st through October 30th.

D. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions allow installation to be performed when beneficial and optimum results may be obtained. Apply recommended products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.12 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
b. Structural failures including plantings falling or blowing over.
c. Faulty performance of tree stabilization.
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods: One (1) full growing season after the date of Substantial Completion of the Project.

a. Trees, Shrubs, and Ornamental Grasses: 12 months.
b. Ground Covers, Perennials, and Other Plants: 12 months.

3. Provide the following remedial actions:

a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
c. Provide extended warranty for period equal to original warranty period, for replaced plant material.
d. Maintain the minimum depth of mulch.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing and other features noted the in Plant Schedule as indicated on Drawings, and complying with ANSI Z60.1. Provide plants with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Single-stem trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots are unacceptable.
2. Multi-stemmed trees shall be typical of their genus, species, cultivar or variety, without defects or damages in the same manner as for single-stem trees.
3. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Hardiness Zones of Origin: Plant material shall be nursery grown in Plant Hardiness Zones 5, 6, or 7 according to the 'USDA Plant Hardiness Zone Map' unless otherwise specified.

C. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants specified. Plants of a larger size may be installed, if acceptable to Landscape Architect, with an associated increase in size of roots, balls, or containers.

D. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

E. Labeling: Label all plants with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus, species and hybrid, variety, or cultivar, if applicable for the plant.

F. Plant material that is misidentified, unsatisfactorily labeled or tagged, or do not conform to the typical, accepted characteristics of the species or cultivar, will be rejected.

G. Plants shall be healthy, free from physical defects and stresses, and have well-developed branches and a vigorous root system. Plants that exhibit wilt, shriveling, insufficient root mass, broken or loose root balls or inadequate protection will be rejected.

H. Container grown plants shall be well rooted, vigorous, and established in the size container or pot specified, shall have well balanced tops for their size, and shall not be root bound.

I. If formal arrangements or consecutive order of plants is indicated on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

J. Substitutions: All plant material substitution requests must be made in writing to the Landscape Architect, and are subject to approval by the Landscape Architect.

K. Trees:

1. All trees shall be Balled and Burlapped (B&B). No trees that have been grown in containers at any time will be accepted.
2. All trees shall have been transplanted or root pruned at least once within the previous three (3) year period prior to digging for this Project.
3. Trees shall not be top pruned in any way prior to planting.
4. Single-stem trees shall have a straight trunk with a single leader, well-branched, intact, undamaged and uncut. All old abrasions and cuts must be completely calloused over. Multi-stemmed trees shall be typical of their genus, species, cultivar or variety without deflects or damages in the same manner as for single-stem trees.
5. All trees shall be measured when their branches are in their normal position. Height and spread dimensions specified refer to the main body of the tree and not branch to branch or root tip to tip.
6. Unless otherwise noted, all trees shall be symmetrical and/or typical for the variety and species, cultivar or variety, and comply with the measurements indicated in the Plant Schedules.
7. Where symmetry is required for a group or line of trees, each tree shall be nearly identical as possible to each other.
8. Trees shall not be bound with rope or wire at any time so as to damage the bark or break branches.

2.2 PLANTING MIX

A. In accordance with Section 329113 “Soil Preparation.”

2.3 MULCHES

A. Mulch: Uniform in texture, free from deleterious materials or concentrations of toxic metals, chemicals or other substances that are harmful to human health, water quality or plant growth, and suitable as a top dressing of plant materials and bed areas, consisting of one of the following:

1. Stormwater Management (SWM) Micro-Bioretention Facilities: In accordance with the approved Stormwater Management Drawings.
2. Landscape Trees, Shrubs, and Plant Beds (not within SWM Micro-Bioretention Facilities):

    a. Shredded hardwood bark mulch.
    b. Shall consist of natural bark and wood chips derived from hardwood trees that has been milled and screened to a maximum 3 in particle size
    c. Shall be aged a minimum of 90 days prior to installation.

B. Color: Natural. No dyed mulches will be accepted.

2.4 PESTICIDES AND HERBICIDES

A. General: Pesticides shall be registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Nonselective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.

2.5 TREE-STABILIZATION MATERIALS

A. Trunk-Stabilization Materials:

1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal by length indicated, pointed at one end.
2. Flexible Ties: Wide rubber or elastic bands or straps of length required to reach stakes or turnbuckles.
3. Guys and Tie Wires: ASTM A 641, Class 1, galvanized-steel wire, two-strand, twisted, 0.106 inch in diameter.

2.6 AMENDMENTS AND FERTILIZERS

A. Subject to compliance with the requirements, provide the following approved amendments:

1. Polymer Granules and Disks:

   a. "Soil Moist" Polymer Granules or "Soil Moist" Polymer Disks manufactured by JRM Chemical, 15663 NEO Parkway, Cleveland, Ohio 44125, or approved equal.
   Telephone: (800) 962-4010 Website: www.soilmoist.com.

2. Mycorrhiza Inoculants:

   a. "Soil Moist" Mycorrhiza products manufactured by JRM Chemical, 15663 NEO Parkway, Cleveland, Ohio 44125, or approved equal.
   Telephone: (800) 962-4010 Website: www.soilmoist.com

   b. "Dynomyco" Mycorrhizal Inoculant manufactured by Dynomyco,
   27 Hashahar Street, Moshav Mazor, Israel 7316000, or approved equal.
   USA Telephone: (888) 964-0685 Website: www.dynomyco.com.

2.7 TREE ROOT BARRIER

A. Tree Root Barrier shall be manufactured by the following, or approved equal:

DeepRoot Green Infrastructure, LLC. (DeepRoot)
530 Washington Street
San Francisco, CA 94111
Telephone: (800) 458-7668 Website: www.deeproot.com

1. Type: "UB 18-2" Tree Root Barrier.
2. Module Size: 18" high x 24" wide, with an integrated Double Top Edge, an integrated Zipper Joining System, and not less than four (4) Molded Integral Vertical Root Directing Ribs plus nine (9) Anti-Lift Ground Lock Tabs.
3. Material: Recyclable, black injection molded panels with 0.75" (1.90 mm) wall thickness.
4. Manufactured with 75% reprocessed polypropylene with added ultraviolet inhibitors.

PART 3 - EXECUTION

3.1 ROOT PRUNING AND INSTALLATION OF TREE ROOT BARRIER AT EXISTING TREES

A. Refer to the Drawings and Details for locations where root pruning and installation of root barrier is required.

B. Refer to Section 015639 "Temporary Tree and Plant Protection" for root pruning and tree trimming coordination with the Arborist.

C. Contact 'Miss Utility' at 1-800-257-7777 or another approved utility locating service to identify and mark utilities in the areas to be root pruned.

D. After root pruning has occurred, install tree root barrier in accordance with the manufacturer's instructions.

E. Install Planting Mix backfill to eliminate air pockets and void spaces along the tree root barrier.

3.2 EXAMINATION

A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid is contained in the existing soil within a proposed planting location or plant bed area.
2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain satisfactory plant installation results.
4. Uniformly moisten excessively dry soil that is not workable or which creates dust.

B. If contamination by foreign or deleterious material or liquid is present in soil within a planting location or plant bed area, remove the soil and contamination as directed by Landscape Architect and replace with new Planting Mix.

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

3.3 PREPARATION

A. Contact ‘Miss Utility’ at 1-800-257-7777 or another approved utility locating service to identify and mark utilities in the areas to be planted.

1. Contact the service a minimum of five (5) working days prior to beginning planting operations. Notify Landscape Architect or Owner’s Representative of conflicts between utilities and proposed plant locations.
2. Conflicts with utilities will be reviewed by the Landscape Architect or Owner’s Representative and direction will be given to the Contractor for adjustment of proposed planting locations.
3. Contractor shall not move plant materials from proposed locations indicated on Drawings without confirmation from the Landscape Architect or Owner’s Representative.

B. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

C. Maintain erosion-control devices and measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

D. Provide the necessary materials, stake out or flag proposed individual tree and shrub locations and outline of proposed areas for multiple plantings.

E. Obtain Landscape Architect’s or Owner Representative’s approval of layout prior to commencement of planting operations. A minimum of three (3) days’ notice is required to schedule each stage of a layout approval inspection with the Landscape Architect or Owner’s Representative. Proceed with operations only after layout approval has been obtained.

F. Plant Acclimation: Ensure that container grown plants are acclimated to the site's prevailing weather conditions before installing.

3.4 PLANTING AREA ESTABLISHMENT

A. General: Prepare planting area for soil placement and Planting Mix according to Section 329113 "Soil Preparation."

B. All shrub and groundcover areas shall be planted in continuous, prepared beds and mulched with mulch as detailed and specified.

C. Placing Planting Mix: Place Planting Mix over prepared subgrade.

D. Before plant installation, obtain Landscape Architect's or Owner's Representative's acceptance of finish grading. Restore planting areas if eroded or otherwise disturbed conditions exist after finish grading.

3.5 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.

1. Excavate planting pits as indicated on the Drawings. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit that have been smeared or smoothed during excavation operations.
2. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball. Retain satisfactory excavated soil if suitable for Planting Mix as specified in Section 329113 "Soil Preparation".
3. If area under the plant was initially dug too deep, add satisfactory soil to raise it to the correct level and thoroughly tamp the additional soil to prevent settling.
4. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
5. Maintain supervision of excavations during working hours.
6. Keep excavations covered or otherwise protected after working hours.
7. If subdrainage is indicated on Drawings or required beneath planting areas, excavate to reach the top of porous backfill over the subdrainage system.

B. Backfill Soil: Satisfactory topsoil and soil removed from excavations may be retained for preparation as Planting Mix as specified in Section 329113 "Soil Preparation."

C. Obstructions: Notify Landscape Architect or Owner's Representative if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Drill 6-inch-diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is less, and backfill augered holes to the bottom of the plant pit with washed #57 stone aggregate material.

D. Perched Water, Springs, or Subsurface Drainage Conditions: Notify Landscape Architect or Owner's Representative if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

E. Fill excavated plant pits with water to moisten subsoil, and allow to fully infiltrate prior to installing trees and shrubs.

3.6 TREE AND SHRUB PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly, do not break.

C. All plants shall be set straight and plumb in approved locations and set at such a level that after minor settlement, normal or natural relationship of the crown with the ground will be maintained.

D. All plants shall be treated at time of planting and initial watering with a hydrophilic acrylic polymer "Soil Moist", or equal, and shall be applied at the manufacturer's recommended rate per caliper inch of tree planted, and in accordance with the manufacturer's recommended rates for shrubs.

E. All trees shall be treated with Mycorrhizae Plant Tabs, or equal, at the time of planting. The rate shall be in accordance with the manufacturer's recommendations per caliper inch of tree planted, and in accordance with the manufacturer's recommended rates for shrubs. The Tab shall be planted 1/3 to ½ the depth of the root zone system.

F. Balled and Burlapped Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.

1. Backfill: Planting Mix in accordance with Section 329113 "Soil Preparation."
2. Planting Mix shall be tamped under and around the base of the root balls to prevent voids.
3. Place the root collar 1-2 inches above the average soil surface grade outside the planting pit.
4. Completely remove all wire baskets, burlap, rope or twine used to secure rootballs prior to backfilling.
5. Do not use planting stock if root ball is cracked or broken before or during planting operation.
6. Backfill around root ball in layers, tamping to consolidate planting mix and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of planting mix. Repeat watering until no more water is absorbed.
7. Continue backfilling process. Water again immediately after placing and tamping final layer of planting mix.

G. Container-Grown Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.

1. Backfill: Planting Mix in accordance with Section 329113 "Soil Preparation."
2. Carefully remove root ball from container without damaging root ball or plant. Loosen the soil mass to eliminate girdling roots.
3. Backfill around root ball in layers, tamping to consolidate planting mix and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of planting mix. Repeat watering until no more water is absorbed.
4. Continue backfilling process. Water again after placing and tamping final layer of planting mix.

H. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough planting mix to cover the downhill side of the root ball.

I. Mulch: Trees and shrubs shall be mulched immediately following installation, within the same day. Mulch shall be spread to an even finished surface, as indicated. Do not place mulch within 3 inches of the trunk or stem of any tree or shrub.

3.7 TREE AND SHRUB PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees and shrubs according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

C. Do not apply pruning paint to wounds.

D. Substantial wounds to the bark as determined by the Landscape Architect or Owner's Representative shall result in the rejection of plant material.

3.8 TREE STABILIZATION

A. Trunk Stabilization by Upright Staking and Tying: Install trunk stabilization as follows unless otherwise indicated:

1. Upright Staking and Tying: Stake trees of 2-inch through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches below bottom of backfilled plant pit and to extend to the dimension indicated on Drawings above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
2. Upright Staking and Tying: Stake trees with two stakes for trees up to 12 feet high and 2-1/2 inches or less in caliper; three stakes for trees less than 14 feet high and up to 4 inches in caliper. Space stakes equally around trees.

3. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
4. Support trees with two strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

3.9 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants other than trees and shrubs as indicated on Drawings in even rows with triangular spacing.

B. Backfill: Planting Mix in accordance with Section 329115 “Soil Preparation.”

C. Dig holes as indicated on Drawings to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that minimally disturbs the root system but to a depth not less than two nodes.

E. Work planting mix around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet planting mix.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.10 PLANT BED EDGES

1. Cut edges of plant beds at a steep angle into the planting bed area to a 3 inch depth. On slopes 4:1 or steeper, cut edges outside of the bermed area on the lower edge of the berm. Remove and discard excess soil material.
2. Edge entirely around all planting beds except at plant pits within planting bed areas.
3. Smoothly cut edges around all plant beds to the shapes indicated.

3.11 PLANT BED AREAS MULCHING

A. Mulch planting mix surfaces within plant bed areas and other areas to the depth indicated on the Drawings.

1. Trees and Treelike Shrubs within Turf Areas: Apply mulch ring around trunks or stems as indicated on Drawings. Do not place mulch within 3 inches of trunks or stems.
2. Mulch within Plant Bed Areas: Apply mulch as indicated on Drawings for individual plant pits and uniformly over the entire surface of plant bed area, and level with adjacent finish grades of pavement or turf areas. Do not place mulch within 3 inches of trunks or stems.
3. Mulch in Micro-Bioretention Facility: Apply as indicated on the approved Stormwater Management (SWM) Drawings.

3.12 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring plant pit saucers, adjusting and repairing tree-stabilization devices, resetting plants to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Contractor shall thoroughly water plantings on a weekly basis for the first 30 days. For three months following the initial 30 day period following installation, Contractor shall water plantings thoroughly on a bi-weekly basis. Watering beyond the above noted timeframes shall be at the discretion of the Contractor pursuant to keeping the plants in a healthy, live condition. Contractor shall supply all the necessary water.

C. Fill in, as necessary, planting mix subsidence that may occur because of settling or other processes. Replace decomposed mulch materials, and materials damaged or lost in areas of subsidence.

D. Apply chemical treatments as necessary to maintain plant materials, plant bed areas, and planting mixes free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

E. At the end of the warranty period, and prior to Final Inspection, the Contractor shall remove all guy wires and stakes.

3.13 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner a minimum of five (5) working days prior to each application.

B. Pre-Emergent Herbicides (Selective and Nonselective): Apply to tree, shrub, and ground-cover areas according to manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective and Nonselective): Apply only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.14 REPAIR AND REPLACEMENT

A. General: Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Landscape Architect.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Landscape Architect.

B. Remove and replace trees that are more than 25 percent dead, the main leader has died back, or otherwise in an unhealthy condition before the end of the corrections period or are damaged

during construction operations that Landscape Architect determines are incapable of restoring to normal growth pattern.

1. Provide new trees of same size as those being replaced for each tree of 6 inches or smaller in caliper size.
2. Provide two new tree(s) of 6-inch caliper size for each tree being replaced that measures more than 6 inches in caliper size.
3. Species of Replacement Trees: Same species as originally installed unless approved otherwise by the Landscape Architect.

C. Damage to existing conditions and utilities shall be repaired and restored at the expense of the Contractor.

3.15 CLEANING AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

E. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.16 MAINTENANCE SERVICE

A. Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as specified in Article 3.11 - "Plant Maintenance." Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period: 12 months shall include two full growing seasons after the date of Substantial Completion of the Project.

B. Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as required in Article 3.11 - "Plant Maintenance". Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period: 12 months shall include two full growing seasons after the date of Substantial Completion of the Project.

END OF SECTION 32930

SECTION 333000 - SANITARY SEWER UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. PVC pipe and fittings.
2. Nonpressure-type transition couplings.
3. Cleanouts.
4. Manholes.
5. Concrete.
6. Inspection and testing.

B. Related Requirements:

1. Section 312000 "Earth Moving" for excavation, subgrade preparation, backfill materials and related requirements.

1.3 DEFINITIONS

A. CIP: Cast iron pipe.

B. DIP: Ductile iron pipe.

C. PVC: Polyvinyl chloride.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Pipe and fittings.
2. Non-pressure and pressure couplings
3. Cleanouts.

B. BCDPW Standard Details: For manholes and cleanouts.

1.5 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of pipe and fitting, couplings, and backwater valves.

B. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Baltimore County, Department of Public Works, Standard Specifications for Construction and Materials (BCDPW), latest edition, as amended to date.

1. Measurement and payment provisions included in standard Specifications do not apply to Section 333000.
2. Comply with Specifications for sanitary sewer piping, including materials, installation, testing, and disinfection.

B. Baltimore County, Department of Public Works, Standard Details for Construction 2007, as amended to date.

1. Comply with Standard Details for sanitary sewer piping, including materials, installation, testing, and disinfection.

C. Baltimore County, Department of Public Works, Division of Construction Contracts Administration, Source of Supply, latest edition, as amended to date.

D. Comply with the Baltimore County Plumbing Code, as applicable and as amended to date.

E. Piping materials shall bear label, stamp, or other markings of specified testing agency.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic manholes, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle manholes according to manufacturer's written rigging instructions.

1.8 FIELD CONDITIONS

A. Interruption of Existing Sanitary Sewer Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Owner’s Representative and Project Civil Engineer no fewer than ten (10) days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without Owner’s Representative’s written permission.

PART 2 - PRODUCTS

2.1 GENERAL

A. All products shall be in accordance with BCDPW Specifications and Standard Details.

2.2 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

A. Pipe and Fittings: ASTM A74, Service and Extra-Heavy classes, in accordance with BCDPW Specifications.

B. Gaskets: ASTM C564, rubber.

2.3 PVC PIPE AND FITTINGS

A. PVC Type PSM Sewer Piping:

1. Pipe: ASTM D3034, SDR 35, PVC Type PSM sewer pipe with bell-and-spigot ends for gasketed joints, or SDR 26 where indicated.
2. Foam-core pipe (ASTM F891) is not an acceptable alternative to the ASTM D3034 PVC Type PSM pipe specified.
3. Fittings: ASTM D3034, PVC with bell ends.
4. Gaskets: ASTM F477, elastomeric seals.
5. SDR 26 pipe and fittings shall be used when the depth of cover exceeds 15 feet.

2.4 NONPRESSURE-TYPE TRANSITION COUPLINGS

A. Comply with ASTM C1173, elastomeric, sleeve-type, reducing or transition coupling; for joining underground nonpressure piping. Include ends of same sizes as piping to be joined and include corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:

1. For Cast-Iron Soil Pipes: ASTM C564, rubber.
2. For Plastic Pipes: ASTM F477, elastomeric seal or ASTM D5926, PVC.
3. For Dissimilar Pipes: ASTM D5926, PVC or other material compatible with pipe materials being joined.

2.5 CLEANOUTS

A. Cast-Iron Cleanouts: In accordance with BCDPW Specifications and Standard Details.

1. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
2. Top-Loading Classification(s): Medium Duty or Heavy Duty as indicated.

3. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings, ductile iron or PVC as indicated.

B. PVC Cleanouts:

1. Description: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.
2. Cast iron caps (tops) shall be required for all PVC sanitary cleanouts.

2.6 MANHOLES

A. Precast Concrete Manholes: In accordance with BCDPW Specifications and Standard Details.

1. Description: ASTM C478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: 48 inches minimum unless otherwise indicated.
3. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated; with top of cone of size that matches grade rings.
4. Grade Rings: Reinforced-concrete rings, with diameter matching manhole frame and cover, and with height as required to adjust manhole frame and cover to indicated elevation and slope.

B. Designed Precast Concrete Manholes:

1. Description: ASTM C913; designed according to ASTM C890 for A-16 (AASHTO HS20-44 in AASHTO HL), heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for sealant joints.
2. Joint Sealant: ASTM C990, bitumen or butyl rubber.
3. Grade Rings: Reinforced-concrete rings, with diameter matching manhole frame and cover, and with height as required to adjust manhole frame and cover to indicated elevation and slope.

C. Manhole Brick Channels and Benches: Field formed from brick (ASTM C32, Grade SS) and mortar in accordance with BCDPW Specifications and Standard Details. Include channels and benches in manholes as indicated.

1. Channels: In accordance with BCDPW Specifications and Standard Details. Form curved channels with smooth, uniform radius and slope.
2. Benches: Concrete, In accordance with BCDPW Specifications and Standard Details, sloped to drain into channel

D. Manhole Frames and Covers: In accordance with BCDPW Specifications and Standard Details.

2.7 BEDDING FOR PIPES AND MANHOLES

A. Bedding for pipes and manholes shall be #57 or #6 washed aggregate in accordance with BCDPW Specifications.

2.8 CONCRETE

A. General: In accordance with BCDPW Specifications and as indicated.

1. Cement: ASTM C150/C150M, Type II.
2. Fine Aggregate: ASTM C33/C33M, sand.
3. Coarse Aggregate: ASTM C33/C33M, crushed gravel.
4. Water: Potable.

B. Portland Cement Design Mix: Mix No. 6 (minimum 4500 psi) in accordance with BCDPW Specifications.

PART 3 - EXECUTION

3.1 GENERAL: In accordance with BCDPW Specifications, Standard Details, and the Baltimore County Plumbing Code as applicable.

3.2 EARTHWORK

A. Excavating, trenching, backfilling and compaction are specified in Section 312000 "Earth Moving."

3.3 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details to indicate general location and arrangement of underground sanitary sewer piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.

C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections.

D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process or microtunneling.

F. Install gravity-flow, nonpressure, drainage piping according to the following and in accordance with BCDPW Specifications and Standard Details:

1. Install piping pitched down in direction of flow, as indicated.

2. Install hub-and-spigot, cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook."
3. Install ductile-iron, gravity sewer piping according to ASTM A746.
4. Install PVC Type PSM sewer piping according to ASTM D2321 and ASTM F1668, and in accordance with the manufacturer's recommendations.

G. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

3.4 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure, drainage piping in accordance with BCDPW Specifications and the following:

1. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
2. Join PVC Type PSM sewer piping according to ASTM D2321 and ASTM D3034 for elastomeric-seal joints or ASTM D3034 for elastomeric-gasket joints, and the manufacturer's recommendations.
3. Join dissimilar pipe materials with nonpressure-type, flexible couplings.

B. Pipe couplings, expansion joints, and deflection fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

1. Use nonpressure flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.

a. Unshielded flexible couplings for pipes of same or slightly different OD.

3.5 MANHOLE INSTALLATION

A. General: Install manholes complete with appurtenances and accessories in accordance with BCDPW Specifications and Standard Details.

B. Install precast concrete manhole sections with sealants according to ASTM C891.

C. Form continuous concrete channels and benches between inlets and outlet.

D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops flush with finished surface elsewhere unless otherwise indicated.

3.6 CONCRETE PLACEMENT

A. Place cast-in-place concrete in accordance with BCDPW Specifications.

3.7 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade as indicated in accordance with BCDPW Specifications and Standard Details. Install piping so cleanouts open in direction of flow in sewer pipe.

1. Use Medium-Duty, top-loading classification cleanouts in paved foot-traffic areas.
2. Use Heavy-Duty, top-loading classification cleanouts in vehicle-traffic service areas.

B. Set cleanout frames and covers as indicated in accordance with BCDPW Specifications, Standard Details, and the Baltimore County Plumbing Code.

C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

3.8 CONNECTIONS

A. Connect nonpressure, gravity-flow drainage piping to building's sanitary building drains as indicated.

B. Make connections to existing piping and underground manholes in accordance with BCDPW Specifications and Standard Details.

1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye fitting plus 6-inch overlap with not less than 6 inches of concrete with 28-day minimum compressive strength of 3000 psi.
2. Make branch connections from side into manholes by cutting opening into existing unit large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of, and be flush with, inside wall unless otherwise indicated. On outside of pipe or manhole wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.

    a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.
    b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.

3. Protect existing piping and manholes to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

C. Connect to grease, oil, and sand interceptors as indicated and in accordance with BCDPW Specifications and Standard Details.

3.9 CLOSING ABANDONED SANITARY SEWER SYSTEMS

A. General: In accordance with BCDPW Specifications and Standard Details.

B. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:

1. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

C. Abandoned Manholes: Excavate around manhole as required and use either procedure below:

1. Remove manhole and close open ends of remaining piping as indicated.
2. Remove top of manhole down to at least 36 inches below final grade. Fill to within 12 inches of top with compacted #57 gravel. Fill to top with Mix No. 3 concrete.

D. Backfill to grade according to Section 312000 "Earth Moving."

3.10 IDENTIFICATION

A. Comply with requirements in Section 312000 "Earth Moving" for underground utility identification devices. Arrange for installation of green warning tapes directly over piping and at outside edges of underground manholes.

1. Use detectable warning tape over ferrous piping and nonferrous piping, and over edges of underground manholes.

3.11 FIELD QUALITY CONTROL

A. General: In accordance with BCDPW Specifications.

B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate report for each system inspection.
2. Repair or replace defective workmanship in accordance with BCDPW Specifications.
3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

C. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects in accordance with BCDPW Specifications.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems in accordance with BCDPW Specifications.
3. Schedule tests and inspections by Baltimore County, Department of Public Works with at least 24 hours' advance notice.
4. Submit separate report for each test.
5. Hydrostatic Tests: Test sanitary sewerage in accordance with BCDPW Specifications.
6. Air Tests: Test sanitary sewerage in accordance with BCDPW Specifications.
7. Manholes: Perform hydraulic test in accordance with BCDPW Specifications.

D. Leaks and loss in test pressure constitute defects that must be repaired.

E. Replace leaking piping using new materials, and repeat testing until leakage is within allowances in accordance with BCDPW Specifications.

3.12 CLEANING

A. Clean dirt and superfluous material from interior of piping in accordance with BCDPW Specifications. Flush with potable water.

END OF SECTION 333000

SECTION 334100

STORM DRAINAGE UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Pipe and fittings.
2. Nonpressure transition couplings.
3. Cleanouts.
4. Inlets and manholes.
5. Pipe outfalls and end sections.
6. Stormwater management (SWM) facilities.

1.3 DEFINITIONS

A. HDPE: High density polyethylene pipe.

B. PVC: Polyvinyl chloride pipe.

C. RCCP: Reinforced concrete culvert pipe.

1.4 QUALITY ASSURANCE

A. Baltimore County, Department of Public Works, Standard Specifications for Construction and Materials (BCDPW), latest edition, as amended to date.

1. References to “Measurement” and “Payment” do not apply to Section 334100.

B. Baltimore County, Department of Public Works, Standard Details for Construction 2007, as amended to date.

C. Baltimore County, Department of Public Works, Division of Construction Contracts Administration, Source of Supply, latest edition, as amended to date.

D. Comply with the Baltimore County Plumbing Code, as applicable and as amended to date.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1. Storm drain pipe, inlets and manholes.
2. SWM Facilities: Include control structure components, details, frames, grates and related components.

B. BCDPW Standard Details:

1. Include standard details for pre-cast concrete manholes, inlets, pipe outfalls, frames, grates, and covers.

1.6 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of pipe and fitting, from manufacturer.

1. Aggregate materials.
2. Concrete design-mix reports.

B. Field quality-control reports.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic components, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle manholes, inlets and pipe outfalls according to manufacturer's written rigging instructions.

1.8 PROJECT CONDITIONS

A. Interruption of Existing Storm Drain Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Owner’s Representative and Project Civil Engineer no fewer than five (5) days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without Owner Representative's written permission.

PART 2 - PRODUCTS

2.1 GENERAL

A. All products shall be in accordance with BCDPW Specifications and Standard Details as applicable.

2.2 HDPE PIPE AND FITTINGS

A. Corrugated HDPE Drainage Pipe and Fittings NPS 3 to NPS 10: AASHTO M 252M, Type S, with smooth interior waterway.

1. Silttight Couplings: PE sleeve with ASTM D1056, Type 2, Class A, Grade 2 gasket material that mates with tube and fittings.

B. Corrugated PE Pipe and Fittings NPS 12 to NPS 60: AASHTO M 294M, Type S, with smooth waterway for coupling joints.

1. Silttight Couplings: PE sleeve with ASTM D1056, Type 2, Class A, Grade 2 gasket material that mates with pipe and fittings

2.3 PVC PIPE AND FITTINGS

A. PVC Type PSM Drainage Piping:

1. Pipe: ASTM D3034, SDR 35 or as indicated, PVC Type PSM drainage pipe with bell-and-spigot ends for gasketed joints.
2. Fittings: ASTM D3034, PVC with bell ends.
3. Gaskets: ASTM F477, elastomeric seals.

2.4 NONPRESSURE TRANSITION COUPLINGS

A. Comply with ASTM C1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:

1. For Plastic Pipes: ASTM F477, elastomeric seal or ASTM D5926, PVC.
2. For Dissimilar Pipes: ASTM D5926, PVC or other material compatible with pipe materials being joined.

C. Unshielded, Flexible Couplings:

1. Description: Elastomeric sleeve with stainless-steel shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.

2.5 CLEANOUTS

A. Cast-Iron Cleanouts: As indicated on the Drawings.

1. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
2. Top-Loading Classification(s): Medium Duty or Heavy Duty, as indicated.
3. Storm Drain Pipe Fitting and Riser to Cleanout: ASTM A74, Service class, cast-iron soil pipe and fittings.

B. PVC Cleanouts:

1. Description: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as storm drainage piping.

2.6 BEDDING FOR PIPES AND MANHOLES

A. Bedding for pipes and manholes shall be #57 washed aggregate in accordance with BCDPW Specifications.

2.7 MANHOLES

A. Standard Precast Concrete Manholes: In accordance with BCDPW Specifications and Standard Details.

1. Description: ASTM C478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: 48 inches minimum unless otherwise indicated.
3. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated, and top of cone of size that matches grade rings.
4. Grade Rings: Reinforced-concrete rings, with diameter matching manhole frame and cover, and height as required to adjust manhole frame and cover to indicated elevation and slope.

B. Manhole Frames and Covers: In accordance with BCDPW Specifications and Standard Details.

2.8 CONCRETE

A. General: Cast-in-place concrete in accordance with BCDPW Specifications:

1. Cement: ASTM C150, Type II.
2. Fine Aggregate: ASTM C33, sand.
3. Coarse Aggregate: ASTM C33, crushed gravel.
4. Water: Potable.

B. Portland Cement Design Mix: Mix No. 3 (3500 psi minimum) in accordance with BCDPW Specifications.

C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.

1. Channels: In accordance with BCDPW Specifications and Standard Details. Form curved channels with smooth, uniform radius and slope.

2. Benches: Concrete, In accordance with BCDPW Specifications and Standard Details, sloped to drain into channel.

2.9 INLETS

A. Standard Precast Concrete Inlets: In accordance with BCDPW Specifications and Standard Details, as indicated on the Drawings.

1. Description: ASTM C478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Pipe Connectors: ASTM C923, resilient, of size required, for each pipe connecting to base section.
3. Frames and Grates: In accordance with BCDPW Specifications and Standard Details.

2.10 STORMWATER MANAGEMENT CONTROL STRUCTURES

A. As indicated on the approved SWM drawings.

2.11 PIPE OUTLETS AND END SECTIONS

A. In accordance with BCDPW Specifications and Standard Details.

B. End Sections: As indicated on the Drawings.

PART 3 - EXECUTION

3.1 GENERAL

A. Installation shall be in accordance with BCDPW Specifications, Standard Details, and the Baltimore County Plumbing Code as applicable, unless indicated otherwise on the Drawings.

3.2 EARTHWORK

A. Excavation, trenching, and backfilling are specified in Section 312000 "Earth Moving."

3.3 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections.

D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process or microtunneling.

F. Install gravity-flow, nonpressure drainage piping according to the following:

1. Install piping pitched down in direction of flow.
2. Install HDPE corrugated storm drain piping according to ASTM D2321 and the manufacturer’s recommendations.
3. Install PVC profile gravity storm drainage piping according to ASTM D2321 and ASTM F 1668 and the manufacturer’s recommendations.
4. Install reinforced-concrete culvert piping according to BCDPW Specifications.

3.4 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure drainage piping according to the following:

1. Join corrugated HDPE piping according to ASTM D3212 for push-on joints, and the manufacturer’s recommendations.
2. Join PVC storm drain piping according to ASTM D2321 and ASTM D3034 for elastomeric-seal joints or ASTM D3034 for elastomeric-gasketed joints, and the manufacturer’s recommendations.
3. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.
4. Join dissimilar pipe materials with nonpressure-type flexible couplings.

3.5 CLEANOUT INSTALLATION

A. General: Installation shall be in accordance with BCDPW Specifications, Standard Details, and the Baltimore County Plumbing Code as applicable.

B. Install cleanouts and riser extensions from storm drain pipes to cleanouts at grade. Use cast-iron soil pipe fittings or PVC pipe and fittings as indicated in storm drain pipes at branches for cleanouts and cast-iron soil pipe or PVC pipe as indicated for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in storm drain pipe.

1. Use Medium-Duty, top-loading classification cleanouts in paved foot-traffic areas.
2. Use Heavy-Duty, top-loading classification cleanouts in vehicle-traffic service areas.

C. Set cleanout frames and covers as indicated. Set with tops flush with earth grade in turf and plant bed areas.

D. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

3.6 MANHOLE INSTALLATION

A. General: Install manholes, complete with appurtenances and accessories indicated, and in accordance with BCDPW Specifications and Standard Details.

B. Install precast concrete manhole sections with sealants according to ASTM C891.

C. Set tops of frames and covers flush with finished surface of manholes that occur in pavements

3.7 INLET INSTALLATION

A. Construct catch basins to sizes and shapes indicated, and in accordance with BCDPW Specifications and Standard Details.

B. Set frames and grates to elevations indicated.

3.8 PIPE OUTLET AND END SECTION INSTALLATION

A. Install pipe outlets that spill onto grade, with flared end sections that match pipe, where indicated, and in accordance with manufacturer’s recommendations.

3.9 CONCRETE PLACEMENT

A. Place cast-in-place in accordance with BCDPW Specifications.

3.10 STORMWATER MANAGEMENT (SWM) CONTROL STRUCTURES AND DRAINAGE SYSTEM INSTALLATION

A. Install as indicated on the approved SWM Drawings.

3.11 CONNECTIONS

A. Make connections to existing piping and underground manholes.

1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
2. Make branch connections from side into existing piping as indicated, or to existing manholes and structures by cutting into existing unit and creating an opening large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall unless otherwise indicated. On outside of pipe, manhole, or structure wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.

    a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.
    b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.

3. Protect existing piping, manholes, and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

3.12 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

A. General: In accordance with BCDPW Specifications and Standard Details.

B. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:

1. Close open ends of piping with at least 8-inch thick, brick masonry bulkheads.
2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

C. Abandoned Manholes and Structures: Excavate around manholes and structures as required and use one procedure below:

1. Remove manhole or structure and close open ends of remaining piping.
2. Remove top of manhole or structure down to at least 36 inches below final grade. Fill to within 12 inches of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.

D. Backfill to grade according to Section 312000 "Earth Moving."

3.13 IDENTIFICATION

A. Materials and their installation are specified in Section 312000 "Earth Moving." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.

1. Use detectable warning tape over ferrous piping.
2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

3.14 FIELD QUALITY CONTROL

A. General: In accordance with BCDPW Specifications.

B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate reports for each system inspection.
2. Repair or replace defective workmanship in accordance with BCDPW Specifications.
3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

C. Inspect new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects in accordance with BCDPW Specifications.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Inspect completed piping systems in accordance with BCDPW Specifications.
3. Schedule inspections by authorities having jurisdiction with at least 24 hours advance notice.
4. Submit separate report for each inspection.

D. Leaks constitute defects that must be repaired.

E. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

3.15 CLEANING

A. Clean interior of piping of dirt and superfluous materials. Flush with water.

END OF SECTION 334100

SPECIAL PROVISIONS

Builder's Risk Insurance

A. The Contractor shall, at his/her own cost, insure the work and keep it insured at all times during the period of construction, and until final acceptance of it by the County against loss of damage covered by an "All Risk" Builders Risk type of policy. The amount of insurance shall be the 100% estimated replacement cost of the work.

B. The policies shall be made payable to the County and the Contractor, as their interest may appear, and the policies shall be left in the possession of the Engineer, prior to the start of construction.

S E C T I O N I I I

Permits

Baltimore County, Maryland
Department of Permits, Approvals, and Inspections
BUILDING PERMIT

Permit Number: CEN24-000161

Permit Type: Commercial Environmental

Sub Type: Grading

Date Issued: 05/05/2025

Expiration Date: 05/04/2027

Property Information

Property Address: 8601 HARFORD RD

City, State, Zip: PARKVILLE, MD, 21234

Tax ID: 1402058646

District: 14

Existing Use:

Proposed Use:

Is this property located in a Floodplain: NO

Sprinkler to be Installed?:

Plumbing Work?:

Electrical Work?:

Lot Size and Setbacks

Size:

Set Backs - Front Yard:

Set Backs - Rear Yard:

Set Backs - Right Side Yard:

Set Backs - Left Side Yard:

Owner Information

Owner: Baltimore County Property Management

Owner Address: 12200A Long Green Pike, Glen Arm, MD, 21057

Tenant:

Applicant: Rebekah Wolf

C. Pete Gutwald, AICP, Director

E. John Bryan, Building Engineer

***Please log into your account to get up-to-date information regarding the permit process and related inspections. Refer to the Permit Number when making inquires.**

Baltimore County, Maryland
Department of Permits, Approvals, and Inspections
BUILDING PERMIT

Permit Number: CEN24-000161

Permit Type: Commercial Environmental

Sub Type: Grading

Date Issued: 05/05/2025

Expiration Date: 05/04/2027

Building Permit Contractor

Name of Contractor: TBD

Phone Number:

Address:

City, State, Zip: , ,

Is Owner Contractor?:

Building Permit Information

Description of Work: Grade 16,010sf for proposed parking lot renovation, sports court renovation, and stormwater management. Permit expires two years from date of issue.
No construction to begin until pre-construction meeting. Failure to comply will result in penalties. Schedule your pre-construction meeting in your portal.

C. Pete Gutwald, AICP, Director

E. John Bryan, Building Engineer

***Please log into your account to get up-to-date information regarding the permit process and related inspections. Refer to the Permit Number when making inquires.**

Baltimore County, Maryland
Department of Permits, Approvals, and Inspections
BUILDING PERMIT

Permit Number: CEN24-000162

Permit Type: Commercial Environmental

Sub Type: Storm Water

Date Issued: 04/19/2025

Expiration Date: 04/18/2027

Property Information

Property Address: 8601 HARFORD RD

City, State, Zip: PARKVILLE, MD, 21234

Tax ID: 1402058646

District: 14

Existing Use:

Proposed Use:

Is this property located in a Floodplain: NO

Sprinkler to be Installed?:

Plumbing Work?:

Electrical Work?:

Lot Size and Setbacks

Size:

Set Backs - Front Yard:

Set Backs - Rear Yard:

Set Backs - Right Side Yard:

Set Backs - Left Side Yard:

Owner Information

Owner: Baltimore County Property Management

Owner Address: 12200A Long Green Pike, Glen Arm, MD, 21057

Tenant:

Applicant: Rebekah Wolf

C. Pete Gutwald, AICP, Director

E. John Bryan, Building Engineer

***Please log into your account to get up-to-date information regarding the permit process and related inspections. Refer to the Permit Number when making inquires.**

Baltimore County, Maryland
Department of Permits, Approvals, and Inspections
BUILDING PERMIT

Permit Number: CEN24-000162

Permit Type: Commercial Environmental

Sub Type: Storm Water

Date Issued: 04/19/2025

Expiration Date: 04/18/2027

Building Permit Contractor

Name of Contractor: TBD

Phone Number:

Address:

City, State, Zip: , ,

Is Owner Contractor?:

Building Permit Information

Description of Work: Storm Water Management for 0.55 acres drainage area. Permit expires two years from date of issue. NO CONSTRUCTION TO BEGIN UNTIL PRE-CONSTRUCTION MEETING. FAILURE TO COMPLY WILL RESULT IN PENALTIES. SCHEDULE YOUR PRE-CONSTRUCTION MEETING IN YOUR PORTAL.

C. Pete Gutwald, AICP, Director

E. John Bryan, Building Engineer

***Please log into your account to get up-to-date information regarding the permit process and related inspections. Refer to the Permit Number when making inquires.**

SECTION I V

Proposal

This Section to be Completed by Time of Bid

SECTION – IV
PROPOSAL

DESCRIPTION OF WORK

Bid Opening via Teleconference WebEx: Thursday, August 28, 2025 @ 10:30 a.m. EST.

WebEx Phone Number 1-415-655-0001, Access Code Number 2314 267 3522##.

Begin Work Within Fifteen (15) Days After NOTICE TO PROCEED

Calendar Days for Completion: Two Hundred Seventy (270)

Liquidated Damages: FIFTEEN HUNDRED DOLLARS ($1500.00 PER CALENDAR DAY)

Cost Group "D" ($1,000,001 to $2,500,000) (Prequalified contractors with a Cost Group restriction must bid within the dollar amount stated on their Certificate of Prequalification)

Work Classification: M2

TO BALTIMORE COUNTY, MARYLAND: Parking Lot Reconfiguration with parking and ADA accessible parking spaces, walkways, recreational facilities, site lighting, stormwater management, and site related improvements. **Parkville - District 14c6.**

The following listed Drawing Number(s) are collectively the "Drawings", and are hereby incorporated in the Contract.

Workday Number	Drawing Number(s)
107011880	2024-0401 thru 0431

A pre-bid meeting will be held on Wednesday, August 13, 2025 at 10:00 a.m. EST via WebEx. *Phone-In (Audio Only)* – 1-415-655-0001, Meeting Number 2314 863 3969##. *Video Conference* – Meeting Number 2314 863 3969 , **Password**: **AMbaXjMW623,** go to https://signin.webex.com/join,or for the WebEx link go to www.baltimorecountymd.gov/departments/public-works/engineering/contracts/current-solicitations

NOTE: No successful bidder may withdraw their bid within NINETY (90) days after the opening thereof.

The Contractor hereby declares that it has carefully examined the solicitation, plans and specifications, form of contract, Special Provisions and Drawings (collectively the "Contract Documents"). The Contractor also hereby declares that it has carefully examined the September 2023 "Standard Specifications for Construction and Materials" and "Standard Details for Contraction", collectively the "Applicable County Law" and any and all Department of Public Works and Transportation revisions thereto as of the date of advertisement. The Contract Documents, the Applicable County Law and the Department of Public Works and Transportation revisions thereto are collectively the "Specifications" and are incorporated herein. Copies of any and all Department of Public Works and Transportation revisions including but not limited to the General Conditions Building Projects, are available online at www.baltimorecountymd.gov/departments/public-works/standards. Also, the Contractor has, to its satisfaction, examined the locality of the proposed work and agrees to furnish all labor, tools, materials, machinery, equipment, and other means of construction called for in the manner provided in the Specifications for the prices shown on the next page(s) and as evidenced by Contractor's signature on the last page thereof.

SCHEDULE OF PRICES

NOTE: The Bidder shall fill out this Proposal, write in the unit prices in clear numerals, and make the extensions.

For complete information concerning these items, see Specifications and contract forms.

CONTRACT PROPOSAL

Parkville Senior Center Parking Lot Reconfiguration - 8601 Harford Road, Parkville, Maryland 21234
CONTRACT NUMBER: 25021 PO0
WORKDAY NUMBER: 107011880
JOB ORDER NUMBER: N/A
CALENDAR DAYS: 270

CONTRACTOR: _____
ADDRESS: _____
PHONE: _____

BID ITEM	COMM. CODE		DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	0	0000	PARKVILLE SENIOR CENTER PARKING LOT RECONFIGURATION	LS	1		$
TOTAL COST FOR CONTRACT							$

_____

TOTAL COST FOR CONTRACT IN WORDS

_____ _____

OFFICER SIGNATURE TITLE

UNIT PRICING SCHEDULE (Spec Section 012220):

Furnish the requested unit price(s), which will be used for Project, where applicable:

LINE NO.	COMMODITY/SERVICE DESCRIPTION	UNIT	UNIT RATE
1	Removal of Unsatisfactory Soil Material and Replacement with Satisfactory Soil Material	CY	$ _____
2	Soil Moisture Reduction – Provision and Incorporation of "Quicklime"	LBS	$ _____
3	MDSHA Graded Aggregate Base (GAB)	CY	$ _____
4	MDSHA #57 Washed Aggregate	CY	$ _____
5	MDSHA #2 Course Aggregate	CY	$ _____
6	Hot-Mix Asphalt Intermediate-Duty "Superpave" Paving and Aggregate Base Course	SY	$ _____
7	Hot-Mix Asphalt "Superpave" Overlay	SY	$ _____
8	Concrete Paving, Reinforcement and Aggregate Base Course	SF	$ _____
9	Planting Mix for Turf Establishment	CY	$ _____
10	Hydroseeding for Turf Establishment	SY	$ _____

PROPOSAL AFFIDAVIT

1. AUTHORIZED REPRESENTATIVE

I HEREBY AFFIRM THAT:

I am the [title]_____and the duly authorized representative of [business]_____(the "Business") and that I possess the legal authority to make this Affidavit on behalf of myself and the Business for which I am acting.

2. PROPOSAL CERTIFICATION

THE UNDERSIGNED HEREBY ACKNOWLEDGES receipt of the following Addenda (list by number and date):

_____

_____

Accompanying this Proposal is a Bid Bond in an amount of 5% of the bid, the exact amount to be determined by the difference between the low bid and the next lowest bid, if two or more bids are received, or 5% of the bid if one bid is received. This guarantees payment to Baltimore County of the amount thus determined as liquidated damages in case of default in any matter specified as required before award or in any matter resulting in failure to execute and deliver an Agreement, together with Payment and Performance Bonds, after award.

3. AFFIRMATION REGARDING BRIBERY CONVICTIONS

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, nor any of its officers, directors, partners, or any of its employees directly involved in obtaining or performing contracts with public bodies (as is defined in Section 16-101(f) of the State Finance and Procurement Article of the Annotated Code of Maryland), has been convicted of, or has had probation before judgment imposed pursuant to Section 6-225 of the Criminal Procedure Article of the Annotated Code of Maryland, or has pleaded nolo contendere to a charge of, bribery, attempted bribery, or conspiracy to bribe in violation of Maryland law, or of the law of any other state or federal law, except as follows [indicate the reasons why the affirmation cannot be given and list any conviction, plea, or imposition of probation before judgment with the date, court, official or administrative body, the sentence or disposition, the name(s) of person(s) involved, and their current positions and responsibilities with the Business]:

_____

_____

4. AFFIRMATION REGARDING OTHER CONVICTIONS

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, nor any of its officers, directors, partners, or any of its employees directly involved in obtaining or performing contracts with public bodies, has:

(1) Been convicted under state or federal statute of a criminal offense incident to obtaining, attempting to obtain, or performing a public or private contract, fraud, embezzlement, theft, forgery, falsification or destruction of records, or receiving stolen property;

(2) Been convicted of any criminal violation of a state or federal antitrust statute;

(3) Been convicted under the provisions of Title 18 of the United States Code for violation of the Racketeer Influenced and Corrupt Organization Act, 18 U.S.C. §1961, et seq., or the Mail Fraud Act, 18 U.S.C. §1341, et seq., for acts arising out of the submission of bids or proposals for a public or private contract;

(4) Been convicted of a violation of the State Minority Business Enterprise Law, Section 14-308 of the State Finance and Procurement Article of the Annotated Code of Maryland;

(5) Been convicted of conspiracy to commit any act or omission that would constitute grounds for conviction or liability under any law or statute described in subsection (1), (2), (3), or (4) above;

(6) Been found civilly liable under a state or federal antitrust statute for acts or omissions in connection with the submission of bids or proposals for a public or private contract;

(7) Admitted in writing or under oath, during the course of an official investigation or other proceedings, acts or omissions that would constitute grounds for conviction or liability under any law or statute described above, except as follows [indicate reasons why the affirmations cannot be given, and list any conviction, plea, or imposition of probation before judgment with the date, court, official or administrative body, the sentence or disposition, the name(s) of the person(s) involved and their current positions and responsibilities with the Business, and the status of any debarment]:

_____

_____

5. AFFIRMATION REGARDING DEBARMENT

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, nor any of its officers, directors, partners, or any of its employees directly involved in obtaining or performing contracts with public bodies, has ever been suspended or debarred (including being issued a limited denial of participation) by any public entity, except as follows [list each debarment or suspension providing the dates of the suspension or debarment, the name of the public entity and the status of the proceeding, the name(s) of the person(s) involved and their current positions and responsibilities with the Business, the grounds of the debarment or suspension, and the details of each person's involvement in any activity that formed the grounds of the debarment or suspension]:

_____

_____

6. AFFIRMATION REGARDING DEBARMENT OF RELATED ENTITIES

I FURTHER AFFIRM THAT:

(1) The Business was not established and it does not operate in a manner designed to evade the application of or defeat the purpose of debarment pursuant to Sections 16-101, et seq., of the State Finance and Procurement Article of the Annotated Code of Maryland; and

(2) The Business is not a successor, assignee, subsidiary, or affiliate of a suspended or debarred business, except as follows: [you must indicate the reasons why the affirmations cannot be given without qualification]:

_____

_____

7. SUB-CONTRACT AFFIRMATION

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, has knowingly entered into a contract with a public body under which a person debarred or suspended under Title 16 of the State Finance and Procurement Article of the Annotated Code of Maryland will provide, directly or indirectly, supplies, services, architectural services, construction related services, leases of real property, or construction.

8. AFFIRMATION REGARDING COLLUSION

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, nor any of its officers, directors, members or partners, nor any of its employees, have in any way:

(1) Agreed, conspired, connived, or colluded to produce a deceptive show of competition in the compilation of the accompanying bid or offer that is being submitted;

(2) In any manner, directly or indirectly, entered into any agreement of any kind to fix the bid price or price proposal of the bidder or offeror or of any competitor, or otherwise take any action in restraint of free competitive bidding in connection with the contract for which the accompanying bid or offer is submitted;

(3) Colluded with anyone to obtain information concerning the bid that would give the Business an unfair advantage over others.

9. POLITICAL CONTRIBUTION DISCLOSURE AFFIRMATION

I FURTHER AFFIRM THAT:

The Business affirms that it is aware of, and will comply with, the provisions of Sections 14- 101 through 14-108 of the Election Law Article of the Annotated Code of Maryland, which require that every person who makes, during any 12-month period, one or more contracts, with one or more Maryland governmental entities involving cumulative consideration, or at least $200,000.00, shall file with the State Board of Elections certain specified information to include disclosure of attributable political contributions in excess of $500 during defined reporting periods.

l0. CERTIFICATION OF CORPORATION REGISTRATION AND TAX PAYMENT

I FURTHER AFFIRM THAT:

(1) The Business is a _____ *(State)* (Corporation), (LLC), (Partnership), (Sole Proprietor/Individual), (Other:_____), that it **is** registered in accordance with the Corporations and Associations Article of the Annotated Code of Maryland, that it **is** in good standing in the State of Maryland, and that it **has** filed all of its annual reports, together with filing fees, with the Maryland State Department of Assessments and Taxation, and that the name and address of its resident agent filed with the State Department of Assessments and Taxation is:

Name: _____

Address: _____

_____

(If none, so state)

(2) Except as validly contested, the Business has paid, or has arranged for payment of, all taxes due the State of Maryland and Baltimore County, and has filed all required returns and reports with the Comptroller of the Treasury, the State Department of Assessments and Taxation, and the Employment Security Administration, as applicable, and will have paid all withholding taxes due the State of Maryland prior to final settlement.

11. CONTINGENT FEES

I FURTHER AFFIRM THAT:

The Business has not employed or retained any person, partnership, corporation, or other entity, other than a bona fide employee or agent working for the Business, to solicit or secure the Contract, and that the Business has not paid or agreed to pay any person, partnership, corporation, or other entity, other than a bona fide employee or agent, any fee or other consideration contingent on the making of the Contract.

12. NONDISCRIMINATION IN EMPLOYMENT STATEMENT

I FURTHER AFFIRM THAT:

During the performance of any contract awarded of which this affidavit is a part:

(1) The Business will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, national origin, marital status, sexual orientation, genetic information, or disability unrelated in nature and extent so as to reasonably preclude the performance of the employment, or because of the individual's refusal to submit to a genetic test or make available the results of a genetic test. The Business will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, age, national origin, marital status, sexual orientation, genetic information, or disability unrelated in nature and extent so as to reasonably preclude the performance of the employment, or because of the individual's refusal to submit to a genetic test or make available the results of a genetic test. Such action shall include, but not be limited to the following: employment, promotion, upgrading, demotion or transfer, rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Business agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the owner setting forth provisions of this nondiscrimination clause.

(2) The Business will, in all solicitations or advertisements for employees placed by or on behalf of the Business, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, national origin, marital status, sexual orientation, genetic information, or disability unrelated in nature and extent so as to reasonably preclude the performance of the employment, or because of the individual's refusal to submit to a genetic test or make available the results of a genetic test.

(3) The Business shall send to each labor union or representative of workers with which the Business has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the owner, advising the said labor union or workers' representative of these commitments, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Business shall furnish, if requested by the County, a compliance report concerning our employment practices and policies in order for the County to ascertain compliance with the special provisions of this affidavit concerning nondiscrimination in employment.

(5) In the event of the Business's noncompliance with the nondiscrimination clause of this affidavit, the contract may be canceled, terminated, or suspended in whole or in part, and the Business may be declared ineligible for further County work.

(6) The Business shall include the special provisions outlined herein pertaining to nondiscrimination in employment in every subcontract, so that such nondiscrimination in employment provisions shall be binding on each subcontractor or vendor.

13. FOREIGN CONTRACTS

I FURTHER AFFIRM THAT:

The Business affirms that it is aware of, and will comply with, the provisions of Sections 10-2-110 Article 10. Finance, Title 2 – Purchasing, Baltimore County Code 2003, which requires that prior to the award of a contract for services under the provisions of this title, and during the entire term of a contract award, the bidder or vendor shall disclose to the County whether any services covered by the bid or contract, including any subcontracted services, will be performed outside the United States. The disclosure shall be made to the Office of Budget and Finance, Purchasing Bureau.

14. MINORITY BUSINESS ENTERPRISE AND FEMALE CONTRACTORS

THIS BUSINESS INTENDS to affirmatively seek out and consider minority business enterprises to participate in this contract as subcontractors and/or suppliers of materials and services.

THE UNDERSIGNED UNDERSTANDS AND AGREES: that any and all subcontracting of supplies and services in connection with this contract, whether undertaken before or after award of contract, will be in accordance with the Minority Business Enterprise and Female Contractor requirement included in the Bid Proposal package and incorporated herein as if fully set forth; and

THE UNDERSIGNED ALSO UNDERSTANDS AND AGREES that no subcontracting will be approved until Baltimore County has reviewed and approved the affirmative actions taken by this firm.

15. REQUIREMENTS FOR EXECUTING AFFIDAVIT & PROPOSAL

The Affidavit must be signed in ink in order for the bid to be accepted and that the Proposal must be typewritten or filled out in ink.

THE UNDERSIGNED ALSO UNDERSTANDS that:

Proposals submitted by an INDIVIDUAL must be signed by an individual.

Proposals submitted by a PARTNERSHIP must be signed by the partner who is legally authorized authority to bind the partnership. Attach a copy of the Partnership Agreement and a duly certified resolution evidencing the authority of the partner so signing on behalf of the partnership.

Proposals submitted by a CORPORATION must be signed by a legally authorized officer of the corporation and attested to by the Corporate Secretary. Attach a copy of the Articles of Incorporation, By-Laws and a duly certified Board Resolution evidencing the authority of the officer so signing on behalf of the corporation.

Proposals submitted by a LIMITED LIABILITY COMPANY must be signed by a legally authorized member of the company and attested to. Attach a copy of the Operating Agreement, Articles of Organization and a duly certified resolution evidencing the authority of the member so signing on behalf of the limited liability company.

NOTE: The contractor may file with the County a list of the names of those officers, partners or members, as applicable, having legal authority to execute documents on behalf of and legally bind the contractor, duly certified, as applicable and legally required, together with the aforesaid corporate documents, which shall remain in full force and effect until such time as the County Department of Public Works and Transportation, Construction Contract Administration is advised in writing to the contrary.

16. ACKNOWLEDGMENT

I ACKNOWLEDGE THAT this Affidavit is to be furnished to the County and may be distributed to units of (1) Baltimore County; (2) the State of Maryland; (3) other counties or political subdivisions of the State of Maryland; (4) other states; and (5) the federal government. I further acknowledge that this Affidavit is subject to applicable laws of the United States and the State of Maryland, both criminal and civil, and that nothing in this Affidavit or any contract resulting from the submission of this bid or proposal shall be construed to supersede, amend, modify or waive, on behalf of Baltimore County, or the State of Maryland or any unit of the State of Maryland having jurisdiction, the exercise of any statutory right or remedy conferred by the Constitution and the laws of Maryland with respect to any misrepresentation made or any violation of the obligations, terms and covenants undertaken by the Business with respect to (a) this Affidavit, (b) the contract, and (3) other Affidavits comprising part of the contract.

I DO SOLEMNLY DECLARE AND AFFIRM UNDER THE PENALTIES OF PERJURY THAT THE CONTENTS OF THIS AFFIDAVIT ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF.

WITNESS/ATTEST:

_____ By: _____

Name: _____

Date: _____ Title: _____

(Authorized Representative and Affiant)

BID BOND

Principal | **Business Address of Principal**

Surety

Obligee: **BALTIMORE COUNTY, MARYLAND**
A body corporate and politic

A Corporation of the State of _____ and authorized to do business in Maryland

Five Percent of Bid Amount **$** **5% of Bid**
Penal Sum of Bond [shall be determined pursuant to latest revised Specification / G.P. 2.07 (2000 Ed.)]

Parkville Senior Center Parking Lot Reconfiguration
Contract Name

25021 PO0
Contract Number/Proposal Item Number

KNOW ALL MEN BY THESE PRESENTS, that we, the Principal, above named, and Surety, above named, and authorized to do business in the State of Maryland, are held and firmly bound unto the Obligee, above named, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that if the aforesaid Principal is the apparent low bidder and complies with all specified matters required before award or if the aforesaid Principal is awarded the contract, the said Principal will, within the time required, execute and deliver to the Obligee a formal contract and good and sufficient payment and performance bonds in the form provided by the Obligee, then, this obligation to be void; otherwise the Principal and Surety will, upon demand, pay unto the Obligee the entire Penal Sum of this Bid Bond as liquidated damages.

THE SURETY FURTHER GUARANTEES No Proposal will be considered unless accompanied by a guaranty of the amount specified in the Proposal in the form of either a certified check, bank cashier's check or a Bid Bond on the form provided therein or an exact facsimile thereof. The Bid Bond must be executed by a Surety that is, as of the date of the Bid: (a) licensed in the State of Maryland, (b) rated "B" or better by the A.M. Best Company, (c) on federal funded projects, authorized by the underwriting limitation contained in the U.S. Department of the Treasury Circular 570, as amended, to guaranty the amount of the Bid, and (d) in good standing as determined by the County's Engineer. The Bid Bond must guaranty payment to the County of liquidated damages as follows: (a) if only one Bid is received, the guaranteed payment shall be five (5%) percent of the Bidder's Bid amount, (b) if two or more Bids are received, the guaranteed payment shall be the difference between the Bidder's Bid amount and the next lowest Bid amount, subject to the limitation that the guaranteed payment not be greater than five (5%) percent of the Bidder's Bid amount. This Bid Bond is required in case the successful Bidder, after issuance of notice of Award, fails to comply, timely and completely, with each of the requirements set forth under Section GP-3.04.

Signed and sealed _____
Date

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

In Presence of: **Individual Principal**

Witness: _____ **as to:** _____ **(SEAL)**

Print Name: _____ **Print Name:** _____

Corporate Principal

In Presence of:

_____
(Name of Corporation)

Witness: _____ **By:** _____

Print Name: _____ **Print Name:** _____ **(SEAL)**

Title: _____

Surety

_____
(Name of Surety)

Business Address: _____

Witness: _____ **By:** _____ Affix

Print Name: _____ **Print Name:** _____ Corporate

Title: _____ Seal

Revised
February 4, 2015

BALTIMORE COUNTY
PREVAILING WAGE AND LOCAL HIRING

AFFIDAVIT

(Project Name) _____
Proposal No.: _____
Project No.: _____

On behalf of_____, I do solemnly declare and affirm,
(Contractor)
under penalty of perjury, that to the best of my knowledge, information, and belief:

1. I have submitted all documentation in accordance with Baltimore County Code § 10-2- 506 and § 10-2-507 regarding the prevailing wage and local hiring laws and requirements of the prevailing wage guidelines located at (Prevailing Wage and Local Hire Laws), and acknowledge that I have read and agree to all provisions of said law, as amended, and have a continuing obligation to be compliant with the law and any changes to the law.

2. I shall not knowingly provide any false information relating to payroll documentation and/or hiring of local employees for capital improvement contracts that are subject to the prevailing wage and/or local hiring laws of Baltimore County. I further attest and certify that all documentation relating to the same will be accurate and complete and will remain accurate and complete on an ongoing basis, and will reflect the payroll and/or local hiring status of contractors, subcontractors, apprentices, and independent contractors performing work for the Contract (contract number_____). I acknowledge that I have been informed and am aware of the foregoing requirements and that I am authorized to make this certification on behalf of myself and all subcontractors and parties performing work pursuant to this Contract.

3. I certify and attest that I am an officer or agent of the Contractor or subcontractor who supervises the payment of employees. I understand and agree that all documentation related to prevailing wages and/or local hiring required by law shall be submitted to Baltimore County's Prevailing Wage Administrator or designee before any surety is released or final payment due under the terms of the Contract is made.

4. I further certify and attest that I will have personal knowledge of the wages paid to all employees of_____for work performed on the Contract and of all of the hours worked, and that I am an authorized agent of the Contractor and assume responsibility for my actions.

5. I further certify and attest that_____will comply with prevailing wage rates set by the State of Maryland as the same apply to the Contract and are a part of the bid documents and Contract, and that_____will comply with applicable local hiring requirements.

6. I attest and certify that, if the Contract is subject to the local hiring requirement under §10-2-507 of the Baltimore County Code, _____ will make best efforts to ensure that residents of Baltimore County constitute at least 51% of the new hires made for the Contract, subject to all exceptions allowable by law.

7. I certify and attest that, if the Contract is subject to prevailing wage requirements, no rebates or deductions will be made, directly or indirectly, from any wages paid in connection with the Contract, other than those provided for by law.

8. I certify and attest that, if awarded the Contract and if the Contract is subject to prevailing wage law, I will submit certified payroll to the County through its electronic compliance system or as instructed by the Prevailing Wage and Local Hire Unit.

9. I certify that if awarded the Contract, I will provide a list of subcontractors who will participate as a beneficiary of this project to the agency and the Prevailing Wage and Local Hire Unit at PrevailingWage@baltimorecountymd.gov.

10. I understand that no funds will be dispersed by the County until an Employment Analysis has been issued to the Prevailing Wage and Local Hire Unit in compliance with the local hire law. The Employment Analysis will include how many jobs will be required to complete the project; how many current employees are available to complete the project, and how many of those jobs will require new hires.

_____
Contractor/Bidder/Offeror

_____
By

_____
Printed Name

_____
Printed Title

_____
Date

_____
Phone

_____
License Number

_____
Business Email

BALTIMORE COUNTY, MARYLAND

Prevailing Wage and Local Hiring Contract Requirements and Policies

The Contractor and all Subcontractors must comply with the Prevailing Wage and Local Hiring Laws, contained in Baltimore County Code § 10-2-506 and § 10-2-507, respectively, as amended. Prevailing wage means the wage rate paid by employers that is determined by a governmental authority, based upon a particular geographic area, for a given class of labor and type of project. The County will use the prevailing wage established by the State of Maryland (the "State") Department of Labor for state funded construction contracts in the County at the time of award. These rates include the basic hourly rate and fringe benefits. Apprentices must be paid at least the rate that the State's Apprenticeship and Training Council sets for an apprentice in the trade involved, based on a percentage of the prevailing wage rate in that trade. Any Contractor that is subject to the prevailing wage or local hiring law will be required to agree to the below provisions:

For the purposes of these requirements, an employee means an apprentice, laborer or mechanic employed by a contractor or subcontractor on a capital improvement project with a value of over $300,000 or a County-subsidized capital project with a value over $5,000,000.

Capital Improvement Project does not include blanket order or open-end agreements, capital improvement projects subject to a federal or state prevailing wage law, awarded without competition; with another governmental entity; to the extent the contractor is precluded from compliance by the terms of any federal or state law, contract or grant; entered into pursuant to Baltimore County Code § 10-2-310(e); entered into as a joint or cooperative purchase; or entered into as an emergency purchase.

The purpose of a prevailing wage is to ensure that contractors institute local hiring practices for Capital Improvement contracts and Capital Projects under certain circumstances as required by law, and that the Contractor's employees who work on capital improvement contracts are paid the going rate for their services. The prevailing wage rates are established by the State of Maryland Department of Labor and apply to all of the Contractor's employees and any and all Subcontractors. The Contractor and all Subcontractors must comply with all of the requirements of the Prevailing Wage Law including, but not limited to, the following:

1. Pay employees the prescribed rate as annually established by the State's Department of Labor; the prevailing wage rates in effect on the date a solicitation is issued and will apply throughout the term of a contract resulting from that solicitation. Contractor or subcontractors may NOT split or subdivide a capital improvement contract, pay an employee through a third party, treat an employee as a subcontractor or independent contractor to avoid any requirement of the County's prevailing wage law; or employ an individual classified as a helper or trainee to perform direct and measurable work on a capital improvement contract.

2. Pay employees at a rate equal to or more than the prevailing wage rate currently in effect for the type of work performed.

3. Pay employees overtime for work (I) more than eight hours in any single calendar day; (II) more than 40 hours in a work week; or (III) on a Sunday or a legal holiday.

4. Classify employees in their proper work classification in conformance with the schedule established by the State's Department of Labor.

5. May only make fair and reasonable deductions that are (a) required by law; (b) authorized in a written agreement between an employee and contractor or subcontractor signed at the beginning of employment (any deductions taken from employee paychecks including healthcare, pension, 401K, IRA, etc., child/spouse support, or tax levies); and submitted by the contractor or subcontractor to the Director of the County's Prevailing Wage Program; or required or allowed by a collective bargaining agreement between a bona fide labor organization and a contractor or subcontractor.

> Electronically submit a certified copy of payroll records through the County's designated certified payroll and compliance system within 14 days after the end of payroll week ending date, to verify that Prevailing Wage rates have been paid to employees.

6. Backup documentation may be required upon demand from the County to be submitted for all 3rd party benefits being claimed, to include, but not limited to: *one month's healthcare transmittal showing employee name and amount company pays on their behalf, company vacation/sick policy, etc. or if Union, a Union transmittal for one month in which work has been performed*.

7. Retain records for a period of five (5) years after the work is completed and permit the Director of the County Prevailing Wage Program, or his/her designee, to inspect the payroll records at a reasonable time and as often as necessary.

8. Payroll records shall contain a statement signed by the contractor or subcontractor (including tiered subcontractors) certifying that the payroll records are complete and correct; the wage rates are not less than required by the Prevailing Wage Law; and the rate of pay and classification for each employee accurately reflects the work the employee performed.

9. All payroll records shall include the name, address, telephone number and email address of the contractor or subcontractor; the name and location of the job; and each employee's name, current address, unless previously reported; specific work classification; daily basic time and overtime hours; total basic time and overtime hours for the payroll period; rate of pay; fringe benefits by type and amount; and gross wages, and any deductions taken from employees' paychecks including, but not limited to, healthcare, pension/401K/IRA. Late submission of copies of any payroll records may be deemed deficient by the County until the required records are provided, and the County may postpone processing payments due under the Contract or under an agreement to finance the Contract.

10. Submit to random or regular audits and investigation of any complaint of a violation of the County's Prevailing Wage and Local Hiring Laws and requirements.

11. Make best efforts to fill at least 51% of new jobs required to complete the capital improvement contract or capital project with Baltimore County residents.

12. Submit monthly reports to the Director of the County's Prevailing Wage Unit relating to local hiring with respect to capital improvement contracts over $300,00 or County-subsidized capital construction projects receiving assistance over $5,000,000, that includes (a) the number of new hires needed for the contract or project, (b) the number of County residents hired during the reporting period, (c) the total number of all employees hired during the contract period, (d) best efforts made to fill open positions with County residents, and(e) 5) for new hires: name, last four (4) digits of the social security number, job title, hire date, address and referral source.

13. Agree that any and all disputes will be handled as set forth in the County's Prevailing Wage and Local Hire as a condition of award.

14. In the event the County determines that a provision of the Prevailing Wage and/or Local Hire Law has been violated, the County shall issue a written decision, including appropriate sanctions, and may withhold payment due the Contractor in an amount sufficient to pay each employee of the Contractor or any subcontractors the full amount of wages due under the Prevailing Wage Law, and an amount sufficient to satisfy a liability of the Contractor for liquidated damages as provided under the Prevailing Wage Law, pending a final decision on the violation by the County. The Contractor may appeal a written decision of the Director of the County's Prevailing Wage Unit that the Contractor violated a provision of the Prevailing Wage and/or Local Hire Law, to the Office of Administrative Hearings ("OAH"), within ten (10) working days after receiving a copy of the decision. OAH will conduct a hearing upon the receipt of a timely appeal. If no appeal, the decision of the Director of the County's Prevailing Wage Unit or his/her designee becomes final. A Contractor who is found to have violated the provisions of the Prevailing Wage or Local Hiring Laws intentionally, may not be awarded a County contract or work on any County project for a period of one year from the date of the OAH determination.

15. May not discharge, or otherwise retaliate against, an employee for asserting any right under the Prevailing Wage Law or for filing a complaint of a violation;

16. An aggrieved employee is a third-party beneficiary of the Contract and may by civil action recover the difference between the prevailing wage for the type of work performed and the amount actually received, with interest and a reasonable attorney's fee.

17. Each Contract subject to the Prevailing Wage and Local Hire Laws may specify the payment of liquidated damages to the County by the Contractor for any noncompliance with the Prevailing Wage and Local Law. Liquidated damages are:

a. $10 for each calendar day that the payroll records are late (payrolls are to be submitted no later than 14 days after the week ending date shown on Certified Payroll Record CPR); $20 for each day that an employee is misclassified and/or paid less than the prevailing

wage rate; and a civil penalty of $50 per violation of the requirement to post the prevailing wage rates at the work site.

b. $50 per month for each month the Local Hire report is not submitted by the last day of the existing month due.

These liquidated damages are solely related to prevailing wage and local hiring compliance and do not negate any other remedies available or set forth in the Contract, including delay damages or actual damages. These remedies are separate from, in addition to, and not in lieu of, any remedies available and set forth in the Contract, or at law, for other breaches or defaults under the Contract.

18. Where the initial Contract Sum is $300,000 or below, but it is subsequently increased and exceeds $300,000 due to an approved Contract Modification, the amount of any such Contract Modification that causes the Contract Sum to exceed $300,000 is subject to the Prevailing Wage and Local Hiring Laws.

19. The Contractor and all subcontractors must post a clearly legible statement of each prevailing wage rate in a prominent and easily accessible place at the Work Site during the entire time Work is being performed, in English and any other language that is primarily spoken by the employees, at the Work Site.

20. A contract may include the actual cost of health and dental insurance, pension or retirement plan, paid time off such as vacation or sick daysand life insurance. In calculating the cost per hour, divide the annual cost of benefits by 2,080 hours for each employee. Other benefits such as the use of a company vehicle, cell phones, lodging reimbursement, company owned tools **may not be credited towards the fringe benefit amount**.

21. All apprentices must be registered with the Maryland Apprenticeship and Training Council, V.A., or US DOL as well as be currently enrolled in, and attending appropriate classes, to which is considered “actively enrolled”. Only actively enrolled apprentices may be employed on the project at the apprentice prevailing wage rate.

CONTRACT NUMBER: 25021 PO0

BALTIMORE COUNTY PREVAILING WAGE RATES
BUILDING CONSTRUCTION

Print Date 7/23/2025

Classification	Modification Reason	Basic Hourly Rate	Borrowed From	Fringe Benefit Payment
BALANCING TECHNICIAN	AD	$47.92		$24.44
BRICKLAYER	AD	$37.50		$14.78
CARPENTER	AD	$34.41		$14.49
CARPENTER - SHORING SCAFFOLD BUILDER	AD	$34.41		$14.49
CARPET LAYER	AD	$34.12		$14.86
CEMENT MASON	AD	$25.00	510	$1.94
COMMUNICATION INSTALLER TECHNICIAN	AD	$36.37		$12.89
DRYWALL - SPACKLING, TAPING, & FINISHING	AD	$34.41		$14.49
ELECTRICIAN	AD	$47.13		$21.94
ELEVATOR MECHANIC	AD	$56.36		$45.50
FIRESTOPPER	AD	$29.81		$10.08
GLAZIER	AD	$35.60		$14.41
INSULATION WORKER	AD	$40.02		$19.92
IRONWORKER - FENCE ERECTOR	AD	$40.02		$19.92
IRONWORKER - ORNAMENTAL	AD	$31.17	510	$24.38
IRONWORKER - REINFORCING	AD	$29.20	510	$23.57
IRONWORKER - STRUCTURAL	AD	$33.12		$25.63
LABORER - AIR TOOL OPERATOR	AD	$24.46		$9.69
LABORER - ASPHALT PAVER	AD	$24.46		$9.69
LABORER - ASPHALT RAKER	AD	$22.63		$4.88
LABORER - BLASTER - DYNAMITE	AD	$24.46		$9.69
LABORER - BURNER	AD	$24.46		$9.69
LABORER - COMMON	AD	$22.63		$4.88
LABORER - CONCRETE PUDDLER	AD	$22.63		$4.88
LABORER - CONCRETE SURFACER	AD	$24.46		$9.69
LABORER - CONCRETE TENDER	AD	$22.63		$4.88
LABORER - CONCRETE VIBRATOR	AD	$22.63		$4.88
LABORER - DENSITY GAUGE	AD	$22.63		$4.88
LABORER - FIREPROOFER - MIXER	AD	$22.63		$4.88
LABORER - FLAGGER	AD	$22.63		$4.88
LABORER - GRADE CHECKER	AD	$22.63		$4.88
LABORER - HAND ROLLER	AD	$22.63		$4.88
LABORER - HAZARDOUS MATERIAL HANDLER	AD	$24.46		$9.69
LABORER - JACKHAMMER	AD	$22.63		$4.88
LABORER - LANDSCAPING	AD	$22.63		$4.88
LABORER - LAYOUT	AD	$22.63		$4.88
LABORER - LUTEMAN	AD	$22.63		$4.88
LABORER - MASON TENDER	AD	$24.46		$9.69
LABORER - MORTAR MIXER	AD	$22.63		$4.88
LABORER - PIPELAYER	AD	$24.46		$9.69
LABORER - PLASTERER - HANDLER	AD	$22.63		$4.88
LABORER - SCAFFOLD BUILDER	AD	$24.46		$9.69
LABORER - TAMPER	AD	$22.63		$4.88
MECHANICAL SYSTEMS SERVICE TECH - ELECTRICAL SYSTEMS	AD	$46.21	510	$24.90

MECHANICAL SYSTEMS SERVICE TECH-HVAC SYSTEMS	AD	$46.21		$24.90
MECHANICAL SYSTEMS SERVICE TECH-PLUMBING SYSTEMS	AD	$46.21		$24.90
MECHANICAL SYSTEMS SERVICE TECH - REFRIGERATION SYSTEMS	AD	$52.27	003	$24.58
MILLWRIGHT	AD	$38.61		$17.21
PAINTER	AD	$28.55		$11.87
PAINTER-INDUSTRIAL	AD	$35.55		$15.28
PILEDRIVER	AD	$36.60		$16.78
PLUMBER	AD	$46.21		$24.90
POWER EQUIPMENT OPERATOR - BACKHOE	AD	$33.00	510	$13.55
POWER EQUIPMENT OPERATOR - BROOM / SWEEPER	AD	$32.23	510	$14.62
POWER EQUIPMENT OPERATOR - BULLDOZER	AD	$34.18		$14.62
POWER EQUIPMENT OPERATOR - CONCRETE PUMP	AD	$44.35		$0.00
POWER EQUIPMENT OPERATOR - CRANE	AD	$41.00		$18.10
POWER EQUIPMENT OPERATOR - CRANE - TOWER	AD	$41.00		$18.10
POWER EQUIPMENT OPERATOR - DRILL - RIG	AD	$33.16		$14.15
POWER EQUIPMENT OPERATOR - EXCAVATOR	AD	$34.18		$14.62
POWER EQUIPMENT OPERATOR - FORKLIFT	AD	$34.18		$14.62
POWER EQUIPMENT OPERATOR - GRADALL	AD	$34.00	510	$13.55
POWER EQUIPMENT OPERATOR - GRADER	AD	$34.18		$14.62
POWER EQUIPMENT OPERATOR - GUARD RAIL POST DRIVER	AD	$23.50		$5.07
POWER EQUIPMENT OPERATOR - LOADER	AD	$34.18		$14.62
POWER EQUIPMENT OPERATOR - MECHANIC	AD	$36.24		$14.62
POWER EQUIPMENT OPERATOR - MILLING MACHINE	AD	$30.58	510	$13.55
POWER EQUIPMENT OPERATOR - PAVER	AD	$32.10	510	$13.55
POWER EQUIPMENT OPERATOR - ROLLER - ASPHALT	AD	$32.10	510	$13.55
POWER EQUIPMENT OPERATOR - ROLLER - EARTH	AD	$28.60		$14.62
POWER EQUIPMENT OPERATOR - SCREED	AD	$30.00	510	$11.80
POWER EQUIPMENT OPERATOR - SKID STEER (BOBCAT)	AD	$32.23		$14.62
POWER EQUIPMENT OPERATOR-VACUUM TRUCK	AD	$37.50		$14.85
RESILIENT FLOOR	AD	$34.12		$14.86
SHEETMETAL WORKER (INCLUDING METAL ROOFING)	AD	$47.92		$24.44
SPRINKLERFITTER	AD	$42.32	510	$26.05
SPRINKLERFITTER/PIPEFITTER	AD	$46.21		$24.90
STONE MASON	AD	$44.30	510	$21.22
TILE & TERRAZZO FINISHER	AD	$28.09		$12.59
TILE & TERRAZZO MECHANIC	AD	$33.41		$14.24
TRUCK DRIVER - DUMP	AD	$17.64	510	$1.92
TRUCK DRIVER - FLATBED	AD	$20.94		$7.63
TRUCK DRIVER - LOWBOY	AD	$29.68	510	$10.51
TRUCK DRIVER - TACK/TAR TRUCK	AD	$27.35	510	$8.97

BALTIMORE COUNTY, MARYLAND

USE OF MINORITY BUSINESS ENTERPRISES AND WOMEN'S BUSINESS ENTERPRISES

IN
COUNTY CONTRACTS

MWBE Plan Package

Division of Diversity, Equity and Inclusion
The Jefferson Building
105 West Chesapeake Avenue
Towson, Maryland 21204
410-887-3407
www.baltimorecountymd.gov/go/mwbe

PROSPECTIVE BIDDERS/OFFERORS

Baltimore County Executive Order 2022-005 Use of Minority Business Enterprises and Women's Business Enterprises states:

SECTION 6. BID REQUIREMENTS.
(A)(l) All bidders shall submit a list of all subcontractors contacted in preparation of their bid package or proposal.
(2) The list shall include the service to be performed, bid amount, and the race/ethnicity/gender of the business owner(s).
(B)(l) All bidders shall submit a list of all subcontractors to be used on a county contract in the bid package.
(2) This list shall include all subcontractors (both MWBE and non-MWBE) used, the service to be performed, the total amount to be paid, and the race/ethnicity/gender of the owner.

If the solicitation includes a MWBE **subcontracting** goal, you **MUST** demonstrate **"Good Faith" effort** either by**:**

1. Complete and sign FORM A, FORM B (to include FORM B-Prime if MWBE Prime wishes to count towards the goal) and FORM C **listing all subcontractors** with the initial bid submission.
    a. *All Forms must be completed and signed. However, FORM C **MUST** be completed and signed by both the prime and the MWBE subcontractor.*

OR

2. If you are unable to meet any portion of the goal, you **MUST** do one of the following**:**

a. If you are requesting a **partial waiver**, complete and sign FORM A with initial bid submission. FORM B (to include FORM B-Prime if MWBE Prime wishes to count towards the goal) and FORM C **(listing all subcontractors**). In addition, complete, sign and submit FORM D and FORM E **accompanied with all supporting documentation** for the portion of the goal that will not be achieved as specified on FORM A.

b. If you are requesting a **full waiver**, complete and sign FORM A indicating your intent to request a full waiver **accompanied with a completed and signed FORM C listing all subcontractors**, FORM D and FORM E **accompanied with all supporting documentation**. **This MUST be submitted with the initial bid as specified on FORM A.**

c. *All Forms must be completed and signed. FORM C and FORM D **MUST** be completed and properly signed **by both** the Prime **AND the MWBE subcontractor(s).***

NOTE: The MWBE **subcontracting** goal applies to **ALL** prime/general contractors including certified and non-certified minority and women owned firms. **However, a Minority-owned or a Women-owned prime may self-perform up to 50% of MWBE subcontracting goal set in the solicitation. The MWBE primes that wish to count towards the goal must list themselves on all appropriate forms.**

12/2023

BALTIMORE COUNTY, MARYLAND
MWBE PARTICIPATION SUMMARY

Executive Order: Minority Business Enterprises and Women Business Enterprises (MWBE) shall have the maximum opportunity to participate in the performance of contracts financed in whole, or in certain circumstances, in part with County funds. Accordingly, on December 6, 2022, the County Executive adopted the EXECUTIVE ORDER No. 2022-005 addressing MWBE participation in County contracts. The December 6, 2022 Executive Order may be found on the Baltimore County website at www.baltimorecountymd.gov/go/mwbe.

Each Contract: The County shall establish a minimum MWBE participation amount for each contract, as applicable.

Bidder/Offeror Responsibility: The bidder/offeror shall ensure that MWBE participation occurs in accordance with the contract requirements and the County Executive's Executive Order. All bidder/offerors shall ensure that MWBE have the maximum opportunity to compete for and perform County contracts, as applicable. Baltimore County, Maryland, and/or its bidder/offerors and contractors shall not discriminate on the basis of race, color, national origin, disability or sex in the award and performance of any County contract.

Mobilization Payments: For subcontractors, project start-up costs can also be significant. A subcontractor that has limited resources and access to credit may find that start-up expenses inhibit its ability to bid County contracts. Under circumstances where mobilization payments are approved for the prime contractor, the subcontractor should be paid an amount equal to their participation percentage no later than five (5) business days before they are required to mobilize to perform the contracted work.

Mobilization costs represent pre-contract costs incurred by a contractor to prepare a job site before the actual commencement of the contract. These costs can include movement of personnel and equipment to the project site and for the establishment of the Contractor's offices, buildings, and other facilities necessary to begin work.

APPROVED MWBE LISTINGS

Published compilations of approved and certified MWBE, contractors, subcontractors, material suppliers, etc. include:

DIRECTORY OF MINORITY BUSINESS ENTERPRISE (MDOT):

https://marylandmdbe.mdbecert.com

MINORITY BUSINESS DIRECTORY OF THE CITY OF BALTIMORE:

https://baltimorecity.diversitycompliance.com

BIDDER/OFFEROR'S ACTIONS

Seeking Firms:

The bidder/offeror will seek commitments by subcontract or otherwise from MWBE firms for supplies and/or services, any combined value of which equals or exceeds the required percentage of MWBE participation goal for the County contract. However a MWBE Prime that affirms its MWBE status on the Minority and/or Women Prime Participation Affidavit may count up to 50% of the goal.

Expenditures for Materials and Supplies:
A bidder/offeror may count toward its MWBE contract requirements all expenditures for materials and supplies obtained from MWBE suppliers and manufacturers, provided that the MWBE firm is furnishing and installing the materials and is certified to perform these services. If the MWBE firm is only being used as a supplier, wholesaler and/or regular dealer or is not certified to install the supplies/materials, for purposes of achieving the MWBE participation goal, you may only count sixty percent (60%) of the value of the subcontract for these supplies/products (60% Rule). To apply the 60% Rule, first divide the amount of the subcontract for these supplies/products only (not installation) by the total Contract value. Then, multiply the result by sixty percent (60%) and insert the percentage in the Percent of Total Contract field of Form B Subcontractor Participation Schedule.

BALTIMORE COUNTY, MARYLAND
MWBE PARTICIPATION SUMMARY

Information to be supplied: All bidder/offerors shall submit the following information to the County at the time of bid submission:

1. The name of an employee designated as the bidder/offeror's liaison to the County's Minority Business Enterprise Office.

2. The following forms shall be completed and submitted:
   - Certified MWBE Utilization and Fair Solicitation Affidavit (**Form A);** from among those names appearing in the Approved MWBE Listings (excepting Federal Highway Administration projects, which exclusively require DBE approved and certified by the Maryland Department of Transportation MBE Advisory Committee);
   - A Subcontractor Participation Schedule (**Form B**) completed by the prime contractor for each MWBE listed on the Form.
   - A MWBE Prime Participation Schedule (Form B-Prime) completed by a MWBE prime contractor if the firm wishes to self-perform up to 50% of the MBE/WBE goal.
   - A MWBE Disclosure and Participation Statement (**Form C**) completed and signed by the prime contractor and MWBE firm for each MWBE listed on the Form. Form C **must match** what is stated on Form B.

   - If applicable, MWBE Subcontractor Unavailable Certificate (**Form D**) completed and signed by the prime contractor and MWBE for each MWBE listed on the Form.

3. If applicable, MWBE Outreach Efforts - Compliance Statement (**Form E**) completed and signed by the Bidder/Offeror. The prime shall submit a list of all subcontractors.

4. For DPW contracts, if the bidder/offeror intends to fulfill the MWBE requirements by use of a joint venture, he/she must submit a Joint Venture Disclosure Affidavit (**Form D-EEO-006-A** and **B** showing the extent of MWBE participation. If a bidder/offeror intends to use a MWBE joint venture as a subcontractor to meet its MWBE requirements, the affidavit must be submitted through the bidder/offeror by the proposed subcontractors and signed by all parties.

5. If the bidder/offeror's proposed MWBE participation does not meet the MWBE contract requirements, information sufficient to demonstrate that the bidder/offeror has made every effort to meet the requirements must be submitted. (See DETERMINATION OF BID RESPONSIVENESS hereafter)

RECORDS AND REPORTS

Returning Records: The bidder/offeror must keep such records as are necessary to determine compliance with its MWBE utilization requirements:

1. The MWBE and non-minority contractors, type of work being performed, actual values of work and services.

2. Documentation of all correspondence, contacts, telephone calls, etc., to obtain MWBE services for the contract.

3. All prime contractors and MWBE sub-contractors are required to report monthly, by the 10th of each month, to the County through an online system called PRISM. If the contractor cannot submit his/her report on time, he/she will notify the County MWBE office and request additional time to submit the report. Failure of the contractor to report in a timely manner may result in a finding of noncompliance. The County in its sole discretion and/or upon written request may require additional reports regarding MWBE. In the event you are not able to enter your payments in PRiSM, a spreadsheet is attached for your use. Please be sure to list the PO for each invoice/ payment reported and include in your submission any corresponding documentation (e.g. copies of invoices or cancelled checks).

Retaining Records: All MWBE records must be retained for 3 years following the expiration or any earlier termination of the contract and shall be available for inspection and photocopying by the County.

Investigation and Notification: Whenever the County believes the bidder/offeror, contractor, or any subcontractor may not be operating in compliance with the MWBE requirements, the County may, in its sole discretion, conduct an investigation. If the County finds the bidder/offeror, contractor, or any subcontractor is not in compliance with the MWBE requirements, the County may exercise any and all rights and remedies available to the County, under the contract, at law or equity, as deemed applicable and appropriate by the County in its sole discretion.

BALTIMORE COUNTY, MARYLAND
MWBE PARTICIPATION SUMMARY

DETERMINATION OF BID RESPONSIVENESS

Request for Deviation: If the bidder/offeror is unable to procure from MWBE firms (by subcontract or otherwise), supplies and services, any combined value of which equals the required percentage of the total value of the contract, the bidder/ offeror may request, in writing, a deviation or waiver of the contract requirements. To obtain such a waiver, the bidder/ offeror must submit the following information at the time bids are due:

1. The request for waiver request shall include (1) a signed unavailability statement (Form D) executed by all MBEs and WBEs that the bidder/offeror solicited for participation and (2) Outreach Efforts/Compliance Statement (Form E) that demonstrates the bidder/offeror's good faith efforts to comply with the contract requirements, including copies of solicitation documentation to all potential subcontractors:

2. Emails, letters, facsimile transmittals and confirmations containing plans, specifications, and anticipated time schedule for portions of the work to be performed and meeting notes and agendas clearly identifying the certified MBE or WBE classification and dates that the bidder/offeror contacted each MWBE; and

3. Telephone logs containing names, addresses, dates, telephone numbers, work to be performed, anticipated time schedule and classification of certified MBEs and WBEs contacted.

Bid Rejection: The failure of any bidder/offeror (including the apparent low bidder/offeror) to provide a responsive MWBE Plan as required by the solicitation may result in the bidder/offeror being deemed non-responsive and the County's rejection of the bid.

Liquidated Damages If the County issues a notice of intent to awards contract to the apparent low bidder/offeror who provided a responsive MWBE Plan, but, if after said notice and before execution of Contract Documents, it is determined by the County that the apparent low bidder/offeror has failed to comply with the MWBE Plan, such failure may result in the recommendation by the appropriate Procurement Official to annul the award and forfeit the bidder/offeror's Proposal Guaranty to the County, not as a penalty, but as liquidated damages, it being acknowledged that actual damages will be difficult if not impossible to accurately measure. In addition, the County may proceed as it determines to be in its best interest, including but not limited to, the Notice of Award may be made to the next lowest responsive and responsible bidder/offeror or the work may be re-advertised.

Contract Breach: If, after execution of a County contract, the contractor becomes aware it may or will fail to fulfill the applicable MWBE requirements and/or may or will deviate from the contractor's bid response/contract terms, the contractor shall promptly advise the County of this in writing. Thereafter, the County will determine what action or remedy is appropriate on a case-by-case basis, in the County's sole discretion.

Approval Required for Changes: Any and all changes to the MWBE subcontractors or the type or amount of work to be performed by such subcontractors during the contract term must be mutually agreeable to the County and the contractor and shall be documented via a contract amendment, executed by legally authorized representatives of the County and the contractor.

Cooperation in Reviews: The bidder/offeror will cooperate with the County in any reviews of the contractor's procedures and practices with respect to MBE or WBE firms, which the County may from time to time conduct in its sole discretion.

Other: If the documents used to determine the contractor's efforts, achievement of, and/or the status of an MWBE requirement or fulfillment thereof contain false, misleading or misrepresented information, the contractor may be declared in breach of the contract and the County may take any and all actions and/or remedies available to the County under the contract, at law, or in equity. If an MWBE is disqualified by any public entity, including but not limited to, Baltimore City, the State or MDOT, at any time after award or during the term of the contract, the County may, in its sole discretion, require the prime contractor to promptly submit for County approval, the contractor's plans for fulfilling the required MWBE participation under the contract, and/or request such detail and additional information as the County, in its discretion deems appropriate.

PRIME CONTRACTOR MINORITY AND WOMEN PARTICIPATION AFFIDAVIT

A. AUTHORIZED REPRESENTATIVE

I HEREBY AFFIRM THAT:

I am the [title]_____and the duly authorized representative of [business]
_____ (the "Business") and that I possess the legal authority to make this Affidavit on behalf of myself and the Business for which I am acting.

B. AFFIRMATION REGARDING MINORITY AND WOMEN PARTICIPATION

I FURTHER AFFIRM THAT:

I am aware that, pursuant to the December 6, 2022 Executive Order of Baltimore County, Maryland, the following words have the meanings indicated.

(A) "Minority Business Enterprise" or "MBE" means a business enterprise that is owned, operated and controlled by one or more minority group members (African American, Hispanic American, Asian American, or Native American) who have at least 51% ownership and in which the minority group members have operational and managerial control, interest in capital and earnings commensurate with their percentage of ownership.

(B) "Women's Business Enterprise" or "WBE" means a business enterprise that is owned, operated and controlled by one or more women who have at least 51% ownership and in which the women have operational and managerial control, interest in capital and earnings commensurate with their percentage of ownership.

____ The Prime is a MBE ☐ or WBE ☐

☐ Maryland State Department of Transportation (MDOT) #_____

☐ City of Baltimore #_____

☐ Name Other Jurisdiction:_____#_____

☐ The ownership of the Noncertified MWBE business consists of___ ___% minorities and ___% women (for a total of____ %), each of which has operational and managerial control, interest in capital and earnings commensurate with their percent ownership.

_____ % African American_____% Hispanic American_____% Women
_____ % Asian American _____% Native American _____% Disadvantaged (DBE)

___The MWBE prime anticipates meeting up to 50% of the stated participation goal with its own workforce. **MWBE primes percentage must be stated on the MWBE PRIME PARTICIPATION SCHEDULE (FORM B-PRIME) to count towards the goal**.

___The prime anticipates ☐ does not anticipate ☐ utilizing subcontractors for_____% of the work of the contract requirements, of which it anticipates_____% will be MBEs and____% will be WBEs.

I DO SOLEMNLY DECLARE AND AFFIRM UNDER THE PENALTIES OF PERJURY THAT THE CONTENTS OF THIS AFFIDAVIT ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF.

Date: _____ By:_____
(Authorized Representative and Affiant's Name and Title)

BALTIMORE COUNTY, MARYLAND
Certified MWBE Utilization and Fair Solicitation Affidavit
(FORM A)

This document must be completed and submitted with Bid/Proposal to Baltimore County.

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

* * * * * * * * * * * * * * *

I acknowledge the goal for solicitation # 25021 POC is a minimum of 25 %. This goal must be met by any combination of the MWBE subcontractors. However, for instances where the Prime is counting up to 50% of the goal, the remaining goal balance must be met by any combination of the MWBE subcontractors.

- The goal breakdown is as follows:
  - ____% Minority/Women Prime
  - ____ % for certified MBE-owned businesses and/or
  - ____ % for certified WBE-owned businesses.

I have made a good-faith effort to achieve this MWBE solicitation requirement. If awarded the contract, I will comply with this MWBE contract requirement and will continue to use my best efforts to increase MWBE participation during the contract term.

PLEASE CHECK ONE BOX (EITHER 1, 2, OR 3)

1 ☐ Prime has met the MWBE contract requirements for this solicitation and contract. I submit the Subcontractor Participation Form B and Form C, along with this Affidavit, which details how the Prime will achieve the contract requirements. Submit a complete list of all additional subcontractors

Or

2 ☐ After having made a good-faith effort to achieve the MWBE requirements, the Prime can only achieve partial success. I submit the Subcontractor Participation Form B, Form C, Form D and Form E along with this Affidavit, which details how the Prime will partially achieve the contract requirements. Submit a complete list of all additional subcontractors

I request a partial waiver and will meet the following MWBE participation goals:

- Partial waiver of MWBE subcontract participation:
  - ____% Minority/Women Prime
  - ____ % for certified MBE-owned businesses and/or
  - ____ % for certified WBE-owned businesses.

Or

3 ☐ After having made a good faith effort to achieve the MWBE requirements for this contract, the Prime is unable to achieve the requirements and/or sub requirements for this contract. I submit the MWBE Participation Form D and Form E, along with this Affidavit, which details the steps the Prime has taken in an attempt to achieve the contract requirements. Therefore, I request a full waiver.

IF YOU HAVE CHECKED BOX 2 OR 3, THE FOLLOWING IS APPLICABLE:

1) If a bidder is unable to comply with the goals established in a bid for a project, the bidder may submit a request for a waiver at the time of bid submission. However, occasions for granting waivers will be limited.

2) The request for waiver shall include documentation that demonstrates the bidder's good faith efforts to comply with the goals, including:
   a. Signed unavailability statements from all MBEs and WBEs that the bidder solicited for participation; and
   b. Copies of solicitation documentation to include the scope of services to be performed by the subcontractors accompanied with the following:
      i. Emails, letters, facsimile transmittals and confirmations containing plans, specifications, and anticipated time schedule for portions of the work to be performed and meeting notes and agendas clearly identifying the certified MBE or WBE classification and dates that the bidder contacted each; and
      ii. Telephone logs containing names, addresses, dates, telephone numbers, work to be performed, anticipated time schedule and classification of certified MBEs and WBEs contacted.
      iii. Responses from MWBE firms contacted to fulfill the goal.

As I have checked Box 2 or 3 of this Affidavit, I understand I must submit the following supporting documentation with the bid:

- *Subcontractor Participation Schedule* (Form B)
- *MWBE Subcontractor Disclosure and Participation Statement* (Form C)
- *MWBE Subcontractors Unavailable Certificate* (Form D) (if applicable)
- *MWBE Outreach Efforts – Compliance Statement* (Form E) (if applicable)

I acknowledge that the MWBE subcontractors/suppliers listed on the *Subcontractor Participation Schedule* (Form B) will be used to accomplish the percentage of MWBE participation that the Prime shall achieve. A fully executed Form C must match Form B.

In the solicitation of subcontract quotations or offers, MWBE subcontractors were provided the same information and amount of time to respond, as were non-MWBE subcontractors.

The solicitation process was conducted in such a manner so as to not place MWBE subcontractors at a competitive disadvantage to non-MWBE subcontractors.

I solemnly affirm under the penalties of perjury that this Affidavit is true to the best of my knowledge, information, and belief.

Bidder/Offeror Name	Phone Number
Address	Affiant Signature
Address (continued)	Printed Name & Title
E-mail address	Date

BALTIMORE COUNTY, MARYLAND
SUBCONTRACTOR PARTICIPATION SCHEDULE (FORM B)

**This document must be completed and submitted with Bid/Proposal to Baltimore County.*

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

Prime Name	**Prime Address, Telephone Number and Email**
Bid/Proposal Name and Number	**Project Location**
	Base Bid $_____
1. Subcontractor Name and Tax ID	**Subcontractor Address**
Telephone Number _____ **Email Address** _____ **Select One:** ☐ **MBE** ☐ **WBE** ☐ **SBE** ☐ **N/A** **Provide if Applicable:** ☐ **MDOT** ☐ **Baltimore City** **#**_____	**Minority Status (If applicable):** ☐ **African American** ☐ **Female** ☐ **Asian American Pacific** ☐ **Native American** ☐ **Asian American Sub-continent** ☐ **Hispanic American** ☐ **Supplier, Wholesaler and/or Regular Dealer - 60% Rule**
NAICS Code(s), Work to be Performed and Subcontract Dollar Amount	**Percent of Total Contract (See instructions on Page 1 of the MWBE PARTICIPATION SUMMARY for 60% rule)** _____%
2. Subcontractor Name and Tax ID	**Subcontractor Address**
Telephone Number _____ **Email Address** _____ **Select One:** **MBE** ☐ **WBE** ☐ **SBE** ☐ **N/A** ☐ **Provide if Applicable:** ☐ **MDOT** ☐ **Baltimore City** **#**_____	**Minority Status (If applicable):** ☐ **African American** ☐ **Female** ☐ **Asian American Pacific** ☐ **Native American** ☐ **Asian American Sub-continent** ☐ **Hispanic American** ☐ **Supplier, Wholesaler and/or Regular Dealer - 60% Rule**
NAICS Code(s), Work to be Performed and Subcontract Dollar Amount	**Percent of Total Contract (See instructions on Page 1 of the MWBE PARTICIPATION SUMMARY for 60% rule)** _____%
3. Subcontractor Name and Tax ID	**Subcontractor Address**
Telephone Number _____ **Email Address** _____ **Select One:** **MBE** ☐ **WBE** ☐ **SBE** ☐ **N/A** ☐ **Provide if Applicable:** ☐ **MDOT** ☐ **Baltimore City** **#**_____	**Minority Status (If applicable):** ☐ **African American** ☐ **Female** ☐ **Asian American Pacific** ☐ **Native American** ☐ **Asian American Sub-continent** ☐ **Hispanic American** ☐ **Supplier, Wholesaler and/or Regular Dealer - 60% Rule**
NAICS Code(s), Work to be Performed and Subcontract Dollar Amount	**Percent of Total Contract (See instructions on Page 1 of the MWBE PARTICIPATION SUMMARY for 60% rule)** _____%
Subcontractor Total Dollar Amount $_____	**Total Subcontractor Percent of Entire Contract** _____%
Form Prepared by: **Name/Date:** _____ **Title:** _____ **Email:** _____	**Reviewed and Accepted by Baltimore County Minority Business Enterprise Office** **Name** _____ **Title** _____ **Date** _____

MBE or WBE Prime Participation Total	_____%	$_____
MBE Subcontracting Participation Total	_____%	$_____
WBE Subcontracting Participation	_____%	$_____
Total MWBE Participation	_____%	$_____
Total SBE Participation	_____%	$_____

BALTIMORE COUNTY, MARYLAND

MWBE PRIME PARTICIPATION SCHEDULE
(Form B-Prime)

PLEASE COMPLETE AND SUBMIT THIS FORM TO ATTEST EACH SPECIFIC ITEM OF WORK THAT YOU AS THE MWBE PRIME FIRM WILL PERFORM USING ITS OWN WORKFORCE PERTAINING TO THE PERCENTAGE STATED ON THE SUBCONTRACTOR PARTICIPATION SCHEDULE (FORM B) FOR PURPOSES OF MEETING THE MWBE PARTICIPATION GOALS.

This document must be completed and submitted with Bid/Proposal to Baltimore County.

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

Provided that_____(Prime Contractor's Name) with Certification Number _____ is awarded the County contract in conjunction with Solicitation No._, such MWBE Prime Contractor intends to count the distinct, clearly defined portion of the work of the contract that the MBE/WBE Prime Contractor performs with its own forces toward fulfilling **up to fifty-percent (50%) of the MWBE participation goal**, at least $_____ which equals to___% of the Total Contract Amount for performing the following products/services for the Contract:

NAICS CODE	WORK ITEM, SPECIFICATION NUMBER, LINE ITEMS OR WORK CATEGORIES (IF APPLICABLE). FOR CONSTRUCTION PROJECTS, GENERAL CONDITIONS MUST BE LISTED SEPARATELY.	DESCRIPTION OF SPECIFIC PRODUCTS AND/OR SERVICES	VALUE OF THE WORK

MWBE PRIME CONTRACTOR

Signature of Representative:

_____

Printed Name and Title:_____

_____

Firm's Name: _____

Federal Identification Number: _____

Address: _____

_____

Telephone:_____

Email Address: _____

Certified Yes ☐ No ☐

Certifying Jurisdiction _____
Date:_____

MWBE PRIME CONTRACTOR

Minority Status:

☐ African American

☐ Hispanic American

☐ Women

☐ Asian American

☐ Native American

Reviewed and Accepted by Baltimore County Minority Business Enterprise Office

Name _____

Title _____

Date _____

Rev 12/2024

BALTIMORE COUNTY, MARYLAND

MWBE SUBCONTRACTOR DISCLOSURE AND PARTICIPATION STATEMENT (FORM C)

This document must be completed and submitted with Bid/Proposal to Baltimore County.

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

NOTE: ANY INCONSISTENCY BETWEEN THIS FORM AND FORM B *MWBE PARTICIPATION* MAY RENDER A BID/PROPOSAL NON-RESPONSIVE AND THE COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

Contract Name, Bid/Proposal Number: _____

Prime Contractor Name: _____

Name of MWBE Subcontractor: _____

_____ _____

Subcontractor Contact Name, Title Subcontractor Email Address

☐ MDOT ☐ Baltimore City

_____

Certification Number

☐ MBE ☐ WBE ☐ SBE ☐ N/A

1. NAICS Code(s), Work/Services to be performed by MWBE Subcontractor: _____

_____

Percent of Total Contract (See instructions on Page 1 of the MWBE PARTICIPATION SUMMARY for 60% rule)

2. Subcontract Amount: $ _____ or _____ % of the County contract cost.

3. Bonds - Amount and type required of Subcontractor if any: _____

4. MWBE Anticipated Commencement Date: _____ Completion Date: _____

Mobilization Cost Amount $_____

5. This is a MBE-Owned Business Firm: Yes _____ No _____

6. This is a WBE-Owned Business Firm: Yes _____ No _____

****

NOTE: If the Prime is notified that it will be awarded the above referenced contract, the undersigned MWBE subcontractor and Prime must enter into a subcontract for the work/service indicated above upon the Prime's execution of a contract for the above referenced project with Baltimore County, and provide a copy of the fully executed MWBE SUBCONTRACTOR PARTICIPATION NOTICE OF INTENT TO AWARD (FORM C-Subcontractor) accompanied with the anticipated Work Breakdown Schedule (providing the subcontractor's mobilization timeframe) to mwbe@baltimorecountymd.gov **within 10 calendar days of receipt by the Prime of FORM C- Subcontractor from the County.** The undersigned subcontractor is an MDOT or Baltimore City certified MWBE firm. The terms and conditions stated above are consistent with our agreements.

Signature of MWBE Subcontractor: _____ Date: _____

Prime's Printed Name and Title: _____ Email: _____

The terms and conditions stated above are consistent with our agreements.

Signature of Prime: _____ Date: _____

Revised 12/2024

BALTIMORE COUNTY, MARYLAND

MWBE –UNAVAILABILITY CERTIFICATE

(FORM D)

If applicable, this document must be completed and submitted with Bid/Proposal to Baltimore County.

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

1. It is hereby certified that the firm of _____
(Name of Minority firm)

located at _____
(Number) (Street)

_____
(City) (State) (Zip)

was offered an opportunity to bid on the _____ contract.

2. The _____ (MWBE Firm), is either unavailable for the work/service or unable to prepare a bid for this project for the following reason(s):

_____

_____

_____

_____ _____ _____
Signature of Subcontractor MWBE Representative Title Date

_____ _____ _____
MDOT/Baltimore City Certification # Email Address # Telephone #

3. PRIME'S SIGNATURE AND CERTIFICATION

I certify under oath that I contacted the Certified MWBE and they advised me that they are unavailable, unable to perform the work/services for the above-contract or failed to respond to repeated requests for a price proposal for the above-contract.

_____ _____ _____
Signature of Prime Title Date

Rev 12/2024

BALTIMORE COUNTY, MARYLAND
MWBE - OUTREACH EFFORTS - COMPLIANCE STATEMENT
(FORM E)

This document must be completed and submitted with Bid/Proposal to Baltimore County.

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

In conjunction with the bid or offer submitted in response to Solicitation Number_____, I state the following:

1. Bidder/Offeror identified opportunities to subcontract in these specific work categories:

   _____
   _____
   _____
   _____

2. Attached to this form are copies of the solicitation documentation in accordance with Section 6 (E) Bid Requirements of the Executive Order, used to solicit certified MWBEs for the subcontract opportunities accompanied with the signed MWBE Subcontractor Unavailability Certificate (Form D).

   _____
   _____
   _____
   _____

3. Bidder/Offeror made the following attempts to solicit MWBEs:

   _____
   _____
   _____
   _____

_____
Signature – Bidder Offeror

_____
Print or Type Name of Firm

_____
Street Address

_____
City State Zip Code

_____
Date

JOHN A. OLSZEWSKI, JR.
County Executive

SEVETRA PEOPLES-BROWN
Executive Director
Chief of Diversity, Equity and Inclusion

To: Contractors/Consultants

From: Minority and Women Business Enterprise Office

Date: December 13, 2024

Subject: Compliance Reporting and Penalties

Baltimore County, Maryland (the "County") requires all Prime Contractors and all Subcontractors to submit payment reports by the 10th of each month through an online MWBE Compliance Portal (PRISM). The Portal can be found under Compliance Reporting for Primes and Subcontractors at www.baltimorecountymd.gov/ go/mwbe. In the event you are not able to enter your payments in PRiSM, a spreadsheet is attached for your use. Please be sure to list the PO for each invoice/ payment reported and include in your submission any corresponding documentation (e.g. copies of invoices or canceled checks).

The County has found that a number of companies are failing to file reports in a timely manner, which makes it difficult for the County to verify compliance. As a result, the County has determined to assess penalties for non-compliance, effective September 1, 2018, as follows:

(a) For failure to file timely monthly reports:
   a. Assessment of a late fee of $10 per day per task, up to a maximum of $1,500 per task; and/or
   b. For multiple violations, termination of the contract for convenience or for default, with the contractor suspended from participating in County contracts for five (5) years.

(b) For failure to meet MWBE requirements:
   a. Assessment of a penalty of up to 10% of the contract value; and/or
   b. Termination of the contract for convenience, with the contractor suspended from participating in County contracts for five (5) years together with assessment of a penalty of up to 10% of the contract value; and/or
   c. Termination of the contract for default together with assessment of a penalty of 10% of the contract value.

Each action and/or remedy described above is at the sole discretion of the County, and is in addition to any damages which the County may be entitled to under the contract.
This short video can be used as guidance on submitting the Prime to Subcontractor Payment Reporting:
http://stage.prismcompliance.com/etc/movies/vendor_contractpayment_tutorial.htm

If after contract expiration, it has been determined the MWBE firms named were not used or were under used, by the contractor and supporting documentation was not provided and approved by the County the contractor may be assessed a penalty of up to 10% of the contract value and/or suspended from participating in County contracts for 5 years.

Questions regarding this correspondence and/or the use of this system can be directed to the MWBE Office at mwbe@baltimorecountymd.gov or call (410) 887-3407.

Attachment: MWBE Payment Report Form
MWBE Payment Acknowledgement Form

Cc: File

S E C T I O N V

POST AWARD DOCUMENTS

This Section to be Completed
by Successful Bidder after Award

CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT ("Contract"), IS MADE THIS _____ day of _____ 20_____, by and between Baltimore County, Maryland, a body corporate and politic ("County"), and _____, ("Contractor").

WITNESSETH, that the Contractor, for and in consideration of the payment or payments herein specified and agreed to by the County, hereby covenants and agrees to furnish and deliver all the materials and to do and perform all the work, services, and labor in fulfillment of the requirements of Contract Number **25021 PO0** "Project") in strict conformity with the solicitation, plans, specifications, special provisions, any and all addenda, and the proposal, at the prices named therein, and all of which are collectively the Proposal, and said Proposal is attached hereto and made a part thereof.

The Project shall be done in strict compliance with (i) the Proposal, (ii) the Baltimore County Department of Public Works and Transportation September 2023 "Standard Specifications for Construction and Materials" and "Standard Details for Construction" (iii) and any and all revisions thereto as of the date of advertisement, including but not limited to the General Conditions Building Projects, as applicable, and all of which (i-iii) are made a part hereof and incorporated herein (collectively, the "Specifications"). Contractor understands and agrees it is Contractor's responsibility and obligation to obtain a copy of the "Specifications" and agrees the Specifications are incorporated herein. Copies are available on the County's website at www.baltimorecountymd.gov/departments/public-works/standards.

The Project shall be subject to the inspection and approval of the Office of Budget and Finance – Property Management for Baltimore County, or his authorized representative, and in the event any portion thereof shall be rejected by said Director or his representative as defective or unsuitable, then the said portion shall be removed and replaced and be performed anew to the satisfaction and approval of the said Director or his representative at the cost and expense of the Contractor.

THE CONTRACTOR AFFIRMS that it is aware of, and will comply with, the provisions of Sections 14-101 through 14-108 of the Election Law Article of the Annotated Code of Maryland, as the same may be amended from time to time, which require that every person who makes, during any 12-month period, one or more contracts, with one or more Maryland governmental entities involving cumulative consideration, of at least $200,000.00, to file with the State Board of Elections certain specified information to include disclosure of attributable political contributions in excess of $500 during defined reporting periods.

THE CONTRACTOR FURTHER COVENANTS AND AGREES that all the Project shall be furnished, performed and delivered, in every respect, to the satisfaction and approval of the Office of Budget and Finance – Property Management, aforesaid, on or before the expiration of **Two Hundred Seventy (270) CALENDAR DAYS** (the "Contract Period") after written notice has been given by the Director or their authorized representative to begin the work.

IT IS AGREED THAT TIME IS OF THE ESSENCE. In the event the Contractor fails to achieve Final Completion and Final Acceptance of the Contract work within the Contract Period specified herein, plus any extensions thereto agreed to in writing by a legally authorized representative of the County pursuant to the terms of this Contract, then Contractor shall pay the County the sum of **FIFTEEN HUNDRED DOLLARS ($1500.00)** as Liquidated Damages for each **CALENDAR DAY** after the expiration of the Contract Period, as may be extended by the County, until the Contractor achieves Final Completion and Final Acceptance of the Project.

_____

Contractor's Initials

_____

Date

Rev. 09/2024

IT IS FURTHER AGREED that:

(a) These Liquidated Damages are a reasonable estimate of the County's damages solely due to the public's loss of use of the Project during the delay period and is not a penalty.

(b) It is very difficult, if not impossible, to accurately measure the damages to the County due to the public's loss of use of the Project during the delay period.

(c) Notwithstanding GP 8.09 of the Baltimore County Standard Specification for Construction, in addition to the damages due to the public's loss of use of the Project during the delay period, the County is likely to incur additional direct costs during the delay period, including but not limited to, costs for construction management, consultants, architectural services, office trailer and supplies, utilities, County employees' time, County vehicles, and such other costs that the County will incur to continue administration of the construction and the Contract during the delay period, all of which will be monitored by the County, and if so required by the County, the Contractor shall pay such actual damages incurred during the delay period. THE PARTIES HERETO UNDERSTAND AND AGREE THAT CONTRACTOR'S OBLIGATION TO PAY THE COUNTY FOR ACTUAL DAMAGES DURING THE DELAY PERIOD SHALL BE IN ADDITION TO THE CONTRACTOR'S OBLIGATION TO PAY THE LIQUIDATED DAMAGES DUE TO THE PUBLIC'S LOSS OF USE OF THE PROJECT.

(d) The County shall have the right, but not the obligation, to deduct the Liquidated Damages due to the public's loss of use of the Project, and the County's actual costs and costs to continue administration of the construction and the Contract, from any monies due or any monies that may become due to the Contractor.

IT IS DISTINCTLY UNDERSTOOD AND AGREED that no claim for extra work, material or overhead not specifically provided for in the Contract will be allowed by the County, nor shall the Contractor do any work or furnish any materials not covered by this Contract and the Specifications, unless the same is ordered in writing by a legally authorized representative of the Office of Budget and Finance – Property Management in accordance with the terms of the Contract. Any such work or materials which may be done or furnished by the Contractor without any such written order first being given shall be at said Contractor's sole risk, cost and expense and Contractor hereby covenants and agrees that without such written order, Contractor shall make no claim for compensation for work, materials, or overhead so done or furnished.

NOTWITHSTANDING GP 4.06 OF THE BALTIMORE COUNTY STANDARD SPECIFICATIONS FOR CONSTRUCTION, IT IS SPECIFICALLY AGREED that the Contractor shall have no entitlement to damages arising out of delay, disruption, interference or hindrance from any cause whatsoever. However, this provision shall not preclude recovery or damages by the Contractor for hindrances or delays due solely to fraud or gross negligence on the part of the County or its agents.

IT IS FURTHER DISTINCTLY AGREED that the said Contractor shall not assign this Contract, nor any part thereof, nor any right to any of the monies to be paid hereunder, nor shall any part of the work to be done or material furnished under said Contract be sublet without the prior written consent of a legally authorized representative of the Office of Budget and Finance – Property Management in accordance with the terms of this Contract. Further, the acceptance of the final payment by the Contractor shall effectuate a release in full of all claims against County and its officials, employees, representatives, and agents arising out of, or by reason of the Project and this Contract.

The Contractor shall review government issued identification and badge all employees of the Contractor and its subcontractors. The Contractor shall also review all federal forms, including but not limited to I-9's, for compliance as well as copies of all employment eligibility and identity documentation maintained to the extent required by law.

The Bonds, given by the Contractor in a sum equal to the total contract price of the Project in compliance with the terms and provisions of this Contract, are hereby attached and incorporated herein.

IT IS AGREED that in the event that the County is delayed or prevented from timely execution of this Contract, the Contractor releases County and agrees Contractor shall have no action, claim or demand against County therefore.

Contractor's Initials

Date

THE CONTRACTOR HEREBY FURTHER AGREES to receive the prices set forth in the Proposal incorporated herein as full compensation for the completion of the Project and, in all respects, to complete said Contract to the satisfaction of the County.

THE CONTRACTOR REPRESENTS AND WARRANTS:

(i) it is duly formed and validly existing under the laws of the State of _____;

(ii) it is in good standing in the State of Maryland;

(iii) it has the power and authority to consummate the obligations and responsibilities contemplated hereby, and has taken all necessary action to authorize the execution, delivery and performance required under this Contract;

(iv) the Contractor and the person executing this Contract for the Contractor each warrant that he/she is duly authorized by the Contractor to execute and seal this Contract on the Contractor's behalf;

(v) the warranties of merchantability and fitness for a particular purpose and use and warranties of title and against infringement, and all express warranties contained in this Contract, including but not limited to the Proposal (and any sample or model presented by Contractor and expressly accepted by the County) shall apply to the portion of this Contract pertaining to or for goods;

(vi) all representations and warranties made in the Proposal and herein remain true and correct in all respects when made, as of the date of this Contract, and throughout the term of this Contract; and

(vii) there exists no actual or potential conflict of interest between its performance under this Contract and its engagement or involvement in any other personal or professional activities and in the event such conflict or potential conflict arises during the term of this Contract, the Contractor shall immediately advise the County in writing thereof.

THE CONTRACTOR shall not disclose any documentation and information of any kind or nature disclosed to the Contractor in the course of its performance of duties hereunder without the express prior written consent of the County.

Those sections in this Contract which by their nature are intended to survive, including but not limited to, Contractor's representations and warranties, confidential information, and indemnification shall survive the termination of this Contract.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand and seal the day and year first above written.

CONTRACTOR NAME: _____

WITNESS

FEDERAL TAX ID or SS #: _____

_____

By: _____ (Seal)

_____
Type (Print) Name

Name: _____

Title: _____ Date: _____

WITNESS:

BALTIMORE COUNTY, MARYLAND

_____
Executive Secretary

By: _____ Date: _____
D'Andrea L. Walker, County Administrative Officer

_____
Type (Print) Name

APPROVED FOR FORM AND LEGAL AND SUFFICIENCY* (Subject to execution by the duly authorized Administrative official and Chairperson of the County Council, as indicated).

APPROVED:

_____ Date: _____
Kevin D. Reed, Director
Office of Budget and Finance

_____
Office of the County Attorney

*Approval of Form and Legal Sufficiency does not convey approval or disapproval of the substantive nature of this transaction. Approval is based upon typeset documents. All modifications require re-approval.

Rev. 09/2024

P E R F O R M A N C E B O N D Bond No._____

Principal	**Business Address of Principal**
Surety	**Obligee:** **BALTIMORE COUNTY, MARYLAND** A body corporate and politic

A Corporation of the State of _____ and authorized to do business in Maryland

Penal Sum of Bond (express in words and figures) DOLLARS $_____	
Parkville Senior Center Parking Lot Reconfiguration	_____ **20** _____
Contract Name	**Date of Contract**
25021 PO0	_____ **20** _____
Contract Number	**Date Bond Executed**

KNOW ALL MEN BY THESE PRESENTS, that we, the PRINCIPAL, above-named, and SURETY, above-named, and authorized to do business in the State of Maryland, are held and firmly bound unto the OBLIGEE, above-named, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, THE PRINCIPAL entered into a certain contract with the OBLIGEE described and dated as shown above and is required to provide this bond pursuant to Maryland State law and/or County law and the contract.

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

THE SURETY FURTHER GUARANTEES That it is (a) licensed in the State of Maryland, (b) rated "B" or better by the A.M. Best Company, (c) on federal funded projects, authorized by the underwriting limitation contained in the U.S. Department of the Treasury Circular 570, as amended, to guaranty the amount of the Bid, and (d) in good standing as determined by the County's Engineer. A Performance Bond is required for each and every Contract in excess of twenty-five thousand ($25,000). A Performance Bond shall be in the amount equal to at least one hundred (100%) percent of the Contract price. The fully executed Performance Bond shall be delivered by the Bidder to the Department's Division of Construction Contracts Administration no later than the time the Contract is to be executed by the Contractor.

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

In Presence of: **Individual Principal**

Witness: _____ **as to:** _____ **(SEAL)**

Print Name: _____ **Print Name:** _____

Attest: **Corporate Principal**

_____
(Name of Corporation)

Witness: _____ **By:** _____ Affix

Print Name: _____ **Print Name:** _____ Corporate

Title: _____ Seal

Attest: **Surety**

_____
(Name of Surety)

Business Address: _____

Witness: _____ **By:** _____ Affix

Print Name: _____ **Print Name:** _____ Corporate

Title: _____ Seal

Reviewed for Baltimore County Requirements

_____
Office of the County Attorney

Revised
February 4, 2015

PAYMENT BOND

Bond Number_____

Principal | **Business Address of Principal**

Surety

Obligee: **BALTIMORE COUNTY, MARYLAND**
A body corporate and politic

A Corporation of the State of _____ and authorized to do business in Maryland

Penal Sum of Bond (express in words and figures) DOLLARS $_____

Contract Name: Parkville Senior Center Parking Lot Reconfiguration
Date of Contract: _____ 20 _____

Contract Number: 25021 PO0
Date Bond Executed: _____ 20 _____

KNOW ALL MEN BY THESE PRESENTS, that we, the PRINCIPAL, above-named, and SURETY, above-named, and authorized to do business in the State of Maryland, are held and firmly bound unto the OBLIGEE, above-named, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, THE PRINCIPAL entered into a certain contract with the OBLIGEE described and dated as shown above and is required to provide this bond pursuant to Maryland State law and/or County Law and the contract.

NOW, THEREFORE, the condition of this obligation is such that if the aforesaid PRINCIPAL shall promptly make payments to all persons supplying labor and/or material to the PRINCIPAL and to any subcontractor of the PRINCIPAL in the prosecution of the work provided for in said contract and any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the SURETY being hereby waived, then, this obligation to be void; otherwise to remain in full force and effect.

THE SURETY FURTHER GUARANTEES That it is (a) licensed in the State of Maryland, (b) rated "B" or better by the A.M. Best Company, (c) on federal funded projects, authorized by the underwriting limitation contained in the U.S. Department of the Treasury Circular 570, as amended, to guaranty the amount of the Bid, and (d) in good standing as determined by the County's Engineer. A Payment Bond is required for each and every Contract in excess of twenty-five thousand ($25,000). A Payment Bond shall be in the amount equal to at least one hundred (100%) percent of the Contract price. The fully executed Payment Bond shall be delivered by the Bidder to the Department's Division of Construction Contracts Administration no later than the time the Contract is to be executed by the Contractor.

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

In Presence of: **Individual Principal**

Witness: _____ **as to:** _____ **(SEAL)**

Print Name: _____ **Print Name:** _____

Attest: **Corporate Principal**

_____
(Name of Corporation)

Witness: _____ **By:** _____ Affix

Print Name: _____ **Print Name:** _____ Corporate

Title: _____ Seal

Attest: **Surety**

_____
(Name of Surety)

Business Address: _____

Witness: _____ **By:** _____ Affix

Print Name: _____ **Print Name:** _____ Corporate

Title: _____ Seal

Reviewed for Baltimore County Requirements

_____Office of the County Attorney

Revised
February 4, 2015

BALTIMORE COUNTY, MARYLAND

INSURANCE PROVISIONS

1. **GENERAL REQUIREMENTS**

1.1 Coverages Required:
Unless otherwise required by the specifications or the contract, the Contractor/Vendor shall purchase and maintain the insurance coverage's listed herein.

1.2 Certificate of Insurance:
Before starting work on the contract, or prior to the execution of the Contract on those bid, the Contractor/Vendor shall provide Baltimore County, Maryland with verification of insurance coverage evidencing the required coverages.

1.3 Baltimore County as Insured:
The coverage required, excluding Workers' Compensation and Employers' Liability and Medical Malpractice Liability/Professional Liability/Errors and Omissions Liability, must include Baltimore County, Maryland and its agents, employees, officers, directors, and appointed and elected officials as an additional insured.

1.4 Contractor's/Vendor's Responsibility:
The providing of any insurance herein does not relieve the Contractor/Vendor of any of the responsibilities or obligations the Contractor/Vendor has assumed in the contract or for which the Contractor/Vendor may be liable by law or otherwise.

1.5 Failure to Provide Insurance:
Failure to provide and continue in force the required insurance shall be deemed a material breach of the contract. The Contractor/Vendor must maintain the insurance coverages required under the terms and conditions on this Contract while this Contract is in effect including renewal and extension terms.

2. **INSURANCE COVERAGES**

2.1 General Liability Insurance

2.1.1 Minimum Limits of Coverage:
Personal Injury Liability and Property Damage Liability
Combined Single Limit - $500,000 each occurrence.

2.1.2 Such insurance shall protect the Contractor/Vendor from claims which may arise out of, or result from, the Contractor's/Vendor's operations under the contract, whether such operations be by the Contractor/Vendor, any subcontractor, anyone directly or indirectly employed by the Contractor/Vendor or Subcontractor, or anyone for whose acts any of the above may be liable.

2.1.3 Minimum Coverages to be Included:
(a) Independent Contractor's coverage;
(b) Completed Operations and Products Liability coverage;
(c) Contractual Liability coverage.

2.1.4 Damages not to be Excluded:
Such insurance shall contain no exclusions applying to operations by the Contractor/Vendor or any Subcontractor in the performance of the Contract including but not limited to:
(a) Collapse of, or structural injury to, any building or structure;
(b) Damage to underground property; or
(c) Damage arising out of blasting or explosion.

2.2 Automobile Liability Insurance

2.2.1 Minimum Limits of Coverage:
Bodily Injury Liability and Property Damage Liability
Combined Single Limit - $500,000 any one accident.

2.2.2 Minimum Coverages to be Included:
Such insurance shall provide coverage for all owned, non-owned and hired automobiles.

2.3 Workers' Compensation and Employers' Liability Insurance

Such insurance must contain statutory coverage, including
Employers' Liability insurance with limits of at least:
Bodily Injury by Accident - $250,000 each accident
Bodily Injury by Disease - $500,000 policy limit
Bodily Injury by Disease - $250,000 each employee

2.4 Valuable Papers and Records Coverage and Electronic Data Processing (Data and Media) Coverage

Minimum Limits of Coverage:
$100,000 Per Claim and Each Occurrence
$100,000 in the Aggregate

2.5 Other

Such other insurance in form and amount as may be customary for the type of business being under taken by the Contractor/Vendor.

2.6 Builder's Risk

See Special Provisions page 316 and General Conditions page 34,35, Article 33.