TECHNICAL SPECIFICATIONS

FOR

GATES ELEMENTARY PARKING EXPANSION
DAVISON COMMUNITY SCHOOLS
DAVISON, MICHIGAN

CONSTRUCTION DOCUMENTS ISSUED: AUGUST 17, 2026

A/E NO. 2790-22.0B

OWNER
DAVISON COMMUNITY SCHOOLS
1490 N. OAK ROAD
DAVISON, MICHIGAN 48423
(810) 591-1050

ARCHITECTS/ENGINEERS
KINGSCOTT ASSOCIATES, INC
950 TRADE CENTRE WAY, SUITE 130
PORTAGE, MICHIGAN 49002
(269) 381-4880

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Kingscott Associates, Inc.
Architects/Engineers
Portage, Michigan

Gates Elementary Parking Expansion
Davison Community Schools
Davison, Michigan

NOTICE TO BIDDERS

Sealed Bids for the **Gates Elementary Parking Expansion Project** will be received by Davison Community Schools, at the Davison Administration Office, 1490 N. Oak Road, Davison, Michigan 49423, on **September 22nd, until 2:00 p.m.**, local time.

Bids will be opened publicly and read aloud at the Davison Administration Office.

Bids received after 2:00pm will be returned unopened. Each bid shall be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the owner or any employee of the firm submitting the bid and the Superintendent of Davison Community Schools or any member of the Board of Education.

Bids shall be executed on the Bid Form provided. Each proposal must be accompanied by a satisfactory certified check, money order, or bid bond payable to **Davison Community Schools** for not less than five (5%) percent of the amount of the bid and delivered in a sealed envelope bearing the bidder's name, address, and project identification.

All bids submitted shall be from a prime bidder only and shall include all subcontractor costs for scopes identified in the contract documents. **This project does not require prevailing wages.**

Successful bidder(s) will be awarded by AIA A101-2017, Standard Form of Agreement Between Owner and Contractor, issued by the Owner following direction by Davison Community Schools**.**

Bidding and Contract Documents will be available from Kingscott Associates, Inc. on **August 24, 2026,** on the Kingscott ShareFile site. For access to the Kingscott ShareFile site, please contact Lisa Dailey ldailey@kingscott.com. No printed sets of contract documents will be issued; however, the electronic files may be reproduced for bidding purposes by the bidder and at the bidder's expense.

The Owner reserves the right to accept or reject any or all bids, to waive any irregularities in bidding and to refrain from accepting or rejecting any bids for a period of thirty (30) days after the bid opening.

Contractors wishing to inspect the site shall contact **Rod Hoover at (810) 600-0306.**

The project scope of work includes the following:

1. Expansion of parking at west side of Gates Elementary School.

INSTRUCTIONS TO BIDDERS

DEFINITIONS: Bidding Documents include the Advertisement or Invitation for Bids, or Notice to Bidders, Instructions to Bidders, Bid/Proposal Forms and Supplements (if any), Sample Forms and the Proposed Contract Documents, including General Conditions of the Contract for Construction, Supplementary Conditions, Specifications, Drawings, and any Addenda issued prior to receipt of bids.

All definitions set forth in the General Conditions of the Contract for Construction or in any other Contract Documents are applicable to the Bidding Documents.

Addenda are written or graphic instruments issued by the Architects/Engineers prior to execution of a Contract which modify or interpret the Bidding Documents by additions, clarifications or corrections.

A Bid is a complete and properly signed proposal to do the Work or designated portion thereof for the sums stipulated therein submitted in accordance with and supported by such data as required by the Bidding Documents.

A Bidder is a person or entity who submits a Bid for the Work or specified portion thereof as described in the Proposed Contract Documents.

A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

BIDDER'S REPRESENTATIONS: Each Bidder by submitting a Bid represents that the Bidder has; read and understands the Bidding Documents and the Bid is made in accordance therewith; read and understands the Bidding Documents to the extent that such documentation relates to the Work for which the Bids is submitted, and to other portions of the Project (if any) that may be bid concurrently or are presently under construction; visited the site, become familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the proposed Contract Documents; based the Bid upon materials, systems, and equipment described in the Bidding Documents without exception, unless so noted as may be provided on the Bid Form.

BIDDING DOCUMENTS: Bidding Documents may be obtained from the issuing office as stated in the Advertisement, Invitation, or Notice to Bidders. All plans and specifications remain the property of the Architects/Engineers.

Complete sets of the Bidding Documents shall be used in preparing Bids. Neither the Owner nor the Architect/Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

In making electronic copies of the Bidding Documents available, the Owner and the Architect/Engineers do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant permission for any other use of the Bidding Documents.

INTERPRETATION OF BIDDING DOCUMENTS: Bidders shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it is related to the Work for which the Bid is submitted. Bidders shall promptly notify the Architect of any ambiguity, inconsistency or errors that they may discover upon examination of the Bidding Documents or of the site and local conditions.

Bidders or Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make such written request to the Architects/Engineers at least three (3) days prior to the date of receipt of bids. Any required interpretation, correction or change of the Bidding Documents will be made by addendum and will be issued by electronic transmission or posting to a File Transfer Protocol (FTP) site. Interpretations, corrections or changes made in any other manner are not binding and Bidders shall not rely upon such.

SUBSTITUTIONS: The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution. No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least three (3) days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work including changes in the work of other contracts that incorporation of the proposed substitution would require shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect decision of approval or disapproval of a proposed substitution shall be final.

If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum and will be issued by electronic transmission or posting to a File Transfer Protocol (FTP) site. Bidders shall not rely upon approvals made in any other manner. No substitutions will be considered after the Contract award unless specifically provided in the Contract Documents.

ADDENDA: Addenda will be issued by electronic transmission or posting to a File Transfer Protocol (FTP) or similar site to all who are known by the Architect to have received access to the Bidding Documents. Copies also will be made available for inspection wherever Bidding Documents are on file for that purpose. Each Bidder shall ascertain prior to submitting a bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the allotted space on the proposal form.

It shall be understood and agreed that the requirements contained in all Bidding Documents shall apply to all addenda items and the general character of the work called for in the Addenda shall be the same as originally required for similar work (unless otherwise noted) and that all incidental work necessitated shall be included, even though not specified herein.

BIDS - FORM AND STYLE: Bids shall be submitted in duplicate on forms provided by the Architects, with all applicable blanks filled in by typewriter or manually by ink. Where so indicated by the makeup of the Bid Form, sums shall be expressed in both words and figures. In case of discrepancy between the two, the written amount shall govern. Any interlineation, alteration or erasure must be initialed by the signer of the Bid.

Each Bid shall include the legal name and address of the Bidder and a statement whether the Bidder is a sole proprietor, partnership, corporation or any other Legal Entity. Each copy shall be signed by a person legally authorized to bind the Bidder to a Contract. Bids submitted by a corporation shall have the corporation seal affixed. Bids submitted by an agent shall be accompanied by a current power of attorney certifying the agent's authority to bind the Bidder.

SUBMISSION OF BIDS: **Bids can be submitted by mail**. All Bids submitted by mail shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the Owner and shall be identified with the Bidders name and address, the Project name, and the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with a notation "BID ENCLOSED" on the face thereof. If the bid is submitted via email, the subject line should consist of the Project Name and include the notation "BID ENCLOSED".

Bids shall be deposited at the designated location prior to the time and date indicated in the Advertisement, Invitation to Bid or Notice to Bidders or any extension thereof made by Addendum. Bids received after the time and date set for receipt of Bids will be returned unopened.

Bidders shall assume full responsibility for timely delivery to the location designated for receipt of Bids. Oral, telephonic, or telegraphic bids are invalid and will not receive consideration.

BID MODIFICATION OR WITHDRAWAL: The Bidders so agrees in submitting a Bid that it may not be modified, withdrawn or canceled during the stipulated time period following the time and date designated for receipt of Bids. Modification or withdrawal of an early submitted Bid may be made only by notice to the party receiving Bids at the place and prior to the time designated for receipt. Such notice shall be in writing over the signature of the Bidder or by telegram. If by telegram, written confirmation over the signature of the Bidder must have been mailed and postmarked on or before the date and time set for receipt of Bids. Modified or withdrawn Bids may be resubmitted up to the time designated for receipt of Bids, provided that they comply fully with all Bidding Documents.

CONSIDERATION OF BIDS: The Owner shall have the right to reject any and all Bids. A bid may be rejected if not accompanied by a required bid security, or by other data required by the Bidding Documents or which is in any way incomplete or irregular.

The Owner shall have the right to waive informalities or irregularities in a Bid received, and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

SUBMISSION OF POST BID INFORMATION: Bidders to whom award of a Contract is under consideration shall, upon request of the Architect, promptly submit statements setting forth previous experience, references, physical plant and equipment possessed, description of organization, financial resources and such other evidence as may testify to the ability to carry out contracts. This requirement may be met by submitting AIA Document A-305, Contractor's Qualification Statement.

Unless waived by the Architect, the Bidder shall as soon as practicable after notification of selection for the award of a Contract, submit the following information to the Architect:

A designation of the Work to be performed by the Bidders own forces.

The proprietary names and the suppliers of principal items or systems materials and equipment proposed for the Work.

A list of names of the Subcontractors or other persons or organizations (including those who are furnished materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

The Bidder will be required to establish to the satisfaction of the Architect and the Owner the reliability and responsibility of the proposed Subcontractors to furnish and perform the Work described in the sections of the specifications pertaining to such proposed Subcontractors respective trades.

Prior to the award of the Contract, the Architect will notify the Bidder in writing if after due investigation, the Owner or Architect has reasonable objection to any person or organization, on such list. If the Owner or Architect has a reasonable objection to any person or organization, the Bidder may, at the Bidders option, (l) withdraw the Bid or (2) submit an acceptable substitute person or organization with an adjustment in the Bid to cover the difference in cost occasioned by such substitution. The Owner may, at his discretion, accept the adjusted Bid or may disqualify the Bidder. In the event of either withdrawal or disqualification under this paragraph, bid security will not be forfeited.

Subcontractors and other persons and organizations proposed by the Bidder and accepted by the Owner and the Architect must be used on the Work for which they were proposed and accepted and shall not be changed except with the written approval of the Owner and Architect.

PERFORMANCE BOND AND PAYMENT BOND: The successful Bidder shall furnish a Performance Bond in an amount of not less than one hundred (l00%) percent of the contract sum as a security for the faithful performance of this contract and also a Payment Bond in an amount of not less than one hundred (l00%) percent of the sum of contract as security for the payment of all persons performing labor on the project under the contract and/or furnishing materials in connection with the contract. **Bidders shall include the premiums for bonds in their proposals, with all costs for the performance and payment bond included in the base bid amount.**

The Bidder shall deliver the required bonds to the Owner not later than the date of execution of the contract, or if the Work is commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work and if required by the Owner, submit evidence satisfactory to the Owner that such bonds will be issued.

The Bidder shall require the attorney in fact who executed the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney indicating the monetary limit of such power. Bonds shall be written in the form of AIA Document A-3l2, Performance Bond and Payment Bond or equivalent. Bonds shall be dated on or after the date of the Contract.

INSURANCE: Successful Bidders will be required to furnish evidence of insurance of the kind and in the amounts as required by the General Conditions of the Contract for Construction and Supplementary General Conditions.

PAYMENTS RETAINED: Owner shall make payments on account upon issuance of Certificates of Payment by the Architect for labor and material incorporated in the work and for materials suitably stored at the site up to ninety (90%) percent of the value thereof.

When the cumulative total of payment retained is equal to ten (10%) percent of the contract sum, subsequent payments will be made in the full amount for labor and material incorporated in the work and for materials suitably stored at the site, if, in the judgment of the Architect and the

Owner, the work is progressing satisfactorily. This amount shall be retained until final acceptance of the work.

FINAL PAYMENT: Final payment, including retained percentage, shall become due when the contractor submits satisfactory evidence to the Architect that:

All payrolls, bills for materials, equipment and other indebtedness connected with the work for which the Owner of his property might in any way be responsible have been paid or otherwise satisfied.

Consent of surety in writing to final payment.

Data establishing payment or satisfaction of all obligations, such as receipts, releases and waivers of liens from each supplier and subcontractor covering each item of work.

SPECIFICATIONS/AUTOMATED TECHNICAL SECTIONS: Portions of the specifications may have been derived from an automated master specification production system and may include minor deviations from traditional writing forms. Such deviations must be recognized as a normal result of this production technique, and no other meaning will be implied or permitted.

The editing and printing methods utilized by the automated procedures can produce some irregularities in grammatical structure such as form, structure, spelling and punctuation. Most are of common practice. Should any Bidder be in doubt as to the intended meaning, he shall so notify the Architect who in turn shall clarify the question by means of addenda to all Bidders.

MICHIGAN OCCUPATIONAL SAFETY AND HEALTH ACT (MIOSHA): The contractor is to note the MIOSHA - (ACT 154 of the Public Acts of 1974) amendments that include requirements for the communication of information regarding safe handling of hazardous chemicals present in Michigan workplaces known as “Michigan’s Right to Know Law”. The Contractor and all subcontractors shall comply with all required provisions that may relate to any materials that contain hazardous chemicals.

VOLUNTARY ALTERNATES: When reference is made in the specifications to one or more trade names or to the names of one or more manufacturers, such references are made to designate and identify the material or equipment to be furnished. The Bidder may, at his option, in addition to the Base Bid on the specified items, provide Voluntary Alternate proposals for optional materials and/or methods that the Bidder proposes to use, together with the difference in cost from that basically specified. The Owner reserves the right to accept or reject such options.

Submission of Voluntary Alternate proposals does not require prior approval of the Architect. However, where a proposed Voluntary Alternate requires changes or modifications, in assembly, detail or form of any other construction, for accommodation, it shall be the responsibility of the Bidder to reconcile and include all costs necessary for incorporation of such into the work. Voluntary Alternates, if accepted, will be incorporated into the executed contract.

ALTERNATES: Where, by make up of the Proposal Form provision is made for an "Alternate" the Bidder shall state the amount that will be added or deducted from the Base Bid if the Owner decides to accept a change in the scope of work or in products, materials, equipment, systems or installation methods that is described in the Contract Documents.

Included as part of each Alternate shall be all miscellaneous devices, appurtenances and similar items incidental to or required for a complete installation whether or not specifically mentioned as part of the Alternate.

BIDDING SCHEDULE

Documents available:	**August 24, 2026**
Bid Due Date:	**September 22, 2026, 2:00pm**
Post Bid Interviews:	**September 22, 2026, 2-4pm**
Owner Review:	**September 22-25, 2026**

CONSTRUCTION TIME OF COMPLETION:

Start date:	**October 6, 2026**
Final completion:	**November 20, 2026**

EXAMINATION OF SITE, EXISTING BUILDINGS AND CONTRACT DOCUMENTS:
Before submitting a proposal, each Bidder shall carefully examine the Contract Documents, visit the site of the Work, fully inform himself as to all existing conditions and limitations and shall include in the proposal a sum to cover the cost of all items included in the work. No additional compensation for the omission of any work, materials, and/or labor required to complete the work in accordance with the contract will be granted due to the bidder's failure to conform to these requirements.

Arrangements to visit the site may be made by contacting: Rod Hoover (810) 600-0306

Questions regarding the bid or contract documents shall be directed to:

T.J. O'Connor
Kingscott Associates, Inc.
950 Trade Centre Way, Suite 130
Portage, MI 49002

E-mail: tjoconnor@kingscott.com
Phone: (248) 506-8561

END OF SECTION

BID FORM

Owner:
Davison Community Schools
Davison, Michigan

The undersigned, having carefully examined the Notice to Bidders, Instruction to Bidders, the premise and conditions affecting this work, together with drawings and specifications for the **Gates Elementary Parking Expansion Project for Davison Community Schools** and other documents related thereto, does hereby propose to furnish labor, materials, services and equipment necessary to complete all work, called for by and in accordance with the drawings and specifications for same, issued for bidding and dated **August 17, 2026** including addenda numbered _____.

TIME OF COMPLETION

The undersigned agrees to start work upon receipt of the Contract and shall achieve Final Completion by **November 20, 2026**. Installations are to happen between **October 6, 2026** and **November 20, 2026.** (Note: Contract will be issued after a meeting (regular or special) of the Davison School Board).

EXCEPTIONS AND/OR SUBSTITUTIONS

We have submitted our proposal(s) complete as specified and in accordance with the Construction Documents WITH/WITHOUT (circle one) exceptions or substitutions. (Explain the exceptions or substitutions below).

_____
_____
_____
_____
_____

BASE BID for **Gates Elementary Parking Expansion Project for Davison Community Schools**:

_____

ACCEPTANCE:

The undersigned agree(s) to accept a contract for the work covered by this proposal, in accordance with the contract and bidding documents.

The Owner reserves the right to accept or reject any and all proposals or parts of the same.

BIDDER STATUS:

(Check One)
_____Individual _____Partnership _____Corporation

Submitted By:
Company _____

Address _____

_____

Telephone/Fax _____

Email _____

Signature/Date _____

Print Name/Title_____

SCHEDULE

The proposed schedule may be a deciding factor in the selection of the successful bidder. Please indicate the proposed schedule as follows:

Proposed Material Delivery Date: _____

Proposed Installation Start Date: _____

Proposed Completion Date: _____

SUBCONTRACTORS

Provide a list of subcontractors included in this bid:

_____

_____

_____

Kingscott Associates, Inc.
Architects/Engineers
Portage, Michigan

Gates Elementary Parking Expansion
Davison Community Schools
Davison, Michigan

AFFIDAVIT OF BIDDER #1

The undersigned, the owner or authorized officer of _____ (the "Bidder"), pursuant to the familial disclosure requirement provided in advertisement for construction bids and Instructions to Bidders, hereby represent and warrant, except as provided below, that no familial relationships exist between the owner(s) or any employee of and any other member of the Board of Education or Administration of **Davison Community Schools**, or the Superintendent of **Davison Schools**.

List any Familial Relationships:

BIDDER:_____

By: _____

Its:_____

STATE OF MICHIGAN)
)ss
COUNTY OF _____)

This instrument was acknowledged before me on the _____ day of _____, in the year _____, by_____.

_____
, Notary Public
_____County, Michigan

My Commission Expires: _____

Acting in the County of: _____

Kingscott Associates, Inc.
Architects/Engineers
Portage, Michigan

Gates Elementary Parking Expansion
Davison Community Schools
Davison, Michigan

AFFIDAVIT OF BIDDER #2

The undersigned, the owner or authorized officer of _____ (the "Bidder"), hereby certify that they are not an Iran-linked business nor on the U.S. Government Services Administration's Excluded Parties List.

BIDDER:_____

By: _____

Its:_____

STATE OF MICHIGAN)
)ss
COUNTY OF _____)

This instrument was acknowledged before me on the _____ day of _____, in the year _____, by_____.

_____
, Notary Public
_____County, Michigan

My Commission Expires: _____

Acting in the County of: _____

GENERAL CONDITIONS

GENERAL CONDITIONS A-201:

The General Conditions shall be the "General Conditions of the Contract for Construction ", AIA Document A-201, 2017 edition, issued by the American Institute of Architects, 1735 New York Avenue, N.W., Washington D.C. 20006.

The General Conditions are on file at the following location:

Architect:
Kingscott Associates Inc.
950 Trade Centre Way, Suite 130
Portage, MI 49002

SUPPLEMENTARY GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

SPECIAL NOTE:

These supplementary General Conditions consist of amendments and/or additions which shall take precedence over and modify specific articles and/or paragraphs of the "General Conditions of the Contract" A-201, 2007 Edition, and shall be used in conjunction with them as part of the contract documents. Any and/or all articles and/or paragraphs of the "General Conditions of the Contract" not specifically amended in this section shall apply in their entirety.

AMENDMENTS AND ADDITIONS:

The following items relate to the General Conditions by specific article and/or paragraph number being amended or added to. These items, as amendments, shall have precedence over only such portions and said articles and/or paragraphs of the General Conditions which are specifically modified thereby.

MODIFICATIONS OF THE GENERAL CONDITIONS

ARTICLE 1 GENERAL PROVISIONS Paragraph 1.2 Correlation and Intent of the Contract Documents, add the following subparagraph:

1.2.4. In case of an inconsistency between Drawings and Specifications or within either Document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.

ARTICLE 3 CONTRACTOR Paragraph 3.2. "Review of Contract Documents and Field Conditions by Contractor":

DELETE PARAGRAPH 3.2.2 AND REPLACE WITH THE FOLLOWING:

3.2.2 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner pursuant to Section 2.2.3 and shall at once report to the Architect errors, inconsistencies or omissions discovered. The Contractor shall not be liable to the Owner, or Architect for damage resulting from errors, inconsistencies or omissions in the Contract Documents unless the Contractor recognized such error, inconsistency or omission and knowingly failed to report it to the Architect. If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the Contract Documents without such notice to the Architect, the Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate amount of the attributable costs for correction. Prior to submitting its bid, the Contractor shall have studied and compared the Contract Documents and shall have reported to the Architect any error, inconsistency or omission in the Contract Documents. It will be presumed that the Contractor's bid and the Contract Sum include the cost of correcting any such error, inconsistency or omission, which could have been

discovered by the exercise of reasonable diligence. Unless the Contractor establishes that such error, inconsistency or omission could not have been discovered by the exercise of reasonable diligence, the contractor will make such corrections without additional compensation so that the Work is fully functional.

ARTICLE 3 CONTRACTOR Paragraph 3.4. "Labor and Materials" add the following to subparagraph 3.4.3:

Contractor shall enforce regulations regarding the use of tobacco products on school property.

ARTICLE 3 CONTRACTOR Paragraph 3.4 Labor and Materials, add the following subparagraph.

3.4.4 The Contractor shall take precautions to ensure that he or his subcontractors utilize no asbestos containing building materials (ACBM, as defined in section 763.83 of 40 CFR Part 763 amended). Upon completion of the work, and before final payment, the contractor shall submit a signed statement that "to the best of his or her knowledge no asbestos containing building materials (ACBM) was used as a building material in construction of the project."

ARTICLE 11 INSURANCE AND BONDS Paragraph 11.1 Contractor's Liability Insurance, add the following subparagraphs:

11.5 The Contractor shall purchase and maintain insurance for the following with minimum coverage as indicated and naming **Davison Community Schools and Kingscott Associates, Inc.**

COMPENSATION

Employer's Liability, Occupational Disease and Workmen's Compensation	$1,000,000 minimum and as required by the laws of the State of Michigan

PUBLIC LIABILITY AND PROPERTY DAMAGE

Comprehensive General Liability Form Required

Bodily Injury and Death	$1,000,000 each occurrence $1,000,000 aggregate
Property Damage	$1,000,000 each occurrence $1,000,000 aggregate

AUTOMOBILE LIABILITY

Comprehensive Automobile Liability Form Required

Bodily Injury and Death	$1,000,000 each person $2,000,000 each occurrence
Property Damage	$2,000,000 each occurrence

ADDITIONAL CONDITIONS

ADD ARTICLES 16 AND 17 AS FOLLOWS:

ARTICLE 16:

Pursuant to Michigan House Bill No. 5376, which amends Public Act 451 of 1976, each contractor/subcontractor shall provide the following:

"All bids shall be accompanied by a sworn statement disclosing any familial relationship that exists between the owner(s) or any employee of the bidder and any member of the Board of Education of the School District or the Superintendent of the School District**. The Board of Education shall not accept a bid that does not include a sworn and notarized relationship disclosure statement**."

ARTICLE 17

Pursuant to the Iran Economic Sanctions Act 517 of 2012,

(1) Beginning April 1, 2013, an Iran linked business is not eligible to submit a bid on a request for proposal with a public entity.

(2) Beginning April 1, 2013, a public entity shall require a person that submits a bid on a request for proposal with the public entity to certify that it is not an Iran linked business.

The contractor shall submit with their bid a sworn statement certifying the above.

END OF SECTION

Request for Information

RFI:

To: **Date:**

Company: **Project Name:**

Subject: **Response By:**

Reference:

Request:

Requested By: **Company:**

Response:

Response By:

Date:

PORTAGE
950 Trade Centre Way, Suite 130
Portage, MI 49002
T:800.632.7815

GRAND RAPIDS
801 Broadway NW, Suite 306
Grand Rapids, MI 49504
T: 800.632.7815

CHELSEA
300 N. Main Street, Suite 204
Chelsea, MI 48118
T:800.632.7815

ROYAL OAK
818 W. Eleven Mile Road
Royal Oak, MI 48067
T: 800.632.7815

Creating Places You'll Love!

SECTION 013300
ARCHITECT'S SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 DEFINITIONS

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

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

1.3 SUBMITTAL PROCEDURES

A. General: Electronic copies of CAD Drawings of the Contract Documents will be provided by Architect for Contractor's use in preparing submittals. See 1.4 below.

B. All submittals must be in electronic form. Paper copies are not acceptable unless specifically listed. The architect will review, stamp and return an electronic document for the contractor's use. Copies of the reviewed shop drawings shall be provided by the contractor for distribution as required by the Construction Manager.

C. Each submittal item shall be submitted in its entirety as one complete package including all information required to fully review the item. Material sample, data, warranty and maintenance information, and drawings shall come as one package. Submittals missing required components and / or without product selections identified will be rejected without review.

D. Compliance Certificate: Refer to the attached Compliance Certificate. Compliance Certificates are to be used by contractors to indicate the products/devices intended for use in this project without the need and time for product data submittals. Contractors shall use Compliance Certificates whenever possible to expedite the work and limit paper work. Items listed on the form must be approved products listed in the specifications. No substitutions allowed. Select one (1) source for each category, sign this sheet, and submit as the contractor's commitment to use products required by the contract documents. No further product data submittals are required for this section. Physical sample, color samples, or layout shop drawings must be submitted where required by the specification. Refer to the attached specification list for sections that are subject to this certificate. **NOTE: Not all specification sections listed below will apply to the project listed above. There might not be specification sections included that are in the**

project listed above, in that case coordinate with architect at post bid interview for submittal requirements.

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

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

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

F. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

G. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. RFI's, request for information: Allow 5 working days for initial response for each RFI. Allow additional time if coordination with subsequent RFI is required, or when additional information is need for the response.

2. Shop drawings, sample, and product data:

    a. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

    b. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.

    c. Resubmittal Review: Allow 15 days for review of each resubmittal.

    d. Sequential Review: where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.

    e. Submissions that are large or of multiple submissions or requires detailed or lengthy review by the Architect or his consultant may require additional time.

    f. Submissions for products or material that require a long lead time for delivery shall be noted as such and marked "Top Priority" so the architect may expedite the process. The architect will expedite reviews when the contractor legitimately can't submit within a reasonable time due to construction schedule. Failure to submit in a timely manner or to allow sufficient time for initial review and resubmittal reviews may result in project delays, additional service charges by the architect, or other penalties for the contractor.

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

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information on label for processing and recording action taken:

a. Project name.
b. Date.
c. Name and address of Architect.
d. Name and address of Contractor.
e. Name and address of subcontractor.
f. Name and address of supplier.
g. Name of manufacturer.
h. Submittal number or other unique identifier, including revision identifier.

1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).

i. Number and title of appropriate Specification Section.
j. Drawing number and detail references, as appropriate.
k. Location(s) where product is to be installed, as appropriate.
l. Other necessary identification.

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

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

1. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.

K. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form including electronic submittals. Architect will discard submittals received from sources other than the Construction Manager. Architect will return any submittal with a transmittal, which doesn’t fully list, and properly identify the enclosed items.

L. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked " Review or reviewed with comments."

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

1.4 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

A. General: At Contractor's written request, copies of Architect's CAD files will be provided to the Contractor for Contractor's use in connection with Project, subject to the following conditions:

1. The Architect will provide, electronic data files, compatible with AutoCAD for contractor's convenience and use in the preparation of shop drawings. **Refer to Terms and Conditions at the end of this specification.** Requests for electronic data shall be in written form through the architect. Prior to the release of electronic files, the Architect will require a signed waiver of release. Contractors should allow a minimum of 1-week for this process.

PART 2 - RFI'S – REQUEST FOR INFORMATION

1. All RFI's shall be submitted to the Architect in electronic form. PDF's and Word files are acceptable.

2. PDF RFI forms shall include an editable text area for response, date, and signature.

3. RFI's shall be distributed by e-mail. E-mail title shall be specific to job name, and RFI number. This is mandatory for proper tracking.

4. Faxed and Hand written RFI's are not acceptable and will be rejected.

PART 3 - PRODUCTS

3.1 ACTION SUBMITTALS

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

1. Submittal Types:
   a. Shop Drawing
   b. Product Data
   c. Sample
   d. Other

B. Kingscott Review Stamp Statement: "Reviewed only for the limited purpose of checking for conformance with the design concept expressed in the Contract Documents. Dimensions, quantities, accuracy, assembly methods, installation methods, coordination with other trades and field verification are the responsibility of the contractor."

1. The following Actions will be taken:
   a. Reviewed with no exceptions
   b. Reviewed with Exceptions
   c. Revise and resubmit
   d. Rejected

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

1. Use the Material Compliance form when permitted and whenever possible to save time and paper work.
2. If information must be specially prepared for submittal because standard data are not suitable for use, submit as Shop Drawings, not as Product Data.
3. Mark each copy of each submittal to show which products and options are applicable. Unmarked submittals will be rejected. Failure to mark appropriate products will result in rejection of the submittal.
4. Include the following information, as applicable:

    a. Manufacturer's written recommendations.
    b. Manufacturer's product specifications.
    c. Manufacturer's installation instructions.
    d. Manufacturer's catalog cuts.
    e. Wiring diagrams showing factory-installed wiring.
    f. Printed performance curves.
    g. Operational range diagrams.
    h. Compliance with specified referenced standards.
    i. Testing by recognized testing agency.

5. Number of Copies: Submit one electronic copy of Product Data, unless otherwise indicated. Architect will return one electronic copy. See the Constriction Manager's submittal requirements for final record and distribution copy requirements.

D. 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, unless submittal of Architect's CAD Drawings is otherwise permitted.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Dimensions.
    b. Identification of products.
    c. Fabrication and installation drawings.
    d. Roughing-in and setting diagrams.
    e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    f. Shop work manufacturing instructions.
    g. Templates and patterns.
    h. Schedules.
    i. Notation of coordination requirements.
    j. Notation of dimensions established by field measurement.
    k. Relationship to adjoining construction clearly indicated.
    l. Seal and signature of professional engineer if specified.
    m. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
3. Number of Copies: Submit one opaque (bond) copy, and one electronic copy of each submittal. Architect will return one electronic copy for printing and distribution.

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

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

    a. Generic description of Sample.
    b. Product name and name of manufacturer.
    c. Sample source.
    d. Number and title of appropriate Specification Section.

3. 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.
4. 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. **Scanned color charts, samples, etc. will be REJECTED. Send physical samples, color charts, etc. as described in each specification section.**

    a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection**. Scanned color charts, samples, etc., will be REJECTED. Send physical samples, color charts, etc. as described in each specification section.**

    a. Number of Samples: Submit three sets of Samples. Architect will retain one Sample set; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.

3.2 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit four copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 4 - EXECUTION

4.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions prior to submission for review. It is the contractor’s responsibility to review and identify major discrepancy with the contract dements, and significant missing information. Documents with discrepancies and substantially missing information shall be returned for revisions prior to submission to the Construction Manager.

B. Mark with approval stamp before submitting to the Construction Manager.

C. 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.

4.2 CONSTRUCTION MANAGER'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions prior to submission for review. It is the Construction Manager’s responsibility to review and identify major discrepancy with the contract dements, and significant missing information. Documents with discrepancies and substantially missing information shall be returned for revisions prior to submission to the Architect.

B. Mark with approval stamp before submitting to Architect.

C. 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 approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

4.3 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's and Construction Managers approval stamp, and have not been fully reviewed and will return them without action.

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

1. Reviewed with no exceptions.
2. Reviewed with exceptions.
3. Revise and resubmit.
4. Rejected.

C. Partial submittals are not acceptable, will be considered non-responsive, and will be returned without review.

D. Incomplete submittals with substantial missing information, will be considered non-responsive, and will be returned without review.

E. Non-complaint submittals, will be considered non-responsive, and will be returned without review.

F. Submittals not required by the Contract Documents will not be reviewed and will be discarded.

SUMBITTALS REQUESTED BY SPECIFICATION SECTION						
This is a general guide, but may vary by project.						
Given the age of digital submittal, product information and images, and multiple files can be compiled into one complete product data page. When this complete product data sheet is submitted, it becomes an acceptable option to help limit physical samples and paper.						
SECTION. NO.	SECTION TITLE	PRODUCT DATA	SAMPLE	SHOP DRAWINGS	MATERIAL COMPLIANCE	TESTING
033000	CAST-IN-PLACE CONCRETE	X		X		X
042000	UNIT MASONRY/BRICK	X	X (BRICK)			
047200	CAST STONE	X	X			
051200	STRUCTURAL STEEL FRAMING			X		
052100	STEEL JOIST			X		
053100	STEEL DECKING				X	
054000	COLD-FORMED METAL FRAMING			X		
055000	METAL FABRICATIONS			X		
055113	METAL PAN STAIRS			X		
055213	PIPE AND TUBE			X		
061000	ROUGH CARPENTRY				X	
061053	MISCELLANEOUS ROUGH CARPENTRY				X	
061063	EXTERIOR ROUGH CARPENTRY				X	
061600	SHEATHING				X	
061753	SHOP-FABRICATED WOOD TRUSSES			X		
062013	EXTERIOR FINISH CARPENTRY		X		X	
062023	INTERIOR FINISH CARPENTRY		X		X	
071326	SELF-ADHERING SHEET	X			X	
072100	THERMAL INSULATION	X			X	
072119	FOAMED-IN-PLACE INSULATION	X			X	
072500	WEATHER BARRIERS	X			X	
072600	VAPOR RETARDERS	X			X	
073113	ASPHALT SHINGLES		X			

SECTION. NO.	SECTION TITLE	PRODUCT DATA	SAMPLE	SHOP DRAWINGS	MATERIAL COMPLIANCE	TESTING
074113.16	STANDING-SEAM METAL ROOF PANELS		X			
074213.13	FORMED METAL WALL PANELS		X	X		
074213.19	INSULATED METAL WALL PANELS		X	X		
075323	ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING			X		
075423	THERMOPLASTIC POLYOLEFIN (TPO) ROOFING			X		
076200	SHEET METAL FLASHING AND TRIM		X			
077100	ROOF SPECIALTIES	X			X	
077129	MANUFACTURED ROOF EXPANSION JOINTS	X			X	
077200	ROOF ACCESSORIES	X			X	
078413	PENETRATION FIRESTOPPING				X	
078443	JOINT FIRESTOPPING				X	
079200	JOINT SEALANTS	X	X			
079219	ACOUSTICAL JOINT SEALANTS	X	X			
081213	HOLLOW METAL DOORS AND FRAMES			X		
081416	FLUSH WOOD DOORS		X	X		
083113	ACCESS DOORS AND FRAMES				X	
083313	COILING COUNTER DOORS			X		
083323	OVERHEAD COILING DOORS			X		
083513	FOLDING DOORS			X		
083613	SECTIONAL DOORS			X		

SECTION. NO.	SECTION TITLE	PRODUCT DATA	SAMPLE	SHOP DRAWINGS	MATERIAL COMPLIANCE	TESTING
084113	ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS		X	X		
084413	GLAZED ALUMINUM CURTAIN WALLS		X	X		
084523	FIBERGLASS-SANDWICH-PANEL ASSEMBLIES	X			X	
085113	ALUMINUM WINDOWS		X	X		
087100	DOOR HARDWARE			X		
088000	GLAZING	X			X	
088300	MIRRORS				X	
089119	FIXED LOUVERS		X	X		
092116.23	GYPSUM BOARD SHAFT WALL ASSEMBLIES				X	
092216	NON-STRUCTURAL METAL FRAMING				X	
092900	GYPSUM BOARD				X	
093013	CERAMIC TILE	X			X	
095113	ACOUSTICAL PANEL CEILING				X	
096513	RESILIENT BASE & ACCESSORIES				X	
096516	RESILIENT SHEET VINYL	X				
096519	RESILIENT TILE FLOORING	X				
096566	RESILIENT ATHLETIC FLOORING	X				
096813	TILE CARPET	X				
096816	SHEET CARPET	X				
097200	WALL COVERINGS	X				
098433	SOUND ABSORBING WALL UNITS	X				
098436	SOUND ABSORBING CEILING UNITS	X				
099113	EXTERIOR PAINTING		X			
099123	INTERIOR PAINTING		X			
099600	HIGH PERFORMANCE COATINGS		X			

SECTION. NO.	SECTION TITLE	PRODUCT DATA	SAMPLE	SHOP DRAWINGS	MATERIAL COMPLIANCE	TESTING
101100	VISUAL DISPLAY BOARDS			X	X	
101200	DISPLAY CASES			X	X	
101423	PANEL SIGNAGE		X	X		
102113	TOILET COMPARTMENTS	X		X		
102116	SHOWER AND DRESSING COMPARTMENTS	X		X		
102123	CUBICAL CURTAINS AND TRACK	X			X	
102800	TOILET, BATH, AND LAUNDRY ACCESSORIES (CONTRACTOR TO VERIFY QUANTITIES				X	
104413	FIRE PROTECTION CABINETS				X	
104416	FIRE EXTINGUISHERS				X	
105113	METAL LOCKERS		X	X		
105613	METAL SHELVING				X	
105626	MOBILE STORAGE SHELVING			X	X	
113100	RESIDENTIAL APPLIANCES				X	
115123	LIBRARY STACK SYSTEMS		X	X		
115213	PROJECTION SCREENS				X	
115313	LABORATORY FUME HOODS		X	X		
116143	STAGE CURTAINS		X	X		
116623	GYMNASIUM EQUIPMENT		X	X		
126600	TELESCOPING STANDS		X	X		
122113	HORIZONTAL BLINDS	X				
122413	VERTICLE BLINDS	X				
122413	ROLLER SHADES (OPERABLE SHOP DRAWINGS)	X		X	X	

SECTION. NO.	SECTION TITLE	PRODUCT DATA	SAMPLE	SHOP DRAWINGS	MATERIAL COMPLIANCE	TESTING
123___	CASEWORK AND COUNTERTOPS		X	X		
124816	ENTRANCE FLOOR GRILLS	X				

Material Compliance Form

Name of Building:

Owner:

Bid Package #:

A/E #:

Cc:

Material Compliance Submittal Section:

This document is to be used by this contractor to indicate the products/devices intended for use in this project without the need for product data submittals. Items listed are approved products in the specifications. No substitutions allowed. Select one (1) source for each category, sign this sheet, and submit as the contractor's commitment to use products required by the contract documents. **No further product data submittals are required for this section. However, physical sample, color samples, or layout shop drawings must be submitted where required by the specification.**

As contractor for work specified under the section named above, I agree to use only the products/devices listed below that were listed in the specification section.

Contractor:

Date:

Print Name: Filled out by Contractor

Title:

Signature: _____

Notary:

County:

Date Commission Expires:

Name:

Signature: _____

Filled out by Contractor and Notary used from Contractor

Reviewed By: Construction Manager, Inc.

Date:

Print Name: Filled out by Construction Manager

Signature: _____

Reviewed By: Kingscott Associates, Inc.

Date:

Name:

Signature: _____

Filled out by Architect

List the manufacturer's name and model number(s) for each item being submitted in this division. Provide all relevant information not covered by the model number to show full compliance with each requirement of the specification. This will include but is not limited to color, finish, size, thickness and all other selectable option. Note: Use location for each listed item when several different products in this division are used in specific locations.

Specification Section:	Manufacturer's Name:	Model Number:
096519	Shaw Commercial	Uncommon Ground 6 #0188V (LVT-1)
096519	Shaw Commercial	Skyline #02560 (LVT-2)
095113	Armstrong	#1713 (CP-1)
095113	Armstrong	#3101 (CP-2)
095113	Armstrong	Armstrong Prelude XL (ME-1 grid)
095113	Armstrong	Armstrong Axiom Classic Trim (ME-2 grid and trim)

SAMPLE

Material Compliance Form

Name of Building:

Owner:

Bid Package #:

A/E #:

Cc:

Material Compliance Submittal Section:

This document is to be used by this contractor to indicate the products/devices intended for use in this project without the need for product data submittals. Items listed are approved products in the specifications. No substitutions allowed. Select one (1) source for each category, sign this sheet, and submit as the contractor's commitment to use products required by the contract documents. **No further product data submittals are required for this section. However, physical sample, color samples, or layout shop drawings must be submitted where required by the specification**.

As contractor for work specified under the section named above, I agree to use only the products/devices listed below that were listed in the specification section.

Contractor:

Date:

Print Name:

Title:

Signature: _____

Notary:

County:

Date Commission Expires:

Print Name:

Signature: _____

Reviewed By: Construction Manager, Inc.

Date:

Print Name:

Signature: _____

Reviewed By: Kingscott Associates, Inc.

Date:

Print Name:

Signature: _____

List the manufacturer's name and model number(s) below for each item being submitted in this division. Provide all relevant information not covered by the model number to show full compliance with each requirement of the specification. This will include but is not limited to color, finish, size, thickness and all other selectable option. Note: Use location for each listed item when several different products in this division are used in specific locations.

Specification Section:	Manufacturer's Name:	Model Number:

Electronic Media Authorization

Signed waiver required prior to release

Project Name: _____ KAI Project# _____

Name : _____ Company: _____

Address: _____

City, State, Zip: _____

Phone: _____ Email: _____

File version: _____

Signature: _____ Date: _____

By signing, you are agreeing to the Terms and Conditions on the following page

Documents Requested: KAI DWG # Issued Date on DWG

_____

_____

_____

_____

Approved by: _____ Date:_____

Return Form to:
Project Architect
Kingscott Associates
tjoconnor@kingscott.com

CHELSEA
300 N. Street, Suite 204
Chelsea, MI 48118
800.632.7815

DETROIT
7303 W. Seven Mile Road
Detroit, MI 48221
800.632.7815

GRAND RAPIDS
801 Broadway NW, Suite 306
Grand Rapids, MI 49504
800.632.7815

PORTAGE
950 Trade Centre Way, Suite 130
Portage, MI 49002
800.632.7815

Creating Places You Love!

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INDEMNIFICATION
You agree to the fullest extent permitted by law, indemnify and hold harmless, Kingscott from all claims, damages, losses and expenses, including attorney's fees arising out of or resulting from your use of these electronic files. Because of the potential that the information presented on the electronic files can be modified, unintentionally or otherwise, Kingscott reserves the right to remove all indicia of its ownership and/or involvement for each electronic display. These electronic files are for the exclusive use of the addressee and shall not be transferred to a second party without the written consent of Kingscott.

Kingscott will furnish to you electronic files after the completion of the Electronic Media Authorization Form. Under no circumstances, shall a delivery of the electronic files for use by you, be deemed a sale by Kingscott.

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. This Section includes the following:

1. Protecting existing trees, shrubs, groundcovers, plants and grass to remain.
2. Removing existing trees, shrubs, groundcovers, plants, and grass.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Temporary erosion and sedimentation control measures.

B. Related Sections include the following:

1. Division 01 Section "Sustainable Design Requirements" for additional LEED requirements.
2. Division 01 Section "Temporary Facilities and Controls" for temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and temporary erosion and sedimentation control procedures.
3. Division 01 Section "Temporary Tree and Plant Protection" for protecting trees remaining on-site that are affected by site operations.
4. Division 01 Section "Execution" for verifying utility locations and for recording field measurements.
5. Division 02 Section "Structure Demolition" for demolition of buildings, structures, and site improvements.
6. Division 02 Section "Selective Structure Demolition" for partial demolition of buildings or structures undergoing alterations.
7. Division 31 Section "Earth Moving" for soil materials, excavating, backfilling, and site grading.
8. Division 23 Section "Turf and Grasses, Plants" for finish grading including preparing and placing planting soil mixes and testing of topsoil material.

1.3 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.

B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 MATERIAL OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

B. Record drawings, according to Division 01 Section "Project Record Documents," identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 PROJECT 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 authorities having jurisdiction.

B. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

C. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place. Finalize and submit soil erosion permit and bond prior to earthwork construction. Coordinate with Architect/Engineer. Comply with conditions of permit.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 31 Section "Earth Moving."

1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly flag trees and vegetation to remain or to be relocated.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction and sediment and erosion control Drawings.

B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE PROTECTION

A. Erect and maintain temporary fencing around tree protection zones before starting site clearing. Remove fence when construction is complete.

1. Do not store construction materials, debris, or excavated material within fenced area.
2. Do not permit vehicles, equipment, or foot traffic within fenced area.
3. Maintain fenced area free of weeds and trash.

B. Do not excavate within tree protection zones, unless otherwise indicated.

C. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.

1. Employ an arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
2. Replace trees that cannot be repaired and restored to full-growth status, as determined by Architect.

3.4 UTILITIES

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.

B. Sections covering site utilities.

3.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, grass, 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.
2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
3. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
4. Use only hand methods for grubbing within tree protection zone.
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 8 inches, and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and nonsoil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Limit height of topsoil stockpiles to 72 inches.
2. Do not stockpile topsoil within tree protection zones.
3. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.7 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

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. This Section includes the following:

1. Preparing subgrades for slabs-on-grade, walks, pavements, lawns, and grasses and exterior plants.
2. Excavating and backfilling for buildings and structures.
3. Subbase course for concrete walks, pavements.
4. Excavating and backfilling for utility trenches.
5. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures.

B. Related Sections include the following:

1. Division 01 Section "Allowances" for quantity allowance provisions related to unit-price rock excavation and authorized additional excavation.
2. Division 01 Section "Unit Prices" for unit-price rock excavation and authorized additional excavation provisions.
3. Division 01 Section "Photographic Documentation" for recording pre-excavation and earthwork progress.
4. Division 01 Section "Temporary Facilities and Controls" for temporary controls, utilities, and support facilities.
5. Division 01 Section "Temporary Tree and Plant Protection" for protecting and trimming trees to remain.
6. Division 03 Section "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
7. Divisions 21, 22, 23, 26, 27, and 28 Sections for installing underground mechanical and electrical utilities and buried mechanical and electrical structures.
8. Division 31 Section "Site Clearing" for temporary erosion and sedimentation control measures, site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
9. Division 31 Section "Dewatering" for lowering and disposing of ground water during construction.
10. Division 31 Section "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.

11. Division 31 Section "Drilled Concrete Piers and Shafts" for excavation of shafts and disposal of surplus excavated material.
12. Division 32 Section "Turf and Grasses" for finish grading, including preparing and placing topsoil and planting soil for lawns.
13. Division 32 Section "Plants" for planting bed establishment and tree and shrub pit excavation and planting.
14. Division 33 Section "Subdrainage" for drainage of foundations, slabs-on-grade, walls, and landscaped areas.

1.3 UNIT PRICES

A. Unit prices for earthwork are included in Division 01 Section "Unit Prices."

B. Quantity allowances for earthwork are included in Division 01 Section "Allowances."

C. Rock Measurement: Volume of rock actually removed, measured in original position, but not to exceed the following. Unit prices for rock excavation include replacement with approved materials.

1. 24 inches outside of concrete forms other than at footings.
2. 12 inches outside of concrete forms at footings.
3. 6 inches outside of minimum required dimensions of concrete cast against grade.
4. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
5. 6 inches beneath bottom of concrete slabs-on-grade.
6. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.

1.4 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material 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. Base Course: Course placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. 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 Architect. 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 Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

F. Fill: Soil materials used to raise existing grades.

G. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,090 lbf and stick-crowd force of not less than 18,650 lbf; measured according to SAE J-1179.
2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 210-hp flywheel power and developing a minimum of 48,510-lbf breakout force with a general-purpose bare bucket; measured according to SAE J-732.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by an independent geotechnical testing agency, according to ASTM D 1586.

I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

J. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

K. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

L. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.5 SUBMITTALS

A. Product Data: For the following:

1. Each type of plastic warning tape.
2. Controlled low-strength material, including design mixture.

B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D 2487 of each borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D 698 for each borrow soil material proposed for fill and backfill.

C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earthwork operations. Submit before earthwork begins.

1.6 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.

1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.
3. Contact utility-locator service for area where Project is located before excavating.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

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

B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM AASHTO M 145 Soil Classification Groups A-1, A-2-4, A-2-5, and A-3, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487 A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch

sieve and not more than 12 percent passing a No. 200 sieve. Acceptable alternative - MDOT Class II fill.

E. Base Course: Dense Graded Aggregate conforming to MDOT current specifications for grade of gravel as designated on the plans.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve. Acceptable alternative – MDOT Class IIIa fill.

H. Sand: ASTM C 33; fine aggregate, natural, or manufactured sand. Acceptable alternate – MDOT Class 2NS.

2.2 CONTROLLED LOW-STRENGTH MATERIAL

A. Controlled Low-Strength Material: Low-density, self-compacting, flowable concrete material as follows:

1. Portland Cement: ASTM C 150, Type I.
2. Fly Ash: ASTM C 618, Class C or F.
3. Normal-Weight Aggregate: ASTM C 33, 3/4-inch nominal maximum aggregate size.
4. Foaming Agent: ASTM C 869.
5. Water: ASTM C 94/C 94M.
6. Air-Entraining Admixture: ASTM C 260.

B. Produce low-density, controlled low-strength material with the following physical properties:

1. As-Cast Unit Weight: 30 to 36 lb/cu. ft. at point of placement, when tested according to ASTM C 138/C 138M.
2. Compressive Strength: 80 psi, when tested according to ASTM C 495.

C. Produce conventional-weight, controlled low-strength material with 80-psi compressive strength when tested according to ASTM C 495.

2.3 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.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer 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 earthwork operations.

B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 31 Section "Site Clearing."

C. Protect and maintain erosion and sedimentation controls, which are specified in Division 31 Section "Site Clearing," during earthwork operations.

D. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost.

3.2 DEWATERING

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

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. Install a dewatering system, specified in Division 31 Section "Dewatering," to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

    a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations 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. Pile Foundations: Stop excavations 6 to 12 inches above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
3. 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.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks 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. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

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, unless otherwise indicated.

1. Clearance: 12 inches each side of pipe or conduit or as detailed.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. For pipes and conduit less than 6 inches in nominal diameter and flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe circumference. Fill depressions with tamped sand backfill.
3. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.8 SUBGRADE INSPECTION

A. Notify Architect when excavations have reached required subgrade.

B. If Architect 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 heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not 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. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices .

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

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 compressive strength of 2500 psi, may be used when approved by Architect.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 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 and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of 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. 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 Division 03 Section "Cast-in-Place Concrete."

D. Provide 4-inch- thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase.

E. Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the utility pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

F. Backfill voids with satisfactory soil while installing and removing shoring and bracing.

G. Place and compact final backfill of satisfactory soil to final subgrade elevation.

H. Install warning tape directly above utilities, 12 inches below finished grade, except 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.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

C. Place soil fill on subgrades free of 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 compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 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 unit weight according to ASTM D 698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
3. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 90 percent.

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 Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 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 SUBBASE AND BASE COURSES

A. Place subbase course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course under pavements and walks as follows:
1. Shape subbase course to required crown elevations and cross-slope grades.
2. Place subbase course 6 inches or less in compacted thickness in a single layer.

3. Place subbase 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 subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.18 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades 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 ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than 3 tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least 1 test for each 100 feet or less of wall length, but no fewer than 2 tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least 1 test for each 150 feet or less of trench length, but no fewer than 2 tests.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.19 PROTECTION

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

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; 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.

3.20 DISPOSAL OF SURPLUS AND WASTE MATERIALS

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

B. Disposal: Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.

1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off 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. Hot-mix asphalt paving.
2. Pavement-marking paint.

B. Related Sections:

1. Division 31 Section "Earth Moving" for aggregate subbase and base courses and for aggregate pavement shoulders.
2. Division 32 Sections for other paving installed as part of crosswalks in asphalt pavement areas.

1.3 DEFINITION

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

1. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.

B. Material Test Reports: For each paving material.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or MDOT.

B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of MDOT Standard for asphalt paving work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.

B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Prime Coat: Minimum surface temperature of 60 deg F.
2. Tack Coat: Minimum surface temperature of 60 deg F.
3. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
4. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials and 55 deg F for water-based materials, and not exceeding 95 deg F.

C. Imprinted Asphalt Paving: Proceed with coating imprinted pavement only when air temperature is at least 50 deg F and rising and will not drop below 50 deg F within 8 hours of coating application. Proceed only if no precipitation is expected within two hours after applying the final layer of coating.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

2.2 ASPHALT MATERIALS

A. Prime Coat: Asphalt emulsion prime coat complying with MDOT requirements.

B. Tack Coat: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397 or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

C. Water: Potable.

2.3 AUXILIARY MATERIALS

A. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248, Type N; colors complying with FS TT-P-1952.

1. Color: White for general striping and pavement markings. Provide blue for barrier free parking areas.

2.4 MIXES

A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction. Refer to Drawings for specific additional information.

1. Pavement Cross Section
   a. As indicated on plans.

2. Heavy Duty Pavement:
   a. Base Course: As indicated on plans.
   b. Surface Course: As indicated on plans.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not 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. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

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

3.2 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

3.3 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
2. Place hot-mix asphalt surface course in single lift where indicated.
3. Spread mix at minimum temperature of 250 deg F.
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.4 JOINTS

A. Construct joints to ensure 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. 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 according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
3. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
4. Compact asphalt at joints to a density within 2 percent of specified course density.

3.5 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 96 percent of reference laboratory density according to AASHTO T 245, but not less than 94 percent nor greater than 100 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while 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.

3.6 INSTALLATION TOLERANCES

A. Thickness: Compact each course to produce the minimum thickness specified. No minus tolerance is provided.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch.
2. Surface Course: 1/8 inch.
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

C. Ponding or birdbaths of any degree will not be acceptable, even for areas of milling and repaving. Contractor shall field adjust exact final surface to avoid such.

3.7 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow paving to age for 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979 or AASHTO T 168.

E. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.9 DISPOSAL

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

1. Do not allow milled materials to accumulate on-site.

END OF SECTION 321216

SECTION 321313
CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes exterior cement concrete pavement for the following:

1. Driveways and roadways.
2. Parking lots.
3. Curbs and gutters.
4. Walkways.

B. Related Sections include the following:

1. Division 03 Section "Cast-in-Place Concrete" for general building applications of concrete.
2. Division 31 Section "Earth Moving" for subgrade preparation, grading, and subbase course.
3. Division 32 Section "Decorative Concrete Paving" for surface-imprinted, stamped finished concrete pavement.
4. Division 32 Section "Concrete Paving Joint Sealants" for joint sealants of joints in concrete pavement and at isolation joints of concrete pavement with adjacent construction.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.4 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Qualification Data: For testing agency.

D. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:

1. Aggregates.

E. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Admixtures.
4. Bonding agent or epoxy adhesive.
5. Joint fillers.

F. Field quality-control test reports.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.

B. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.

C. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

1.6 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.

1. Use flexible or curved forms for curves with a radius 100 feet or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

C. Plain Steel Wire: ASTM A 82, galvanized.

D. Deformed-Steel Wire: ASTM A 496.

E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

A. Normal-Weight Aggregates: ASTM C 33, Class 4S coarse aggregate, uniformly graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 1 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

B. Water: ASTM C 94/C 94M.

C. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

2.4 CURING MATERIALS

A. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

B. Water: Potable.

2.5 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to requirements, and as follows:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.6 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.

1. Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 4000 psi.
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
3. Slump Limit: 5 inches, plus or minus 1 inch.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

E. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements for concrete exposed to deicing chemicals.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 deg F 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.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll prepared subbase surface below concrete pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a loaded 10-wheel tandem-axle dump truck weighing not less than 15 tons.
3. Subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch require correction according to requirements in Division 31 Section "Earth Moving."

C. Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edgings 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 pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.

1. Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
2. Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 50 feet, unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows to match jointing of existing adjacent concrete pavement:

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. 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.
2. Sawcut joints shall be clean and straight.
3. Contractor to provide sketch of proposed contraction joint spacing pattern. Do not rely or use any assumed lines on plan drawings.

E. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 3/8-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site.

F. Do not add water to fresh concrete after testing.

G. 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.

H. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

I. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.

1. Remove and replace concrete that has been placed for more than 15 minutes without being covered by top layer, or use bonding agent if approved by Architect.

J. Screed pavement surfaces with a straightedge and strike off.

K. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

L. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.

M. Slip-Form Pavers: When automatic machine placement is used for pavement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce pavement to required thickness, lines, grades, finish, and jointing as required for formed pavement.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of paver machine during operations.

N. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.

O. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.

P. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, 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 during curing period using cover material and waterproof tape.

3.9 PAVEMENT TOLERANCES

A. Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot- long, unleveled straightedge not to exceed 1/4 inch.
4. Joint Spacing: 3 inches.
5. Contraction Joint Depth: Plus 1/4 inch, no minus.
6. Joint Width: Plus 1/8 inch, no minus.

B. Ponding or birdbaths of any degree will not be acceptable, even for areas of exact replacement. Contractor shall field adjust exact final surface to avoid such.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least 1 composite sample for each 5000 sq. ft. or fraction thereof of each concrete mix placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test 1 specimen at 7 days and 2 specimens at 28 days.

    a. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mix will be satisfactory if average of any 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 Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect 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 Architect.

G. Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.

B. Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.

C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

SECTION 321723
PAVEMENT MARKINGS

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 painted markings applied to asphalt pavement.

B. Related Requirements:

1. Section 321216 “Asphalt Paving”.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to marking pavement including, but not limited to, the following:

a. Pavement aging period before application of pavement markings.
b. Review requirements for protecting pavement markings, including restriction of traffic during installation period.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include technical data and tested physical and performance properties.

B. Shop Drawings: For pavement markings.

1. Indicate pavement markings, colors, lane separations, defined parking spaces, and dimensions to adjacent work.
2. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of MDOT for pavement-marking work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Aexcel Inc.
2. Benjamin Moore & Co.
3. Color Wheel Paints & Coatings.
4. Columbia Paint & Coatings.
5. Conco Paints.
6. Coronado Paint; Division of INSL-X Products Corporation.
7. Diamond Vogel Paints.
8. Dunn-Edwards Corporation.
9. Ennis Traffic Safety Solutions, Inc.
10. Frazee Paint.
11. General Paint.
12. Kwal Paint.
13. M.A.B. Paints.
14. McCormick Paints.
15. Miller Paint.
16. Parker Paint Mfg. Co. Inc.
17. PPG Industries.
18. Pratt & Lambert.
19. Rodda Paint Co.
20. Rohm and Haas Company; a subsidiary of The Dow Chemical Company.
21. Scott Paint Company.
22. Sherwin-Williams Company (The).

2.2 PAVEMENT-MARKING PAINT

A. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type II, with drying time of less than 45 minutes.

1. Color: As indicated on plans.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that pavement is dry and in suitable condition to begin pavement marking according to manufacturer's written instructions.

B. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

B. Allow paving to age for a minimum of 14 days, or 7 days with ambient temperature above 65 deg. F. before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to pavement. Mask an extended area beyond edges of each stencil to prevent paint application beyond the stencil. Apply paint so that it cannot run beneath the stencil.

3.3 PROTECTING AND CLEANING

A. Protect pavement markings from damage and wear during remainder of construction period.

B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 321723

SECTION 329119 - TOPSOIL FOR LANDSCAPING & CONSTRUCTION

PART 1 – GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents and shall be coordinated with the applicable provisions of the other parts.

B. Related Requirements:

1. Section 329113 Soil Preparation
2. Section 329200 Turf and Grasses
3. Section 329300 Plants
4. Section 329600 Transplanting

1.2 DEFINITIONS

A. ASTM: American Society for Testing and Materials

B. CEC: cation exchange capacity

C. Cm: Centimeter, unit of length in metric system

D. Engineered Soil Amendment: in erosion control, an alternative to topsoil to accelerate development of depleted soils/substrates with low organic matter, low nutrient levels and limited biological activity.

E. pH: a measure of how acidic or basic a liquid or solution is. It's measured on a scale from 0 to 14, with 7 being neutral. Values below 7 indicate acidity, and values above 7 indicate alkalinity (or basicity).

F. Ppm: Parts Per Million, unit used to express concentration of a substance in a solution or mixture.

G. Mmhos: "Millimhos", a unit of electrical conductivity specifically $1/1000^{th}$ of a mho (also known as siemens). It's commonly used to measure the ability of a substance to conduct an electric current, particularly in water or soil.

H. Saturated past extract: in soil testing, a mixture of soil or plant media created from a mixture of distilled water and soil or plant media used for obtaining soil testing values, the mixture usually creates a "paste" like material.

I. SI units: International System of Units, also known as the metric system.

J. Topsoil: in soil horizons, the naturally formed top horizon of ten designated as “A” horizon consisting of soils and materials which support the growth of plants and normally has a greater degree of weathering and greater accumulations of organic matter than underlying soil horizons or soil parent material.

1.3 REFERENCED DOCUMENTS

A. ASTM D18: Soil and Rock

B. ASTM D18.22: Media for Plant Growth

C. ASTM D653: Terminology Relating to Soil, Rock, and Contained Fluids

D. ASTM D2216: Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

E. ASTM D2974: Test Methods for Determining the Water(Moisture) Content, Ash Content, and Organic Material of Peat and Other Organic Soils

F. ASTM D3740: Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction

G. ASTM D4972: Test Methods for pH of Soils

H. ASTM D6026: Practice for Using Significant Digits and Data Records in Geotechnical Data

I. World Trade Organization Technical Barriers to Trade (TBT) Committee.

J. Decision on Principles for the Development of International Standards

1.4 SCOPE

A. This specification covers a physical evaluation of a soil containing organic material, relative to its use as a topsoil for vegetative growth purposes in landscaping and construction. For classification, a full agricultural textural classification may be used. Soils being evaluated for use as a topsoil must meet the requirements in Table 1.

B. When physically evaluating a soil, relative to its suitability to support plant growth (primarily grasses), tests must be made to determine the presence and the amount of organic matter, moisture content, inorganic matter (sand, silt and clay), pH, salt content, cation exchange capacity percentages and deleterious materials.

C. The presence in the soil of the correct nutrients, salts, and pH is necessary for healthy plant growth. This specification does not cover a determination of the nutrients, nor their availability.

D. Typical ranges of topsoil composition are presented in Table 1. Sils falling within these ranges will generally form a suitable topsoil. Soils being used as a topsoil with organic matter contents between 10 and 90%, may need to be amended prior to use. It must, however, be recognized that in some geographic regions, achieving the values in Table 1 could be difficult. In such cases, alternative specifications may need to be considered, or an engineered soil amendment meeting the requirements in Table 1 excluding the sand, silt, and clay content as those materials will come from the subsurface soil being amended. When using an engineered soil amendment, the organic matter values need to be >75% to help rebuild the subsoil layers.

E. Units – The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

F. All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice D6026, unless superseded by this test method.
   1. The procedures used to specify how data are collected/recorded and calculated in the standard are regarded as the industry standard. In addition, they are representative of the significant digits that generally should be retained. The procedures used do not consider material variation, purpose for obtaining the data, special purpose studies, or any considerations for the user's objectives; and it is common practice to increase or reduce significant digits of reported data to be commensurate with these considerations. It is beyond the scope of these test methods to consider significant digits used in analysis methods for engineering data.

TABLE 1 Specification for Topsoil and Engineered Soil Amendment

Property	Test Method or Technique	Requirement	
		Topsoil	Engineered Soil Amendment
pH	D4972	5.5-7.5	5.5-7.5
Organic Matter	D2974 (Method A)	3-10 %	≥75 %
Moisture Content	D2216 (Method A)	≤20 %	≤40 %
Material retained on 2.00 mm (No.10) sieve	D6913/D6913M (Method A)	<5 %	<5 %
Sand Content (Material passing 2.00 mm (No. 10) and retained on 0.075 mm (No. 200) sieve	D6913/D6913M (Method A)	20-60 %	...
Fines (silt and clay) Content (Material passing 0.075 mm (No. 200) sieve)	D6913/D6913M (Method A)	35-70 %	...
Total Dissolved Solids (TDS)	Saturated Past Extract	<960 ppm	<960 ppm
Soluble Salt Concentration	Saturated Past Extract	<2.5 mmhos/cm	<2.5 mmhos/cm
Potassium (K)	Ammonium Acetate Extraction	3-10 % CEC	...
Magnesium (Mg)	Ammonium Acetate Extraction	12-25 % CEC	...
Calcium (Ca)	Ammonium Acetate Extraction	55-75 % CEC	...
Sodium (Na)	Ammonium Acetate Extraction	<5 % CEC	...

1.4 PHYSICAL PROPERTIES

A. Table 1 presents the requirements the topsoil or engineered soil amendment must meet.

1.5 ACTION SUBMITTALS

A. SAMPLING AND TEST SPECIMENS

1. Take a representative sample of the topsoil following the guidance given Test Methods D691/D6913M for sampling and specimen preparation. The total amount of representative samples sample needed will vary based on the maximum particle size of the topsoil or engineered soil amendment under evaluation. Each test method typically specifies a minimum dry mass required to perform the test; therefore, the representative sample shall be of such quantity that the needed amount of material for each of the test specimens is obtained. (In general for a topsoil with a maximum particle size of 4.75mm, the representative sample is usually between 500 and 1000 g.)

2. Thoroughly mix the representative sample to make sure each of the test specimens are representative of the sample.

3. Select the test specimens to be tested following the specimen mass requirements given in the individual test methods listed in Section B.

B. TEST METHODS

1. Agencies are required to meet the criteria of Practice ASTM D3470 for objective testing/sampling/ inspection/ etc. Use a test specimen for each to determine the:

a. pH using test Methods D4672. Record the nearest 0.1 pH unit.

b. organic matter using Test Method D2974, Method A. Record to the nearest 1 %.

c. water content using Test Method D2216, Method A. Record to the nearest 1 %.

d. particle-size gradation using Test Methods D6913/D6913M, Method A. Record to the nearest 1 % the amount retained on the 2.00 mm (No.10 sieve), the amount of material passing the 2.00 mm (No. 10 sieve) and retained on the 0.075 mm (No. 200) sieve (sand content), and the amount of material passing the 0.075 mm (No. 200) sieve (fines content).

e. During soaking and washing, take care to agitate the specimen so that as much as practicable, the organic matter is decanted away.

f. total dissolved solids using the Staurated paste Extract method. Record to the nearest 1

ppm.

e. soluble salt concentration using the Saturated Paste Extrat method. Record to the nearest 0.01 mmhos/cm.

f. potassium using the ammonium acetate extraction method. Record to the nearest 1 % CEC.

g. magnesium using the ammonium acetate extraction method. Record to the nearest 1 % CEC.

h. calcium using the ammonium acetate extraction method. Record to the nearest 1 % CEC.

i. sodium using the ammonium acetate extraction method. Record to the nearest 1 % CEC.

1.6 INFORMATIONAL SUBMITTALS

A. CERTIFICATE

1. Prepare a certificate that includes pertinent information regarding the materials and testing performed. The certificate must include the results of the testing, the requirements listed in Table 1, and the status of the testing: requirement was or was not met.

END OF SECTION 329119

SECTION 329200
NATURAL TURF & SODDING

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, Hydroseeding, mulching and fertilizer.
2. Erosion-control material(s).
3. Temporary Maintenance.

B. Related Sections:

1. Section 013300 – Submittals and Substitutions
2. Section 311000 "Site Clearing" for topsoil stripping and stockpiling.
3. Section 312000 "Earth Moving" for excavation, filling and backfilling, and rough grading.
4. Section 312500 “Soil Erosion and Sedimentation Controls”
5. Section 329200 “Topsoil”
6. Section 329300 “Exterior Plants”

1.3 DEFINITIONS

A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

B. Finish Grade: Elevation of finished surface of planting soil.

C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

F. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and fertilizers to produce a soil mixture best for plant growth.

G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.

H. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.

I. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.

2. Seed Mix Data

3. Fertilizer Data

4. Weed Control Data

5. Maintenance Data: The Contractor shall furnish to the Owner and the Landscape Architect, a written schedule of advised maintenance procedures which the Owner should follow during the guarantee period. This will include a watering schedule which shows amounts of water to be applied and frequency of application for all contractual plant material and lawn areas. This schedule must be submitted prior to final acceptance by the Landscape Architect. The Owner will undertake no maintenance until the final acceptance. Final acceptance will be given upon completion of all work as defined in the contract and above conditions are met satisfactorily as determined by the Landscape Architect.

6. Application Records shall be submitted at the end of the project. See Execution Section for additional detail.

1.5 INFORMATIONAL SUBMITTALS

A. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass sod. Include identification of source and name and telephone number of suppliers.

B. Qualification Data: For qualified landscape Installer.

C. Product Certificates: For soil amendments and fertilizers, from manufacturer.

1.6 QUALITY ASSURANCE

A. Qualification of Workmen: Provide at least one person who shall be present at all times during execution of this portion of the work, who shall be thoroughly familiar with the type of materials being installed and the proper materials and methods for their installation, and who shall direct all work performed under this section.

B. A pre-installation conference may be called to address concerns related to timing, seasonal concerns, weather conditions, or execution.

C. Preliminary Investigations: The Contractor shall visit the site and make his own interpretation of conditions, based on his investigation of existing conditions and on soil conditions. Where underground services, utilities, structures, etc. are located on the drawings or given at the site, they are based on available records but are not guaranteed to be complete or correct. They are merely available for assistance.

D. Comply with regulatory agencies for fertilizer and herbicide composition.

E. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
2. Pesticide Applicator: State licensed, commercial.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Seed: Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

B. Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.

C. Give all tags to Construction manager for record

D. Deliver fertilizer and weed control products in waterproof bags showing weight, chemical analysis, and name of manufacturers.

E. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

1.8 PROJECT CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion. If field is irrigated with built system, planting restrictions do not apply and may be planted immediately.

1. Spring Planting: April 15 through May 15, within 55º - 75º soil temperatures.
2. Fall Planting: August 15 through September 15, within 55º - 75º soil temperatures.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

1.9 MAINTENANCE SERVICE

A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:

1. Seeded Turf: 180 days 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.

1.10 WARRANTY

A. All seeding shall carry a full replacement guarantee for one (1) full growing year from date of acceptance by Landscape Architect/Civil Engineer.

B. Any seeding that, in the opinion of the Landscape Architect/Civil Engineer, requires reseeding shall be reworked to meet the original specifications requirements.

C. The contractor will not be responsible for plant material that has been damaged by vandalism, fire, removal, relocation, losses due to abnormal weather conditions, non-irrigated areas or other activities beyond the Contractor's control.

PART 2 - PRODUCTS

2.1 SEED MIXTURES

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species: Seed of grass species as follows, with not less than 95 percent germination, not less than 90 percent pure seed, and not more than 0.5 percent weed seed:

(Specified seed varieties may be substituted for equal or better as approved by Landscape Architect/Civil Engineer)

1. Type "A" Mix: "EGS Pro Blue" (3-4 lbs. /1000)
[sun, athletic, irrigated, high-end]
29.34% Shannon Kentucky Blue Grasses
24.88% Lunar Kentucky Blue Grass
19.91% Salinas Perennial Ryegrass
9.96% Gray Star Perennial Ryegrass

2. Type "B" Mix "EGS Green Grounds" (4-6 lbs. /1000)
[fine lawn, high-end residential/commercial w/ irrigation & fertilizer programs]
19.91% Shannon or Avalanche Kentucky Blue Grass
19.90% Lunar or Blue Star Kentucky Blue Grass
19.82% Corsair or Gaelic Kentucky Blue Grass
19.96% Showtime or Salinas Perennial Ryegrass
19.92% Gray Star Perennial Ryegrass

3. Type "C" Mix: "EGS Quality 50/50" (4-6 lbs. /1000)
[fine lawn, residential, general purpose sports fields, overseeding]
24.94% Sox Fan or Showtime Perennial Ryegrass
19.78% Secretariat II GLSR or Gray Star Perennial Ryegrass
14.94% Blue Bonnet or Avalanche Kentucky Blue Grass
14.93% Lunar or Blue Star Kentucky Blue Grass

14.85% Shannon or Gaelic Kentucky Blue Grass

4. Type “D” Mix: “EGS Plus” (4-6 lbs. /1000)
[front lawn, improved MDOT, appear, perf.]
29.75% Oracle Creeping Red Fescue
14.94% Shannon Kentucky Blue Grass
14.93% Lunar Kentucky Blue Grass
19.93% Sox Fan Perennial Blue Grass
19.81% Showtime Perennial Ryegrass

5. Type “E” Mix: “EGS Tuff Grounds” (8-10 lbs. /1000)
[drought, non-athletic, playground, fringe area, low maintenance]
29.22% Green Hornet Turf Type Tall Fescue
29.83% Meridian Turf Type Tall Fescue
19.81% Rover Turf Type Tall Fescue
9.94% Gallop Perennial Ryegrass
9.91% Gaelic Kentucky Bluegrass

6. Type “F” Mix: “EGS MDOT Class A” (6-8 lbs. /1000)
[roadside]
40% Creeping Red Fescue
30% Kentucky Blue Grass
30% Perennial Ryegrass

7. Type “H” Mix: EGS HD 2.0 PLUS Sports Field Mixture (4-5 lbs. /1000)
[World Cup athletic Grass]
24.80% Benchmark or Sox Fan Perennial Ryegrass
24.61% Salinas or Exacta II Perennial Ryegrass
19.87% Shannon Kentucky Blue Grass
14.93% SPF 30 Kentucky Blue Grass
14.87% Hampton Kentucky Blue Grass

8. Type “I” Mix: Shady Supreme Seed Mixture (4-6 lbs. /1000)
[rough, non-irrigated, gen. purpose, no foot/veh. traffic, not attractive]
51.16% Marvel Creeping Red Fescue
19.49% Gaelic Kentucky Blue Grass
9.97% Minimus Hard Fescue
9.96% Woodall Chewings Fescue
9.94% Spark Perennial Ryegrass

2.2 SOD

A. Sod shall be nursery grown Kentucky Bluegrass with an equal mixture of at least three(3) varieties: Merion or Fylking/ Kentucky Bluegrass shall NOT be included.

B. Sod shall be cut at a uniform soil thickness of 0.625", plus or minus 0.250", at the time of cutting. Measurement for thickness shall exclude top growth and thatch. Supplier standard width and length.

C. Sod shall be mowed uniformly at a height of 2.0-2.5" before harvesting. Sod shall not be harvested or transplanted when moisture content (excessively wet or dry) may adversely affect survival. Sod shall be harvested, delivered and transplanted within a period of 36 hours of installation.

2.3 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 15% percent derived from natural organic/(insoluable) sources of urea formaldehyde, phosphorous, and potassium in the following composition:

B. Provide a commercial balanced fertilizer delivered to the site in bags labeled with the manufacturer's guaranteed analysis. If stored at the site, protect fertilizer from the elements at all times.

1. Fertilizer "A": applied at the time of seeding at 50 lbs. per 8000 square feet.
   a. 16-32-4 (14.3% Ammoniacal Nitrogen, 1.7% Urea Nitrogen, 32% Phosphorous, 4% Available Potassium)

2. Fertilizer "B": applied 3-4 weeks after seeding at 50 lbs. per 10,000 square feet.
   a. 22-16-6 (6.3% Ammoniacal Nitrogen, 15.7% Urea Nitrogen, 16% Phosphorous, 6% Soluble Potassium.

3. Fertilizer "C"; *Alternate* applied in addition to Fertilizer "A" at seeding and Fertilizer "B" at 3 week application at 50 lbs. per 3,500 square feet.
   a. Healthy Grow 4-2-2 (2.15% Ammoniacal Nitrogen, 1.85% Water Insoluble Nitrogen, 2% Available Phosphorous, 2% Available Potassium, 8% Calcium, 0.8% Sulfur, complete Mycorrhiza and Bacterial Package, sea plant meal, molasses meal, yacca extract.

   [apply to areas that must be done successfully = athletic, playgrounds, high-end, high visibility]

C. Crabgrass Control:
1. Starter: Mesotrione (5 oz acre) – to be added to the Hydromulch mixture at seeding in all seed mixes with less than 25% fescues.
2. Maintenance: Quinclorac (1 lbs. /acre) to be sprayed as a post emergent.

D. Weed Control: Trimec 92, T-Zone, Horsepower, Surge or comparable. Submit product data to Landscape Architect/Civil Engineer for review.

2.4 SOIL MATERIALS

A. Planting Soil: Topsoil to be fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, and taken from drained site. It is to be free of subsoil, clay or impurities,

plants, weeds, roots, sod, stones and other extraneous materials harmful to plant growth with a pH value of minimum 6.4 and maximum 7.6. Minimum depth to be 6" in planting beds, or 4" min. in turf areas unless otherwise noted in Topsoil and Exterior Planting Specification Sections.

1. A complete soil test must be submitted to a reputable soil testing facility prior to being spread on site to identify any nutrient deficiencies and determine soil pH levels.

B. See soil specification section 329200 "Topsoil" for expanded needs and details.

2.5 MULCHES

A. All Mulches shall be free from noxious weeds and foreign materials.

1. Hydromulch: Deliver to the site in sealed containers with manufacturer's guaranteed analysis. All seeding shall be hydromulched after drill seeding.

a. Hydromulch shall be a minimum of 20-40% recycled paper and 60-80% thermos-mechanically processed wood fiber.

b. Hydromulch shall include a polymer tactifier.

2. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

3. Peat mulch in first paragraph below may be required if seeded turf is subject to hot, dry weather or drying winds within 30 days of planting.

4. 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.

5. Fiber mulch in paragraph above and nonasphaltic tackifier in first paragraph below are primarily used to protect hydroseeded areas from wind and water erosion during establishment.

6. Non-asphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturers for slurry application; nontoxic and free of plant-growth or germination inhibitors.

B. Apply a water absorbent aqua gel as a moisture manager to all non-irrigated areas that have been seeded.

C. Asphalt emulsion in paragraph below may be used as a tackifier in a hydroseeding slurry or to temporarily bond straw mulch in place.

2.6 PESTICIDES

A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

2.7 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.

C. Erosion-Control Mats: Cellular, non-biodegradable slope-stabilization mats designed to isolate and contain small areas of soil over steeply sloped surface, of 3-inch nominal mat thickness. Include manufacturers' recommended anchorage system for slope conditions.

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

a. Invisible Structures, Inc.; Slopetame 2.
b. Presto Products Company, a business of Alcoa; Geoweb.
c. Tenax Corporation - USA; Tenweb.

D. Hydromulch slopes greater than 1: 4.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel,

paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.

2. Do not mix or place soil and soil amendments in frozen, wet, or muddy conditions.
3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

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

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
2. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soil and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TOLERANCE

A. Sodded areas will be allowed a tolerance of 0.1 foot.

B. Slope for drainage over turf areas shall have a minimum grade of 1.0%.

C. Sodding shall not be done on soil that has been chemically treated until sufficient time has elapsed to permit dissipation of all toxic materials. The Contractor shall assume full responsibility for any loss or damage to turf arising from improper dissipation of toxic residues, whether or not such materials are specified herein.

3.4 TURF AREA PREPARATION

A. Limit turf subgrade preparation to areas to be planted.
B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Spread planting soil to a depth of 6 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet. Final planting soil compaction must not exceed 85 percent.

a. Spread approximately 1/2 the thickness of planting soil over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil.

b. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:

1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.

2. Loosen surface soil to a depth of at least 8 inches. Apply soil amendments and fertilizers as instructed and mix thoroughly into top 4 inches of soil. Till soil to a homogeneous mixture of fine texture.

3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.

4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

E. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

F. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.5 PREPARATION FOR EROSION-CONTROL MATERIALS

A. Prepare area as specified in "Turf Area Preparation" Article.

B. For erosion-control mats, install planting soil in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.

C. Fill cells of erosion-control mat with planting soil and compact before planting.

D. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.

E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.6 FERTILIZING

A. Apply fertilizer in accordance with Manufacturer's/Distributer's instructions.

B. Apply starter fertilizer after smooth raking of topsoil and prior to roller compaction.

C. Do not apply fertilizer at same time or with same machine as will be used to apply seed unless combined together in the hydromulching mixture.

D. Fertilizer "A": Apply starter fertilizer at time of planting.

E. Fertilizer "B": Apply three (3) weeks and seven (7) weeks after planting.

F. Notify in writing the Owner of future fertilization requirements when grass has been approved by Landscape Architect/Civil Engineer.

[Note #1 – Alternate. In situations where rapid establishment is required or stress potential is high due to temperature (mid-summer seeding), include applications of Fertilizer "C" in Section 2.2 Healthy Grow 4-2-2 (50 lbs. /3500 sq.) at seeding in addition to 16-32-4, and with the 3 week application in addition to the 22-16-6.]

3.7 SEEDING

A. Drill Seed: All seeding shall first be drill seeded to ensure soil contact. Seed in two separate directions at opposing 45 degree angles.

B. Apply seed at the Application Rate noted in Section 2.1.

C. Do not seed areas in excess of that which can be mulched on same day.

D. Do not sow immediately following rain, when ground is too dry, or during windy periods.

E. Immediately following seeding and compacting, apply mulch at the rate indicated in Section 3.8. Maintain clear of all other objects.

F. Following germination, immediately re-seed areas without germinated seeds that are larger than 8 by 8 inches.

3.8 SODDING

A. Lay the first row of sod in a straight line with subsequent rows, placed parallel too and tightly against each other. Lateral joints shall be staggered. Be sure that the sod is not stretched or overlapped and that all joints are butted tightly in order to prevent voids, which would cause air drying of the roots.

B. Water sod immediately after transplanting to prevent drying during progress of the work. As sodding is completed in any one section, the entire area shall be rolled. It shall then be

thoroughly watered to a depth sufficient that the underside of the new sod pad and soil immediately below the sod is thoroughly wet. Contractor will be responsible for having adequate water available at the site prior to, and during transplanting the sod for the establishment of the turf.

C. During the first week, provide all labor and arrange for all watering necessary for rooting in the soil. Soil on sod pads shall be kept moist at all times. For the second and subsequent weeks, water the sod as required to maintain adequate moisture in the upper 0.4 feet of soil to promote deep root growth.

3.9 HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. For all non-irrigated areas, slit seeding shall happen first before application.

2. Mix slurry with fiber-mulch manufacturer's recommended tackifier.

3. Apply slurry uniformly to all areas to be seeded. Apply slurry at a rate so that mulch component is deposited at not less than 2000-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate.

3.10 HYDROMULCH

A. Apply seeded slurry with a hydraulic seeder at a rate of 1,750 lbs. per acre evenly after drill seeding.

B. Do not Hydromulch area in excess of that which can be mulched on same day.

C. Allow Hydromulch to dry and bond to the soil prior to beginning watering program.

3.11 PROTECTION

A. Identify seeded areas with stakes and string around area periphery. Set string height to 36 inches. Space stakes at 20 ft. max.

B. Cover seeded slopes with erosion fabric as noted on plans or if required.

3.12 TURF MAINTENANCE

A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and

replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

3.13 MOWING SEED

A. When grass reaches 2.5” in height, mow to 2” in height. Maintain grass between 2” and 2-1/2” in height. Do not cut off more than 30% of grass leaf in single mowing. Do not remove grass clippings.

B. A minimum of four (4) mowings will be required, or until turf is accepted.

C. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet.

3.14 MOWING SOD

A. The Contractor shall provide first mowing when the sod is firmly rooted and secure in place.

B. Clippings shall be removed from the sod.

C. The duration of maintenance responsibilities shall be for 30 days after installation. Additional mowings by the Contractor may be required.

3.15 WEED CONTROL

A. Apply herbicides 1-2 days after the fourth mowing. Apply herbicide to control weed growth per manufacturer’s label rates.

B. 4 weeks after germination with adequate moisture for post-emergent herbicide; use Quinclorac for grassy weeds and Three-Way for broadleaf weeds.

3.16 IRRIGATION

A. Contractor shall closely monitor watering of newly seeded areas. Seed must be kept moist at all times. Multiple light waterings per day as weather dictates. Watering must be monitored carefully to avoid overwatering/standing water. Watering times are to be adjusted frequently to maintain adequate moisture levels at all times until complete grass establishment is achieved and accepted by Landscape Architect/Civil Engineer.

3.17 APPLICATION RECORDS

A. Contractor shall notify and clarify with Construction Manager all fertilization applications, weed control applications, etc. at time of application. This information shall be written down and logged in the trailer on a daily basis. Seed mix tags, fertilizer bag tags, weed control tags, and Hydromulch tags shall be submitted to Construction Manager prior to daily installation.

3.18 MAINTENANCE

A. Provide maintenance as required by this specification at no additional cost until seeding has been accepted by the Landscape Architect/Civil Engineer.

B. Neatly trim edges and hand clip where necessary.

C. Water to prevent grass and soil from drying out. Coordinate with Owner.

D. Control growth of weeds. Apply herbicides in accordance with manufacturer’s instructions. Remedy damage resulting from improper use of herbicides.

E. Immediately reseed areas that show bar spots.

F. Protect seeded areas with warning signs during maintenance period.

G. Weed kill all areas where grass is growing in beds, sidewalk cracks, maintenance strips, etc.

3.19 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Landscape Architect/Civil Engineer:

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 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.20 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.21 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. If seeding operations result in tracking or spilled material on paved surfaces the Contractor will be required to sweep and wash surfaces.

B. 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. Remove all barriers and signs from project site at termination of establishment period.

C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION 329200